ISSUE 110 • FINAL

EUROPEAN OIL&GAS

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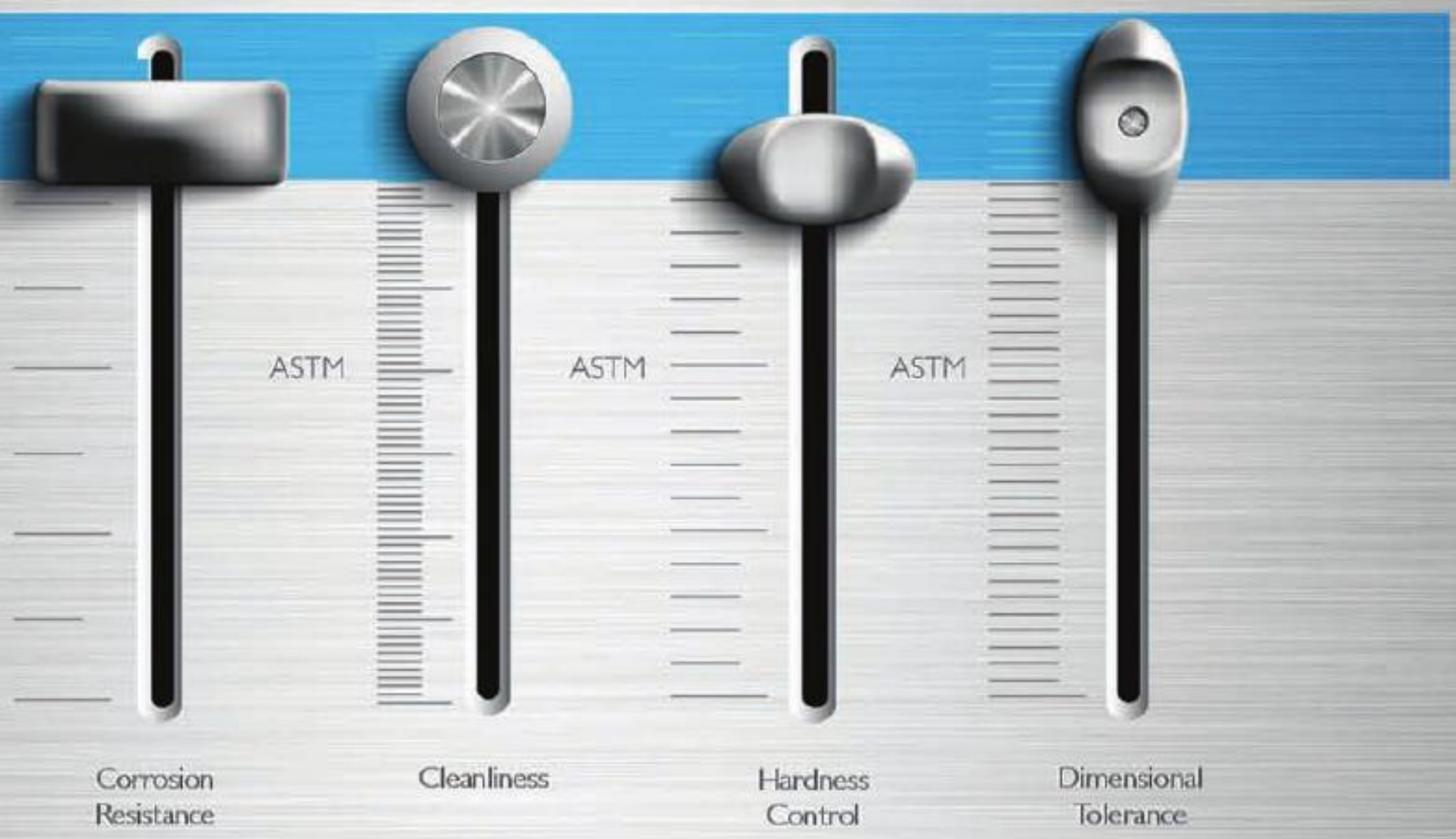
Sanctioned growth

The serious consequences of breaching sanctions and embargoes

Devil in the detail
Details matter when it comes to early stage developments

Designed for life
The IT design challenges and trends facing the industry

THIS ISSUE: Flow measurement and optimisation



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> The exposure to sanctions and embargoes legislation, and breaches thereof is immense"

In recent years sanctions and embargoes related to oil and gas have become a focal point for politicians, the press and public and commercial enterprises.

We are all aware of the socio-political impacts of sanctions; particularly as such embargoes have been in place against countries like Iran for some years. But in practice how does this impact oil and gas companies?

It's this issue that we look at in our lead feature in this edition, as Toby Duthie of Forensic Risk Alliance addresses the complexities of operating in areas of risk and the consequences of breaking, either willingly or unwillingly, these sanctions. "Oil and gas companies tend to be huge corporate entities," he explains. "They are often multinationals dealing internationally across a broad range of territories and jurisdictions. The exposure to sanctions and embargoes legislation, and breaches thereof is immense."

Consolidation of the industry in recent years has only exacerbated the problem, and as Toby goes on to explain there are serious risks of breaching sanctions throughout an oil and gas business. Compliance and transparency is key, so turn to page four for valuable advice.

EDITORS LIBBIE HAMMOND & MATT HIGH

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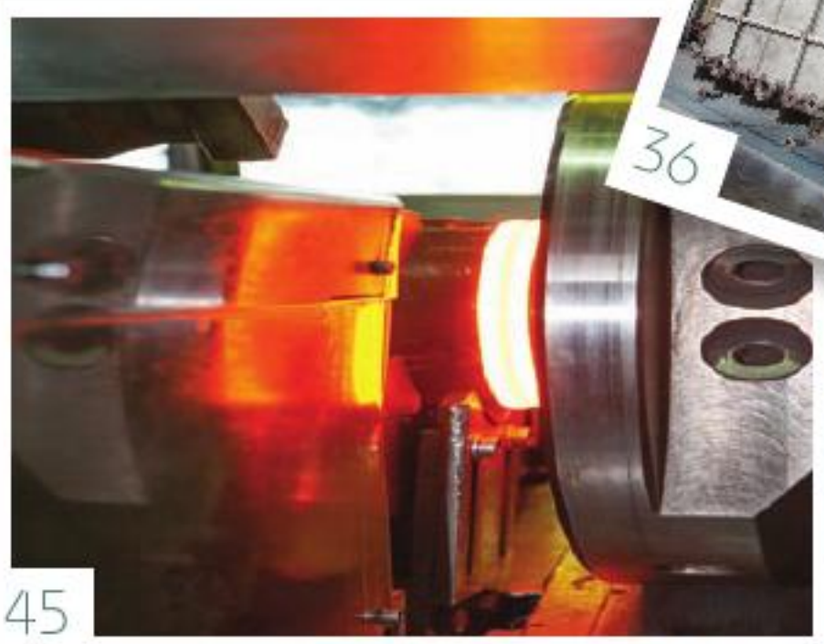
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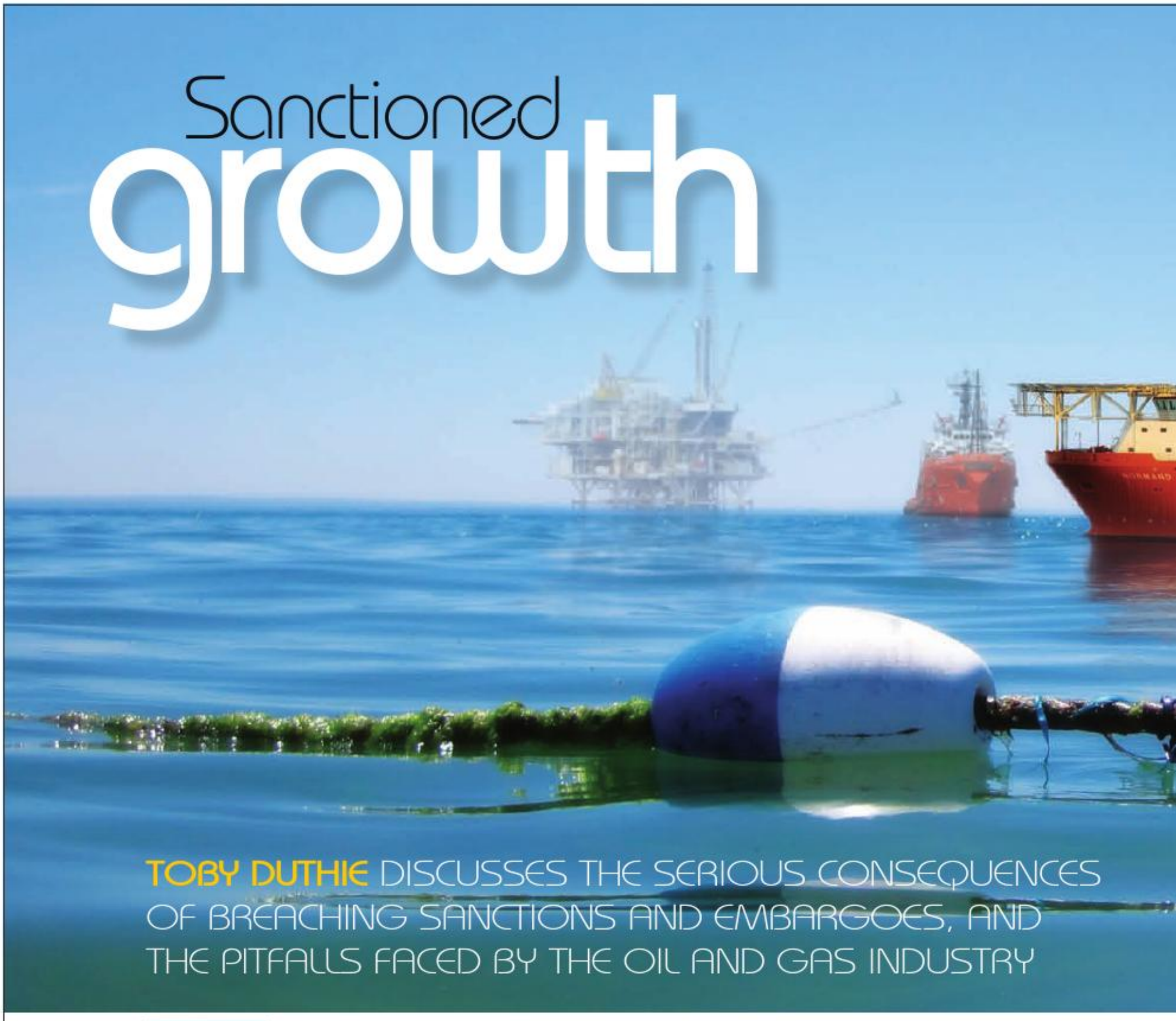


TOBY DUTHIE DISCUSSES THE SERIOUS CONSEQUENCES OF BREACHING SANCTIONS AND EMBARGOES, AND THE PITFALLS FACED BY THE OIL AND GAS INDUSTRY

US and EU Sanctions have isolated Iran financially for many years by precluding any financial transactions (insurance, banking, energy business, etc.) with Iranian persons or entities. EU Council Regulation 961 of 2010, for example, specifically "prohibits the provision of insurance or reinsurance to the Government of Iran, an Iranian person, entity or body and to any natural person or legal person acting on behalf of or at the direction of an Iranian person."

With the recent announcement of an interim agreement easing USD 7 billion of sanctions against the Islamic Republic of Iran in return for the regime curbing some of its nuclear activities, sanctions have again become a focal point for politicians, the press, and the public and commercial enterprises alike.

The agreement was negotiated by "The P5+1" (the 5 permanent members of the UN's Security Council plus Germany with the EU in attendance) and marks significant progress since the US and EU's imposition of sanctions against Iran in 2010.

However, it is not yet possible to assume that business with Tehran will 'normalise' in the short term. While the interim agreement prohibits new sanctions, it is still just that: an interim agreement. If the P5+1 are not satisfied with Iran's progress then even stricter sanctions may come into force. To quote US Secretary of State, John Kerry: "If they fail, sanctions will be increased". Moreover, as Daniel Martin, a partner who has specialised in sanctions for several years at the London-headquartered law firm Holman Fenwick Willan, says: "So far, there has been no EU or US lessening of sanctions against Iran at all and, indeed, Iran has suggested that recent designations and draft legislation in the US goes against the letter (or at least the spirit) of the Geneva accord."

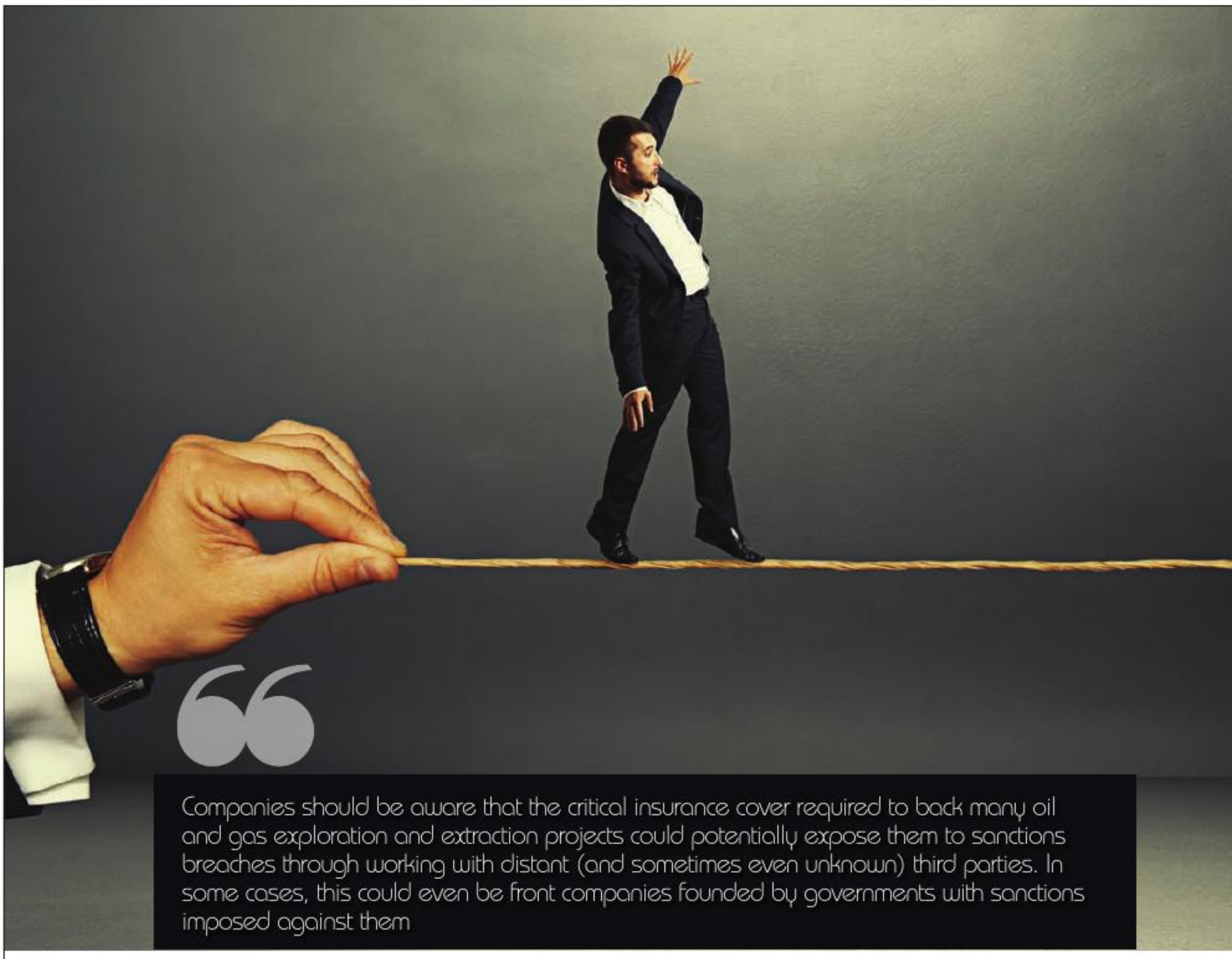
The consequences of breaching sanctions and/or embargoes are extremely serious and severe. Aside from the hefty fines that can be levied, there are the huge costs incurred in investigations – legal costs in defending prosecutions, business interruption, and loss of profits if the relevant authorities order business activity to be suspended or cease entirely. There is also the ultimate cost: the loss of one's liberty if a custodial sentence is imposed. This is the

harsh reality facing anyone who breaches sanctions, whether deliberately or inadvertently.

Given the high-profile nature of sanctions, most oil and gas sector companies are prone to a knee jerk reaction, thinking it would be inconceivable for them to breach sanctions legislation; i.e. "It could never happen to me". When asked what measures they have to mitigate the risks of sanctions breaches, most typically answer, "We don't deal in sanctioned territories or with designated persons or entities." Be that as it may, it could ultimately be a perilous approach to the problem. For example, how can one be sure – in the complex transactions that form upstream, midstream and downstream contracts – that there is not a designated person or entity (DP) in the chain? It is important to put in place controls that evidence consideration of the key risks and attempts to mitigate and avoid breaches – intentional as well as the more arcane unintentional.

European companies had originally planned multi-billion dollar investments to develop Iran's vast oil and gas reserves. Iran needed the technology to develop and fully exploit its reserves, so the fact that the US had imposed restrictions on its own nationals and companies from trading with Iran for nearly two decades lessened the competition and forced Iran to think about other ways of getting hold of that expertise. However, recent EU legislation – and the disincentive that any European company's US interests may be put in peril for dealing with Iran – has stifled any investment plans. Nonetheless, because of the massive potential revenues involved, there is a huge temptation for western companies to breach or attempt to circumvent sanctions. Moreover, it is not unheard of for Iranian companies to set up fronting or "dummy" companies in other non-sanctioned territories in the Middle East as a way of getting around Western sanctions and recruiting their missing expertise. This, of course, brings into play all kinds of money laundering issues and can lead to companies attempting to circumvent sanctions, or breaking them unknowingly, both of which are an offence.

Appreciably, with the long-established US Foreign Corrupt Practices Act (FCPA) and the UK Bribery Act, which came into force in the summer of 2011, some companies have gone a little way to implementing improved anti-bribery and corruption measures, as well as an increased vetting of



Companies should be aware that the critical insurance cover required to back many oil and gas exploration and extraction projects could potentially expose them to sanctions breaches through working with distant (and sometimes even unknown) third parties. In some cases, this could even be front companies founded by governments with sanctions imposed against them

direct counterparties, to ensure that they are not DPs. The problem, however, is that the concentration tends to be on gifts and entertainment, third party payments and only direct counterparties or dealings. Essentially, the accusation can be (and often is, by regulators) that the due diligence conducted has not gone far enough, deep enough or wide enough.

Oil and gas companies tend to be huge corporate entities. They are often multinationals dealing internationally across a broad range of territories and jurisdictions. The exposure to sanctions and embargoes legislation, and breaches thereof, is immense. Furthermore, the consolidation in the energy sector over the last few years, as well as dealings with a vast array of counterparties (vendors, distributors, advisers, etc.), only exacerbates the problem. Furthermore, in the oil and gas sector, whistleblowing policies seem to be very rudimentary and under-developed. Does the average employee know his or her own organisation's whistle blowing policy, and what to do should the need arise? Would they even have the confidence to 'blow the whistle' without fear of reprisals or recriminations for their job security?

Another area of concern is data handling and management. Those working on the administration of the oil and gas companies have to deal with a huge amount of data, often stored on various incompatible systems, but the management and oversight of this data can sometimes fall short of regulators' expectations. The various systems often do not complement each other, nor do they work in concert. This is a potential recipe for disaster and a damning indictment when trying to evidence to the authorities the analysis of one's own management information.

Companies should be aware that the critical insurance cover required to back many oil and gas exploration and extraction projects could potentially expose them to sanctions breaches through working with distant (and sometimes even unknown) third parties. In some cases, this could even be front companies founded by governments with sanctions imposed against them. For example, many commercial insurance transactions will involve the client insured, a local agent and/or introducer and/or a producing broker, a placing broker and finally the insurer in a placing contract. A claim can involve the insurer, the placing broker, the local agent (and/or introducer and/or producing broker), a loss adjuster and finally the client insured and/or nominated loss payee. With this in mind, it is absolutely crucial that your Know Your Client (KYC) and Anti-Money Laundering (AML) measures are fully up to speed.

A further problem is raised when dealing with a counterparty or client that may be owned or controlled

by a DP. This may not be obviously apparent and, in the UK, Her Majesty's Treasury's (HMT) guidance does little to shed light on or clarify the matter. Its FAQ guidance notes state: "There is no absolute legal rule as to when an entity is owned or controlled by another. The matter must be subject to a case-by-case evaluation, taking into account the degree to which the entity concerned is owned or controlled." So, the guidance hardly sets down any reassuringly clear lines of demarcation within which one can safely navigate.

Nor does there have to be any direct or indirect payment or remittance of funds to a DP: the UK's Iran (European Union Financial Sanctions) Regulations 2012 state a "person ("P") must not make funds available to any person for the benefit of a designated person if P knows, or has reasonable cause to suspect, that P is making the funds so available".

Therefore, the complex subject of sanctions and embargoes is something of a broad and long minefield that is precarious to traverse. What, then, are the remedies and potential solutions? As stated above, your KYC and AML measures must be robust, regularly reviewed and regularly updated to conform to each regulatory regime in which, or through which, you transact business. This, in turn, should complement and feed into comprehensive Anti-Bribery & Corruption (ABC) policies and procedures. Your Financial Crime team should keep a regular watch over sanctions legislation and enact systems and controls accordingly.

It is important to remember that sanctions and embargoes legislation, the designation of individuals and entities, and the penalties ensuing for any actual or alleged breach is a constantly "moving feast". Take the examples of Myanmar and Zimbabwe, where sanctions have eased, compared to the likes of North Korea and Syria, where they are increasingly tightening.

Even if there are no direct dealings with sanctioned or embargoed regimes or individuals and/or entities therefrom, you have to be sure and evidence to the various regulatory authorities that there are no DPs standing behind the individuals and entities with whom you deal.

In a market that is subject to constant consolidation, the due diligence that is applied during mergers and acquisitions must also be accompanied by a comprehensive due diligence in respect of ABC risks. A vital component in the struggle to steer along the right path is to acquire, on a regular basis, independent advice, guidance and verification of your systems and controls. Employ external, iterative transactional testing to provide this verification. Organise your data across all databases into a readily available, easily understood format. This will help to identify any anomalies and/or discrepancies, which, in turn, should prove to be rectifiable exceptions rather than systemic failings.

With the "top-down, bottom-up" approach that regulators expect to see, there must be buy-in to this compliance culture from the board downwards and a familiarity across the spectrum of the organisation: from the chairman and CEO to the intern. Be aware of everyone's responsibility to be compliant and beware at all costs of missing, ignoring or being wilfully blind to any issues.

The regulatory authorities in the US, UK, EU and around the world are taking a keen interest in the oil and gas industry due to its massive financial impact and its global reach. Do not be tomorrow's front-page headline simply because you do not believe the subject matter applies to you.

Above: Sami Halfawi, new regional manager for the Middle East at Wood Group Intetech

Bringing experience

Wood Group Intetech (WGI), the world leader in well integrity, has appointed Sami Halfawi to the position of regional manager for the Middle East. He brings over 40 years industry experience to WGI having held roles with both ADMA OPCO and Weatherford covering a wide range of disciplines, including both well integrity management and business development.

"Wood Group Intetech is at a critical growth point, with our unique approach to well integrity management winning contracts globally," commented Dr Liane Smith, managing director and founder of Wood Group Intetech. "The Middle East has long been a mainstay of Wood Group Intetech's business focus and Halfawi's dual disciplines of business development and well integrity management will allow us to service more companies in this important region."

As a fluent French, English, German and Arabic speaker, Halfawi also brings impressive linguistic skills to the position, enabling smooth client contact across the globe. He said: "I first came into contact with Wood Group Intetech during my time at Weatherford. I was struck by the team's specialised knowledge, client service focus and commitment to preventing well failures. I am delighted to be joining as the company continues its impressive growth curve."

Century of success

This year ExxonMobil's Equipment Builder Group, dedicated to helping optimise the performance of machinery and equipment in the oil and gas industry, is celebrating its 100th anniversary. The Group specialises in working alongside leading original equipment manufacturers (OEMs) in more than 150 countries around the world to develop high-performance lubricants which can help oil and gas companies to improve the safety, environmental awareness and productivity of their operations.

Established in 1914, the Equipment Builder Group has helped OEMs maximise industrial equipment performance and design. Comprised of technical experts and engineers with backgrounds across many disciplines, the Group is often involved with OEMs from the start of equipment conception through to design and construction. This unique level of insight, from the ground up, enables the team to develop recommendations on formulating lubricants that help to optimise the performance of equipment.

"For 100 years, ExxonMobil's Equipment Builder Group has been helping leading oil and gas OEMs develop new equipment, which can help to improve their customer's operations. Today the Group continues to dedicate significant resources to build innovation-led relationships with equipment builders worldwide and develop lubricants which will help industrial organisations optimise the performance of their operations today and into the future," said Rainer Lange, Mobil SHC brand advisor - Europe, Africa & Middle East, ExxonMobil Fuels & Lubricants.

Air support

Statoil (UK) Limited has awarded the helicopter transportation contract for the Mariner field to CHC Helicopter in the UK. The contract calls for CHC to operate two Sikorsky S-92 aircraft on behalf of Statoil. The helicopters will fly from Aberdeen or Sumburgh on the Shetland Isles to the Statoil operated Mariner field, 250 kilometres off the northeastern coast of Scotland. The contract has a duration of five years, plus an extension option for up to three years. The service is anticipated to begin in mid-2016.

"We are pleased to have entered into this contract, meeting our needs for safe and efficient transportation to the Mariner field, our first operated field development on the UK Continental Shelf (UKCS)," said Gunnar Breivik, managing director of Statoil Production UK and head of the company's Aberdeen office. "We will have substantial offshore activity as the Mariner project enters the hook-up and commissioning phase in 2016 and production starts in 2017."

CHC Helicopter regional director Mark Abbey said: "We're proud to partner with Statoil as they start up operations in the UK sector. Our pilots, engineers and support teams will be using their extensive experience of the North Sea environment to help Statoil to go further, do more in the Mariner field, and come home safely".

Above: Reef Despina working on the Angus Pipeline project

Milestone project

Technocean Subsea has successfully completed a milestone decommissioning scope of work on the Angus Pipeline PL1857 Flushing project for global energy company, HESS Limited. The company has also further executed a second successful campaign for the client, which was completed in April.

Technocean Subsea deployed the Reef Despina construction support vessel to complete the first workscope, which took place in the Fife, Fergus, Flora and Angus fields, commonly known as FFFA, located in the central North Sea in water depths of 70 metres.

As part of the phased decommissioning programme, Technocean Subsea performed the removal of the PL1857 pipeline contents with ROV assistance and delivered a filtration package, suction pump and associated down lines to evacuate pipeline contents to the vessel. Technocean Subsea delivered a multi-skilled team to ensure project completion, flushing 290m3 of diesel from the Angus pipeline and recovering this content to deck with a flushing result of 180m3 pure diesel.

Following the successful engineering and management of Technocean Subsea's first decommissioning project of this kind, the specialist subsea contractor was awarded a further decommissioning workscope with HESS Limited. Again, supporting the Angus Pipeline PL1857 Flushing project, Technocean Subsea undertook the recovery of an 80 tonne wellhead protection structure which was successfully completed this month. Both the campaigns were executed safely and efficiently.

Advanced technology

Rapidly growing subsea services and technology products company Cortez Subsea has been granted a UK patent for its Modular Pipelay System, making new shallow water pipelay technology available to the North Sea for the first time.

The culmination of three years of research and development to bring the technology - a collaboration between Cortez Subsea and NOV Tuboscope Zap-Lok - to the marketplace, the first trials will get underway at the beginning of 2015 and will see Cortez Subsea build on its current six-figure investment over the next six to 12 months.

"This is a significant step in the development of our company towards advancing technology and maximising value for the subsea market," said Cortez Subsea managing director, Alasdair Cowie.

"The Zap-Lok connection, which has been used onshore and offshore for over 40 years, has gone through significant testing and is now approved by a number of major and independent oil and gas companies who see the advantage of the Zap-Lok technology. We are now progressing towards fabrication and trials of the first of the units for operations at the beginning of 2015."

Dynamic solutions

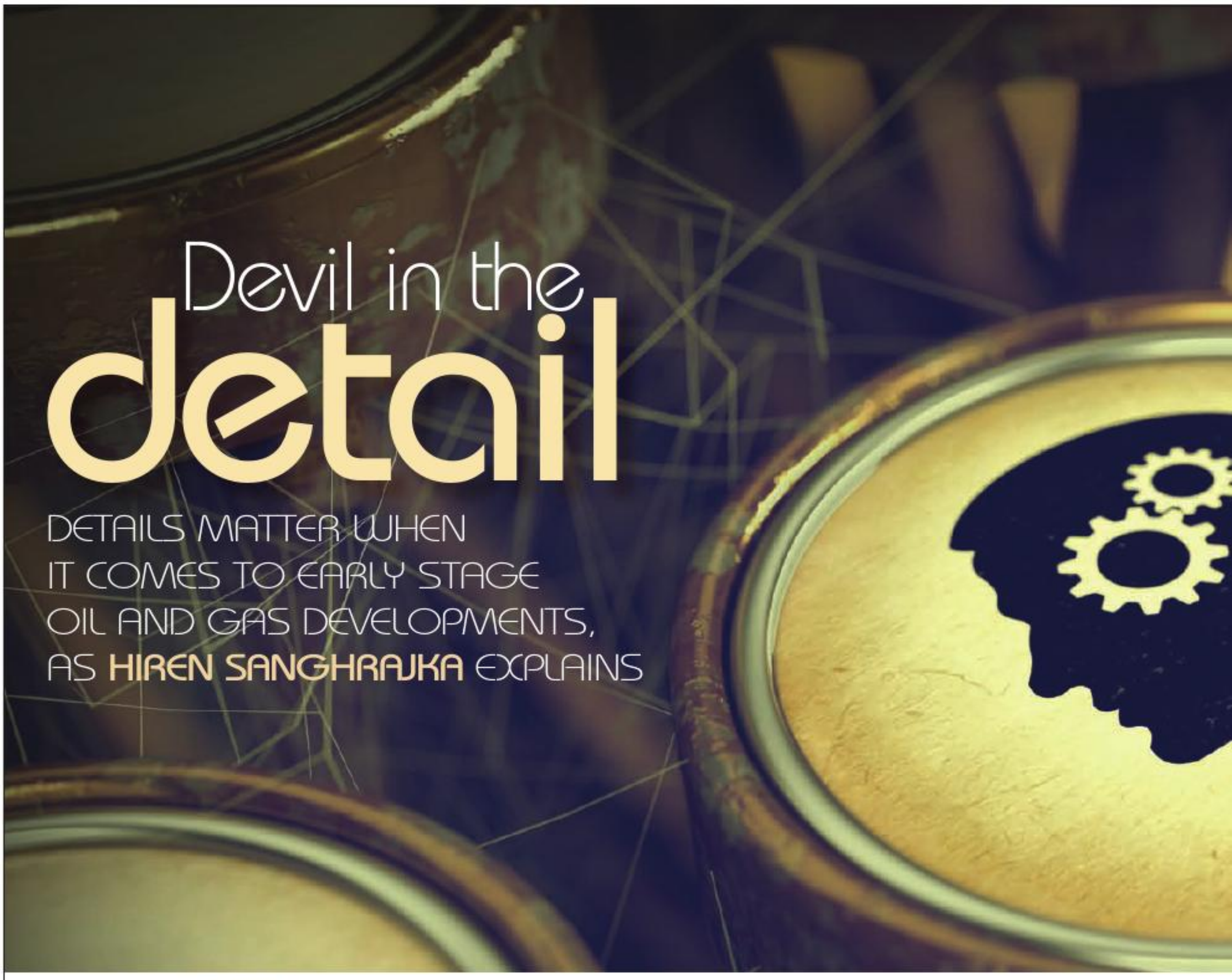
Oil and gas extraction on the Norwegian continental shelf has been given a boost after Nexans recently delivered the first of four "Statoil Standard" umbilicals ordered by the company in 2012. The first umbilical will be employed at the Oseberg Delta field in the Norwegian part of the North Sea.

The "Statoil Standard" umbilicals are made up of electrical and fibre optic cables, in addition to hydraulic and chemical lines. In December 2012 Nexans was awarded a contract from Statoil to supply static and dynamic umbilicals for three developments on the Norwegian continental shelf: Oseberg Delta field (North Sea), Snøhvit gas field (Barents Sea) and Smørbukk South (Norwegian Sea). In the autumn of 2013 the contract was extended to include the delivery of umbilicals for the Gullfaks Rimfaks Valley gas field. In total, Nexans will provide 50 kilometres of static and dynamic umbilicals.

"Over the course of the Oseberg project, Nexans has created a simplified 'package solution', custom designed to meet Statoil's administrative and technical requirements. In management and engineering, standard procedures and cost-effective solutions have been developed and can be repeatedly used on future projects," says project manager Liv Molvik Lundegaard of Nexans.

Devil in the detail

DETAILS MATTER WHEN IT COMES TO EARLY STAGE OIL AND GAS DEVELOPMENTS, AS **HIREN SANGHRAJKA** EXPLAINS



A shock profit warning issued by one of the oil majors at the beginning of this year has brought into sharp focus just how changeable the commercial landscape for oil and gas production has become. With costs soaring for many of the new megaprojects tapping petroleum deposits, industry commentators warn that even though oil prices are high, profits at operators are likely to be down when annual results are announced.

Notwithstanding the fact that resource estimates are highly variable in the early stages of exploration and pilot development, the fact that the 'easy oil' is gone and oil majors are having to go farther and deeper to find new reserves has meant oil and gas companies are also having to dig deeper into their pockets to cover capital costs. Moreover, the commercial environment is influenced by multiple factors that can drive rapid change. These include extreme weather, civil issues, varying demand, and market sentiment.

Those responsible for managing the early stage planning process must take into account a multitude of risks and build-in time and cost contingencies accordingly. However, a greater understanding of each risk is necessary than in the past because the environment can alter rapidly. What might have seemed fairly inconspicuous during the early stage of a development can suddenly become a potential point of failure during project delivery and execution.

For example, a plethora of consents and approvals are required before a development is sanctioned to proceed. In new development regions this has often been assumed to be achievable through 'political' actions by supporters of the development, but often proves otherwise, and time and cost overruns can quickly escalate as a result.

Investigations show that all too often, projects encountering issues during the later stages have done so as a result of factors listed on the risk register during the pre-decision process. However, there is a tendency for risk managers to be sidelined if their initial assessment is considered too negative, and potential issues identified during the early stage work can be 'lost' amidst the optimism, inertia, and shareholder pressure that takes hold of a project as it moves into delivery and execution.

Less haste

Pressure from shareholders is one of the key reasons for risk factors being sidelined. Many companies rush into projects in order to demonstrate value creation to their investors. This in turn puts heat on project managers to make rapid progress and shorten project cycles because their reputations are at stake.

