offshore holland 05

dutch innovations and **technologies** for the international oil and gas industry

New generation, self-propelled multi-purpose vessel

Unique hyperbaric test centre attracts worldwide attention

Every lubrication system is custom-made

Innovative Dutch offshore engineering

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The management of DCN is above all focusing in the future on the international oil and gas market, and specifically the field of hyperbaric underwater repair work. In Bergen Op Zoom a hyperbaric test centre is under construction – a first in the Netherlands.

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Innovation and durability. These two words in combination form the basis of the company philosophy of the Dutch-based TrustLube. The company designs, fabricates, assembles and installs automatic lubrication systems and monitoring systems.

Offshore Holland is a high-quality magazine with the objective to promote the interests and export opportunities of the Dutch supply and service companies in the upstream oil and gas industry. Moreover technological developments will be highlighted in order to contribute to a positive representation and positioning of the Netherlands as innovative and ingenious partner country.

Initiators

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Supporting business opportunities

This Offshore Holland edition is dedicated to the 15th ADIPEC, which will take place in Abu Dhabi from 11-14 November 2012. I personally feel very comfortable with the theme of this year's conference 'Sustainable Energy Growth: People, Responsibility and Innovation', as it is a topic to which we can make significant contributions from the Netherlands' perspective and experience. Effective safety and risk management programs, developing the workforce, developing new technology, and ensuring competency across the organization have become a focus for major oil and gas companies in the GCC-region and provide additional scope for Dutch companies.

John Barry, Vice President Technical (Middle East and North Africa) & Country Chair for Shell Abu Dhabi B.V, said in a recent article that "... pulling together a top quality technical program, together with a great exhibition pulling together top IOCs, NOCs and suppliers, make ADIPEC a truly impactful event in this region. Shell has been a keen supporter from the inception, and looks forward to another record breaking ADIPEC."

Dutch Energy Solutions: an initiative to be proud of

The Dutch presence is of course not only visible through Shell, but also very much through Dutch Energy Solutions (DES), a three year program clustering Dutch oil and gas related companies supported by the Dutch government. With this ADIPEC, DES is set to cement ties with its counterparts in the Gulf. Again this year we will have a significant Dutch presence at ADIPEC, under the umbrella of a Holland Pavilion, with over thirty companies participating.

IRO (Association of Dutch Suppliers in the Oil and Gas Industry) together with DES has successfully organized an impressive collective representation of the Dutch oil and gas supply industry for this year's ADIPEC. The Dutch delegation that participated in the last ADIPEC (2010) was ranked among the top five pavilions by the ADIPEC organization! Also this year, we will be looking forward to successful matchmaking between Dutch companies and local and regional partners.

Gateway to Opportunities: in Abu Dhabi, the UAE, the GCC, and beyond

ADIPEC is a prime destination for oil and gas industry professionals to get together to experience, discover, network, discuss and debate core industry issues. The bi-annual ADIPEC has grown by 16% since 2008 and attracted over 45.000 attendants in 2010. The announcement that ADIPEC will be held on an annual basis from 2013 onwards reflects its success.

ADIPEC is known for its excellent networking opportunities. It features the biggest attendance of national oil companies (NOCs) and international oil companies (IOCs) of any event in the region. Networking enhances opportunities to develop and deepen relationships. The Netherlands Embassy in collaboration with IRO/Dutch Energy Solutions (DES) will host a reception by bringing IRO/DES delegates and local and regional industry players together.

Learning how to work in the GCC-area

Some Dutch companies have well established and extensive business relationships with GCC oil and gas players; some may have entered the market recently, and some may aspire to market-entry. For all companies seeking to do business in the GCC it is essential to have a good understanding of the Gulf business dynamics in the oil and gas industry. This year's exhibition brings the region to Abu Dhabi with the introduction of GCC Country Briefings featuring key industry figures and companies.

The country briefings will be of great help to companies wanting to enter GCC markets by promoting awareness of local regulations, trends and best practices. These briefings have already attracted the support of PDO, KPC and ADNOC, and more NOC's are due to come on board shortly. We certainly encourage Dutch companies to participate for additional insights into the GCC oil and gas company dynamics.

We look very much forward to support business opportunities for Dutch companies at the 2012 ADIPEC.

Gerard Michels
Ambassador to the United Arab Emirates

It is my great pleasure to invite you to discover the November issue of Offshore Holland

Greetings!

OSEA: An invitation and an Opportunity

For those of you visiting Singapore for the OSEA conference this 27-30 November, welcome to the Lion City. A forum for top Oil & Gas industry players from around the world, this is certain to be a prime event for showcasing an impressive range of technologies, products, and cutting-edge ideas. Since its beginnings in 1976, OSEA has proven a select platform for forward-thinking professionals in the industry to network, discuss important technological and strategic developments, and further creative exchanges regarding solutions for the future.

This year, the Show organizer looks forward to welcoming approximately 25,000 visitors, a remarkable success made possible with support from sponsors, government institutions, exhibitors, visitors, conference speakers, delegates, press, & partners. I am proud to note that the 'Holland Pavilion', organized by IRO (Association of Dutch Suppliers in the Oil and Gas Industry) and HME Holland Marine Equipment, will feature over 25 well-respected, innovative companies, making the Netherlands a key presence at this dynamic event.

The Dutch Oil & Gas Industry: A history of excellence

It is well known that the Dutch oil and gas industry belongs to the top five in the world, along with the US, the UK, Norway, and France. Not only is the Netherlands an important onshore and offshore gas producer, its strengths in infrastructure and logistics also make it one of the world's foremost hubs for transporting goods to every part of the globe. In addition, the Dutch history of struggling against - and learning to harness - the sea's power has led to a wealth of maritime experience. Thanks to this legacy of challenge and excellence, turnover of the Dutch oil and gas supply industry has grown to approximately five billion Euros, with an added value of 2,250 billion Euros. Roughly 70% of this is export, with markets from the North Sea to the Gulf of Mexico; from Abu Dhabi to West Africa; from Kazakhstan to Brazil; from Asia to the Arctic.

Around 400 companies in the Netherlands currently supply goods and services for oil and gas exploration. Even more impressive is the 20,000 people these companies employ. Although the Dutch oil and gas industry covers the whole vertical production chain, from consultancy to engineering to fabrication, particular areas of expertise include gas and offshore exploration technology and logistical management of large and heavy offshore structures and vessels.

Expanding Horizons: Innovation & Cooperation in Singapore and Asia beyond

Globalization, economics, and the Netherlands' penchant for international collaboration mean that many Dutch-designed oil and gas industry projects now come to fruition in Asian shipyards, including in Korea, Malaysia, Indonesia, China, and of course Singapore.

As one of the world's foremost manufacturing bases for the conversion and new building of offshore platforms, drilling rigs, and supply ships, Singapore is a key player in the booming Asia-Pacific deep-water oil & gas market, and a much-respected partner for Dutch companies. Accordingly, many prominent representatives of the Dutch oil & gas industry are present and extremely active in Singapore.

The similarities between the Netherlands and Singapore are compelling: As forward-thinking, knowledge-based economies that function as global hubs, both countries can be proud of a Maritime legacy built on excellence and innovation. As we grow the relationship, we will further develop cooperation in the maritime and offshore industries with regards to trade, investments, R&D, education, training, academic exchange, and much more. It is in keeping with this exciting atmosphere of exchange and innovation that I invite you, once again, to take full advantage OSEA in Singapore, and to enjoy this edition of Offshore Holland.

Johannes Jansing
Ambassador to Singapore

Fifth edition of Offshore Holland!

As Managing Director of IRO - the Association of Dutch Suppliers in the Oil and Gas Industry, I am proud to present you the fifth edition of Offshore Holland!

Also in this edition, you will be informed about the expertise and service of Dutch companies that are related to the offshore industry. High profile technological developments are presented to you and demonstrate the innovative, creative and resourceful character of The Netherlands.

The Dutch oil and gas supply industry belongs to the top of the world. Responsible for this position are the facts that The Netherlands is an important onshore and offshore gas producer; the maritime history of the country; its continuous struggle against the sea and the fact that The Netherlands is the home base of Shell. Also the position of The Netherlands as a logic hub with an excellent infrastructure to transport goods to destinations all over the world plays an important role. The Dutch oil and gas industry is involved in oil and gas projects all over the world.

Every year IRO organizes Dutch group participations at successful international oil and gas events and exhibitions throughout the world, often in cooperation with Dutch embassies and sister associations abroad. These exhibitions are outstanding opportunities to meet the Dutch suppliers displaying their products and services.

From 11-14 November 2012 IRO members will demonstrate their products and expertise at ADIPEC in Abu Dhabi, UAE. The Dutch suppliers have very good connections with the oil and gas industry in the Middle East.

