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THIS ISSUE: Optimising asset performance

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> Despite substantial top line growth in the UK supply chain, significant inefficiencies are still present"

The UKCS is regarded as one of the most expensive basins in the world to operate in. In such an environment it is vital for all parties to operate as efficiently and effectively as possible, and this is particularly true for the UK oil and gas supply chain. While there has been growth throughout the supply chain in recent years, David Delvin of Hitachi Consulting explains that there are still inefficiencies to be ironed out and improvements to be made in this issue's lead feature.

"Despite substantial top line growth in the UK supply chain, significant inefficiencies are still present," he says on page four, before adding that: "The success of the UK oil and gas supply chain should not be undermined but, looking to the future, significant changes must be made to both process and behaviour for this industry to remain world-class in a competitive global economy."

This vital aspect of the industry can be improved through a number of strategies including better planning and visibility, reducing the inefficiencies through contracting and tendering, and by making the working environment more efficient. While it may seem a complex challenge, it is essential for the future of the UKCS.

EDITORS LIBBIE HAMMOND & MATT HIGH

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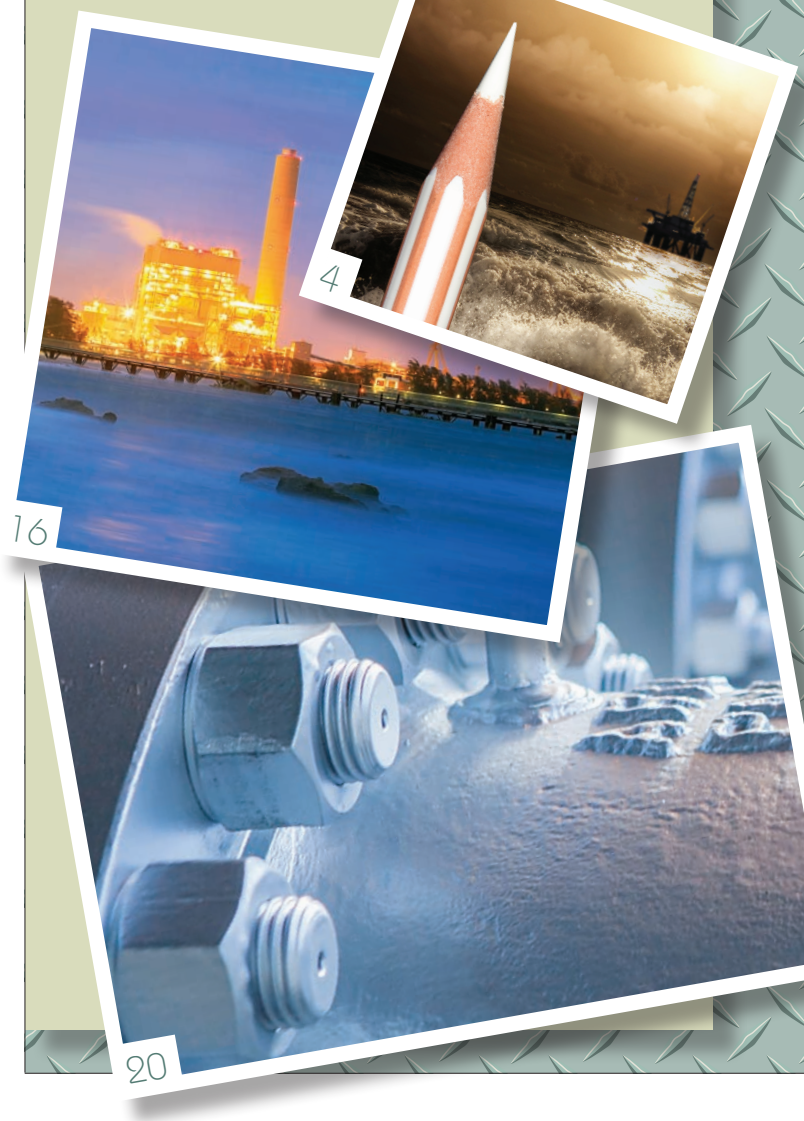

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Calculated change

DAVID DELVIN, VICE PRESIDENT HITACHI CONSULTING, DISCUSSES AN E&P SUPPLY CHAIN UNDER PRESSURE

The recent UK upstream oil and gas supply chain surveys conducted by EY (April 2014) and the Wood Review (February 2014) have highlighted a number of worrying trends. Despite turnover growth, driven largely by healthy capital expenditure, the forecast does not look so positive. This means the supply chain will need to focus even more on eliminating inefficiencies in its processes to reduce activities that do not add value and optimise costs.

A major factor in the improvement of supply chain turnover has been the increase in capital investment in the UK Continental Shelf (UKCS), which has grown 140 per cent between 2008 and 2012 [4]. The main reasons for this rise in investment can be linked to:

- Five multibillion-pound projects being sanctioned from start of 2010, which are now nearing completion
- Fiscal policy, as new field allowances have increased attractiveness. Half of the £14.4 billion in CAPEX in 2013 was incentivised by an allowance
- A renewed focus on asset integrity and prolonging asset life
- A stable and relatively high oil price

E&P supply chain service providers have been a major beneficiary of the increased capital investment and have had significant revenue growth over the last five years as a result with turnover increasing by £11.4 billion, or 47.5 per cent, between 2008 and 2012 [1]. However, this increased turnover has failed to translate into increased EBITDA margin. This suggests that despite substantial top line growth in the UK supply chain, significant inefficiencies are still present. Splitting the supply chain into the main categories, one can see that supply chain companies associated with reservoirs, which include services such as seismic, have actually seen EBITDA profit drop by ten per cent while turnover has increased by 70 per cent (between 2008 and 2012) [1].

Future outlook

Current market trends observed in the UKCS suggest that top-line revenue for the supply chain will come under pressure. The current forecast for capital investment is for a dramatic downturn of around 50 per cent reduction in the next five years [4]. Exploration drilling rates are also at an all-time low, which is a leading indicator for lower future investment through development.

There is a trend of increasing operating costs. Adjusting for inflation, nominal costs are the highest ever in the UKCS. Coupled with lower production, this means that unit operating costs, or lifting costs, have increased from around £4/boe to over £17/boe in the last decade. Operators have historically absorbed this cost, but the lower margins will eventually be taken on by the supply chain as operators are forced to cut costs themselves. Although the oil price has remained steady, any significant drop will expose a number of operators and make it uneconomical to produce.

What is causing the inefficiency in the oil and gas supply chain?

Cost competitiveness

The UKCS is regarded as one of the most expensive basins in the world to operate. International competition and a shift in demographics have led to a shortfall in the required skills and experience need to fill existing needs. This has inevitably pushed up demand and, subsequently, wages to well above the national average. Within well services, for example, average salaries have increased by 16 per cent in recent years, while employment sectors across the rest of the UK have only seen flat or minimal increases.

Other significant cost levers for supply chain service providers are their overhead costs or the scale and complexity of their operating footprint. This includes the size and location of offices, warehouses, back office support and distribution. Many supply chain service providers need to update their current processes to meet what a lean and agile supply chain would look like in today's economy.

Fragmented market with larger number of smaller operators

An influx of smaller independent operators buying assets from the larger integrated majors with a view to extending their life has brought opportunities for the supply chain providers, but has also fragmented the marketplace. Projects have reduced in size, which has made it increasingly difficult for the service providers to benefit from economies of scale. Supply chains have also become stretched as they seek to deliver services on multiple fronts. With more operators offering smaller pieces of work, the tendering and contracting process has become wasteful and time consuming. Oil and Gas UK's LOGIC suite of cross-industry standard contracts to promote collaboration has been effective for a number of scopes of work; however, there is still a lot to be done in terms of buy-in and expansion.

Limited collaboration

Collaboration is certainly not uncommon in the oil and gas sector. Large and complex projects have required multiple service providers to work together and joint ventures exist between operators to manage risk and exposure to the significantly high investment costs required when developing field opportunities. However, further collaborative opportunities such as sharing exploration rigs, field cluster developments, exploration and drilling projects, sharing of critical spares and technology innovations need to be considered as a way of reducing costs within the industry.

Operator expectations of supply chain service providers

Over the years, operators have placed a significant emphasis on being able to measure the performance of their internal processes. However, when it comes to being able to measure the performance of their supply chains, the clarity starts

to become diluted. A number of operators still struggle to measure the performance of their service providers accurately and transparently. This means delivery and lead time infringements have limited consequence. Operators have a tendency to blame service providers for not delivering while the service providers blame the operators for not providing enough detail, providing requests with too little notice or changing the scope of work at the last minute.

Inefficient commercial structures

As the industry has developed, so too has the complexity of the tendering and contracts process. As operators and service providers try limit their exposure to commercial risk, a significant amount of inefficiency has been introduced to the process. A vast amount of back office support is now required to manage and navigate through these processes, which is exacerbated by the fact that service companies now deal with more operators in a fragmented market. This is often acceptable for the larger operators but for the smaller niche service providers, this can be a considerable cost. Contracts have traditionally included an understanding that successful 'over-delivery' will result in a share of the rewards. In reality however, it is often the case that an over-zealous contracting process has fostered at best an untrusting, and at worst an adversarial relationship between operator and service provider. There has not, therefore, been a noticeable movement towards a genuine and mutual risk and reward contracting structure.

Conclusion

The UK supply chain has been able to generate significant revenue from exporting services, which accounted for 42 per cent of turnover in 2012. For this to be sustainable, there will have to be a significant reduction in its cost base to remain competitive in a global service market where lower cost options are available overseas. A decrease in the cost base for the UK supply chain is therefore imperative both for revenue growth overseas and profitability from a squeezed UKCS market. This may be achieved through:

Better planning and visibility

To ensure the correct goods and services are received On Time and In Full (OTIF), greater visibility has to be provided to the supply chain via better planning and an increased collaborative work environment between purchaser and supplier. An effective Integrated Activity Plan (IAP) should

> The UK supply chain has been able to generate significant revenue from exporting services, which accounted for 42 per cent of turnover in 2012. For this to be sustainable, there will have to be a significant reduction in its cost base to remain competitive in a global service market where lower cost options are available overseas

include a prioritisation process that provides focus to the business to deliver on the key activities, an integrated materials management process that reduces the costs and inefficiencies associated with the movement of materials and increased collaboration between activity sponsor and contractor. The use of Service Level Agreements (SLAs) can enable operators to have greater control over budgets, provide greater transparency to the supplier and allow shared responsibility for performance.

Reducing the inefficiencies through contracting and tendering:

The demanding qualification process is one of the reasons why the tendering process is inefficient. The PILOT Supply Chain Code of Practice (SCCoP), along with FPAL, has introduced supply chain KPIs that benchmark performance for both purchasers and suppliers, thus reducing the necessity for excessive qualification reviews. However, with just over 150 signatories from over 1500 companies, there is still substantial progress to be made, particularly with the smaller niche contractors. Bundling similar services is an attractive solution, and The Wood Review suggests sharing exploration rigs to reduce cost. This could even be further expanded through the supply chain to include service contracts such as wireline operations and cementing.

Make the working environment more efficient:

The industry as a whole can reduce inefficiencies. Current Hitachi Consulting benchmarking measures UKCS offshore wrench time at 52 per cent. Increasing the workforce efficiency would allow more work to be done without extra labour costs, especially with offshore bed space at such a premium. The industry needs to be honest about current productivity and the work together to address the underlying issues, as the current levels observed in the UKCS are not sustainable. Changes to the commercial structure of the big contracts would provide an incentive to the service companies to increase their productivity and performance.

A realignment of the infrastructure and footprint would increase margins by reducing the costs associated with managing the complex and fragmented supply chain infrastructure centralised around Aberdeenshire. Suppliers could share warehouse facilities and, in turn, collaborate to bundle tier-2 and tier-3 supplier contracts, affecting the whole supply chain. Operators could improve working capital by adopting consistent sparing philosophies. This will also increase delivery performance (OTIF) and have a positive effect on safety and production by reducing the lead-time of critical equipment.

The success of the UK oil and gas supply chain should not be undermined but, looking to the future, significant changes must be made to both process and behaviour for this industry to remain world-class in a competitive global economy. OSG

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HITACHI CONSULTING

David Delvin leads Hitachi Consulting's EMEA Oil and Gas practice and has been working as a consultant in the sector for over 20 years. During his time with the business, he has supported senior industry executives including super majors, growing independents and service providers to develop major performance improvement programmes.

Hitachi Consulting is the global management consulting and IT services business of Hitachi Ltd. Its Oil & Gas Practice has provided professional services to over 50 of the world's leading oil and gas companies across all segments of the hydrocarbon value chain. Leveraging deep industry knowledge and experience, Hitachi Consulting works with many of the world's leading companies to deliver measurable and sustainable business results.

For further information please visit: hitachiconsulting.com

Above: Keith Wallace, Costain Upstream executive vice president

Knowledge and understanding

Costain Upstream has secured a contract extension with Premier Oil worth £12 million over the next three years. The Aberdeen-based company has worked with Premier Oil on a number of development projects in the North Sea during the past four years. Costain Upstream will continue to provide project and technical support across Premier assets, including the Catcher development.

On the Catcher project, Costain Upstream will provide development engineering and consultancy support in various technical areas including subsea infrastructure and floating production.

Peter Kirkbride, senior vice-president of the Select division at Costain Upstream, said: "Premier Oil benefit from the extensive experience and detailed knowledge of Costain Upstream staff who deliver services to support all aspects of offshore lifecycle from pre-feed studies to engineering and production.

"Our comprehensive knowledge of the North Sea oil and gas industry is one of the main reasons our clients choose to work with us. We have an excellent understanding of how the market operates so can offer greater certainty when it comes to project budgets and our experience and processes aid the efficient management vendors in the supply chain."

Keith Wallace, executive vice president of Costain Upstream, said: "We are delighted that we will continue our work with Premier Oil. This contract is testament of the recognised value our services bring to projects."

What to wear

It has been announced that Statoil has entered into an agreement with Wenaas (Kwintet Norge AS), resulting in Northern Europe's largest contract in the PPE and workwear sector.

Statoil has been a customer of market leader Wenaas for many years, utilising its products on a global scale in recognition of the high quality and Norwegian origin of the Wenaas product range. Statoil has been a strategically important customer in terms of innovative new product development for Wenaas workwear and protective footwear in harsh climatic environments, as part of the groundbreaking Petromaks Project. Under the new contract, Kwintet has also been trusted to deliver all protective gear for the energy company.

Lars Tendal, managing director of Kwintet said: "This contract is the largest contract in this sector in Northern Europe. When awarding the contract, price has obviously been an important factor, but factors such as competence, quality, delivery reliability and logistics have played a key role in gaining the trust to become such a significant supplier to Statoil.

"Kwintet has dedicated product managers and key personnel who are highly competent in all Statoil's areas of priority. This is why we have the competence required to operate large and operationally complex agreements such as this."

Below: Karen Seath, new general manager at Decom North Sea

New appointment

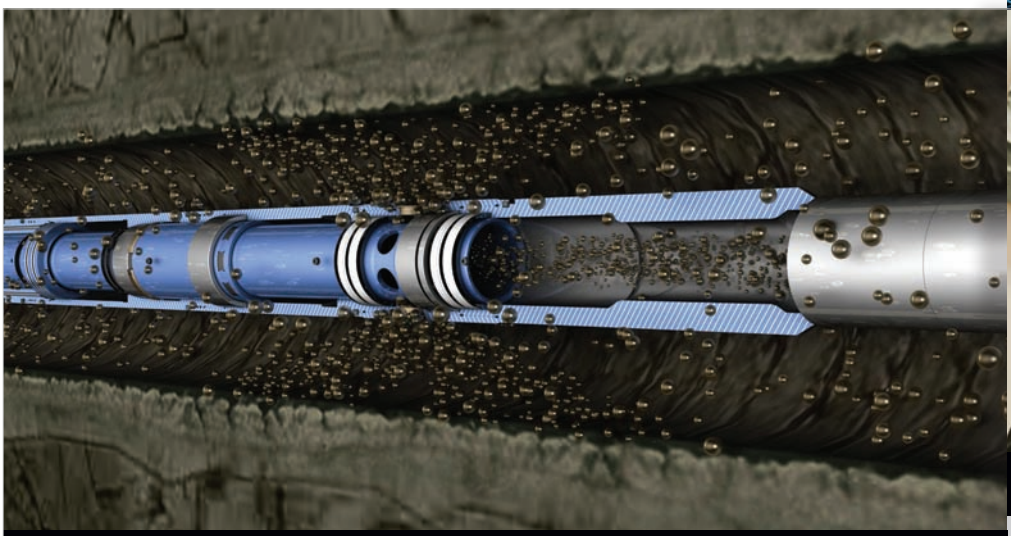
Decom North Sea (DNS) is delighted to announce Karen Seath will join the organisation in September, in the role of general manager.

With the total cost of UKCS decommissioning expected to reach approximately £4.5 billion in the next five years, these are strategically critical times for the North Sea decommissioning industry.

This has been amply demonstrated by the publication of the Wood Review and the more recent "Scotland's Independent Expert Commission on Oil and Gas: Maximising the Total Value Added". Both reports urge the industry to find "game changing" solutions to the challenges of decommissioning.

Karen therefore joins DNS at an exciting time for the industry. With significant experience in both the public and private sectors, Karen has spent over 20 years ensuring that collaboration, strategic development, and risk and regulatory management are top of the agenda.

Commenting on her appointment, Karen said: "I am delighted to be joining Nigel and the team at Decom North Sea - this is an exciting time for the North Sea decommissioning sector. The promotion of solutions and delivery of effective cross-sector working relationships is a substantial challenge for any industry. As time progresses, the work of DNS becomes ever more critical to the success of the decommissioning industry and I look forward to facilitating these relationships within the current membership and beyond."



Above: The Sandface valve is a permanently installed electronically actuated sleeve and is one of a range of tools in Omega Completion's ReACT Technology offering

Complete service

Independent well completion and intervention technology developer and manufacturer Omega Completion Technology has secured a completions framework contract with Statoil ASA.

The contract awards Omega the right to supply its unique ReACT Technology (Remotely Activated Completion Technology) to all Statoil assets in the Norwegian continental shelf, totalling 35. Omega delivered the first ReACT completion solution to Statoil ten years ago and has provided completion equipment for more than 30 Statoil wells.

The initial contract period is for approximately two years with an option for an additional period of six years thereafter.

The ReACT signalling method provides a means to remotely activate downhole completion equipment without the need for costly and complex intervention operations. The technology is a reliable, industry recognised solution providing both a primary and back-up remote actuation functionality and mechanical contingency option.

Fredrik Harestad, general manager for Omega Completion Technology AS commented: "This is a great milestone for Omega in Norway and very well timed, as confirmation was received on the first anniversary of the business operations in Norway. The contract award is a result of dedication, teamwork, our unique technology offering and successful operations over many years. It shows that Statoil has acknowledged Omega as a leading supplier of unique completion equipment."

Key intervention

Aberdeen-based wireline and well intervention technology specialist Wireline Engineering has increased its support for North Sea customers by offering an operational training course on gas lift intervention.

The first series of three training events was held from 5th to 7th August at Wireline Engineering's facility in Aberdeen, with a total of 25 personnel from Nexen Petroleum and its UK service providers participating.

One of the principal objectives was to achieve a common understanding of the key operational challenges involved in deviated gas lift intervention and how best practice could be employed to achieve the most effective outcomes in different circumstances.

The course also allowed delegates to take part in hands-on practical sessions using Wireline Engineering's revolutionary Advanced Kickover Tool to set and retrieve gas lift valves in a real side-pocket mandrel.

Bill Petrie, chairman of Wireline Engineering, said: "Gas lift intervention can be a critical part of production optimisation in many fields, both in the North Sea and elsewhere, and is often carried out in challenging circumstances. I believe there is a profound need to exchange expertise and operational experiences with other industry professionals. In the end everyone benefits."

Above: Mark Cavanagh, XPD8 managing director

Vital assets

Asset integrity management specialist XPD8 Solutions has secured more than £2.25 million in combined contract wins for work in the North Sea and Malaysia.

Over a period of 12 months, XPD8 will develop the work management system, which includes asset register, maintenance programme and population and analysis of 'spares' data for a major operator on the UK Continental Shelf.

In the Asia Pacific region, the Aberdeen-based firm's risk mitigation department will provide quality assurance and control services on a three-year contract with a two-year extension option.

XPD8 is recognised as a leader in maintenance engineering, condition monitoring and integrity services for the oil and gas sector. The company's international reach has grown in the past year to cover Europe, South East Asia and Africa.

Mark Cavanagh, XPD8 managing director, said: "These latest contract wins continue what is proving to be a busy year for XPD8. We have secured work all over the world to provide services that operators are increasingly looking to use.

"Investing in the correct maintenance engineering system can help to provide a sustainable performance improvement and ensure quality standards are met. We have the software and skilled maintenance engineers to help clients prevent anticipated failures on assets, prolong equipment life and ensure optimal performance."

Enhancing safety

THE CAPABILITY TO BENCHMARK THE RELIABILITY OF SAFETY-CRITICAL WELL BARRIER COMPONENTS AGAINST A GLOBAL COMPONENT TEST DATABASE WILL ENABLE OIL AND GAS OPERATORS TO OPTIMISE ASSET PERFORMANCE, SAYS GED LUNT

Optimising asset performance remains a continuous challenge for oil and gas operators. A key element in achieving this is selecting well equipment with reliable performance. However, making the correct selection is far from simple; different equipment models may be more suited to certain operating conditions. When conditions are very challenging, well designs may need to be adjusted to allow for lower achievable reliability of particular equipment to maintain an acceptably low overall level of well failure risk. A lot of considerations lie behind the selection of well designs and the selection of replacement components during well workovers.

The performance of installed well components must be totally predictable. Should a problem arise at any given point in time, operators must be confident that they know how their well barrier components will respond. For example, if they shut a subsurface safety valve (SSSV), then they know with certainty that it's going to close and contain the well fluids in the specified time.

Getting accurate reliability figures for well barrier components requires access to a statistically significant database. Whilst the industry recognises this need, a key challenge has been the reticence of operators to make data such as component reliability and failure rates available externally.

In addition to concerns over data confidentiality, efforts to build such a database have tended to be limited to single regions such as the North Sea, or focussed strongly on specific components such as the SSSV. Previous systems have also been badly structured and suffered from poor quality of data or difficulty of use or access.

Better insight, better decisions

In response to industry demand, Wood Group Intetech has launched a global database of well performance data. Known as 'iQRA', this online quantitative reliability analysis tool is providing operators with access to global well and oilfield component performance information. Subscribers can identify the highest performing well components, benchmark reliability figures, and extract statistical and mean-time-to-failure (MTTF) data to support cost-saving decisions.

Most operators accept that certain well barrier component failures are inevitable and operational constraints may mean that they cannot be repaired immediately. It can be necessary for wells with individual components not in full working order to continue to operate, provided risk assessment

indicates the risk level is acceptable. Of course, some types of failure call for the well to be shut-in and repaired immediately, but for the majority of non-critical failures, repairs are scheduled to take place within a designated timeframe, or when the opportunity arises.

Testing can actually reduce the lifetime of the equipment – especially an active component that is opened and shut, each cycle causing some amount of wear and fatigue. Given that it is necessary to close valves in order to test the leak rate across them, using risk-based analysis to determine that testing can be safely performed less frequently, should extend the lifetime of valves, as well as reducing operating costs.

Access to this kind of reliability information makes it possible for operators to identify where they have low reliability equipment or potentially a faulty component installed. They can pre-empt potential failures on other wells by taking the opportunity to replace a questionable piece of equipment if another well intervention is taking place.

Meeting user needs

The quality and volume of data upon which iQRA is based means that operators can make independent and impartial assessments of reliability performance. For example, decisions on well components for new well designs or replacement during workovers can be made based on the highest performing and most reliable equipment. Selecting high reliability components is a must to reduce well entries, establish optimum maintenance levels, and justify plugging and abandonment decisions.

The development of iQRA was driven by operators. The ability to benchmark company performance against the global database is particularly attractive, as is the core functionality to carry out reliability and MTTF evaluations. This not only supports corporate social responsibility objectives, but also helps well integrity teams utilise the available budget more effectively to attain a higher level of performance. Furthermore, it provides them with robust and risk-based evidence to present to production managers when requesting that a well be shut-in.

Following the ISO-14224 standard, iQRA's functionality also includes failure data analysis such as critical failures versus degraded failures. These features have been designed to accelerate the industry shift to risk-based assessment and performance-led decision-making for maintenance scheduling.

These capabilities are already enshrined in UK health, safety and environmental practices, and in Norway, where the Petroleum Safety Authority stipulates that each well workover case be assessed per well and based on reliability data. As regulations evolve, iQRA's ultimate aim is to equip operators with the insight to optimise well operations by identifying potential weaknesses in their equipment and pre-empting future issues.

As the global oil industry increasingly aims to quantify decision-making based upon a risk evaluation approach, the need for a trusted resource of oilfield component reliability data will continue to grow. O&G

iQRA solution

The iQRA reliability information service allows an independent and impartial assessment of well component reliability performance. The scope of data incorporated includes all well environments: onshore; platform; and subsea. What's more, source data is subject to rigorous quality assurance (QA) checks.

iQRA can be accessed from anywhere via a standard web browser. Within a few mouse clicks users can build data queries based on:

- Individual Xmas tree, wellhead valve and seal components as well as SSSV
- Global regions and well location (land, platform, subsea)
- Equipment manufacturers
- Operating environment characteristics
- Time period of data to interrogate

Results reported include statistical evaluation of the failure data and the mean-time-to-failure (MTTF) report, while a "saved searches" option allows users to quickly run further reports according to their specific requirements, as new data becomes available.

Ease of data provision is one of the most important features of iQRA. Data upload from spreadsheet or direct from third party systems is supported to make life easier for subscribers with existing large test failure databases. iQRA's data integrity is assured as all data submitted to the system is automatically passed through a QA workflow incorporating multiple validation steps and manual checks by engineers.

Crucially, iQRA keeps ultimate sources of data generating MTTF and reliability statistics strictly confidential. Sensitive data is anonymised with well, field and operator identification information kept entirely absent from the end-user database. Access to system functions is also protected, using password strength gates and a robust set of user roles and privileges.

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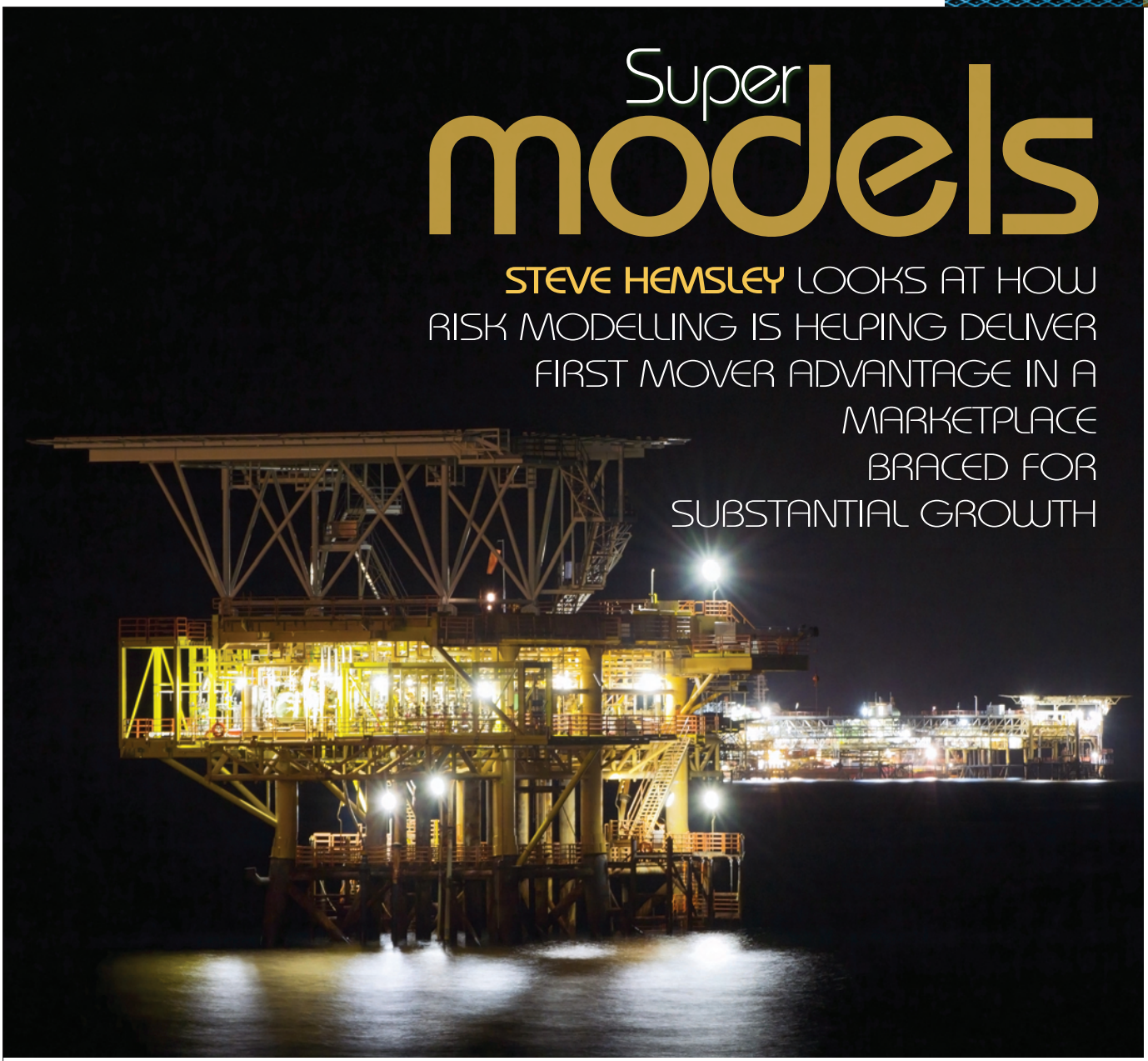
Super models

STEVE HEMSLEY LOOKS AT HOW RISK MODELLING IS HELPING DELIVER FIRST MOVER ADVANTAGE IN A MARKETPLACE BRACED FOR SUBSTANTIAL GROWTH



Natural gas is the fastest growing sector within the energy market. Demand driven by its relatively low cost (it is reported to be 80 per cent cheaper than oil on an energy equivalent basis) and cleaner burning properties makes natural gas an attractive energy source for downstream consumers looking to diversify their energy resource portfolio and reduce emissions in line with tightening global standards.