Yet time spent early in a project's life is crucial to completing successfully within the time and cost estimate, and in accordance with quality standards. In a study published recently by the Norwegian Petroleum Directorate (NPD), insufficient planning at the front-end engineering and design (FEED) stage was identified as one of the most critical failings of projects that see cost and budget overruns.

NPD's Evaluation of Implemented Projects on the Norwegian Shelf report found that although most projects on the Norwegian shelf end up with development costs falling within the +/- 20 per cent range of uncertainty stated in the plan for development and operation (PDO), there were some projects with 'very extensive' overruns. Those that encountered significant time and cost overruns were found to have had major shortcomings in the early design work before delivery of the PDO and before procurement and construction commenced. Projects with deficient early phase work experienced a substantial need for changes along the way, with significant parts of the work having to be redone.

Furthermore, the NPD found that several projects had been driven by a far too ambitious implementation plan from the very start, which shortened the time spent on early phase work. This meant that FEED had not been 100 per cent complete when the PDO was submitted, or that equipment had been ordered and construction work commenced before the necessary engineering phase was complete. In other cases, new information that could have impacted the preconditions for the project had not been taken into account as the project was already well underway.

Truer picture

Development of a project typically starts with seismic information using scans of a formation to ascertain the size of reserves that might be there. The findings are then confirmed by drilling an exploratory well. However, some companies will drill only one or two wells and, if they get a positive production rate, use that to estimate the size of the reserve. This approach is risky, because it is unlikely to provide a true picture of the size of the reservoir, whether there are faults in it, or whether the production rate anticipated will actually be achieved.

Another common oversight is to make assumptions without adequate analysis of flowing well data and fluid sampling. Often companies drilling a well take samples of the core as they go, to see whether or not it contains oil-bearing sands. But the true data of how the field will perform comes from analysis of the fluids found. This must be done via a flow test, which is typically performed over a period of 12-24 hours. EOG

Smaller companies and those less experienced will usually perform a core sample, but then neglect to perform a flow test. Not only does the flow test provide the best indication of how strong the well will flow, it also establishes how corrosive the extracted fluids are. The latter informs the design of facilities and whether corrosion resistant materials are required. These can be extremely costly to add retrospectively.

Likewise, costs can balloon post-approval if the fluid or gasses need further treatment before they can be transferred into a pipeline or tanker. Distributors will charge a higher tariff to transport fluid and gasses if they are particularly corrosive or need to be kept at constant temperature, or where there is a variable frequency of supply or flow rate. These factors are not always highlighted during contract negotiations but will almost certainly be included in the fine print. A seller therefore needs to be aware of every element of commercial agreements before entering full development.

Avoiding the optimism trap

Implementation of new technology is another area introducing significant uncertainties that are often not considered adequately in the budgeting and execution of oil and gas projects. The increasing complexity of exploration as frontiers are extended into more challenging environments and depths, and a background of the persistent threat posed by the skills shortage and tight supply markets, are all factors pushing for new technology – particularly in production drilling, well completion, and floating production facilities with subsea wells.

However, 'new' means 'high degree of risk', which in good risk management requires higher levels of testing and trials plus mitigation planning for likely scenarios that the new technology will not work flawlessly. In other words, it is important to allow higher contingencies on time and cost where the use of new technologies is concerned, especially since vendors make bold claims for their technologies both in terms of capabilities and ability to fix issues quickly.

Additional challenges come in the form of the evolving regulatory environment and uncertainty around energy policies. This is especially true for the growing number of National Oil Companies and small and medium enterprises entering the scene. Unlike super majors, these companies simply don't have the experience or permanent in-house capabilities. It is also important to recognise that the quality of the supply chain for oil and gas developments remains limited because of the high cost of entry into the market, so the necessary resources are not always available.

Unfortunately, optimism rather than hard data drives actions and careers in companies today. Peer reviews of stage gate processes for example almost always show the approvers

> Ultimately, effective pre-decision management is about orchestration and leadership: knowing all the players, and all of the elements necessary to make the best decision possible

to be not vigilant in their work, too optimistic and pursuing company goals to create new revenue streams rather than preventing potentially poor revenue streams. The point of no return is generally after the 'Define' stage and before the 'Execute/Deliver' stage in the project approval cycle.

Orchestration and leadership

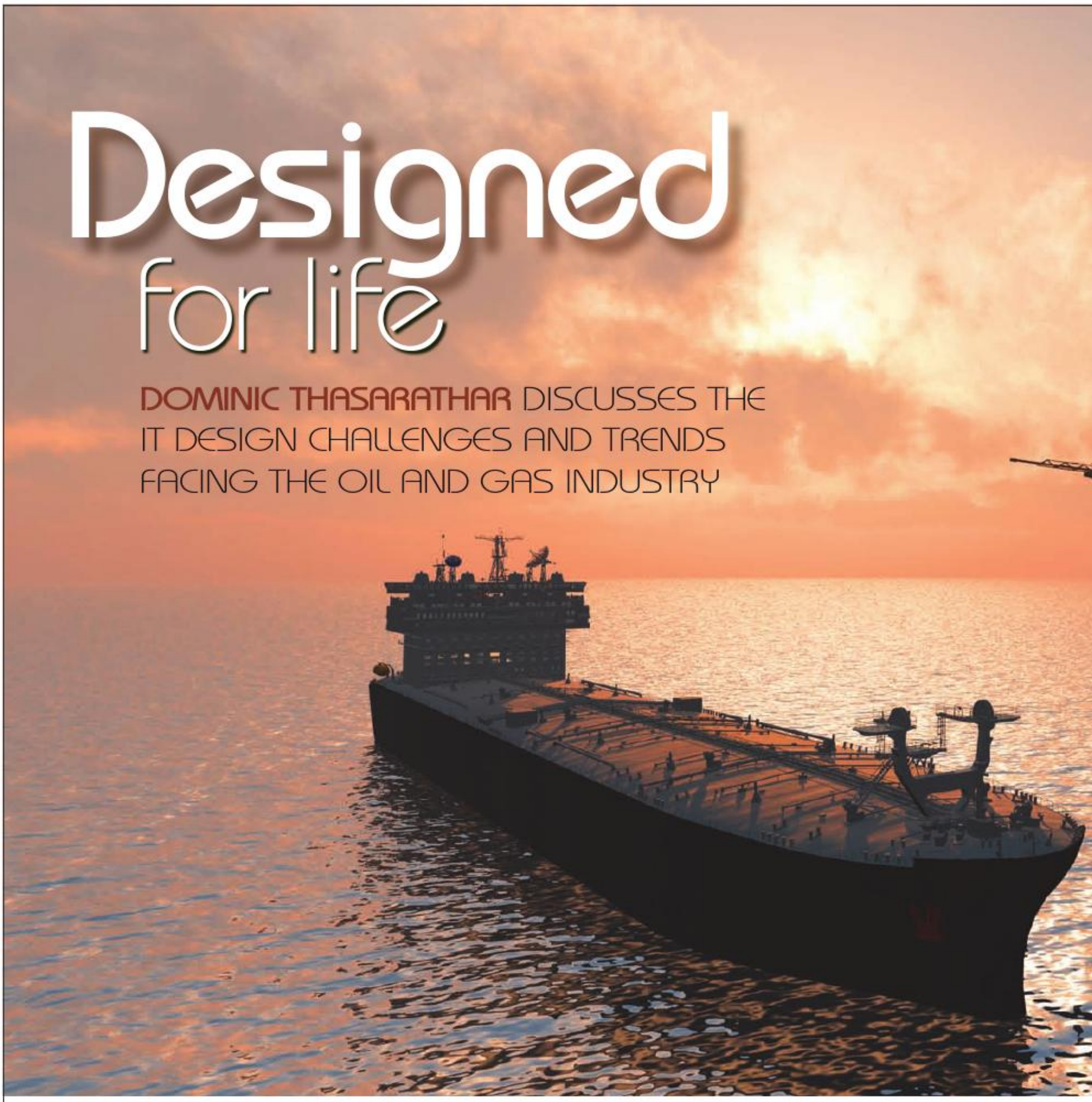
Given the sums involved in many major projects and the substantial knock-on costs and effects of a bad decision, an external audit can add significant risk management value for a relatively tiny cost. Even the most scrupulous companies with the most sophisticated processes and systems in place can benefit from having an external eye. At Upstream Advisors, we have heard the majors saying they could have done with an outside view on things earlier.

As advisors, we are driven by process, industry knowledge, understanding of current issues and perspective. What militates against this are things like gut instinct, bias, hunches and overly compressed timetables, all of which tend to precipitate bad decisions. The truth is that in most cases, in order to speed up, you need to slow down. Unpicking a decision and building the case for pursuing another option should never be seen as anything other than a major 'win', saving an organisation from sometimes inestimable financial and reputational costs of going down the wrong road.

Ultimately, effective pre-decision management is about orchestration and leadership: knowing all the players, and all of the elements necessary to make the best decision possible. It demands a properly structured pre-decision process, based on a lot of detailed experience, not high optimism. At Upstream Advisors, we have collaborated with many clients in this field and have helped them through a management process that ensures that every option is considered in an equal and balanced way to achieve high-quality revenue streams as a result. O&G

Designed for life

DOMINIC THASARATHAR DISCUSSES THE IT DESIGN CHALLENGES AND TRENDS FACING THE OIL AND GAS INDUSTRY



Below
Dominic Thasarathor

Dominic Thasarathar is Autodesk's primary "thought-leader" and evangelist for the construction and natural resources sectors (oil & gas, mining & metals), and his role is to guide Autodesk's long-term vision for those industries, while building relationships with companies across their ecosystems. This involves looking at the role that digital technology can play in tackling the industry's long-term macro trends and challenges, from the escalating production costs of oil, to the future of project financing for major capital projects, to meeting the talent needs of tomorrow. He recently spoke to *European Oil and Gas Magazine* about the IT design challenges and trends facing the industry:

Q How has 3D design and engineering been used in the oil and gas industry in the past, and what are its typical applications?

3D design and engineering have been used to support the efficient design and construction of oil and gas infrastructure facilities (oil refineries, pipelines, offshore platforms etc.), and the design and manufacture of oil and gas equipment (tool and equipment design, skid design etc.) for over twenty years.

As the technology has advanced, it's become pervasive, finding applications and uses beyond just representation of an asset's physical geometry, and is now used in complex simulation of asset performance and behaviour.

There are four categories of applications:

- **Representation & Visualisation** – Enabling project teams to convey the physical layout of a facility, or design of a piece of equipment, from an engineering perspective – essentially a modern, intuitive version of the old-fashioned drafting board. Then generating one or more 3D images from that model to visualise the design as it would appear in reality – which could range from a single high-definition image of a drill bit, to a full 'fly-through' of an oil refinery.
- **Analysis & Simulation** – Using software tools from within the 3D environment, such as computational fluid dynamics and finite-element analysis, firms can test things out before taking them into the real world. For example, this could be modelling a design's performance, such as pipe stress for a line, or simulating a finished project, allowing the project managers to analyse the crane operation required to install a column in a refinery under construction.
- **Collaboration** – facilitating the process of multi-discipline and multi-company working. 3D design software can be used to both detect 'design clashes' when different elements of the design interfere with one another – e.g. pipes with cable trays in that refinery project – and can serve as the primary vehicle for all involved in a project to

coordinate any aspect of it (design, schedule, budget etc.).

- **Realisation** – streamlining the process of moving from the design world to the real world. For capital projects, 3D models find employment in constructability planning, progress reporting, project controls and more; for equipment manufacturers, for direct control of machines for fabrication and optimisation of the manufacturing process (reducing the number of prototypes and unit cost).

Q What would you suggest are the key challenges and trends facing the oil and gas sector in terms of IT design and engineering?

The industry is becoming both more sophisticated and complex in its quest to maintain reserve replacement ratios. The trend of 'frontier' environments – whether physical, geographical, environmental, or otherwise - is presenting a number of major IT challenges; some of those I'm tracking include:

- How can IT ensure remote locations are able to work seamlessly with the rest of the organisation, or support asynchronous working that doesn't cause a drop in productivity?
- How can IT help the industry deal with the exponentially increasing volume of data being produced by complex plays and assets, turning that data into useful, actionable information?
- As projects become more complex, how can IT support cost-efficient access to computing horsepower to crunch bigger problems without having to incur escalating costs of owning and servicing an estate of hardware and software?
- How can IT help to 'design in context'? Frontier environments in particular present the need to take account of the real world. It's no longer viable to just undertake design in a vacuum as has been traditionally done, but move beyond 3D and towards 'modelling in reality'. That's going to mean an increasing need for reality capture solutions to blend the digital and real worlds.
- Conversely, there are a number of key trends happening in the IT world that have the potential to disrupt the way the industry operates. How will the industry respond to the oncoming technology waves of digital reality, cloud computing, 3D printing, reality capture, social technology and more?

Q You mentioned frontier environments and remote locations, do you foresee these more complex areas creating increased infrastructure design and engineering challenges?

Yes, I certainly see that. The industry is experiencing a significant amount of change, and being such a large and diverse sector it can sometimes be difficult to keep track with all that's happening, but some of the key 'industry trends' which are all impacting the supply infrastructure equation in some manner, would include:

- Resources: changes in the source and makeup of hydrocarbon supply (from the push into frontier environments, to the rise of unconventional energy).
- Projects: project performance in an era of increasing project complexity and size, together with structural trends impacting delivery (financing, global EPC capacity, skills shortages).
- Sustainability: issues surrounding expectations from regulators, stakeholders, communities and others that affect a company's 'social licence to operate'.
- Operations: the impact of changing business models, rising operating costs and similar trends.

Of course, each of these has an implication, either directly or indirectly, on the cost of supply infrastructure. Considering that the marginal cost of a barrel of oil for the world's 50 largest listed oil companies increased by 229 per cent between 2009 and 2010 then anything that can be done to reduce the lifecycle cost of that infrastructure has to be a good thing. The primary focus, in my opinion, is to align the technology trends with these changing industry trends.

Q Looking at IT specifically, is the cloud helping oil and gas companies overcome infrastructure design and engineering challenges?

As projects become more complex, the 'number crunching' that needs to be done to optimise the design in a timely manner is growing. In the past that meant buying more hardware – and that's just not an attractive proposition given the transient nature of projects, even then you can invariably never cram as much power into a desktop environment as you need.

In future I anticipate we're going to see some fundamentally new ways of doing design altogether. The current process for infrastructure design is iterative; you undertake the design, analyse that design, then redesign based on the output of the analysis. You keep going through that cycle until you get to the result that's acceptable. The problem is, getting to that result when you have an increasing number of constraints as the projects become more complex, makes that an onerous undertaking. With the vast amount of computing power the cloud offers, perhaps it will enable the industry to adopt a more 'concurrent' approach to design, in a similar manner to the evolutionary process which nature employs – though over minutes rather than eons.

Furthermore, the 'anywhere, any device' accessibility of the cloud delivers that computing power to the user community democratically – whether they're in the design office (the traditional location of powerful computing), or in the field using a tablet or smartphone, and that's opening the door to remote working.

Q Can a model-based approach to the design of oil and gas assets help operators to improve their operations?

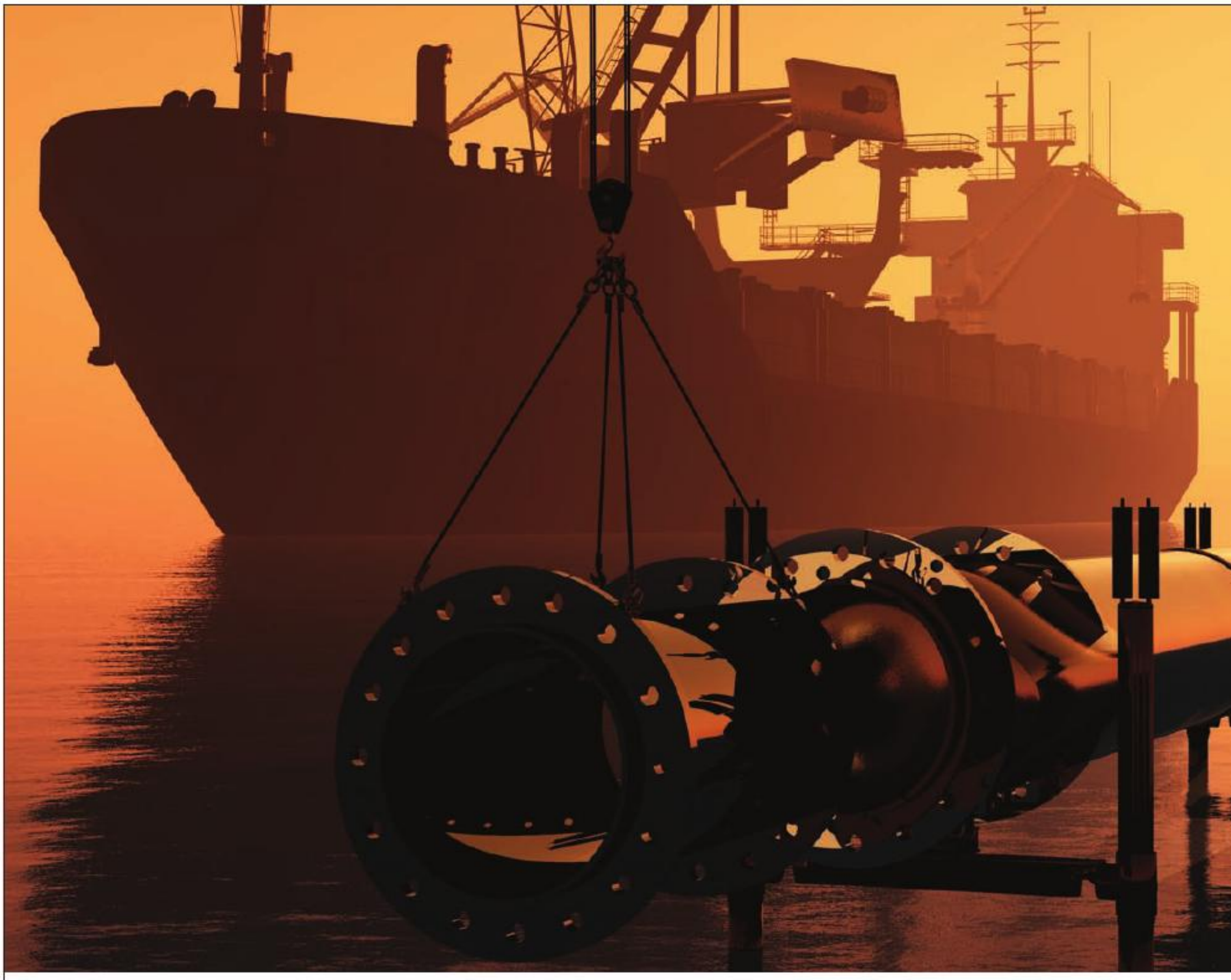
Model-based project delivery certainly offers the potential of delivering higher levels of productivity and better predictability of outcome (i.e. more chance it will come in on budget and on schedule) when compared with traditional processes. Generally the ability to 'try before you buy', of simulating asset performance in the digital world before physical project delivery commences results in better assets. Early involvement of the operating team in the design process enables the facility to be optimised for ease of maintenance and other operational considerations. Similarly, with the increasing requirements around decommissioning end-of-life assets, model-based approaches can support 'design-for decommissioning', and when combined with laser-scanning or photogrammetry, better planning of the decommissioning of existing assets.

A more tactical benefit is improved handover of information at the commercial interface between the EPC and owner, at project stage-gates and on closeout (this can reduce the risk of delay in seeding the facility's operational systems, in particular plant operations and maintenance).

Q Has the rise of social media and social collaboration benefitted the design process?

Social technology, in particular social media platforms, has brought us all closer together. Their personable, extensible nature, supporting collaboration, communication and content management are shifting the way in which individuals, in particular those of the millennial generation, approach problems. Older workers are more inclined to use the internet to search for an answer, seeking facts. Younger, digitally-native workers are more inclined to ask a question of their social network. There are pros and cons for both, but the latter offers the added dimension of subjectivity (providing an answer in the context of the question).

The use of technology in supporting 'social licence to operate' is something we're likely to see more of as the industry operates in either environmentally or socially sensitive areas. The civil infrastructure sector already uses social media to communicate the design impact of proposed



projects on the communities they touch, heightening the level of engagement and speeding the consultation process. Online gamification and crowd-sourcing are both likely to usher in an era of shorter, deeper transactions for design, one where complex design problems will be solved quicker and with better results by harnessing the power of cloud computing to crunch algorithms and the power of 'crowd computing' for subjective input.

Q There is a well-documented engineering skills shortage in the industry, do you see this having an impact on infrastructure design and the use of IT/engineering systems?

I suspect that it may be the other way round, with trends in technology helping to mitigate the risks of skills shortages, and even perhaps neatly sidestep the problem altogether. I think the nexus of the 'technology role' in solving the skills challenge will be a combination of trends in social connectivity, digital reality (the ability to simulate the real world), reality capture and predictive analytics (the application of cloud computing horsepower to the vast amounts of project and asset data being created to predict future outcomes).

To be part of the solution, technology will need to either help broaden the pool of available talent, help improve productivity of individual workers, or help accelerate transition through the learning curve for new recruits.

Digital reality will likely support virtual project environments, upholding the ability to both deliver instruction ergonomically, but also the freedom for trainees to explore and push the boundaries in the context of 'the real world'. There's a good chance that this ability to 'learn by doing' might accelerate the time to transition from raw recruit to productive worker.

Social connectivity is likely to increase the pool of talent available to projects by supporting the notion of the knowledge worker. Those candidates that were once excluded from consideration for reasons of geographic separation, or perhaps were retired, or were only seeking part-time positions, could now be included.

Predictive analytics is likely to improve individual worker performance, providing support to enable better informed decisions. For example, helping a design engineer to make the best choice of rotating equipment manufacturer based

on historical performance, lead time, lifecycle cost, ease of maintenance etc; or assisting a project planner in reducing the amount of contingency in the construction schedule by analysing past project outcomes.

Reality capture is set to transform the speed and level of effort required to capture existing assets and existing topography/conditions into a model, where the technology will increasingly be able to 'recognise' real world objects for what they are (pumps, motors, switchgear etc., not just a set of dots in a point cloud). As a result, much of the mundane work associated with manual modelling of brownfield sites will likely disappear.

Q What is Autodesk doing to alleviate some of these challenges?

Across the board, our software is evolving to incorporate the technology that is second nature to this generation. For example, they've been raised on 3D and virtual environments and thinking in terms of 3D design comes naturally to them. All of our products firmly embrace the 3D side of the design process, incorporating the advanced simulation and rendering that is made possible by using advanced 3D models. Equally, many of them will have been using social media from its very inception, and see complex engineering challenges as team efforts, using the cloud and its infinite computing power as the tool to achieve the levels of collaboration needed to make projects a success. In recognition of this, cloud collaboration and workflows are now an integral part of many of our products. Autodesk AutoCAD 360 and Autodesk Fusion 360 are both powerful, cloud-based design solutions incorporating the cloud features that the millennial generation is coming to expect.

Q Looking to the future, how do you see the sector developing over the coming years?

The answer to that question lies in what's driving the size and nature of supply and demand for hydrocarbons over the coming years. Population growth, urbanisation and economic globalisation are underwriting an increased demand for oil and gas resources. On the supply-side, if the 'game-changing' rise of the unconventional sector plays out the way many are discussing, it's likely that gas will not only contribute a greater portion of the energy mix, but more countries will be notable producers.

In its 2012 edition of the World Energy Outlook, the International Energy Agency forecasts under its New Policies Scenario that by 2035 global demand for oil is set to reach 99.7 million barrels per day and gas 4955 billion cubic meters. Much of that increased demand will be coming from today's emerging nations. That presents the industry with the challenge of delivering more output, to more markets. Fulfilling that demand will require a significant investment in infrastructure. The same scenario from the IEA forecasts the required cumulative investment in supply infrastructure, across the oil and gas value chains between 2012 and 2035 at approaching $19 trillion.

Though there are many other drivers for how the sector will develop, for me, this one of supply infrastructure is probably the most interesting, and one in which developments in information and technology will have an increasingly important role to play. O&G

The high-value, secure lone

KLAUS ALLION OUTLINES HOW INVESTING IN A UNIFIED COMMUNICATION SYSTEM THAT INTEGRATES LONE WORKERS CAN MAKE YOUR BUDGET – AND YOUR MOBILE WORKFORCE – GO FURTHER AND WORK HARDER

It's a commonly held view that nothing works in isolation. But the estimated six million people in the UK classified as 'lone workers' may well disagree; they're expected to do it every day.

With a sizeable chunk of the UK workforce required to operate alone in remote geographies and high-risk environments, employees increasingly work in isolation. But, despite the obvious challenges of hazardous conditions, unsociable hours and often-poor mobile coverage, some organisations' support for vulnerable lone workers remains sub-optimal.

Lone working has a particular resonance in manufacturing arenas such as energy, oil and gas, chemical plants and distilleries. In these disparate environments, employees are often required to work on-site at the isolated extremes of production plants, or off-site in the seclusion of the field. Yet whilst physically they may appear cut off from the rest of the world, companies cannot afford for lone workers to be disconnected from the rest of the workforce; they must be available any time, any place and anywhere.

Surprisingly, there is no specific legislation that governs lone working. The Health & Safety at Work Act makes basic provisions – the most pertinent being the need to provide equipment and procedures to control the risks of lone working. But in the main, companies' processes to support mobile working do little to reflect the wholesale transformation of the ICT landscape.

Many still adopt primitive check-in procedures where lone workers telephone base at agreed intervals to report their whereabouts. Conversely, some companies deploy a 'buddy-up' methodology where remote workers operate in pairs, to safeguard against delays and mitigate the risk of unreported incidents. But these methods are flawed and inefficient. And in emergency situations, where speed of response is critical, they are also potentially life threatening.

Lone solutions

Organisations are increasingly deploying lone worker solutions to improve visibility and contact with their mobile workforce. The breadth of these tools is considerable. Solutions can provide positioning information to help users locate lone workers, alarm systems for when employees find themselves in dangerous situations, and no-motion sensors to provide alerts when a lone worker may be injured or unconscious. For workers operating in explosive atmospheres containing gas and dust, intrinsically safe handsets are available to minimise the risk of unwanted electrical ignition. And since the technologies to support mobile working have proliferated to include GSM, DECT/IP, WiFi and Private Mobile Radio, companies can now reach lone workers regardless of geography, terrain or mobile blackspots. As a result, they can tailor their solutions accordingly. The goal of maintaining uninterrupted connectivity is therefore easily achievable.

Lone worker systems are a sensible attempt to provide round-the-clock protection for remote workers. But, aptly, on their own, they are not enough. The cure for isolation is integration.

Too often, lone worker solutions are commissioned in isolation from an organisation's broader communications strategy. As such, they lack interoperability and true connectivity. In reality, standalone systems are a self-fulfilling prophecy; they stand-alone. Without integration into a company's unified communications network, lone worker solutions are as isolated as the workers they are designed to protect.

Below
Klaus Allion, managing director at ANT Telecom

Value of integration

Companies' continued reliance on 'island solutions' means many are missing out on the far-reaching value of integrated communications – and the benefits go way beyond health and safety compliance. By stitching lone worker provisions into the fabric of company-wide communications, organisations can drive operational and commercial gains.

Unified communications offer major economies of scale. Rather than buying disparate systems, companies can exploit existing infrastructure and significantly reduce the speed and cost of implementation. Operationally, fully integrated solutions can help plant managers become more responsive to problems in the production line, thus improving organisational slickness. And geo-locational asset tracking technologies can empower managers with increased staff visibility and enhanced performance metrics, improving resource management and driving productivity.

The benefits are not confined to operations. Unified communications can also improve sales and marketing – giving customer service teams instant access to mobile workers, enabling them to respond to customer queries with agility and immediacy. This collaboration can have a direct impact on customer loyalty, brand reputation and commercial growth.

Remote access

So how do you get there? Organisations seeking to improve connectivity with their mobile workforce should look at the bigger picture. Lone working is just one piece of a bigger communications jigsaw – and the puzzle is unlikely to be completed by the patchwork procurement of individual solutions.

The best approach is to assemble a cross-functional team of stakeholders from across your organisation, and examine your company's diverse communications needs. The considerations are simple, but the answers are company-specific. How do employees currently communicate? How could that be improved? In which areas could people be at risk – and how can those risks be alleviated? Where could functionality be enhanced to bolster health and safety compliance or drive operational gains?

And once you've identified your challenges, how do you tailor a system and implement actions to drive meaningful change? The most effective plans are often developed in partnership with independent specialists that can design customised, unified communications strategies, and adapt them in line with changing market dynamics.

With human and commercial risks at the heart of the discussion, an integrated approach is key. It is only through a full examination of your entire communications infrastructure that you can develop a system that keeps your people safe and your business productive.

Unified communications

Forget the notion that nothing works in isolation; the UK's burgeoning reliance on remote workers provides tangible proof to the contrary. But it's hard to argue with a minor modification: nothing works well in isolation.

For an optimal performance that protects workers, integrates operations and drives commercial gains, a unified communications strategy is undoubtedly the safest move for a mobile workforce.

Lone workers will, by definition, always remain physically isolated. But your communications systems do not have to be. OGC

Flowing free

CHRIS MILLS DISCUSSES FLOW MEASUREMENT AND OPTIMISATION FOR HEAVY/ UNCONVENTIONAL OILS

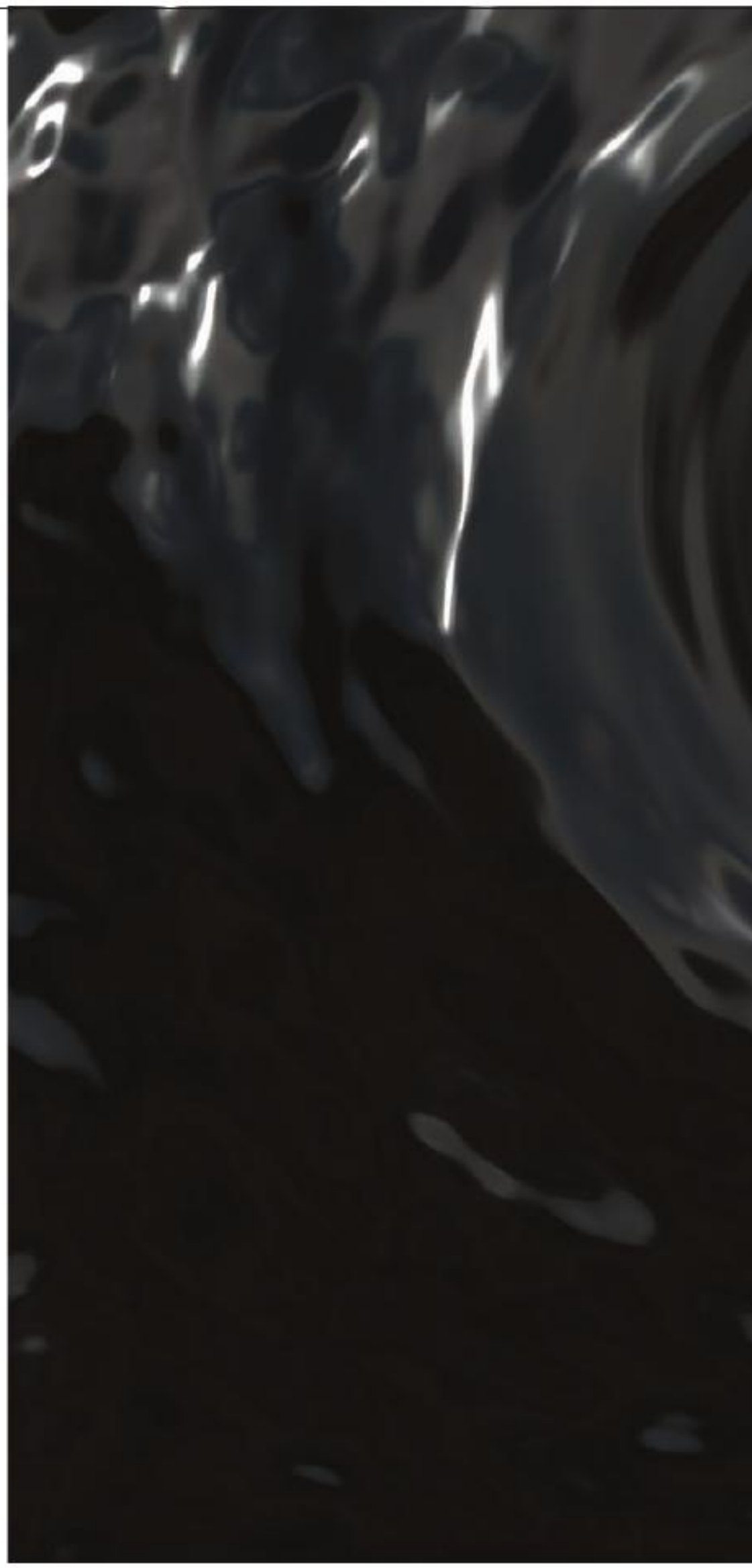
oping with flow measurement of viscosity fluids

The vast majority of the world's remaining oil reserves are categorised as heavy/ unconventional oils. The viscosity of the unconventional oils can be so high (>10000 cP) that they are immobile at ambient conditions. Due to diminishing conventional oil reserves and the need to secure future energy supplies to a rising world population, the exploitation of unconventional oils is increasing. As the development of these viscous deposits grows, so too does the requirement for accurate flow measurement of heavy crude oils and other viscous products.

Unfortunately, the performance of conventional flow meters when applied to viscous fluids remains relatively poorly understood. However, a number of technical challenges are immediately identifiable. These include the higher viscous friction of the fluid being metered, the possibility of extreme or varying velocity profiles, and the increased susceptibility of viscous liquids to entrain secondary components such as solids or gas. It is also reasonable to predict that different metering devices will be affected by these phenomena in different ways, and to date the most appropriate technologies to use for viscous flow measurement are not yet well defined.

Well-established flow measurement technologies, such as differential pressure devices, are already recognised as being sensitive to viscosity variations. However, there is little published data on their performance across a range of viscosities and Reynolds number (Re). The same can also be said for newer measurement technologies such as Coriolis and ultrasonic devices. Also, confusion can arise when flow meter manufacturers make specific claims on performance with little independent and verifiable data published.