Abu Dhabi accounts for 90 per cent of UAE oil and gas production, having more than 90,000 million barrels of recoverable crude and the world's fifth largest deposits of natural gas. In the oil and gas sector, Abu Dhabi National Oil Company (ADNOC) is planning a large investment in engineering, procurement and construction (EPC) to raise its sustainable oil capacity and upgrade its hydrocarbon infrastructure. This offers great opportunities for the Dutch suppliers in the oil and gas industry as well.

From 27-30 November, the Dutch suppliers in the oil and gas industry are represented at OSEA in Singapore. The Netherlands and Singapore have many similarities. Both are well developed industrial countries with a well-developed maritime industry that serves a wide region. Singapore as the world's foremost important manufacturing base for the conversion and new building of offshore units is a very important market for the Dutch oil and gas supply industry. Not only for the supply of equipment and services, but many of the offshore structures and ships built in Singapore are of Dutch design. Reason why many Dutch suppliers from the oil and gas industry are represented in Singapore by an agent or with their own office. Keppel for instance, one of the most important shipyards in Singapore for the offshore oil and gas industry, also has a shipyard in Rotterdam, The Netherlands: Keppel Verolme.

In the Netherlands Oil & Gas Catalogue you can find more information on the activities, products and services of the Dutch suppliers. The catalogue is distributed at (international) exhibitions, trade missions and seminars and can also be found online at *www.iro-noc.nl*. For up-to-date information on where and when to meet the Dutch suppliers at export promotional events, have a look at *www.iro.nl*.

I wish you all a pleasant reading of Offshore Holland!

Yours sincerely,
Sander Vergroesen
Managing Director

IRO - The Association of Dutch Suppliers in the Oil and Gas Industry

IRO Exhibitions and Export programme 2012/2013

Date	Activity	City/Country
2012		
11-14 November	ADIPEC	Abu Dhabi, UAE
27-30 November	OSEA	Singapore, Singapore
2-7 December	Trade mission Vietnam	Hochiminh City, Vietnam
2013		
20-22 February	Australian Oil & Gas	Perth, Australia
26-28 March	On & Offshore	Gorinchem, The Netherlands
6-9 May	OTC	Houston, USA
5-7 June	Oil & Gas Asia	Kuala Lumpur, Malaysia
3-6 September	Offshore Europe	Aberdeen, United Kingdom
8-10 October	OTC Brasil	Rio de Janeiro, Brazil
15-16 October	Offshore Energy 2013	Amsterdam, The Netherlands

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Dutch designs built in Asia

One of the foremost offshore ship designers is Ulstein Sea of Solutions from the Netherlands. Since its establishment back in 2001, the company has been known for its innovative, yet cost effective ship designs. Over time, the company has gained world market leadership in the design of large, complex construction vessels, which all have been built or are currently under construction in South East Asia. Below and on the next three pages is an overview of their designs which could not have been realized without a big touch of Asia.

Seven Borealis

Subsea 7's flagship 'Seven Borealis' is a true example of the cooperation between Asia and Holland. Fully developed by Ulstein Sea of Solutions of the Netherlands as a customized ULSTEIN SOC 5000 design, the vessel started off as a heavy lift vessel and during the construction was upgraded to the deepwater heavy lift/pipelay vessel she is today. Huisman Equipment was the other major Dutch party in realizing this project, where Sembawang Shipyard from Singapore was responsible for the construction of the vessel platform.

Global 1200 / Global 1201

The 'Global 1200' and 'Global 1201' pipelay / heavy lift vessels owned by Technip are customised ULSTEIN SOC 600 designs, fully suited to cover the entire range of pipelay operations; from beachpulling to deepwater S-lay. The vessels' capabilities were increased during the construction period in close cooperation between owner, designer and Keppel Singmarine.

Flintstone

The deepwater fallpipe rockdumping vessel 'Flintstone' is the result of a long term relationship with Tideway Offshore Contractors from the Netherlands. The vessel, build at Sembawang Shipyard is another example of a Dutch design with Dutch equipment realized in an Asian yard. The vessel is capable to perform rock dumping operations in up to 2,000m water depth and features ice class notation.

Jasper Explorer / Aban Abraham

Besides newbuild designs, Ulstein Sea of Solutions (USOS) is also actively involved in upgrade and conversion designs. Drillship upgrades includes the Pelican Class self propelled drill ship Jasper Explorer and Aban Abraham, where USOS performed the design activities to enable the vessels to operate in much deeper waters. Sponsoons were added to cope with the added equipment and payload capacities, which included a latest generation drilling derrick. Sembawang Shipyard was once again the construction yard.

Sapura 3000

With the ‘Sapura 3000’, a customized ULSTEIN Seabarge 3000 design, Ulstein Sea of Solutions introduced the double deck principle in the market for derrick lay barges. The principle allows separating the heavy lift functionality from pipelay operations as all pipelay related activities are performed on the freeboard deck. Over time, the double deck principle of the ‘Sapura 3000’ has been trendsetting, putting the designers in the forefront of setting market standards.

DLS 4200

The ‘DLS 4200’ is currently under construction in China at ZPMC Shipyard for NPCC from Abu Dhabi. The vessel features a double joint fabrication area below the main deck and a large 4200 tonne AmClyde main crane, also being build in China. With its 10-point mooring and DP 2 system, the vessel can operate in both shallow and deep water areas.

Aegir

Based on the successful ULSTEIN SOC 5000 design, Heerema's new deep water construction vessel 'Aegir' is currently under construction at DSME shipyard in Korea. The vessel is lengthened by 28 m compared to the original SOC 5000 design to accommodate a large moon pool off centerline for J-lay and reel lay operations. Again, the vessel is an excellent example where Dutch design and equipment work closely with an Asian construction yard to deliver a successful project.

Sapura 1200 / Sapura 3500

For the development of their new derrick lay vessels 'Sapura 1200' and 'Sapura 3500', currently under construction at COSCO shipyard in China, SapuraKencana, one of the world's largest integrated oil and gas services and solutions providers, has once again chosen for the vast design experiences of USOS in the field of complex construction vessels. Both vessels feature a ZPMC revolving tub crane and again below main deck pipelay facilities, the distinctive feature of Ulstein Sea of Solutions' derrick lay vessel designs.

New generation, self-propelled multi-purpose vessel

The Seafox 5 is one of the world's largest vessels of its kind.

The Seafox Group, leading providers of offshore accommodation and multi-support service jack-ups, has increased its working interest in the new generation multi-purpose offshore installation jack-up vessel Seafox 5. The Dutch player now owns 51% of the four-legged, self-propelled jack-up vessel, with Keppel Fels from Singapore holding the remaining 49%. The Seafox 5 will be managed and operated by Workfox BV, a member of the Seafox Group.

On 18 August 2012 the Seafox 5 was named by Lady Sponsor Mrs Marlies Cordia Roeloffs.

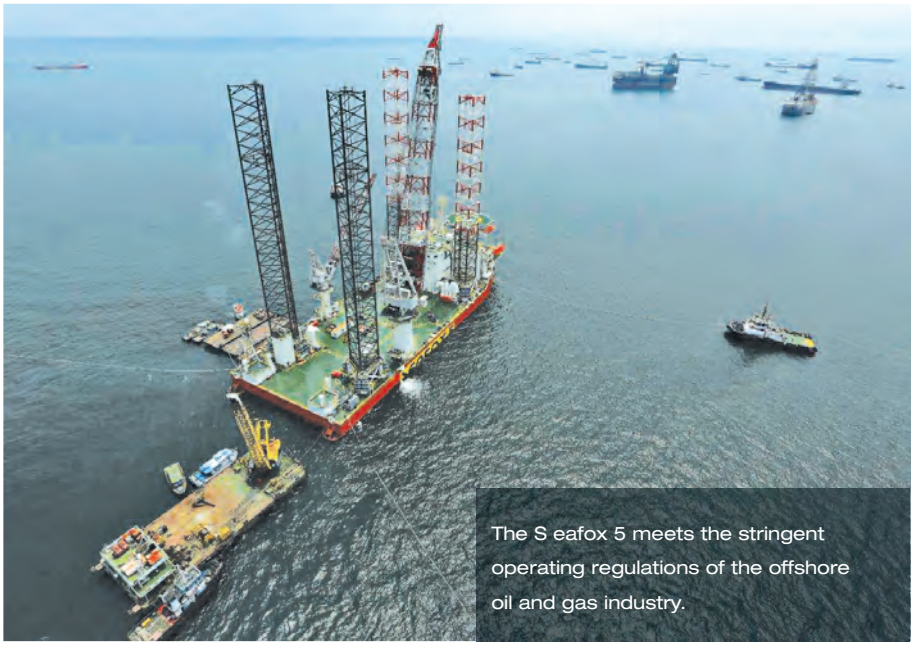
On 18 August 2012, the Seafox 5 was named by Lady Sponsor Mrs Marlies Cordia Roeloffs at the Keppel Fels Shipyard in Singapore. The Seafox 5 is one of the world's largest vessels of its kind in its market, and was built according to Keppel's new proprietary Multi-Purpose Self-Elevating Platform (MPSEP) design, developed by Keppel's R&D division, the Offshore Technology Department, and was selected by the Dutch leading fleet owner and operator, Seafox Group, in July 2010. This design is an innovative concept for a variety of offshore applications, offering significant advantages in terms of safety, operations, time and costs, for operators working in harsh environments.