Despite this demand, only ten per cent of the world's natural gas currently finds its way into the LNG market. It is no wonder that the LNG industry is poised for explosive market growth as suppliers seek to capitalise upon a widening global customer base, such as the energy hungry economies of South East Asia and Western Europe. It is expected that world trade in LNG, having already tripled over the previously 15 years, growing from just over 280 mm3/d (million cubic meters per day) in 1997 to over 900 mm3/d by 2011, is anticipated to expand rapidly with many new players entering the race and creating fierce competition for securing contracts within these new markets.

Those currently planning to enter the LNG market require large capital investment in order to build the necessary infrastructure. With such high costs at stake, investors need to be clear that facilities and shipping capacity are able to perform as expected in the face of such a volatile market and shifting supply chain.

From initial scoping studies to the final investment decision, once feasibility has been established, designs for any new LNG facility need to be validated against both short and medium term operational objectives as well as longer term strategic plans to ensure success.

Predicting success

Predictive simulation is a powerful technology that has been used to achieve this for many years. In fact, over 30 per cent of the world's LNG capacity and shipping operations have been studied, designed and validated using Lanner's LNG Logistics Simulation software.

Predictive simulation allows project owners to experience visually how potential operational scenarios will play out across their infrastructure designs. This insight delivers a

LNG Logistics Simulator Modules provide Predictive Analytics across the LNG Value Chain

quantifiable, statistically accurate and unbiased projection of how proposed value chain facilities will function both in a steady state, but also crucially how it will react under the stress of real world conditions.

- Visually experience how future operations will play out
- Quantifiable, statistically accurate, unbiased projection of planned operations
- Effortlessly demonstrates how complexity, randomness and tolerance levels affects plans
- Rapidly experiment and evaluate scenarios to understand feasibility and robustness
- Quickly and cost effectively alter the modelled operation as the project matures so that analysis is future proofed
- Understand trade-offs and identify the factors that impact key objectives so that unnecessary cost can be avoided

The many elements of the LNG value chain each have subtle intricacies, performance variables and operating characteristics that present a variety of challenges when it comes to predicting performance. Lanner's LNG Logistics Simulator contains a suite of modules, each specifically created to represent different elements of the value chain. Modules can then be selected based on the specific needs of individual projects, delivering an end-to-end analysis tool tailored to the project's needs.

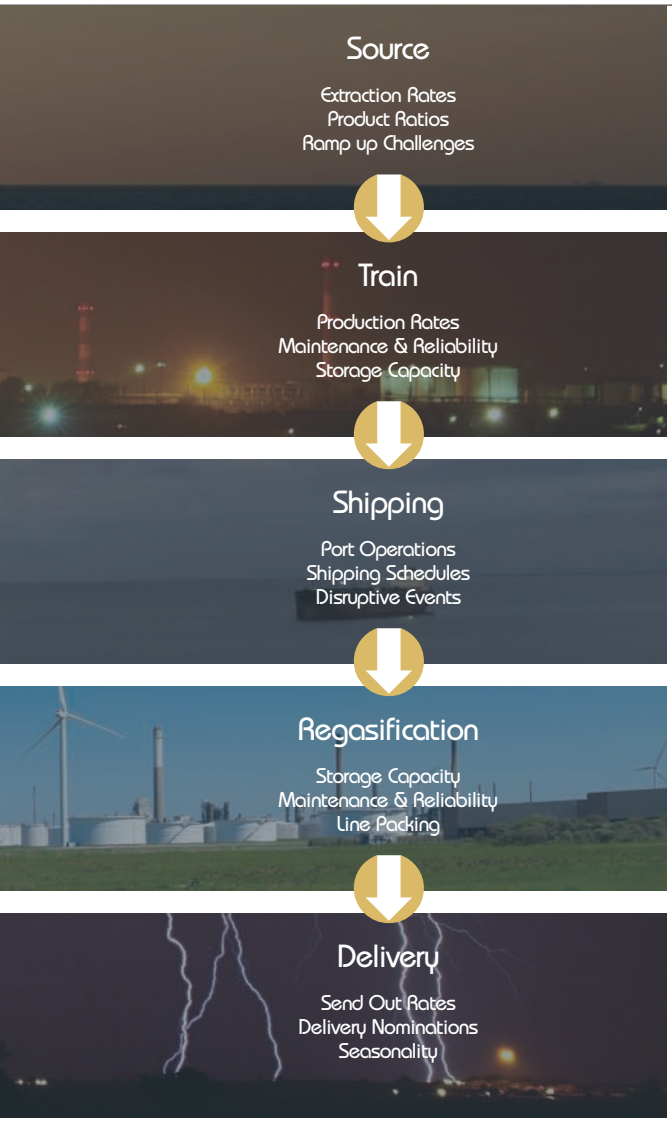
A case in point

One of Lanner's customers recently proposed additional export facilities to its regasification terminal in Louisiana, United States; a move that reflects shale gas viability across the continent.

The project proposes supplementing existing infrastructure with liquefaction trains and additional marine berths, storage tanks and complex marine traffic scheduling in order to begin exporting LNG from the facility to markets in East Asia and Europe.

The project team was tasked with using analytics to better understand future operating options, quantify risks and validate investment milestones to secure commitment and financing from the three commercial partners involved. They needed a model that would allow them to test, refine and validate key decisions during the planning stage, enabling them to balance the requirements from each partner and create a solid business case for investment.

With investment levels around the $7 billion mark, accurate foresight was required into the operational capacity of the terminal so that its long-term import contracts could still be fulfilled while export operations were ramped up. In order to gain accurate projections of throughput and assess the storage capacity required to manage the import and export operations, predictive simulation was deployed.



Lanner was selected because of its depth of experience and expertise in the LNG industry, as well as the configurable modular design of its LNG Logistics Simulator, built upon its core WITNESS simulation platform. A key requirement was that models developed in the LNG Logistics Simulator could be re-configured and rapidly re-used by the project team to evaluate new conditions as the project itself evolved.

Predictive simulation was used to prove that the terminal could operate effectively, with sufficient berthing capacity to avoid undue delay to shipping. One of the main considerations when looking at capacity was that the channel leading to the terminal was particularly congested and susceptible to tides and storms, limiting the number of vessels that could enter and leave at any one time.

The model mimicked the constraints in the real world environment so that the project team could accurately test shipping schedules and correctly size the export facility to ensure output would be sufficient for all the partners involved.

Analysis of the projected scenarios confirmed that the terminal could comfortably cope with the planned requirements, but it also demonstrated that the company would require specific maintenance regimes and strategies to manage characteristics that would affect the steady state operation. Increased channel traffic; channel closures owing to bad weather; variable tanker ship sizes and arrival schedule disruptions; and the impact of an increased number of cargos on train production would each have a significant impact on performance.

The analyses generated by Lanner's LNG Logistics Simulator were fed into the business, case confirming the viability of the new terminal and the predicted operational profitably as set out in the proposal. Through projecting future performance, risk was effectively removed from the project prior to the final investment decision (FID) stage.

Real-world behaviour without real-world risk

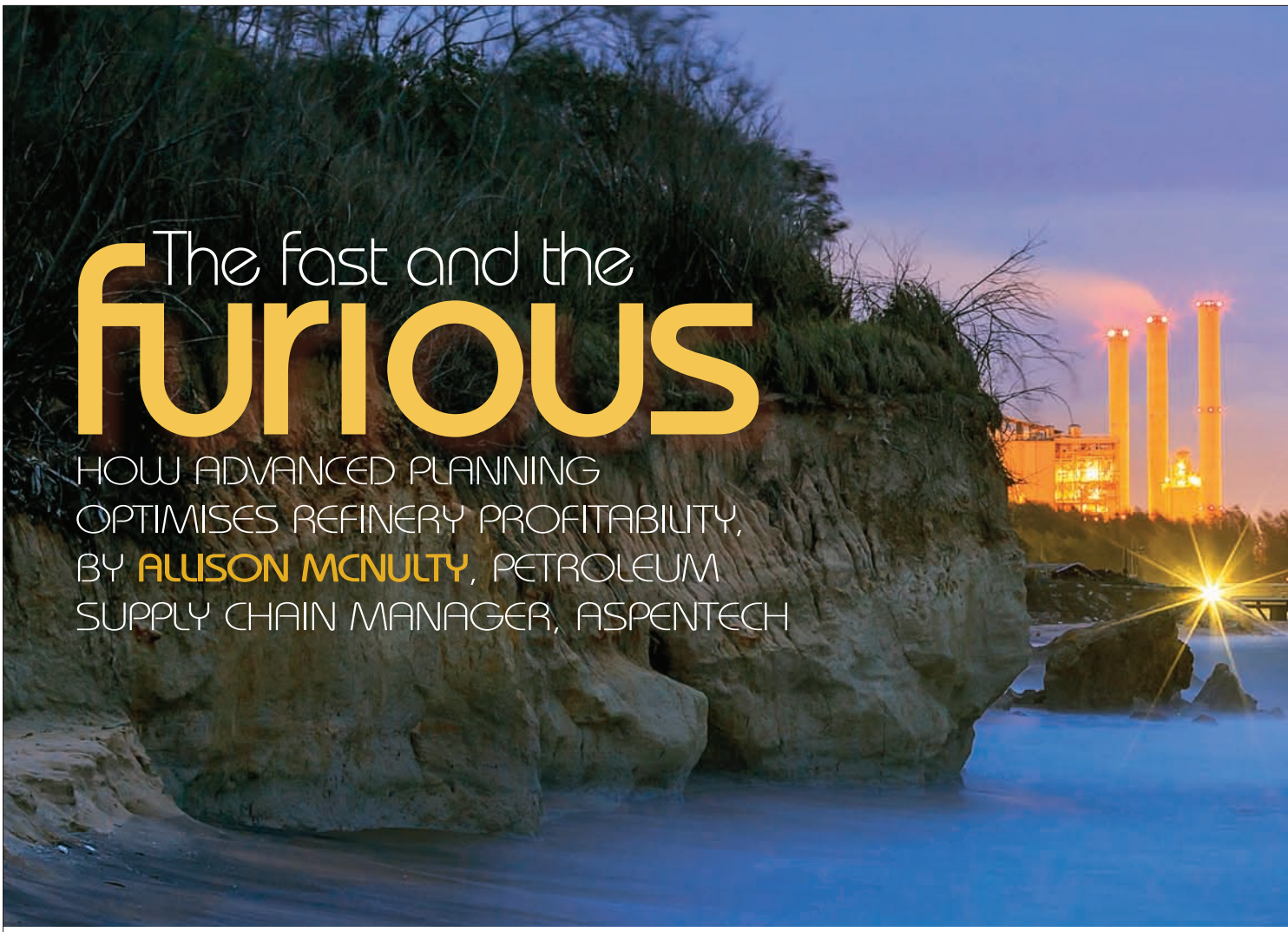
As this example demonstrates, predictive simulation mimics events to provide foresight into how a value chain would behave in the real world against a spectrum of conditions and variables. It is unique in its ability to go beyond static data analysis to reflect dynamic process complexities, interdependencies and real-world uncertainties in order to visualise and predict future performance. Because scenarios can be tested and optimised before decisions are made, risks to performance are better understood and mitigated.

Both the demand and supply of LNG is on the rise driven by the diversification of its use, improvements in technology and lowering costs of extraction. We cannot predict exactly how the global LNG market will evolve but it's certain that the challenge of getting the risk/reward balance right isn't going to get any easier. The foresight provided by Lanner's LNG Logistics Simulator means that LNG value chain players can better predict how they can capitalise on this opportunity, minimising risk and maximise returns, gaining a clear advantage in this lucrative market. O&G

LANNER

Steve Hemsley, LNG business lead at predictive simulation provider Lanner. Lanner delivers predictive simulation technology, a key component of advanced analytics that allows organisations to harness big data, model complex processes and experiment with business decisions within a risk free, virtual environment. Lanner's predictive simulation solutions deliver unprecedented insight into existing operations as well as guidance through foresight for making the best business decisions for the future. With its headquarters and software development based in the UK, Lanner works with organisations around the world to optimise their resources, streamline supply chains, design new facilities, manage valuable assets and drive business performance. Lanner's vast experience in the LNG market has been encapsulated within a suite of configurable LNG simulation modules that cover the entire LNG value chain from source to customer. Together these form a comprehensive, rapidly deployable solution that models your specific plans, delivering both insight into proposals and foresight to manage potential problems down the line.

For further information please visit:
lanner.com



The fast and the furious

HOW ADVANCED PLANNING OPTIMISES REFINERY PROFITABILITY,

BY **ALLISON MCNULTY**, PETROLEUM SUPPLY CHAIN MANAGER, ASPENTECH

To maximise profitability in today's volatile market, refineries must make fast, accurate and optimal planning decisions. With rapidly changing market conditions and furious competition, refinery planners need to tackle many different challenges, including feedstock selection, price volatility, process runs and product mix. At the same time, quickly reacting to discrepancies between the plan and schedule is vital to fully exploiting profitable decisions in the supply chain and capitalising on newly available feedstocks as products of global shale plays. The race to maximise profitability is well underway.

So, how can refinery managers and planners react to the pressure of developing the most profitable operational plans, of running even more scenarios faster than ever, evaluating feedstock basket limitations and easily determining the global optimum plan? The answer is that shorter run times lead to faster and more effective analysis. Equipping planners with advanced planning software tools helps make profitable planning decisions more quickly than could even be imagined only a few years ago. Refinery managers and planners are constantly under pressure to develop not only feasible, but optimal operating plans while meeting regulatory requirements and maintaining uptime with low, yet safe, working volumes. For many refiners time is the enemy. Companies can now run more cases and evaluate more scenarios faster than ever before by employing parallel processing and also using multi-start to ensure they have found the global optimum.

A fast evolving market needs a solution that is both dynamic and fast. Now companies can elevate their refinery planning to the next level with scalable planning software that helps organisations optimise feedstock selection, product slate, plant design and operational execution to not just remain competitive, but to leave the competition behind.

Raising the standard for crude feedstock planning

With increasing commercial pressures and a more fast-moving economic environment in the refining industry, growing numbers of people within the organisation need access to the data generated by the planners in order to make informed business decisions. Equipping the business with leading-edge software helps address this challenge by not only enabling even the less-experienced planners to become effective quickly, but to allow the output from their effort to be accessible to and understandable by others in the organisation.

Using cutting-edge proprietary technology results improves downtime planning, risk and inventory management, whilst the impact on profitability is always taken into consideration. In addition, many refineries can choose to take their planning to the next level. In doing so, using advanced planning tools containing additional layers with added functionalities will help them capitalise on

market opportunities and improve overall plant performance. With the best tools, companies can more effectively stabilise operations by simplifying their crude basket, resulting in greater overall profitability. In essence, there are three key benefits to using advanced planning tools compared to standard applications. Firstly, performance levels can be enhanced by running more scenarios more quickly than ever before. Secondly, stability can be improved by more accurately evaluating feedstock bucket reduction. Thirdly, the global optimum for the best possible solution can be more easily determined.

Advanced software quickly makes the difference

Refiners want to lower their crude feedstock acquisition costs by using new techniques to analyse their options. Crude costs remain high relative to finished product prices and this exerts downward pressure on margins. As crude production declines in established producing areas like the North Sea, Mexico and the Alaskan North Slope, refiners are taking advantage of new sources developed in recent years to replace the older, declining sources. Over time, most refiners are being forced to broaden their crude slates in an effort to lower average acquisition costs and increase refining margins.

For many refineries the move to advanced planning software beyond standard planning applications results in tremendous returns. This is particularly true for those refineries with access to coastal facilities where spot crudes are available and important, as well as for those locations that have tankage constraints where reducing the crude basket can help to reduce crude blending issues and overall logistics.

The capabilities within advanced optimisation planning software deliver greater results than standard tools. For example, by reducing the number of crudes being stored and processed, the planner can reduce inventory and switching costs and propose an overall more profitable crude slate. One leading refinery alone reduced their crudes from seven to five and estimated that they are saving 15 to 20 cents per barrel. By adopting leading-edge tools, companies gain the ideal macro and micro view of the plant to help deliver significantly improved profitability.

Today, three-quarters of the world's refining crude feedstock is planned using AspenTech's Aspen PIMS™ solution. By using newly developed collaborative tools, this software system enables planners to deliver optimal plans faster and more easily. They can visualise and evaluate multiple scenarios along with plant data to make better, more profitable decisions. It de-mystifies the plan by providing clearly displayed data with an easy-to-use interface on a common platform available to all key stakeholders.

By integrating the new PIMS advanced optimisation capability, embedded into PIMS-AO with aspenONE PIMS Platinum, companies can achieve a competitive advantage by responding to traders' enquiries more quickly and can

Fluctuating feedstock and production costs make it difficult to predict profit margins. To remain competitive, refiners need to equip both the experienced and the new generation of planners with intuitive, dynamic solutions that integrate and optimise planning and scheduling across the entire supply chain

evaluate more options when crude opportunities arise. This combination allows traders to interpret the data and share their findings with key stakeholders across the organisation. Aspen PIMS Platinum is a part of the PIMS application that combines planning data output with sophisticated analytics for a new way to make more informed refining decisions.

Best practice planning tools now also include revolutionary assay management capability. By making it easier than ever to add, modify and re-cut assays, this capability helps refinery planners deliver more accurate plans to yield greater profitability. Additionally, advanced optimisation planning allows the use of both linear and non-linear modelling and constraints to create an even more accurate representation of their plants and operations than ever possible before. Industry-leading tools also provide the capability to share production targets, assay data, process unit sub-models, as well as blending model libraries and optimum recipes with scheduling and refinery multi-blend optimisation software. This provides powerful synergies between planning and operations, which results in greatly reduced margin leakage. Efficiency is the key here. In planning, the more scenarios evaluated, the more likely it is the best decision will be made. The latest advanced optimisation planning solutions provide answers rapidly and leverages parallel processing to generate those answers in minutes rather than hours.

In addition to faster solution times, many customers have achieved additional savings of up to 10 cents per barrel once they make the switch to PIMS-AO. Further customer feedback examples include:

"It used to take four hours to get an answer for a trader in Singapore. With PIMS-AO it takes only 14 minutes" - $39bn multi-national corporation

"A 300 case run went from 3.5 hours to 12 minutes with PIMS-AO" - Multinational oil & gas company

Step up to the next level

Better planning performance delivers better profitability. When refineries operate in fast and furious environments, production plans must keep pace with continuously changing demand. Fluctuating feedstock and production costs make it difficult to predict profit margins. To remain competitive, refiners need to equip both the experienced and the new generation of planners with intuitive, dynamic solutions that integrate and optimise planning and scheduling across the entire supply chain.

By running more scenarios faster than ever, planners can leverage advanced software to evaluate multiple scenarios simultaneously in a fraction of the time used by traditional methods. Consequently, shorter run times lead to quicker analyses resulting in better decision-making. In turn, better decision-making results in improved bottom-line profitability. The race is fast and furious to achieve a competitive edge. It's time to advance and take your planning to the next level. OEG

PIMS-AO Case Study

World-class petrochemical company maximises olefins profitability with more robust planning

Aspen PIMS-Advanced Optimisation enables faster feedstock selection and higher variable margins for better recovery options.

With annual revenues of over $45 billion and more than 10,000 employees worldwide, this global petrochemicals company is a market leader in olefins, utilising multi-site and single-site models for its US assets and creating a complex decision system. Considering that over 100 cases must be evaluated routinely to optimise profit margins and other complexities, they elected to conduct a review of current practices and technology in an effort to be more agile in responding to industry changes.

Using Aspen PIMS-AO, the company was able to take its planning to the next level, addressing critical issues, such as determining the optimum cracking conditions for the company's assets, the most profitable disposition options for products and what evaluation should be in place for feedstock cracking at certain assets. Additionally, the company turned to AspenTech to maintain its competitive advantage, which would involve enhancing feedstock selection, maximising the variable margins from current assets, operating plants close to true constraints and enhancing existing work processes to improve efficiency and maximise profitability.

Changing industry dynamics

Given the recent changes to the petrochemical industry, this world-class leader was looking for new ways to enhance its existing models. Some of the changes included shifting cracking economics due to increased shale gas drilling, which involved infrastructure investments that bring more NGLs to the market, as well as the surging ethylene cash margins that went from $0.05-0.10/lb on average to $0.30/lb.

Optimised planning solution

The company implemented Aspen PIMS-AO - a robust planning solution with easy-to-analyse results to achieve efficiency improvements, approve transparency and effective analysis of planning results and cultivate opportunities to further improve performance around planning needs. AspenTech allowed the company to explore options that would provide a platform to efficiently view, run and analyse results of planning models, help communicate the plans effectively with plant operations and offer support tools for training new and/or less experienced analysts.

Benefits gained

Upgrading to Aspen PIMS-AO provided new opportunities to the company to further improve planning performance. There were four key areas of importance to the company:

- The multi-core processing capability of Aspen PIMS-AO significantly reduced the company's case work time cutting run times by as much as 80 per cent increasing performance dramatically
- The installation of a robust solution to address complex multi-plant models with an open equation environment and XNLP solvers
- The introduction of non-linear equations for yields and process limits increased flexibility
- The capability to bring in external models into Aspen PIMS using "DLLS" (Dynamic Link Libraries) created multiple new opportunities

All of these benefits lead to the optimisation of the company's US olefins assets through increased optionality in feedstock selection and aligned operating costs closer to constraints.

"A 40-case run that used to take three hours now only takes 25 minutes with Aspen PIMS-AO." - Business Lead, Olefins Planning

ASPENTECH

Allison McNulty is petroleum supply chain manager at AspenTech, the world's leading supplier of software that optimises process manufacturing. The company's software tackles the most complex process manufacturing challenges, creating value and improving profitability for its customers. AspenTech serves clients in the oil and gas, chemical, engineering and construction, pharmaceutical, food, beverage, and consumer packaged goods industries, all of whom rely on AspenTech solutions to effectively run their businesses.

For further information please visit:
aspentech.com

Protecting pipelines

JOHN PETERS OF NEL DISCUSSES SAND EROSION IN PIPELINES AND HOW COMPANIES CAN PROTECT THEIR ASSETS

Combating sand wear, erosion

Sand was once dismissed by the oil and gas industry as it only represented a small fractional percentage of flow from an oil/gas well. However, because the industry is now more aware of the severe damage caused by sand particles, the presence of sand in many well flow streams is now well documented.

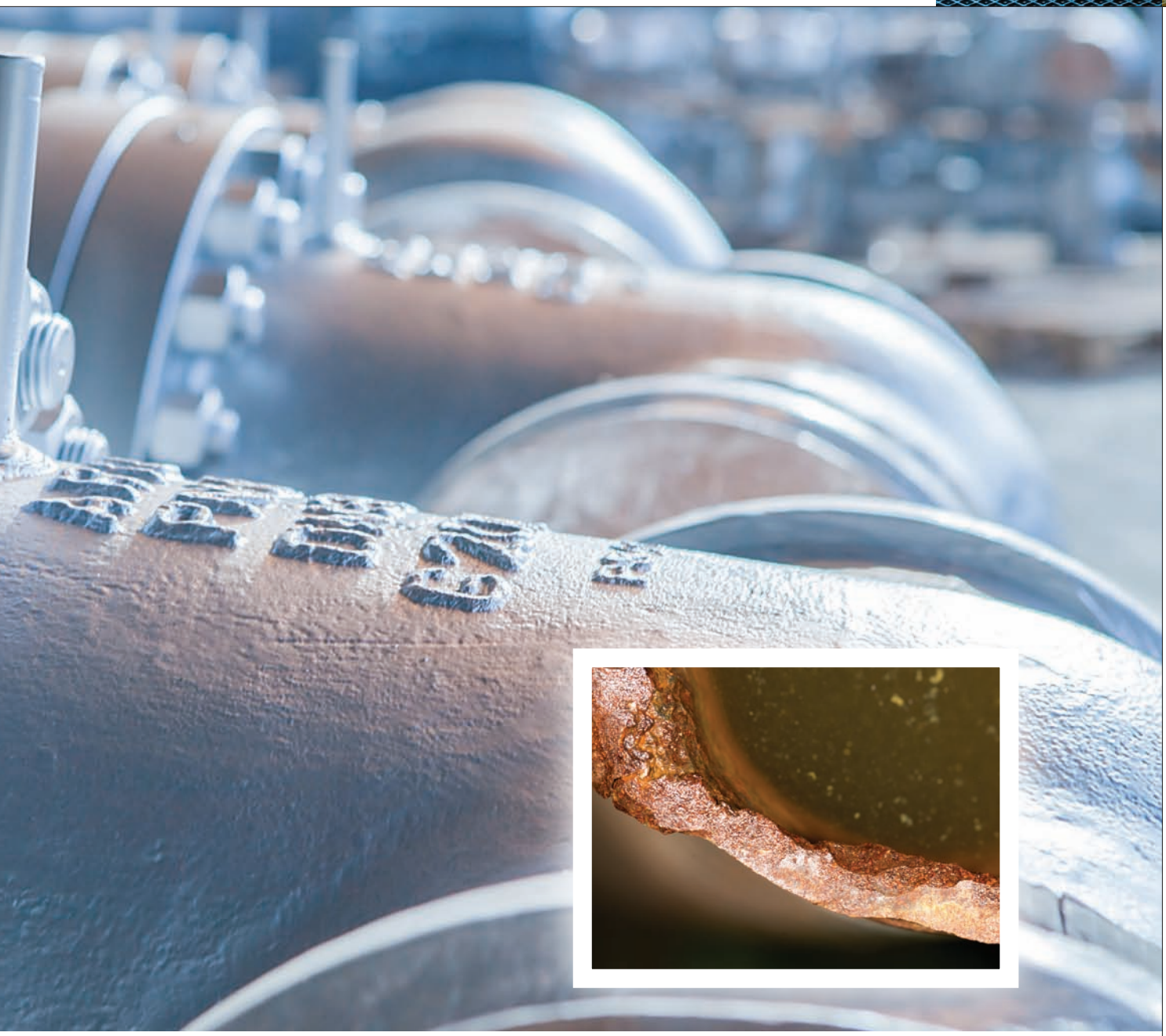
Sand production is now of increasing concern as the field ages, because many fields are becoming 'mature' and sand production levels always tend to increase. Also, as new, more difficult fields (i.e. conditions such as higher pressures, temperatures and higher sand levels), are developed, they often have higher starting and ongoing levels of sand production.