Below
Chris Mills, flow measurement engineer at NEL

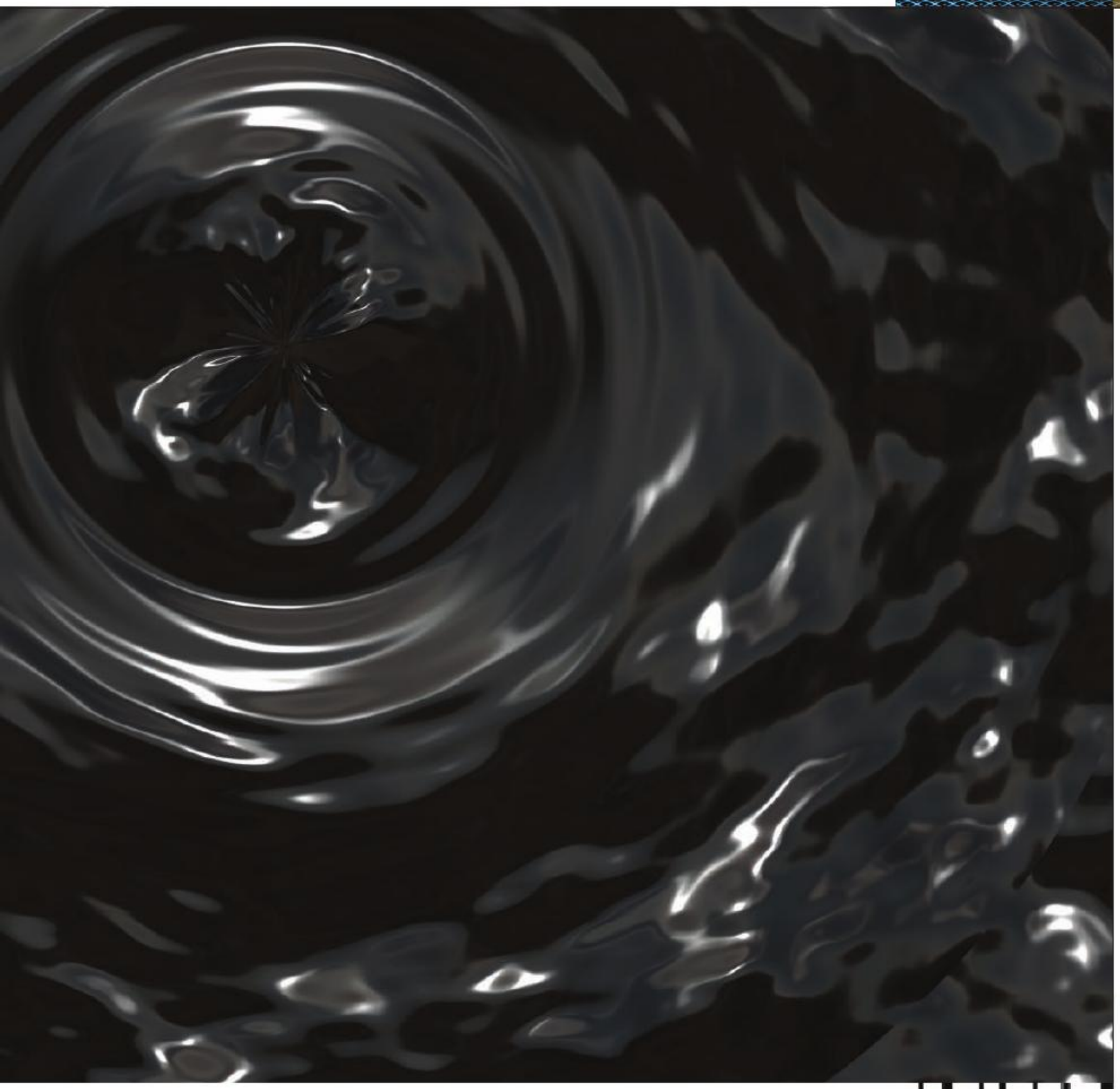


Flow measurement challenges

Flow measurement of medium and heavy crude oils present additional technical challenges compared to light crude oils due to their greater viscous friction. For most liquids, an increase in temperature normally results in a decrease in fluid viscosity. The decline in viscosity with increasing temperature is generally far greater for highly viscous fluids and can pose several problems.

Problems can arise in the flow measurement of viscous fluids when small fluctuations in temperature result in a significant change in the fluid viscosity. If the flow meter has been calibrated at a specific viscosity for its application, any temperature and thus viscosity fluctuation, could potentially have a notable effect on the flow measurement.

In highly viscous fluids there can be distinguishable variations in the measured temperature due to thermal



gradients within the flow path. Thermal gradients are often present in laminar flow due to the parabolic velocity profile that occurs. As there is no mixing taking place between the layers of fluid, the fluid at the centre of the pipe might be at a different temperature than the fluid at the pipe wall. These thermal gradients can make it problematic to obtain a suitably representative mean fluid temperature, which increases the uncertainty of any temperature-based correction applied by the device.

The velocity profile of the fluid is also considerably altered by changes in its viscosity. The influence that fluid viscosity exerts on the velocity profile is best defined using the Reynolds number (Re). A flowing fluid travels in one of three different flow regimes:

1. Low viscosity fluids travelling at moderate velocities would normally have a high Reynolds number (greater than ~10,000), leading to turbulent flow. In this regime dynamic forces dominate and the motion is parallel to the pipe axis with mixing occurring between the different layers, which breaks up any gradual transfer of drag from the pipe wall. This results in a well-mixed flow with a relatively flat velocity profile. The central axis of fully developed turbulent flow normally has a value of 1.1 to 1.3 times the average flow velocity.
2. When the Reynolds number is low (less than ~2,000) the flow is laminar. In this O&G▸

regime viscous forces dominate and there is no mixing between the layers, with substantial friction against the pipe wall and the adjacent fluid. This results in drag between the layers of the fluid with the fluid velocity gradually increasing from the pipe wall to the centre. The maximum velocity at the centre of the pipe can be approximately twice the average velocity of the flow, which results in a velocity profile that is parabolic in shape.

3. The regime between laminar and turbulent flow is described as transitional and can be extremely unpredictable as it switches back and forth between laminar and turbulent behaviour, and can cause significant flow measurement challenges.

> While industry recognises that the growth in the development of viscous oil deposits has changed the flow measurement regime within which conventional flow meters are expected to perform accurately, a lack of research brings significant uncertainty

Due to the highly viscous nature of heavy oil, gas entrainment is a serious operational consideration. It is already acknowledged that gas can become easily entrained in flowing viscous liquids, and that this has the potential to lead to mis-measurement.

Gas can become entrained within viscous fluids from a variety of sources including the loading/unloading of bunker ships, production wells, test separators as well as rapidly altering process conditions. The effects of gas entrainment are complicated and will likely differ depending on metering technology applied.

Improved understanding

The effect that medium fluid viscosities have on the current generation of liquid flow meters (Coriolis, ultrasonic and turbine) has already been researched and is understood. However, the effect of high viscosity fluids on these conventional flow meters has not yet been defined with independent and verifiable test data. This follows partly from the scarcity of suitable test facilities capable of providing viscous flow in combination with accurate and traceable reference instrumentation.

To help address some of the challenges associated with flow measurement of viscosity fluids, NEL completed an investigative programme at its UK National Standards Oil Flow Facility in Glasgow, Scotland. A range of commercially available conventional liquid flow meters (Venturi, quadrant edge orifice plates, ultrasonic and coriolis flow meters) were operated

across a range of viscosities to investigate some of the technical issues likely to be faced as the demand for accurate heavy oil flow measurement grows.

Performance

When assessing the suitability of a flow meter for a particularly high viscosity application, the results show that it will be extremely important to calibrate the device in similar conditions to those that it will encounter in service. While matching the fluid viscosity is not always feasible, NEL's experimental data shows that all flow meter types cannot simply be relocated from low viscosity to high viscosity service without suitable consideration, characterisation or modification.

The response of the flow meters evaluated in this test programme displayed a significant dependence on the liquid viscosity/flow profile. The measurements exhibited distinct trends for each measurement device with increasing fluid viscosity at a given flowrate. The results also clearly demonstrated a relationship with the flow profile. As the Reynolds number of the flow decreased, the response of the device varied significantly.

The discharge coefficients of both the Venturi tubes and Quadrant Edge Orifice Plates were strongly influenced by Reynolds number. The slope of the discharge coefficient tended towards horizontal at high Reynolds numbers. In the transitional and laminar regions, the discharge coefficient appears to be strongly dependent on Reynolds number. At low Reynolds Numbers, errors up to 9.5 per cent can be experienced. To put that into context, for an oil field producing 1000 bbl/day of oil that would equate to a potential mis-measurement of approximately £3.5 million a year.

Although ultrasonic flow meters have the benefit of being non invasive devices, and thus in theory have negligible pressure drop, they generally had high errors when operated uncorrected in the transitional and laminar (low Reynolds number) flow regions. In highly viscous fluids, it is possible to attain low Reynolds numbers with a moderate flow velocity relative to the fluid properties. The performance of some ultrasonic devices was repeatable and in theory could be corrected for. How robust these corrections would be in the field requires further investigation.

The Coriolis flow meters in this test programme generally had low errors. The errors were typically less than 0.75 per cent, even at Reynolds numbers as low as 200. The Coriolis flow meters seemed unaffected by the laminar-turbulent transition but did show a distinct relationship with Reynolds number. One meter being tested displayed a significant under-read at low Reynolds numbers before the meter's correction was applied. With corrections applied, the maximum error observed for Coriolis meters was -0.56 per cent, and the majority of the data was within 0.25 per cent error. As such, Coriolis meters appear to show promise for viscous fluid measurement. However, the device should be calibrated with a similar viscosity fluid as to which it will operate with in service.

Further research

The test programme in this research project was focussed on one dimension - testing conventional liquid flow meters with high viscosity fluids. It did not research installation effects, or the effects of temperature gradients within the flow stream under laminar conditions and sensor-signal attenuation, which all have a significant impact on the accuracy of flow meter readings.

Another area that would also be valuable to explore is two phase oil and gas flow using a high viscosity fluid. New advancements and the utilisation of multiple technologies might enable accurate determination of the gas volume fraction, and it should then then be possible to correct for the presence of a second phase within the flow stream. This would minimise the mis-measurements encountered when a second gas phase is present in an oil flow stream.

As already discussed, overall the results reported from the test programme reinforce the notion that conventional liquid flow meters cannot simply be relocated from low viscosity to high viscosity service without suitable consideration, characterisation or modification. The results also show that the performances of devices of the same technology (i.e. ultrasonic or Coriolis) are not necessarily similar as there are many other variables that must be considered. These include sensor design, correction algorithms, transducer design and the amount of development work carried out by the manufacturer.

While industry recognises that the growth in the development of viscous oil deposits has changed the flow measurement regime within which conventional flow meters are expected to perform accurately, a lack of research brings significant uncertainty. However, with the industry pushing to exploit older fields that contain more viscous deposits, the pressure to address these issues through extensive research programmes is increasing. This will allow a more accurate flow measurement capability to be developed so that the end user will be assured that chosen meter technologies perform as expected. O&G

NEL

Chris Mills is flow measurement engineer at NEL. NEL is a world-class provider of technical consultancy, research, testing, and flow measurement services to the energy and oil and gas industries, as well as government.
NEL, part of the TÜV SÜD Group, is a global centre of excellence for flow measurement and fluid flow systems and is the custodian of the UK's National Flow Measurement Standards. It provides services in key areas including measurement consultancy, meter development and calibration, erosion, environmental, CFD modelling, and training and knowledge transfer.

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We have been support partners for Technip Umbilicals for over 20 years, during which time we have seen the company grow from strength to strength.

This recent expansion will hopefully not only benefit both our companies but the region as a whole.

We look forward to continuing our relationship with Technip Umbilicals and we would like to wish them continued success for the future.

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

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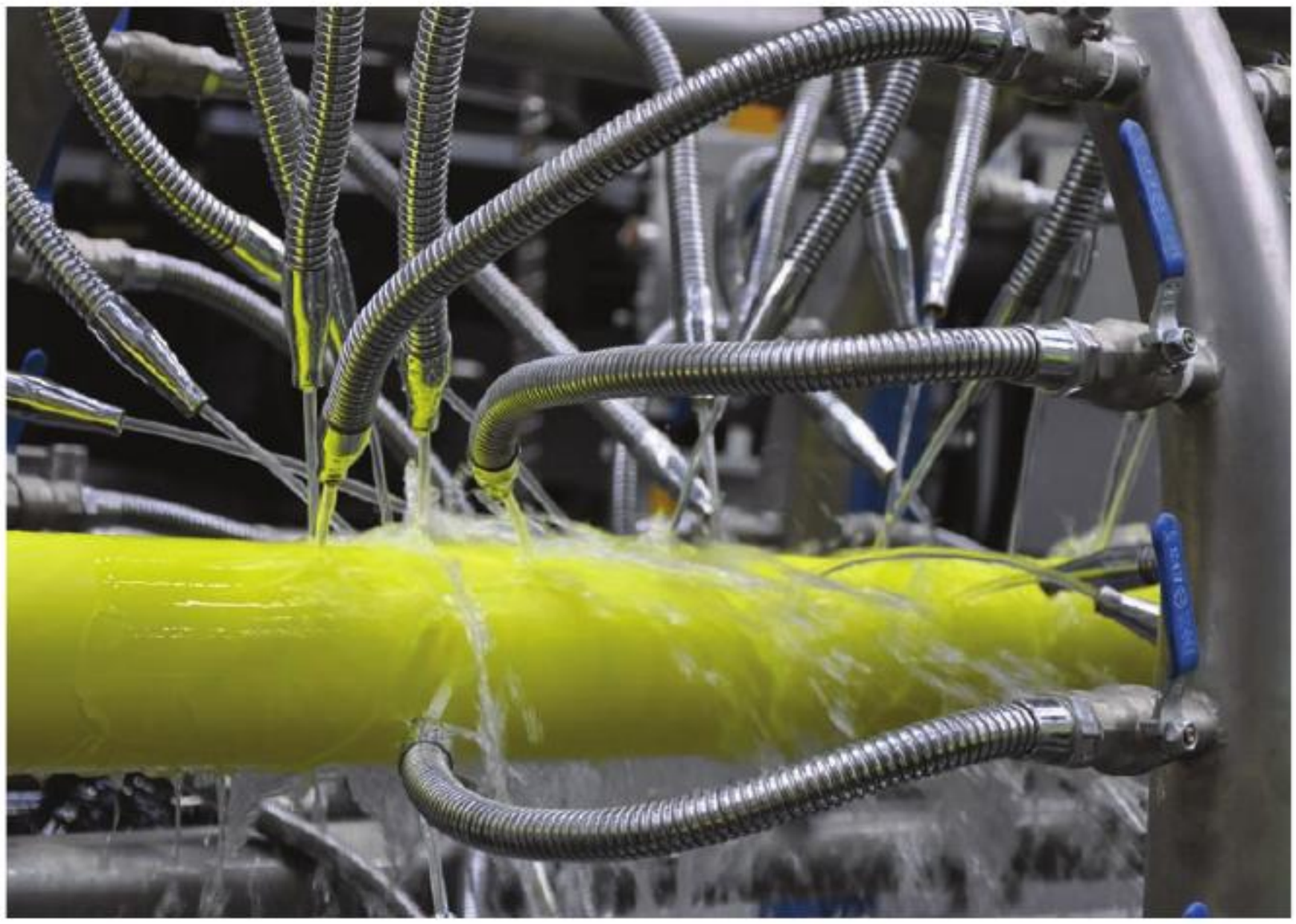


growing demand," Jean-Louis highlights.

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. OEG

GENERAL CABLE

GENERAL CABLE offers oil and gas (OGP) cabling solutions relying on 57 modern production facilities and 14,000 associates worldwide addressing the three market segments of onshore, offshore topside and subsea*. Exceeding 20 years of experience in subsea cables and junctions supply to major EPCs, GENERAL CABLE has delivered thousands of kilometres of highly specialised products (low, medium and high voltage, from high to arctic operating temperatures) to demanding oil and gas companies worldwide.

Investments in extra long lengths provide GENERAL CABLE's partners with a competitive edge, as do current developments by addressing market trends (ultra-deep, gas blocking, higher voltage).

**Subsea = subsea power distribution and SURF (subsea umbilicals risers & flowlines)*

The next generation

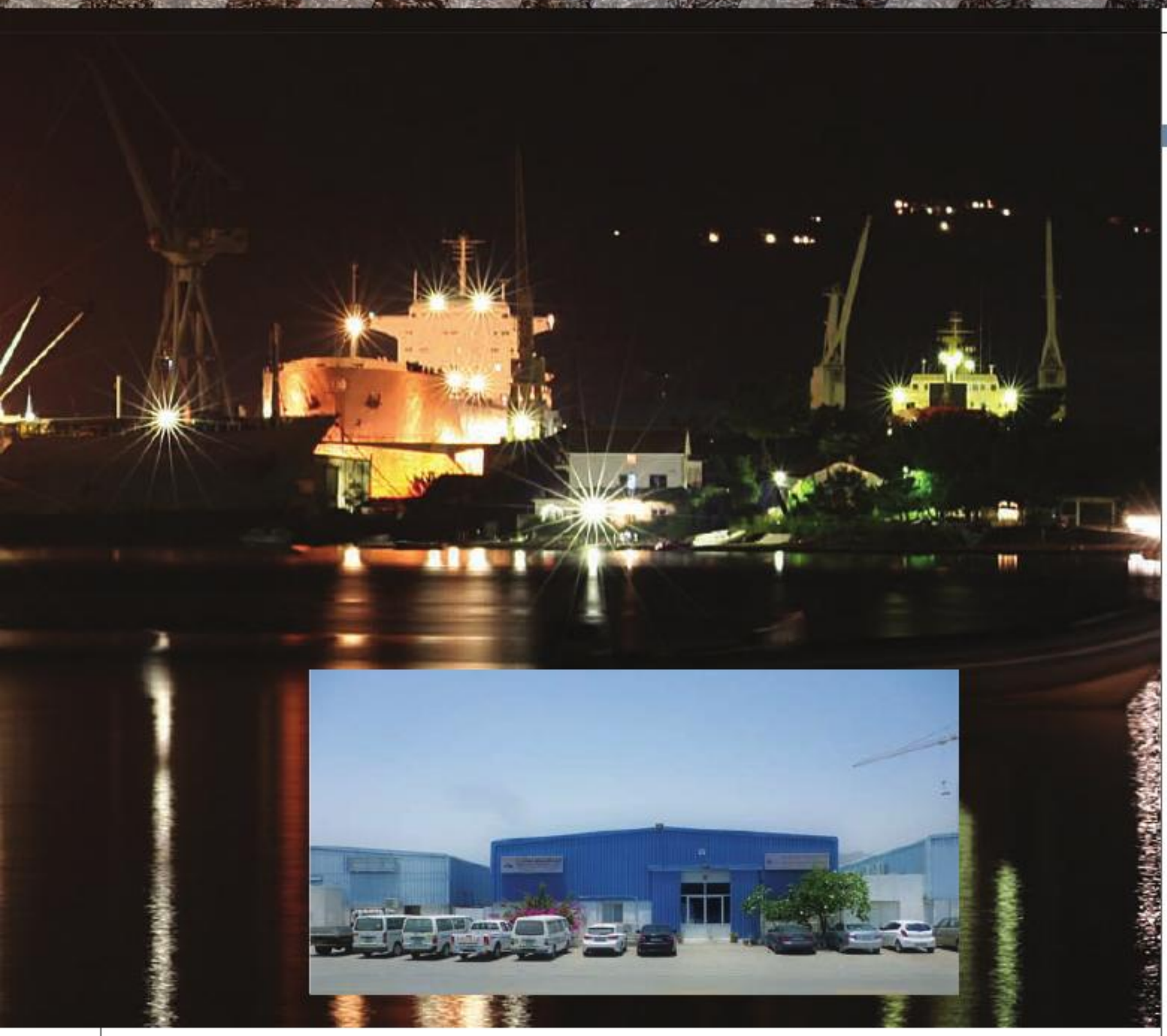
George Manetas, CEO at Ionian Ship Management has long been an established figure in the shipping industry. With a working history as an electrical engineer and recognised as a master tradesman, he has been working in the industry for a number of decades. With a successful past George felt compelled to take a step into ship management, establishing a group of businesses, working out of the hub of Fujairah in the UAE.

"Our group consists of a handful of companies," begins George. "Through our marine workshop we specialise in marine calibration, mechanical engineering and conducting refurbishment and surveying work. A second company manages three LPG vessels, an area in which we have a lot of experience and our third operation provides shipping management for 12 vessels, and has for two years undertaken full management on behalf of the owners, such as Vitol, chartering Aframax vessels."

Ionian Ship Management, Ionian Shipping Agency and Marine Safety Services collectively employ in the region of 160 personnel, each a specialist division operating both in the UAE and globally. Through its team of mechanical and electronic engineers it is able to provide calibration, inspection services and certification for safety equipment on vessels. Headquartered in the commanding trade centre overlooking the Arabian Sea, manual activities are undertaken at its premises in the port, a centre for the shipping community in the Middle East.

Over the last 12 months, industry demand has been varied, as George explains: "Our interests in vessel management and the chartering of fuel oil vessels has remained steady, but repair services has slowed down somewhat. However, this is a trend that I have witnessed before, and it will improve in time. We are very busy and I do not foresee any problems for the future." As he works towards retirement, George has appointed his two sons to eventually take full control of the business. "Having been in the industry for my entire career there have been many changes, and significantly over the last decade I have seen a growing demand from ship owners for a fast response time to service. We have consistently reacted to this, offering a 24-hour service. Benefitting from our location and facilities our clients recognise the advantages of using Ionian, and this has helped the business continue its growth," he adds.

All the vessels under its management have Lloyd's classification, and upgrading in line with this classification is a demanding operation. With a continued and growing interest in marine safety services, work on such a modern fleet



can occasionally prove a challenge, particularly due to the many safety considerations "There is always a lot going on, be it on the ships or in the office. We are active all the time, ensuring any defect list is addressed in its entirety. This aspect of the business exists to improve the safety of the ship, and our team is focused on maintaining this, and as such we have become known in the market for our clear approach.

"My background in shipping, before starting the management company, has ensured I hold a clear understanding of the fundamental requirements on board vessels, and importantly how to treat the crew," says George. Recognised for its honesty, experience, background and quality service, its customers are from regions as far spread as the UK, the US, Greece and Singapore and have been returning for over 20 years. Such customers include New Shipping, Holland Bros, AMPTC, Benelux Overseas Inc, Capitol Shipping and Logistics, and Hellespont Group, all of which Ionian has been working together with for many years.

With the fresh management structure set to take full control of the business in the coming years the company begins to look towards further expansion. Commenting on the future plans, George points out: "We have employed two newly graduated personnel already as we work in line with our ISO accreditation and we are actively looking for another six young people, with new ideas to bring into the company. We expect to have realised this ambition before the end of the year." Operating today in a strong financial position, the success of the company has been consistent since its inception, providing marine safety services from its workshop. However, despite its strength, it is faced with logistical challenges as its team travels globally to carry out works installing a range of equipment, but through regular training and focus on its operations the business continues to strive forward.

"Over the next ten months we are looking to acquire contracts on another six to seven vessels and we have already been in discussions with those owners who have requested our management services. Business volume is set to increase and this is one of the main drivers behind recruiting more personnel, and there are also a greater number of local companies in the region looking to utilise our services. Not only is there an increase in shipping management demand but also an increase in the business of marine safety, and demand for our engineers and the fully equipped, modern technology which we have. Over the next four years I see the volume increasing by at least 25 per cent," concludes George.

"Not only is there an increase in shipping management demand but also an increase in the business of marine safety, and demand for our engineers and the fully equipped, modern technology which we have

Maintaining integrity

WERNINK INTERNATIONAL

Wernink International delivers an in-depth and tailored recruitment service to Flexlife Offshore, providing high calibre personnel. The strategic placements of corporate and senior management personnel and subsea technical experts are supporting the positioning of the company in the subsea industry. Wernink's professional approach and technical and commercial knowledge, allied to an extensive database of international contacts, provides the basis for a long track record of achievements in the global oil and gas industry.

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.

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

Flexlife
flexlife.co.uk

Services
Flexible pipe technologies and engineering services

On the pull

Established in January 2010,

the Netherlands based ALP Maritime Services originally provided consultancy services in the heavy transport and ocean towage market via a fleet of third party vessels before progressing into the role of ship owner.

"ALP is currently in a transitional phase of becoming a ship owner, with a particular focus on long-haul towage and the installation of ultra-large objects as well as transportation via semi-submersible heavy transport vessels," explains Paul Mulder, CEO of ALP Maritime.

In order to facilitate the investment required for ALP's expansion to shipowner, the company was acquired by Teekay Offshore Partners in February 2014. This was a mutually beneficial venture that has resulted in the order of four state-of-the-art towage and anchor handling newbuilds. The vessels are specifically designed for the long distance towing, positioning, mooring and installation of ultra-large offshore storage/production units and drill rigs. In the future the vessels will also work on mooring leg survey/maintenance works and ultimately decommissioning projects.

Totalled at $260 million for both the construction of the vessels and acquisition of ALP, the contract will not only complement Teekay's existing services to the oil and gas industry, but will critically enable ALP to take advantage of anticipated demand for long-haul towage and anchor handling vessels.

"This acquisition not only strengthens ALP with the order of our four powerful, state-of-the-art vessels, it also provides us with financial strength to continue our vision of growing in the burgeoning towage market. Meanwhile, ALP's operational knowledge within the long-haul towing and heavy transport sector will add to Teekay's own operations and projects within the oil and gas industry," says Paul.

As a global provider of commercial and operational services to its customers in ocean towage and heavy load transportation, ALP's consultancy services include finding the optimal means of transport, cargo preparation prior to departure, supervision of departure and loading operations, supervision and co-ordination at immediate ports of call, transport engineering and the supervision of arrival and discharge operations.

Furthermore, ALP provides complete package deal solutions to clients as a ship operator; this service is based on independent advice to find the best means of towage and transportation in line with quality, safety, efficiency, economy and speed.

Fully prepared to take on the most challenging of projects within the field of non-conventional maritime services, ALP has used its knowledge in the FPSO, FLNG and heavy load market to design the new build vessel that will deliver innovative benefits to customers, as Paul highlights: "Using all our knowledge and experience gained over the past two decades this vessel design will allow us to perform both the towage services as well as the subsequent positioning and hook-up operation to the FPSO's/FLNG's pre-laid mooring spread.

"The towage and hook-up operation is certainly an area where we have seen increased demand for our services; you must imagine these units, they are built in the Far East, Korea, China or Singapore and they need to be repositioned in areas such as Africa, Brazil, the US Gulf or the North Sea, more than 10,000nm from the building yard. Many of these units don't have propulsion or, in the case of FPSO's built from converted tankers, they may remain with inadequate propulsion capacity after the conversion. So they require towing or towing assistance services. We predict that an increasing number of these high-spec production units in the market results in a higher demand for high-spec long-distance towing vessels like the four we have under construction.

"If you look to the specifications of these vessels you will see they have very large fuel capacity, they have in total 3500 metric tonnes of fuel capacity, enabling the units to transit the world's oceans non-stop, to safely reach the nearest refuelling location. With these extremely large objects,

KONGSBERG MARITIME

Kongsberg Maritime offers a full range of dynamic positioning systems to keep the vessel within specified position and heading limits. These systems are designed to minimise fuel consumption and wear and tear on the propulsion equipment. The K-Pos dynamic positioning systems are available in single, dual or triple configurations. Kongsberg Maritime has supplied more than 2500 dynamic positioning systems.

allowing us only to proceed maybe around six to seven knots, we need fuel capacity of minimum 40-45 days. There are very few vessels that can do this, which makes our vessel unique.

"We are also equipping the vessels with DP2 (dynamic positioning capability), which is not unique in the offshore market but is unique in the long distance towing market; this is providing us with a competitive advantage as our clients are looking for more advanced long-haul towage vessels that not only provide the highest level of safety to the towing operation, but also comply with the stringent in-field DP requirements once the unit arrives on location," he adds.

Designed in accordance with DNV standards, the new builds will meet DNV DYNPOS AUTR notation, which means no single fault in an active system will lead to full system failure. "The production units that are being designed for future markets are so large that you need several vessels to pull them. We prefer to limit the amount of vessels used, but instead do it with vessels that are more powerful and of a higher standard. This is why we have increased the bollard pull with 50 per cent compared to the majority of existing towing vessels and have redundancy on all systems" explains Paul.

Focused on marketing its vessels throughout 2014, the company will continue participating in tenders with the aim of being awarded contracts that will begin in 2016 and 2017. "A lot of preparation works and the construction of the vessels will start over the next few months, which will keep us very busy throughout 2014, however if new opportunities arise we will not hesitate to step in. We of course hope to grow further; despite four vessels arriving, this is not the end of our ambition. With the towing market in our vision undersupplied with adequate high-spec vessels we foresee the need for at least another eight of these vessels in the market, required to cover the operations foreseen for 2016-2022 period. We will be very satisfied if we can grow our fleet with another two to four vessels in the next year," concludes Paul. O&G

> If you look to the specifications of these vessels you will see they have very large fuel capacity, they have in total 3500 metric tonnes of fuel capacity, enabling the units to transit the world's oceans non-stop, to safely reach the nearest refuelling location.

ALP Maritime Services
alpmaritime.com

Services
Long-haul towage
and offshore installation

Award winning technology

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.

Cegelec

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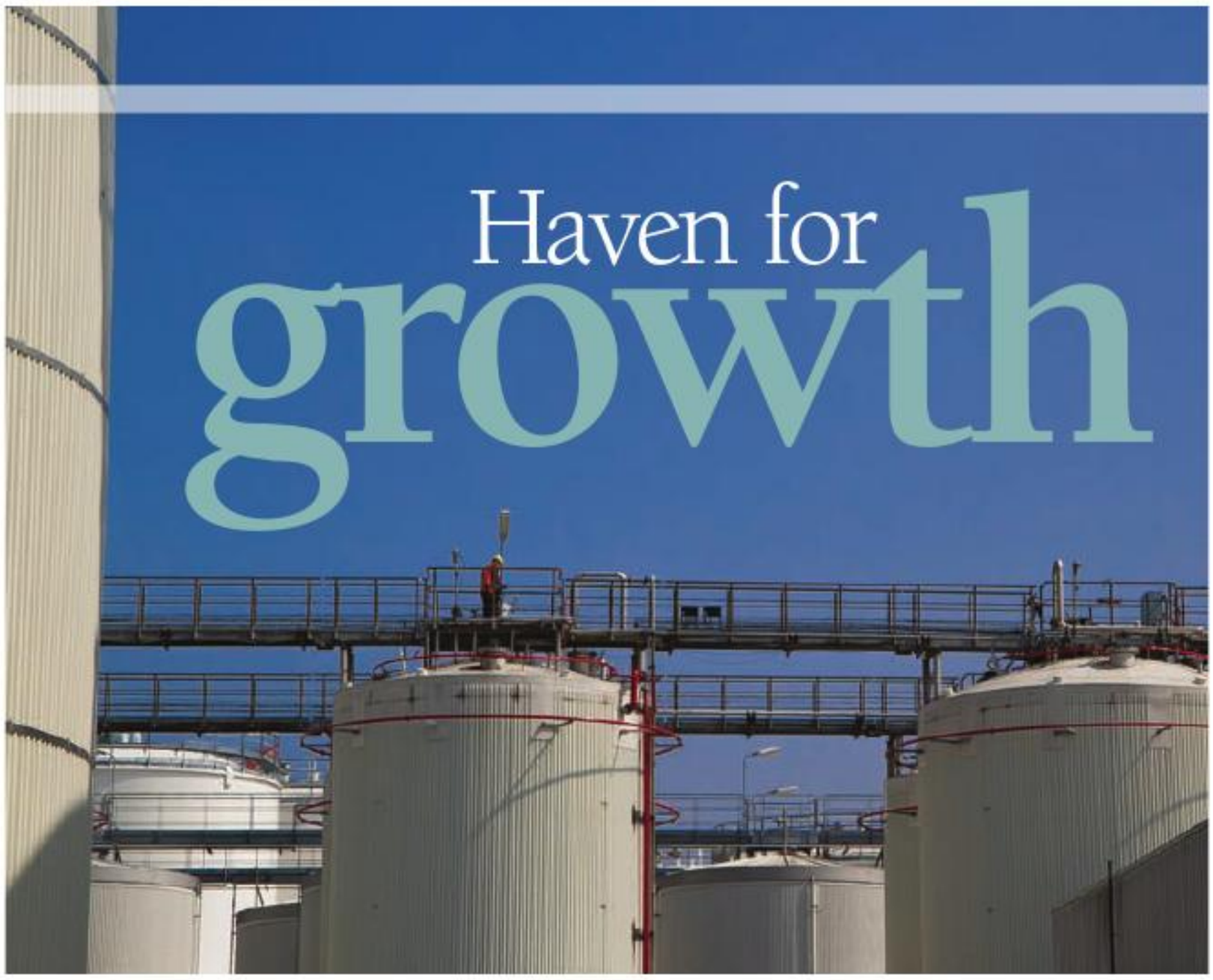


Stolthaven Moerdijk BV is a strategically located storage terminal facility located between Antwerp and Rotterdam that offers tank storage for bulk liquid, drumming and services such as an IBC filling station, jetty, repacking, tolling, blending, heating and cooling (bulk liquids). The facility, which presents an attractive and popular option for many of Europe's leading bulk operators is situated in a congestion-free and lock-free port that is accessible via sea, inland waterways, highways and rail.

The facility, which benefits from high levels of experience and skill throughout its organisation and a deep understanding of the bulk liquid sector, is part of Stolt-Nielsen's Stolthaven Terminals division, which is a distinct advantage for the business. For example, Stolt-Nielsen is a global business that operates six divisions that cover a broad range of services and industries.

Currently this group consists of Stolt Tankers, Stolthaven Terminals, Stolt Tank Containers, Stolt-Nielsen Gas, Stolt Bitumen Services, and Stolt Sea Farm. Being a part of this diverse range of business activities gives Stolthaven Moerdijk access to a wealth of knowledge across a global spectrum, while the overall strength of Stolt-Nielsen means that the facility has solid and dependable support in terms of continued expansion and investment.

The facility in Moerdijk was acquired by Stolthaven Terminals in 2012, so it is a relatively new enterprise, but it has quickly become an important aspect of the terminals division's business by providing additional support to its intra-European coastal tanker and inland barging service. The terminal, which is managed by Marco Dalmeijer, currently consists of 37 tanks which equates to a total of 31,720 CBM of storage space, with tank sizes of 340 CBM, 500 CBM, 900 CBM, and 2000 CBM. This provides storage for (hazardous) bulk goods and there is also warehousing capacity for the storage and handling of dangerous goods for approximately 13,000 pallet places, with an additional 1600m2 warehouse space for non-hazardous chemicals. The site can be accessed via jetty, which is suitable for loading and unloading barges and sea-going vessels with a maximum length of 175 metres. There is a pigging system for all jetty lines and vapour return and nitrogen blanketing are also available.

Considering the products passing through Stolthaven Moerdijk, the storage tanks themselves are naturally of the highest quality. For example, all tanks are made of stainless steel 316 L and Mild steel, with each tank having dedicated pumps and lines to exclude

contamination. Furthermore, most of the tanks at Stolthaven Moerdijk have capabilities for nitrogen blanketing and a vapour return system and can be heated through the employment of electrical tracing circuits. As well as storage Stolthaven Moerdijk also provides a drumming service, from a sheltered filling station with two filling lines. Both of these lines are suitable for filling steel or PE drums up to 250 litres and one filling line for filling IBC's up to 2500 litres. The facility also has full unloading/loading capabilities for containers, trucks and vessels.