Offshore wind

The Keppel Fels MPSEP design has distinctive advantages over existing vessel designs for the installation and maintenance of heavy wind turbine foundations, for example jacket and tripod type systems, with its particular capacity for operating in water depths of up to 65 metres, as compared with the standard 45 metres. With the carrying capacity to handle up to twelve 3.6 MW turbines, three jackets or four tripods at a time, the Seafox 5 improves the efficiency of offshore wind farm construction.

This offshore, multi-purpose vessel has a heavy-lift pedestal crane on board, capable of hoisting 1,200 metric tonnes, a free deck area of 3,750 m2 and a variable deck load of 7,000 metric tonnes. In addition, the vessel can be elevated above sea level on its four legs, providing 30 metres of clearance between the legs and crane, for easy cargo access. The enhanced jacking and moving criteria (Hs 2.0m by 6-8/sec period) of the vessel offer operators substantial added value in terms of efficient utilisation throughout the year, also because this vessel requires shorter weather windows to complete the job at hand. As compared with other jack-ups, the Seafox 5 can carry out offshore installation projects with 30% less weather downtimes.

Keesjan Cordia, MD of the Seafox Group commented: “By overcoming the typical limitations of the existing offshore wind fleet on the market, Seafox 5 redefines the way in which offshore wind farms are installed and maintained, across the world. In the future, offshore wind farms are expected to move further offshore and into harsher environments such as the Central North Sea, where wind speeds are higher and more constant, but where at the same time more robust solutions are required. There is also a growing trend towards wind turbines with larger capacities, which are automatically heavier in terms of weight.”



The S eafox 5 meets the stringent operating regulations of the offshore oil and gas industry.

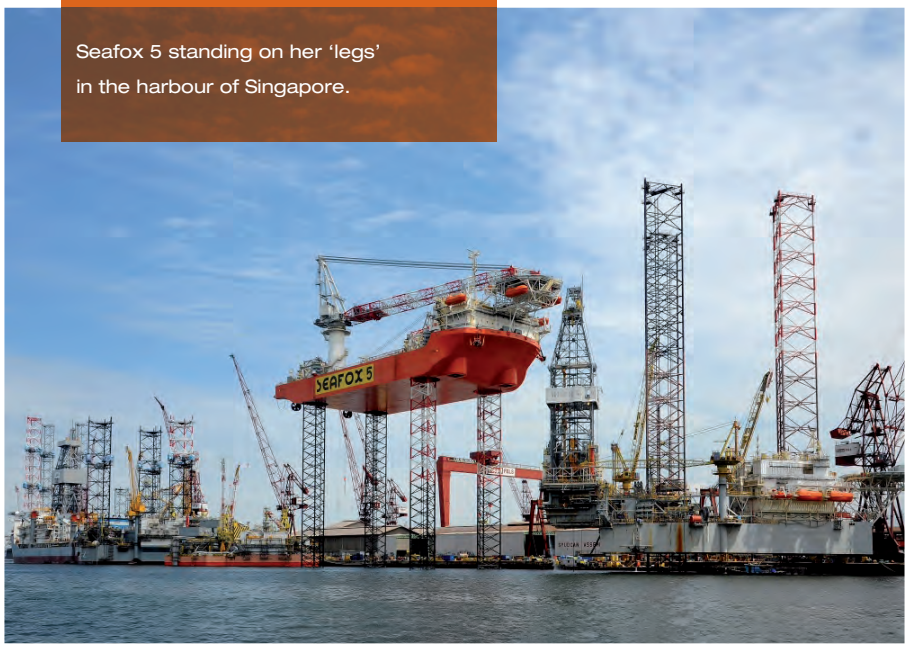
This new-built jack-up will start work as early as November this year with Aarsleff Bilfinger Berger in the German sector of the North Sea. The first assignment will consist of installing 80 offshore wind foundations in the 288 MW Dan Tysk wind farm, over a nine-month period, with further options for an extension of up to 90 days.

Keesjan Cordia went on: “Developers and operators of offshore wind farms place a clear emphasis on the reliability of delivery and operations. As such, the collective strengths and track records of the Seafox-Keppel alliance, augmented by an outstanding vessel concept, have pushed us forward in sealing the charter contract with ABJV DanTysk. The ability of the Seafox 5 to withstand harsh offshore environmental conditions all year round will be advantageous in this first charter, where we are expected to work through winter in the North Sea. Our engineers have designed a jack-up which is self-propelled. In designing other units, the underlying principle was for a vessel also capable of being jacked up on legs. This vessel represents a completely different philosophy. With the Seafox, we can cope with conditions that in all probability would be too much for our competitors, and even if they were to continue operations, the risk of damage would be relatively high. The concept of the Seafox 5 is based on the fact that a jack-up when offshore must always be able to survive, even with full equipment, even in a force 12 gale. To be able to guarantee safety, other units are often forced to head for port to shelter and to avoid damage to the deck loads. Although the Seafox 5 may be slower in covering the short distances relevant for these operations, this fact should represent no problem. For us, the decisive factor is the capability of the Seafox 5 to be deployed in even the severest of weather conditions - that ability is the critical path. Performance and delivery are the key words in projects of this kind. What we now need to do is prove how reliable we are in project execution; therein lies the key.”

Oil and gas

In addition to being well-suited for servicing offshore wind farms, the Seafox 5 also meets all the stringent operating regulations of the offshore oil & gas industry, and is able to support a wide range of related activities such as accommodation, hook-up, commissioning, well intervention, maintenance, construction, installation of monopods and small platforms, and decommissioning, in and outside the North Sea region. The Seafox 5 has for example been built to accommodate up to 150 crew in two-person cabins, in compliance with Norwegian standards, but these facilities can easily be modified to fit up to 300 staff on operations elsewhere in the world.

The Seafox 5 is expected to give larger state-of-the-art crane vessels such as the Stanislav Yudin and the Oleg Strashnov a run for their money, in delivering projects at half their going rates but within the same time frame. “If we are able to achieve the same delivery and project track record, we will be more competitive, and that is precisely the challenge facing us,” explained Cordia. He conceded that demand for offshore wind installation in the North Sea has



Seafox 5 standing on her 'legs' in the harbour of Singapore.

been slow in picking up, a fact that explains the current focus of the Seafox on short-term work in the oil and gas sector, prior to the expected upswing in the wind market. Cordia attributed the delays in North Sea wind developments to the challenges faced in raising the multi-billion euro project financing and the lack of the necessary network infrastructure for connecting new offshore wind farms to the existing grids in Germany and the UK. "I estimate that offshore wind installation in the North Sea will build up momentum by mid-2015, and will really take off in 2016," he suggested to Offshore Holland, adding: "That is why we have proposed use of the jack-up for offshore installation work on several oil and gas projects in the Middle East that need to be executed in 2014. We are of course also looking forward to the advent of the decommissioning market, for the removal of platforms on the basis of a lump sum agreement. At present we are preparing our organisation to offer this type of activity to our customers – the same customers, in fact, to whom we have traditionally provided our other Seafox work vessels."

The Seafox 5 is able to operate in harsh environments and up to 65 meters water depth.

Shackles and round slings combined with confidence

The Dutch company Van Beest is a leading manufacturer and supplier for a complete program of high quality fittings for lifting chain and steel wire rope. For over 90 years the production of high tensile shackles has been the core business and competence of the company, founded in 1922. From the very beginning Van Beest has been forging shackles and its ironwork expertise gave the shackle an edge over the competition.

In the 1970's, the trade name Green Pin® was launched to emphasize product quality, recognition and demand worldwide. Green Pin® shackles are manufactured in the Van Beest production unit in Sliedrecht, The Netherlands. It is a genuine 'Made in Holland' product. Currently, not only shackles are sold under the name Green Pin®, but also other items, such as sockets, turnbuckles, wire rope clips, loadbinders, etc.

In 2007 Van Beest acquired the brand EXCEL®. Under this brand grade 8 and grade 10 lifting hooks are produced. The EXCEL® range of chain accessories is very complete. Everything you need to make a chain assembly is in the program. From the master link to the hook, whether this should be an eye-, swivel-, or clevis hook. And not only in grade 8, but almost every product can also be supplied in grade 10 or stainless steel.

Background

Round slings, made out of textile fibres, are frequently used in combination with shackles of the same load-capacity in everyday lifting applications. But in many cases the bend radius of the shackle is a sharp edge for the sling as defined by the rule of thumb (Bend radius of the bearing surface of a sling must be no smaller than the thickness of the sling). As there are no standards or regulations for assessing these situations.