It is therefore important that the presence of sand is anticipated and that oil and gas production systems, from downhole right through to the processing facilities, are designed to handle the sand safely and reliably, because the production stream can be highly erosive due to the sand particles contained within the fluid. The size of the sand particles varies widely from as little as 15-30 microns (fines), up to 180-250 microns (moderate) to 450-600 microns (large), with each well and field having its own characteristic.

Worldwide, sand erosion costs the oil and gas industry billions of dollars annually due to increased wear and maintenance downtime, which manifest themselves as cut-backs in production, un-planned shut-downs or failures of equipment, with possible loss of containment and consequent environmental damage. Both the drilling and production sectors of the industry must therefore consider the risk of potential sand erosion damage and wear more seriously and ensure they are using validated equipment that is fit for purpose.

Although the sand present in the flow may still represent only a fraction of one per cent, if this is flowing in the piping system or inside components such as choke valves at high velocity it can cause significant erosive damage or even penetrate the wall or body leading to loss of containment - a very serious risk. Also, if sand particles become trapped in equipment with sliding or rotating parts with very small clearances, such as a valve, they can cause the operating force to increase significantly making it difficult to operate or to reliably close and seal, in some cases even causing the valve to seize. These scenarios are often potentially high-risk situations.

To control and limit the production of sand, operators often install sand screens downhole to retain sand particles but still allow a reasonable flow of fluid. However the smaller grains, typically <60 microns, will still pass through, and these can still cause erosive damage, albeit at a slower rate. A downside of installing sand-screens is that they can sometimes block and fail.



The only realistic option is to make the whole production system 'sand-tolerant', which inevitably makes it more expensive. However, for fields likely to be producing sand (even low levels), in the long-term an investment in sand-tolerant equipment will pay dividends with its benefits of extended life, increased reliability and lower risk.

Equipment validation

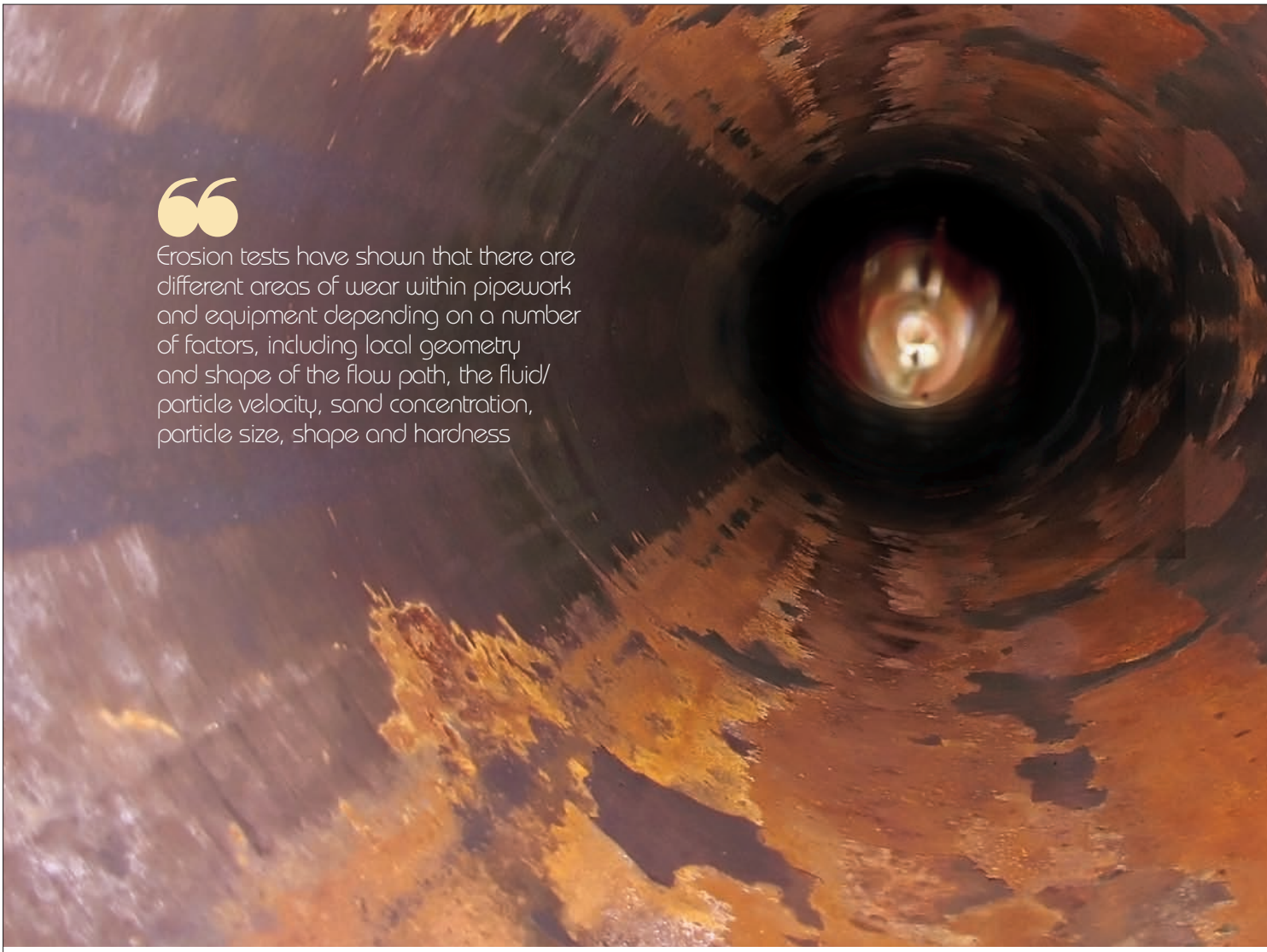
For equipment and pipework that is susceptible to sand erosion, how can operators be assured of the equipment's performance and integrity? Verification or validation, also known as type testing and qualification testing, is increasingly becoming the answer for both manufacturers and operators. A number of ISO standards and API specifications include such tests and procedures. as well as some manufacturers and operators having their own procedures.

Rather than relying solely on their own product capability claims, manufacturers are finding that independent evidence, as part of the verification process, delivers a competitive edge as it assures purchasers that the product indeed performs reliably, particularly under arduous conditions.

However, operators are faced with a complex problem: not only are equipment designs and technologies often evolving in advance of an appropriate standard, every individual field they develop will have different attributes.

For new equipment for which there is no relevant standard, the first step is to ask what standard is similar or closest to being applicable (if any), and assess whether it may be used as a basis to form a tailor-made test programme. This needs to be done in collaboration with the operator, who best understands the conditions under which the equipment will operate; the manufacturer, who is familiar with their product's design and material specifications; and the test authority. Consequently such equipment is often not tested to a specific existing standard, but tested using a recognised 'industry best-practice' approach.

The importance of verification testing equipment that may be subject to erosive conditions is becoming increasingly evident as the industry experiences more 'loss of integrity' or leak incidents. For example, high profile incidents such as



> Erosion tests have shown that there are different areas of wear within pipework and equipment depending on a number of factors, including local geometry and shape of the flow path, the fluid/particle velocity, sand concentration, particle size, shape and hardness

the Deepwater Horizon disaster means that the performance of production equipment is now under even greater scrutiny, particularly if it is located in an erosive environment. As a consequence, rigorous testing, to demonstrate the equipment's performance, is now increasingly part of the delivery process.

Inaccurate flow measurement

For regulatory, fiscal and allocation flow-metering requirements, operators are responsible for ensuring that their flow meter readings are accurate. However, depending upon a meter's location, eg upstream or downstream of the separator, particle erosion may have a significant adverse impact on a flow meter's accuracy, reliability and body integrity.

Upstream of the separator, sand particles are likely to be in the flow stream all the time, the sand concentration (level) varying throughout the life of the well. Flow meters located downstream of the separator are likely to receive flow streams relatively free of sand particles, depending upon the effectiveness of the separator in trapping and removing the particles. However, whenever there is a production upset in the separator, sand particles (potentially high levels) could pass through the flow meters and this could easily cause the meters to have significant errors.

By knowing how particulate flows and erosion affect the performance of different types of flow meter, a meter's design and performance may be improved, and meter selection can be optimised, resulting in improved accuracy, reliability and improved service (wear) life. Planned meter inspection, calibration and maintenance procedures can also be suitably optimised, resulting in a sizeable reduction in operating costs and downtime.

To evaluate some of the effects of sand erosion on flow meter uncertainty, NEL, supported by the UK's National Measurement System (NMS), recently designed and constructed a sand/water Erosive Flow Test Facility. An experimental investigative test programme supported by NMS was then undertaken on a number of different meter types - coriolis, turbine-meter and venturi.

With sandy water flow streams of around five per cent sand by volume, an average particle size of ~280 microns and flows of up to 1500 l/min, this will enable meter performance to be measured under controlled erosive flow conditions. Subsequent examination of the meters and data analysis will provide knowledge of the performance characteristics, uncertainty and responses of the meters under erosive flow conditions. A report on the Coriolis meter tests has recently been issued and a copy is available from NEL.

The flow meter project plays an important role in terms of life extension of existing assets and fields within the oil and

gas industry. Any unforeseen downtime caused by erosion to equipment has a direct and major impact on operator performance and productivity. The erosive flow facility enables industry to fully investigate the effects of erosion and implement control measures on equipment. This is vital for ensuring the long-term viability of the industry.

Erosion testing

NEL has undertaken a wide range of erosive flow tests on components and equipment in both sand/water and gas/sand flow regimes. Erosion tests have shown that there are different areas of wear within pipework and equipment depending on a number of factors, including local geometry and shape of the flow path, the fluid/particle velocity, sand concentration, particle size, shape and hardness. Also different flow regimes- gas/sand, liquid/sand and gas/liquid/ sand, all have different erosive flow patterns and wear characteristics.

The flow path also influences significantly where erosion occurs in equipment, for example sudden expansion or contraction, bends, or a series of bends where rapid changes in velocity or direction often have significant adverse erosion implications. Particle velocity dominates erosion and erosion rates - typically, doubling the particle (fluid) velocity gives a six-fold increase in erosion rate.

CFD erosion modelling

To further understand and predict how components and equipment are likely to perform under erosive flow conditions, Computational Fluid Dynamics (CFD) erosion modelling can be used, for example, during the design phase of wellheads, piping systems and equipment. Critical erosion levels and potential erosion hot spots can be identified and the wear life predicted. CFD erosion modelling therefore provides an invaluable tool in the product development phase to assist designers in identifying critical erosion areas and to then optimise the design to minimise erosion.

However, CFD erosion modelling prediction techniques are still evolving, so results cannot be relied on without validating the CFD model with erosion test data. Such physical testing is undertaken using erosive flow loops, where under controlled flow conditions, known quantities of sand flow through the equipment or component under test, allowing engineers to accelerate erosion effects.

By subsequent examination and measurement of erosion levels, the test data can be compared with the CFD erosion model test predictions and the model adjusted if required. In NEL's experience, erosion tests often identify critical erosion areas or hot spots that the CFD modelling does not reasonably predict in terms of location or the level of erosion. The "adjusted" CFD model can then be used with greater confidence to estimate erosion levels at field operating conditions and predict component wear-life.

While erosion is difficult to stop, operators and manufacturers are able to take steps to minimise or control the level of erosion and reduce the risk of serious failure. For example, at the design stage of the pipeline, wellhead or equipment, using CFD erosion modelling, erosion hot spots can be eliminated or reduced to acceptable levels.

By a combination of physical erosion testing and CFD erosion modelling, the test data can be used to validate the erosion model. This preventative approach enables equipment manufacturers and operators to estimate the lifetime costs of equipment, and to plan and manage an inspection/maintenance programme. O&G

NEL

John Peters is principal consultant at NEL, a world-class provider of technical consultancy, research, measurement, testing and flow measurement services to the energy and oil and gas industries, as well as government. Part of the TÜV SÜD Group, the company 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.

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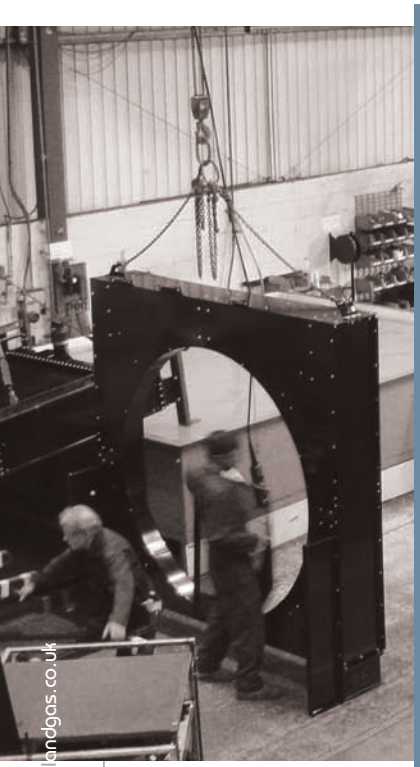


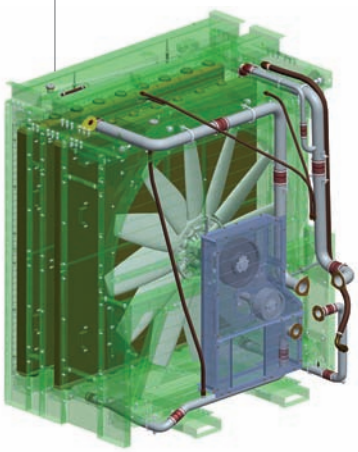
Keeping its cool

With decades of experience and heavy investment in technology, the Wabtec owned company, Bearward Engineering Ltd is one of the largest producers of industrial radiators in the world. Growing annually since it was founded in 1958 the business is now based on a 40,000 square metre site in Northampton, UK. Supplying to the world generating set market, as well as supplying radiators for pumping and construction equipment, off highway, and other specialist equipment, the business manufactures over 35,000 radiators a year with a turnover of £50 million.

In an industry that has seen increasing requirements in the reduction of noise and emissions pollution, the business puts great emphasis on innovation and technical expertise. Leading the way for the industry, it has developed a new range of sectional radiators that provides customers with the most advanced range of cost effective material, backed by the worldwide and immediate after sales support. The applications and installations of the products are many and varied, from engine mounted to power modules, and purpose designed low airflow, high pressure reserve units for high acoustic applications, and as such, Bearward manufactures a range of radiators to cool engines from 500 KW to 3MW including conventional jacket water radiators and water/charge-air configurations.

The company works closely with a large customer base covering the main manufacturers in the power generation and construction market such as Caterpillar, Cummins, MTU, Mitsubishi and SDMO. Recognised as a leader in innovation, the success of the business is attributable to a combination of modern thinking and a base of traditional experience as UK sales manager Matthew Eggleton explains: "Bearward has a number of old-school engineers combined with modern technology, which allows us to be very quick to market with new designs/bespoke applications. We have developed a product, which allows on site serviceability for any size of engine, and which is also designed to eliminate the failures associated with thermal expansion within cooling systems – this is our innovative sectional core solution."

Sectional radiators give huge benefits to end users for all markets. The sectional cores principally split one large cooling surface into many smaller modules, and the sectional product is designed in such a way that they can be individually removed whilst the cooling system is in situ for maintenance or replacement. Ultimately, a cooling system that is maintained will provide superior cooling performance against one that is not. Section removal can be completed by hand without the need for heavy lifting equipment and for critical applications and sites, spare sections can be kept on site for quick changes. "We use the analogy that it is similar to a spare wheel in a car," points out Matthew, continuing: "The sectional core removes all gasket joints associated with traditional cooling systems. The section is designed to float within rubber



seals removing the thermal stress to the cooling surface and isolating from heavy vibration." If a radiator is damaged, sections can be replaced on site making repairs much quicker and easier, additionally assisting cleaning if the radiator is operating in dirty conditions.

Belonging to the Wabtec Group, the business benefits from the ability to expand globally, setting up facilities in the local regions as it does. "Enabling local serviceability and manufacture reduces the total cost of the product. As part of the cooling group within Wabtec we have the ability to share technology and resources with sister organisations such as Young Touchstone and Unifin," explains Matthew. "One of the biggest threats to Bearward are the many lower cost producers of cooling systems, which are popping up globally. However, it is our trusted sectional product and global manufacturing ability that ensures we can keep these threats at bay," he adds.

Renowned worldwide for its customer service, Bearward remains focused on its clients beyond the point of purchase, offering its comprehensive world-wide aftercare service.

As part of its fast and efficient response to all service and repair issues on a global level, all parts are supplied with full warranty promoting the quality and reputation the company has worked hard to build. "We have state-of-the-art R&D facilities that are continually sharing data within the group, which ultimately supports new developments," says Matthew. The most recent introductions are aluminium sectional radiators that have a direct cooling performance and dimensions to the copper brass sectional product.

Manufactured with the aid of the latest automated processes, quality is absolutely consistent, and Bearward's sectional radiators give the highest levels of process control. Beyond the continuous and targeted developments of the product line, as the company looks towards the future Matthew highlights the strategy, destined to ensure that the next five years will be as positive as the last few decades: "Our aim is to keep a heavy focus on pushing our global presence, setting up local sub assembly and service locations, effectively complementing and supporting our continually improving portfolio." O&G

Manufactured with the aid of the latest automated processes, quality is absolutely consistent, and Bearward's sectional radiators give the highest levels of process control

Bearward Engineering Ltd
bearward.com

Services
Manufacturer of industrial radiators

Rising up

Formed in 2008 as a spin-off from the globally successful 2H Offshore company, which carries out global riser analysis, Subsea Riser Products (SRP), as the name implies, had a different charter to develop and produce High Pressure (HP) risers. Operating a development and procurement business model, SRP has built it's capability on HP riser flanges and integrally forged joints – up to 15 tonnes in weight – to now delivering complete riser strings and the associated deployment tooling. Sitting within the Acteon Group of subsea companies, SRP's core knowledge and expertise is in the understanding, analysis, design and production of joints and connectors that are subject to high stress and fatigue loads. This has led to the development of new products including HP riser connectors and subsea mooring connectors.

"Although we are currently a small company, our extensive knowledge and track record of delivering high fatigue, high-stress riser joints for HP drilling applications, makes us one of the biggest and most experienced suppliers of these kind of products globally," begins head of business development Mike Ridgway. "This is in both the HP drilling and CWOR intervention sectors and we can cover the complete process from initial FEED studies, through design to product manufacturing and project delivery."

Able to meet the increasingly complex demands of the evolving offshore industry within its niche service offering, SRP has enjoyed steady growth over the last 12 months, as Mike states: "Geographically it would be easy to say we are operating globally, as the projects we are currently working on, or where we are involved in tenders, are truly global from GoM through Europe and West Africa to Asia. Having said that, we are based just outside London in the UK and our principal clients are UK, Europe or US-based. Over the last 12 months, although our activity levels have generally increased within the sectors we operate, there have also been a number of major projects delayed; this is often due to the re-evaluation of the financial viability of projects as costs are firmed up."

Despite these economic difficulties in the market, SRP was awarded a multi-million pound contract with Total in mid-2013. This major contract, which involves the supply of 3500-psi drilling risers and deployment tooling for the Moho Nord project based in the Republic of the Congo, is the first time that Total has awarded the subsea and riser applications specialist a direct contract. "The scope of the contract includes 43 joints and the associated deployment tooling for drilling from a tension leg platform. Manufacturing and assembly work will take place in the UK and mainland Europe and the

equipment will be delivered during the first quarter of 2015," highlights Mike.

The 43 joints will be used for drilling from a tension leg platform based 75 km off the coast of Pointe Noire, in water depths of 780 m. The major project will require the skills of employees operating in a range of departments at SRP, such as designers and engineers, as well as quality and project management. When discussing the contract earlier in the year, Johnny Shield, managing director at SRP said: "This contract provides a solid base from which SRP will grow and provide its riser engineering and procurement capability offering to other companies. A key aspect of the contract win was our ability to deliver to the highest quality level against an aggressive schedule at a competitive price."

Elaborating further on the company's strengths in a competitive market, Mike adds: "We have a straight-talking approach, which I believe our customers respect, and a real desire to deliver what our customer really wants – cost efficiency, on-time delivery and best-in-class quality. On top of this, our size allows us to be agile and responsive to requests, whether simply for information or for changes to project requirements; we also look to continuously improve in all areas.

"We recognise that we are a niche supplier that is operating in a specialised field; however, our very strong track record for delivering technically challenging projects is allowing us to develop highly strategic supplier relationships with some of the major players in the oil and gas industry."

With a large number of specialist engineering firms in the industry, Mike notes that the company's success lies in the innovation of its products, which are designed and developed to resolve specific industry demands: "An example of this is the Rocksteady Mooring Connector and we are very pleased to have just delivered the first mooring foundation connector assemblies to Carnegie Wave Energy (CWE) for its CET05 project off Western Australia." The scope of the project includes three Rocksteady mooring or foundation connectors that have a breaking load rating of 2000 tonnes; these will be used as part of articulated bearing assemblies in a water depth of 30 m. The groundbreaking project will deliver the first wave power application to operate with an array of multiple wave power converters; it is also the first project to produce both clean power and fresh water.

"This is the first time that a variant of the Rocksteady subsea mooring connector will be deployed on such a project, following successful qualification and fatigue testing in 2013. This project provided us with a lot of serious engineering challenges due to the demanding load conditions, and in CWE's own words: 'SRP was very responsive to key selection criteria and demonstrated an appetite to provide an innovative solution to project requirements', which sums up exactly what we offer to our clients," says Mike.

In addition to innovation, the company's focus on a strong engineering ethic and resourcing the right people has ensured it is fully prepared for demands in the industry, both now and in the future. "We can offer people a much wider experience than larger organisations because we don't put our personnel in one area of the business and instead actively encourage cross-team working, movement and promotion within the organisation. This results in a varied, and usually high, workload, but it means we have the flexibility to move personnel to support projects when they spike in activity," explains Mike.

Looking ahead, this focus on integration is certain to continue as SRP's parent company, Acteon, aims to cement its 'Working Together' strategy through the provision of synergies within the group. This will not only benefit clients, but will also further enable SRP to reach its goal of becoming the 'go-to' company for HP riser projects and subsea products. OSG

J P FORREST & SON

J P Forrest & Son are a long-established sub-contract engineering company, specialising in high quality machined fabrications for a variety of industries. J P Forrest & Son offer a one-stop shop for fabrication, machining, fitting and assembly to customer specific requirements in single units or small batch quantities. J P Forrest & Son are proud to have worked with SRP for over six years supplying individual components or sub assemblies for various SRP contracts.

W. MAASS (UK) LTD

W. Maass (UK) Ltd is pleased to have served SRP over several years in technical support and provision of special forged products, with successful supply of several major projects.

Subsea Riser Products Limited
srpsubsea.com

Products
Subsea and riser hardware

The natural step

LLOYD'S REGISTER CONSULTING

During commissioning and initial operation of the Energinet Egtved Compressor Station, the noise and vibration consultancy was performed by Lloyd's Register Consulting (LR Consulting). In addition to an overall verification of the compressor performance testing, LR Consulting investigated the environmental noise in neighbouring buildings and the working environment noise on the actual compressor station. The noise was mainly generated by the compressor and radiated as a high-frequency tone by the connected pipes. The easy solution would be to install acoustic pipe insulation on the entire pipe system, but that would interfere with planned regular inspections and could lead to increased moisture problems and corrosion. LR Consulting therefore decided to investigate the system and identify the sections with the highest noise radiation. The required pipe insulation could then be outlined and the expected effect could be predicted. Based on LR Consulting's recommendations, pipe insulation has since been installed and the noise levels have been reduced to below required levels.

"Trading since 2004, we are the transmission system operator for Denmark's gas and electricity networks," begins Torben Brabo, senior vice president of Energinet.dk. Two years ago the Danish government set out in its ambitious environmental and energy policy that by 2050 it would provide a 100 per cent carbon-neutral gas supply. "We are undertaking analysis of how the overall energy system and gas systems should develop so that over the next 35 years we can convert the existing mainly fossil based natural gas system to be progressively more green based."

The state-owned business maintains a well-established infrastructure for transmission, and now focuses – together with the distribution companies – on intensifying the conversion of oil and coal fired consumption into gas, achieving immediate CO_2 reduction, and at the same time significantly developing the production of a greater quantity of biogas. Biogas production has been in Denmark for the past 15 years, being used locally in smaller heat and power plants, but as Torben indicates: "A greater number of these projects are increasing in size and we expect up to 40-50 future biogas production sites, either connected to the distribution or transmission networks with an annual production capability of 5-15 million cubic metres per site."

With rising imports of gas through Germany from the North European markets, Energinet.dk has recently completed a new 94-kilometre gas pipeline project in Southern Jutland, implementing further investment in the pipeline through the installation of four compression units in the main intersection of the Danish system in Egtved. The infrastructure has been prepared so that it can pressurise gas at different levels for transit in each direction, enabling multiple usages from the investment. "We have also upgraded the SCADA and system operation tools to be able to get full value from the new import option. Historically, 100 per cent of gas in the system was supplied from the offshore fields in the Danish sector, so upgrading to two main sources is a big step," says Torben.

Having drawn to a conclusion a very successful project, Torben mentions a few of the mishaps along the way: "In constructing the compressor station, we were keen to make it as aesthetically pleasing as possible, and as such reduced costs on installing sound reduction. However, when the four compressor units run simultaneously it produces a very high pitched, audible sound." Concerned for its neighbours, Energinet.dk has already started upgrading the facility to eliminate the sound disturbance.

Eight years ago the business established an exchange to develop a transparent market price in the Danish and Swedish gas market. Through a partnership change, an opportunity opened to incorporate a new player with the knowledge to develop the exchange and its markets. In 2014 Energinet.dk teamed up with EEX, the German gas and power exchange and is currently focusing on development of the Danish/Swedish natural gas market and its alignment with continental European standards. "It could also open up opportunities for the distribution of some niche products, such as regional green gas products, or products based on gas from offshore fields in the North Sea," points out Torben.

Through steady and analytical progression Energinet.dk is always aware of what challenges or opportunities lie ahead and as such takes a step-by-step approach to adaptations in infrastructure, systems, personnel or their competences. However, the business has been heavily developing the resources, shown with regard to i.e. gas quality. Following a period of heavy analysis on the co-ordination and mixture of gas quality to support free trade of gas across the borders, it was highlighted that Denmark utilises the widest range of the EU gas specification. "Essentially we allow a full combination of gases throughout our entire network, whereas other countries' systems are geographically split using various sub-standards in the sub-systems. We conducted a review of all consumption aspects, establishing contact with all producers of appliances (household boilers as well as large turbines, etc.). The natural step has been to move forward in that direction. Complementing the move to a broader range of gases, all operatives in the supporting service sector and at the distribution companies have attended educational programmes to update their skills," says Torben.

Energinet.dk participates and supports research projects based on electrolysis process, as part of its company strategy - working towards a future where the primary power production comes from wind and solar. "We need to be able to convert the power to an energy form that can be transported, stored and used in the wider

energy sector," adds Torben. Actively supporting two electrolysis projects, electricity from wind power and water is converted into hydrogen, which is used for upgrading biogas before it is injected into the natural gas grid. Biogas also contains CO_2, and therefore it cannot be sent to the Danish gas customers through the natural gas grid. However, a new biological process, where microorganisms and hydrogen convert CO_2 to methane, is upgrading the biogas. At the same time, the sister project is testing a new technology for chemical upgrading of biogas. "We test both hydrogen and methane products in our own transmission system in a 100-metre section of redundant transmission pipeline and connected M/R station. We need to test how large a percentage of hydrogen can be handled safely within the system, an area in which very few studies have been undertaken," he explains.

Following the record setting year for Danish wind power in 2013, the business is preparing for the construction of a traditional power grid connection system, connecting new offshore wind farms to the main electricity grid. "We have several new wind farms in the area with the newest, Anholt, producing around 400MW and the next two major wind farms, signifying the sixth and seventh," Torben highlights. A joint venture with Germany will see both nations developing wind farms in the sea between Denmark and Germany. Power connections between the wind farms and the two countries will provide both social-economic benefit as well as business opportunity. "We have just signed a co-operation agreement with the Netherlands, and another with the UK for new electricity interconnectors between the countries. We have also developed our national operating system, taking more and more renewable energy from local production sites, helping to strengthen the system," he announces.