Stolthaven Moerdijk is of course just one link in the Stolthaven Terminals global chain. The division has a network of 20 owned and joint-venture bulk-liquid terminals around the world in Australia, Brazil, China, Europe, Malaysia, New Zealand, Singapore, South Korea, and the US, with a total storage capacity of 3.8 million CBM. Stolthaven Moerdijk is one of six fully owned terminals, the rest being in New Orleans and Houston (US), Santos (Brazil), Singapore, and Dagenham (UK). The Dagenham facility was acquired in 2012 having been formerly owned by a French business, and it was an important foothold into the UK market for Stolt-Nielsen. Situated just 15 miles from London, the facility provides storage for petroleum products, CPP solvents, base oil and vegetable oils and has an overall capacity of 134,232 CBM.

The Stolthaven Terminals network is vast, providing high quality storage solutions for customers worldwide and building strong, lasting relationships with individual clients in order to establish integrated transportation and storage solutions that reduce costs and increase overall operating efficiencies.

Stolthaven Moerdijk plays an essential role in this network, and moving forward the business

has firm expansion plans that involve increasing its capabilities and adding new services to its portfolio. All of this is firmly in line with Stolt-Nielsen's main strategy of enhancing berth efficiency. The business is planning to expand its storage capacity in the near future by adding a total of 16,000 CBM of stainless steel tank capacity, which will ensure increased business opportunities in the market.

Furthermore, it is also currently in the process of building a major new depot for cleaning both its own and third parties' tank containers. This is taking place on a large plot of undeveloped land near to the Moerdijk site, which will ultimately become a Stolt Tankcontainers Depot. Lastly, there are also plans in the pipeline for the construction of a new drumming installation, which will consist of two drumming lines – a fully automated and a semi-automated line capable of filling a wide variety of drums and IBCs, which is due for completion in 2015. Ultimately the terminal is ideally located to take advantage of ongoing market growth, and with the backing of Stolt-Nielsen it means that there is the drive and support to make this development happen, taking Stolthaven Moerdijk successfully into the future. OEG

The Stolthaven Terminals network is vast, providing high quality storage solutions for customers worldwide and building strong, lasting relationships with individual clients

GRÖNINGER CLEANING SYSTEMS

Gröninger Cleaning Systems (Schiedam-NL) is an innovative, global designer and manufacturer of (high and low-pressure) cleaning systems. The company's activities include design, development, engineering, installation and service of the complete cleaning technology as well as the infrastructure around it. Even the most specific customer requirements can be met through customisation. Close cooperation between Gröninger and Stolt Haven Moerdijk will result in ultra-modern tank container cleaning and heating facilities for this site.

Wired for success

Based in ICAD 1 within the Industrial City, Abu Dhabi, Specialized Oilfield Products (SOP) has developed a highly regarded reputation as the leading provider of wireline manufacturing equipment in the Middle East.

"Historically the company started as a joint venture with Lee Specialties from Canada during 2004 and by 2007 we became independent of that joint venture and are today wholly owned by three local partners," says general manager Bob Thubron. "We deal with local operating companies and international operating companies as well as service providers. Some of our biggest clients include customers like National Drilling Company here in Abu Dhabi, SC Oilfields in Brunei and a number of clients in Malaysia."

Formally known as Lee Specialties Middle East LLC, SOP today operates from its ICAD 1 facility that covers an area of 7500 square metres, which it has occupied since 2009. From this location SOP is able to deliver fully turnkey solutions in wireline equipment, with both standardised and bespoke solutions. "We have an in-house design team, which can tailor each product to the exact specification of the client. We also carry out 95 per cent of our manufacturing in-house with our own machine shop, fabrication facility and painting facility, which allows us to monitor the quality of the product much better then through sub-contracting," explains Bob. "Our strength is in our focus on client satisfaction, we endeavour to meet and exceed their expectations by supplying custom built equipment specific to the customer's own specification."

The company maintains a broad product range that is subdivided into four main areas comprising of custom wireline units, wireline masts, auxiliary equipment and depth/tension measuring systems. An example of the technology deployed from the SOP portfolio to support and add value to its client's operations is the Slickline Eddy Current Tester (SECT). "We have a fairly innovate wire testing device known as a SECT, which is a very good application for clients using slickline wire," Bob elaborates.

"Currently when most operators and service companies utilise slickline wire they only have a finite number of hours before they have to scrap it and take new wire. Typically this is around 200 hours and this wire can be very expensive depending on the material used. The SECT that we have developed is designed to continuously monitor the condition of the wire and provide a graphical display that allows clients to know if the wire is in good condition regardless of how long it has run. This will allow operators to run the line for much longer than has previously been the case."

The SECT system is a compact, user friendly and highly functional application in flaw detection in slickline wire. The unit is able to detect hidden cracks in solid materials as well as other discontinuities in metals. An alarm will sound upon flaw detection and survey results are made easily available through the unit's colour LCD display and built-in USB printer cable and power cable, allowing results be saved and reviewed later. Probe options are available in sizes ranging from 0.092", 0.108" and 0.125" to 0.140".

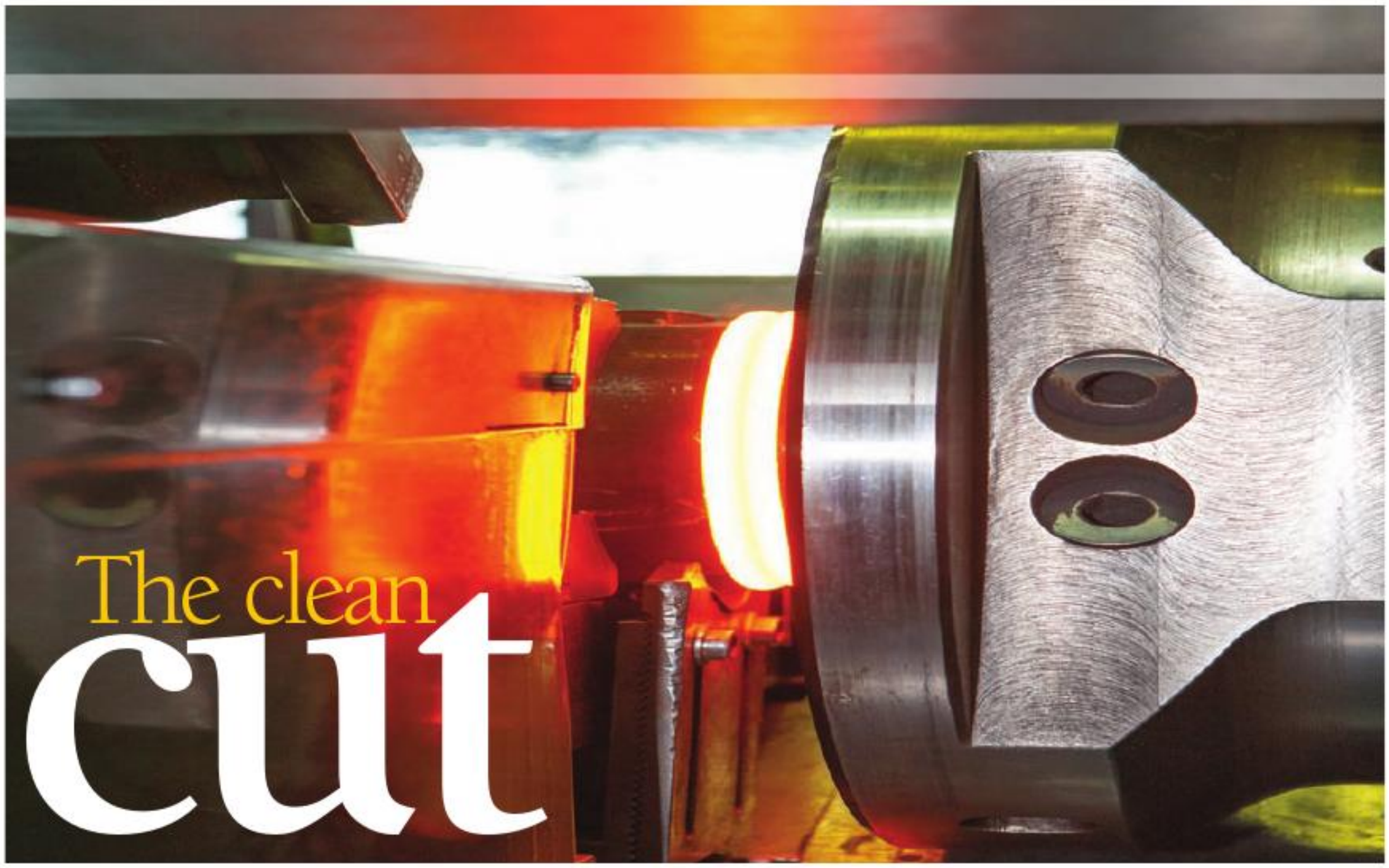
In tandem to its standard equipment packages SOP is able to deliver bespoke solutions that often call for imaginative and out-of-the-box thinking. "One of the most challenging projects that we have undertaken was the production of some equipment for a local operating company called Zakum Development Company (ZADCO)," observes Bob. "The equipment had to be high specification with a lot of bespoke options added, but simultaneously it had to be very lightweight and able to be moved around by helicopter. That was a challenge that involved us using some unusual materials to make sure we had the weight limitations covered."

Specialized Oilfield Products is keen to demonstrate that it is a trusted solution provider, both through the world-class solutions that it delivers and through obtaining the industry standards that establish SOP as a trusted brand. "We are committed to operating to the highest levels of health and safety, environment and quality," says Bob. "As such we meet ISO 9001, ISO 14001 and occupational health OHSAS 18001 certification, and this is combined with a good pricing strategy resulting in a service that other service providers cannot offer."

Furthermore, during 2013 SOP was given accreditation by the UAE Ministry of Environment and Water to declare the company as environmentally suitable for operation in the ICAD region. "This was an important step for us because environmental concerns are on everybody's lips at the moment and these are often the hardest targets to achieve. So by gaining that award I feel that we have demonstrated our commitment to being environmentally friendly and that we walk the talk," notes Bob.

As the company transitions the rest of 2014 and looks to the greater future, it will continue to focus on delivering world-class solutions to its existing customers while preparing to make moves into new pastures over the coming years. "For the rest of this year we will be looking at consolidating our current markets and looking into entering the CIS and Russian markets with a view to achieving good penetration next year," concludes Bob "Over the next three to five years we will look to continue on a planned growth path by increasing the company's market share in our current markets and gaining new markets. Ultimately we will bring in some new products that will balance the manufacturing highs and lows that occur with our single product line as it is now." OEG

Specialized Oilfield Products is keen to demonstrate that it is a trusted solution provider, both through the world-class solutions that it delivers and through obtaining the industry standards that establish SOP as a trusted brand



The clean cut

The history of Perforator dates back to 1885, initially trading as Schmidt, Kranz GmbH & Co (SK), producing tunnel drilling machines and shaft sinking equipment for the central German potash mining and salt industry. In 1922 Prof. Dr. Karl Glinz, who added reprocessing plants and coal mining equipment to the product range, acquired the business. His successors succeeded in developing the company into a holding, constantly adding new products to the portfolio and entering international markets. In 2002 the brand 'Perforator' was transformed into an independent company with headquarters in Germany, continuing the traditional core business of the former Schmidt, Kranz mining technique.

Today the company, under the direction of CEO Wolfgang Schmidt, offers customised solutions for worldwide drilling projects, supplying innovative and technically advanced drilling products to an international range of customers. Drill pipes and tools for oil and gas field drilling, DTH and HDD pipes, augers for vertical and horizontal drilling, drilling tools and injection systems for applications in mining, tunnelling and reconstruction are the cornerstones of its production.

"The basis of our success is the quality of our products, reflected by satisfied customers. We strive to maintain high manufacturing standards with production of drill pipes to API 5DP and regularly certified quality management systems according to DIN EN ISO 9001:2008," says Steffen Henning, sales director. Employing a highly motivated team of 125 qualified personnel ensures that the quality of its products is at a top level, which attracts a customer base that ranges from drilling contractors and rental companies to customers in the construction and mining industries. "We take care to keep close contact with our customers through an experienced field sales force and a well-structured net of associated companies and partners, mainly independent local companies, who ensure the distribution of our equipment worldwide," he adds.

Through a combination of experience, quality and development, the business has established itself in a strong position in the market as Steffen explains: "Drilling equipment is our business and we have decades of experience in a range of different horizontal and vertical drilling techniques. High quality products secure our good reputation, but it is equally as important to remain flexible and to adapt design and manufacture of products continuously to incorporate customer requirements or new technical standards. A close collaboration between our engineers, production, sales team and customers, guarantees that customised products can be supplied within a short time frame."

Operating as an independent company supports the flexibility but also encourages a flat hierarchy, offering direct contact to its customers with small expert teams, providing quick and effective solutions. However, as O&G

part of SK Holding it is able to take advantage of the synergetic potential of a strong group. In September 2013, MTS Perforator, its sister company and part of the Schmidt, Kranz Group took responsibility for the Perforator thrust boring technique division, already recognised internationally as a supplier of micro-tunnelling systems. Commenting on this business move, Steffen explains: "In recent years we experienced that the Perforator thrust boring technique perfectly complemented their product range. There have been many interfaces between the products regarding production as well as range of customers and market activities, so the target was to bundle resources under one roof and to offer single-source solutions to the customers."

Last year Perforator developed a new type of friction welded drill pipe, mainly for geothermal and other applications up to 1500 metres drilling depth. Using S-135 high-grade tube material with special highly quenched and tempered friction welded connections, these pipes meet all standards of comparable API 5DP drill pipes. The tube material is plain end, without upsetting, therefore the biggest advantage is a considerable cost reduction compared to upsetted API 5DP drill pipes.

Perforator also provides repair services of drill pipe threads, drill collars, HWDP's, subs and other tools according API or DS1 specifications including all necessary documentations.

"In co-operation with a major Scandinavian partner company we recently delivered double walled drill pipes with hexagon connections and outer casings up to outside diameters of 1016 millimetres, which are used with big DTH hammers for foundation drilling. These huge drill pipe diameters were a real challenge for our engineering and production team, but we successfully passed this pilot scheme and hope to enter the market with these large size drill pipes quickly," says Steffen. "Just a few days before we got a second big order for this type of drill pipes."

As the company seeks to develop its interests, it ultimately looks to the market to bring in new talent. Continuing, Steffen adds: "Training of employees is a critical success factor for a company. The main focus of our training sessions, which are regularly carried out either by our QA department, or by external institutions, is of course on the requirements of API or ISO standards." With a strong focus on certification, Steffen explains that the company's customer base views it as a traceable proof of high quality standards, furthermore, Perforator always put emphasis on the training of apprentices. "It is an investment in the future but it will pay off to have access to expert personnel.

"As we move ahead the challenge will be not only to assert our position but to extend our share in a highly competitive international market. The manufacture of customised high-quality products is only one side of the coin; the cost factor also has a heavy influence on our customers' decision to buy. As a medium-sized company we have been successful in maintaining a relatively equal balance between these two factors. Our target this year is to consolidate our position in Europe and to intensify our activities in the Middle East and South America. As we strive to reach this goal we will be focusing on our DTH and rotary drill pipes, field-tested reliable equipment with a high market acceptance. These drill pipes are well known for their excellent drilling performance at competitive prices," says Steffen.

Drawing to a conclusion Steffen provides an insight into the strategic vision for the business as it looks to the horizon: "We aim to strengthen Perforator's market position as a global, flexible supplier of high quality drilling equipment and to increase our market share continuously by entering the 'white spots' on our global map. At the same time it is important to keep pace with the changing requirements of our customers and to have an eye on new product development, such as high torque connections for oil field applications." O&G

> Through a combination of experience, quality and development, the business has established itself in a strong position in the market

VETCO COATING GMBH

Vetco Coating GmbH is the premier provider of internal tubular coatings, pioneering the use of advanced plastic-coating technology to substantially enhance the performance of tubulars.
In this role it supports Perforator's drill pipe with corrosion resistance and increases hydraulic efficiency by applying TK®-34P, a phenolic-novolac coating formulated especially for resistance to corrosion over a wide temperature up to 200 °C (400 °F) and pH range.
Vetco Coating GmbH has appreciated and honored Perforator as a professional and competent manufacturer of drill pipe in the oil and gas Industry for more than 20 years.

Perforator GmbH
perforator.de

Services
Customised solutions for drilling projects

CAMCON OIL

UK-based Camcon Oil, a partner of Special Oilfield Services (SOS) with whom it has a distribution agreement, is introducing greater digital intelligence into gas lift operations through its gas lift solution, APOLLO. APOLLO enables operators to vary injection rates and depths in real-time without production interruption, reduces the risks of well intervention, and delivers improved oil and gas recovery. APOLLO is currently being deployed on an onshore well in Oman, improving the production performance of the well and pre-empting well intervention requirements.

A solid supplier

As the oil and gas industry in Oman began to expand, the need arose for a business that was able to meet the specialised requirements of this industry. Special Oilfield Services Co. LLC (SOS) was formed to address this gap in the market – it is a joint venture between Mohsin Haider Darwish LLC (www.mhdoman.com), one of the largest business houses in Oman; and Al Mansoori Specialised Engineering (www.almansoori.biz) of Abu Dhabi, one of the largest national oilfield services companies operating in the Middle East.

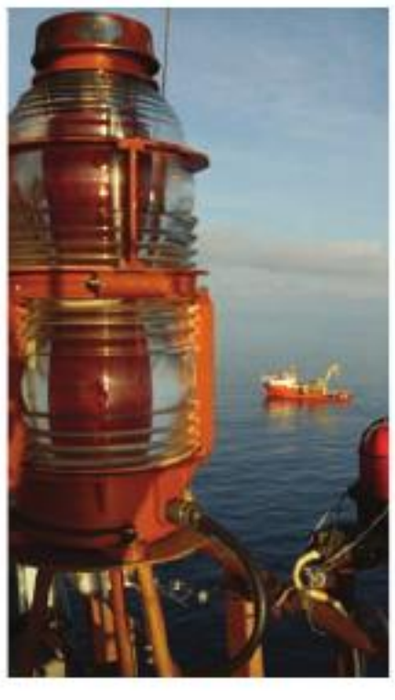
SOS was established in March 1986 and today its main field of activity is the provision of specialised services and supply of equipment to the oil and gas industry. It aims to provide local expertise, in order to benefit both its community and the wider country of Oman as a whole, from its operations in the interior of Oman at Fahud, Qarn Alam, Bahja, Nimr and Marmul, and its corporate office at Athaiba.

The company provides a very wide range of skilled services, including wireline services (slickline), well testing services, mud engineering services, inspection services and corrosion management services. SOS also represents various reputed international organisations to cover a range of products relating to the oil and gas industry. The major classifications of products are as follows:

- Well head equipment
- Downhole and completion equipment
- Production chemicals
- Instrumentation
- Process equipment
- Mechanical/production equipment/systems
- Pumps and gas compressors
- Laboratory supplies including chemicals

Complementing this product range is a skilled sales department, which oversees products and service representation (as covered by sales agency agreements) with some of the leading foreign oil and gas companies. The sales department markets a wide range of quality products, as well as hosting a 24 x 7 service in co-ordination, supervision and monitoring for clients' equipment and operations.

The complete SOS team numbers 189 employees, which includes contracts and operations managers, sales engineers, mechanical and instrumentation engineers, pump



supervisors, ASNT level II inspectors and health, safety, environment and quality (HSEQ) advisors.

In fact, these HSEQ staff play a very important role in the company, as SOS wishes to be the best service organisation in the industry with regards to its standards of HSEQ. Accordingly health, safety, environmental protection and quality are at the top of the agenda and it has created a guidance strategy to which all employees and management are expected to adhere.

This policy is consistent with its overall vision, mission and values, and states that SOS will continually seek to conduct its oilfield activities and other related operations in such a way as to avoid harm to its employees, contractors and all others who may be affected directly or indirectly by its activities. It also works to ensure there is no damage to the environment surrounding a work area, and no loss or damage of company owned and customer assets. Finally, it works hard to uphold both the company and clients' reputations and maintain the highest practically achievable standards of safety, occupational health, environmental protection and quality in its day-to-day business.

These very high standards can only be upheld if the company is prepared to work hard on their implementation. As a result, the company considers HSEQ a line function and all employees are empowered to stop work if an unsafe condition exists.

SOS also ensures that it provides the management structure, personnel, financial and human resources necessary to maintain and improve the quality of its services as well as minimise the potential adverse impacts of its operations on the environment and human health and safety.

Training is also a major element of this HSEQ approach. SOS provides education and training for all its employees to impart an understanding of this policy, as well as to promote the awareness of quality assurance and protection of the environment and health and safety, and to hold the manager, site managers, supervisors and workforce accountable for their performance.

As well as complying with the applicable legislation in Oman, where possible SOS also aims to conform to internationally accepted best practices and standards. This requires the creation of management programmes with defined objectives and targets to improve the pro-active control of risks, and create a step change in staff behaviour. Both company and individual performance is monitored and evaluated through regular internal audits and management reviews to achieve responsible self-regulation of the company's operations.

Through its dedicated approach to excellence, SOS has created a company that puts quality at the heart of all its operations. Beginning with a customer enquiry and going all the way through to completion, SOS' standards and methods are all designed to not only meet but also exceed customers' requirements. These standards are necessary to meet the needs of highly demanding clients from the oil and gas arena, such as Petroleum Development Oman, with which SOS now performs 65 per cent of its business.

As the oil and gas industry in Oman continues to grow at a fast rate, SOS is ideally positioned to meet the needs of the market. Already working with blue chip clients and representing some of the best brands in the industry, SOS can continue to draw on its history of innovation (it was the first company to introduce real-time inspection to the Middle East) in order further solidify its position as a reliable and high quality service provider. O&G

> Through its dedicated approach to excellence, SOS has created a company that puts quality at the heart of all its operations

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First class service

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 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 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." OEG

Amazon Filters
amazonfilters.com

Services
Turnkey filtration equipment

Protecting pipelines

For 30 years iNPIPE PRODUCTS has been a world leader in the manufacture and supply of pipeline products with a dedication to innovation and quality. The company, which is based in North Yorkshire in the UK, operates in the oil, gas, petrochemical and water industries. It was established in 1984 by Ken Hemingway, who was widely regarded as a lifelong innovator and highly reputed expert in the pipeline industry.

Throughout its history the business has been at the forefront of innovation in the industry. From its first patented product, an intrusive signaller that to this day is acknowledged as a market leading solution, the company has continued to expand its product range, which today is unrivalled in the market and includes metal bodied pigs/scrapers, spheres, foam pigs, weld testers, pig signallers, and launching and receiving solutions.

Many of these products have become the standard bearers in their field, with iNPIPE PRODUCTS exporting 84 per cent of its turnover to six continents worldwide. In its 30 years of business the company has established a series of strong strategic alliances globally, which allow it to quickly and efficiently respond to the needs of its clients.

Alongside this network iNPIPE PRODUCTS' manufacturing facilities in the UK are equipped to produce the highest quality machined parts and polyurethane pigs to both standardised and customised specifications. In fact, in order to maintain its leading position in the market the company has recently opened a new, state-of-the-art 60,000 sq ft factory. Set in six acres of land this new site will provide iNPIPE PRODUCTS with the necessary space for training, pig loops, product prototype testing and demonstrations/ training for pig tracking and location.

iNPIPE PRODUCTS is the world leader in the design and manufacture of pigging, pipeline pigging and pigging components, which are used for pipeline pigging for maintenance, pipeline abandonment and decommissioning, and pipeline products for testing and isolation. The former is an essential factor in successfully running and operating any asset or pipeline to its maximum efficiency, with reliable and high quality pigging being integral to pipeline maintenance. For this particular application iNPIPE PRODUCTS provides a number of different pigs and maintenance products, such as foam pigs, which are used for cleaning, swabbing, product separation, de-watering and drying; spheres, which are effective to separate and batch products; and bi-di and cup pigs.

iNPIPE PRODUCTS is the largest manufacturer of foam pigs in the UK and works very closely with its clients to ensure development of the optimum pigging solution. Foam pigs are developed from materials that provide a number of advantages and are available in bare foam, criss cross, silicone carbide and wire brush variations. The pigs can travel up to 400km in a pipeline and are capable of negotiating short radius bends, mitres, tees and different valve configurations. Furthermore, they are maintenance free and disposable for ease of use and are designed specifically for each individual clients' request.

The application of iNPIPE PRODUCTS' pigs and accompanying products is essential for ensuring that the inside of a pipeline remains debris-free, has no deposits, and is condition-monitored along its entire length. This not only has significant benefits for the longevity of pipelines, but also ensures that the quality of the product in the pipeline remains high and that overall production is not affected. For that reason, iNPIPE PRODUCTS' solutions are a vital component of many of the major pipeline operators' maintenance programmes worldwide.

In recent years the decommissioning of offshore assets has grown considerably, and in this field iNPIPE PRODUCTS' pigs and associated solutions are playing a vital role. Pipeline decommissioning involves pigging, flushing, filling and eventual plugging of the pipeline and iNPIPE PRODUCTS has a number of pigging tools that are extremely effective at these operations. For example, the company's abandonment plugs are used to permanently seal a pipeline during the decommissioning phase, while its hyperbaric spheres are applied to ensure a dry subsea hyperbaric pipeline tie-in or repair where radiographic inspection may be required.

While the company's pigs are extremely reliable and able to effectively and efficiently work through a pipeline, iNPIPE PRODUCTS offers a range of pig locators to track the pig during operations. The CD42 pipeline pig tracking and location system allows operators to detect and record pig passages quickly and easily. The system features a state-of-the-art back-lit graphics display to highlight

clean oceans love safe solutions

PU solutions for the offshore industry. Companies working within the offshore industry operate under severe pressure and need solutions that perform far beyond the norm.

Tackling problems quickly and effectively and working closely with our clients, BASF Polyurethanes develops individually tailored and economically viable solutions for the subsea sector.

Clients can rely on BASF Polyurethanes's intelligent polyurethane solutions to function under the most extreme conditions. From bend stiffeners, pigs, strakes, doghouses, field joints to piggy backs – and much more. Because at BASF, we create chemistry.

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the passage of pigs that are equipped with transmitters, thus eliminating doubt over the pig's operation and eliminating stop and go progress through the pipeline.

Pigs being tracked are equipped with transmitter devices, widely regarded as the most durable, longest lasting transmitters in the industry. Resistant to shock and vibration, the transmitters are protected from damage from hydrocarbons and manufactured to exacting tolerances. The transmitters operate on the principles of a magnetic field, which is emitted and passes through the pipeline to be received on the surface. iNPIPE PRODUCTS provides a range of transmitters to allow for various performance variables like pipe wall thickness, metallic pipeline coverings, large pipeline diameters, depth of pipeline cover and battery strength, all of which can have an impact on signal strength and reception.

Alongside pigging, pipeline maintenance also involves extensive testing to ensure the integrity of the pipe. Regular testing not only means that pipes are complying to safety standards, but also increases lifespan and reduces overall maintenance costs by highlighting any potential issues as early as possible. During pipeline testing pressure indicators are used to assess the integrity of the pipe, while pipeline isolation solutions are used to section off a particular piece of pipe for subsequent repairs.

iNPIPE PRODUCTS has developed a portfolio of tools that can be used for both of these vital maintenance processes. For example, its flange weld testers and internal weld testers can be used to test new flange welds or new internal welds respectively, while it has a range of pipeline plugs and dual tools for isolation and hydrostatic testing.

When it comes to looking after a pipeline iNPIPE PRODUCTS is a world leader, with a suite of state-of-the-art solutions that are capable of ensuring pipelines are operating as effectively and efficiently as possible with any maintenance being seamlessly carried out. The company, which prides itself on continuous development and innovation is at the forefront of the industry, and with the depth of experience and skill within the business this is likely to continue for the foreseeable future. O&G

BASF POLYURETHANES

BASF Polyurethanes is a leading supplier of Polyurethane solutions and has a comprehensive product and service portfolio. Through its global network, BASF provides fast local support, from technical service and sales, to production and marketing during the development of customised solutions. Over the past years BASF Polyurethanes has been consistently expanding its expertise by developing customised polyurethane solutions for offshore applications. The development has been focused not only on the resistance to high temperatures and seawater, but also on the use of environmentally friendly catalysts. In the area of pipeline pigging BASF Polyurethanes has been a key supplier in the market and long-term supplier to iNPIPE PRODUCTS Limited. Initially focusing on pigging foams and coatings, BASF's portfolio has now expanded to include two and three component solid elastomer systems, enabling customers to produce a range of high quality components with excellent physical properties, all developed without the need for heavy metal based catalysts.

Next level solutions

Above
Colin Milne, sales director at HCS Control Systems

VERSATILE CONTROLS LTD

Versa 316
Stainless Steel Regulators

Versatile Controls Ltd introduces the latest addition to its successful range of Versa 1/4" and 1/2" npt AR-316 series hi-flow regulators, by completing it with 1" npt regulators, filters, and combination units.

The ARFA 316 stainless steel construction is ideal for sour gas and/or corrosive environments and is NACE compliant. This meets sulphide stress cracking material requirements of the NACE standard MR-01-75.

Standard seals and diaphragms are FKM (fluorocarbon), to meet low temperature conditions of -51°C to 149°C (-60°F to 300°F).

The Versa Type AR-316 series of stainless steel regulators and filter regulators are designed to stand up to the harshest environments while providing highly accurate pressure regulation.

Having undergone a £9 million equity funding deal during June 2013, HCS Control Systems Ltd has grown from strength-to-strength and continues to aggressively push its ambitious goal of reaching the 'next level' within the subsea market.

Since the business was last featured in *European Oil and Gas Magazine* during November 2013, HCS has reached a number of important milestones and taken significant strides in developing the company. These included the strengthening of the company's team with new key personnel, such as newly appointed sales director Colin Milne who comments: "There have certainly been some milestones that HCS has reached in a relatively short time, for example the company has been accredited as compliant with the ISO18001 safety standard and has also recently exceeded its financial goals for the period since November 2013 - hopefully that will continue to be the case in moving forward."

Further elaborating on his experience in joining HCS at such a transitional period Colin elaborates: "It is a very exciting time to have joined HCS at present, especially as it is a leading designer and manufacturer in subsea equipment, which is certainly the case from my perspective coming in. We have a team of highly experienced personnel and it has been an easy transition from a company where I had previously worked for 14 years to HCS, which is moving in the right direction with the company growing steadily."

In addition to Colin's appointment as sales director, HCS has increased its competence through increasing its workforce in its sales, engineering, purchasing and workshop teams in order to develop its sales strategy for ambitious growth. This has been done in tandem with the opening of a new office in Aberdeen specialising in sales and service support that rounds out its main 60,000sq.ft engineering and manufacturing facility in Glenrothes, North East Scotland. This combined approach is driven by the management team's invigorated approach to growing the business, and in support of innovative new technologies developed by HCS in response to the problems faced by the subsea industry.

As a result of close engagement with its clients to identify the needs of the subsea sector, HCS has developed a new Zone 1 rated high-capacity electric umbilical reeler. As with all of its products and services, HCS offers a full turnkey package solution with its line of reelers and offers a dedicated spooling service where it will install the umbilical onto the reeler and deliver a complete field-ready system to the client. The Zone 1 high-capacity electric reeler it has developed is a patent-pending system owned by HCS that features a simple, yet highly reliable design that makes it highly suitable for use in hazardous areas of operation. In addition, the design offers several advantages over conventional pneumatic and hydraulic systems including reduced maintenance, increased control capabilities and more consistent performance, simplified fault-finding and diagnostics, increased data-logging capabilities, reduced requirement for spares inventory and the ability for integration with umbilical tension sensing.

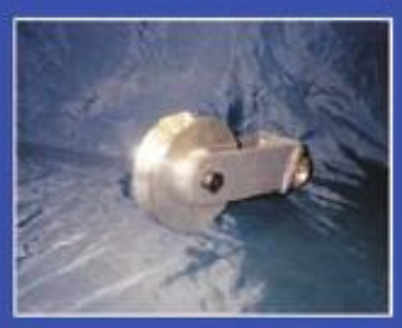
HCS Control Systems' umbilical reelers and high capacity reelers are complemented by a

host of subsea products encompassing umbilical termination units, production control systems, hydraulic power units, and subsea distribution units, as well as orbital welding services and comprehensive aftersales and support services that are available to clients 24/7.

Today HCS is a leading subsea design, manufacture and support company throughout the world with strong relationships with clients operating in Europe, South Africa, Asia, Nigeria and India. Recently, the company was given a massive boost when it was awarded a multi-million pound contract with Aker Solutions to provide instrumentation and subsea welding equipment. The project will see HCS assisting Aker by providing equipment to be used in the BP Quad 204 development off the shore of Shetland, UK. As well as instrumentation and equipment, HCS will manage a project welding team responsible for manufacture at the company's own facility and for the fabrication of equipment on site. Commenting upon the contract, CEO Brett Lestrange says: "The award from Aker Solutions is a fantastic achievement by the HCS team, and we look forward to providing an outstanding level of safe, high quality services to Aker Solutions. The award also bolsters our confidence to continue our rapid expansion plans, having already increased our headcount by nearly 30 per cent since June 2013."

While the company's contract with Aker has indeed proven to be an important catalyst to the growth strategy of the HCS management team, it is but one step for the business at it continues to grow as Colin concludes: "HCS was recently awarded two framework agreements by two major companies worth between three to four million pounds per year, which is another major milestone for us as a company. In relation to the business over the next three to five years we anticipate that the market will continue to be very buoyant with a lot of opportunities, and we also expect a definite increase in projects with the company's current clients so things are looking very positive from an HCS and market perspective over the coming months and years." O&G

Today HCS is a leading subsea design, manufacture and support company throughout the world with strong relationships with clients operating in Europe, South Africa, Asia, Nigeria and India



The total solution

With a proven 30-year track record in supplying turnkey rig solutions to clients all over the world, TSC Offshore FZE is a leading oil and gas drilling product, service and solution provider. TSC Offshore exists as part of TSC Group Holdings Ltd and operates from eight manufacturing facilities and three engineering research centres globally, which allows the company to reach its customers quickly from a strong base of competence.

The business has a rich history, with roots dating back to 1995 and the formation of Emer International in Houston. Later in 2001, the company's first manufacturing plant was founded in China and Emer would go on to be listed on the Hong Kong stock exchange in 2005. During 2008 Emer underwent some significant changes that would have a marked impact in defining the company as it is recognised today, including the rebranding of the company to TSC Offshore and the acquisition of the UK stock market listed company Global Marine Energy (GME). This brought with it the combined competence of Patriot and MOS Offshore, which were founded in 1989 and 1990 respectfully and which were then owned by GME. Furthermore the GME subsidiary Ansell Jones, which was founded in the 1850s, was brought into the company bringing with it over 100 years of experience.

By 2011 TSC Offshore was rebranded as TSC Group and today the company is active within a broad base of markets located in China, the US, the UAE, Brazil, UK, Singapore, Hong Kong, Mexico and Russia. Commenting on the meteoric growth of the company, general manager Nick White says: "With the rapid expansion of the group from relatively small beginnings and the incorporation of GME and other companies, there have been some growing pains and lessons learnt. Since the launch of the company's five year strategic development plan in 2013 the many locations of the group are all working together to meet the company's high quality, reliability and delivery targets."