Van Beest has tested the breaking strength of certain combinations of round slings and shackles together with SpanSet GmbH & Co. KG, Axzion GKS Stahl- und Maschinenbau GmbH and the DGUV, Deutsche Gesetzliche Unfallversicherung – Fachausschuss Metall und Oberflächenbehandlung (German Social Accident Insurance – Metal and Surface Treatment Technical Committee), Hanover in the 600 t test rig at Axzion, the lifting beam manufacturer belonging to the Spanset Group. Green Pin shackles proved to be ideal for use with round slings thanks to their smooth contact area.

The Spanset Group has been intensely involved in the safety of lifting, working at height and load control,

The strength tests were carried out on calibrated 250 T and 600 T tensile testing machines.

for more than 40 years and has developed into a market leading international company.

Selecting the products for the test
The spectrum of tested lifting capacities for the combinations of round slings and shackles covered the most common increments of the load capacities ranging from 0.5 t up to 150 t. Van Beest tested round slings made of both classic polyester fibres as well as round slings of high-performance fibres. The latter is of particular interest since the properties of the fibre material used in these slings differs from those of conventional polyester fibres.

Standard Green Pin® shackles were used in the tests. These shackles have a uniform high quality, produced by upset forging from round bars, making them very different from standard imported, drop forged shackles and ideal for use together with round slings. Often, drop forged shackles are insufficiently deburred and can have sharp edges. Deliberately the use of special sling shackles was avoided in line with common practice.

Test procedure

A test plan was drawn up in cooperation with the DGUV that took into account the usual combination of parts with the same WLL. 5-times the nominal carrying capacity was defined as the target strength to be achieved for round slings with a nominal lifting capacity of below 10 t and 4 times the nominal carrying capacity for slings with a nominal lifting capacity of 10 t or more. The slings were positioned in the bow of the shackles in each case.

The strength tests were then carried out on calibrated 250 T and 600 T tensile testing machines. The test was deemed to have been passed successfully as long as there was no sudden drop in force or a complete breakage of the sling. Damage to the sling's sleeve or deformations of the shackle were acceptable in view of the excess load.

In the tests the force was applied gradually and then maintained, so that the force did not fluctuate sharply and a complete failure of the sling did not occur. In addition, variable load tests were performed in which the same parts of the sling were subjected to cyclic loading. The range of tested load capacities of the round sling shackle combinations covered the commonly available products with load capacities of between 0.5 tons and 150 tons.

To ensure that the highest stresses on the round slings always occurred at the bearing area on the shackle, the ends of the sling opposite the suspension points were passed over a pin with a substantial larger radius than that of the shackle. The applied test load was related in each case to the pressure in the hydraulic cylinder of the testing machine.

Result

After loading and removal from the machine, the test specimens were examined and the findings recorded in a test report. In addition to the main criterion i.e. whether the combinations of round slings and shackles had withstood the applied test force, it was also ascertained whether the individual components had been easy to separate from one and other. And whether pressure points had led to any damage to the round slings due to contact pressure at the shackle radius.

All of the various combinations that were tested achieved the respective target strength. High performance fibres of a previous generation such as that were originally used in round slings displayed susceptibility to this type of loading and resulting stresses. This was not observed with the latest generations of Spanset high-performance fibre slings in combination with Green Pin® shackles.

First for DCN from Bergen op Zoom

Unique hyperbaric test centre attracts worldwide attention

Overview of the test centre in Bergen op Zoom, Holland.

For a number of years, there was little news from DCN International Diving and Marine Contractors. However, this does not mean that nothing was happening in Bergen op Zoom, Holland. Indeed, the opposite was the case. The Vriens brothers have been quietly working on an imposing comeback with the positive outcome that since 2010, their position has improved steadily. The order book is continuously well-filled with eye-catching projects, much hard work is underway on completing a hyperbaric test centre, a specialist ROV division has been established, and more than 10 million euro have been invested in two new ROVs (Seaeye Cougar and Seaeye Falcon), a mobile saturation system and additional welding systems.

A hyperbaric welding habitat as provided by DCN.

"The most exciting period was the first six months of 2012," explains joint director Wim Vriens. Together with his brothers Rob and Carlo, he has been in charge of the company originally established in 1957, which in addition to offices in Germany also has a 30% interest in the Abu Dhabi-based DCN Global.

Offshore

After mainly focusing for a number of years on work in the Dutch waters, DCN returned just a few years ago to its offshore activities, with considerable success. The company was as it were rediscovered by the international oil and gas market. Given the number of orders, everyone is fully confident in our ability. "Everything is running smoothly once again," confirms Carlo Vriens. "We are perhaps particularly lucky that besides the major diving contractors, there is only a limited pool of small diving companies working in the offshore industry. We are part of the latter group, and our strength lies in the fact that we can guarantee sound quality at a reasonable price. We deliver good service, are able to offer more than many other parties thanks to our innovative approach, and are not overly expensive."

Examples of recent projects from the oil and gas market include hyperbaric welding work on a leaky 26-inch gas pipeline in Azerbaijan, and repair work on a working rig in the Black Sea, close to Sorchy, on which the legs had not been driven deep enough.

Engineering

What changes have taken place within the organisation? Wim Vriens explains: "We decided to turn DCN into an operational diving company. We do not run our own vessels, because we have no desire to be a boat operator. Whenever necessary, we charter the support vessels we need. Secondly, we only accept projects at a fixed-rate fee, while many of our competitors operate according to a day rate. On that basis, for example, we have won orders for work on projects in Russia. From a financial point of view, our clients know in advance exactly what they will have to pay us. Diving is our core business, but we attach considerable importance to delivering added value in the form of engineering, an area in

which we have huge knowledge, in particular in respect of construction-related jobs.

For Maersk, in Denmark, we recently carried out an underwater injection project. They had a problem, and asked us to come up with a solution. Based on past experience, we suggested a grouting method. We ourselves supplied all the seals, pumps and the grout. In other words, we supplied both the hardware and the software. Maersk were delighted and we were satisfied. It was in fact thanks to our innovative approach that we won the earlier referred to orders in Russia. Gazprom put a very serious problem to us, and we came up with a hyperbaric welding solution.

Working with a habitat was something never previously undertaken in Russia. In the presence of a delegation of no less than ten Gazprom specialists, our divers in Bergen op Zoom demonstrated their broad experience with the habitat technique, and a series of tests were carried out to convince them of the workability of our proposal. The success of that proposal in practice was demonstrated shortly afterwards."

Test centre

It is clear from current activities, that the management of DCN is above all focusing in the future on the international oil and gas market, and specifically the field of hyperbaric underwater repair work. Partly against that background, frantic work is currently underway in a large hall in Bergen op Zoom on constructing a professional, hyperbaric test centre – a first in the Netherlands. The test facility is not only intended to train divers, but also to carry out tests on large pipe sections of up to 48 inches, that can be driven into the hall by forklift truck, via an entrance door. There are practically no further restrictions in terms of size. The tank has an operating pressure of 200 metres and a test pressure of 280 metres. All in all, it is full-scale hyperbaric test centre, where welding work can be undertaken and tests carried out, in a completely separate welding chamber. Depending on the purpose for which a client wishes to use the test chamber, the desired atmosphere is set. If the degree of humidity in the chamber has to be 70%, it is set at 70%. If it has to be zero, it is reduced to zero. Irrespective of the divers sleeping in the overpressure system, the degree of humidity can be fully adjusted. In other words, the required circumstances can be created for any qualification. In the test chamber, work can be carried out using polyesters, adhesives and repair cements that are not allowed to be evaporated in the normal environment.

Another major advantage is that two to three divers can work simultaneously in the chamber. These divers must of course be certified to dive to a depth of 200 metres. The test chamber is not only suitable for welding tests. It is also possible to depth test welding robots, ROVs, diving systems, control systems, hydraulic motors, kink arms and drive systems. The overall equipment of the hyperbaric test centre at DCN even offers a separate control container and separation chamber under overpressure, including an accommodation module with shower and washing facilities. There are very few facilities available anywhere in the world capable of offering such simulated test conditions.

'We are already receiving requests from all over the world for our new test centre.'

Interest

Rob Vriens continues: "Although we have issued limited communication about the test centre (which will officially go into use at the end of 2012), we are already receiving requests from all over the world, from Canada to Indonesia. And we have signed up for five projects. This interest is of course not only based on the availability of the facility, but also the technical know-how we can offer in the field of hyperbaric, underwater welding. We have been involved in the wet welding process since 1960. Wet underwater welding is perfectly feasible, but its major disadvantage is the huge speed with which the welding pool cools down. In a fraction of a second, it cools from liquid to 5/6 degrees, with disastrous consequences for quality. As a result, the outer edge of the welding area is extremely brittle, right in the parent material. It is there that the weakness occurs. Above all in applications requiring high weld quality, for example pipelines, the solution to this problem is hyperbaric welding or 'dry underwater welding' achieved by surrounding the work piece with a gas-filled space. This space or habitat is kept at raised pressure, equivalent to the local water pressure. We have been using this system since 1987. The gas mixture most commonly used is oxygen and helium, at a partial oxygen pressure of 0.5 bar. The ratio between oxygen and helium is varied depending on the welding depth. The advantage of this system over wet underwater welding is that it is far easier to control the welding conditions, for example the temperature immediately before and after welding."