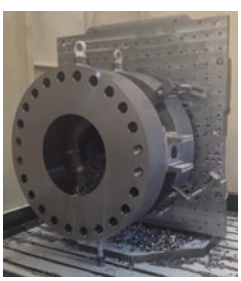
With the political aim of achieving the 2050 goal, Energinet.dk continues to introduce innovative thinking to the market, utilising its own assets and capabilities, as well as those from outside sources. Summarising, Torben notes: "Small steps and working in unison with our neighbours to produce regional and market based solutions are the key factors to a long-lasting greener future." O&G

> With the political aim of achieving the 2050 goal, Energinet.dk continues to introduce innovative thinking to the market, utilising its own assets and capabilities, as well as those from outside sources

Energinet
energinet.dk

Services
Gas and electricity transmission system operator

Controlling the process



Tomoe Valves Ltd was first established in Japan over 60 years ago, and since then has worked hard to develop its position, becoming a global leader in the production of high quality and technically advanced ranges of butterfly valves, actuators and control systems. "Over the past 12 months the market has remained fairly levelled," begins Nick Robertson, technical sales director. "There are certain regions which have shown good growth but this has been offset by reduced sales in other regions. As always the oil and gas business goes through cycles and we just need to adapt to the changes and keep our focus on the right areas," he adds.

The company has four manufacturing sites in the UK, Japan, China and Indonesia, all of which are owned and operated by Tomoe personnel, ensuring that the levels of quality and customer service are consistently maintained. Working across multiple time zones, it has established a network of agents worldwide that support its business, as Nick explains: "Our agents provide us and our clients with local support. We will always need a local company to guarantee that the client gets a response quickly and we look to ensure that our local agents are seen as an extension of Tomoe. This gives the customer the confidence that the answers they receive are always accurate."

Tomoe is currently working closely with a Dutch client on a set of projects for which the valves are destined to be used on an FPSO in Brazil. Elaborating on the contracts, Nick says: "We have quickly built up a strong relationship with this client. This has proven to be a huge benefit as any changes to specification or delivery date is quickly and clearly communicated, which in turn ensures that any delivery and cost impact is either non-existent or kept to a minimum.

"We have also been working with a Belgian chemical company developing a valve for a specific application. We were approached by our local agent who set up a meeting with the client, which was experiencing a number of issues with their current ball valve equipment. The current design only lasts for a period of three months before the client has to repair them, which proves costly from both a repair aspect but also from the point of plant downtime. We sat with the client and discussed their various issues and also went to look at the plant to see how the valves were installed. That visit gave us a great insight on the application and enabled the production of a prototype for them to test. The testing will be performed over the next few months and if successful will lead to an order for seven valves and will also be rolled out across

similar plants in Europe."

The company's flexible approach to design has proved to be one of its greatest attributes, ensuring it holds a strong position in the market. "We look to make our valve fit the application, not ask the customer to make their application fit our valve. Many customers we speak to tell us that their existing valves do not work in the way that they want them to. As those issues have occurred for many years they start to accept this as the norm. This is where Tomoe then steps in to show the customer that their issues can be solved. We show them that with clear communication and a good understanding of their requirements we can design a valve that will give them the performance they expect and need. This is also helped by our flexible and supportive supply chain. A good example of this is our supplier Gee Graphite, who works closely with us to enable us and them to quickly bring new products to market whilst ensuring they meet the stringent requirements of our customers," explains Nick.

As a regular investor in its facilities and machinery the business replaced its main milling machine in 2013, which has assisted in an increase in production capacity and the product range, as well as proving significantly beneficial in terms of cost efficiency. "We originally planned that the milling machine would give us a cycle time saving of around 20 per cent. In fact it is giving us a saving of around 35 per cent and this enables us to be more competitive and flexible for our customers. The machine also impresses our customer during factory tours and it shows them that we are investing in the business to improve price, quality and delivery," highlights Nick.

It is important for the business to recognise its strengths in order to remain competitive within the market. Throughout the history of the business, its flexibility in regard to design and attentive customer service has ensured complete satisfaction for its clients, further enhanced by the fact that its deliveries periods are half that of its competitors. As the business moves forward, it looks to 2015 and beyond with a very similar approach that has proved its success in the past. Drawing to a conclusion, Nick says: "The sector changes so much that we are constantly adapting our plans to suit the current market. This flexibility is a core strength of Tomoe, demonstrating our ability to adapt our way of working to suit our customers whenever they change." O&G

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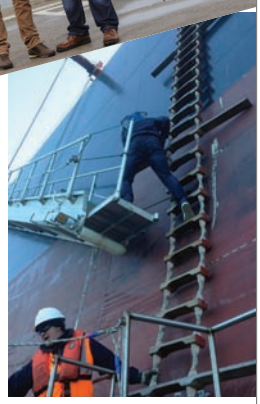
Tomoe Valves Ltd
tomoeeurope.com

Services
Manufacturer of butterfly valves and actuators



Ship shape.

Originally known as Castle Charter Marine Services, Aberdeen-based McLachlan Marine Services was acquired four years ago by owner and managing director Ruari McLachlan, who has used his long-term experience of the maritime industry to diversify the business into three segments: workboat and survey boat services, crew transfers and maritime training.

Discussing the company's development, Ruari begins: "When our boat trips and fishing charters were affected by the recession I visited some of my colleagues from my previous activities in subsea electronics to find out where we could potentially support this market.

"Three years ago we had two commercial customers in this area of the business and today we have over 40. We have continued to grow to meet customer demands and launched a new workboat, the Blyth 33 catamaran True North, in early 2014.

"We continuously adapt to the needs of the market and have invested almost one million pounds on boats over the last year or so. This has been a huge undertaking and partly stems from our contract with Kongsberg Maritime, which was signed in March 2014 and follows our regular work with the survey positioning equipment manufacturer. True North has been kitted out with approximately £500,000 worth of Kongsberg's equipment and was adapted to suit our client's needs. The vessel now enables them to train offshore surveyors and survey engineers on their acoustic positioning systems. As part of this 80-day charter contract we will be providing Kongsberg with a comprehensive range of services, from sea trials for AUVs to training for their customers."

True North's features include a 700 x 700 moon pool for the deployment of pole mounted equipment through the deck, a large wheel house with surveyor's desk and workbench and twin 17-inch monitors. Ruari said: "True North is a state-of-the-art catamaran with a sophisticated moon pool system that is unique in Scotland. This system allows her to deploy equipment and carry out tests and sea trials."

Able to accommodate a maximum of 11 delegates, in addition to an instructor and two boat crew, True North will enable Kongsberg to introduce practical on-water training every two weeks between March and December alongside the courses already offered at its training centre in Westhill, Aberdeen.

Based at Stonehaven, just 18 miles from Scotland's booming oil and gas hub, Ruari noticed an opportunity to diversify his company further and set up a safe, reliable and cost effective crew and cargo transfer service company in Aberdeen harbour in 2013.

"We began offering crew transfers under the name Aberdeen Crew Transfers just over a year ago and acquired a purpose-built boat for ship-to-ship transfers. The harbour is currently going through an expansion phase because there is not enough space to accommodate all of the boats and for customers who require our services we are available 24/7, all year round."

Wholly-owned by McLachlan Marine Services, Aberdeen Crew Transfers offers personnel and cargo transfers from the 12 x 6 metre catamaran Ocean Predator, which boasts fast turnaround capability and a safe, stable platform even in the most challenging weather conditions.

A major customer of McLachlan Marine Services is GAC, which enjoys a long-term partnership with the dynamic firm. Ruari commented: "We are the number one approved supplier of crew transfer and ship services for GAC and this achievement follows a whole week of their agents reviewing our

standards and operations, which we passed with flying colours."

Following the high demand for crew transfer services, Ruari and coxswain Paul Haynes have expanded the organisation's services further through the development of a maritime training course. Viewed as a major achievement by the firm, McLachlan Marine Services has set a new industry standard that didn't previously exist. Ruari said: "Most employees at McLachlan Marine Services have RNLI experience and share the same passion for safety. This makes us different from the rest because we attract guys that like to get things right. Paul not only works for us but also has his own business, Haynes Marine, which is a renowned defence industry maritime training provider. The two of us joined forces to set up a venture for crew transfer training on True North.

"This is a big deal for us because we feel there are many crew transfer boats with different capabilities all over the world and we hear a lot of negative information within the industry as to how companies transfer personnel or crew.

"Over the past two months we have put 60 people through our course for passenger transfer at sea safety training and there is further demand from companies wanting to know how to make transfers safe."

Involved with boats since the age of 12 and having acquired his first commercial vessel at 25, Ruari has pushed his company past economic challenges in the shipping industry through adaptability and a keen eye for opportunities.

Now a successful and diversifying company, the next step for McLachlan Marine Services is a more integrated service offering what Ruari calls "A one-stop-shop for our customers."

He said: "We are now looking into how we can provide better support to our customers on the transportation side of the business. There are outline plans to develop a wheeled logistics division and come on to the land side of the business in and around Aberdeen harbour. If there are opportunities we can progress with then we will." OSG

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McLachlan Marine Services
mclachlanmarine.com

Services
Provides survey operation to subsea electronic firms and premier crew transfer services

Plans to grow

HEMPEL

Hempel is a world-leading coatings supplier for the decorative, protective, marine, container and yacht markets. From wind turbines and bridges to hospitals, ships, power stations and homes, its coatings protect man-made structures from the corrosive forces of nature.
With a focus on R&D, advanced production techniques and professional coating advice, it works around the globe to help keep its customers' investments safe and beautiful for longer. Its working concept is simple: it is curious, creative and self-critical, and always aims to create extra value for its customers.
Hempel is a proud supplier of marine paints for Atlantic Maritime Group for dry-docking and sea stock requirements worldwide.

Atlantic Maritime Group FZE (AMG) is the key operating entity of Atlantic Navigation Holdings (S) Ltd, an integrated offshore supply operation. Based in the UAE and primarily serving customers in the Middle East and India, Atlantic Navigation Holdings also has a second subsidiary, Atlantic Ship Management LLC, which is based in Abu Dhabi.

AMG is based in the Hamriyah FreeZone Sharjah, United Arab Emirates and its business activities can be broadly segmented into two operating divisions, which are vertically integrated to provide a wide range of services to customers. These are marine logistics services (MLS) and ship repair, maintenance and fabrication (SRM).

The MLS division provides ship chartering as well as technical management services principally for the offshore oil and gas and marine construction industries in the Middle East and India, as well as other geographical regions. The MLS division also provides cross chartering and management services of third parties vessels and shipbroking services. The MLS Division currently has a young fleet of assorted vessels under its ownership and management and offers a comprehensive range of services such as supporting seismic and subsea survey operations, including ROV operation, supporting offshore diving operations, providing chase boat activities, transporting materials and structures for offshore construction and installation, assisting pipe-laying, cable-laying, jacket commissioning or decommissioning and anchor handling operation.

The division can also offer assistance with the towage of drilling rigs, construction barges etc, providing standby duties such as fire-fighting and anti-pollution and prevention measures, provide supply services for production and

maintenance operation, provide support for SBM operation and maintenance, and support for tanker berthing, cross chartering and management of third parties vessels to serve the specific needs of customers. Finally, it can also provide shipbroking services, and act as an intermediary or negotiator between shipowners and charterers to secure vessels for charterers for their purpose, or between buyers and seller.

The second part of AMG's offering, ship repair, maintenance and fabrication (SRM) provides in-house, afloat and drydock repair and maintenance services for vessels utilised in the MLS division. These full repair services are also extended to third party customers. The SRM Division can provide a variety of repair/maintenance services, including mechanical work, electrical works, air-condition works, steel works, blasting and painting and carpentry.

This range of different activities has been expanded over the years in response to customer demand and the forward thinking approach of AMG. Although only integrated under the umbrella of Atlantic Navigation Holdings five years ago, the history of the company actually extends back to the mid-1990s and the skills and knowledge of three distinct companies: vessel charterer Atlantic Offshore Services, ship repair company Atlantic Marine Services, and steel fabricator Trend-Steel Engineering.

In 2008 the decision was made to integrate these three bodies into a unified organisation that would continue providing the same high quality services but with more efficient delivery. Thus the business of these three companies was transferred to a holding company, Atlantic Navigation Holding and AMG was incorporated to handle all commercial and operational matters of the Group.

As a result, the combined experience of these three companies created an organisation that has been able to establish strong and stable relationships with various leading oil companies, offshore contractors, survey companies, ship owners, shipyards and ship brokers in the region.

Furthermore, a recent new development has expanded AMG's reach, when in May 2014 it set up a new subsidiary in Ghana, known as Atlantic Maritime Ghana Private Limited (AMG-GHANA). Atlantic Maritime Group FZE owns 90 per cent equity interest in AMG-GHANA while an unrelated third party owns the remaining ten per cent equity interest. AMG-GHANA's principal business activities are ship chartering and the provision of brokerage and support services to the oil and gas industry.

It is clear from this new step that AMG is confident that it understands its customers' needs, and continues to benefit from the crucial insights it has gained over the past 15 years. It recognises that remaining physically and operationally close to the construction companies, drillers, surveyors, logistics providers, and port servicers it counts as clients means it can provide the best services. With the industry at large now strengthening in various regions around the world, it is AMG's decision to look there for its own opportunities.

AMG was last featured in *European Oil and Gas*' sister publication *Shipping & Marine* in 2012. At that time, business development manager SP Wong reiterated the strengths of AMG, and stated his vision going forward, all of which still holds true today: "We are all very confident in the company's future," he said. "The demand for energy continues to grow and a lot more exploration will be taking place now, so the future of our company is exciting. We plan to increase our fleet through strategic acquisitions of additional vessels whilst expanding our regional coverage to other areas. Our plan for the future is simple: to grow." O&G

> The demand for energy continues to grow and a lot more exploration will be taking place now, so the future of our company is exciting

Atlantic Maritime Group
atlanticmaritimegroup.com

Services
Marine logistics and ship repair, maintenance and fabrication

Technically sound

Fugro has over 30 years' experience of delivering meteorological and oceanographic (metocean) and environmental services worldwide, continually developing and enhancing its integrated solutions to support the oil and gas industry. The metocean business line maintains a global footprint, actively modelling, measuring and analysing metocean data and structural responses to environmental forces in strategic locations worldwide.

With a large equipment pool and a global office network, Fugro is able to mobilise equipment quickly for its clients, delivering reports on collected data and providing further analysis and guidance on what should be measured in a particular location and how this should be performed. "One of our key skill sets is our knowledge of regional metocean conditions across the globe. Knowledge of the impact of metocean conditions on our clients' activities during the operational planning, execution or design stages is particularly useful for companies that don't have in-house metocean expertise, as we can help them to formulate cost effective metocean strategies," highlights Mark Calverley, Global Metocean R&D manager.

Fugro is known as an innovator and has recently taken steps to enhance this reputation. Explaining recent progress Mark adds: "We are improving delivery of R&D across the Fugro Group. A key area of focus is on cross-divisional synergies in point cloud data and its application in oceanographic projects." This initiative has already led to successful bids. "We have won

GILL INSTRUMENTS

Fugro GEOS has used WindObserver IS in its offshore systems for over a decade. The only ultrasonic intrinsically safe anemometer in the world is offered with both ATEX and IECEx certifications, making it available to the international offshore industry.

Requiring no routine maintenance, the anemometer utilises Gill's compact and galvanically isolated LVPCI (low voltage power and communications interface) to streamline offshore platform installation.

Gill also provides a range of anemometers for use in ship dynamic positioning systems and other marine meteorological applications.

EIDESVIK HAVFISKE

During the last decade Eidesvik Havfiske has been a trusted provider of vessels for Fugro GEOS' work in the North Sea. We have been performing a number of services for Fugro GEOS, such as deploying and collecting buoys in the North Sea. We are also performing duties in connection with surveys, bottom sampling and localisation projects. M/S Elisabeth, and her sister ship Bømmelbas, is well suited for this type of engagement due to her well suited deck space.

Elisabeth is 60.9 m long, has nine cabins and bunk space for 15 people. Service speed is 12-15 knots with a maximum of 17.5 knots.

two Technology Strategy Board (TSB) grants, which makes funding available in areas that are of great interest to the oil and gas industry, such as robotics."

In partnership with Sonardyne, Fugro is leading a three-year, all-British project for the Energy Technologies Institute (ETI) to develop a carbon dioxide (CO2) monitoring system using marine autonomous systems. The project aims to provide assurance that CO2 stored deep below the seabed in carbon capture and storage (CCS) sites is secure. The safety of such a method is of paramount importance, with feasibility studies currently underway in the UK and overseas on a number of CCS projects. A consortium of British multi-discipline partners will examine the requirements for the measurement, monitoring and verification (MMV) system. The project will result in the construction of a technology demonstrator with sea trials; a comprehensive review at the end of the three-year period; and a solution to a legislative requirement to monitor potential CO2 leaks and the subsequent effect on the environment.

Recognising the impact of deep sea resource exploitation, the European project MIDAS was developed with the objectives of establishing a set of environmental regulations and guidelines for subsea mining. The partnership represents a unique combination of scientists, industry, social scientists, legal experts, NGOs and SMEs from across Europe with Fugro as a leading commercial entity within the group. "We are providing a certain amount of realism to academic thoughts, ensuring that costs and technologies are correct and reliable," explains Mark. "By working closely with a number of people in the international seabed authority and attending parliamentary scientific meetings we have been able to secure positive representation for the MIDAS initiative. That particular market is in its infancy and currently only exploration licences exist. Fugro is very much at the forefront.

"One of our great strengths is that we have matured with the oil industry, moving from working in very shallow water to deep water and developing methodologies to ensure that we obtain the right data for deepwater activities. We have an excellent internal training scheme and, thanks to our highly skilled staff, we have developed close, long-term relationships with clients who continue to return to Fugro," he adds.

The breadth of Fugro metocean services can support clients throughout offshore development, offering cost-effective delivery by combining services such as measurement survey, real-time offshore systems, weather forecasting, consultancy services and structural monitoring into one contract.

"Interest in our structural response service has increased over the last couple of years due to events such as the Macondo blowout, where the importance of riser and wellhead monitoring capability is in the spotlight," notes Mark.

Fugro's wellhead and riser instrumentation service (WARIS) uses its innovative DeepData pods to deliver high-quality motion data from the BOP stack and lower riser. These are used to verify the integrity of subsea assets during a drilling campaign, recording motion and strain to quantify fatigue damage incurred by the wellhead.

"We are planning to introduce real-time capability to our deep data products – something in which our clients have shown a lot of interest. For offshore monitoring we are continually extending the suite of sensors that we include in

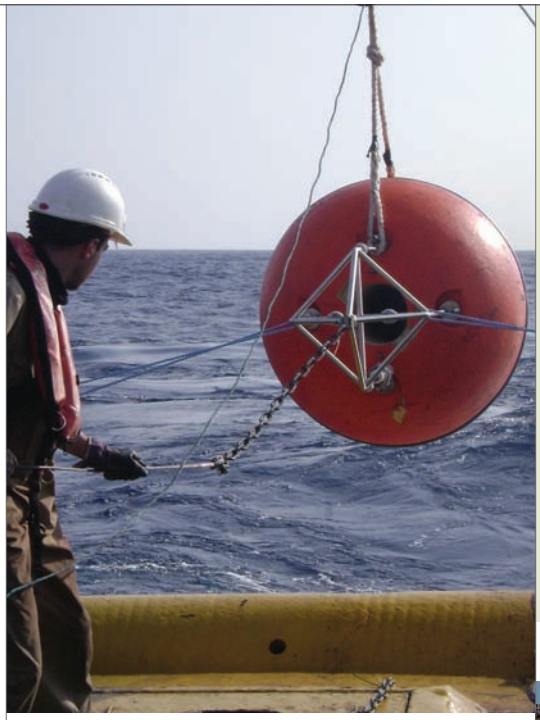
our software and distribute either in real-time or to clients' management systems.

"Over the coming year we expect our measurement business to remain strong and we will continue to service clients using traditional techniques with additional services. We intend to provide greater value through the addition of environmental measurements alongside our traditional metocean measurement services.

"Our strong consultancy division continues to expand. As our modelling capability grows, we are building a suite of regional models, nesting into those for specific activities, whether they are oil spill modelling or coastal sediment transport," concludes Mark.

Fugro

Fugro creates value by acquiring and interpreting Earth and engineering data and providing associated consulting services to support clients with their design and construction of infrastructure and buildings. Fugro also supports clients with the installation, repair and maintenance of their subsea infrastructure. Fugro works around the globe, predominantly in energy and infrastructure markets offshore and onshore employing approximately 12,500 employees in over 60 countries. In 2013 Fugro's revenue amounted to €2.4 billion, it is listed on NYSE Euronext Amsterdam and is included in the AEX-index. O&G



RS AQUA (HAMPSHIRE, UK)

RS Aqua has been supporting the worldwide activities of Fugro GEOS for more than a decade; supplying oceanographic instrumentation and technical support for several market-leading products: The WaveRadar REX (a precise and stable air-gap and ocean wave measurement system for metocean data collection and safety monitoring), the Datawell directional waverider buoy, and RBR CTDs, also Novatech beacons and Vitrovex glass buoyancy for moorings of all depths. Our WaveRadar REX is supplied worldwide from our UK headquarters.

Fugro
fugro.com

Services
Oceanographic measurement

Riding the waves

A powerful drive in 2014

has resulted in a very exciting period for the young company. Ocean Installer has had three long-term chartered vessels in operation simultaneously, including its new world-class asset, Normand Vision, as well as hiring several vessels on short-term charters for specific operations. "We have worked on a number of offshore projects for key clients including Shell, Statoil, BP and Noble Energy, both in the North Sea and in the Gulf of Mexico (GoM)," explains Steinar Riise CEO, having completed several lay operations from its new build vessel, Normand Vision, for customers such as Norske Shell in the North Sea. "At the same time we performed lay operations from the Normand Clipper for BP in GoM," he adds, with the broad range of offshore work illustrating continued expansion of activities.

Commenting on the delivery of Normand Vision in July 2014, Steinar points out: "We are extremely pleased; construction was to the original schedule, below supervision budget, and with timely delivery from the yard." The vessel is a result of a consultation partnership between STX, Solstad Offshore and Ocean Installer, as he adds: "Normand Vision is one of the most innovative CSVs in the market and is built for heavy construction work. Highly advanced when it comes to station keeping, efficiency and operational performance, she is capable of conducting the full range of subsea construction operations in the global market and is particularly well fitted for subsea, umbilical, riser and flowline (SURF) operations."

Additionally, the vessel is equipped with a 150t VLS and a 3000t below deck carousel, ROVs in hangars launched through moonpools, and two AHC offshore cranes all topside rated for water depths of 3000 metres. "Normand Vision supports our strategy of serving the SURF engineering, procurement, construction and installation (EPCI) market in the North Sea in a targeted manner, whilst also being very well suited for global operations. The vessel will play an important part in the development and growth of Ocean Installer," says Steinar. The vessel completed its first planned offshore campaign with Norske Shell on the Draugen field with heavy lifting, flow line and umbilical works delivered, tested and commissioned on time, successfully installing two heavy lift/subsea manifold structures weighing more than 280 tonnes using the high capability crane. "We were also awarded a long-term subsea lines modification project

Below
Steinar Riise, CEO of Ocean Installer

for Statoil in 2013 that will last until 2017, in which we are performing well and according to the client's expectations," he adds.

In April 2014 the company was awarded a contract by Fairfield Energy with a work scope that included air diving services and light subsea construction at the Dunlin field. "So far we have performed our first air diving campaign in the successful fast track project constellation between OI and CalDive. We are very pleased with the opportunity to work with Fairfield Energy and expand our operations in the UK. A month later, we were awarded, and have now completed, a subsea installation job for BP at Thunder Horse in the GoM. The project involved the installation and testing of umbilicals and associated equipment and was our first SURF-contract in the region," points out Steinar.

Having enjoyed an extremely positive year in 2013, success has continued throughout 2014, and as Steinar explains: "We are still expanding in terms of operations and vessel days. The successful delivery and introduction of Normand Vision has been a milestone for the company this year and we have established our presence in promising new regions. We are currently in a strong investment and development phase and overall 2014 will reflect the market with several extensive long-term projects and company development with global expansion."

The 280 strong workforce consists of individuals whose qualifications, aspirations, ambitions and working style allow them to contribute and excel with rapid development. "Every employee plays an important part in the further development and success of the company and we offer our personnel sufficient training at all levels. Further growth depends on the market and Ocean Installer's ability to win new contracts in the global industry. In recent months, there has been some spending reduction from operators in the North Sea and fewer contracts to bid on; however we still feel there are a lot of opportunities in the increasingly important global market. We constantly monitor opportunities, ensuring market utilisation," says Steinar.

As a key service provider in the global SURF market, Ocean Installer targets constant development and expansion of its global presence

in several promising markets, as Steinar indicates: "In January, we entered into a co-operation agreement with a partner in Mexico in order to gain a foothold and position ourselves for potential work. We have also hired Patrick Chapalain, who will be present in the AFMED & MIddle East region in order for us to assess our commitment to another promising region. Moreover, we consider Canada to be an exciting region and we have already started to assess projects there." Looking towards the future for the business, Steiner summarises the company's focus: "Beyond completing our current projects to client's expectations, we will furthermore continue to build the company in all established regions by contracting and delivering on complex projects. In terms of assets, we will build further on the successful introduction of the Normand Vision, as well as exploring other assets in line with the company's strategy." O&G

> As a key service provider in the global SURF market, Ocean Installer targets constant development and expansion of its global presence in several promising markets

Ocean Installer AS
oceaninstaller.com

Services
Subsea service and EPCI provider in the global SURF market

Delivering innovation

Founded in 1998, Conserve Oilfield Services Ltd has developed a market-leading reputation as a supplier of containers, cargo carrying units and chemical tanks as well as associated equipment and services for clients operating within the offshore oil and gas sector. The business is currently part of the SCF Partners group of companies after being purchased by the group during 2012.

As such Conserve has the backing of a parent company with a reputation for investing in companies that display high long-term growth potential and a team of executive directors with more than 60 years of experience within the oil and gas industry. The company's primary business concern is focused on the rental of offshore containers, cargo baskets and offshore chemical tanks – a market in which it excels. Conserve has had a strong presence in the North Sea working with operators based in the UK for over a decade, however the company has also supplied cargo carrying units for clients operating in as diverse regions as Alaska to Australia, and from Africa to Azerbaijan. Further to this Conserve is able to offer additional support services to clients including maintenance and re-certification of their own container or tank fleets, adding greater value added service to the Conserve portfolio.

Both Conserve's service portfolio and global reach were recently expanded by the acquisition of Rentair Offshore by the SCF Group, which saw the bringing together of highly complimentary companies underneath the SCF umbrella. Headquartered in Aberdeen, Rentair Offshore is the trading name for the registered company Rentair Ltd, a well-established specialist offshore rental company with a history dating back over two decades in offshore, and today the firm continues to deliver an extensive range of Air Compressors and associated products and support services to clients throughout the world, with facilities in Aberdeen, Great Yarmouth, the Netherlands and Singapore. Co-operation between the two brands will see Conserve containers and tanks combined with Rentair specialist products into turnkey solutions packages that, with the added value provided by each company's individual expertise, will result in an incredibly robust service for new and existing clients. The first client to benefit from the partnership will be Venko Offshore, which was recently awarded a major offshore contract for rig fabric maintenance on the West Sole Bravo for Perenco UK Limited.

Andy Waite co president at SCF said: "SCF is excited to acquire RentAir Offshore and to have the opportunity to work with the company's talented management team and employees. We believe this will be an excellent platform for both organic and acquisition based growth opportunities. We also believe there may be excellent synergies to be realised with other companies in the SCF portfolio."

Conserve has itself been the focus of significant

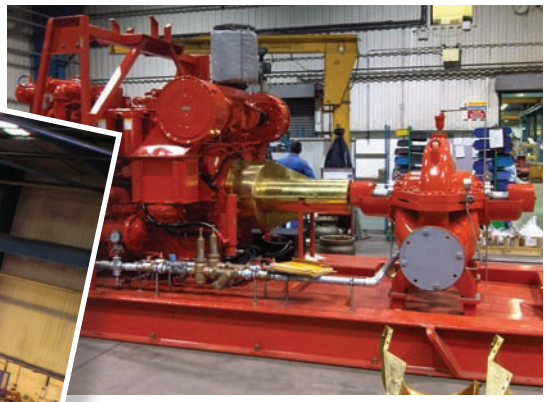
investment in terms of its hire fleet and general facilities in recent years, which have likewise added to the company's strength in providing a premier service to its clients. Just prior to the company's acquisition by SCF, Conserve announced that it had moved to a larger headquarters in Aberdeen during December 2011. 'Hillview House' is a large modern facility that houses the Conserve management team, operations, HSEQ, sales, IT and finance departments under one roof. Additionally the facility is located next to the Conserve 'Hillview Base,' which provides options to develop the eight-acre site over the coming years.