The turnkey products and services provided by TSC include comprehensive product lines in both onshore and offshore rig equipment, O&G

WOM™

WORLDWIDE OILFIELD MACHINE

Invention, Unique Design & Extraordinary Craftsmanship

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What's on your Manifold?

WOM is a multinational, vertically integrated company specializing in the design and manufacture of pressure control products. WOM Manifolds incorporate the globally recognized Magnum™ Gate Valve featuring WOM's Dual-Seal™ technology. The patented Dual-Seal™ design has proven successful in countless pressure control applications including drilling, testing, and production in onshore, offshore and subsea environments.

- Onshore and Offshore Pressure control Equipment for Drilling & Production
- Products meet ISO & API Performance and Quality Requirements
- Industry Leading Patented Equipment
- Strategically Located Manufacturing Facilities, Engineering Centres, Assembly/Testing Facilities and Research & Development Services
- Factory Trained Technicians
- Custom Designs & Manufacturing
- Repair & Retrofit

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expendables and packages that encompass design, manufacture and system integration. The company delivers total solution packages of complete cantilever and drillfloor equipment including drilling equipment, deck cranes, leg jacking systems, solids control, power packages, rig control and drive packages, pipe handling and BOP handling. Additionally, TSC has significant experience in providing specialised handling equipment to semi-submersibles and drillships for the handling of risers, drill pipe and BOP stacks, while Ansell Jones specialises in lifting and mooring equipment, giving TSC access to a broad and highly technical equipment portfolio.

In keeping with the company's beginnings, growth has been strong for TSC over the past 12 months and with the increased efficiency and productivity of its five-year growth plan, it has generated its highest ever return on assets. Recent activities for the company have included projects for China Oilfield Services Limited (COSL), including the delivery of an integrated drilling and electrical control package on the 'HYSY 932' jack-up and packages for Super M2 rigs constructed by CIMC shipyard, as Nick elaborates: "HYSY 932 is a Friede & Goldman designed SM2 rig. TSC provided the complete drillfloor drilling package, which included the design of the drillfloor, derrick, all drilling equipment, mud system, mud cleaning system, well control equipment and an electric control package. The rig is classed by ABS and features ABS CDS 2011 certified drilling equipment.

"Currently TSC has provided seven integrated drilling packages and electric control packages to CIMC shipyard for their SM2 rigs, two of which are being used by COSL. HYSY 932 has found oil on the first well it drilled and the Gulf Driller 1 has successfully started to drill its first well."

Other projects include the construction of a number of jack-up rigs in the Huangpu shipyard by TSC. The R550D rig designed by Zentech incorporates a complete TSC drilling package in a contract valued at $54.69 million. In addition to the large integrated packages that it provides, TSC also provides many individual pieces of equipment to new and older rigs, as Nick details: "A large user of our equipment is Dalin Shipbuilding for their JU2000E rigs. We have supplied or have orders for nearly 30 rig sets of BOP handler and conductor tensioning units for JU2000E rigs. Seadrill and Prospector Offshore drilling have a large quantity of these rigs and the same units are in operation in the North Sea."

As well as operating as a trusted equipment supplier, TSC provides an extensive range of engineering, maintenance and support services that present clients with greater value-added service and ensures that whatever the problem – TSC has the solution. "We are a solutions provider to our client's needs," says Nick. "TSC is dedicated to utilising leading edge technology to create a high product performance, and distinguishes itself from other companies with its reliable and flexible product line."

Adding to the turnkey equipment packages that it is able to offer, TSC is able to supply bespoke engineering solutions as well as upgrade and revamp options. Furthermore, its maintenance and consultancy services ensure that its clients are able to operate at the highest levels of efficiency. Spare parts and expendables are also available, meaning that in conjunction with its equipment packages and maintenance services, TSC truly provides a one-stop shop solutions package.

As the company transitions the rest of 2014 and looks to the coming years, TSC is confident that is has the right foundation to continue to grow well into the future. "TSC anticipates that the demand for rig solutions and equipment will continue to grow due to a sustained oil price and increasing demand," concludes Nick "The company is ideally positioned to take advantage of opportunities present within the oil and gas sector, particularly in China where competitive financing terms can be sourced for rig builds. The future business strategy for TSC revolves around opportunities arising from industry dynamics. We are extensively expanding our manufacturing facilities in Qingdao and we are very optimistic about the future." O&G

WORLDWIDE OILFIELD MACHINE

WOM's patented, field-proven technologies have set the standard of performance, making WOM products preferred by TSC Offshore. Since its founding in 1980, Worldwide Oilfield Machine has re-defined reliability and performance in the pressure and flow control applications in the oil and gas industry. With the Magnum gate valve at the heart of its product line, WOM has been providing TSC Offshore with quality products for over five years. Currently, WOM is manufacturing the H213, H214 and R550 manifolds for several TSC jack-up drilling rigs. These manifolds are 3" 15K and 5" 7.5K standpipe manifolds. WOM is fully vertically integrated, which includes the forging, manufacturing, assembly, and testing of the manifolds. All of WOM's manufacturing facilities are API approved and strategically located in the US, UK, Middle East, India, and Singapore. WOM is proud to provide TSC Offshore with the hardware that is required to operate its equipment safely and reliably, with minimum down time. Additionally, WOM is in the preliminary stages of working with TSC to provide manifolds and BOP systems for its new portable land rig design. WOM is proud of the excellent relationship that has been built with TSC and is excited to continually work together.

TSC Offshore FZE
t-s-c.com

Services
Drilling product, service and solutions provider

Covering new areas

With over 150 years of industry experience behind it and targeted coating solutions designed to meet client demand, Sherwin-Williams Protective and Marine Coatings is a leading authority in the delivery of groundbreaking technical performance in asset protection.

The company was originally founded as Leighs Paints by William and Joshua Leigh during 1860, just six years prior to the formation of Sherwin-Williams in Cleveland, Ohio. Based in Bolton, UK Leighs Paints operated as a family owned and run business producing the world-class FIRETEX range of passive fire protection (PFP) products amongst others, until it was acquired by Sherwin-Williams to become part of the Protective & Marine Coatings divison within its Global Finishes Group during 2011.

Following this the company was given its current name of Sherwin-Williams Protective and Marine Coatings EMEA (SWPMC) as part of the process of integrating the Leighs brand into the wider Sherwin-Williams Group. "Leighs Paints was acquired for a number of reasons," says SWPMC EMEA managing director, Gordon Bell. "One of which was because it had some very strong brands, including the FIRETEX brand and the acquisition also gave Sherwin-Williams a footprint in the European market, which the company didn't originally have. In terms of the integration of Leighs into the wider business, this has gone very well. We started to integrate almost as soon as we joined Sherwin-Williams group in 2011 and successfully completed the move to adopt the Sherwin-Williams brand and to move away from the Leighs Paints brand in 2013. This was important because the protective coatings and marine industry is a truly global business and we wanted to adopt a global platform to match, and obviously the Sherwin-Williams brand was the most well known brand globally."

Today SWPMC EMEA employs a staff of around 260 out of a wider group total of over 36,000 throughout the Sherwin-Williams Group.

12 2013

CLARIANT

Clariant Oil Services
SUSTAINABLE PRODUCTION WITH IMPROVED PERFORMANCE

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SPECIALTY CHEMICALS CREATING VALUE

Clariant Oil Services provides well service additives, production and pipeline chemicals and specialty services to the international oil and gas industry. At the same time, we remain committed to developing innovative, sustainable chemical technologies that are environmentally acceptable and improve performance for better overall results.

innovation assured. value delivered.

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In all, the group enjoys an annual turnover of $10 billion of which, the protective and marine coatings segment of the Global Finishes Group generates around $1 billion. The other three main divisions operating under the Sherwin-Williams umbrella are Paint Stores Group, Diversified Brands and the Latin American Coating Group. SWPMC focuses on the Europe, Middle East and Africa (EMEA) region and from its UK base generates a turnover of around £44 million ($74 million approx) and this figure continues to grow year-on-year.

"I think the biggest strengths of SWPMC come from the fact that Sherwin-Williams is a very much technology based company, and one of the main advantages is also one that is shared with the former Leighs Paints business, in that Sherwin-Williams is very much a customer focused business and driven on meeting the high expectations of its clients. It is a combination of firstly doing exactly what clients want us to do and secondly the process of developing 'leading-edge' technologies that is key for the company," says Gordon.

As such SWPMC regularly introduces new products and extensions to its existing product lines. One recent addition is the DURA-PLATE 301W, which is a low temperature curing, surface and humidity tolerant two-pack modified epoxy. DURA-PLATE 301W can be applied without dew point restrictions and over wet steel surfaces, while displaying excellent chemical and abrasion resistance and good edge-retentive properties. Furthermore it can be applied over steel prepared by hydroblasting, grit blasting or mechanical tooling. As an anticorrosive coating for long service life steel protection, it can be used for projects above the waterline and in submerged applications and is suitable for new building, conversion, repair and maintenance tasks to provide superior protecting performance in areas such as ballast tanks, void tanks, crude oil tanks, slop tanks, mud pits, wet spaces, bilges, decks, external hull and steel bridges.

"DURA-PLATE 301W addresses the current need of non-productive painting time when dealing with offshore assets," explains regional marketing director – EMEA, Nick Ball.

"Traditionally when it is cold and damp and therefore moist, clients are unable to apply coatings to structures. However this product is moisture resistant and is also usable down to zero degrees Celsius, so it significantly widens the painting window for contractors. It is actually part of a wider line called DURA-PLATE 301 so 301W is probably best described as a product extension. This product has been widely used by Petrobras, which has been using the DURA-PLATE range for many years, and has used the new 301W extensively for newbuilds in Asia during last year. We are releasing this product to the European market in 2014 so for us that is quite exciting for our customers because, as far as we know, there is nothing else on the market that provides this type of window of extension for application."

Another important recently introduced product is the HEAT-FLEX HI-TEMP 1200, which represents the next generation single-

component inert multipolymeric matrix coating that outperforms alternatives in combating corrosion under insulation (CUI) and in high heat applications. "This is an example of the leading technologies that SWPMC strives to deliver," observes Nick. "It is very much a next-generation corrosion and insulation product and there is nothing like it in Europe. Competitors are using older technology and this basically gives clients a lot more flexibility in terms of the product's durability when in use. It has market leading technical performance when it comes to corrosion, temperature and thermal shock resistance. It is very much an example of where Sherwin is trying to position itself in the market, as we are trying to give the customer a choice where I think the rest of the market is traditionally very mainstream. Sherwin is about finding what it is that is going to make a difference to the customer and bringing that into the marketplace."

During the coming years SWPMC will focus on continuing to develop new products and growing within the EMEA region. Having successfully integrated itself with the wider Sherwin-Williams brand, the company is in an extremely promising position to further define itself as a provider of leading-edge technology and world-class coating solutions. O&G

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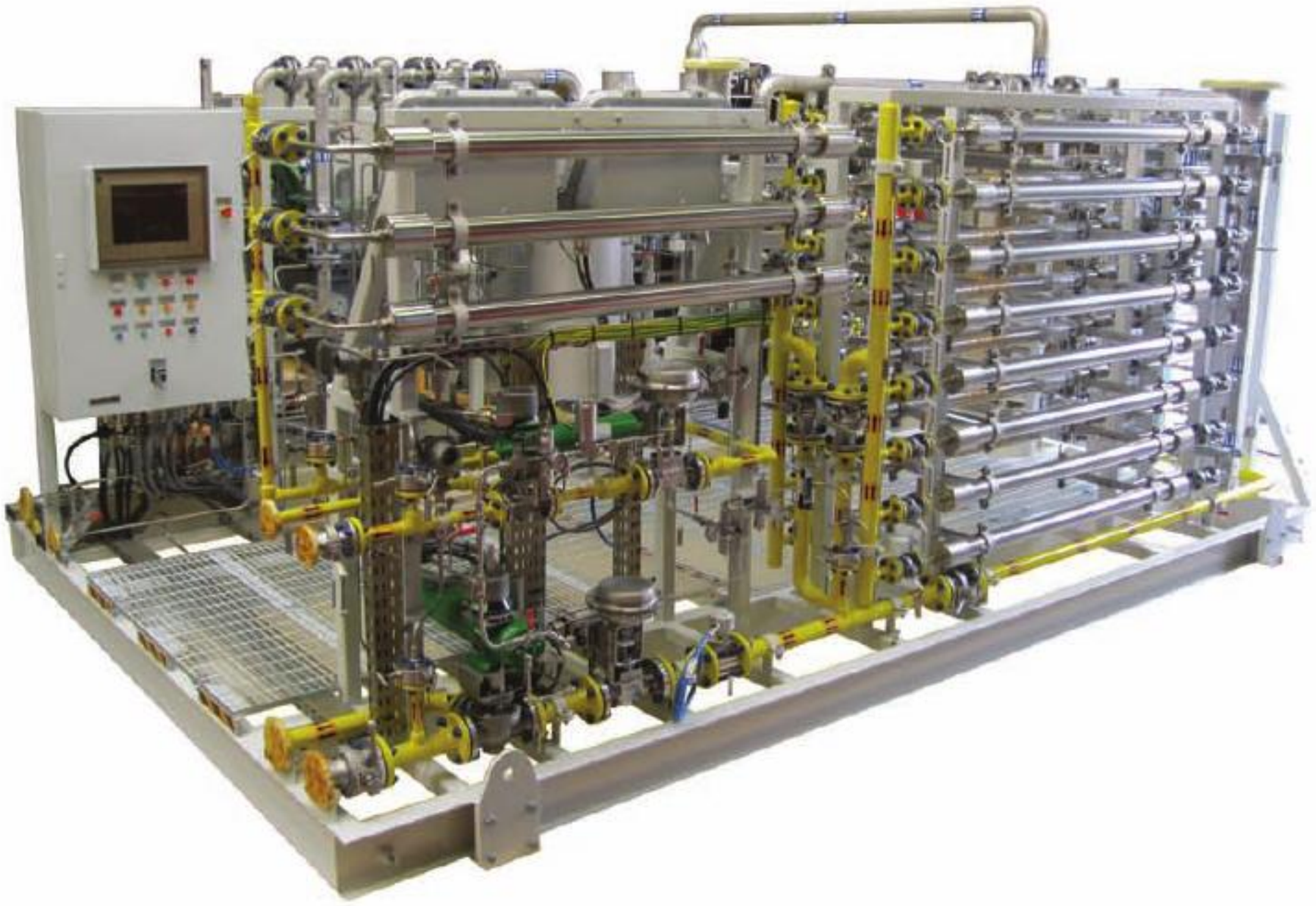
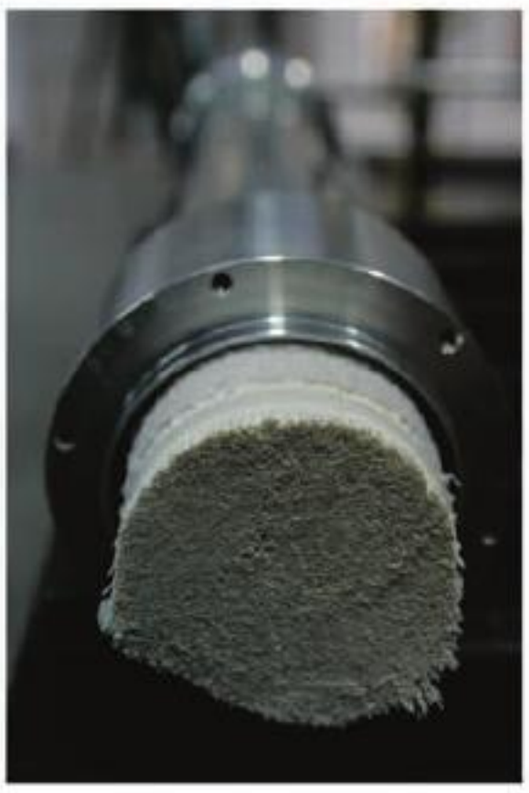


Parker nitrogen generation membranes will provide reliable uninterrupted supply of nitrogen for all offshore applications.

Nitrogen is used throughout the Oil and Gas industry to eliminate hazards such as fire, explosions and the risk of oxidation.
Parker Hannifin hollow fibre membrane technology, offers the latest, state of the art approach for on-site generation of nitrogen gas.
Typical at offshore exploration and production applications the need for on-site nitrogen supplied without any interruptions is essential for safety as well as a continuous production process.
On-site gas separation technology based on hollow fibre membranes is a preferred technology when conditions where movements and vibrations can occur or when severe ambient conditions can occur.
This will require non-sensitive hollow fibre membranes which can operate at a wide operational temperature range and without any performance loss over the entire life time.
For regular nitrogen operations like flare purging; blanketing; pipeline purging and gas sealing the required nitrogen pressure is relative low. With this type of applications the required membrane feedair pressure does not need to be higher than necessary. This design philosophy will result into less condensate formed upstream the membranes and less energy consumption related to the compressed air supply. In addition the Parker hollow fibre membranes do not need a heater for conditioning constant high inlet temperature. Parker hollow fibre membranes will provide already a stable performance at low-inlet temperature. This stable performance will remain at higher temperature ranges.

Summarizing:
A further increasing demand for robust and reliable on-site nitrogen generators in the global off shore oil & gas field is expected. In compliance with the offshore requirements the Parker hollow fibre membranes will provide an optimum fit concerning performance; reliability; footprint and energy consumption.



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Generating excellence

TEKOMA

Since its inception in 1962, Tekoma has been a reliable partner for skid mounted process units for the oil and gas industry. We are familiar with a wide variety of offshore and marine rules and regulations.
Based on P&ID's or flow sheets, all as specified by the client, our engineers will design your process units in accordance with relevant project specifications.
Tekoma is ISO9001 certified for the engineering and fabrication of modular process equipment as well holding EC certificate of conformity according Pressure Equipment Directive 97/23/EC.
In order to maintain its competative edge, Tekoma started its production plant in Hungary in 2004 for all its standard products, pipe spools and construction works.

With a history dating back

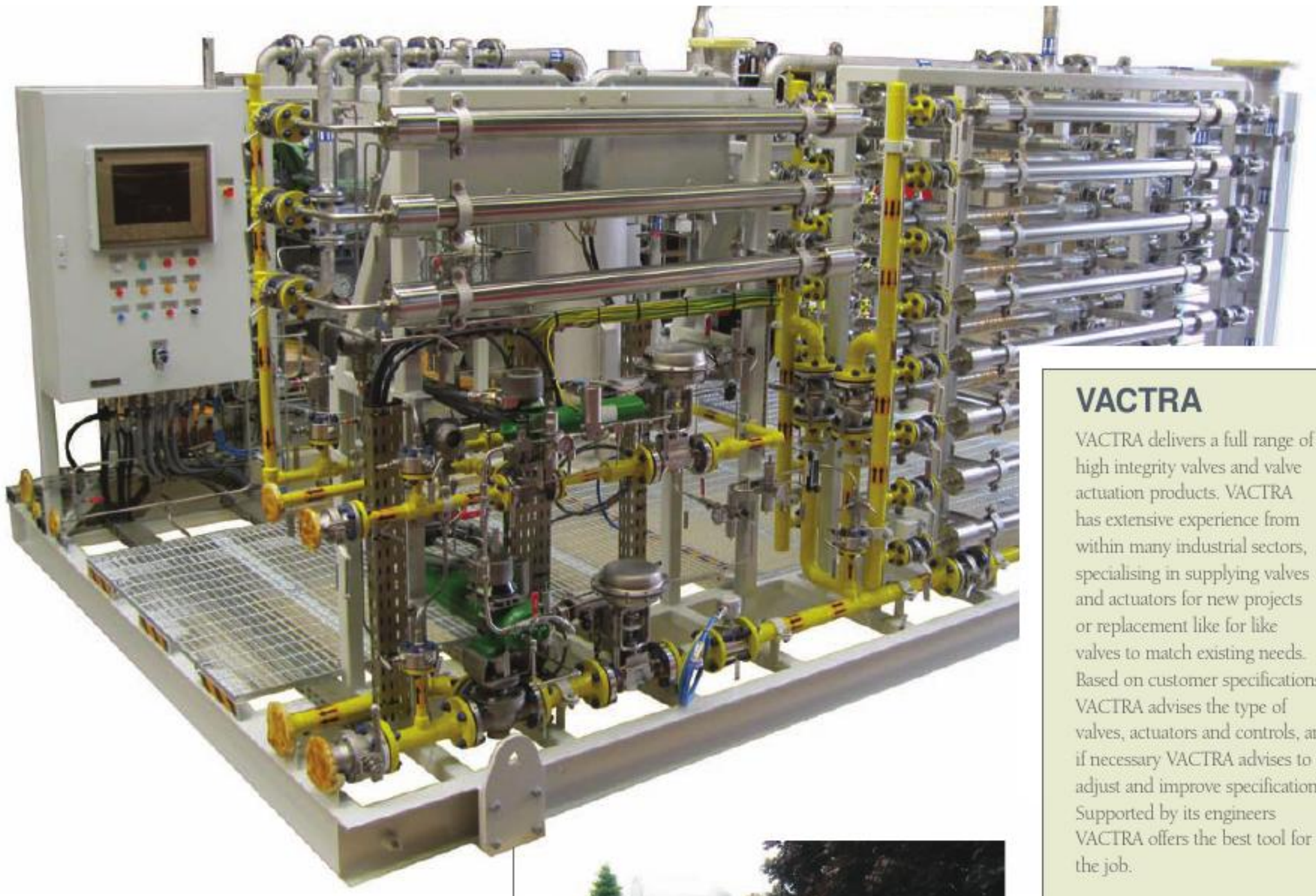
to 1874 when the company was founded in Amsterdam, Geveke Werktuigbouw BV has developed a leading reputation as a trusted supplier of technical pump and service solutions to the oil and gas industry.

Geveke was last year acquired by the Japanese industrial group, NIKKISO Ltd and continues to operate as an independent company within the organisation. From its Amsterdam headquarters Geveke manages offices within its native Netherlands as well as Belgium and Malaysia. The company is divided in two business units comprised of Geveke Pumps and Geveke Compressed Air Technology. This model of an internationally operating company with dedicated technical divisions fits well with the NIKKISO business model and allows for close collaboration with NIKKISO and other entities within the group as Geveke business unit manager, Robert Hessen elaborates: "Over the years we engaged in several takeovers and management buyouts, but the most recent event was the takeover of the company last year by NIKKISO Ltd, based in Tokyo. NIKKISO is also the owner of one our key principles, the LEWA Group in Germany. NIKKISO and LEWA are both internationally operating companies and through that network as well as product development we hope to find good synergies so that we can increase the company's footprint worldwide with the packages we build."

Since 1979 Geveke has supplied chemical injection packages to a range of clients, primarily based in the oil and gas sector. To date it has delivered in excess of 1000 packages to international markets in both standard and bespoke solutions. Today the company's comprehensive product portfolio includes chemical and specialised methanol injection systems; chemical transfer, odorizing and nitrogen generation systems; IRCD distribution panels; instrument air solutions and produced water systems. In addition to these packages, Geveke also regularly designs less common systems that are produced to address unique problems or deliver an unusual solution. These include ejector packages, water injection packages, CO_2 snuffing packages, filtration units, sealing systems and seal barrier systems.

One of the latest and increasingly sought after packages supplied by Geveke is its range of nitrogen generators, which have a wide variety of applications in the oil and gas industry such as tank blanketing; decreasing fire or explosion risk; oxidisation avoidance; buffering of gas compressor seals and start-up purging. In co-operation with Parker, one of Geveke's principals, Geveke is able to deliver nitrogen generation systems in standard and uniquely designed packages. "Through a principle partner we can deliver standard off-the-shelf nitrogen generators, however within the oil and gas industry there is an increasing requirement for bespoke packages and these custom-made packages have to comply with all sorts of regulations and control issues. We build custom-made packages based on the requirements of our customers, and to the specification of design authorities like ABS or DNV."

Nitrogen generation packages supplied by Geveke are based on the Parker Smartfluxx membranes. These membrane modules are highly permeable, which allows the benefit of operating at lower compressed air pressures and air temperatures resulting in minimised energy consumption. In addition these membranes do not require heaters or pressure vessels to contain the membranes. The equipment is supplied with an oxygen analyzer to allow for simple measurement of produced nitrogen quality, which is available at purities of between 95 per cent up to 99.5 per cent at varying pressures and capacities. "We are also working with our partners for units operating at even higher purities and with higher efficiencies, as well



as at increased volumes and capacities," says Robert. "We are also further developing the control panels as in the past these generators had quite basic control systems. Today nitrogen generators are programmable logic controller (PLC) operated and have touch screen control panels with a graphic display, which shows the complete operation of the system including all of its automatic valves and process monitoring transmitters." In combination with these nitrogen generation packages Geveke supplies instrument air compressors, dryers, nitrogen and air vessels, and nitrogen boosters and compressors.

Presently Geveke serves globally recognised brands such as Shell, SBM Group, MODEC and Petrobras on the international market. Over the coming months the company will continue to focus its efforts on delivering world-class products and innovate aftersales and commissioning services to it clients, as well as seeking to increase its global footprint in the wake of its association with NIKKISO. "In many cases for clients this is new technology so we are on hand to help with start-up and commissioning and to provide other services through delivering service contracts," say Robert. "The requirement for safe environments on platforms is increasing, meaning that nitrogen

is replacing air in several cases so we see good opportunity in this. Increasingly remote and technically difficult to produce gas and oil are driving more processes that require nitrogen, so we see a lot of opportunity for future growth."

Commenting on the strengths of the company as it prepares to work with the NIKKISO group of companies to develop products for the future, Robert concludes: "As we develop new products we can move further into the UK, Asia, and the Middle East, where we were not as active before. As a company we can translate the requirements of the customer to an effective working technical proposition and we have direct, short lines of communication. We have a strong understanding of our customers' requirements and long industry experience, which allows us to meet challenging requirements while remaining competitively priced." O&G

VACTRA

VACTRA delivers a full range of high integrity valves and valve actuation products. VACTRA has extensive experience from within many industrial sectors, specialising in supplying valves and actuators for new projects or replacement like for like valves to match existing needs. Based on customer specifications VACTRA advises the type of valves, actuators and controls, and if necessary VACTRA advises to adjust and improve specifications. Supported by its engineers VACTRA offers the best tool for the job.

DOLPHIN ELECTRO INDUSTRIE

Chemical injection pump packages of Geveke Pompen are custom made, cost effective and meet the process industry's requirements. A long lasting partnership with Dolphin Electro Industrie ensures you a high quality chemical injection system. Our engineers, with vast application know-how and flexible order handling, support you with a team of experienced people, dedicated to your operation. We are proud to work with the team of Mr Hesse, and our advice and products in a process and the necessity to ensure continuity, is the underlying thought of our vision. Dolphin provides technical solutions and offshore trained employees as a sub-contractor to Geveke.

Bulk buyer

FEOSO OIL Malaysia is part of the FEOSO Group, which was founded in 1973. Headquartered in Hong Kong it has offices and joint ventures positioned around the globe. The primary activities for its plant in Malaysia include the marketing and manufacturing of lubricants with the terminal recognised as a specialist lubricant blending plant, first going live in December 2003 with an overall storage capacity of 10,000 metric tonnes.

"Our portfolio of clients consists of international companies such as BP, Shell, Petron, Penrite, Top One and Fuchs, but we also supply to many local companies, with whom our own brand is very popular," says Gan Eng Kiong, director and general manager. "As a manufacturing plant, we purchase our base oil in bulk, supplied to the port by vessels. Our plant is 700 metres away from the jetty, and we have our own dedicated pipeline that pumps oil in from the vessels into our tanks.

"We also import a large amount of additives, the essential ingredients that define the end use of the lubricant, be it engine oil, hydraulic oil or various others," he continues. The manufacturer of high quality marine, automobile and industrial-use lubricants has worked closely with the world's largest additive manufacturer, Infineum, for several years through the development stages of premium lubricant products, which have gained approval from oil companies and world-renowned engine builders.

With all blending carried out according to the specification detailed by the customer, the raw materials for the final packaging of the products are all sourced locally, with the packaging approved by the clients. Commenting on the challenges faced by the business in today's tough economic climate, Gan says: "The majority of our purchasing is conducted in USD, but our local currency has become significantly weakened against the dollar, and this makes it hard to remain competitive.

"Secondly, the cost of the base oil, additives, and packaging materials are moving upwards, making it harder for lubricant manufacturers, such as ourselves, to recover costs. There are in the region of 50 blending companies in Malaysia, of which many are small businesses, conducting low-level operations. The challenge posed by this is that because there is no authority controlling the quality of lubricants, everybody is claiming a huge variety of specifications and able to provide the products at a much lower cost than a large, regulated business is able to match."

Dealing with international oil companies, FEOSO OIL Malaysia's processes and product quality are regularly checked. As a business it is also very strict on health, safety and environmental factors, conditions, which have ultimately led to its success in achieving contracts with industry leaders. "Working for major oil companies also attracts interest from

many smaller companies that are keen to work with an authentic business that has a good product and well developed assets.

"Additionally, being located in a free trade zone we can ultimately be very competitive when exporting to different regions," explains Gan. As part of the FEOSO Group, the business has access to financial assistance when required, but has not had any requirement to rely on the corporate identity or buying power associated with the wealthy company. However, as the business continues to mature, group cohesion and communication will ultimately play a major role.

With new lubricant brands becoming available on the market on a regular basis the choice on shelf for the average consumer is particularly vast. Although a competitive market is in many

ways good for the consumer, a non-regulated market can have very much the opposite and negative effect. This is an aspect of the industry that the business takes very seriously as it seeks to ensure all blending companies operate on a level playing field, without making false claims about the products offered. "I think it would be a very positive step to create a regulatory force that monitors the lubricant industry. It is important for the country to actively promote that its lubricant industry is of top quality and to a high specification," says Gan.

Holding a good portion of market exclusivity with oil companies, confirming its position as a market leader, the business was recently able to secure a base oil contract with ExxonMobil. Co-operating with large independent oil businesses that has a very specific brand and range of products does in many ways produce a cap on the available market. As such, FEOSO OIL Malaysia has developed a strategy as it works towards future expansion. "In terms of regional expansion we are looking to supply our

products to China and other countries in South East Asia, and to grow our interests as far south as Australia and New Zealand, both of which are not in a position to be competitive in the manufacturing industry.

"Due to the total market cap, we are also looking to develop a one-stop-shop for our customers, providing warehousing, and transportation for end-users and also into providing tank facilities on a rental basis for large oil companies. To this end, we expect to double our tank capacity in the coming years," Gan points out. The expansion plans detail developments on nearly its entire seven acre site, with units dedicated to serving new markets, such as producing specialised industrial lubricants, the production of grease and the manufacture of additives.

As the business looks towards the future it recognises the sense of uncertainty, as the instability in the Middle East remains current, which ultimately has an effect on all aspects of the oil industry. Comforted by the regular supply contract for ExxonMobil, it continues with an eye on oil prices, with oil being the fundamental ingredient for its lubricants, as well as its plastic packaging cost. "Although the raw material price fluctuates easily, it is not so simple to pass on to the customer.

"Expansion for our company is not just restricted to the oil business. Our parent group is not only involved in the marketing and manufacturing of lubricants, but also bunkering services, the construction and management of oil and gas storage facilities, owning and managing petroleum, liquid petroleum gas (LPG) retail stations, oil trading and property investments. These are certainly markets that we are in a position to move into," concludes Gan. O&G

BRB INTERNATIONAL

BRB International is an international additives, chemicals and silicones producer dedicated to servicing its customers with a wide range of tailor-made solutions. BRB has nine locations worldwide from which it can supply its markets and meet its customers' needs.

BRB's strength lies in the commitment of its 150 employees, putting the customer first and being flexible in both service and product solutions.

Its focus on R&D, technical field support, customised products and problem-solving mentality gives BRB a unique position in the market. BRB is able to service smaller and middle size customers as well as larger multinationals.

Ultimate terminal

JOANNOU & PARASKEVAIDES GROUP (J&P)

Joannou & Paraskevaides Group (J&P) is an international contracting company that undertakes a wide spectrum of construction work in four continents for more than 70 years. J&P has been successfully involved in the oil and gas industry over the last 40 years. It has extensive experience in the construction on EPC basis of oil gathering and processing stations, export terminals and tank farms, gas-oil separation plants, cross country pipelines, gas plants, oil refineries and petrochemical plants and other associated works in most countries in the Middle East, North Africa and Europe. J&P is proud to include amongst its clients, most major international oil and gas companies and operators. Its most recent project is the Vasiliko Terminal in Cyprus, a 600,000 m3 capacity multi-products tank farm comprising of 36 no. tanks and related terminal utilities, and ship loading facilities capable of simultaneously receiving four tanker vessels of max. 160,000 dwt capacity through a 1500 m long marine jetty and mooring/loading platforms.

Set to begin operations in September 2014, VTT Vasiliko (VTTV) is a storage terminal project in Cyprus being delivered by VTTI, a company co-owned by Vitol, one of the largest independent energy traders in the world and MISC, a leading international shipping and marine conglomerate. In an interview, general manager George Papanastasiou provides an insight into the project so far: "We are now commissioning the Phase 1 of the terminal, having nearly completed the jetty structure, which extends 1500 metres offshore. At about 800 metres between the east and west berths of the jetty, it is one of a kind in the Mediterranean."

Through four offshore berthing positions it can accommodate vessels between 10,000 tonnes to Suezmax size 160,000 tonnes. A recent decision was made to create a fifth berth, positioned inside the Port of Vasiliko for vessels of smaller size, a move welcomed by local marketers and particularly useful for Phase 2 developments, as George says: "The next phase will attract bunkering barges providing fuels to ships. This size of vessel will be between 2500 to 5000 tonnes, and berth five will serve this purpose."

With Phase 2 scheduled to be operational by 2016 it will consist of 305,000 cubic metres capacity and provide the terminal with the capacity to store a full range of products from gasoline, diesel, jet fuel, heating diesel, bio-diesel, fuel oil and crude oil, adding to the 543,000 cubic metre capacity constructed in Phase 1. The terminal has been designed with full flexibility so that products may be moved between tanks and vessels or to a road tanker-loading facility as required, providing services to local marketers usually operating smaller tankers, or to bigger trading firms where they can use larger tanks for fuels import, export and blending.

"There is a lot of interest for the terminal, because geographically it is positioned at the exit and entrance of the Suez Canal. Products are flowing from West to East, and East to West and we are positioned right in the middle. There are larger refineries opening up in the Middle East and these are growing as the smaller refineries in Europe are shutting down. The demand for rich fuel products in the East is growing in-line with industrial growth in the region.

"By remaining flexible we have been successful in creating a combination that is expected by the local marketers and one that is supporting local business. There are many products such as Unleaded 95, 98 and low

J&P

Joannou & Paraskevaides Group

Our borders, the world.