Equipped with a powerful fire fighting system

Damen to build 14 terminal tugs for Kuwait Oil Company

Damen's recently launched 3212 model.

Recently Damen and Kuwait Oil Company (KOC) have signed a contract for 14 Damen ASD Tugs. An extensive process of yard prequalification and tender evaluation finally resulted in an award to Damen this summer. The series consist of two types, with 9 tugs of Damen's recently launched 3212 model and 5 units of the well-known 2810 design, providing 80 respectively 50 tons of bollard pull. While being based on existing Damen designs, these tugs have been extensively tailored to meet KOC's exacting requirements on layout, systems and performances.

As part of KOC's long term strategy of increasing the country's export capacity, substantial investments are being made to expand the marine facilities in coming years. The new tugs will be assisting tankers at near shore loading terminals and at the new single point moorings further offshore, for which they will also be equipped with a powerful fire fighting system.

The cooperation between KOC and Damen goes back to late 1980's, when Damen delivered steel crew / pilot tenders and the large fire fighting / terminal tug Sabahi to KOC. In the early nineties, after liberation fromz the Iraqi invasion, Damen delivered to KOC a complete new fleet of tugs, crew tenders, work boats and mooring boats. Damen has supported KOC throughout all these years with provision of technical services, spare parts, and maintenance / renovation assistance.

Damen's naval architects and designers in The Netherlands have already started working on the development of this unique series of state-of-the-art tugs. Damen Shipyards Galati in Romania will be constructing all 14 units, with deliveries scheduled from 2014 onwards.

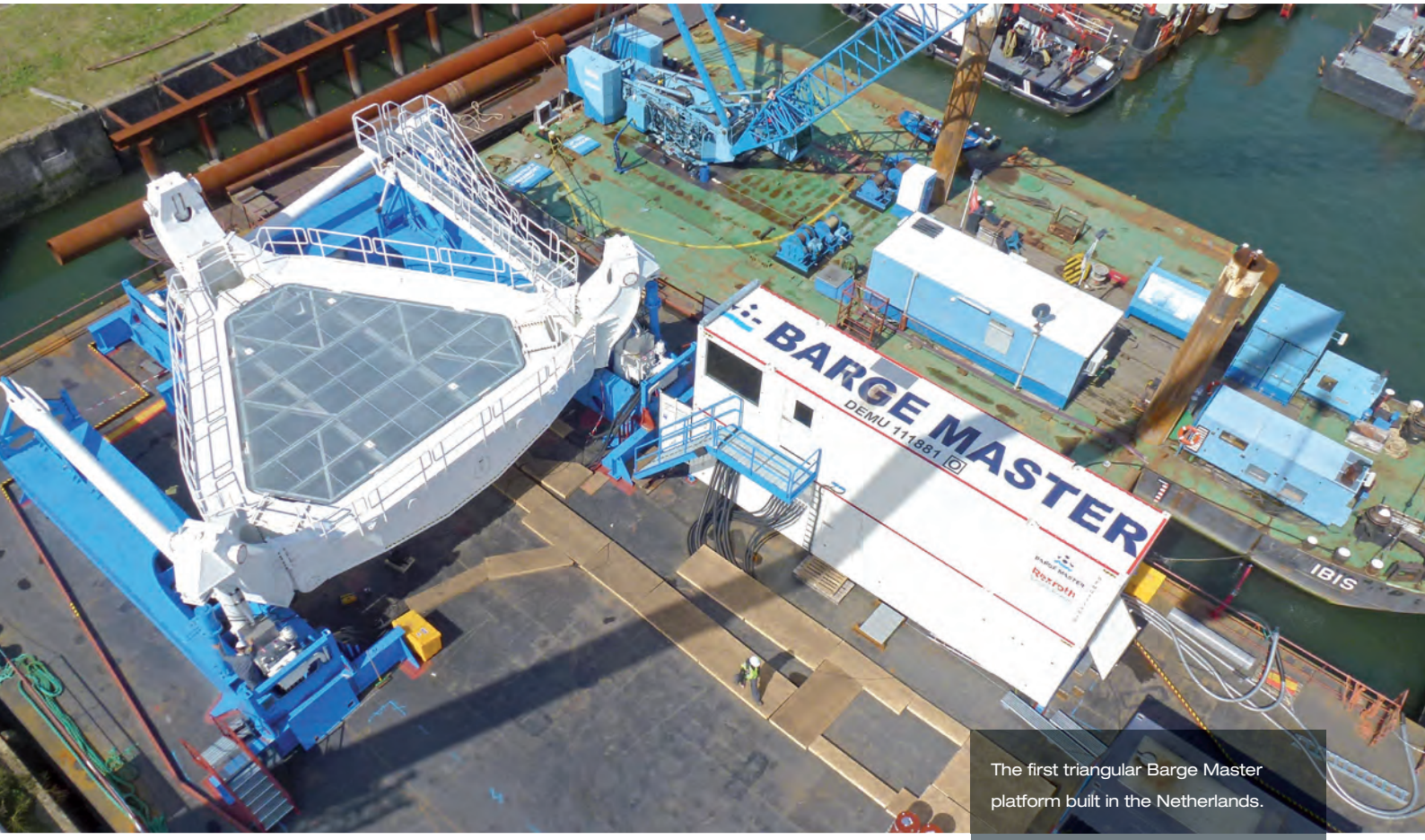
The contract ceremony photo shows Mr Sami Al-Rushaid, Chairman & Managing Director of Kuwait Oil Company (r) and Mr Martin de Bruijn, Area Director Middle East Damen Shipyards Group (l).

Denis Welch.

New Singapore office for IHC Merwede

Earlier this year IHC Merwede, the reliable supplier of custom-built ships and supplies for offshore construction, officially opened its new Singapore office at the PSA Building. This base will be the corporate headquarters for IHC Offshore & Marine's South East Asia businesses as it further expands its footprint in the region. IHC Merwede already has an IHC Parts & Services office in Jurong, which manages its life-cycle support operations. The new venture will focus on promoting IHC Merwede's Offshore & Marine vessels and technology solutions. In addition, it aims to secure building capacity to complement its yards in The Netherlands and add to the considerable marine engineering capability already operating under the company's umbrella. Regional CEO Denis Welch says: "IHC Merwede is not just a shipbuilder per se, but also an aggregation of engineering and manufacturing companies, which combines to provide unique and value-added solutions to its customers."

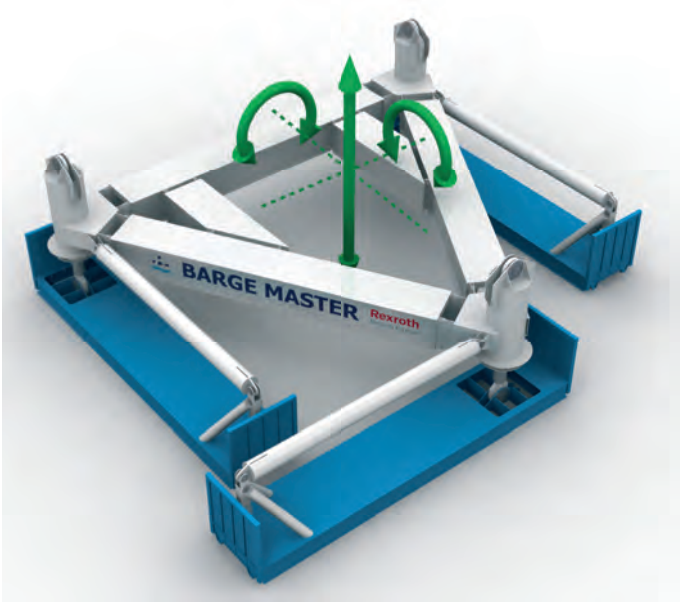
IHC Merwede's President Govert Hamers says: "We are happy to increase our commitment to Asia. It is a major international maritime oil and gas hub and has the necessary infrastructure in place. As our Asian customers come to benefit from our customised and technological solutions, plans are already in place to expand the company in the region."