Responsible and efficient operation are the corner stone of the way in which Conserve does business. During 2014 the company was successfully recertified in internationally recognised OHSAS 18001 Health and Safety, ISO 14001 Environmental and ISO 9001 Quality management standards with zero non-conformances. Additionally, following a three-yearly audit the business and its employees were praised for their contribution to HSEQ achievement and performance. BSI commended Conserve for a traffic management plan implemented at its eight-acre site, which regularly transits 40 plus lorries through the facility in one day.

Presently Conserve Oilfield Services manages a sizeable fleet and is set to extend its service offering and engage with its parent and sister companies to expand into new markets. "We've recently purchased additional land next to our Aberdeen facility in order to extend our yard and storage area for additional container fleet," concludes Chris MacPhee, managing director. "Achieving high HSEQ standards is paramount to our successful growth and I'm delighted with our recent successful recertification audit, the results of which pay testament to the efforts of our entire team in implementing and practising the highest levels of safety each and every day. We continue to explore new technologies and innovations that will deliver safer operations, equipment and solutions for our growing client base." OGG

Conserve Oilfield Services Ltd
conserveplc.com

Services
Rental of offshore containers, cargo carrying units and IMO chemical tanks



A growing presence

With a history dating back to 1875, SPP Pumps Ltd has established a market leading reputation built on almost 140 years experience in the supply of centrifugal pumps and associated systems. The company began its journey when a British engineer bought the patent rights of the Pulsometer Pump from an American, Thomas Hall. This led to the birth of The Pulsometer Engineering Company Ltd. This became SPP Pumps Ltd in 1961 when Pulsometer Engineering joined Sigmund Pumps to form Sigmund Pulsometer Pumps (SPP). Today, the company is able to boast in excess of 600 pumps installed offshore and this number is set to rise as SPP works to push its market-leading position and ensure that it is on hand with the appropriate solutions for its clients' needs.

Throughout its history SPP, has continually engaged in pursuing growth by expanding its product range and through dedicated investment into its manufacturing facilities. This has driven the firm's move into a broad base of industries and applications, with divisions including water; autoprime; fire; transformer oil; parts; standard products; industry; service, as well as oil and gas. The company's entry into the oil and gas market came in 1970 when SPP pumps was the first to deliver North Sea oil to shore from the Argyll platform. From this initial success, SPP has gone on to deliver in excess of 600 pumps to the oil and gas sector in many fields around the world. Since SPP was last featured in *European Oil and Gas Magazine* during January 2012, it has greatly increased its available product portfolio, allowing it to offer a far more comprehensive service package to the oil and gas market, as sales director Bob Tichband elaborates: "One of the most notable recent developments for SPP is that we now have a range of API 610 process pumps, which we didn't previously have. API 610 is the main standard in oil and gas, whereas our focus over the last few years has been mainly with non-hydrocarbon service, including seawater lift and fire pumps, etc. Today, with the API 610 range, we are able to offer a full product portfolio for hydrocarbon services as well."

SPP has also invested in the expansion of its sales and business development teams, enabling it to market the new API 610 product range to its full potential. Furthermore SPP was the first company to achieve ISO/TS 29001 Certification, defining quality management system requirements for product and service suppliers to international petroleum, petrochemical and natural gas companies, which further highlights the expertise that SPP is able to deliver to the oil and gas market.

To date, SPP has delivered services in regions ranging from Azerbaijan to Zimbabwe in both onshore and offshore installations. These include the provision of fire water pumps to BP in the Caspian Sea, ConocoPhilips in Indonesia as well as operators in Qatar, to name but a few. Furthermore, during the past two years SPP has supplied equipment for highly publicised projects including the BP Quad 204 FPSO and GDF Cygnus platform, both located in the UK sector of the North Sea.

The company's broad base of products and services are undertaken from its Coleford manufacturing plant, which represents one of the UK's most advanced manufacturing sites. Its

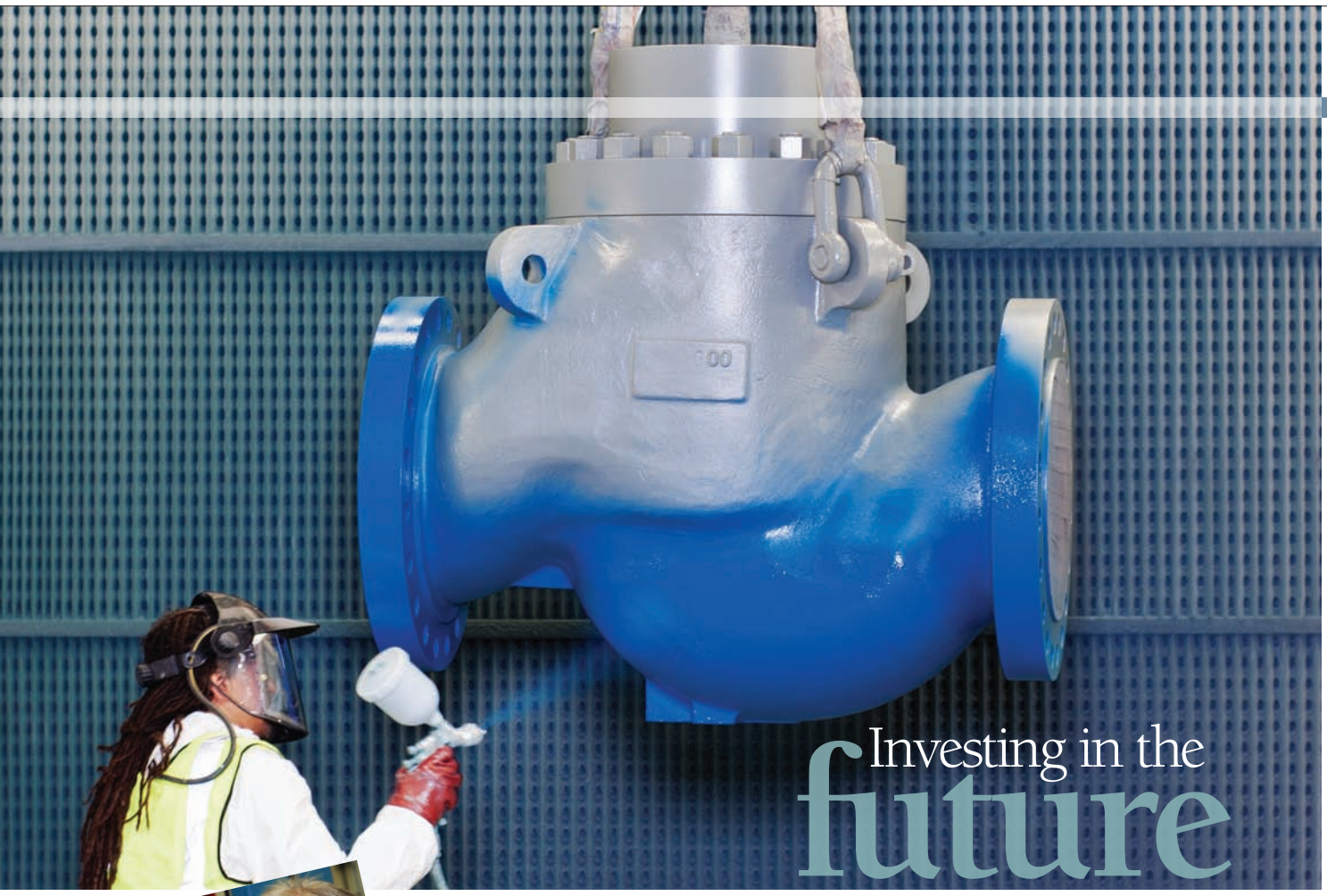
dedicated investment into product development and training were officially recognised in 2013 when SPP won the Manufacturer of the Year award at the 2013 Pump Industry Awards. This award was bestowed again in 2014. "We're delighted. We're honoured to get the award and to be recognised as 'Manufacturer of the Year'," said Bob. "We're proud to be a British manufacturer and we're proud to have been recognised by our peers as a quality manufacturer. Fundamentally we've got great people, we've got a great team and great facilities at the manufacturing centre in Coleford. We've got a really strong management team and they've done wonders over the last ten years. The quality of the products that are manufactured is absolutely world class, which is something that we're really proud of. We're entering into new markets with new products, larger pumps and even more complex packages that we're building. We enjoy what we do, we want to grow and we are growing."

Indeed the next phase in the company's evolution will be to continue to develop its presence in the oil and gas market through the continued marketing of its latest range of API 610 pumps, the on-going development of its staff and the growth of its aftersales service solution package. "We take a lot of pride in what we do and we are willing to go the extra mile. We have an award winning apprenticeship scheme as well as a comprehensive graduate training programme, so we put a lot of investment into young talent and we try to nurture that. We have created a new integrated aftermarket business called SPP Engineering Services, which will have significant focus on the oil and gas industry," says Bob.

"Our strategic vision is to grow in the areas where we excel. It is to add to the API 610 range and fully integrate that into our portfolio and expand that part of the business. From an aftermaket point of view, we aim to become a total solution provider and make sure that we are known for offering world-class service," he concludes. O&G

SPP Pumps Ltd
spppumps.com

Services
Centrifugal pumps
and associated systems



Investing in the future

Control and choke valve

specialist Severn Glocon Group represents all that is great about British engineering. It has a strong global customer base spanning the oil and gas, LNG, renewable and power industries.

The manufacturing arm of its business was first established more than 50 years ago, and its valves continue to be used across major global oil and gas projects. "The market is growing and demand for our products is growing. Our primary market is oil and gas and its derivatives such as LNG. The sector as a whole is really flourishing. There are currently a lot of new build projects requiring bespoke design and manufacture of severe service control valves, particularly in the LNG market. This is very encouraging and plays to our core strength of intelligence-led valve engineering. As long as the price of oil stays above 100 dollars it will probably stay that way," says executive director Colin Findlay.

Severn Glocon has witnessed substantial growth since 2006. This is thanks in part to its ability to deliver cost-effective, severe service valve solutions through a combination of in-field experience, repair intelligence and technical innovation. "It was in 2006 that we started to develop our factories and technical strengths as well as undertaking a global localisation strategy. These developments and investments have reaped dividends, with sales exceeding £100 million for the first time in 2013," highlights Colin.

All aspects of design, testing and manufacture are handled at Severn Glocon's manufacturing centres in Gloucester, Brighouse and Chennai (India). The group has ensured all facilities have state-of-the-art design, machining and testing technology and equipment. This includes advanced 3D CAD design capabilities, which are linked to machining via EdgeCAM production engineering, full weld overlay and coating facilities, high and low pressure testing equipment as well as fugitive emissions and cryogenic testing; in-house specialised paint and coating systems and automation and controls commissioning.

"The business grows all the time. For our core control and choke valve business we have three primary manufacturing centres; two in the UK and one in India, all of which are wholly owned by Severn Glocon and have the most modern facilities available," explains Colin. "Each facility has a different purpose; Gloucester is our head office and main manufacturing facility, which tends to take on large projects while also specialising in cryogenics products. Our base in Chennai is the largest facility we have and is

therefore more about volume manufacture, while our newest facility in Brighouse was opened in 2013; this is very much focused on bespoke products and fast track deliveries. Because of the versatility of these manufacturing centres, we are fully capable of providing three different types of manufacture."

Specifically designed to enhance efficiency and advance technology, the 60,000 square foot, purpose-built £2.5 million facility in Brighouse, Yorkshire is home to advanced technical services division Severn Unival. Butterfly valve specialist Severn Leeds Valve, acquired in June 2012, is co-located here. Now working with Severn Unival, the 104-strong team is benefiting hugely from the well-equipped factory. Furthermore, a dedicated valve innovation centre houses the firm's R&D team, which will play a key role in operations going forward. "In addition to these developments, we also diversified our markets over the last few years by growing a presence in the renewables and subsea sectors; an example of this is our acquisition of Cornwall based subsea developer Calidus Engineering, which provides research and development capabilities. Now renamed Severn Subsea Technologies this business forms the centre of our R&D operations in the subsea market."

Following these business enhancements, the company has gained industry-wide recognition for its achievements. A recent highlight was winning a Queens Award for the second time in four years in April 2014. The award, for Enterprise, International Trade, recognises Severn Glocon's ongoing growth in overseas sales and the fact that international trade now represents an impressive 68 per cent of total group turnover. This growth was not only accelerated by strategic acquisitions of UK specialists in subsea and butterfly valves over the last three years, but also by its expansion into areas such as China, Brazil, India, Iraq and Australia. In Australia, the group has earned the status of 'top three cryogenic manufacturer' as well as being awarded a number of ground-breaking LNG contracts such as the Ichthys project. "Major product supply projects for the likes of Gorgon and Ichthys in the LNG market in North West Australia have global significance and also give us a long-term order book, which is tremendous for our stability," says Colin.

As one of the largest and most challenging contracts in Severn Glocon's history, the Ichthys project involves the supply of 536 engineered control valves for the processing plant based on the project's onshore LNG facilities. Because the valves will handle volatile fluids at temperatures as low as -160 degrees Celsius, Severn Glocon's technical specialists have developed tailor-made designs for the valves, which are being manufactured in the organisation's Gloucester and Chennai factories. To optimise delivery time, Severn Glocon also invested in the extension of its in-house cryogenic testing facilities.

Discussing another major project, Colin continues: "In 2013 we also established an operation in Southern Iraq for a significant, long-term valve support and rehabilitation project. The objective is to support the development of the local workforce as well as the nation's oil industry. We have been contracted there to support BP for approximately five years in the complete rehabilitation of its entire valve population." Operating as a core part of this major project involves more than valve repair. The group's five decades of expertise are playing a critical role in optimising performance and rehabilitating the plant to increase production. "A key part of this aspect of the project has been our localisation strategy, which involves the training and development of the Iraqi people; it is a fairly significant step and an important strategy for BP in terms of Iraq's development," says Colin.

With a substantial order book in place and an anticipated 20 per cent increase in turnover for 2014, the future looks positive for Severn Glocon. It's not only reaping the benefits of its strong reputation in established markets, but is also in an enviable position to grow in new markets such as Brazil and Africa. "These are markets we will be looking at for future development through the localisation of sales people. However, we also have an agenda to deliver local content, which means we are beginning to make steps towards substantive localisation in terms of completing our products in the countries they are sold to," concludes Colin. OSG

With a substantial order book in place and an anticipated 20 per cent increase in turnover for 2014, the future looks positive for Severn Glocon

Severn Glocon Group
severnglocon.com

Products
Severe service valves

The pressure of pipelines

The history of T.D. Williamson (TDW) dates back to 1920 and for nearly a century the company has traded as a family-owned business. In the first three decades the company's scope grew rapidly, reacting to industry demand for pipeline cleaning and service. Approached by pipeline operators to develop solutions, the business engineered the first form of cleaning scraper, later introducing hot tapping and plugging technology, allowing maintenance to lines without disruption to flow.

Through the development of techniques for intervention and isolation of pipelines, whether high pressure or low pressure, onshore or offshore, steel or polyethylene, and of all sizes, the business has built a reputation in the industry as a technology leader. This position was further enhanced by the acquisition of a pipeline inspection company in 2003 and the further development of the business with the capability to carry out pipeline inspection, corrosion protection and geometry identification.

Danny Haykal, TDW's director for the Middle East and Africa, talks about the company's technology and its future as it continues to develop: "One of our most valued technologies is the SmartPlug® tool, which is an inline high-pressure isolation tool, specialised for subsea applications. The tool can be used to isolate one platform from another in an offshore environment, or to isolate a valve from a platform. Recognised as experts in intervention and isolation, TDW embodies the concept of find and fix. We are able to assess the condition and understand the major anomalies within a pipeline, and provide a solution to repair the line or isolate and replace entire sections."

Offering comprehensive solutions, TDW provides operators with a truly unique value, an attribute that continues to attract customers of international standing. "Many operators still have the equipment that we supplied to them in the 1960s. We have established very long collaborations with them. They understand the true value of the products and services, and rely on TDW's expertise to meet their day-to-day needs," explains Haykal.

As a family-owned business the decision making structure resides with the owners, who are driven to ensure that regardless of cost and time consequences, no issue shall be left unresolved. This high level of confidence gives the business an edge in an industry that faces tight regulations. Based on its expertise in maintaining production, TDW is able to advise its customers on the best way to maximise throughput and maintain production as pressure increases to maintain and extend the life of ageing pipelines. "If a pipeline was shut down for a period of two weeks for maintenance, it could be very costly for the operator. We are driven to ensure the integrity of the pipelines, per the local legislation. It is a matter of understanding, holistically, the operators' challenges and ensuring that the solutions address these issues. O&G

Above
SmartPlug isolation system and SmartTrack system by TDW

Below
TDW's SmartPlug tool emerges from temporary launcher

"The amount of R&D and investment into technology has been enormous. We are working on the customers' most valuable assets, so it is vital that operations are carried out to plan. We have developed a lot of safety features in terms of the new technology we are offering, not just from an equipment point of view, but also from the method statements and the way that we perform the work," Haykal highlights. TDW also operates a very thorough training programme with the technicians undertaking comprehensive training before any work on site. "We do not cut corners, we are well prepared, properly trained to several scenarios. We review the risks and make sure that we go through these with plans of what we will do should the need arise," he adds.

Faced with oscillating conditions, the global business works within regionally varying markets as Haykal points out: "There is a major boom in the US with shale gas, good stability in Northern Europe, and a boom in Russia. However, Southern Europe is experiencing economical difficulties. The revolutionary wave of demonstrations seen in the Arab Spring has really affected the Middle East and North Africa markets, whereas there is strong growth in Far East Asia. This is an industry governed by political movements, which affect production rates and the ability to expand or launch new refineries."

Utilising its SmartPlug technology, TDW has been busy with many contracts, including a 53km gas export line where the tool was used to hydro-test the line with the requirements of the client, whilst keeping the flow going, eliminating client downtime. Haykal says: "In addition to delivering standard double-block isolation for maintenance, the SmartPlug tool can also act as a block for hydro-testing. The double seal, which is remotely set and monitored topside via the SmartTrack™ communication transponder, once set, requires no further intervention. The control unit switches itself off, other than for the monitoring purposes, and the two seals, which are effectively maintaining the pressure, are energised by the two levels of differential pressure. This independence and redundancy of the seal is something which is quite unique in the offshore industry."

Another recent project, completed in Indonesia, where a rig was sinking slowly into the seabed, highlights TDW's capability to fulfil particular customer needs. By successfully cutting into nine subsea pipe locations to provide simultaneous isolation and constructing a bypass, the rig was then jacked up to a safe height before reconnection without interrupting the flow. With the gas effectively supplying half of Jakarta, over ten million people, it needed to remain live.

"We are focused on response time, planning and how we react to customer needs. Present in more than 50 countries worldwide, we have a major shift now on regionalising our expertise, not just in offices but also in operational execution. The customer needs us to be in front of him ready to resolve pressures and problems with planned action and emergency solutions. By regionalising our capabilities from a technology point of view, equipment, manpower and expertise, we ultimately improve the communication between TDW and the customer. A local presence ensures we can work in line with our customer's emergency pipeline repair systems (EPRS). And coupled with the new technologies, we are in a position to change the way that operators maintain their pipelines," concludes Haykal.

FULGOSI S.R.L.

FULGOSI S.r.l. provides TD Williamson with a range of products that enables fast, efficient and productive operations and the successful completion of projects. FULGOSI was founded in 1974, initially manufacturing rolled and welded large diameter tubes and consequently gaining much experience also in providing flexible, efficient services.
At present, the company is also a primary manufacturer of pressure vessels components in its sector and is one of the leading direct dealers to the petrochemical industry in Italy and abroad.

T.D. Williamson
tdwilliamson.com

Services
Pipeline maintenance, modification and repair products

Contract driller

Originally established under the name Bassdrill Ltd in 2007, Houston-based niche drilling firm Atlantica Tender Drilling Ltd has been part of a large rebranding effort to reflect the growing success of the company and its acquisition by private equity firm HitecVision. Additionally, because Atlantica is the name of the ancient continent that once connected West Africa and Eastern South America, the name represents the company's current core marketing area as well as its position as an expanding global provider of tender assist drilling vessels.

Formed to design, fabricate, market and operate safe and efficient drilling equipment in a highly competitive and heavily dominated market, the company is able to provide cost-effective solutions for the offshore drilling market as a result of its well-designed vessels, commitment to personnel safety and high quality equipment packages. Because of this focus on quality and innovation, the company has gained a strong reputation and witnessed demand for its services from oil majors across the globe. Discussing company operations, vice president of Atlantica Tender Drilling Mike Smith begins: "The offshore drilling business is dominated by jack-ups, drill ships and semi-submersibles. There are a far smaller number of tender drilling rigs. We use self-erecting tenders because we have a large crane and lift crane transportable drilling package from the deck of the rig onto the deck of the production facility.

"The drilling package actually drills down through the deck of the production facility and completes the wells there with the accommodation, power, mud system, pipe racks and support utilities in our vessel, which is moored alongside and connected to the drilling package with umbilical hoses and electrical cables and so forth. That is the unique aspect of tender drilling as apposed to drilling with the main types of rigs like jack-ups, drill ships and semis."

Since it was previously featured in *European Oil & Gas Magazine* under its previous name in

June 2013, Atlantica Tender Drilling's substantial growth trend has slowed down over the last 14 months due to a somewhat softer market. Despite this, the company is continuing to find opportunities in the tender drilling sector and is focusing on its contracts with oil majors Petrobras and Total.

Following an agreed two-year firm period extension of the present contract for the company's Alpha vessel, which will commence at the conclusion of the present 12 well contract, Atlantica Tender Drilling was also awarded a contract from Total for a new build semi tender assist unit to be used on the Moho Nord development offshore The Republic of Congo in early 2013. The award follows an extended Compensated Call for Tender (CCFT), which the company entered in the first quarter of 2012 as part of a selected group of contenders that were asked to design a modular drilling package to be utilised on the tension leg platform for deployment in 2015. Following a now-concluded tender exercise, Atlantica Tender Drilling's semi tender, 'Delta', is due for delivery in the second quarter of 2015 and will feature a range of unique features as required by Total for its long-term drilling programme, which is due to begin in the third quarter of 2015.

Discussing the company's growing fleet, Mike says: "The Alpha is currently operating in West Africa. Barge type units are rectangular, barge-shaped and tend to work in South East Asia and West Africa because they aren't suitable for more harsh environments. Meanwhile, the Beta is a semi-submersible rig that commenced its term contract with Petrobras in the Campos Basin, Brazil, in March 2014; this is the first time that tender drilling has been attempted in a reasonably harsh environment, but because there is constant motion in Brazilian waters the semi-submersible was chosen. Better motions means improved uptime and generally increased capabilities for customers.

"The Beta and Delta vessels are very similar and have the longest contracts, with an order of around four to five years for those two. However, Delta and Gamma are still under construction at Dalian Shipbuilding Industry Corporation (DSIC) in China. The Gamma is due for delivery in the first half of 2015 and Delta due in the summertime.

Beginning with two rigs capable of drilling past 6000 ft of water in 1996, to 40 by 2002 and approximately 150 in 2014, the ultra-deep water drilling fleet has witnessed dramatic growth over the last two decades. Atlantica believes the huge increase in deepwater wells drilled by this growing fleet will lead to a similar increase in deepwater production installations and therefore opportunities for tender drilling. Furthermore, with Seadrill selling to SapuraKencana, the company became the technology leaders of the niche tender sector, as Mike concludes: "We have two brand new semi tenders drilling on deepwater TLPs on the multi-billion dollar Moho Nord project and the Petrobras PapaTerra project. These are expensive, long-term, high profile projects, which is what we like about the deepwater semi tender business.

"Another benefit is that if we win a contract with an oil company that decided they are going to build a light weight, smaller TLP or Spar because it can be drilled with a tender, that means from then on it can only be drilled with a tender. They must commit to a tender drilling contract at the same time they commit to construction of their deepwater production facility, which allows us to order a new build with a drilling contract already in hand. These are the opportunities we will be looking for in the future." O&G

Beginning with two rigs capable of drilling past 6000 ft of water in 1996, to 40 by 2002 and approximately 150 in 2014, the ultra-deep water drilling fleet has witnessed dramatic growth over the last two decades

Atlantica Tender Drilling
atlanticatd.com

Services
Manufactures and operates drilling equipment

Marine excellence

Established in 1975, Swire Pacific Offshore (SPO) has developed a reputation as a leading service provider to the offshore oil and gas industry with a broad base of services and an operational network that spans the globe. SPO operates as part of the Swire Pacific Group (SPG) of companies, which represents one of the leading commercial groups in the Asia Pacific region and is organised into five operational divisions comprised of property, aviation, beverages, marine services and trading and industrial ventures, all of which maintain a substantial presence across the globe. Its beverages division for example holds exclusive rights to manufacture, market and distribute products of the Cola-Cola Company and operates 16 plants in Hong Kong, Taiwan, seven provinces within Mainland China and a considerable area of the Western US. SPO likewise shares the global reach of its fellow SPG divisions, with a fleet of 87 vessels offering specialist support services to the offshore energy industry in every offshore production and exploration region outside of the US. As such SPO benefits from the global recognition of the Swire brand and the firm bedrock of a vast and highly diverse group of companies.

Like its parent company, SPO is able to offer a broad range of services in the oil and gas market through a series of acquisitions and subsidiaries. Associated companies include The China Navigation Company, Swire Shipping, HUD Group and Swire Oilfield Services. Collectively SPO and its associated companies offer salvage, oil spill preparedness and response, wind-farm installation and support as well as integrated bespoke logistics services. Furthermore with its sizable and growing fleet, SPO is fully equipped to support a broad spectrum of offshore activities including seismic survey, exploration, drilling, pipe-lay, subsea construction, production and FPSO operations.

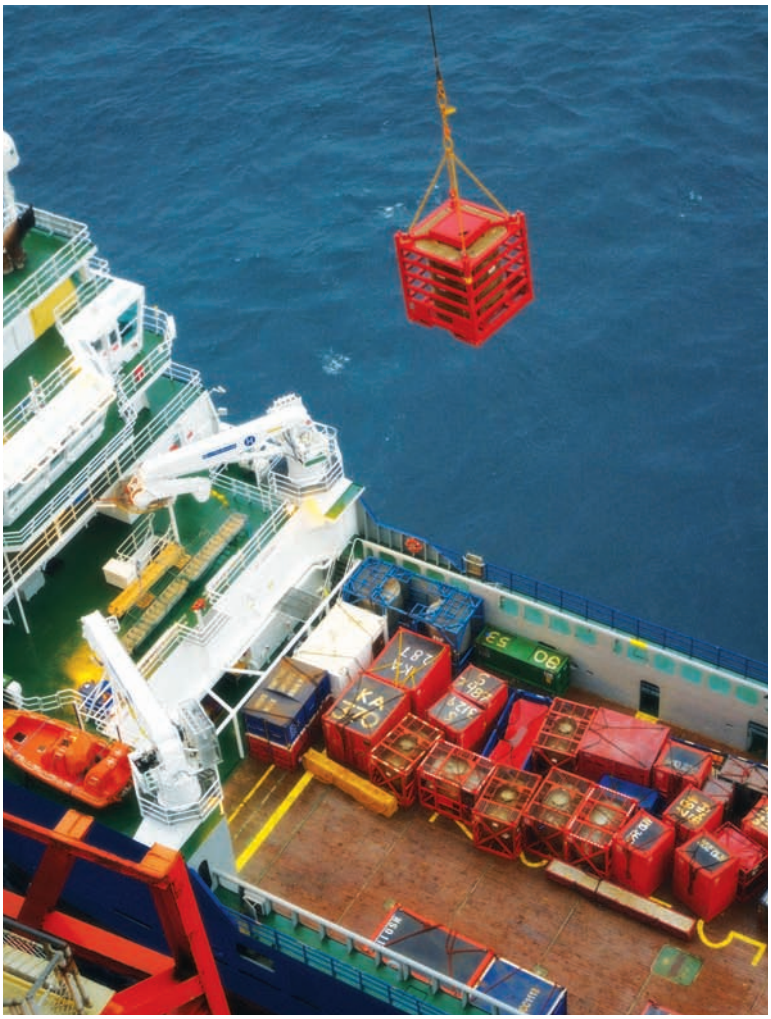
The SPO fleet is comprised of anchor handling tug supply (AHTS) vessels, platform supply vessels (PSV), ice-breaking supply vessels (IBSV), anchor handling tugs (AHT), seismic survey vessels, wind-farm installation vessels, accommodation vessels and multi-purpose offshore vessels. It is a modern and relatively young fleet with an average age of 7.7 years as of August 2013 and the vast majority of vessels are equipped with dynamic positioning systems, either DP1 or DP2. Presently the SPO fleet numbers more than 80 vessels and this number is expected to grow to 100 vessels by 2015. SPO currently has 20 vessels under construction including G-Class ships, which have a deadweight of 4000 tonnes and feature a four diesel electric propulsion plant and highly efficient counter rotating azimuth thrusters that ensure excellent fuel efficiency as well as H-Class vessels which have a deadweight of 4706 tonnes and a deck cargo capacity of 2400 tonnes. The H-Class features a four-engine diesel electric power generation plant that ensures highly economic fuel operations at all times as well as

high efficiency Rolls Royce 'Contra Rotating' propellers that provide further fuel savings often to 15 per cent. Furthermore the H-Class is certified by DNV for 'Clean Design', resulting in lower emissions to atmosphere from all machinery including refrigerant gasses.