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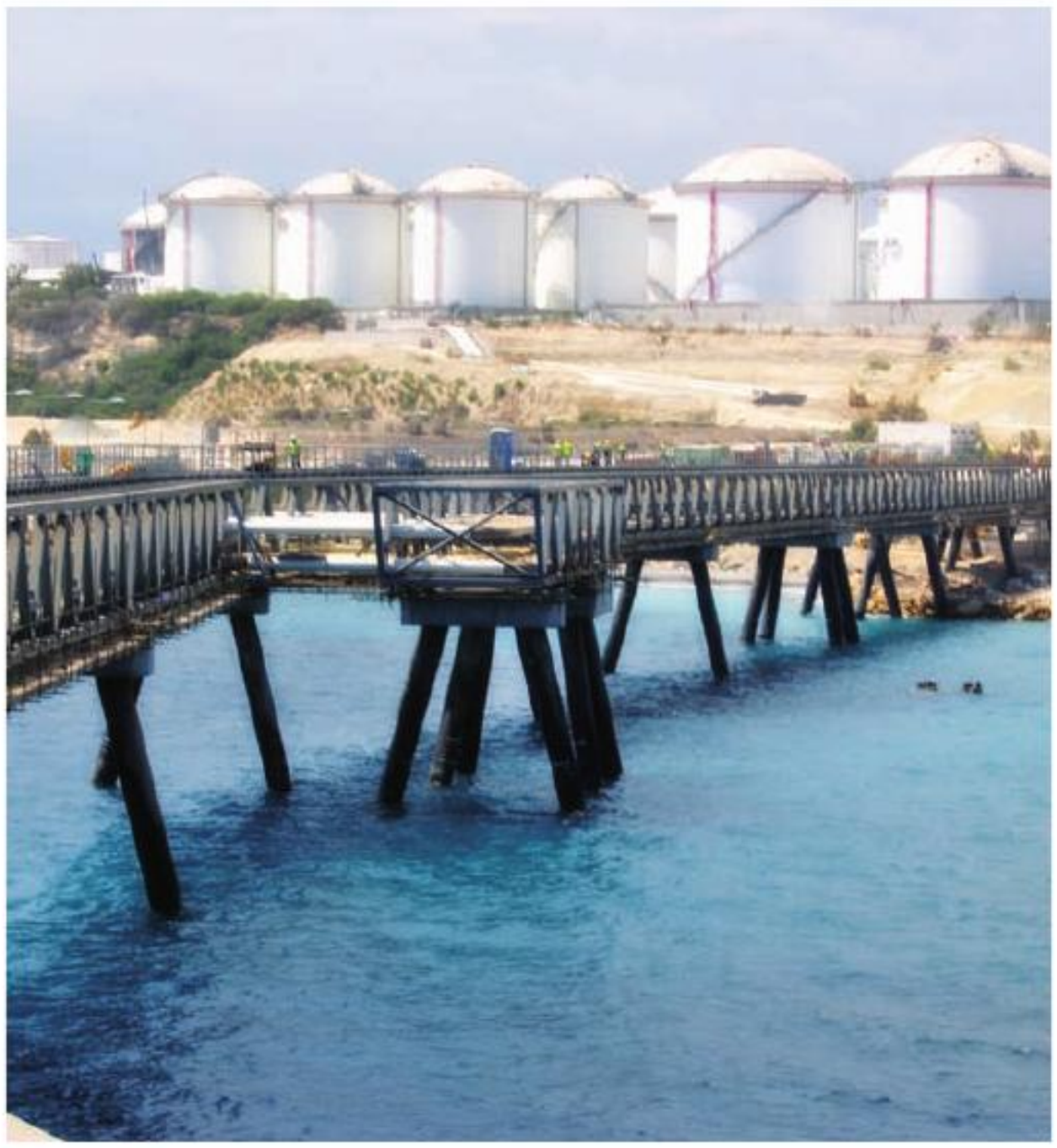
sulphur Diesel that are being marketed in Cyprus and this terminal provides the flexibility to accommodate for these. The bigger tanks provide blending facilities for products that come in which are not necessarily of EU specification," says George.

In line with this, the business has supported the creation of a new laboratory outside of the terminal, employing ten personnel that can re-certify the products so they may be marketed in the EU. With the jetty supporting vessels of 18 metres in depth, it is also attractive for traders looking to break bulk, or indeed create bulk, and has already attracted a wealth of business to the area.

Recognising the potential size of vessels, VTTV looked to address the requirements of providing a 24/7-year round service offering. As such it took the decision to create a sister company to provide towing services, providing both powerful tugboats and pilots, creating a further 20 permanent jobs. "This investment should increase the flexibility of services we are able to offer," points out George. Supporting the local community, the construction phase of the works generated 780 jobs, and it has since been able to create 32 permanent positions on terminal operations. "We have employed local staff from the local market. These employees have undertaken six months of intensive training at VTTI terminals in the Netherlands, Belgium and in Fujairah," he adds. As well as the direct creation of jobs in the terminal, other companies supplying food, spare parts and crew changes directly benefit.

Faced with certain challenges in the construction phase, George points out that in developing terminal berths, extra dredging was required to allow for the large vessels to perform the complete turning circle, which ultimately caused some delay to the project. "There were also some issues for permits and licenses. This is the first terminal of this kind in Cyprus, so the authorities did not have background to deal with all aspects of the legislation. However, the outcome is a very strategic achievement. We have constructed a terminal that is in the heart of a tourism area with infrastructure that extends out over two kilometres. We have implemented the highest standards of operation, at all times keeping the environment and the local communities in mind undertaking all the work to a very high standard," he says. Additionally, in the local area is the main oil fired power station of the country, and as it begins a move to switch from oil to gas, resulting in a cleaner and more efficient burn, the terminal jetty is a great asset to support the vessels that will ultimately bring



and process the gas.

The growing energy hub has also attracted a future LNG terminal, and should this construction go ahead VTTV is in an ideal position to play a role in the storage of the product. "We have expertise on how to construct such terminals and of course we know how to operate the terminals. Being already established in Cyprus we are in a good position to move into this market, which is different to the products that VTTI currently stores around the world.

"In the mean time our focus is to fill up all the 28 tanks of Phase 1 and we are in negotiations with both local partners and international traders. Following this, completion of Phase 2 will become the target and we are confident of achieving success. Potential opportunities to move into LNG and LPG are in our sights and we are ready to move on them if the demand within Cyprus grows. We are very proud of what we have achieved with the project so far. This terminal incorporates the highest of the industry standards, EU Directives, local legislation, and VTTI standards. We have been very proactive with health, safety and the environment and laid impermeable membranes covering all the area of the terminal to contain products in the event of a leak. Additionally, a modern vapour recovery system collects all the emissions that are produced. We believe we have constructed a fit-for-purpose terminal and an energy hub in the Eastern Mediterranean," concludes George. OEG

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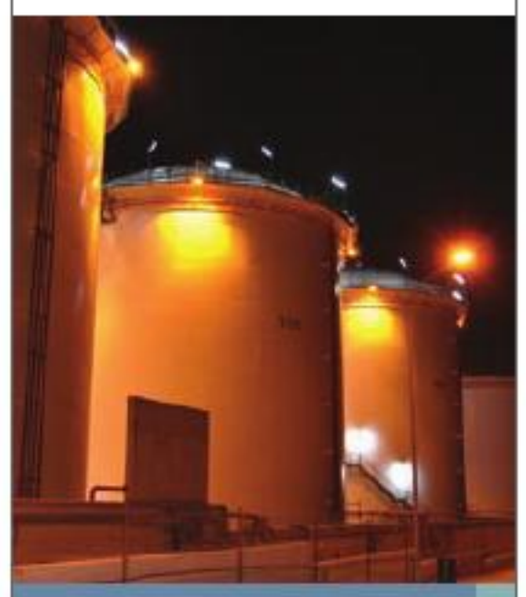

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Services
Fuel storage facility and offshore jetty

A complete solution

Celebrating its 150-year

anniversary in 2012, Sandvik today is a global engineering group with more than 47,000 employees operating in 130 offices strategically located around the world. With unique expertise in materials technology, comprehensive know-how on industrial processes and a strong belief in close customer relationships, Sandvik couples its strengths with ongoing investments in R&D. This has resulted in the company becoming a world leader in areas such as tools and tooling systems for metal cutting, equipment and tools for the mining and construction industries and products in advanced stainless steels, special alloys and titanium.

As a group, Sandvik engineers technologically advanced products for a broad range of niche markets while concentrating on five main business segments, one of which contains Sandvik Process Systems. Operating as a world-leading developer and manufacturer of steel belts and steel belt based processing systems, Sandvik Process Systems has production facilities in the Americas, Asia and Europe, a global presence thanks to high quality products and a customer-orientated sales and service network, 600 employees and a strong tradition in extensive R&D investments.

Previously featured in *European Oil & Gas Magazine* in June 2013, the company has spent the last 12 months focusing on the enhancement of its sulphur processing, solidification and handling systems that are used by clients within the oil and gas industries, as global product manager Tom Smith highlights: "As increased amounts of oil and gas are being processed in conjunction with more stringent regulations on sulphur content to reduce emissions that are harmful to the environment, Sandvik has spent the last 12 months finding a solution to accommodate these larger facilities that are being built to process more than several thousand tonnes of sulphur per day. As a result, on March 24th 2013, we finalised the purchase of the proprietary technology and expertise of the Brimrock Group Incorporated.

"Having reached an agreement with several key employees within the Brimrock Group, these employees have become part of Sandvik's global sulphur organisation, while continuing operations in their Canada based office. These experts not only bring vast experience in equipment design but also in the operation of sulphur plants; this, alongside the line of Brimrock products that have become part of Sandvik, will significantly extend our service offering to the sulphur industry. These include engineering and consultancy services, liquid sulphur degassing, block pouring equipment, re-melting equipment and high capacity granulation. In addition, we also provide customers with downstream handling of solid sulphur products."

Sandvik now has the capabilities and

knowledge to offer a complete turnkey solution. Covering the entire process from degassing units to solidification, the company's strategic internal acquisition of Sandvik Mining & Construction's sulphur segment means it can also offer a comprehensive supply chain solution from solidification through to downstream handling, and shipping. "It was not widely announced, but Sandvik took over our sister company, Sandvik Mining & Construction's sulphur segment, which is based in Hollola, Finland, last year. This company has been designing and supplying equipment for many different types of ores and handling products for our mining group as well as sulphur products, so I would say it has perhaps 15-18 plants in existence today that are handling solid sulphur. Our sulphur handling group does everything from sulphur storage and reclamation to downstream handling, bagging equipment and truck/rail/ship loading systems," says Tom.

Through the strategic acquisitions of these two organisations, Sandvik Process Systems can now provide a high-quality complete solution to customers such as oil and gas producers and EPCs who are building the large oil and gas facilities.

Wholly committed to only providing equipment that produces formed sulphur in accordance with SUDIC (the Sulphur Development Institute of Canada), Sandvik's utilisation of its fully automated model Brimrock RS1500 drum granulation processor – which can process 15 tonnes of sulphur per machine - alongside its own existing Rotoform technology – which can process up to 400 tonnes of sulphur per machine - means it can now provide the best quality sulphur processing, solidification and handling equipment on the market.

"SUDIC was developed in 1978 to create specifications that would enable a safe, solid sulphur product to be handled and shipped around the world; there is a standard quality of sulphur and a premium quality, and with our new Brimrock line of equipment we continue to only produce premium quality products that meet SUDIC standards, but at higher rates for larger plants," explains Tom. "This acquisition also means that with the predicted over-supply of sulphur on the market, customers could get more fussy about the end product they buy; our commitment to only supplying premium quality producing equipment will enable trading companies to sell an attractive, SUDIC compliant product globally, with no worries about it being off-spec or an undesirable."

Keen to get its new products out onto the market and generate interest from new and existing customers, Sandvik Processing Systems looks set to flourish over the coming years following its strategic developments, as Tom concludes: "Looking over the longer term, we would like to possibly offer the operation of plants to our customers, however that is something for the future and right now we are interested in getting this new equipment out there. We want to prove that Sandvik Processing Systems really is the best sulphur solidification and handling company out there, and to show that these products really are the best on the market."

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New frontiers

In January 2013 Vector Technology Group was acquired by Freudenberg Oil & Gas Technologies, forming a global solutions provider of innovative seal solutions, differentiated seal products and high integrity connection systems to serve the global oil and gas industry. Freudenberg is a family-owned group of companies that was founded over 160 years ago and is active on the global stage. Its 16 business groups operate in various markets and in various sectors of industry, always driven by the company's cornerstones of creativity, quality, diversity and innovative strength. In addition, reliability and responsible conduct rank among the basic values of the company.

"We provide solutions to challenging applications, developing proprietary materials and performing in-house product verification as well as independently accredited industry approvals," says Chris Lee, global director of commercial and business development. The Vector range forms the core offering of the business' metal sealing solutions portfolio with the brand continuing to be highlighted in connection with the products that established its high value reputation.

"The market is challenging, but through our strong product range, the demand across all product lines remains high as we focus on offshore and subsea applications," Chris points out. Vector products and sealing technology are used in some of the most demanding applications in oil and gas, including offshore oil and gas platforms, FPSOs, refineries, riser and swivel applications, flowlines and subsea installations, and petrochemical plants. With an extensive product range that includes the SPO Compact Flange™, the Techlok Clamp Connector™ and the ROV operated Optima Subsea Connector™, its products are sold through locations in Australia, Brazil, Canada, Malaysia, Norway, Singapore, the UK, the UAE, West Africa and the US.

The acquisition and successful integration into the Freudenberg Oil & Gas Technologies business has brought a wealth of benefits, as Chris explains: "We have been able to increase our global footprint with the introduction of manufacturing in Malaysia, and the introduction of manufacturing and the relocation of our organisation into a new facility in Houston, US. We are also expanding our site in Wales, UK, into a newly refurbished larger facility as a result of significant investment, which supports the Freudenberg guiding principle of long-term orientation. An increased global footprint, access to funds and existing engineering expertise within the wider Freudenberg Group are highly beneficial as we move forward."

The Vector SPO Compact Flange™ has been used across the globe since 1989, both offshore, onshore and subsea, offering significant weight and space savings over conventional flanges and leak-free joint integrity. Ultimately this has positioned the product as the most effective, environmentally friendly piping joint available today. Its double sealing action prevents hydrocarbon releases, addressing health and safety issues. "There has been an increase in appetite for the SPO compact flange subsea range SPO-S™, specific for subsea diver related applications.

"The popularity of our Optima range is also growing, and this year has seen us deliver a large bore, 36" twin lead screw Optima connector for a project in the Northern North Sea, a step functional change in approach to large bore connection systems. The Vector Optima was developed in collaboration with some of the industry's major operators. By taking into account the clients' need for operational simplicity, the product was developed using minimal parts, which ensures that make up times are kept to a minimum. With innovation playing an important role in the company as a whole, each product is an example of the approach.

"The innovation and flexibility provided by our people and products has been a significant strength for the business and is definitely the leading criteria for our success. Typically we take our proven core products and we provide solutions for specific, challenging applications. Freudenberg Oil & Gas Technologies has a terrific history in research and development (R&D), and providing significant funding, through healthy reinvestment for R&D to support its products," highlights Chris. Significantly the investments have been seen in the formalisation of an R&D department in high integrity and metal-to-metal segment of the business.

In line with its ever-increasing global footprint

and market leading position, the business also invests heavily into training with several mechanical and electrical apprentices employed at the various stages of development. "We also have four mechanical engineering graduates focussing on high technology modelling such as FEA and CFD, and we have established a terrific relationship with Swansea University Engineering department, working closely together developing mechanical engineers to MsC level who fit into our business. We believe we can offer exciting challenges, as well as making a huge difference to their education.

"Globally, there remains a strong appetite in the FPSO market for our products, such as in Korea where there are many construction projects. As well as the Asian market, the Gulf of Mexico offers potential and is again a growing sector for our subsea business. By Q4 2014, along with the manufacture of the SPO™ and Techlok™ range we will have introduced integration testing for our Optima™ subsea products in Houston, to support the growing demand for our products in the region," says Chris. The business' efforts in design and innovation were acknowledged in May 2013, receiving a recognition award from Technip for MWCS subsea project, in which it delivered safety systems to the Gulf of Mexico spill safety conglomeration.

Keeping a firm grip on its vision, the business looks to evolve the historical buy and build strategy of Freudenberg Oil & Gas Technologies into an integrated build and buy process, leveraging current technology and product portfolios through new product development, technology, high integrity connection systems and discreet product acquisitions. "Freudenberg is committed to partnerships with customers, and believes in a long-term orientation, financial strength and the excellence of over 37,000 associates in 58 countries around the globe. We aim to achieve industry recognition as a leader in diverse sealing technology and differentiated sealing solutions focused on the upstream oil and gas segment," concludes Chris. O&G

> We provide solutions to challenging applications, developing proprietary materials and performing in-house product verification as well as independently accredited industry approvals

Supreme marine

The family owned business

Van Aalst Group began in the 1950's, and is today fronted by the third generation of the family. Today the company specialises in the pneumatic cargo handling of machinery, equipment and its development for transport and distribution to the marine, offshore and construction industry. Initially in the market of cement handling from its location in Holland it subsequently became involved in the import of cement, working at shipyards. Recognising that the concepts behind the products it developed to move the cement from ship to shore could be used in other industries, its scope of work began to diversify.

In a period of restructuring and focus the business entered the offshore industry, developing products for installation on supply vessels and expanding its capabilities. "The cement industry is a relatively small market in comparison with the scale of the offshore industry. We wanted to develop a different type of product, which can handle multiple cargos. It was in 2007 that we developed the CargoMaxx division, which has ultimately led to more than 50 orders in supply vessels, witnessing a growing demand from the drilling market, picking up orders for large drilling rigs," says Jeroen Van Lakerveld, commercial director.

The core business is the engineering and enhancement of cargo handling systems aiming for ultimate operational safety, maximised availability and efficiency, at minimum cost. Driven to achieving a more effective use of vessel and cargo capacity, reduced berthing times, plus faster, easier and safer cargo loading/discharging procedures it has saved operators time and money while performing substantially more environmental-friendly procedures. The demand for its products has grown from the requirement to move waste products with a higher degree of safety and flexibility.

Research and development (R&D) is the backbone of CargoMaxx and Van Aalst's continuous growth and success. Its highly skilled, field experienced engineers have tailored the products to the specific demands of clients. From the R&D centre, based at Van Aalst's headquarters in the Netherlands, it works on a variety of products and innovations, including state-of-the-art sustainable machinery and equipment that requires less complicated maintenance cycles. With this in focus, the business constantly monitors the machineries and liquid and dry cargo systems, striving to optimise the performance and endurance in harsh or even arctic environmental conditions.

"We have been able to utilise our knowledge to develop innovative products for different markets. Our focus is on providing solutions

to oil companies and ship owners, offering a product that is environmentally friendly and safe," points out Jeroen. Through an operational history that has encompassed Europe, Asia, the US and Brazil, the business has seen varying trends. "The thriving market in China is currently pushing cost down, and as a European company labour expenses are higher than those competitors so we have to remain very cost efficient whilst ensuring that the products we supply are of a higher quality.

"In 2012 we established an office in Houston, which resulted in picking up contracts from the large oil companies and rig owners with offices located in the region. These companies also have technical offices in Singapore, China and Korea. On the back of the contracts we had won in the Asian region we took the decision to open up an office in Singapore," he adds. For several years the business has traded in Singapore, recognising the important position in serving the offshore market. As a hub for many supply vessels, ship owners and shipyards, it is a base from which a lot of engineering work is carried out. As well as these benefits the move brings ease of communication, and brings the shipyards into direct contact with the trade that enters the region, complementing the service it provides from its office in Shanghai.

Continuing the global growth of the business, Van Aalst has expanded its agency network into Turkey on the back of a very good relationship with Norwegian ship owners undertaking fabrication work in Turkey. "The Turkish market is upcoming and we need to be there on the front line. We expect that in the next couple of years Turkey will begin manufacturing its own vessels," says Jeroen. The Korean market too is very important for the business with fabrication of large vessels, FPSOs and drilling rigs in the region particularly high. "We see a lot of potential in the area, but it takes time to establish good relationships and develop enquiries into orders. We are operating in a very niche market, but our strength comes from being an innovative company, delivering products that the client requires. Our latest development is the drill cutting system and this is picking up particularly well. In 2007 we were asked by Statoil and Petrobras to come up with a solution for moving and transporting waste material such as drill cuttings from the rig back to shore," he points out.

Drill cuttings are a waste product that needs to be recycled within strict guidelines. The material contains different chemicals and materials and as such it is a very difficult material to pump. In normal operation this would be emptied into a skip and hoisted from the rig to a supply vessel. With safety implications relating to the use of the crane, Van Aalst developed its new solution. The pumped solution removes material quickly and in a safe manner. Eliminating manual handling and the use of the crane not only significantly improves the safety aspect, but the speed of the operation means the supply vessel does not have to stay on location for as long.

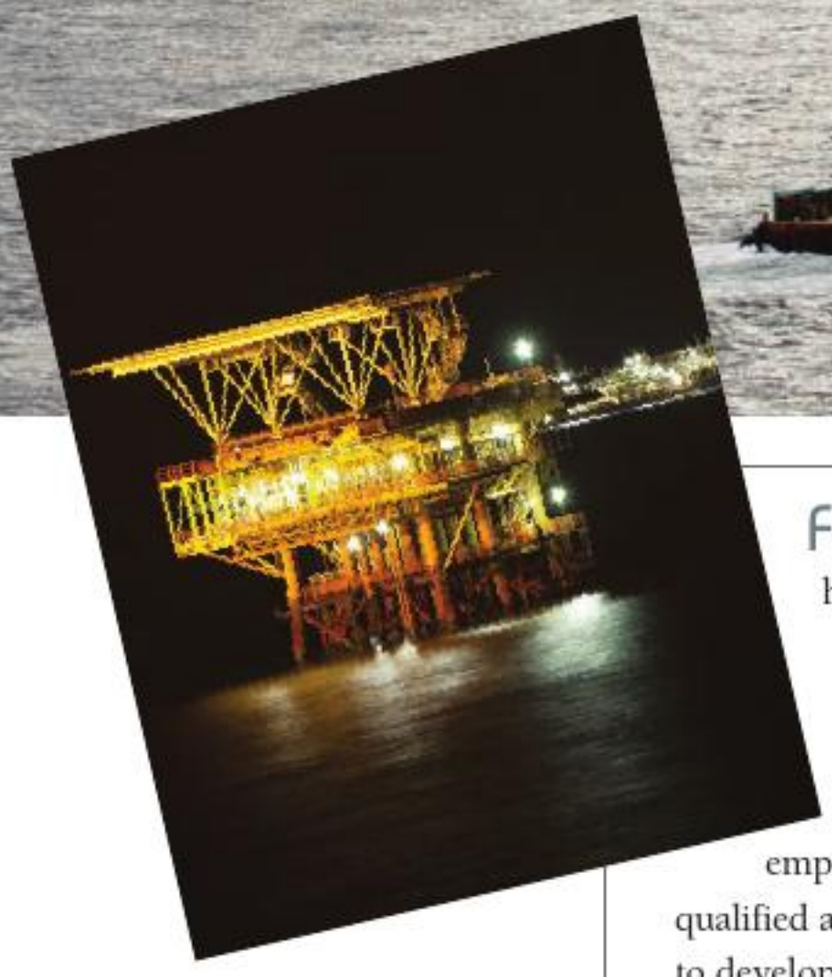
Promoting its innovative approach to the demands of the industry, the business will later this year be at ONS in Norway highlighting the benefits of it products, capable of storing and pumping high-density solids. Looking ahead to the future, the business is set to maintain its worldwide focus, and continue to develop an array of products. "Our focus remains on driving innovation, developing new technologies and establishing ways of implementing these into new markets. Additionally we are looking to diversify with our existing clients and addressing demands of the continuously growing Asian market. However, the market in Europe is also picking up, and as a result for the next two years we expect to be very busy on a global scale," concludes Jeroen. O&G

> The core business is the engineering and enhancement of cargo handling systems aiming for ultimate operational safety, maximised availability and efficiency, at minimum cost

Van Aalst Group
vanaalstmarine.com

Services
Pneumatic cargo handling services

Subsea leader



For 62 years EAB Engineering has been a leading provider of specialised subsea engineering services and solutions. The company, which today is part of OneSubsea Processing AS employs highly experienced, highly qualified and very skilled engineering staff to develop specialised products for the subsea environment, such as tools for subsea operations, lifting and launching equipment, and installation and tie-in equipment.

The company was founded in 1952 by Even Andreas Bakke, initially working with ropeways and transportation systems, and is today overseen by managing director Harald Bakke, who took the reins in 1981 and ensures that the long family traditions of excellence and quality remain within the business. It was under Harald's stewardship that EAB became involved in the subsea sector in 1989, and since that period it has built a strong reputation as an innovative, state-of-the-art business.

During the last 20 years the company has worked with prestigious names in the offshore and subsea industries, such as FMC Kongsberg Subsea, Aker Kvaerner Subsea and ABBOS/VetcoGray. In fact, EAB has participated in the large majority of the pull-in and connections systems available in the North Sea sector. As a result, the business today considers itself a partner in subsea engineering and tie-in technology, acting as a specialist in subsea tie-in and infrastructure from wellhead through to point of export. All of the company's solutions are based on standard products and executions that are then tailored to exact customer specifications accordingly.

EAB's expertise covers a number of areas, but it has been involved with the development of subsea connection systems since the 1990s and contributed to many of the best known systems that are currently available in the market, ranging from 3" to 30" pipe connections. Products in this area include spool connection systems, subsea winches, hub cleaning and inspecting tools, seal replacement tools, intelligent termination heads and umbilical termination solutions. Gaining such experience in the industry has allowed the business to hone its connection solutions, resulting in the latest generation of the EAB spool connection system.

This innovative solution allows for diver-less connection of a large range of sizes but with the advantage of not needing heavy or advanced tooling. Rather, all the tools that are needed during the operation are also launched in a separate tool basket and then picked up and carried by the manipulator of the ROV used in the operation. The spool connection system is capable of use for connecting both rigid and flexible spools, risers and umbilical terminations, and can also be used for vertical or horizontal orientation of the hubs.

For hubs, the company has a range of hub intervention tools that cover cleaning and OGG▸

inspection, as well as seal and cap handling and replacement operations. These tools are provided for a large range of hub types and configurations, both single bore and multi-bore, and are easily and efficiently carried by ROV's for operational ease. As with most of EAB's products, while based largely on standardised tools they are naturally modified or adapted to be each specific hub and configuration required by the client.

For heavy-duty pull-in operations EAB provides clients with a range of linear winches ranging from 30T to 150T. The company's winches have seen considerable action in some of the harshest environments in the North Sea since the early 1990s, performing several hundred successful pull-in operations. Aside from offering the standards of quality and operational capability expected from an EAB product the winches bring clients a number of advantages including no requirement for subsea wire storage reels, a compact and efficient design, and the ability to combine with a surface vessel pull for the initial stage of the pull-in operation.

With such a scope of equipment provision EAB has been able to supply a number of products that have proven to be of considerable worth to the subsea industry as a whole. One of these is the flowline lifting tool, or FLT, which is close to being the industry standard and is used in one or both ends during the launching of pipe or flexible lines that are under tension, and can also be used to pick up lines that have to be retrieved. Rigged with a two leg spread to a delta plate, which also gives access to the hub and room for temporary caps, pig traps and associated equipment attached to the hub, FLT's have been delivered for nearly all of the termination heads that are available on the market.

Due to its experience and knowledge of the subsea sector, alongside products EAB also provides clients with a range of subsea services that are based on the company's intimate know-how of the subsea world, the requirements of operators, and the standards and regulations that are expected in the industry. For example, EAB offers FEED studies and development, engineering and detailed design services for all aspects of subsea operations from flowline and umbilical terminations, connections or branches, through to spools and jumpers and inline modules for distribution and manifold solutions. Other services provided include fabrication, which is subcontracted to workshops that EAB has worked with for many years, and testing services.

Since its inception the EAB Engineering name has been synonymous with the highest standards of engineering and innovation in the subsea sector. The company remains dedicated to maintaining this reputation while conducting its business to the highest ethical standards. The business remains a relatively small organisation, yet the experience and skill of each of these employees gives it a distinct advantage in the industry and as it progresses, with the support of OneSubsea Processing it is likely to remain a premier name in subsea innovation. OEG

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DST

EAB depends on a professional and flexible fabrication partner, with the highest level of welding expertise. DST's ability to perform complete project management combined with superior quality throughout the whole process of fabrication, makes a perfect fit for the two companies.

Upon review of the initial draft design, EAB's and DST's team of engineers and technical staff initiate the planning process, which usually boils down to a very tight time schedule.

Each step is critical and it requires an enormous amount of experience to successfully execute projects of such sophisticated nature.

EAB Engineering
eabeng.no

Services
Subsea technology provider

Bespoke solutions

Above
The lower ROV control panel on an Intervention System

Below
STL's Electric Line Pressure Control Head enters the SLIC connector at the top of a Riserless Well Intervention System

Formed by managing director Drummond Lawson and technical director Dave McKay in January 2010, Subsea Technologies Ltd (STL) provides subsea engineering solutions to blue-chip oil majors and service organisations requiring well control, well intervention and subsea control system applications.

Based in Aberdeen, UK, STL specialises in the design and manufacture of world-class subsea pressure control equipment, which is tailored to meet the specific demands of each client. STL prides itself in developing solutions that not only meet its clients' technical requirements, but their operational needs too. The STL team is committed to the design and manufacture of high quality, innovative, well intervention, well control and subsea control systems, often (but not always) including STL's proprietary application-specific connectors. Developing products for this technically challenging business segment means that STL has built a team capable of delivering engineering design, finite element analysis, 3D graphical visualisation, systems integration engineering, project management, QA, and assembly, test and maintenance.

In its first year, STL secured a contract through Halliburton to develop and deliver the first of its Stackable Lightweight Intervention Connectors (SLIC) to Shell in Nigeria. This provided a huge boost of confidence to the young company, as the SLIC was at that point simply a detailed concept, and both Halliburton and Shell believed in it sufficiently to commit to STL developing and delivering the first one to them. Since those early days, STL has sold five SLICs in a variety of configurations and is seeing continuing growth in the number of enquiries coming through for the product.

STL has a continuous R&D investment programme, and has developed a number of new patent applications since formation, though some IP within STL pre-dates the existing business. Three months after its establishment, STL acquired the intellectual property and assets of a previous business, founded by Drummond in 2005 and acquired 100 per cent by a Norwegian entity in 2008. The Norwegian parent company got into financial difficulties during the economic crisis and ultimately went into liquidation in late 2009. "STL's technical director Dave McKay and I believed in the business and the technology, so we created STL, re-employed a number of the former staff, gathered support from the previous clients and suppliers and ultimately managed to acquire the intellectual property that we had initially developed. I think that our demonstration of our commitment to both our clients and suppliers, and some of the technology foundations laid prior to founding STL can be acknowledged as contributors towards the reason why STL has developed at such an impressive rate," explains Drummond.

He continues: "2013 was a successful year for us. We won a significant contract through Interwell with Shell in the North Sea and we built a simplified well intervention system for a project which is actually just about to go offshore in the next few weeks."

Not long after winning the Interwell contract, STL began work with Malaysian firm Bumi Armada Berhad; recently delivering a FEED study for the design of a complete subsea well intervention system. STL received positive recognition for its work as Bumi Armada progresses towards the construction phase of its project. "The Bumi Armada project stands out as the first time that a client has asked us to design, develop and supply a full specification subsea well intervention system. It is a significant step forward in terms of the company's progress and assuming that it moves from the FEED study stage to the main construction and build phase, which we will find out later this year, it is going to lead to a substantial growth period for the business," explains Drummond.

"We have grown fairly rapidly in both position and in recognition within the subsea well intervention industry as a whole over the last few years. In fact, we were told by Bumi Armada that an industry survey it carried out identified

Release (XR) Connector; highly regarded within the subsea industry, it removes the entire concept of Maximum Riser Disconnect Angle, as Drummond highlights: "The XR Connector is designed for occasional use in an emergency; for example, if you have a vessel connected to the seabed by a riser and the vessel drifts off, you need to be able to disconnect from the subsea infrastructure quickly and reliably. Patented worldwide, the XR Connector is able to release in situations where previously existing connectors could not release." Significantly improving vessel safety and reducing environmental risk, the XR Connector also lowers costs through vastly increased vessel operability.

Hailed as the winner of both the 'New Enterprise' award at the Subsea 2013 Awards and Grampian Award for Innovation at the 2013 Enterprise North East Trust Awards, STL has this year been shortlisted for the Best SME Award at the Institution of Mechanical Engineers' Manufacturing Excellence Awards. The company is certain to flourish over the coming years as it continues to develop its product range and meet the demands of its customers across the globe. "We have a strong position within the well intervention market and anticipate ongoing growth. To ensure this I think a next step for us will be opening an office in the US and continuing to consolidate our position on the other side of the Atlantic. We also want to build on our solid foundation of engineering skills and, where possible, expand our capabilities and technologies into other markets with similar technology applications, such as the drilling and well abandonment markets," Drummond concludes. O&G

Left
A typical Riserless Light Well Intervention (RLWI) scenario

Below left
Hydraulic cylinders for an XR Connector ready for assembly in STL's workshop

Below
STL's senior management team (from left to right) Dave McKay (technical director), Mark Vorenkamp (chairman) and Drummond Lawson (managing director)

us as the recognised source for subsea well intervention systems, hence the company came to us," he adds.

Having worked with service companies such as Helix Energy Solutions Group and Halliburton in the UK, and Weatherford and Wild Well Control in the US, as well as major oil firms such as Shell and Statoil, the company is renowned for providing high quality solutions to technically challenging requirements through innovative engineering. Indeed, a major factor for the company's success is its focus on providing bespoke solutions and industry-leading products that maximise its customers' uptime subsea and at surface in any weather.

STL has developed class leading connector technology, including the previously mentioned multi-functional SLIC Connector. The SLIC comprises of a family of products, which provide the user with a riser connector, a subsea lifting tool or a wireline pressure control head through the installation of different cartridges. Drummond explains: "Designed specifically for the well intervention market, the SLIC Connector is made to be constantly connected and disconnected, unlike previous connectors used in this market, which were originally designed for a different, much less onerous purpose and so were not ideally suited to this application. The SLIC connector's interface is extremely robust and can be used even in marginable weather conditions." Patented worldwide, the SLIC Connector features built-in redundancy and was designed for maximum ease of maintenance offshore.

Another notable product is STL's Xtreme

PENTLAND PRECISION LTD

Pentland Precision Ltd has found a loyal customer base in a wide variety of sectors since opening its doors a decade ago. The company specialises in small to medium batch production and prototyping of high quality precision engineered components, and has developed the capability and gained the experience to provide an end-to-end service from design through machining and fabrication to assembly and finishing. Pentland Precision Ltd's success can be attributed to its trained, committed and motivated staff, and its dedication to high quality and reliability.

Winning formula

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.