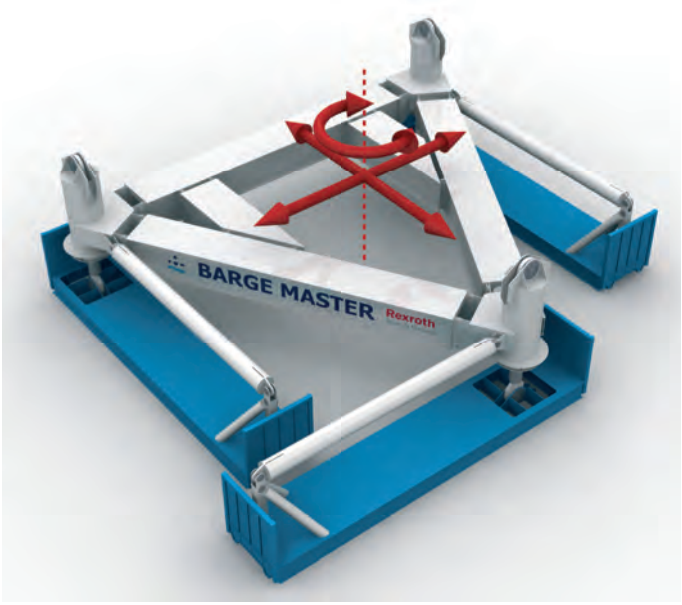
The first triangular Barge Master platform built in the Netherlands.

Barge Master proves very cost effective

Laden crane barges at sea are often faced with severe wave movements, or very long swell, causing them to roll and pitch severely. Waves of just 30 centimetres can already be sufficient to cause the crane hook to swing wildly. The length of the crane's jib further amplifies this movement leading to hazardous situations. The Barge Master, developed in the Netherlands, is a swell compensation platform. The system practically eradicates unexpected movements in a crane placed on a standard barge, thereby guaranteeing safety. "This cost-effective method means that the operational weather window of standard barges is significantly increased. The same applies to the weather window of Platform Supply Vessels (PSV) when equipped with a Barge Master," explained director Martijn Koppert in an interview with Offshore Holland. Offshore Holland first announced this innovation in its second issue, in 2011.



Compensation of roll, pitch and heave.



Fixation of surge, sway and yaw.

Many oil, gas and wind energy projects undertaken offshore with crane assistance on a standard barge are shut down in poor weather. The swinging motion of the crane makes hoisting operations too hazardous.

“The costs for hiring such crane barges or even a considerably more expensive jacking rig and the accompanying personnel rise extortionately, if you are unable to continue working,” suggested Koppert. “It also becomes difficult and highly unpredictable to stick to the original planning. The Barge Master platform is the first floating solution to this problem. The concept can be deployed anywhere, irrespective of seabed conditions. The water depth is also irrelevant in terms of deployment. The system is furthermore very easy to mobilise and install.”

Idea

Martijn Koppert came up with the idea of the Barge Master. He runs an engineering office for maritime and offshore applications. “I spent much time in the Middle East, an area where there is a major problem of very long swell. As a result, crane work often has to be shut down despite fabulous weather conditions (forty degree temperatures). This situation is very difficult to explain to clients. They simply do not understand it. To be honest, I can imagine their confusion.

By way of alternative for the barge and crane combination, a range of jack-up rigs with cranes are available on the market, but clients consider the day rate for these units far too high. Against that background, I came up with the ambitious idea of developing a motion compensation platform, to be offered in combination with a barge and crane. For a price of just 30,000 dollars, our clients effectively have access to a complete crane vessel, but with a series of additional and above all cost-saving advantages. Indeed, many contractors already operate their own barge and crane, making our proposition even more attractive.” To further elaborate the concept and to secure intellectual property, in 2009, Koppert decided to establish the company Barge Master bv, together with financial director Jan-Paul van den Bos. To implement the project, an exclusive collaborative venture was established with drive & control company Bosch Rexroth, the well-established Dutch independent research institute Marin and Temporary Works Design bv, the engineering company owned by Martijn Koppert. The internationally-renowned Dutch entrepreneur Frans van Seumeren also proved highly enthusiastic, when first introduced to the concept. The former owner-director of Mammoet has high hopes for the potential of the Barge Master and has now become shareholder and supervisory director of Barge Master bv.

First

Can the Barge Master operate any crane type? “No, not right now,” explained engineering manager Eelko May in response to our question.

Installation of the Barge Master on an 80 x 24 metre flat top barge.

"The first triangular Barge Master platform built in the Netherlands in the first half of 2012 has a payload of 700 mT, and is suitable for a 600 mT crane. We ourselves were responsible for the complete engineering and supplied all the necessary drawings.

We also calculated all the specifications for the hydraulic system. The hydraulics were then converted into a detailed design by Bosch Rexroth. The very first Barge Master was assembled in Schiedam, and can in principle be installed on a standard crane barge (C) or on a Platform Supply Vessel (S). A design with a maximum payload of 1000 mT has already been produced for the installation of jackets and tripods. In the future, we will be able to offer both larger and smaller systems for the oil and gas market. Initially, however, we are focusing fully on guaranteeing optimum operation of the first system: the S-700/C-400 type Barge Master platform."

DoF

Eelko May joined the Barge Master team in 2009. His task is to develop and roll out the full technology behind the concept. "Our idea is to stabilise the crane without the use of jack-up legs. An object on a floating pontoon is subjected to the six degrees of freedom (DoF), namely moving left and right (sway), moving forward and backward (surge), turning left and right (yaw), moving up and down (heave), tilting side to side (roll) and tilting forward and backward (pitch). The first three DoFs, sway, surge and yaw, are restrained by the use of anchors or Dynamic Positioning systems that keep the barge at a fixed location. The remaining three, heave, roll and pitch are controlled by the Barge Master. It is these movements that the Barge Master measures and counteracts. Early calculations and simulated movements provided a numerical model, which demonstrated the capability of compensating for a significant wave height of 1.5 metres, by providing a platform for the crane driven by three hydraulic actuators. Lifting operations of up to 700 tonnes could now be continued in sea states with waves of up to almost 3 metres high. The Barge Master platform can compensate for up to 95% of the barge's motion."

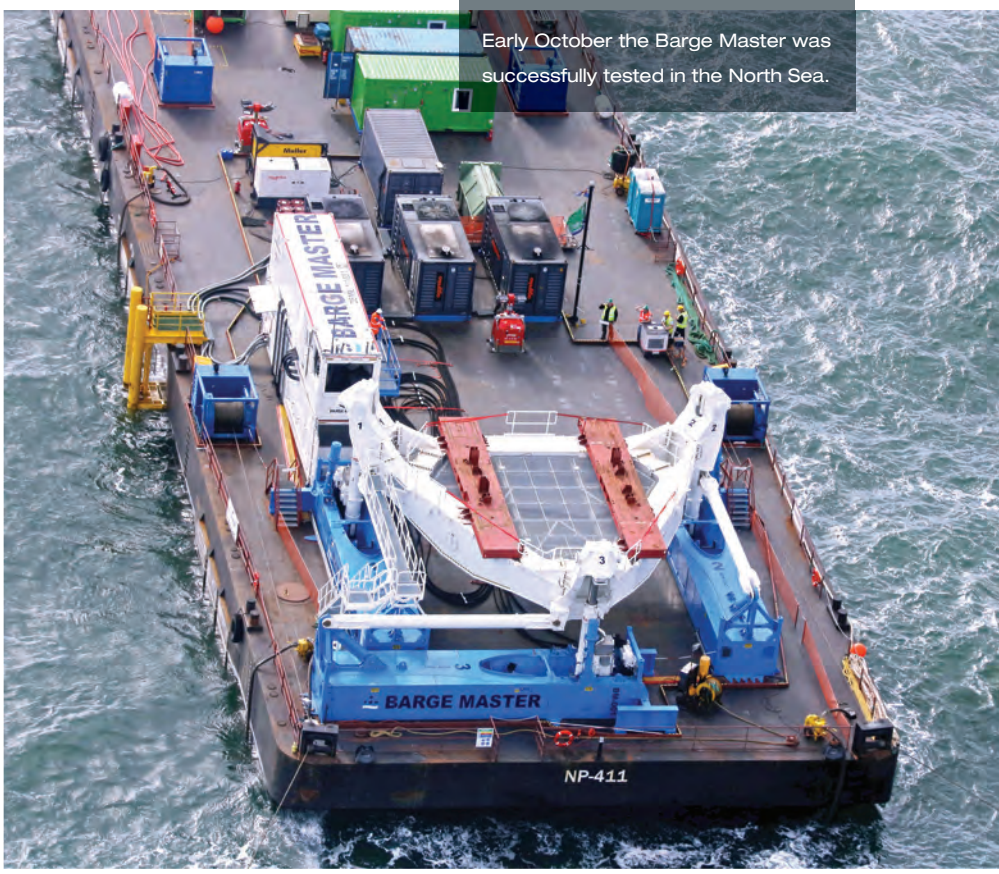
Cooperation

As already explained, Barge Master first looked to Bosch Rexroth to help design the drive and control system for their idea. Martijn Koppert went on: "They agreed immediately and were extremely enthusiastic and indeed eager to help us with the design and construction of the drive and control system." Barge Master then turned to Marin to test the prototype scale model for the stability of the design. The tests were carried out in the Marin Shallow Water basin in Wageningen, the Netherlands, and

the results from the study were very promising. The performance of the Barge Master system was quantified by comparing the heave, roll and pitch of the barge and platform. In Eelko May's words, "In the optimised test setup, the motion compensation scores for the roll, pitch and heave were all 95% or higher. These results demonstrated to me that the numerical model calculated in theory was accurate, and therefore feasible in reality."