During July 2014 SPO celebrated the naming of its second L-Class vessel, Pacific Legacy in Japan. The ceremony was held at the Maizuru Shipyard of Japan Marine United Corporation (JMU), with over 30 people in attendance. The L-Class vessels have a deadweight of 5258 tonnes and feature a fuel-saving design that incorporates newly developed fuel efficient propulsion pods, a four-engine diesel electric power plant, a large cargo carrying capacity and bulk cargo system, which makes the L-Class highly suited for supply operations in deep water environments. "The delivery of Pacific Legacy in Japan continues our successful collaboration with JMU. The L-Class series are very high quality vessels, designed for fuel efficiency and with a specification aligned to the exacting requirements of our clients around the world," said managing director of SPO, Neil Glenn.

The first of the L-Class vessels to be delivered to SPO was named at the Maizuru shipyard in April 2014 and has since undertaken operations in African waters. In April 2014 SPO also celebrated the launch of its eighth D-Class vessel, Pacific Dragon on Good Friday. D-Class Vessels are built to Clean Class Design standard, SPS 2008 and ice notations and are equipped with high capacity 500 MT RRM Brattvaag winches. They are designed to support the latest generation of semi-submersible rigs in unforgiving deep-water environments and have sufficient cargo and deck space to undertake a host of other offshore applications. "The D-Class vessels represent a significant investment for SPO, forming a central part of our fleet expansion, re-balance and renewal strategy to meet the growing demand for large, modern, high specification, deep water offshore support vessels. We are very pleased with their range of operational capabilities and safety and technical performance in serving the needs of our customers around the world," comments Neil.

Swire Pacific Offshore is currently headquartered in Singapore where it maintains a dedicated training centre with a state-of-the-art vessel simulator, which underwent a multi-million dollar upgrade in 2011 so that SPO seafarers can train on the very latest generation of vessels before they have even left the shipyard. Furthermore the company boasts offices in Brazil, Australia, Cameroon and the United Arab Emirates as well as agent offices in various locations globally so that it is never far from its clients. The company operates under the mantra of 'excellence in marine services' and aspires to deliver excellence in every operation, at every time and in every location. As such SPO embodies six key values of continuity, endeavor, excellence, humility, integrity and teamwork so that clients can approach the company with the greatest confidence that they will receive highest possible level of service every time.



With 12 new vessels added to its fleet over the past 24 months and significant investment to reach 100 vessels in 2015, SPO boasts one of the most modern and technologically advanced fleets in the world. Combined with the strength of its parent company and over 35 years of experience in supporting the offshore oil and gas market, Swire Pacific Offshore is poised to become the final word in operational support vessels. O&G

> SPO boasts one of the most modern and technologically advanced fleets in the world. Combined with the strength of its parent company and over 35 years of experience in supporting the offshore oil and gas market

Swire Pacific Offshore
swire.com.sg

Services
Support vessels

A circular solution

Founded in 2001, Norway based company Sevan Marine AS originally was set up for designing, building, owning and operating floating units for production (FPSOs) and drilling (MODUs). In the period till 2011, the company had signed contracts with clients for five FPSOs and two MODUs. The FPSOs were for the Petrobras operated Piranema field in Brazil (prod start 2007), the Centrica operated Chestnut field in the UK (prod start 2008), the Premier Oil operated Shelley field in the UK (prod start 2009), the EoN operated Huntington field in the UK (startup 2013), and the ENI operated Goliat field in Norway (still in construction). The two MODUs are both for drilling in ultra-deep waters for Petrobras in Brazilian waters on six year contracts.

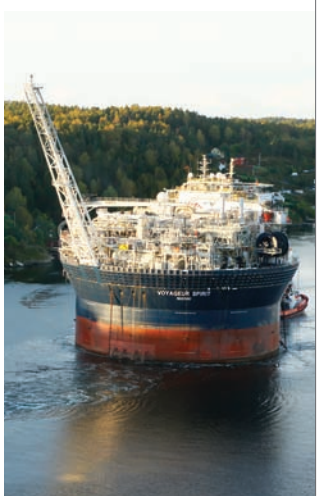
"Following a restructuring of the company in 2011 Teekay acquired our three FPSO units and furthermore invested in the company itself, while Sevan Drilling acquired our four drilling units," begins chief business development officer Fredrik Major. "We then changed our focus from being set up to build, own and operate FPSO units to become a company able to concentrate on harnessing and further developing our unique technology – the cylindrically shaped hull."

Sevan Marine's cylindrical hull is designed to meet the oil and gas industry's need for versatility, flexibility and robust design. The cylindrical hull design developed by Sevan Marine has been utilised in FPSO design and mobile offshore drilling units (MODU) and has been successfully deployed around the world on Sevan Marine built units now under operation by Teekay with the FPSO Piranema Spirit in Brazil and the FPSO Hummingbird Spirit and FPSO Voyager Spirit in the North Sea. The design pioneered by Sevan Marine incorporates a circular hull with symmetry of design, high capacity for oil storage and deck loads, excellent motion characteristics, no turret or swivel, the capacity for FPSO units to carry a large number of risers and high safety standards.

Elaborating on the advantages of the Sevan Marine design over traditional FPSO construction, Fredrik says: "A ship-shaped floating unit will require a complicated and cost driving turret/swivel system allowing it to rotate around its mooring system. Such a system also implies that all connections to the floating unit have to run through a swivel, which becomes very complex and involves dynamic seals for high-pressure well-streams as well as slip-rings for power and signal transfer. A cylindrically shaped floater removes this requirement and therefore represents a significant simplification, resulting in reduced capital expenditure and operational cost as well as increased reliability."

The cylindrical hull concept continues to gain acceptance throughout the oil and gas industry with the design currently in use in the construction of two floating accommodation units (FAU) based on the cylindrical hull by COSCO in China. "All of our units as of today are built in China, except for the Goliat FPSO which is being built in the HHI yard in Ulsan South Korea," says Fredrik. "We have developed a very good working relationship with the COSCO Nantong and Oidong yards for the construction of our FPSO, MODU and accommodation units."

The accommodation units under construction at COSCO are being built by Logitel Offshore, which has the sole right to produce accommodation units using the Sevan Marine design. As of July 2014 it was confirmed that



Teekay had entered into a tri-party agreement with Sevan Marine and the owners of Logitel, Cefront Technology AS, to purchase 100 per cent of the controlling interest in Logitel. Further to this, during August 2014 it was announced that Teekay had exercised the first of six options to construct further FAUs at the COSCO shipyards. The new unit will be constructed at COSCO Shipyard, Nantong, for delivery in Q3 2016, thus expanding the current building programme to three units. Commenting on the decision by Teekay to exercise the build option, Sevan Marine CEO Carl Lieungh says: "Sevan's cylindrical hull design is perceived to have several competitive advantages relative to our competitors such as; lower cost, higher deck load capacity, better stability and more storage space. Teekay's exercise of the first FAU option will also have a positive effect on our earnings."

As Sevan Marine continues to explore its embarkation into a new era of technological development it has continued to invest in complementary technologies that suit its current product portfolio and will expand its current service offering. During February 2014 Sevan Marine acquired the technology rights of TORP LNG AS and its affiliates, giving the company ownership of the proprietary HiLoad offshore LNG loading system. Sevan Marine has developed a floating LNG terminal (FLNG) based on its innovated cylindrical hull shape to provide an extremely efficient offshore LNG loading solution. Because of its low temperature of 163 deg. C the offshore loading of LNG is a complex and potentially dangerous operation and one for which operators are constantly on the lookout for an effective solution. Sevan Marine is confident that it now has the answer. "The floater market is challenging with large and complex projects," Fredrik concludes. "The main hurdle when introducing a completely new concept is convincing the first clients. With 12 projects established, we have this difficult stage behind us and are facing increased interest in our concept – even from the most conservative oil companies." O&G

> Sevan Marine has developed a floating LNG terminal (FLNG) based on its innovated cylindrical hull shape to provide an extremely efficient offshore LNG loading solution

Sevan Marine AS
sevanmarine.com

Services
Technology, engineering and project development

Hot stuff

It was the diffusion bonding technology originally developed at the University of Sydney as part of a post-graduate research study that led to the creation of the original Heatric company in 1985. Five years later that company was acquired by Meggitt PLC and relocated from Australia to Poole, UK, from where it has enjoyed continuous growth and commercial success ever since.

Since it was previously featured in *European Oil & Gas Magazine* in October 2010, Heatric has seen demand for its products increase significantly, in parallel with expanding global demand for gas, as marketing manager Roger Foggitt explains: "The demand for gas has fed a consequential need for new gas processing platforms including a new breed of FLNG vessels in which Heatric technology is now being widely deployed. Strong demand for our Printed Circuit Heat Exchangers (PCHEs) has seen the company grow both in capacity terms – with the construction and opening of new factories and investment in current production facilities – and manpower, with headcount up from approximately 100 in 2010 to more than 400 today." The company has also opened new sales offices in Brazil, Asia and Australia in recent years.

Such rapid growth stems from the unique technology that Heatric uses to produce its PCHEs, enabling the firm to produce highly compact and efficient heat exchangers up to 85 per cent of the size, weight and footprint of traditional designs. "Our PCHEs are ideal in situations where deck space and cost is at a premium, such as on offshore platforms and in other LNG and FLNG applications," says Roger. "The high integrity created by their diffusion bonded construction means that PCHEs offer integral safety characteristics far above other heat exchangers, as well as the ability to handle extremes of pressure and temperatures up to 700 bar and 900 degrees Celsius."

There are big opportunities available to Heatric's unique technology right across the offshore LNG market. In March 2014 the company was awarded a multi-million contract with JGC Corporation to supply PCHEs for the second Petronas floating LNG facility (PFLNG 2), due for completion in 2018: "This project will deliver ten PCHE units, in seven separate designs, to perform various topside duties including cooling nitrogen gas post-compression, pre-cooling treated natural gas, cooling feed gas to the main cryogenic (liquefaction) heat exchangers and cold recovery. The largest of the exchangers will weigh about 35 tons with the complete order weighing in at 135 tons in total."

To keep meeting the expanding needs of a broad customer base – which includes global oil majors such as Shell, BP, and ExxonMobil, as well as EPCs and lease boat operators – 2013 saw the company open its second manufacturing facility in Poole. "The new 5000 m2 factory will enable us to meet current and future PCHE demand. It has effectively doubled our production floor space, allowing us to improve workflow and production efficiency throughout the operation," says Roger. "Much of the final assembly facilities are housed in this new plant, along with greatly expanded on-site testing facilities. Our brand new 560m3 concrete radiographic unit is one of only five similar units in the UK and allows us to carry out radiographic testing of our units on-site during working hours." The new radiographic unit has already proved a shrewd investment for Heatric, vastly enhancing factory throughput by reducing testing times and boosting site flexibility.

The last 25 years have seen more than 2500 Heatric exchangers enter service in onshore and offshore applications and the company's PCHE technology remains unique, but there is no sign that Heatric plans to rest on its laurels. The company has a continuous programme developing its printed circuit heat exchangers to meet the particular needs of new market segments such as renewable energy storage and waste heat recovery. And over recent years more than £2 million has been invested in developing its production facilities. "Upgraded and new equipment has included a five axis plasma cutting machine for header and sub-assembly preparation, improving the manufacturing process and boosting efficiency," says Roger. Another £1.5 million-plus has been spent at Heatric's Langley Drive site where the printed circuit plates at the heart of its exchangers are manufactured. "We have been upgrading machinery, storage and waste systems, as well as greatly improving facilities for factory and office staff, bringing working conditions in line with the most modern of factory environments."

Heatric is ISO 9001, ISO 14001 and OHSAS 18001 certified and can provide first-class, fully customised whole-lifecycle support to its customers. Technical support, operator training, field assistance during commissioning and post start-up, as well as a rapid response team should crises arise, are all available from the Poole HQ. The delivery of consistent product quality and customer-orientated services is seen as the key to Heatric's ambitions as a global leader in heat exchanger technology, says Roger: "We will continue to focus on securing our ability to deliver current and future projects and also to show just how flexible PCHE technology can be, both in terms of the physical scalability of the units and the many different heat transfer duties to which they are suited. In heat transfer applications that need a combination of compact size and high performance our PCHEs are the technology of choice. We are now concentrating on making that so by expanding and deepening our current customer base." OEG

The last 25 years have seen more than 2500 Heatric exchangers enter service in onshore and offshore applications and the company's PCHE technology remains unique, but there is no sign that Heatric plans to rest on its laurels

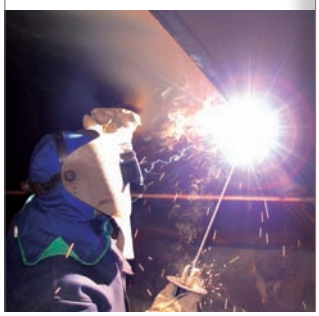
Heatric UK
heatric.com

Services
Designer and manufacturer of heat exchangers

Cool under pressure

Founded in January 1990, CTA Chemie-und Tankanlagenbau GmbH & Co KG (CTA) Berlin is a plant construction company with a focus on planning, delivery and site assembly. Presently the company is based in Altglienicke, Berlin in premises encompassing approximately 10,000m2. It operates with over 140 employees, including 20 graduate engineers and around 80 welders that undertake all of the company's works totally in-house. Services include structural analysis; design; procurement; installation and on-site testing, making CTA a one-stop shop for clients operating within the oil, chemical, power generation, food and pharmaceutical industries.

Inside the oil and gas market the company's clients include globally recognised brands such as Shell DEA; Total; BP; Gulf; Exxon; PCK Schwedt; Vopak and Unitank, all of which benefit from CTA's high level of expertise through years of experience. Furthermore, clients are able to enter into contracts with CTA in full confidence knowing that the company is fully accredited to industry standards such as ISO 9001:2008, encompassing design, planning and construction of tank facilities, pipelines and steel structures, as well as facility inspections and drafting reports; SCC**:2011, covering design, planning, construction, and maintenance of tank facilities, pipelines and steel structures as well as certificates for conformity; DIBt1 accreditation for double bottom tanks; EN1090-1:2009, which encompasses structural components and kits for steel structures to EXC3 according to EN 1090-2; and EN1090-2:2008, which covers all provisions concerning welding as described in technical specifications where applied. Additionally CTA maintains an independent quality and inspection service department, which ensures that at all, levels, CTA delivers first-class technical solutions to it clients without fail.



"CTA offers an all inclusive service," says managing director, René Spangenberg. "This mean that we are able to provide a total solutions package including; static calculation (DIN4119, EN14015, AP1620/650), proposal, delivery, erection onsite with our own staff, turnkey projects as well as later service like recurring inspections, expert opinions, repair, maintenance and remodelling. This is supported by sophisticated technology like floor mapping devices such as top and bottom surface defects discrimination, as well as remote access ultrasonic crawler – for cost-effective A and B-scan imaging on aboveground ferromagnetic structures such as storage tanks."

With an all-inclusive service package, CTA has undertaken a number of complex and challenging projects for its clients, as René explains: "One of our most interesting and sometimes pretty exhausting projects in recent years was work that we carried of for a locally based subsidiary of a German plant manufacturer. The project called for the engineering, delivery and erection of two cryogenic tanks for liquefied oxygen and nitrogen. These products are stored at a temperature of -196°C in a vacuum-insulated

stainless steel tank. This kind of containment houses equipment like control valves and measurement equipment and is insulated with perlite (amorphous volcanic glass). The perlite has a relatively high water content and through heating it has the special property of greatly expanding to become a kind of powder with excellent heat isolation."

Today the company is preparing to embark on the single largest project in its history – a 36-metre heat storage tank just outside of Berlin. This promises to be a complex project, but one that CTA is ready to take on. "CTA has realised several different hot water storage tanks in the past," observes René. "This year we start the erection of a 45,000m3 storage tank in Potsdam near Berlin. The dimensions are 36 metres in diameter and a top height of approximately 50 metres. Hot water at a temperature of 96°C is stored close to vacuum in a layer above cooler water stored at 65°C. The spread between the temperatures is used for storing energy. In phases of too much heat from the power plant water is heated up and ducted from top to bottom into the tank. The trick is that cold and hot water are not mixed due to special internals. These prevent water from uncontrolled flow and a boundary layer forms. This layer moves between inlet and outlet according to the level of hot and cold water. It is a very robust method with an absence of complicated control technology."

Presently CTA has orders that will maintain it for the remainder of 2014 and well into 2015, with a projected turnover of 35 million euros for 2014. Although the impact of the 2008 financial crisis continues to reverberate around the world, CTA is confident that it will remain busy well into the future as René concludes: "The economic situation in Europe is tense at this time. Even if tank construction is largely independent of general economic development we believe in a positive outlook for the coming years. There are a lot of old facilities with repair needs and the EU facilities work abroad and internally. One large problem remains in that value-added tax is not harmonised, but we are able to cope well." O&G

CTA Chemie-und Tankanlagenbau GmbH & Co KG
cta-tankbau.de

Services
Plant planning, delivery, construction and assembly

Complex networking

ENG-WELD SUPPLIES LTD

We at ENG-WELD SUPPLIES are pleased to have an excellent working relationship with MSL ENGINEERING for over 25 years, supplying them with engineering and welding supplies, which are ISO 9001 standard and are all certified.
ENG-WELD SUPPLIES and MSL ENGINEERING have been involved in many major projects, oil refineries, pharmaceuticals etc. and look forward to continued success in the future.

The roots of MSL Engineering Ltd date back to 1979 and through its 34 years of trading experience, the company has built up gradually from an initial small scale to its position today as a large and skilled contractor with a turnover of €20 million and an average workforce of 160. "We specialise in the provision of pipe work installation and process equipment installation, utilising our fabrication facilities to produce piping spools and modules for site installation," says Maurice McGrath, managing director.

With the majority of its work undertaken in Southern Ireland, in 2012 the business invested in a brand new 20,000 sq ft premises from which it fabricates all types of pipe work from carbon steel to stainless steel and chrome-moly, and other exotic materials. "The increased space allows us to undertake modular builds. The reduction in the amount of man hours required on site has a lot of advantages from a safety perspective, as the work is undertaken in a controlled environment," points out Maurice.

In 1990, it received recognition of its capabilities, winning a series of significant contracts that ultimately positioned it as an automatic choice on the tender lists for consultants working with multi-national clients, as Maurice explains: "We received the contract for the maintenance work on the offshore production platforms for Marathon Petroleum on the Kinsale Head gasfield. We held that contract for five years during the peak production period, undertaking a great deal of work and establishing relationships with clients that would last decades." Under exclusive contracts, highlighting the confidence in the business, MSL Engineering executed numerous projects for a range of oil and gas clients including ongoing pipe work maintenance contracts.

Subsequent projects included maintenance and capital works at Whitegate Refinery, which is currently Ireland's only refinery, owned and operated by Phillips 66. Crude oil processed by the refinery is light, low-sulfur crude oil sourced mostly from the North Sea, North Africa and West Africa. The refined products are distributed mostly inland, with some exported to international markets and the site operates a crude oil and products terminal with over seven million barrels of storage facilitated by an offshore mooring buoy in nearby Bantry Bay. "Under this contract we do all of their maintenance work and have also undertaken several major contracts for Phillips 66. The site was originally owned by ConocoPhillips and we had a very similar arrangement with them and a long working history together," says Maurice.

Today, the majority of the company's work is with pharmaceutical companies as well as in the power generation, and agri/dairy industries, which is a growing indigineous sector in Ireland. It has also undertaken a number of large distillery projects such as that with Irish Distillers, worth nine million euros, in which it fabricated and installed over 18,000 metres of pipe over an 18-month period. "As far as our clients are

concerned the two most important factors are safety and quality. We work in industries that are inherently hazardous and any slip up on safety is very serious, so no shortcuts can be taken on safety. One of the reasons we have been successful is that we don't compromise on safety, which is reflected in our high standards and safety record. In our business quality is something that can be very easily measured, with our welding and fabrication subject to thorough NDT testing. The work is also very labour intensive and the personnel that we employ and depend on have a lot of industry specific knowledge and an excellent skill set," highlights Maurice.

With the industry in general feeling the skills shortage, Maurice comments on the impact that this has on the future of the business and industry: "As many of the older generations leave the industry they are not being replaced by new entrants. This seems to be down to a reluctance to get into the industry and a shortage of relevant training and courses." On a global scale, there is a great demand for people in all trades across the industry, particularly in countries such as Canada and Australia, which have several ongoing major mechanical projects. Considerable numbers of skilled tradesmen have emigrated as they search for lucrative opportunities. In response, MSL Engineering has an apprenticeship training programme which takes on youngsters every year.

"This is a very competitive business, particularly in Ireland where there are a number of companies operating in this niche market, which makes it more difficult to compete. In recent times, some of our competitors have moved into bigger markets such as the UK, Holland and Belgium as well as the Middle East. As we look ahead we see the UK as a market we would be able to compete in," explains Maurice. The Cork site benefits from a long tradition in developing the skills required in this industry, leading to a core of valuable experience. "Such resources are required in the UK and Europe where the oil and gas industry and pharmaceutical companies continue to expand. We see many future opportunities developing from this and through leveraging off our experience in Ireland we hope that we can build on opportunities in new markets," he concludes.

> As far as our clients are concerned the two most important factors are safety and quality. We work in industries that are inherently hazardous and any slip up on safety is very serious, so no shortcuts can be taken on safety

MSL Engineering Ltd
mslengineering.ie

Services
Mechanical engineering contractor specialising in pipe work, fabrication and installation

Dynamic expansion

> The modularised packages, such as drilling package, solid control package, power package and living quarters can be tailored to accommodate a customers' well drilling and work-over operations.

TSC Offshore FZE was established in 2010 as part of the TSC Group Holdings Ltd, focusing solely on the Middle East market. The TSC Group is a global product and service provider, serving both onshore and offshore drilling industries worldwide. Offering a comprehensive product line that includes drilling equipment, mechanical handling equipment, solids control equipment, power control and drives, tensioning and compensation systems for semi-submersible rigs and drillships, it is also able to design, build and sell complete rig packages for jack-up rigs, semi-submersible rigs and platform modular rigs, as well as offshore deck cranes for both drilling rigs and production platforms.

Setting its sights upon the Middle East market TSC Offshore FZE is actively involved in the sales and marketing of its range of product lines, additionally providing service related offerings to clients in the UAE, Oman, Bahrain, Saudi Arabia and Kuwait. The company's client base consists of businesses such as Shelf Drilling, Sino Tharwa, Arabian Shipbuilding and Repair Yard, Lamprell, Petrofac, Saipem, McDermott's, Chinese Oilfield Services Ltd, Dry-docks World and other drilling contractors in the Middle East. The specific focus of the business in the area further complements the broad global offering of the group to markets in China, the US, Brazil, Mexico, the UK, Singapore, Hong Kong and Russia.

With a strong reputation as a designer and manufacturer of a complete range of products for the offshore industry, Sarabjeet Marwah, sales representative – Middle East explains: "We manufacture all major oilfield equipment like SCR's, VFD's, jacking systems, CTU's, pipe handling equipment, mud pumps, iron roughnecks and rotary tables. All of our products are of high quality and have an excellent track record." The turnkey products and services provided by TSC include comprehensive product lines in both onshore and offshore rig equipment, expendables and packages that encompass design, manufacture and system integration. As part of a large group, TSC Offshore FZE is able to access the broad and highly technical equipment portfolio provided by its sister companies.

The business deploys an innovative process to provide a complete offshore rig package, whether it is for a jack-up rig, semi-submersible rig, platform modular rig, or a drill ship. Through its turnkey approach, TSC Offshore FZE provides a complete cantilever and drill floor package, which includes the main structure, drilling equipment, solids control system, power package, rig control and drive package, BOP stack and handling, and pipe handling system. With the system pre-tested at its purpose-built facility, it can then be shipped to any location for installation and commissioning, benefitting its many customers. This innovative method of construction is further implemented in blocks for the semi-submersible rigs with the

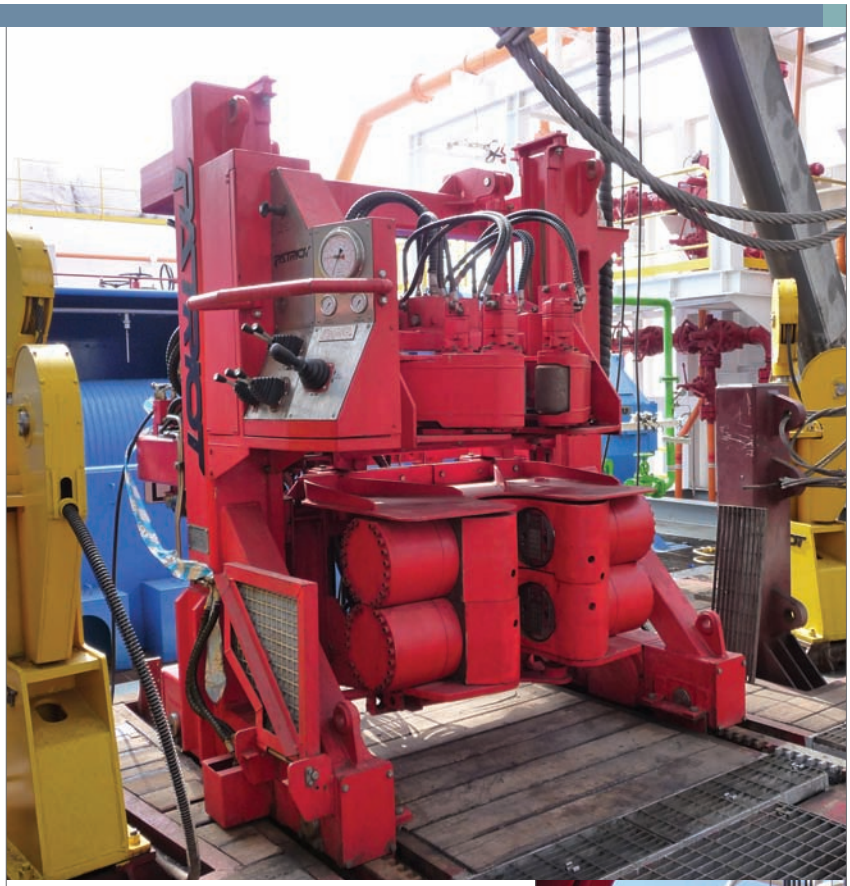
installation of drilling equipment accomplished on the ground before final integration.

Engineering is at the heart of the business with its skilled team able to customise the design of a specific platform modular rig, whether the requirement is for a large modular drilling rig package or a smaller work-over package. The modularised packages, such as drilling package, solid control package, power package and living quarters can be tailored to accommodate a customers' well drilling and work-over operations. As a transferrable unit, the complete packages can be easily lifted and re-located to another platform as required.

The development of its business interests in the Middle East has not been without challenge. There is enormous competition in the region from established vendors in operation such as NOV, Aker and other Chinese manufacturers. However, to continue to grow its market position, TSC Offshore FZE has built up a strong sales workforce, and established a good source and storage of essential products to supply to its customers. "In our warehouse we house mud pump expendables, shakers, screens and valves amongst numerous others," highlights Sarabjeet. As a manufacturer and distributer of mud pump fluid end expendables and spares it can supply for almost all popular pump models used around world, including Emsco, Garden Dever, National Oilwell, Wirth, OPI, Wilson, and IDECO.

"Very soon, we will be well placed to provide servicing jobs directly from the Middle East office. We are already regarded as having good quality products offering effective lead times on all our equipment," explains Sarabjeet. As well as operating as a trusted equipment supplier, TSC Offshore FZE 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 Offshore FZE has the solution. "We are a solutions provider to our client's needs," says Sarabjeet, adding: "We are dedicated to utilising leading edge technology to create high product performance, distinguishing ourselves from other companies with a reliable and flexible product line."