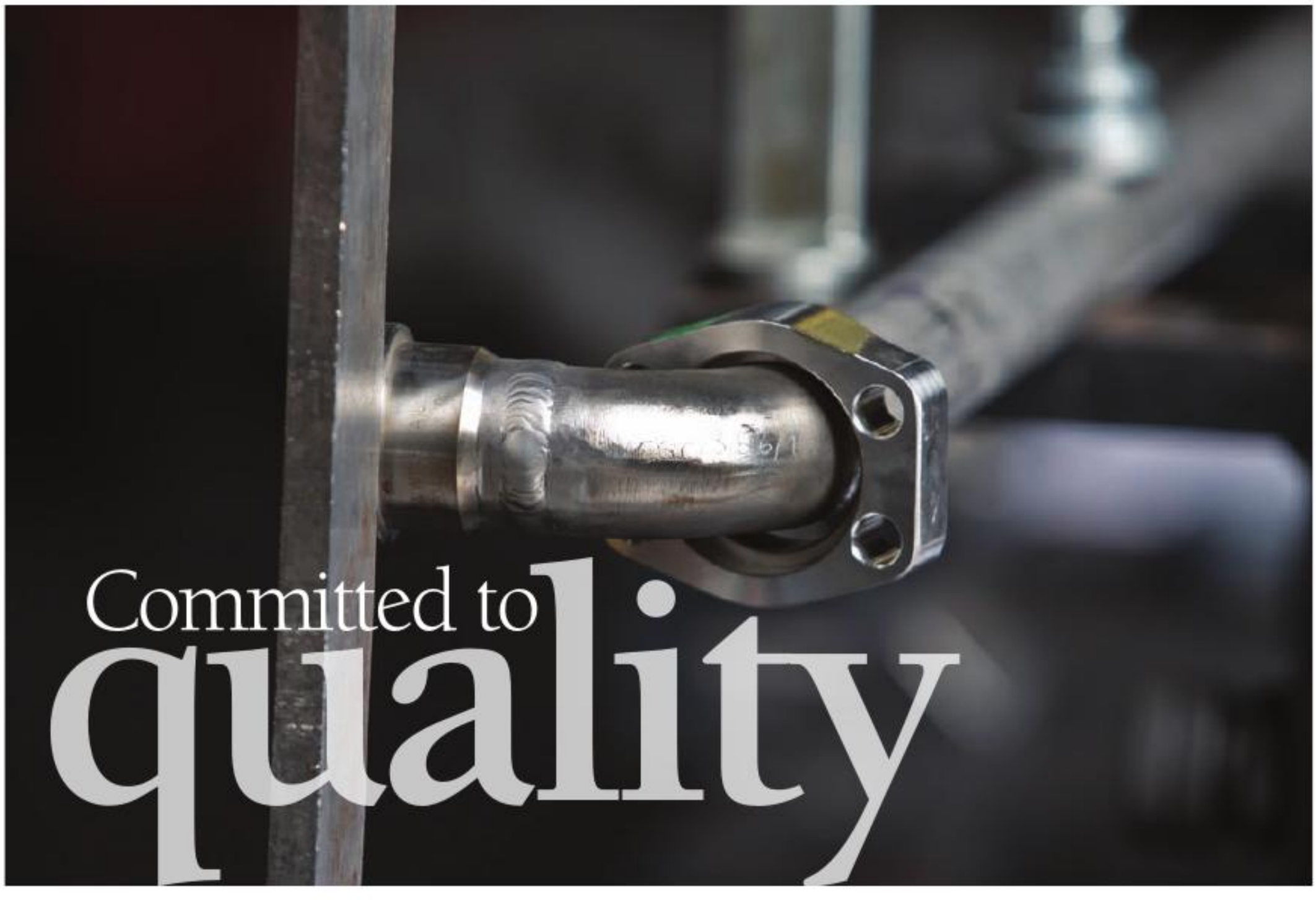
In order to maintain and grow its business while some markets are returning to full growth, Mainport focuses on safety in order to stand out from the rest of the competition. "We work very hard to maintain a very high level of safety in all our operations and this is evidenced in the high marks we continue 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



Committed to quality

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."

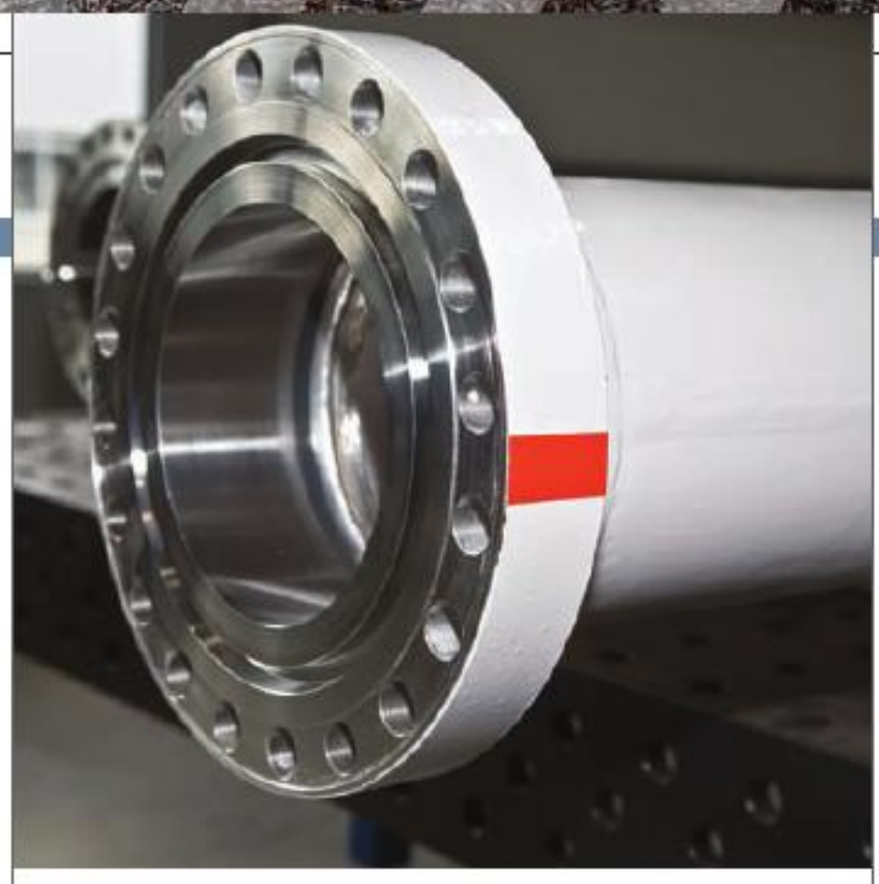
Indeed, by merging decades of experience with an innovative, forward-thinking approach to delivering solutions, BHDT has gained an excellent position on the global market and progressed into bigger and more complex projects, as Manuel highlights: "Due to requirements on the FLNG Prelude, we apply thermal 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." OEG



Left
Compact flange on inner pipe

Below
Inner piping finalised

BHDT GmbH
bhdt.at

Products
High-pressure equipment and high-pressure components

Evolution by revolution

The globally active manufacturer provides access and maintenance solutions for both the offshore and shipping industries, calling upon its strengths in offering flexible standardised solutions, as well as customised applications through to the highest level. The business was founded in 1992 focusing on the construction of marine cranes, and in 2000 established a department focused exclusively on the development and manufacture of innovative access and maintenance solutions.

"In that period as a development department we assessed how the industry reacted to maintenance needs, accessing difficult areas on both ships and jack-up rigs. Realising the cost and time implications in the use of scaffolding and a large number of operators we began designing a system which would eliminate this," says Thomas Hinterseer, managing director. Creating solutions that solve major problems that occur on platforms and ships is the fundamental ambition of the business. Palfinger Systems access solutions increase the safety of repair and maintenance work dramatically, with work platforms and baskets providing safe access in suitable working positions. As a result, handling is much safer and easier compared to climbing and scaffolding systems.

"Essentially we were going in with the goal of changing the industry, with fewer people, a higher level of automation and having a smaller impact on the environment, all of which benefit the end user, speeding up the time that the ship or jack-up is in the harbour or yard," points out Thomas. By listening to the customers, analysing the market and designing prototypes the business developed the ideal solution to carrying out the work. At the same time as developing these new technologies, the business introduced a new water blasting system, eliminating the need to use grit-blasting services, leading the way as the industry looks to greener solutions. "We are a corporate, socially responsible organisation and therefore protection of the environment is high on our agenda and an aspect that we aim to drive forward," he adds.

The focus in the development of the access solution was to design a system for a quick and easy installation. In the offshore industry today it is not possible to reach some locations without special training, such as using industrial climbers. The new access method for Palfinger Systems offers major advantages with all areas brought into reach of platforms and baskets, which means that checks can be effectively carried out at heights. "The initial prototype we developed was for the offshore jack-up segment, called the jack-up maintenance platform (JUMP). We tested the first model in 2009, making more improvements, enhancements and revisions before receiving full approval from the licensing authorities and launching the

development to market in 2013. We have now received our first orders," says Thomas.

The JUMP solution offers safe, reliable and efficient access to the leg, and is designed to allow inspection and maintenance works such as blasting, painting and steel work repairs. The unit is driven by an onboard diesel powered HPU, requiring no external power source, with the configurations including telescopic cranes, aerial platforms, supply and rescue platforms, full enclosure and ancillary power for use with options such as hand tools or lighting. Inspection and maintenance on the legs of jack-up rigs is necessary at regular intervals for both maintenance and class requirements. Conventionally, scaffold towers are erected and rope access teams utilised, which requires a lot of effort, workforce, time and money. The JUMP concept considerably mimimises this outlay.

The market place for jack-up rigs repair and maintenance has been extremely active over the past few months, and despite the general slight depression in shipping, inspection, maintenance and repair remains active. "Our customers, the ship and rig owners are looking towards optimising cost and reducing time out of service," says Thomas. The traditional method of installing and removing a scaffold to service the rig or ship can take up to three weeks and involves a high number of personnel. The Palfinger Systems solution not only reduces the set up time to just 24 hours but also eliminates the number of operatives working, particularly at height therefore eliminating the safety risks.

"One of the biggest challenges we face is that the oil and gas and shipping industries are very traditional businesses, so changing the mindset through the introduction of new automated equipment has, in certain areas, been met with natural resistance to change. Automated systems ultimately result in a lesser requirement for personnel and questions have also been raised as to just how much safer and faster the system can be. Some have questioned whether water blasting is really better than grit blasting, providing the same quality, as well as questioning automatic painting and how a robot can do as good a job as an experienced operative. These are all natural questions that arise when introducing an alternative to an existing business model. There can be a fear of the unknown and modernisation, with the industry comfortable in past systems and methods," explains Thomas.

The second major product development made by the business has been the introduction of the automatic HTC system, which is currently on the final testing and commissioning phase at the Jurong Shipyard in Singapore. The HTC is the world's first environmentally friendly and cost-optimised automated hull treatment system for the coating/de-coating of spots or complete hulls, and also improving shipowners' fuel consumption. "Singapore has very stringent obligations on its environmental footprint, and is also driven to reducing the amount of unskilled labour. Holding a strong image as an innovative technology leader the Singapore

> The JUMP solution offers safe, reliable and efficient access to the leg, and is designed to allow inspection and maintenance works such as blasting, painting and steel work repairs

Palfinger systems

EVOLUTION BY REVOLUTION

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Government has been supportive of our systems and approach to maintaining and painting ships. This has been a great support in the credibility of our system," Thomas highlights.

The product will be officially launched at OSEA 2014 in Singapore in December. Commenting on the drive behind the company's involvement in such trade shows, Thomas says: "It has always been important for our company to be a part of the largest exhibitions, to meet and discuss projects with our existing clients and other members in the offshore area, including establishing new contacts with visitors from all over the world. This year we have been targeting exhibitions much more aggressively, attending five trade shows in 2014, and will be present at OTC 2015. We have the first reference projects now, with very satisfied customers and it puts us in a very good position to convince businesses with a more traditional approach that this is the future for the industry."

Another ship access solution is the ITP8 (Internal Tank Platform). The treatment of the internal areas of tanks and cargo holds on marine vessels, especially tankers, is difficult and labour intensive. Scaffolding is required to reach thousands of square meters of walls and roofs, however, providing access with scaffolding is costly and time consuming. In some cases, the use of cherry pickers is possible. Nevertheless, requirements like big openings and plane surfaces restrict the use of this equipment drastically. Further disadvantages like exhaust pollution or high loss ratio make a successful application even more difficult. The ITP-8 is thus equipped with four two-man baskets. Additionally, the ITP-8 is height-adjustable and can either be placed on the floor where it can be freely positioned or suspended from the tank opening. A very good range is thus available from the company. The ITP-8 can also be used to work on the hull of a ship or a tank, meaning that a wide range of different applications is thus possible.

Focused on contributing to the sustainability of the regions in which it operates, Palfinger Systems recruits and supports the education of a local workforce. "Although we need less personnel than traditional operations we do require people of a certain skill set, and for the industry, automation is the way forward, certainly in European shipyards and Western Shipyards," says Thomas. Because labour is so expensive, automation can make shipyards more competitive and sustainable. Reviewing

the market place he adds: "The US holds great opportunities for the future and we can help shipyards that are struggling to solidify and move systems forward on a healthier basis reducing costs and lay up time.

"In Asia, although there is relatively low cost labour systems available, there is a strong future for these systems. Penetrating the markets of Korea, Singapore and China, which is the biggest shipbuilder in the world in terms of tonnage, offers an interesting future. Brazil, Africa and the Middle East, are new and developing regions and the ability to build a sustainable business with a localised shipyard in those regions using some automated systems, will provide quality, safety and speed. We expect there to be some good opportunities around the corner in Africa and the Middle East with high growth rates, which is very appealing to us."

As Palfinger Systems moves into a very active future Thomas concludes: "We are continuing our drive to introduce our products into the broader market, demonstrating our systems for both rig and shipping businesses. Through the aim of proving our systems are viable solutions to their needs we expect to become the prime supplier for all maintenance, inspection and repairs works for ship and jack-up owners. In the future we will look to expand our product range, entering new markets such as the semi-submersible and drill-ship business. The system and approach that we are taking towards automation, lower environmental impact and speed is completely transferable to a number of other assets and markets." O&G

> There can be a fear of the unknown and modernisation, with the industry comfortable in past systems and methods

Solid grounding

The history of FoundOcean

dates back to 1966 with the establishment of Wimpey Laboratories, which later became Wimpey Geotech. The company was the first in the world to develop the process of offshore grouting, which is now used worldwide on subsea installations. In 1993, the successful offshore company SeaMark Systems acquired the offshore division of Wimpey Geotech, rebranding itself as FoundOcean.

With over half a century of grouting experience, successfully completing over 1000 offshore projects, the company holds firmly its position as the world's largest dedicated offshore construction grouting company. The primary focus of the business is within securing structures to the seabed by foundation grouting, be it a single oil and gas platform or multiple installations for offshore wind turbines. "We specialise in providing grouting services for construction of sub-sea structures, mixing the cement into the foundations of the subsea structures of oil and gas platforms and wind turbines, or for subsea pipeline support and protection, and repair of damaged or ageing assets," begins managing director Jim Bell, continuing: "If a platform is suffering from corrosion or damage, or needs to take additional load then we have a solution."

With a presence in South East Asia, the Middle East, the Gulf of Mexico and Australia, a large share of its business is conducted in the North Sea, serving the oil and gas and windfarm industries. In the region of 70 per cent of the structures in the North Sea are sitting on foundations for which the business provided grouting services. Recognised as an industry leader, FoundOcean was involved in the first offshore windfarm in Europe when construction began in 2003. The business was equally responsible for installing the first pipeline supports for Exxon in California, deployed by ROV in 300 metres of water. In recent years the business has gone significantly deeper, installing pipeline supports at a depth of 1244m in West Africa in 2012. "We are also well known for our involvement in the Costa Concordia salvage project, which is currently sitting on a foundation that we constructed.

"We are a technically led, innovative business with operational directors from an engineering background. Strategy is formed from a technical

perspective, focusing on the clients' needs, allowing us to be innovative in challenging environments. There are always issues that arise offshore so it helps having a workforce that can adapt, so training is a key element in the company. Solving problems has become routine," explains Jim. With successful apprenticeship, graduate and trainee schemes, the company shows its commitment, not only to its own success but also to the achievement of its employees providing continued full support. In an industry where there is a push to drive down the installed cost, success also comes from the ability to reduce installation time. "In the last four years we have built bigger and faster equipment, increasing productivity from four tonnes of cement per hour to 15 tonnes. This represents a greater efficiency offshore with less vessel time," he adds.

"We work with a huge range of cements from the ordinary Portland product used frequently in oil and gas platforms, to ultra-high strength materials that have more than double the strength of standard cement, used on offshore wind turbines which are subject to much higher stresses and forces," points out Jim. The business also works closely with the large chemical company BSAF developing these high strength cements.

With bases in Scotland, Singapore, Mumbai and Houston, FoundOcean expanded its interests in 2013 opening a new office in Dubai. "We decided it was viable to establish a fulltime presence in the region and we are currently involved in the first offshore contract there, won through the local operation and not through long-term relationships with existing customers," says Jim. Working with contractors such as Heerema, Saipem, McDermott and RWE the business has enjoyed an active 12 months, following a four-year period of significantly less construction in the North Sea.

As the industry looks to extend the life of platforms the company has expanded into design services, establishing the new division SMR. Commenting on the expansion, Jim highlights: "We have a heavy involvement in structural repair for offshore installation, providing grouting services for repair clamps installed around damaged joints. Designing these repairs has been a natural progression from customer demand. There are few people in the world with the knowledge of 'off-design' codes but we have been fortunate enough to recruit one, who now heads the SMR division. We have already executed our first contract and we are seeing a high level of interest with enquiries."

Concluding Jim explains that the windfarm industry is moving into a consolidation phase, with work being completed installing turbines and cabling: "The next 12 months are set to be strong in the North Sea. We are also expecting South East Asia, the US and the Gulf of Mexico to become stronger markets. We aim to fully globalise our business, consolidating positions outside of Europe in the Middle East and the Gulf of Mexico, Australia and West Africa markets, supporting our already established position in Asia and India." O&G

In control

Founded in 1967 by British Petroleum following the Torrey Canyon Oil Spill disaster off the south-west coast of England, Vikoma International Limited has become a world leader in the design and manufacture of oil and chemical pollution control systems. Today operating as part of the Aberdeen-headquartered Energy Environmental Group, Vikoma has accumulated almost 50 years of experience in the research and development of high quality, reliable products and boasts a leading position in the market due to its unrivalled understanding of oil containment and recovery. Complementing this is its highly skilled and knowledgeable engineering design team, alongside an in-house manufacturing capability and extensive sales network that is spread across the globe.

Headquartered in the UK, Vikoma designs and manufactures its portfolio of products in England to ensure superior services in all areas of operation. However, to further prove its commitment to quality, the company was the first of its kind to hold the BS ISO 9001:2008 certification for the sales, design, development, manufacture, installation and commission of oil spill response equipment. Being among a select few manufacturers in the world to retain this certification, the company can assure customers such as major oil firms, governments, ports and harbours, as well as major spill response organisations that they are receiving consistent high quality products and related services.

Products manufactured by the innovative firm includes a range of oil spill containment booms in high quality neoprene or polyurethane materials, high efficiency oil skimmers for both marine and industrial applications, a range of workboat vessels and a full complement of auxiliary equipment; this includes storage tanks, hydraulic powerpacks, pumps and even training and commissioning services.

Viewed as a key part of Vikoma's business offering, commissioning of the company's supplied equipment includes services such as equipment inspection, installation, pre-start checks, safety features and equipment training. Commissioning not only ensures the equipment is ready to deploy as soon as the customer needs it, it also means clients are trained in operational aspects of systems, which reduces the possibility of delays in the event of oil spillage.

Previously featured in *European Oil & Gas Magazine* in October 2012, Vikoma has remained focused on the continued improvement and development of its product portfolio in line with the demands of the market. The most recent example of this is the company's launch of an innovative offshore oil recovery solution at Spillcon 2013 in Cairns, Australia. With an optimised design that enables the recovery of a complete range of oil viscosities, the patented Vikoma multi bank oleophilic 'Tufted' discs recover light, medium and heavy oils, while the forward disc bank

retains a brushed conveyor belt that is capable of recovering heavy oils and grease. All operational functions are controlled from a single handheld remote control unit, which allows optimum positioning for the operator.

Created from a truly collaborative effort, the OPRS 300 is the largest capacity recovery system that Vikoma has ever produced. Anticipated to become a leading product in its portfolio, its design ensures optimum manoeuvrability and positioning as well as recovery rates of up to 300 m3 per hours and 95 per cent oil pickup efficiency.

This commitment to quality and innovation led to the company's second major contract with KBR (Kellogg, Brown and Root); worth more than £2.5 million, the contract involves supporting the Ministry of Defence's (MoD) deployable fuels infrastructure, which will include aircraft and ground vehicle refuelling operations. Providing rugged and portable powerpacks for the Joint Operational Fuel System (JOFS) project, which covers the army, air force and navy, the contract will also include the supply of fuel tanker rollover kits.

Specifically adapted from Vikoma standard design under an earlier contract with KBR, the powerpacks deliver hydraulic drive to operate refuelling pumps, which enable fuel transfer, storage and issue in harsh environments and the most extreme weather conditions. The repeat order for the increased number of systems comes after the successful use of the previous power packs supplied, which have been utilised in locations such as Afghanistan and the Falkland Islands. Not only offering the company an opportunity to demonstrate it's engineering and manufacturing prowess, the repeat contract also proves Vikoma's commitment to quality following the rigorous testing of its systems to gain stringent MoD approval.

Supplying to over 140 countries, the company has witnessed an increase in demand for its products in booming oil and gas locations such as Russia, the Far East, Asia and Libya. In line with these developments, Vikoma announced the formal establishment of a new Wholly Foreign Owned Enterprise (WFOE) in China; trading under the name Vikoma Oil Pollution and Environmental Equipment Trading (Shanghai) Co., Ltd., the new entity will demonstrate the company's continued commitment to both its existing and growing client based within China's oil pollution market. The new commercial office will be run by country manager Richard Kang, a fluent Mandarin speaker who will use his understanding of the complex market and business culture within the region to drive Vikoma's growth strategy forward.

Having recently exhibited its exceptional quality oil containment booms, powerpacks and pumps and oil recovery skimmers at the International Oil Spill Conference in the US, the company is certain to continue expanding its formidable presence in developing oil and gas markets in the future. OFG

> Supplying to over 140 countries, the company has witnessed an increase in demand for its products in booming oil and gas locations such as Russia, the Far East, Asia and Libya

Vikoma
vikoma.com

Products
Oil and chemical pollution control systems

Quality service

Formed following Dutch company Pipeline Nitrogen Services' (PNS) acquisition of the Singapore-based Duplex Energy in 2009, PNS Asia Pacific has enabled its parent company to strengthen its presence in the booming South East Asia region. Not only taking advantage of the existing organisational synergies between the two organisations to ensure growth, PNS Asia Pacific has also taken on the values of both Duplex Energy and PNS; PNS Asia Pacific provides a close-knit, open environment to its competent, dedicated and proactive workforce. Taking these values forward, the company has been involved in pipeline and flange management projects for some of the most renowned upstream operators in the region.

Discussing the development of PNS Asia Pacific over the last four years, general manager Jan Frieling begins: "Although PNS has been involved in Singapore since 2009, we acquired a company called Duplex Energy in 2007, so really we have had a presence here since then. To continue our growth strategy we established a joint venture in Jakarta, Indonesia, in 2012 to target to growing Indonesian market. The joint venture was registered in 2012 and the first contract was signed in 2013. Project wise, we completed our first pipeline job in Singapore in 2012 and our first operation in Thailand in 2013. Over the last year or so we have been trying to diversify our business and to bring pipeline and LNG services into the Asia Pacific region. Work has proven fruitful over the last six months and conditions look positive for the future."

Committed to expanding its services to support clients in the best possible way, parent company PNS has developed alongside the evolving oil and gas industry to ensure customer satisfaction and long-term relationships that thus cement the company's future. Merging with Coil Services BV in 2009, the company today is part of the Well Services Group BV, which complements its strong capabilities in providing a broad portfolio of services such as process-pipeline services, bolt-working and LNG services. Digging deeper, this includes pigging, chemical cleaning, pipeline hydrostatic and strength testing as well as a growing number of other services in line with the required demands of customers.

For example, in 2013 the company established a new joint venture for Mercury Solve solution, which it anticipates will be in huge demand over the coming years. "As a company that focuses on developing new services that meet market needs, Mercury removal is certainly something we want to begin providing to the South East Asia region," says Jan. "It is our objective to introduce the Mercury Solve solution to the Asia Pacific Region in 2014."

Present in many of the world's natural gas fields, the concentration of mercury has increased massively in many gas reservoirs; particularly susceptible to mercury caused liquid-metal embrittlement (LME) are the brazed aluminium heat exchangers that are typically found in LNG plants and pipelines. As the oil and gas industry increases its attentions on the

production of LNG, the effective removal of mercury from streams during the production of the gas is becoming an increasing issue. "PNS is constantly focused on new services to support our clients in the best possible way, which has resulted in a new joint venture for Mercury Solve solution. The objective is that in 2014 the first Mercury projects will be performed and we expect a huge demand for these services in the future," says Jan.

A recent major development for PNS has been remedial flow line services with coil tubing, which has been made possible through the representation of a US company. This agreement thus enables the business to offer its clients special patented tools that can pull coil tubing and slick line distances up to and beyond ten miles thanks to hydraulic force thrusters. The equipment can be used in applications such as washing out paraffin and debris, with heated fluids, from subsea pipelines, the retrieval of stuck pigs from subsea flow lines, and jet cleaning the walls of subsea flow lines.

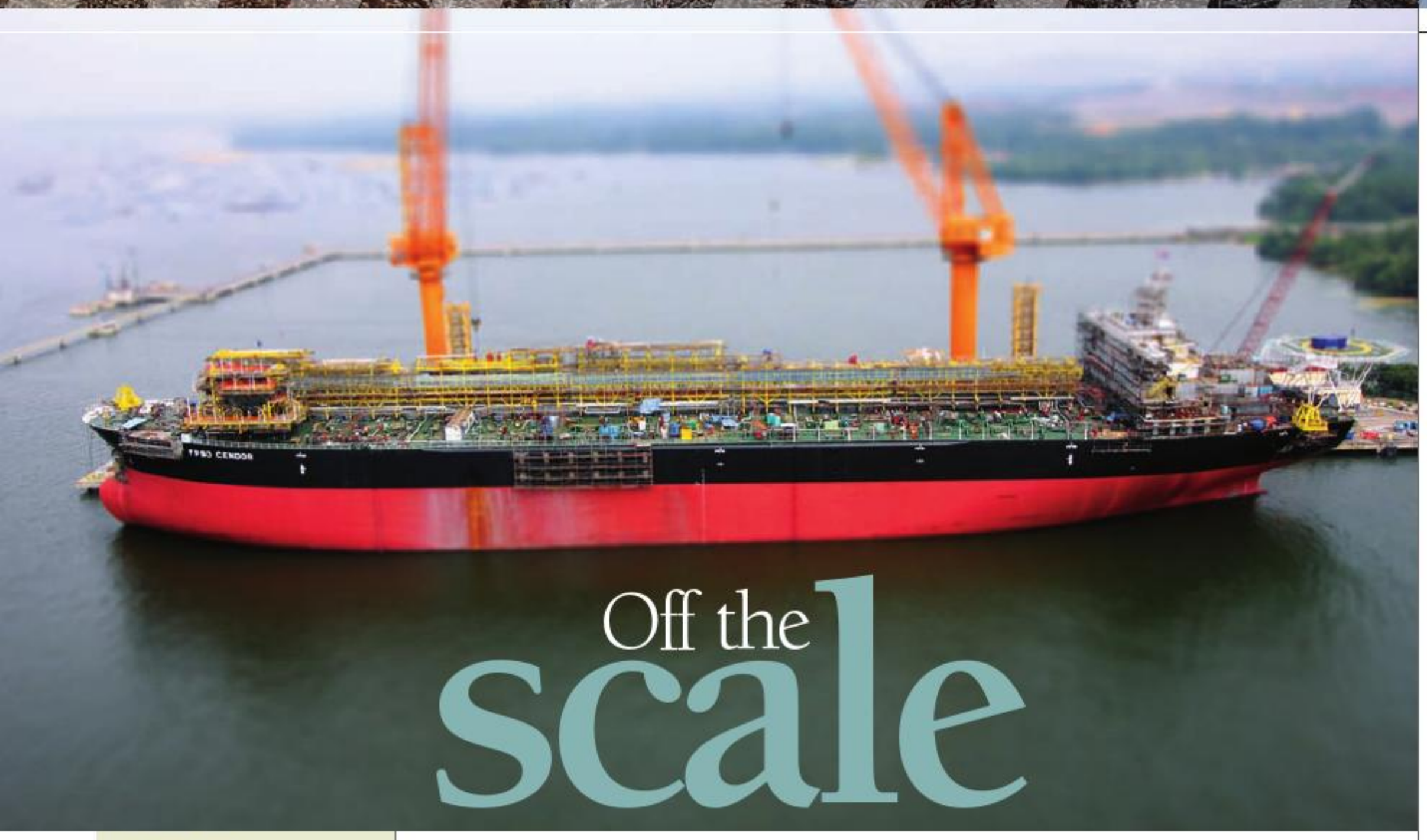
Of course, being part of a major company that focuses on enhancing its services has its benefits, as Jan highlights: "We get the best support to ensure we grow; this is through engineering support, the accumulated experience and expertise of managers and the ability to use the same systems as PNS. We are not in this business to be the cheapest, but to be the best at providing high quality services that are driven by focusing on exactly what our clients want."

Looking ahead, there is a great deal of opportunity for PNS as it looks to develop a wider footprint in the Asia Pacific market through the potential expansion of offices, as Jan concludes: "PNS Asia Pacific currently has a regional office in Singapore and a support base in Batam, which is managed by the Singapore office. Over the coming years we want to increase market growth in Thailand and Malaysia and perhaps look to areas such as Brunei and the Philippines in the future. Depending on market demand, we will look to open a few more bases in the region." OEG

> Committed to expanding its services to support clients in the best possible way, parent company PNS has developed alongside the evolving oil and gas industry to ensure customer satisfaction and long-term relationships that thus cement the company's future

PNS
Asia Pacific Pte Ltd
pns-services.com

Services
Process, pipeline,
LNG and bolting services



Off the scale

HOLME DODSWORTH

Holme Dodsworth is extremely proud to be associated with Cathelco. Over the last decade our partnership has blossomed and we have worked hard to ensure that the products we supply meet Cathelco's high standards of quality, performance and competitiveness associated with the market leader of cathodic protection equipment. We wish them many more years of success.

Top
FPSO Cendor

Above
Example of biofouling in pipe

Right
Cathelco's factory

Cathelco is a world leading designer and manufacturer of equipment and corrosion protection for ships and offshore installations. Founded over 50 years ago, the demand for the company's services has continued to grow, particularly as the oil and gas industry itself has heavily evolved. With a long history of providing anti-fouling (AF) systems for pipe work, the portfolio of its services has expanded to include impressed current cathodic protection (ICCP) systems, reverse osmosis seafresh desalinators and ballast water treatment (BWT) systems.

The AF and ICCP systems are designed to safeguard the hulls of commercial and naval vessels against corrosion, and the popularity of the product continues to grow on offshore platforms, semi-submersibles, FPSOs and FSOs. With the recent surge in the renewable market, the company has further developed its advanced ICCP system to protect monopile, jacket and tripod offshore wind turbines. Specifically designed to protect offshore wind turbines against corrosion, the new ICCP system has involved a complete re-evaluation of ICCP technology to produce new anodes, reference electrodes and control systems, which meet the requirements of jacket, tripod and monopile structures.

In April 2014, the innovative business supplied sea water pipe work AF systems for eight platform supply vessels constructed at Remontowa Shipyard in Gdansk, with four of the vessels already in service for Edison-Choust Offshore. The busy month for the business also saw the awarding of the IMO type approval for the company's BWT system, and currently is applying for AMS approval, enabling the system to be used on ships entering US waters.

The Cathelco system has proved to be an extremely effective and versatile system for eliminating blockages in seawater pipe work caused by bio fouling. Based on the electrolytic principle of providing continuous and reliable protection without the use of chemicals, the dual system, combining pipe work AF and corrosion suppression is offered with a range of control panels and anodes to suit vessels of every size. With each system custom designed for its clients, it is able to create well-suited applications that work with much greater effectiveness.

The automatic operation of the system requires minimal attention and makes very little demands on crew time. This complements the easy installation of the anodes, which may be installed in seachests or strainers on newbuilding or retrofit projects. The system usually consists of pairs of copper and aluminium anodes,

which are mounted in seachests or strainers and wired to a control panel. In the case of copper-nickel pipe work, a ferrous anode is used instead of the aluminium anode. In operation, the copper anode produces ions in very small concentrations, interrupting the settlement sequence of mussel and barnacle larvae. Instead of adhering to the surface of seachests, strainers and pipe work, the larvae pass harmlessly through the cooling water system to the point of discharge. Without anti-fouling protection there is the risk that pipes will become encrusted with organisms, leading to partial or total blockages, which reduce the efficiency of the seawater cooling system.

Cathelco's reputation has been built on providing AF systems for some of the largest fleets of commercial vessels in the world. With the ability to treat high volumes of seawater, the system is ideally suited to the requirements of the VLCCs, container ships, LNG carriers and numerous other types of ocean going vessels. The company continues to be chosen by major operators, reflecting both the effectiveness of the system and the ongoing support, which is provided to customers. In operation, the system is automatic and makes very little demands on crew time, apart from periodically monitoring the anode outputs.

In a £4 million research programme the company developed the new BWT system, which uses a combination of filtration and UV technique to eliminate organisms. The development additionally led to the establishment of a dedicated research facility in Kiel, Germany, supporting the onshore testing at the Royal Netherlands institute for Sea Research (NOIZ). The effectiveness and power consumption of the UV lamps is optimised in all water conditions using UVT sensors, and the water that passes through the UV chambers travels in a 'helix' to maximise the exposure to the light. The BWT system is a natural extension to the Cathelco product range, aimed at the same markets as the existing products and has the support of the long-established agent network.

With its head office in the UK, Cathelco is represented globally through a network of agents and installers covering the Americas, Australasia, Africa, Asia, the Middle East and Europe. With considerable experience in the design and production of ICCP systems for semi-submersibles and jack-up rigs, the company fully understands the factors that influence the performance. As such, anodes are carefully positioned to achieve the optimum level of corrosion protection and avoid areas of shading. Cathelco's existing range of ICCP and AF systems are widely used throughout the North Sea, the Gulf of Mexico, the Middle East, and Brazil. However, one of the company's most interesting and challenging markets is Russia, where particularly harsh environmental conditions have encouraged the business to innovate once again, designing new cathodic protection systems for Lukoil platforms in the Caspian Sea.