Together with Marin, Barge Master then developed a software tool capable of precisely simulating how a Barge Master would behave on a barge. The software also reveals the interaction between the Barge Master and the barge, and shows the degree of compensation. In Martijn Koppert's words: "Together with the scale model tests, we then validated the software by comparing the conditions for the tests in the tank, with the interaction between Barge Master and barge. We can now state with absolute certainty that the software is correct, and predict what you can do with it.

Wherever in the world the Barge Master is deployed in the future, we are able to thoroughly calculate the complete scenario and inform the client of the wave height up to which work can be continued. Plots can also be printed out for the precise specific setup, enabling the client to see exactly the gain achieved in work time. The key in the future will be the interaction between crane driver and the Barge Master platform. For the driver, a new work situation will as it were be created, which at the start will require sound supervision. Fortunately, the strength of the Barge Master system lies in its simplicity. With relatively little power input, relatively large weights will be able to be compensated for, at sea. This massive performance is achieved thanks to the software, the controllability and the rigidity of the system. Not only is this interaction of forces new, but the software itself is a unique advance. Hydraulic cylinders already existed; pumps already existed, too. The innovation lies in the configuration or combination of products and applications."



Early October the Barge Master was successfully tested in the North Sea.

Deployment

While Eelko May was heavily involved in the technical development of the Barge Master and the construction of the first S-700/C-400 type platform, Martijn Koppert started marketing the Barge Master. He has now visited every corner of the globe, to talk with potential customers, and most of the key offshore trade fairs were attended, an activity Barge Master intends to continue.
The company has now found its first customer. In early September of this year, a leading offshore and geotechnical contractor and Barge Master bv signed a cooperation agreement for the testing and deployment of the First S-700/C-400 Barge Master platform.

This August, the first Barge Master platform was installed on an 80 x 24 metre flat top barge, and was successfully tested in the North Sea, in early October.

Order for six SS38E-type units

Petrobras opts for GustoMSC design drilling rig

The first DSS type from GustoMSC is de Maersk Explorer (Photograph: KeppelFELS)

The Brazilian oil company Petrobras is to deploy an entire fleet of large, semisubmersible drilling rigs built according to a Dutch design, for the exploration of oil in deep water off the Brazilian coast. The rigs, of the type DSS38E developed by GustoMSC from Schiedam, will be fabricated at the BrasFELS yard in Angra dos Reis in Brazil.

The order for the fabrication of a total of six SS38E-type drilling rigs has been issued by Sete Brasil. Lead contractor for the fabrication project is Fernvale, a subsidiary of Keppel Offshore & Marine from Singapore that will be responsible for the fabrication work at the Keppel BrasFELS yard in Brazil. The fabrication order was awarded in two parts.
A contract was signed last December with Sete Brasil for the fabrication of one semisubmersible drilling rig of the type DSS38E, followed on 7 August this year by an order for a further five of these units. The keel for the first was laid down on 13 July, and handover is planned for the

The Gold Star is the first semisubmersible drilling rig of the DSS38 type. (Photograph: GustoMSC)

GustoMSC has been active in the design and fabrication of semisubmersible offshore vessels since 1975.

fourth quarter of 2015. The remaining five will follow in the fourth quarter of 2016, the third quarter of 2017, the second and fourth quarters of 2018 and the third quarter of 2019.

The basic design for the DSS38E, in which DSS stands for Drilling Semisubmersible, emerged from the drawing boards of the Dutch engineering firm GustoMSC. The firm has further perfected and marketed this design in collaboration with the Deepwater Technology Group of Keppel Offshore & Marine. This collaboration not only covers this rig type but also the other DSS types developed in Schiedam. Maersk Drilling, for example, is operating a DSS20 type and three DSS21-type semisubmersible drilling rigs, all fabricated at the KeppelFELS yard in Singapore. The rigs in question are the DSS20 Maersk Explorer handed over in 2003 and subsequently deployed in the Caspian Sea, and the DSS21 rigs the Maersk Developer, Maersk Discoverer and Maersk Deliverer, handed over over to Maersk Drilling in 2008, 2009 and 2010, respectively.

First DSS38 type

The first DSS38 type ever fabricated was the Gold Star that was handed over to Queiroz Galvão Perfuracoes from Brazil, by KeppelFELS, in 2009. Three years later, the same yard supplied the same owner with her sister rig, the Alpha Star. The six units currently under construction are a slightly larger version of the Gold Star and Alpha Star rigs.
The smaller version displaces 39,500 tonnes of water and the larger version 45,000 tonnes.
The new rig type is capable of drilling down to 10,000 metres below the seabed in a maximum water depth of 3,000 metres. Accommodation for a crew of 160 will be provided, on board. All the new rigs will be equipped with a class 3 dynamic positioning system that controls eight azimuth thruster units. Petrobras has announced its intention of chartering all six drilling units for a period of fifteen years for drilling work in deep water off the south-eastern coast of Brazil. The management of the six will be entrusted to various companies. Three will be in the hands of Queiroz Galvão Óleo e Gás, two will be operated by Petroserv and one by Odebrecht Óleo e Gás. The order for the fabrication of the entire series of six rigs is worth some 5 billion dollars. The Keppel yard will also be fabricating one further DSS38E rig, on behalf of Urca Drilling, due to be handed over in 2015.

Other types

GustoMSC has also supplied the design for the Development Driller III for Transocean. This DSS51-type rig,

Illustration of an ocean-class semisubmersible drilling rig. (Illustration: GustoMSC)

that came of the slipway at the KeppelFELS yard in 2009, displaces 53,000 tonnes of water. Schiedam was also the birthplace of the design for the semisubmersible drilling rigs Lone Star operated by Queiroz Galvão Perfuracoes and Norbe VI operated by Odebrecht. Both are of the type TDS2000P; each displaces 30,000 tonnes of water and the pair were fabricated in 2010 at the IMAC Shipyard in Abu Dhabi. This same yard was responsible on behalf of Delba Perforadora for the fabrication of the Delba III, a semisubmersible drilling rig of the TDS2500 type, with a water displacement of 36,500 tonnes, completed in 2011.
For this rig, too, GustoMSC produced the design.

The DSS series stands out from other rigs due to its two large floaters, each with two massive columns on which the square deck box is supported, to house the drilling installation and accommodation module. The drilling installation has been designed in such a way that the risers are fed from the front, from a vertical storage facility, while the drilling pipes are mounted on the back. Seven DSS-type drilling units have been fabricated by KeppelFELS over the past few years, and a similar number are currently on the blocks.

Ocean class

In the meantime, the Schiedam-based design firm has not been resting on its laurels. On the basis of experience acquired with the DSS and TDS-type semisubmersible drilling rigs, GustoMSC has come up with the Ocean class. This class comprises the Ocean450, Ocean850 and Ocean1100 series, displacing 32,000, 43,500 and 55,000 tonnes of water respectively, suitable for drilling exploration and production wells in water depths of 900, 2,300 and 3,000 metres. Other characteristics are the vertical storage facility for the risers, the efficiently-operating drilling system and a large, open working deck.

GustoMSC has been active in the design and fabrication of semisubmersible offshore vessels since 1975, including large crane ships, as well as accommodation units and construction vessels. At present there are sixteen semisubmersible drilling rigs operating worldwide, designed in Schiedam, with a further seven currently under construction.

TrustLube products generate major savings

Every lubrication system is custom-made

Innovation and durability. These two words in combination form the basis of the company philosophy of the Dutch-based TrustLube. The company from Oud Gestel designs, fabricates, assembles and installs automatic lubrication systems and monitoring systems for the (petro) chemical, dredging, offshore and maritime industries. With its durable lubricating systems, produced in stainless steel, it is possible to massively reduce the consumption of lubricant and achieve considerable cost savings. “We supply high-quality lubrication systems, without restrictions, as well as guaranteeing a precise dosage of lubricants at the right place at the right time, using the right product,” suggested managing director Chiel van Daelen, summarising the role of his business, established in November 2003.

“Companies throughout the world make use of our grease lubrication and dosing systems, even in the most extreme conditions for example for pumps for offshore oil transport and moving parts in loading and unloading cranes in sea ports. Ambient temperature, pipe length and viscosity have no influence whatsoever on the amount of lubricant delivered. We supply a broad range of specialist equipment. Our product range includes a wide variety of complementary accessories such as pumps, dosing valves, control units and lubricants,” he continued. TrustLube is continuing to grow. In just the past eighteen months,

Managing director Chiel van Dealen showing some of the automatic lubrication and monitoring systems.

the staff has doubled to fifteen and we have moved to new premises equipped with a sustainable, innovative climate control system that complies with the strictest requirements in terms of energy efficiency. “The development of our TrustLube lubrication systems is a constant reflection of the search for perfection and customisation. Suitable for application on seals, bearings, open gear systems and in pin and push couplings, from simple lubrication systems with just a single lubrication point through to large-scale and complex project, we always place the customer’s requirements at the heart of our innovation process. For our workforce, innovation is not an end but merely a means of achieving a goal. Unlike traditional systems, with a customised system from TrustLube, our customers are always fully in control of lubrication policy, from A to Z.