As an international company with over 1000 employees worldwide, the TSC Group is committed to the role it has naturally adopted as a good corporate citizen in the global communities it operates in, treating the environment and society with respect and dignity, whilst regarding the focus on the balance of social responsibility, environmental protection, safety and a sustainable economy as key factors in ensuring business continuity and success. Clearly demonstrating its beliefs in the values that it represents – tolerance, openness, reliability and co-operativeness, Sarabjeet points out: "We have also introduced efficient tools to ensure the comprehensive implementation of social, safety and environmental considerations within the organisation, involving our employees, business associates, supply chain partners as well as individual societies and cultures around the globe."



In line with the entire group's focus for the coming years, TSC Offshore FZE is confident that is has the right foundation to continue to grow well into the future, anticipating that the demand for rig solutions and equipment will continue to grow due to a sustained oil price and increasing demand. Growth of the group as a whole has been strong over the past year and the increased efficiency and productivity has generated its highest ever return on assets. The future business strategy for TSC revolves around opportunities arising from industry dynamics. Having already seen significant increase in demand over the last 24 months for offshore equipment sales Sarabjeet concludes on the future vision for the business: "We aim to expand the clientele base in the Middle Eastern region, effectively becoming one of the top vendors in the Middle East region." O&G

TSC Offshore FZE
t-s-c.com

Services
Drilling equipment, service and solutions provider

Superior service

Headquartered in the Philippines, the Atlantic Gulf & Pacific Company (AG&P) was established in 1900 and is today recognised as a pioneer of breakthrough design, engineering, fabrication and construction services. Synonymous with the country's construction industry, the company built the first steel bridge in the Philippines as well as other major infrastructure, such as Manila's water and sewage system, which still exists today. Following decades of steady growth, the company honed its skills for ingenuity and reliability and became renowned as one of the leading modularisation and infrastructure services in the world.

Purchased by its current investors in 2011, AG&P has since witnessed a period of aggressive growth and modernisation, which has thus resulted in it becoming the only Philippines headquartered, multi-national organisation. Elaborating on these rapid developments, AG&P's executive general manager David Northall begins: "AG&P offers industrial process outsourcing services to some of the world's most critical resource and infrastructure projects. As part of its recent expansion, AG&P grew its module fabrication yard capacity from one million square metres to 1.5 million square metres. AG&P's Bauan Yard is one of the largest fabrication and assembly yards in Southeast Asia, and features 900 metres of waterfront in a protected harbour. The newly opened Batangas City yard is located just ten kilometres from the Bauan yard, and is adjacent to a major container port, as well as a general and heavy cargo berth area.

"The yards are located next to easily accessible deep water jetties, enabling seamless module delivery," says David. "The Bauan yard is currently being upgraded to allow for multiple and much larger projects. Currently, the yard can handle individual modules of up to 6500 tonnes, and this capacity will grow to 10,000 tonnes by the time the upgrade is complete around the end of 2015."

He continues: "AG&P's second yard is located in Batangas City, fewer than ten kilometres from its Bauan yard. The yard measures over 500,000 square metres, and is able to support two major projects at any time, with up to 25 modules being worked-on simultaneously. It is adjacent to a major port, as well as a general and heavy cargo berth area, with port depths up to 14 metres. In addition to growing its yard capabilities, AG&P has also grown its workforce, and has brought in international expertise to manage multiple projects for international blue chip organisations. The company currently employs more than 7500 staff across its two fabrication yards, with another 1500 employees working overseas as part of AG&P's FieldCOM division. Moreover, as a multinational company, we offer globally recognised qualifications, including SMAW, 3G, 4G, 6G/FCAW, and

MTE

MTE was commissioned to design, engineer and fabricate a high integrity external blast and fire rated carbon steel cladding system. Cladding was designed and engineered utilising MTE's highly advanced proprietary in-house software to resist potential explosion and impulse loadings as well as local cyclonic winds.
Due to MTE's high degree of experience on similar projects the scope of supply rapidly grew to include internal cladding, doors, insulation and raised access floors. Particular importance was placed on the high integrity insulation system, which was designed with the use of thermal modelling software to ensure the designated performance criteria were achieved along with certification in compliance with the project technical specifications and Australian building regulations.
Initial constraints of multinational time zones and the limited window for live communications were overcome by regular progress meetings and workshops, which were held in the Philippines, Japan, Australia and UK.
These resolved many of the interface and communication issues before commencement of design and fabrication, thus ensuring ease of installation at site with supervision being performed by MTE highly trained supervisors.

GTAW, thus ensuring that AG&P professionals are accredited to American, Japanese, Australian and European standards."

With a mission to change the way companies within the infrastructure and construction industries do business, AG&P's core aims are to accelerate construction through the delivery of its purpose-designed Modstruction solutions for complex projects, while also providing holistic, competent personnel to job sites around the world. Furthermore, by working with the best global partners, the company can provide cost-effective services across the whole infrastructure lifecycle; this includes phases such as planning, design, construction and operation. Indeed, through providing its expertise from the early planning stages of a project, all the way through the commercial operations, AG&P optimises cost, quality and safety through delivery its mission-ready modules that also enhance ease of construction, versatility, and reusability during critical infrastructure projects.

Currently working with a number of blue chip companies within the oil and gas industry, AG&P's competitive advantage not only stems from its unique Modstruction approach and large, state-of-the-art fabrication yards; its highly trained Filipino workforce execute services to the highest level of quality and exhibit an unrivalled passion and commitment to their work. Indeed, it is these strengths, as per press reports in 2012, that have led to the company being awarded a $152 million contract in October 2012 to provide the 'electrical backbone' of the Inpex Corp led Ichthys LNG project in Australia's Northern territory.

As per the 2012 press report, a vital project that will provide critical LNG to countries such as Japan, AG&P will modularise 26 local electrical rooms (LER), in addition to local instrumentation rooms (LIR), to support the second largest private investment in Australia's history. AG&P's work involves the design, construction and delivery of highly engineered modules. The modules, called 'e-houses', contain sophisticated electrical control and monitoring systems that will govern all power distribution for the project. With construction beginning in the first quarter of 2013, the LER/LIR fabrication and assembly will be wholly constructed and integrated in Batangas before it is shipped back to Australia in 2015.

In addition to this major contract, AG&P in partnership with ALE through Australian-based consortium, AG&P ALE Ventures Pty Ltd., has unveiled the Hydro Deck, a world-first mobile port solution capable of enabling delivery of combined loads of up to 22000 metric tonnes, regardless of tidal conditions.

Elaborating on the groundbreaking mobile port solution, David highlights: "After extensive research, AG&P, in partnership with ALE, an international heavy transportation and lifting company, developed and constructed the Hydro Deck. The Hydro Deck uses a proprietary water ballast and air tank system to provide buoyancy control, which allows it to compensate for both rapid tidal variations and load balancing as massive modules move across its deck. The Hydro Deck allows for significantly wider roll-on, roll-off (Ro-Ro) module delivery windows, and enables efficient, cost-effective and timely module delivery, which in turn helps to keep the construction timeline for projects on-schedule and within budget. Its leasing arrangement also reduced capital expenditure, as project owners are not burdened with an expensive asset that must be dealt with after project completion."

Measuring 140 metres x 40 metres x 12 metres, the now complete Hydro Deck has been delivered to its first project, where it is being used as a gateway through which large-scale modules from across the globe will be delivered. A world-first, the mobile port solution can ensure 24/7 delivery of combined loads up to 22000 metric tonnes in all weather.

AG&P also recently worked on the world's largest modularised complex coker unit for BP's refinery modernisation project in Indiana,

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which involved the fabrication of the world's first modularised complex coker unit. "AG&P managed the fabrication, assembly, packaging and delivery of more than 70 modules and 20 large vessels. All of the modules were completely fireproofed on delivery. The project received an 'Award of Excellence' from the Safety Organisation of the Philippines for exceeding seven million safe hours worked in AG&P facilities without Lost Time Incident (LTI). AG&P's ability to deliver infrastructure on-schedule was pivotal to the project's success, with access to the project site via the Great Lakes freezing over during winter each year," says David.

With a stringent commitment to operational excellence, quality and safety - the company recently passed 32 million man hours without a Lost Time Incident (LTI)- as well as its highly advantageous Modstruction process, the future looks positive for AG&P as it continues with the execution of its major projects and plans further investments, as David concludes: "In 2014 we aim to provide some of the largest and most highly engineered modules in the world, and delivering the world's first mobile

port solution capable of overcoming even the most extreme tidal variations. Furthermore, we will be upgrading the Bauan yard, bringing its capacity to over 100,000 metric tonnes while also continuing to provide world-class training to its workforce, which will further establish AG&P and the Philippines as a leader in advanced industrial process outsourcing services to the world's most complex and essential infrastructure projects." OEG

CNW ENERGY/ BENFIELD

CNW Energy/Benfield has assisted AG&P with product selection for Ex and industrial E&I equipment to meet the Ichthys Onshore LNG facilities project specification, and in accordance to AS/NZ and IECEX standards.

We have provided technical support to the AG&P engineering team and have managed the global supply chain being utilised to supply products to AG&P, focusing considerable resources and working in partnership with the AG&P project team on ensuring project timelines can be achieved.

AG&P
agp.ph

Services
Fabrication, assembly, modularisation and asset management

Heavy duty

Founded in 1972 by the late Chung Ju-yung, Hyundai Heavy Industries (HHI) cultivates a vision of operating as a global leader in the heavy industries sector. Indeed what began as a dream was quickly made into a reality as the company rapidly established itself and determinedly expanded in line with the 'Hyundai Spirit' encompassing creative wisdom, positive thinking and unwavering drive. By June 1974 HHI had completed and commissioned the world's largest shipyard, located in Ulsan, South Korea and today the yard extends across two and a half miles along the coast of Mipo Bay in Ulsan and covers an area of 1780 acres. During the same period the company successfully completed the construction of two 260,000 DWT very large crude carriers (VLCCs) and only a decade after this initial delivery HHI topped ten million deadweight tons in aggregate ship production, with the company retaining a leading position within the world's shipbuilding market ever since. The next key chapter in the company's history occurred in February 2002 when HHI moved away from the Hyundai Group. The independent establishment of the Hyundai Heavy Industries Group included mergers with Hyundai Samho Heavy Industries and Hyundai Mipo Dockyard.

Since it was last featured in *European Oil and Gas Magazine* during June 2012, HHI has continued to win high-value orders with some of the oil and gas market's leading operators. "In 2013 we booked new orders worth $6.5 billion," explains senior vice president of HHI's Offshore & Engineering Division C.S. Kim. "The new orders won by HHI include a spar floating gas platform in Norway, an FPSO for a project in the North Sea and a tension leg platform and floating production unit for the Congo's Moho Nord field. We also won pipeline orders in Qatar, India and Vietnam as we successfully secured a balanced order volume for both our fabrication and installation businesses. As for projects delivered, we have completed the Ofon platform in Nigeria, Vanguard heavy lift vessel, Ras Gas platform in Qatar and the Thang Long-Dong Do (TL-DD) pipeline in Vietnam on schedule. We also made the decision to build a 10,000 ton floating crane to improve the productivity of our topside and module production operations. The crane is expected to enter service in the first quarter of 2015."

During 2014 alone HHI has won projects including an FPU in Indonesia, Bergading fixed platform in Malaysia, a pipeline order for Nghi Sin Refinery and Petrochem complex in Vietnam and the second package of the Nasr Full Field Development (FFD) project in UAE. The $1.94 billion order for the second package of the FFD is a major project comprising a gas treatment platform, separation platform and accommodation platform as well as a bridge and bridge support tower and flare tower. The package will also include subsea power cables and other components. Commenting on how HHI will approach the project C.S. Kim says: O&G

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"HHI is well aware that the early commitment to the FFD is the key to completing the project successfully. To achieve this, HHI has already finalised the mobilisation of the project personnel and established the relevant plans such as manpower resources and yard facilities operation dedicated to the project."

Furthermore HHI has many years of experience in delivering large projects and crucially in liaising with all involved parties, as C.S. Kim elaborates: "Taking into consideration the complexities of major projects, including Nasr FFD, the effective management of interfaces at all projects' levels is critical and essential for the successful execution of the work. HHI always co-operates with other contractors and third parties for the successful resolution of external interfaces that may affect the clients' or other contractors' execution of their scopes of work."

As part of its mission to remain at the forefront of the heavy industries sector, HHI regularly invests in the development of revolutionary technology that can deliver significant benefits to the oil and gas market and other sectors. In July 2014 HHI developed a revolutionary new remote control welding robot, which is designed to greatly increase welding efficiency. "We expect that our new robot's faster welding speed will help increase operators' productivity," Kim Eung-soo, manager of Overseas PR Department of HHI, says, "The new hot-wire tungsten inert gas (TIG) robot combines conventional welding process with a six-axis robot that HHI independently developed. The robot can weld six times faster than manual welding as it can continuously support more welding wires. Also, it features a remote control system to enhance work efficiency."

As well as developing the TIG welding robot HHI has also recently unveiled its Hyundai intelligent Collision Avoidance Support System (HiCASS) to aid in providing safe and optimum navigation of vessels. "The system searches for optimum sea routes and prevents collisions by automatically detecting potential obstacles such as ships and reefs that are within 50 km distance," explains Kim Eung-soo. "In addition, the enhanced accuracy of the system enables vessels to identify hazards based on the type of vessel, weather conditions, waves and wind. Also, the system is equipped with a collision notification system that signals 'caution', 'urgent' and 'danger' to ensure safe operation at sea."

When installed along with voyage systems such as automatic radar plotting aid (ARPA), automatic identification system (AIS) and electronic chart system (ECS), HiCASS is capable of analysing the locations of obstacles according to international regulations for preventing collisions at sea (COLREGS).

Throughout the rest of 2014 HHI will focus on expanding its capability in building the world's largest floating offshore units. Presently it is building a new shear leg type heavy lifting vessel at its shipbuilding affiliate Hyundai Samho Heavy Industries. The vessel will have a lifting capacity of 10,000 tonnes and is due to begin operation first quarter 2015. With this vessel HHI will greatly expand its ability to build FLNG units and floaters such as FPSO, TLP spar and so on for deepwater exploration and fixed platforms.

"The recent growth in global gas demand is spurring major gas field developments especially in Australia, North America and Southeast Asia, leading to increased orders and inquiries for both floating LNG units and onshore LNG modules," observes C.S. Kim. "In West African states, development of oil resources to fund national infrastructure will be anticipated to continue as planned. We will concentrate on the above areas and also continue to leverage our production capabilities to win mega floating facility projects as well as further sharpen our competitiveness in traditional EPCI platform projects." OSG

Throughout the rest of 2014 HHI will focus on expanding its capability in building the world's largest floating offshore units. Presently it is building a new shear leg type heavy lifting vessel at its shipbuilding affiliate Hyundai Samho Heavy Industries

Neptune Energy Park

Newcastle upon Tyne

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

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Hub of activity

A little more than a decade after entering the North Sea, Apache Corporation is opening a new chapter with first oil from the Forties Alpha Satellite Platform (FASP) expected in the second half of 2014.

Commissioning of the newest platform at Forties comes as Apache celebrates its 60th anniversary. Since it was established in 1954 with $250,000 of investor capital and a goal to become a profitable oil corporation, Apache has developed its capabilities to become one of the most successful independent oil and gas exploration firms in the world. A member of the Fortune 500, Apache's market capitalisation is approximately $37 billion on the New York Stock Exchange; this incredible growth over the last 60 years stems from strategic expansion into burgeoning oil and gas areas as well as acquisitions. Today the company has nine operating regions across the globe and presently has a global production of over 635,000 barrels of oil equivalent per day (boepd).

Since entering the North Sea through a strategic $680 million acquisition of the Forties field from BP in 2003, Apache has invested in drilling activity, facility upgrades and an intensive re-evaluation of the field to find a significant increase in the proven reserves originally purchased. At the time of the acquisition there were 140 million barrels of oil equivalent (boe) of proven reserves, yet Apache has since produced more than 200 million barrels from the Forties field, and anticipates many millions of barrels are still be to found.

Following the success of the Forties field, Apache expanded its foothold in the North Sea with its acquired ownership of the Beryl complex, which included the subsea fields of Ness, Nevis, Skene and Buckland from ExxonMobil in January 2012. This agreement also included the SAGE gas plant and its pipeline as well as non-operated interests in the Maclure, Scott and Telford fields.

Apache's North Sea average annual production presently sits at 71,000 boepd and their lifting cost per barrel is below $18 per barrel. This high level of performance is being driven by; the maintenance of a great safety record, acquiring new seismic, significant drilling activity, major project investment and the best operational efficiency in the North Sea.

With under 500 personnel onshore managing the fields, the relatively small workforce has further strengthened its collaboration and communication capabilities by moving into the new Caledonia House on the state-of-the-art business park at Prime Four in Kingswell, close to Aberdeen, a world-class hub of activity for the energy industry.

With 25 per cent of the development wells drilled in 2014 in the North Sea in Apache's portfolio, the subsurface teams have been busy and very successful in finding new targets and continuing to focus on producing new oil opportunities from its hubs. This year saw a total of seven operational drill strings across the two fields, with drilling being undertaken from every platform at some point during the year.

FASP, the new platform, was constructed by British manufacturer OGN on Tyneside. It is linked to the existing Forties Alpha platform via a 90 metre bridge and includes a 12 pile jacket and deck weighing a total of 18,000 tonnes that stands in a water depth of 106 metres. O&G

ENERMECH

EnerMech's long-term relationship with Apache North Sea is based on an honest and open working partnership and a commitment to providing Safer Smarter Solutions to their UK assets, which also extends to Apache's international network.

Careful planning, early intervention and teamwork are the foundations on which we provide Apache with a fully integrated service across all of our business lines. A truly collaborative approach brings mutual benefits to Apache and EnerMech.

PETROFAC AND APACHE CELEBRATE SAFETY MILESTONE

Petrofac and Apache North Sea Limited have delivered a major safety milestone of two million man-hours without a Lost Time Incident (LTI), across all Apache's North Sea assets.

Petrofac provides onshore engineering and both onshore and offshore construction services to Apache's assets - where the teams have delivered sustained safety performance to prevent a single LTI since January 2013.

Iain Watt, Director, Petrofac Offshore Projects & Operations said: "This achievement is a result of an integrated approach and shared commitment to safety performance. Safety is our highest priority and eliminating accidents and injuries is our goal."

Mark Richardson, Projects Group Manager, Apache North Sea said: "Safety, compliance and production are the order of priority for all our projects and operations.

The successful delivery of some significant projects in the last two years has added considerable value to Apache, but they are only truly successful projects because they have been completed without lost time injuries. We need to continue to work hard to ensure that safety remains the number one priority."

To mark the milestone, a joint donation was made to Petrofac's 'Charity of the Year', Friends of the Special Nursery, the charity of Aberdeen Maternity Hospital's Neo-Natal Unit.

The FASP has added 18 new well slots to accommodate further drilling opportunities with a processing capacity for 25,000 barrels of oil per day, production and deep gas lift gas compression and 25 megawatts of additional power for all the field through the Forties Power Ring Main.

At press time, the Rowan Gorilla VII was on location, drilling the first well at FASP. "The facility is best in class when it comes to the delivery of projects," highlights Mark Richardson, Apache Projects Group Manager. "It won the Oil and Gas UK award for business efficiency; it was built at significantly lower cost than most North Sea platforms, demonstrating that we can still build platforms in the UK." The award recognises the tireless work of both Apache and OGN over the last three years of planning and construction, and the efficiency, innovation and sustainability in the delivery of enhanced performance, streamlining and cost effectiveness.

Meanwhile, in line with its constant commitment to safety, Apache recently installed a new Subsea Isolation Valve in the 36 inch Forties Pipeline System to improve safety on the Forties Charlie platform. From concept, through fabrication to completion of the installed the valve onto the BP export pipeline, took four years. The final tie-in was completed during the 2014 Forties Field maintenance shut down and was commissioned two days ahead of plan, while the Turnaround (TAR) overall was completed one day ahead of plan; it was a highly successful project. An investment of £60 million to ensure the safety of their people and assets is a significant marker of how important major accident prevention is for Apache.

With a turnover of approximately $2.7 billion dollars in 2013, Apache North Sea has generated significant cash flow to Apache's global capital programme due to its prolific subsurface, drilling and project activity and its ability to maximise and monetise opportunities for production. Apache doesn't have any special technology, vendors, equipment or systems that aren't available to other companies operating in the North Sea; the Apache success as one of the best producers in the region stems from their attitude and approach towards doing business. Apache have achieved a very high rate of return on their assets, which has been achieved through clear leadership and very competent teams with the will to undertake active campaigns.

Within Apache there is a culture of open accountability, where personnel are given the responsibility and authority to make the right decisions for the business, where the best answers win. To aide this approach Apache has a very flat management structure with a solid management team that have worked together for a long time. They understand progression and success is about taking managed commercial and technical risks to deliver results. If Apache sees a good opportunity that will move the bottom line they implement an action plan.

Looking ahead, Apache will continue with its focus on operational efficiency; this includes an ongoing focus on production through the utilisation of a very competent and capable operations and maintenance team. Apache has an impressive portfolio of opportunities around the Forties and Beryl fields that will start to be exploited with two additional semi-submersible drilling assets, with 20 new wells drilled this year and even more planned next year. Apache is continuing to look to invest in the ideas of the personnel who are in the best position of ensuring that the company moves from strength to strength, and it will continue to explore what's possible. O&G

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CHC Helicopter's unmatched helicopter services enable people around the world to go further, do more and come home safely. CHC's global team is talented and passionate in providing offshore transportation to the oil and gas industry, including for Apache North Sea, carrying their people to the Forties Field using new-technology Sikorsky S-92 and Airbus EC225 aircraft. CHC's capabilities are based on unique knowledge and accomplishments amassed from traveling out to and back from the world's most remote and challenging destinations.

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Celebrating its 25th year in operation during 2014, Caledonian Petroleum Services (CPS) has developed a highly trusted reputation as a leading supplier of support services relating to fabrication, project management and manpower services for the offshore industry. The company has performed strongly since its inception and was acquired and became part of the Global Energy Group (GEG) during 2010. The CPS brand was retained and has continued to strengthen its fabrication service with the acquisition of A&B Welding in 2012, and its most recent acquisition of S&D Fabrication as of 2014. Today CPS is able to offer full turnkey solutions in structural fabrication, pipework, site services, offshore services, dimensional control, 3D laser scanning, and design services from three facilities in Aberdeen and a further base in Dunfermline, which specialises in vessel design and fabrication.

Integrity service

CPS differentiates itself from other companies in that it has developed a niche service that targets, support and delivers service operations for older, mature assets. As discussed in Sir Ian Wood's report under the Asset Stewardship Strategy, asset integrity is a primary objective. "The biggest challenge in the UK is in supplying a service in a mature market at a lower cost," explains CPS's Raff Celentano. "We can not keep doing the same thing over and over again and expecting different results."

Trying to apply the usual tools is not cost-effective on mature assets so this becomes the challenge, how you provide support to mature, and lower production assets? "This is where we fit in, we provide a level of support appropriate for that asset. We provide practical solutions to the mature asset market, which has been recognised by Apache. We have worked with them since 2005 and in 2012 we were awarded a contract for a further three years delivered to the company."

By focusing its efforts on meeting the needs of clients managing mature assets that require a 'lighter touch' and a more specialised approach to maintain, CPS has positioned itself as a vital part of the support network within the offshore industry. Raff likens the company's role to that of a mechanic in the automotive industry, saying: "CPS are the mechanics supporting our clients' MOT rather than designing and building the car from scratch, which the larger engineering companies perform excellently. It's about doing what you need to do to maintain integrity."

Through a combination of steady, organic growth and expertise added by its recent acquisitions, CPS is uniquely placed to provide an 'Integrity Service' to ensure that these mature assets remain productive and profitable. For example, during 2012 Global Energy Group amalgamated its specialist survey company, Global Dimensional Controls Ltd (GDC) with CPS, optimising its existing design capability by bringing outstanding dimensional control and 3D laser scanning services under the same umbrella as the company's already comprehensive service portfolio. This was an important development for CPS as it brought several services vital to maintaining mature asset integrity into the company, significantly bolstering its ability to deliver a fully turnkey service.

Dimensional control for example is predominantly used in spool replacement and routing of new piping systems, where an extremely reliable feed of data, coupled with the development of CPS' own software, provides precise lengths for piping as well as flange deviations and bolt hole rotations. For the client dimensional control delivers a host of benefits including accurate tie point information to guarantee first time fit, clash free routing of new piping and structural systems, the elimination of 'hot work, the ability to be carried out while the plant is live and the prefabrication of replacement parts greatly reducing shutdown times. Furthermore, the 3D laser scanning technology brought into CPS by GDC Z+F HD Scanners, can survey 50.5 million points, with a range of up to 80m, in less than seven minutes. Scans can be co-ordinated and stitched together to form a 360° master cloud point database

that can be used alongside existing software to provide comparison between design and as-built, making the technology useful in both design and diagnostic roles. It can also be integrated with AutoCAD to facilitate modeling alongside the scan information.

Building the skills

At the core of the business is a strong belief in the investment in the technical skill of its staff, both for today and of tomorrow. "As we have grown we have always made a strong point of ensuring that we have the right resources," says Raff. "We have always had a very strong fabrication apprenticeship scheme and take on around six fabrication apprentices each year in what is a very robust programme. Additionally, we have a strong relationship with the Prince's Trust and became heavily involved in its 'Get into Oil and Gas' programme. We first became involved around a year and a half ago in helping disadvantaged people through the programme and a number of them are now going through our apprenticeship scheme."

In an industry first, CPS in partnership with Scottish Credit and Qualification Framework (SCQF) has also established the CPS Academy, which is notable in that it is the first and currently only organisation to have a training programme accredited by a university as a third-party partner. "We have recently looked into one of the key elements of integrity, which is survey," Raff elaborates. "With the support of SCQF we have developed a qualification for offshore oil and gas survey sector, which has been accredited by the Robert Gordon University in Aberdeen. This is the first time they have accredited a third party course and we are very proud of that."

As CPS moves forward into the future it will continue to develop the academy and its services and ensure that it has the right skill-sets to carry the business well into the future. The company's progressive attitude towards training and career development has earned it a retention rate of 92 per cent amongst its staff, and the CPS Academy is an industry defining first that is sure to influence the direction of offshore training in the future. With such a forward thinking philosophy engrained into the business, it is unsurprising to think that CPS has a very bright future indeed. OSG

> Through a combination of steady, organic growth and expertise added by its recent acquisitions, CPS is uniquely placed to provide an 'Integrity Service' to ensure that these mature assets remain productive and profitable

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Pulling forward

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

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

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

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

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

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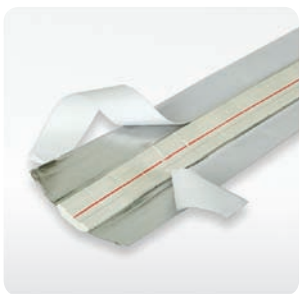

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FPSOs and SPAR buoys. The main advantage of the design is the low lifecycle cost with reduced maintenance. Huse has supplied windlass winches that have served up to nine mooring lines and have a capacity of more than 350 tons. Fairleads are utilised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

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

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

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

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

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

NST

I.P.Huse AS has been using NSSW seamless flux cored wires from NST for almost two decades. One of the main products has been the SF-3A(NVE Grade E) wire designed for welding carbon steel with impact requirements down to -40°C.
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NSSW flux cored wires are widely considered to be the industry standard in Norwegian offshore yards.

I.P. Huse AS
iphuse.no

Services
Design and construction of large winches

Licence to drill

Established in 1995 to create a portfolio of onshore oil and gas exploration assets in the onshore Canning Basin, based in the Kimberley region of Western Australia, New Standard Energy (NSE) today is strategically focused on finding, acquiring and developing oil and gas projects that will add to its diverse range of onshore assets and fuel future growth. Indeed, the Australian firm is committed to realising the oil and gas potential of prospective shale and tight gas basins across Australia and the US and is currently operating four primary basins, Eagle Ford, Texas; Cooper, South Australia; and the Canning and Carnarvon basins, Western Australia.