As the industry progresses into deeper waters to exploit oil and gas reserves, FPSOs and FSOs are increasingly used. Cathelco provides a range of diver changeable anodes and reference electrodes, which are important factors in the long-term protection of the vessels. Seawater lift pumps on offshore platforms are prone to bio-fouling, and as a result, the company has devised special AF units, which are bolted to the bottom of the caisson and dose the incoming seawater with ions to protect the pipe work system against blockages. With the ability to co-ordinate projects utilising agents, the business is further supported by representation at shipbuilding and fabrication yards in the Far East and throughout the world. Keeping hold of that position, the next 12 months are forecast to be a positive period for Cathelco, with plenty of free flowing opportunities. O&G

As the industry progresses into deeper waters to exploit oil and gas reserves, FPSOs and FSOs are increasingly used. Cathelco provides a range of diver changeable anodes and reference electrodes, which are important factors in the long-term protection of the vessels

Above
Eland PSV fitted with Cathelco AF system

Above left
Engineer working on BWT system

Below left
Jack-up rig

Cathelco
cathelco.com

Services
Pipe work anti-fouling systems and cathodic protection

Solutions provider

Headquartered in Dunleer,

Ireland, Suretank is the world's largest manufacturer of cargo-carrying units for the offshore oil and gas industry. Last featured in *European Oil and Gas Magazine* in September 2013, the company has seen several important developments over the ensuing seven months, as John Fitzgerald, CEO, explained: "We have taken on several staff, with Philip Murphy taking the brand new position of 'director of customer care'," he began. "This is based on the philosophy that happy customers keep on coming back, and therefore we have created a dedicated customer care team with representatives who will manage the whole relationship with clients from first contact to aftersales service.

"In fact, the materialisation of a customer care department is at the vanguard of what we are trying to do as a business and it is at the centre of our strategic plan," John continued. "Putting the customer at the heart of what we do is a huge theme running through the business and so that appointment, allied to other appointments in the customer care and sales area have been solid evidence of what we are committed to."

In fact Suretank prides itself on the quality and reliability of its entire service offering to its clients, which extends from a reliable and high quality product through to ensuring the most efficient and effective logistics service. For the latter the business has worked closely with IJS Global for many years. Formed in 2004, IJS Global is a premier global logistics service provider that is dedicated to excellence in service through personalised solutions for its clients. The company, which works closely with its clients to bring significant business advantages and efficiencies through customised solutions provides a range of services such as freight forwarding, logistics, customs services, safety and security, consulting services, and express services.

"In our line of work, where quality and reliability are essential, it is absolutely vital to have a strong and reputable logistics service provider so that we can maintain the high standards that our clients expect, and IJS Global is just that," explained Martin Winters, operations manager at Suretank. "The services that IJS Global provide mirror the values that Suretank have as a business, which is why we have had such a strong relationship for a number of years.

"Working within the oil and gas industry means that Suretank's engineered solutions may have to be delivered to difficult or remote locations," he continued. "IJS takes care of all of our logistics needs, by working out the best routes, timeframes, delivery schedules etc. IJS are excellent at being able to deliver the product to the client when and where they need it."

Martin was keen to stress: "We work very closely with IJS throughout a project, but usually at the beginning/planning stage, and then at the end stage prior to delivery from our factory. Having this kind of close collaboration means that we are able to take away the hassle of ensuring our product is delivered efficiently and successfully for the client. In the oil and gas industry efficient delivery is essential. The engineered solutions we provide often have very tight deadlines and specific start-up dates. It is vital that our product solutions are on the ground and ready to go when they are supposed to.

"Typical projects can range from a small

IJS GLOBAL

As a preferred supplier of Suretank, IJS Global prides itself on its ability to work and communicate very closely with its client. Experience has taught us that only by fully understanding your clients' own business in detail, can you provide a level of service and responsiveness in a positive and professional way. Our global relationship with Suretank underpins the success of this approach and Suretank's confidence in us to ensure the job is handled correctly and meets the necessary criteria.

Suretank were perceptive enough to understand that for your logistics partner to deliver service and solutions consistently, the interaction between both parties has to be transparent and candid, moving product from A to B is only part of the overall equation. The oil and gas vertical demands that suppliers are able to think on their feet when things go wrong or demands change, therefore the ability to be both flexible and devise workable solutions, at speed, are paramount to the ongoing service platform we provide to Suretank and all our clients.

Some time ago IJS Global decided to form a dedicated oil and gas team that had a deep rooted knowledge of the industry and the exacting requirements demanded to address the client base; this has proven very successful and added value to the customers' business. An additional benefit to this close alliance with Suretank is that it allows the opportunity to develop potential cost saving initiatives and smarter working practises. As you become closer to the customer and the communication and interaction improves you are able to investigate processes that can be complimented or changed to reduce pinch points in the customer's supply chain.

IJS Global's proven track record to support oil and gas customers through its impressive working practises and global footprint puts us in a unique position to service our customers and be seen as a safe pair of hands to manage project based business in the oil and gas arena.

IJSGLOBAL

quantity of five units through to a large quantity of 100 to 200 units, and either way IJS is equally reliable and efficient," Martin said. "We have various manufacturing sites around the world and on some projects we can be manufacturing from several sites at the same time i.e. in Ireland, the UK and Poland for example. IJS can collect all of the equipment from these sites, bring it to a central location and deliver it in one package to the end user. As we look to grow Suretank's business in the coming years I have no doubt that with IJS' track record to date they will be essential to our future."

Perhaps the most recent development for Suretank [at time of writing] was the opening of a new multi-million euro corporate centre at the Group's head office in Dunleer, Ireland. Opened with a customer appreciation day, by Ireland's Minister for Jobs, Enterprise, and Innovation Richard Bruton, the facility marks an important stage in the company's history. "We are aiming to create a world-class centre of excellence here, to support our vision of being the world's leading provider of engineered solutions to the offshore oil and gas industry," explained John.

"The investment in the new building fits within that vision because we have now housed all our engineering, design, product development and R&D teams under one roof, which is the first time that we can say that. Our employees are all highly qualified and are working together on a whole range of customer-led projects. Really we are moving away from just making products, into creating whole engineered solutions that include design, construction, validation and approval, which ultimately culminates in a product offering that has a lot of value added at the front end. This new building allows that to take place.

"Furthermore, for the first time in the company's history we have put a lot of focus on our marketing approach in order to raise the profile of the business. So we have engaged an external marketing advisor, and we have employed marketing personnel here and their job is both tactical and strategic. Strategic in the sense that we are trying to understand where our markets are going, what the opportunities are, and how we can align ourselves to those opportunities; and tactical in the form of developing higher profile activities for Suretank, through PR, e-marketing, social media and online."

All of these activities are being performed alongside an active growth strategy, through both organic means and targeted acquisitions. "On the organic side this involves strengthening our sales presence on the ground in places like Brazil and the US, and aligning that to our existing sales presence throughout Europe and Asia," John noted. "On the M&A side we have been actively seeking out acquisition opportunities throughout the globe to extend both our geographical reach and our product offering. We currently have a number of exciting discussions underway, which will lead to new entrants to the Suretank family over the coming months. The intention is that the acquired businesses will fit under the Suretank branding and we will use our existing customer relationships to leverage our positions there."

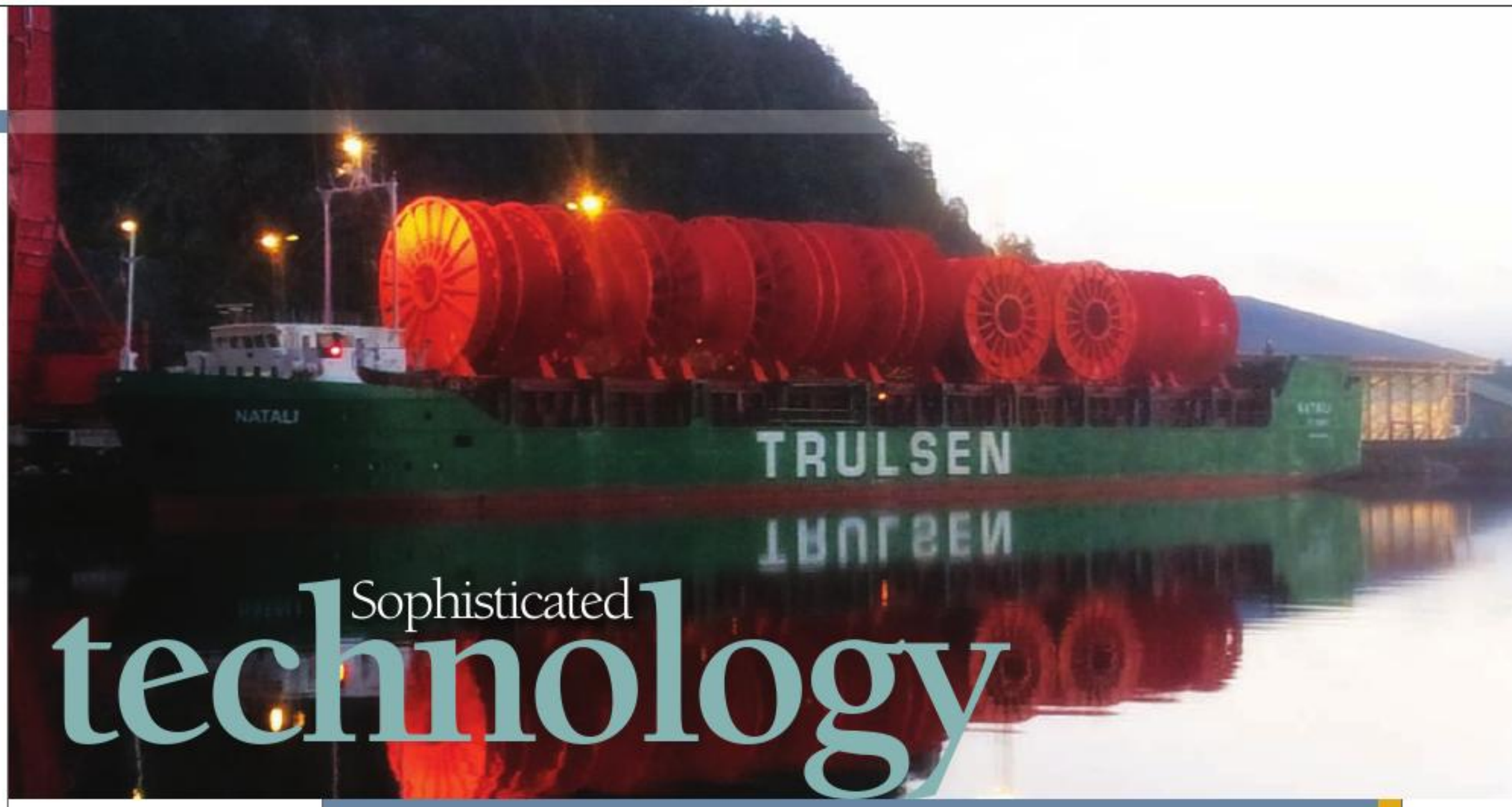
This M&A activity is supported by Suretank's majority shareholder HitecVision. "They have proven to be a very proactive and supportive investor, who are willing to promote and canvas M&A opportunities for Suretank through their own global network," said John. "They have introduced a number of acquisition candidates to us, and are very supportive in our evaluations of those candidates and in putting a potential deal together. They have also brought a great discipline to our business through their 'plan to work, work to plan' attitude, and at their behest we have created what we call 'Suretank 2018', a strategic plan that sets out the road map for our business over the next five years."

He continued: "Suretank 2018 calls for us to treble the size of this business over the course of the next four to five years and that is not an option, it is a requirement. This will be achieved by both organic and acquisition led growth, which are two of our central pillars going forward.

"Looking more short-term, in 2014, we will be continuing to invest in customer care and sales and marketing, and developing our presence on the ground in new locations. My vision is that wherever there is offshore oil and gas being drilled you will find Suretank - we will be there alongside our clients supporting their requirements by having our feet on the ground beside them, not managing them from miles away. We are very dedicated to supporting and assisting clients in whatever way we can, and we will continue to develop and expand on that by unrelenting attention to customer care and creating the right product solutions. We are a real market and product specialist and the leader in our field and so our focus is on further increasing our visibility and brand recognition and expanding our global footprint." OSG

Suretank
suretank.com

Services
Provides engineered solutions to the offshore oil and gas industry



Sophisticated technology

Above
Cable reels for BP Shah Deniz, ready to be shipped away from Nexans' plant in Halden, Norway

Below
Drums with Nexans' cables to BP Shah Deniz field, ready to be loaded outside Nexans' plant in Halden, Norway

Nexans Norway has been operating in the international cabling market since 1915 when the core interests were first founded. As part of the Nexans Group, the Oslo headquartered business has in recent years significantly expanded in line with the industry. "We are one of the largest cable manufacturers in the world. One of our main focuses is on offshore oil and gas and subsea developments, to which we supply umbilicals, topside and subsea cables, Direct Electrical Heating (DEH) systems, ROV umbilicals, seismic systems and fibre optic submarine cables," says Ragnvald Graff, sales and marketing director of Nexans Norway.

"We have several major projects under execution as well as some good prospects for new contracts. Nexans' ten-year framework agreement with BP has some major projects on the horizon, which will be initiated in the near future.

"Through this BP agreement we are supplying our Direct Electrical Heating (DEH) cable systems which will be installed to help in maintaining the reliable flow of products from the Shah Deniz field, located in the Azerbaijan sector of the Caspian Sea," announces Ragnvald. Due for completion by the end of the year, the project will see the first batch of deliveries of a total of 130 km of the cable system to provide flow assurance for ten subsea flow lines, worth approximately 100 million euros. The framework agreement covers the supply of umbilical cables, DEH systems, accessories and services for various deepwater oil and gas projects across the globe.

In 2013 Nexans was awarded a major contract by OneSubsea to design, manufacture and supply an integrated power umbilical solution and associated termination hardware for Exxon Mobil Corporation's Julia oil field development in the deepwater Gulf of Mexico. "We are in the process of manufacturing umbilicals for this project, providing a 23 kilometre power umbilical to the Gulf of Mexico" says Ragnvald. The innovative power umbilical combines power cables and umbilicals in a single cross-section, which will be installed in water depths in excess of 2000 metres to tieback the Julia field subsea systems to a semisubmersible production unit.

Nexans pioneered the development of power umbilicals that integrate the functions of power cables and umbilicals in a single cable, enabling a high-voltage (HV) supply to be provided for deepwater projects. The power umbilical includes a number of steel tubes, as well as fibre optic elements and signal cables for control and monitoring purposes. For the Julia project, the power umbilical will operate subsea pumps supplied by OneSubsea.

In December 2012 Nexans was awarded a contract from Statoil to supply static and dynamic umbilicals for three developments on the Norwegian continental shelf, further extended in 2013 to include delivery to a fourth field. The 'Statoil Standard' umbilicals are made up of electrical and fibre optic cables in addition to hydraulic and chemical lines.

In the spring/summer of 2014, Nexans delivered the four umbilicals and power umbilicals to be installed at the Aasgard field for Statoil in the Norwegian North Sea. The total deliveries for

the Aasgard project is 160 km of advanced subsea umbilicals. Over the past 12 months there have been a number of projects in the offshore sector which have been delayed or cancelled, a trend which was less common previously. However, utilising its strong position and reputation amongst some major players in the industry Nexans' business continues to operate successfully.

As well as maintaining the company's interests in the standard product markets in which it operates, Ragnvald additionally highlights the growing area of the submarine fibre optic market: "Wherever people are in the world, there is now an expectation of full coverage and access to data transmission capacity, both offshore and in areas that previously lacked broadband connections. More cable connections therefore need to be installed to meet these requirements. We supply Unrepeated Optical Cables (URC-1) that is produced with various types of armouring, depending on the installation area. One cable may incorporate several armouring types along its length depending on the varying requirements along the cable routes. It can be installed in water depths down to 000 metres and in lengths of up to 4-500 kilometres."

For longer distances where fibre optic cables are needed, typically for ocean crossings, a different type of cable system must be used that amplifies the optic signal. Approximately every 100 kilometres the signal is amplified by having an amplifier in line on the cable. Repeated Optical Cables (ROC-2) contain a vault cable core and a conductor for a 10kV repeater power supply. With various armouring packages this cable can be installed in depths down to 8000 metres. This type of cable is commonly used for trans-Atlantic or trans-Pacific cables. "We signed our first contract for the product in February 2014 and we are currently equipping the factory to industrialise this product for delivery in the first quarter of 2015. Although at the moment the product is not directly related to the oil and gas industry, as the market continues to evolve we expect demand for more sophisticated cable technology to grow," concludes Ragnvald. OEG

> Wherever people are in the world, there is now an expectation of full coverage and access to data transmission capacity, both offshore and in areas that previously lacked broadband connections

Nexans Norway
nexans.no

Services
Power, umbilical and telecommunication cables

Industrial strength

Established in 2001, Protea S.p. z.o.o has developed an industry leading reputation for the supply of high quality offshore handling equipment, including cranes, winches and specialist handling systems.

To support its drive to become a premier equipment supplier in its target markets, Protea has continuously invested in its facilities and capabilities. Following a strong entry into the market, the company merged with NTD Olesno during 2004, which greatly increased its design and engineering capabilities.

As Protea continued to grow, and to supply ever more complex and varied equipment, it focussed on reducing its reliance on subcontractors – this in due course led to the construction of an all new manufacturing facility in 2008 at Kluczbork, southern Poland. Having its own production facility ensured tight control of both quality and production costs and resulted in a production capacity in excess of 1000 tonnes of steel fabrications per year.

Five short years later a second new assembly workshop was opened at Kluczbork site in April 2013. The 900m2 extension of the existing fabrication hall has a ceiling height of 26 metres and allows final assembly and testing of large equipment to be completed undercover.

As of 2014 Protea continues to design, develop and manufacture a wide range of equipment for the offshore industry. "Protea is a material handling systems provider," says marketing specialist, Slawomir Przewozniak. "Not only do we make state-of-the-art cranes and winches for the offshore industry, but also complete handling system packages. For example, Protea recently supplied a handling system for well intervention comprising five winches, active heave compensators and power and control equipment - this system was installed as an upgrade package on the Skandi Constructor, a well intervention vessel owned and operated by Helix Energy Solutions."

Another high profile project recently delivered was a new Proteus FSU crane for Statoil, which was showcased to the industry at an open day earlier in 2014. Visitors were able to witness first hand the cranes impressive capabilities with a full technical demonstration of the 50 tonne SWL unit.

The Proteus design stands apart from other cranes on the market in a number of ways; for example, it features a box boom construction (rather than the more complex lattice boom design), has two hydraulic cylinders for RAM luffing and can tackle loads of up to 50 metric tonnes whilst still remaining weight efficient.

"The new Proteus crane design draws on the knowledge that my colleagues and I have gained from over 25 years of designing, building and operating offshore lifting equipment," explains Tomasz Paszkiewicz, Protea's CEO. "We have

achieved exceptional performance whilst minimising overall weight, and complying with EN 13852-1 Offshore Cranes standard, DNV N Class standard, the latest NORSOK regulations and Statoil's internal requirements - it is probably the highest specification offshore crane that has been delivered to date."

In addition to the crane demonstration, visitors were given a full tour of Protea's production facility as well as the opportunity to learn more about some of the company's other recent developments including the supply of BOP cranes, pipe handling equipment, vehicle launch and recovery systems and heave compensation systems.

Although the company has enjoyed great success in the past, it remains ambitious for the future and is focussed on further developing its relationships with existing clients, as well as making the company known to new customers.

"Generally Protea exhibits at two major biannual exhibitions regularly – Offshore Europe in Aberdeen and ONS in Stavanger. These events bring many new contacts and business opportunities. At the moment we are also planning to include new events in our calendar for the end of 2014 and 2015, which will allow us to further develop our business in the Middle East, Asia and Australia."

Protea equipment is available globally through Protea and its subsidiary company Protea Norge AS, Norway, as well as through representatives in several European countries, the Middle East, Venezuela, the US, South Korea, Singapore and Australia. O&G

GLOBE AIRMOTORS B.V.

GLOBE Airmotors B.V. has supplied several of Protea's projects with the air motors for winches. Besides the air motors control cabinets, directional control valves and pneumatic brakes were also delivered. Together this resulted in a complete customised pneumatic drive, perfectly adapted to the requirements of Protea and its customers. We are pleased to have Protea as our partner because of its technical knowledge, constructive and close co-operation, and its challenging projects.

Protea S.p. z.o.o
protea.pl

Services
Heavy machinery, cranes, winches and underwater handling systems

Pulling together

With a fleet of over 45 vessels servicing ten Italian ports and supplying salvage services throughout the Adriatic, the Gesmar Group has grown to be a vital partner to both the maritime and oil and gas industries. The history of the group can be traced back to the 1980s when Gesmar was founded by the Neapolitan ship owner Eduardo Vitiello with the takeover of S.E.R.S., which was then engaged in supplying tug services in the port of Ravenna. During 2005 Gesmar entered into an agreement with the Poggiali family owned Setramar Group, which saw it acquire a 50 per cent stake in Gesmar. This remained the case until as recently as January 2014 when Setramar sold its stake in Gesmar to the Genoa-based tug group, Rimorchiatori Riuniti. Today the Gesmar Group is co-owned by the Vitiello family and Rimorchiatori Riuniti, each controlling 50 per cent of the company.

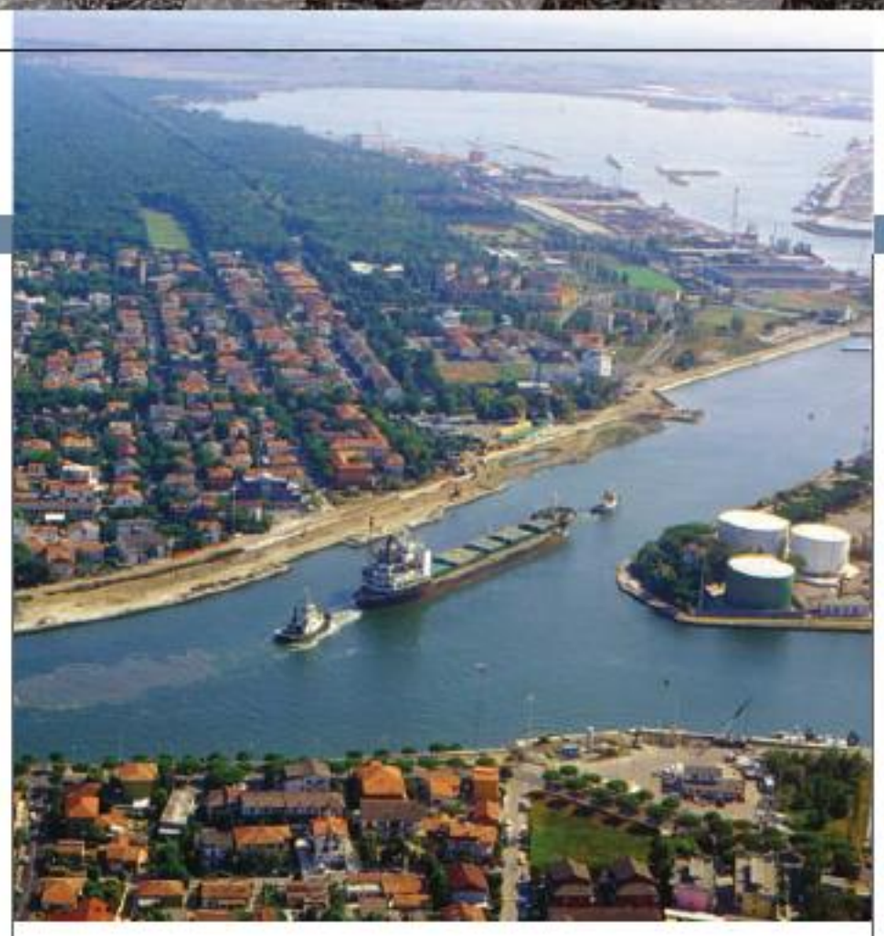
The size of its fleet makes Gesmar Group the largest towage operator in the Adriatic Sea and its vessels not only deliver harbour, offshore and terminal towage, but also related services including salvage and marine pollution control. By providing towage services to ten of Italy's ports as well as to all types of terminal including container; oil, gas and chemical; grain and bulk terminals, the Gesmar Group is present in more than 30 locations with a major focus on the oil and gas industry. Within the offshore sector Gesmar provides towage and safety cover including fire fighting, oil pollution control and tanker escort to various offshore terminals and refineries. Clients include Falconara SPM, offshore terminal I.V.F. (Isola Vecchia Falconara) and API oil terminal, Trieste offshore oil terminal, FSO in Rospo Mare Field and S.O.N.E. Terminal offshore Ravenna. Furthermore, some of the group's tugs with bollard pull between 70 and 80 tonnes operate on the spot market in the Mediterranean Sea for tanker assistance operations, safety cover and rig moving for clients including ENI Group, Saipem and DIDON Tunisia.

In addition to its towage and support operations, Gesmar Group is a founding member of the Castalia Consortium, of which it is also a majority shareholder. Castalia was formed in 1987 and today comprises 35 Italian maritime companies working in pollution control. The consortium is able to call on in excess of 35 vessels, one third of which maintain high oil recovery capacity and advanced remediation technology intended for deepwater operation, while ensuring that the vessels are also suitable for operation in shallow depths. Examples of the consortium's operations include recovery work on the Costa Concordia and cargo removal and pollution remediation on the Hanife Ana, which ran aground on the Adriatic coast. Aside from emergency response, Castalia also focuses on environmental monitoring, training and awareness campaigns aimed at

marine and environmental protection.

The Gesmar Group has continuously invested in its fleet to ensure that it meets the needs of its clients and that it is able to operate in the ever-changing marine marketplace. The most recent additions to the fleet are the rec-oil tug San Giusto and Rigel and Gladiator azimuth stern drive tugs (ASD), which arrived in 2013, 2011 and 2012 respectively, and the Fox and Wolf fast support intervention vessels (FSIV), which were delivered in 2013. The ASD escort tugboats were each designed with manoeuvrability and functionality in mind; Rigel features FiFi 2 and oil recovery capabilities, unattended machinery spaces (AUT-UMS), automated operation in port (AUT-PORT), 110 tonne bollard pull, and a hydraulically-driven waterfall towing winch with a one drum capacity of 1000 tonnes. Gladiator features FiFi 1, water spraying and oil recovery capabilities, 65 tonne bollard pull, one fore winch with split drum escort type winch Kraaijeveld SW-80, and one after winch Kraaijeveld including double drum KA-30 1500 knots brake. In addition, Gesmar Group has recently commissioned a Turkish shipyard to build two 70 tonnes bollard pull multi-purpose ASD escort tugboats.

While discussing the ways in which the vessels have enhanced the company's capabilities during its last feature in *European Oil and Gas Magazine*, managing director Riccardo Vitiello said: "The tugs have been specially designed to carry out berthing and unberthing of vessels at harbour premises, pull and push during vessels' mooring manoeuvrings, escort, open sea and harbour tug services from stern, and fire fighting activities. Gesmar Group has always opted to invest in port-sized tugs that also have the



capability both in terms of power and bunkering capacity to perform ocean towage, offshore services, and salvage operations as well. We believe that a certain degree of flexibility in naval construction is of the utmost importance."

The delivery of the Fox and Wolf FSIVs during 2013 has enhanced the company's capabilities further still by filling the oil and gas sector's need for reliable high performance support vessels. The Fox features a top speed of 27 knots, a capacity to carry 250 tonnes of cargo and 70 passengers, FiFi 1 and a deck space of 212 m2. The Wolf on the other hand is a slightly smaller craft with a top speed of 27 knots, a cargo space of 65 tonnes and a passenger compliment of 60 and deck space of 70m2.

As it adjusts to the introduction of Rimorchiatori Riuniti as part owner of the company, Gesmar Group will continue to offer expert towage and support services to the oil, gas and marine industries while considering expansion in to new markets including African and Middle Eastern waters. Indeed, with a strong fleet, leading expertise and strong financial backing the future of the Gesmar Group is set to be a very buoyant time.

"The Gesmar Group has continuously invested in its fleet to ensure that it meets the needs of its clients and that it is able to operate in the ever-changing marine marketplace

Gesmar Group
gruppogesmar.com

Services
Towage, offshore support and pollution control

Active explorers

Gulfsands Petroleum Plc is an independent oil and gas exploration and production (E&P) company, which has a major focus on the Middle East and North Africa. It has oil exploration and development projects in the Syrian Arab Republic (currently suspended owing to sanctions), and oil and gas exploration projects in Morocco and Tunisia. Gulfsands is also the operator of two exploration licences in Colombia and produces oil and gas from a portfolio of properties in the US, offshore the Gulf of Mexico.

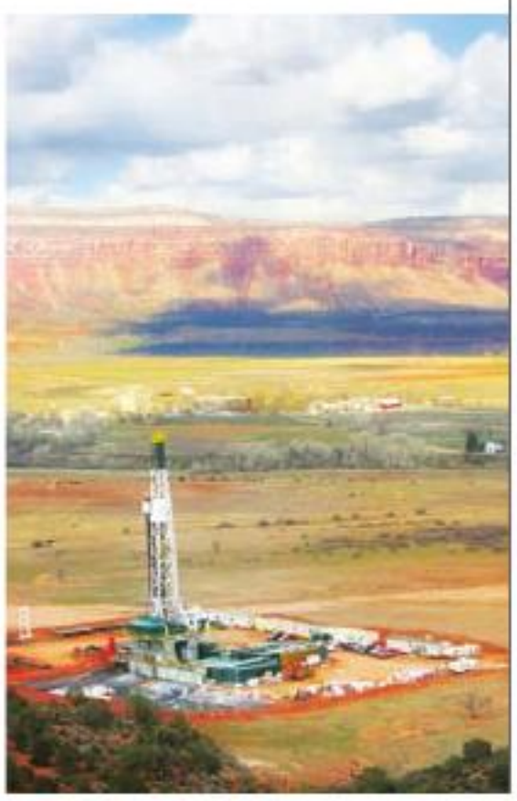
The organisation was last featured in *European Oil and Gas Magazine* during October 2013, and as Mahdi Sajjad, CEO, noted the business has seen a lot of new activities over the ensuing eight months: "We have been very active in Morocco since we last spoke," he said. "We have undertaken a 220 sq km 3D seismic programme on the Rharb permit area and a 650 km 2D seismic programme on the Fes permit area, drilled three shallow exploration wells on the Rharb Centre permit and negotiated the acquisition of the oil prospective Moulay Bouchta permit adjacent to the Rharb and Fes permits."

He continued: "We are currently drilling the LTU-1 exploration well in Morocco and have our technical team fast tracking the interpretation of the seismic data we captured in both of these programmes. We are also developing an integrated geologic model for these permits, which is using a geophysical database created from the consolidation of significant amounts of historic 2D and 3D seismic data and well results from earlier exploration on the Rharb, Fes and Moulay Bouchta licence areas.

"At the same time we have been preparing to commence exploration activities (2D seismic programmes) on both the Chorbane permit, Tunisia and the Putumayo-14 and Llanos-50 permits in Colombia, so we have been very busy indeed."

The Moulay Bouchta permit that Mahdi mentioned was only acquired by Gulfsands in April 2014, when agreements with Morocco's Office National des HYdrocarbures et des Moines (ONHYM) were finalised. He gave some details about the project: "We believe, and there seems to be a consensus among other oil and gas companies operating in Morocco, that the Moulay Bouchta permit potentially represents the final and very important piece of a significant and contiguous licence position we have spent a year or so assembling.

"That permit covers what is known to be Morocco's most promising acreage for oil



discoveries, and also includes rights to evaluate and further explore three historic and currently closed in oil fields.

"So in addition to undertaking exploration on the rest of this promising permit, we will be looking closely at whether well reactivation or enhanced oil recovery techniques might recover additional oil from one or more of those old oil fields. In addition we will be examining the possibility of there being deeper horizons below these old oil fields, which might be confirmed through deeper drilling."

It is clear from the allocation of this permit to Gulfsands that the company is regarded as a reliable and top quality operator. Mahdi confirmed that it has earned a glowing reputation across the MENA region: "We are known for our ability to fast track the development of production assets that we discover or acquire. In addition, the company's management is widely recognised for its ability to work with governments, regulators and big and small E&P companies anywhere in the MENA region and for its extraordinary network of contacts in the international energy sector."

He added: "Gulfsands has been fortunate to have had a loyal institutional following and the good fortune to have accumulated a significant cash balance by the time we were forced by the EU's sanctions to cease operations in Syria. We believe we have made astute investments in the countries in which we operate, especially Morocco and Colombia, and we have therefore had a developing investment story to discuss with our shareholders, which is something we do on a regular basis."

Indeed, Syria is an area where the company sees much potential, and it is looking at all the options available that will enable it to re-establish operations there as soon as the sanctions permit. The company also appointed Ian Conway as new executive director: technical and operations, and his experience, as Mahdi highlighted, will be essential for the company's future operations in Syria. "I am sure his industry knowledge will be invaluable to help us navigate our way through the challenges of evaluating and pursuing new business opportunities, and with the commercialising of discoveries we have made onshore Syria that have yet to be developed," he said.

"When the EU introduced further sanctions on Syria in December 2011 obliging us to cease to be involved with production activities on our two oil fields in Block 26, north east Syria, we were producing approximately 24,000 barrels of oil per day, we had 2P reserves of approximately 75 million barrels and had made several further discoveries, giving us confidence that upon being able to return to work, with some additional increase in the capacity of our facilities, we should be able to increase production to 30,000 bopd and beyond. We are looking forward to returning to Syria and at levels of production higher than when we were forced to stop work."

Like all resource and energy companies with exposure to international capital markets, Gulfsands keeps a constant eye on the market and investor sentiment. Mahdi noted that at the moment, investors appear to lack much appetite for what is perceived to be risky exploration and are more focused on investment destined for near-term development and production. "The sector is therefore beginning to see early signs of what is anticipated to be a wave of consolidation among junior oil and gas companies and an increasing use of the farm out process to fund future exploration and appraisal activities. Therefore we might also expect that asset acquisitions/disposals by the larger E&P companies may increase as it is well known that the larger E&P companies are more aggressive acquirers of advanced projects with discovered O&G

> We are known for our ability to fast track the development of production assets that we discover or acquire

resources when the capital markets are not competing to provide the funding that those projects require," he said.

Mahdi also noted that Gulfsands regularly receives approaches from third parties to consider various asset level transactions. "We are confident that the work we have done in Syria and Morocco will continue to attract this sort of attention to our company and therefore we may well see asset level transactions such as farm outs and disposals of some portions of the substantial exploration interests that we currently hold," he said.

As the company moves forward through 2014 and beyond, it has plans to expand upon its current projects, which involves interpreting more data. "We anticipate we will be drilling a few more shallow exploration wells on the Rharb permit, finishing the processing and interpretation of all the seismic and well log data we have been able to gather into one cohesive and coherent resource. Hopefully, we will also be moving towards the development of a gas sales business onshore Morocco with the completion of a series of successful exploration wells," said Mahdi, as he looks forward to the next six to twelve months.

> "Hopefully, we will also be moving towards the development of a gas sales business onshore Morocco with the completion of a series of successful exploration wells

"Later this year, we will likely undertake the capture of additional seismic data to assist us in refining our list of possible targets to be drilled as deep exploration wells on the Fes permit area, while we will also be focused on fast tracking our geologic modeling of the prospectivity of the Moulay Bouchta permit." OGC

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