The diversification of the company's assets stems from the financial and geographical challenges of operating as a small cap company in Western Australia, which in turn led to the company making the strategic decision to expand into new areas and thus generate a much more sustainable business model, as managing director of NSE Phil Thick discusses: "In late 2013 NSE made the decision to diversify our asset and risk portfolio as it was becoming very obvious that the cost, timelines and risks associated with drilling one-off exploration wells in one of the most remote parts of Australia, with no path to market even if successful, was an unacceptable business model for a small cap company. In January 2014 New Standard completed a transaction that has transformed the company into a diverse oil and gas explorer, developer and producer."

Benefiting from a strategic alliance with major shareholder Magnum Hunter Resources Corporation, NSE aims to efficiently develop the Atascosa project in the Eagle Ford assets as well as the Cooper Basin alongside the US based company, as Phil explains: "NSE's current primary focus is the development of our Eagle Ford shale assets to raise revenue and increase reserves. Over the next 18 months we will be accelerating our drilling programme in Texas to drive the company's growth. In addition, we are seeking to develop our Cooper Basin acreage in South Australia with drilling planned to commence late 2015, taking advantage of existing infrastructure and connections to the gas-short Eastern States market. Our frontier Western Australian assets will be managed to retain the upside whilst limiting short-term expenditure."

As a major shareholder of NSE, MHR has taken on two positions on the NSE board, which will give the company ample opportunity to operate NSE's US assets with as much efficiency and technical support as possible. Moreover, with a market capitalisation of approximately $1.3 billion and long-term expertise in the major shale plays in North America, MHR also provides NSE with financial strength and experience; experience that NSE views as a vital ingredient to help it unlock the emerging unconventional opportunities in Australia. Furthermore, NSE's drilling programme in the Eagle Ford will be managed and operated by MHR's technical team on behalf of NSE. "This is the same experienced technical team that oversaw the company's other assets in the Eagle Ford – assets that MHR sold for $401 million in

April 2013. The MHR team has drilled 60 wells in the Eagle Ford," highlights Phil.

The acquisition in both the Eagle Ford shale in onshore Texas and the Cooper Basin in South Australia has not only boosted the company's assets but has completely transformed its portfolio and risk profile. "Since the transformation of the company eight months ago we have drilled our first two Eagle Ford wells and brought them into production; we have also put in place a debt facility to fund these and future wells. The wells were completed and in production before the end of May, on schedule and under budget and the results have been fully in line with expectations. A $45 million debt facility has been put in place with Credit Suisse and the first $9 million has been drawn down to fund part of the cost of the first two wells. Future wells will be funded by a combination of debt, revenue and equity," highlights Phil.

Despite Eagle Ford operations being at the core of NSE's current operations, the dynamic company has a strategic plan in place to continue developing its other assets over the coming years. The Cooper Basin in South Australia will be at the heart of the company's activity in 2016, when its seismic and drilling programme is carried out. "There has been a lot of recent activity around our Cooper acreage that has significantly added value to it, and we expect a lot more to come. There will also be a lot of other companies drilling wells around us over the next 12-18 months, which will add to our knowledge and understanding and drive our programme planning," says Phil.

"However, right now we have approximately 5000 net acres in the Eagle Ford with up to 55 additional well locations identified to be drilled on that acreage. We plan to grow our net acreage position to 10,000 acres over the next twelve months through a combination of acquisition of 'bolt-on' permits around our existing land and new permit opportunities. We would expect to drill between six and eight wells by the end of 2015 and build our production up to 1500 -2000 Boepd in that time," he concludes. O&G

> There has been a lot of recent activity around our Cooper acreage that has significantly added value to it, and we expect a lot more to come

New Standard Energy Ltd
newstandard.com.au

Services
Explorer, developer and producer of onshore hydrocarbons

A history of success

i-Tech was formally established in 2006 as a division of Subsea 7. Today the company is one of the world's largest operators of ROV systems onboard floating drill rigs, platforms and support vessels with offices in Aberdeen, UK; Rio das Ostras, Brazil, Houston, US; and Perth, Australia as well as several global satellite offices. "We have deployed over 100 workclass ROV systems, operating in the main offshore oil and gas markets around the world," says Brazilian director Clovis Galdino. "One of our biggest achievements to date was the successful delivery of 30 systems to Petrobras under a single contract, all of which were mobilised on time within a three year window and are performing extremely well."

Below
The Toisa Valiant ROV spread

i-Tech was last featured in *European Oil and Gas Magazine* in February 2014 and during the intervening period the company has continued to deliver market-leading ROV and survey services to clients throughout the world. This includes two more contracts in Brazil for remote intervention services amounting to $90 million. "We were recently awarded two vessel based contracts to support Petrobras with ROV and survey services for four years," Clovis elaborates. "With our partners Sealion, both the Toisa Valiant and Toisa Vigilant will have dual ROV systems and a comprehensive inventory of survey sensors for high accuracy survey and positioning up to 3000msw, including inertial navigation capabilities."

These contracts further consolidate i-Tech's working relationship with Sealion Shipping and allow the company to focus exclusively on its ROV services, as Clovis explains: "ROV and Survey services are our core business and this partnership allows us to focus on what we do best. Our partners see the same benefit when working with us, resulting in a very competitive and efficient model for our customers."

The company's focus on ROV Services is exemplified by the first deployment of its class-leading and exclusive Centurion SP work-class ROV. This system, which i-Tech specified to its ROV supplier, delivers market leading hydraulic power and thrust. This unit has been designed particularly for ultra-deepwater deployment. "These ROVs are the most powerful in the market, able to achieve 1600 Kgf of bollard pull, combined with a compact footprint making it possible to work in subsea currents of over 3.5 knots. They are currently working with vessels such as the Toisa Coral and Far Saga in

Brazil and are performing very well. They add great value to operations due to their amazing performance in the water," Clovis explains

As a market leader, i-Tech also ensures that it maintains a highly skilled workforce. "Our workforce is continually developing through our in-house training programme," Clovis says. "This strategy has been the key in creating a culture focused on safety and quality. This stands out in a market where companies tend to concentrate on short-term demand instead of investing in long-term personnel development."

The company's dedication to continuous development also extends to its pool of intervention tooling solutions where i-Tech places great importance on the design, fabrication and operation of tools and equipment as Clovis expands: "Innovation is one of the key values of the company and is at the very heart of our business. We have invested strongly in the development of new solutions for our clients and have important partnerships with key suppliers, which have been quite fruitful over time to bring new technologies to the industry."

Presently the company maintains a fleet of over 100 work class and observation systems, with designs to meet the varied needs of its clients. These are supported by a global network of supply bases and project management services through which i-Tech is dedicated to providing subsea intervention technology anywhere in the world.

With its long-established history, strong track record and firm working partnerships, the company is well positioned. Commenting on the future of the company from his perspective, Clovis concludes: "Our vision is to consolidate our position as a market leader and partner of choice in Brazil. We have a history of success and a great business model, I can only see a bright future ahead of us as we continue to position the business in the right places at the right time, with the right resources. Investing in people, technology, reliability and efficiency gives us the best opportunity to support our customer's needs." O&G

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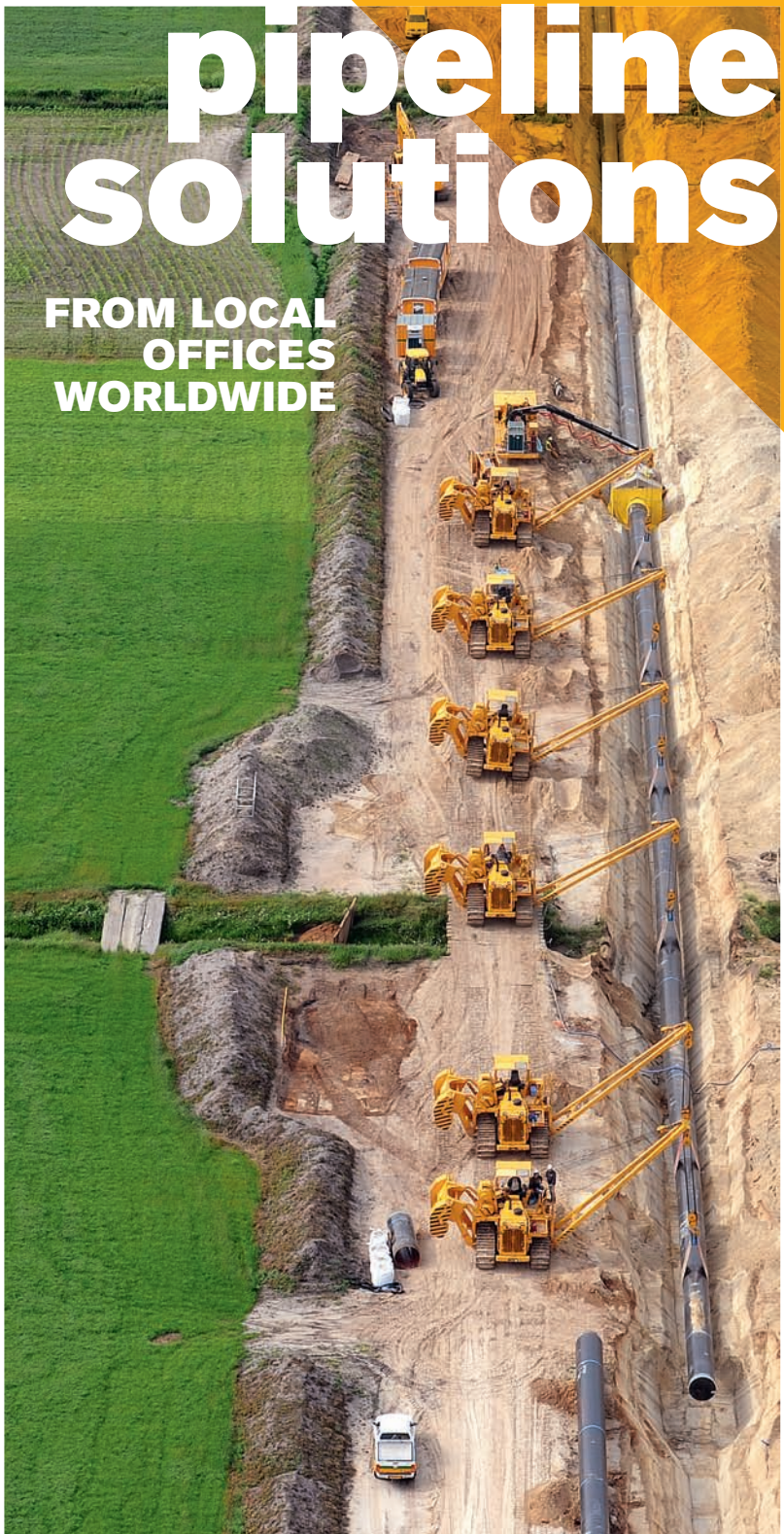

As a cohesive group of independently operating companies A.Hak delivers global solutions for the transport and distribution of oil, gas, water and electricity, renewable energy and telecommunications.

Active in the field of pipelines since 1963, the company grew from a local firm to a multidisciplinary player, with its headquarters in the Netherlands and offices in over twenty countries on five continents. Nowadays, we service the entire chain, from drilling, coating and engineering, to construction, testing and inspection.

To offer the best possible service to our French clients, such as GRTgaz, A.Hak France opened an office in Toulouse in 2013.

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French connection

A.HAK

With the opening of the A.Hak France office in Toulouse in 2013, A.Hak strengthened its positon on the French market. As an important client, GRTgaz rewarded A.Hak France with the 'Pavillon Vert' (green flag) after successfully completing a very strict audit, in which special attention was paid to the environment and local job creation.

A.Hak International also works for GRTgaz. In a joint venture with Spiecapag it realises one of the lots of the Arc de Dierrey project: over 60 km of 48" gaspipe. The project is carried out on scheduled and will be finished later this year.

Established in January 2005

in line with the European directives on the European electricity and gas market, and operating with a similar structure to a public limited company, GRTgaz is 75 per cent owned by GDF Suez, with the remaining 25 per cent stake retained by Société d'Infrastructures Gazières, a public consortium comprised of CNP Assurances, CDC Infrastructure and Caisse des Dépôts. As a public utility, the company ensures the smooth running of the natural gas market in France while focusing on the interests of all consumers. These include industrial sites, and gas industrial sites and gas-fired power plants that benefit from a direct connection to the transmission network as well as households, businesses and local authorities that are supplied via distribution networks that in turn utilise the transmission network.

Able to provide access to diverse supply sources through its connection to LNG terminals on the Atlantic and Mediterranean coasts, as well as neighbouring European networks and underground storage facilities, the company not only contributes to both France and Europe's energy security, but also transmits natural gas in a safe and economical manner. Indeed, by transporting vast amounts of energy via underground pipelines, GRTgaz can protect local landscape and biodiversity while also operating as a driver of future energy solutions such as renewable gas.

Today renowned as one of the leading European operators in natural gas transmission, GRTgaz's natural gas transmission network covers 32,246 km; this includes the main transmission network, 25 compressor stations (with an installed capacity of 525 MW), six interconnections with adjacent networks and three LNG terminal interface points. In addition, the company has complete shares over GRTgaz Deutschland GmbH, which is one of the major pipeline systems in Germany. The system, known as MEGAL, connects the Czech Republic, Germany, Austria and France and comprises of the MEGAL Nord (North) pipeline and MEGAL Süd (South) pipeline; these are interconnected by a pipeline at Rothenstadt. GRTgaz Deutschland operates the MEGAL pipeline as part of a joint venture with Open Grid Europe GmbH.

With more than 100 shipping organisations using the GRTgaz network and services for the transportation of their gas, the company serves 4475 delivery stations and supplies 16 distribution network operators, 828 industrial customers and 12 electricity power plants that are connected to the transmission network. Focused on the delivery of commercial and operational excellence, GRTgaz offers

exceptional support to its customers through tailor-made, flexible services.

Indeed, by pursuing a policy of active dialogue the company can assess the needs of customers using the natural gas transmission network and make the necessary improvements. For example, having become aware of the demand for the guaranteed optimum use of existing infrastructures, the company is increasing network capacity to improve the competitiveness and security of gas supplies. In fact, GRTgaz invests over 800 million euros annually in the modernisation and development of its network, thus ensuring regional stakeholders reap the local benefits. Meanwhile, for its industrial customer base, it is developing services to enable access to the gas market, which will thus allow consumers to optimise their sourcing.

To meet future market demand, the company has a ten year development and investment plan in place, with billions of euros anticipated to be invested in securing the French gas market (between the North and South) through the construction of a new gas pipeline. Due for completion and to begin operations in 2018, the new pipeline will enable access to new supply routes, strengthen the security of natural gas supply and allow new transit capacities to develop and improve the operation of the natural gas transmission network.

As part of a plan to merge the northern and southern France market areas, GRTgaz currently has two major projects underway, one of which being the Arc de dierrey pipeline that will enable gas from other European countries to flow into the network. Work began on the approximately 310 km long, 1.20 m diameter pipeline on 17th March and is scheduled for completion in 2016. Beginning in Dierrey-Saint-Julien, the pipeline will proceed north to Cuvilly (Oise) before progressing to Voisnes (Haute Marne); it will run across three regions (Picardie, lle-de-France and Champagne-Ardenne) and five departments (Oise, Seine-et-Marne, Marne, Aube and Haute-Marne). Estimated to cost around 619 million euros, the Arc de Dierrey project is part of a major transport development programme in North and East France, which aims to enhance network flexibility and bring gas from the Dunkirk LNG terminal from 2015.

In relation to the Arc de Dierrey project, the Hauts de France II project will result in the connection of the Dunkirk methane terminal to the grid, which will thus guarantee the fluidity of natural gas flows in the northern half of

> Today renowned as one of the leading European operators in natural gas transmission, GRTgaz's natural gas transmission network covers 32,246 km

France. Work began on the Hauts de France II pipeline in 2012; it will connect the future LNG terminal in Dunkirk to Cuvilly and will cover a distance of 191 km. The project is due for completion in 2015.

Ever prepared for future market demands and challenges, GRTgaz will continue to utilise its existing infrasturctures as optimally and efficiently as possible, while also expanding its transmission capacity to remain a robust, reliable and flexible option for its consumers. O&G

GRTgaz
grtgaz.com

Services
Transmission system operator

Your local partner

Newly formed in January 2014, Drilling Service Center is a company that has evolved out of the Deep Drill Supply Group and incorporates over 30 years of experience in supplying drill services and equipment to clients throughout Europe and beyond. B.G.H van Amsterdam founded Deep Drill during 1980 before the second generation of Amsterdam entrepreneurs identified the need for an experience centre in Europe combining supply, storage and handling services. This led to formation of Drilling Service Center as a central hub for Deep Drill and several partners forming a cohesive, customer facing umbrella company that provides an all-in-one shop for specialist requirements.

Presently Drilling Service Center is comprised of four partners, with each company focusing on a highly specialised part of the drilling process. Deep Drill Supply Group provides a wide range of drilling equipment through direct sales and on a rental basis. As an OEM distributor and service provider, Deep Drill Supply Group supplies pressure control, flow line and drill string equipment as well as well equipment including oil country tubular goods (OCTG), cement and float and wellhead assemblies. Other partners include Equipment Trading International (ETI), which operates as a global company trading surplus and downgraded equipment; SMFR, specialising in the fabrication and repair of tubulars, equipment and accessories and TD Well Solutions, a Tercel dealer that supplies high quality drill bits, reamers and stabilizers and innovative equipment to ensure tubulars reach TD through sales and rentals providing Total Depth Solutions

Although Drilling Service Center and its partners already encompasses a broad base of products and services, it continues to grow and incorporate new services into its portfolio. "What the centre does is focus on the synergies between all of the partners in the Drilling Service Center," says managing director Jochem van Amsterdam. "What is really interesting is that besides the four partners, there is another partner joining us soon. This is an inspection company and it will take care of the centre's third party inspections. In addition with this new partner we will start developing pipe cleaning storage and handling and conservation services, so in this respect the Drilling Service Center will be able to give a full service package so that contractors and operators will be able to drill a well but also to maintain the well most efficient and effective."

Drilling Service Center is ideally located in Middenmeer, the Netherlands from where the main Dutch offshore ports in Amsterdam, Den Helder, Harlingen and Ijmuiden can all be reached within 45 minutes. Through the use of the Netherland's efficient transport infrastructure the company has excellent access to the rest of Europe and its major international harbours. Drilling Service Center's Middenmeer headquarters employs around 70 staff and includes warehouse facilities of around 4100 square metres, yard space of 19,500 metres, a 1500 square metre workshop, 1500 square metres of cleaning and inspection area and offices, meeting and training rooms comprising 27,000 square metres. In addition to its strong presence in Western Europe, through its partners, Drilling Service Center has branch offices in Algeria, Egypt and Romania providing support to its customers around the world at a local level.

Presently Drilling Service Center and its associated companies remain focused on European projects, where it has developed a clear and targeted business strategy. "Our current target is the North Sea and we are only 40 kilometres from Europe's main North Sea ports," Jochem explains. "We focus mainly on the smaller, independent manufacturers so the equipment that we sell is at the same quality or ever better than that of the majors, while

remaining cost effective. Because we focus on the synergy between all of the partners in the group, there is no competition as all of the companies focus on different areas so they are very complimentary. So for a customer to come to buy or rent equipment or to use services, they can come to one centre and only need to deal with a few people and this greatly simplifies logistics, invoicing and quality control. It's an all-in-one service centre and we provide all of the stock and services under one roof.

"We have long standing experience throughout Deep Drill Center, so the only real change was to move to the Drilling Service Center and to make it one specific entity. Operationally things have not changed much, however customers now see Drilling Service Center as an umbrella company and this makes everything much more accessible for clients and offshore/onshore drilling contractors."

Drilling Service Center is firmly established on the European mainland and the region's oil and gas market, however, the company anticipates that over the next ten to 20 years production will be entered in the emerging markets within Northern Africa and the Middle East. As part of its strategy to establish itself in expanding markets its main partner, Deep Drill, has opened a sales office in Algeria in association with agents with which the company has had a successful relationship for several years. Over the coming years the business will look to opportunities in Libya, Egypt, Tunisia, Romania and surrounding countries as possible regions for expansion.

Now that Drilling Service Center has been established as the customer facing umbrella for Deep Drill and its associated partners, the firm will look to focus its efforts on delivering targeted services that differentiate it from of market players, as Jochem concludes: "Business growth is mainly in specialist services rather than diversifying. Previously the companies at the service centre could do all brands and products, but during the past three years they have been much more focused on specific core businesses and brands and developing those. We are also focused on supplying very cost-effective but high quality products compared to what the majors are supplying. Recently through Deep Drill we have worked with RAG in Austria, NAM in the Netherlands, Chevron and Noble – these are customers that are much bigger then we normally focus on, but over the past years it has been noticed that Deep Drill makes a difference so we are able to supply these larger companies. This is something we are very proud of. We are also proud to announce the co-operation between TSP and Deep Drill, developing drill collars and heavy weight drill pipe under API 7 and NS 1 license. Come and check us out on the SPE ATCE in Amsterdam, booth 3022." OSG

Drilling Service Center
drillingservicecenter.nl

Services
Drill services and equipment

Full of energy

Above
The Skærbæk power station in Jutland, Denmark, is currently being converted to use wood chips as primary fuel instead of natural gas

Below
Flemming Horn Nielsen, DONG Energy, senior vice president and responsible for DONG Energy's Danish oil and gas business

DONG Energy was established in 2006 by the merger of six Danish energy companies: DONG, Elsam, Energi E2, Nesa, Københavns Energi and Frederiksberg Forsyning. Initially created as a vehicle to develop Danish energy activities, the company has expanded significantly through organic growth and acquisitions both in Denmark and across Europe. Over the past 12 months DONG Energy has led the development of the Hejre field in the Danish sector of the North Sea. The field, which is DONG Energy's first High Pressure – High Temperature (HPHT) expansion, is expected to start production in 2017.

Commenting on the progress of the project, Flemming Horn Nielson, senior vice president says: "We have successfully installed the jacket and started on the first out of five production wells. The topside is under fabrication by Daewoo in Korea and we have manufactured and installed both the gas and oil pipelines for the platform. The big focus and challenge at the moment is on drilling these wells on time and on budget with a great focus on the construction and finalisation of our topside," he adds.

By the conclusion of 2013, the Merchant Banking Division of Goldman Sachs and two other pension fund investors, ATP and PFA made a heavy investment in the company, reducing the state's ownership to 57 per cent. "Today we have a much bigger chunk of private investors in the company and an exciting future ahead," highlights Flemming. The parties agree to seek an initial public offering (IPO) of DONG Energy by 2018 at the latest and as such the Hejre project plays an important role.

The large scale of the project poses several engineering and manufacturing challenges, and in the company's half year report, released in August 2014, it highlighted design related challenges of the topside with knock on effects to the manufacturing, isolation, hook up and commissioning work. "Overall, the project is going well with great expectations for the future although we have the challenges with the topsides. This is a key project, not just for exploration and production but for the whole company," says Flemming.

National predictions highlight a significant increase in oil production when Hejre enters the production phase as Flemming points out: "With approximately 40,000 barrels a day, the project has a big impact on the self-supply of oil for Denmark and will prolong it for several years. Since the mid 1980's Denmark has been self-supplying its oil and gas. However, there has been a down-going trend since 2003 but the boost from the Hejre project certainly helps that

curve improve for the future.

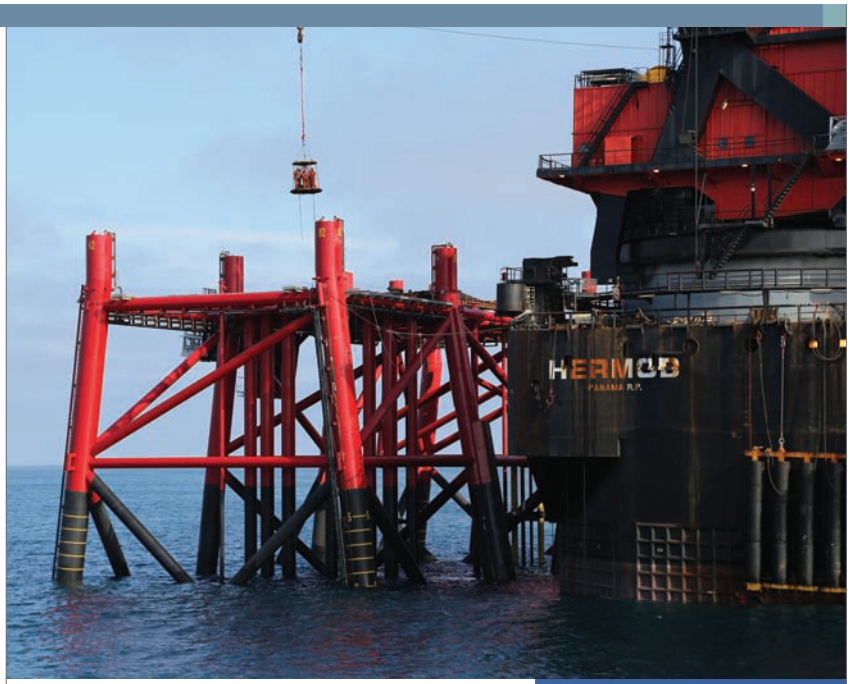
"We have ongoing operations in the area around the Siri field, and with Hejre our presence in Esbjerg will be reinforced from which we can run our operations more efficiently. Essentially, our whole daily operations will be given more of a lift and as a company we can do more with competences and synergies and so on, so it is a really good add on to our existing business."

Ensuring that key competences exist within the traditional positions is vital to the success of the business in all areas, understanding both old and new reservoirs. "We also look closely at the technology side, but the most important part is how you project manage the developments on time and to budget, ensuring you achieve the quality expected. How to execute projects on time and on budget and orchestrating this for the future is a huge topic for the oil companies," Flemming explains.

The company has a very strong focus on the development of wind energy, and despite some initial concerns from external parties that the strategy may change following the private investment, it has been made clear that the investors have bought into a strategy that has a heavy footprint on the development on wind energy with approximately half of the investments in DONG Energy going into wind turbines. "Wind energy has a strong future and we believe in bringing down the price of energy. The other big chunk of investment, closely following wind investments will be going into exploration and production.

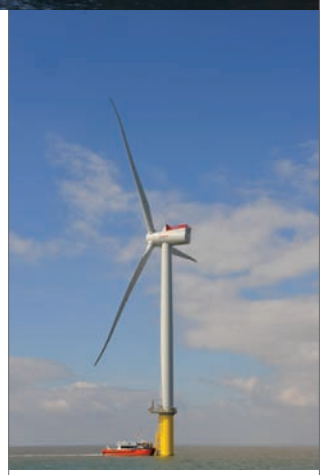
"Additionally we will be doing a lot of work on our existing traditional thermal power plants, where on a broad scale we are converting coal and gas fired plants to plants using biomass. As a whole company we have targeted our carbon emissions, significantly reducing the amount per energy produced," explains Flemming. Recognised amongst the best in Europe in the transformation of the electricity and heat production, the company has set itself an ambitious target of reducing the CO2 emission per produced kWh by 60 per cent in 2020 compared to figures of 2006 and is well on its way to achieving it.

Within the business is a strong team of employees that has been involved in the design of power plants from the original coal source to today's biomass solution. "The team has been undertaking extensive R&D work, focusing on topics such as addressing the aggressive corroding products released when hay is burned as a fuel source, but also ensuring that products can be more easily sourced and of a high quality. The transformation over the last seven years has been particularly impressive," says Flemming.



In 2013, a government deal with supporting parties agreed a new national oil strategy aimed at the oil and gas industry, working towards ensuring exploration and research of smaller assets in minor fields and getting the most out of production. DONG Energy reached a major milestone in 2014 having been dealing with fatigue crack issues on structures in the Siri field and in July 2014 installed new stabiliser legs securing the life of the platform and surrounding satellites. "We have also progressed on the Solsort discovery following the successful drilling that proved the presence of hydrocarbons in both the eastern and western parts of the region. Together with our partners we are focused on the next stages, deciding on the concepts and expecting to reach some final strategic decisions in 2015.

"As we move forward, the focus in Denmark for the business is two-fold. Firstly, driving forward and executing the ongoing projects in Hejre, Solsort, and Siri, are ensuring the growth. In Demark we will significantly increase the production when Hejre starts producing, and delivering projects on time and on budget is a huge focus area but the other target goes beyond 2020 and sustaining production. We are currently at the seventh licensing round, so it is important that we focus on being successful with this to continue in line with the strategy," concludes Flemming. O&G



Top
Installation of the Hejre jacket in Danish North Sea

Above
The Gunfleet Sands Offshore wind farm, UK, where DONG Energy has erected its first 6MW wind turbine

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