We can even guarantee savings of up to 70% on lubricant consumption – good for the environment – and, it goes without saying, also delivering considerable cost savings for the customer.”

Saving

In November 2003, for the first time in his life, Chiel van Daelen found himself on board a cutter suction dredger, operating just off the coast of Dubai. The experience came as a considerable shock. “The deck was covered in grease and I had to step very carefully to avoid slipping. A cutter suction dredger of that kind has between 200 and 250 lubrication points. It was then that the idea was born of seriously tackling the problem of excess lubrication, by developing a lubricating system that provides a precise dosage at each lubrication point, at both extremely high temperatures and at temperatures around the freezing point. I started by talking to the chief engineer on the cutter suction dredger. I wanted to convince him that he could easily get by with less grease. My attempt was a complete failure. His credo, based on his past experience was: the vetter, the better. In other words, the more lubricant used the smoother every-thing runs. From a logical point of view his attitude was wrong, but given the situation it was nonetheless understandable. At the time no one knew better and there was no obvious solution. I spent the next two years lobbying, convinced that my product would deliver huge savings. We had to bring about a cultural sea change, but in the end we did succeed in convincing the market of the potential advantages. In 2006, we received the go ahead to install a pilot lubricating system on the same cutter suction dredger.

TrustLube guarantees a precise dosage of lubricants at the right place at the right time, using the right product.

The positive outcome was that we were able to prove a saving of 70% in grease consumption; a staggering three barrels a week."

From the drawing board

TrustLube employs a staff of four engineers whose daily task is the development of new lubrication systems using the latest 3D packages. "We do everything in-house," explained Chiel van Daelen.

"We produce the systems ourselves, we assemble the modules and we have our own modern test area. Testing is followed by installation, a task we undertake worldwide. Right from the drawing board, we contribute ideas to meet the customers' needs, keeping a very close eye on such aspects as return on investment and total costs of ownership. In other words, we first engineer and develop a system, and only then do we sell it to the customer. That makes every lubrication system from TrustLube custom-made. Naturally we have a number of basic components, such as electrically-powered pumps that we are able to assemble explosion-proof, 40 or 300-litre tanks, valves and dosing valves. Using that set of components, every time we come up with a new, unique lubrication solution, including control systems, software and monitoring."

Innovations

Alongside the four system engineers, TrustLube employs two staff permanently involved in product innovation. On behalf of the offshore and dredging industry, their developments include two lubricating agents that are supplied with the systems. For direct delivery of this very heavy load grease and a biodegradable variant, the company operates support locations in Asia and the Middle East. As Van Daelen explained, "We are currently involved in no less than six new developments, specifically explosion-proof applications for our systems in the offshore sector, as well as TrustLube dosing valves offering a larger range. We can now lubricate up to three grams of grease per lubricating cycle, but would like to see that range extended to five and ten grams.

Our dosing valves are individually mounted on solid manifolds. Every completely assembled system is fully hermetically sealed. Under pressure, the lubricating points receive a precise dose. Against that background, we aim to market our range of dosing valves under the name 'Doseur'. By making use of an MDS sensor on a Doseur, crucial lubrication points receive additional monitoring.

We are also hard at work optimising a unique monitoring module capable of rapidly recording messages and actions taken. It represents a 24/7

monitoring service. Our aim is to arrive at a situation whereby the customer is permanently informed in good time whenever a threat to the system arises. These low level, pressure or other error messages are generated from the central lubrication system. A microcontroller monitors the entire system and stores all the data. This controller can then communicate directly with a PLC network or SCADA system, already installed on board."

New products are fully designed, developed and tested in-house.

Worry-free

TrustLube describes its service provision as making life worry-free for its client base. "Our worry-free service means that our clients truly have no worries about their lubrication activities," emphasised the managing director. "We take over from them a huge proportion of their maintenance work. Thanks to our carefully-conceived systems and appendages, surprises are a thing of the past."

Examples in use in practice include the cutter fleets operated by a number of leading Dutch dredging operators. On vessels that in the past consumed up to 500 kg of grease per week, TrustLube systems now deliver between just 60 and 80 kg of grease. In 2010, TrustLube received request from a Dutch offshore contractor to develop an automatic lubrication system for the 7,000-tonne cranes on a crane vessel. Every day, sixteen crew members were set to work lubricating the 2200 wheels on which the cranes run over a total of thirteen kilometres of rail. Following intensive consultation with the client, the decision was taken to install 48 custom-made grease applicators to ensure a permanent, precise lubricant film on the wheel running surfaces and the counter-surfaces on the rails, on both the port and starboard side of the vessel. This optimum lubrication procedure has resulted in a huge saving in labour. Lubrication is now a continuous operation during the daily running of the crane vessel, and the large winches on board the crane vessel are now also equipped with TrustLube lubrication systems, as are a number of jack-up rigs.

During jacking, a minute volume of lubricant is applied automatically to the 70 metre-high legs, on both the underside of the gear tooth and the the topside, depending on the jacking direction. One typical example of an explosion-proof custom-made system is the fully-automated lubrication system developed by TrustLube for large rotary crane bearings on board floating loading and unloading systems for the oil and gas industry. The Dutch-based company also built the skids for this application.

TrustLube is also ever ready to make 'just in time' deliveries. A heavy transport vessel was recently fitted with a lubrication system during a transport operation. For projects of this kind, the company operates three fully-equipped mobile workshops, with every modern convenience, including parts warehouses and workshops.

High efficiency grease unit.

Bulk Handling

For ship crews, working with steel grease drums was always a difficult task. The drums often arrive damaged and extracting grease from a drum is a major challenge in itself. Two years ago, TrustLube developed a system according to which the content of a steel drum is stored in a bulk handling system with a capacity of at least 300 litres. In no time, TrustLube was able to sell a number of these systems. In other words, there was a clear demand for this solution, on the market. During the OSEA trade fair in Singapore in November 2012, the company plans to introduce the system to Asia.

New multifunctional concept provides flexibility in heavy transport and offshore installation

Damen Shipyards presents a new shipping concept to the market: the Damen Offshore Carrier (DOC) 7500, specifically designed as a smaller heavy transport, offshore installation and ro-ro platform suitable for multiple markets. The Damen Offshore Carrier aims to provide flexibility and year-round utilisation.

Damen developed the new vessel in cooperation with Singapore based heavy lift transport specialist Hans van Mameren, managing director of Ha-Ce Engineering. The DOC has an endurance of 65 days, a large, flat and unobstructed deck of 2,300 m², a deck strength of 20 t/m² and is highly fuel-efficient.

Remko Bouma, Sales Manager of Damen Shipyards Bergum, says: "When we decided to realise a new design together, we wanted to create a vessel that was able to carry modules and cargo on an open deck over medium and long distances, complying the demands of today's market. I think this vessel will be 'the' alternative for the more time consuming tug and barge transportations."

The Damen Offshore Carrier is able to handle higher sea states, whilst maintaining course and speed and, by that, being more economical and reliable, he stresses. As well as economical fuel consumption, the vessel can run on HFO380, making it even more cost efficient.

Speed

"Tug-barge combinations are not able to cope with the challenging seas so easily. Deviation from course and reduced speeds can have great impact on the schedule," says Bouma. Therefore, Damen set out to find an alternative. The DOC offers much lower fuel cost and is better able to maintain course and speed, typically averaging 10-12 knots, where a tug and barge would average only 5-7 knots. "There is a definite time advantage; the DOC can keep to the schedule and at a higher speed!"

Reduced fuel consumption

Damen's R&D Department's extensive model test programs show that the DOC reduces fuel consumption by 50-75% compared to a tug-barge combination. In the design process particular attention was paid to the bow and hull form. The new distinctive, sleek bow and slender hull enables the vessel to sustain its speed and course in head seas, as well as helping to reduce fuel consumption. The bow design diminishes accelerations and reduces slamming to a very low level, improving comfort and safety for the vessel, crew and cargo.

Multifunctional

A multifunctional ability was a key part of the DOC design. Damen was keen that it should find deployment in several markets, hence its suitability for shore-to-(off)shore transport, ro-ro operations and installation work. The large unobstructed deck is free of any manholes, exhaust and de-aeration pipes. Ro-ro operations are unobstructed and modules can be stowed and secured everywhere on deck. An efficient ballast system and the ability to handle ro-ro over the stern and sides are other important advantages.

DP2

The DOC equipped with DP2 will meet the present offshore market demands. DP2 makes the DOC extremely stable for safe offshore loading/unloading operations. DP3 can also be implemented.

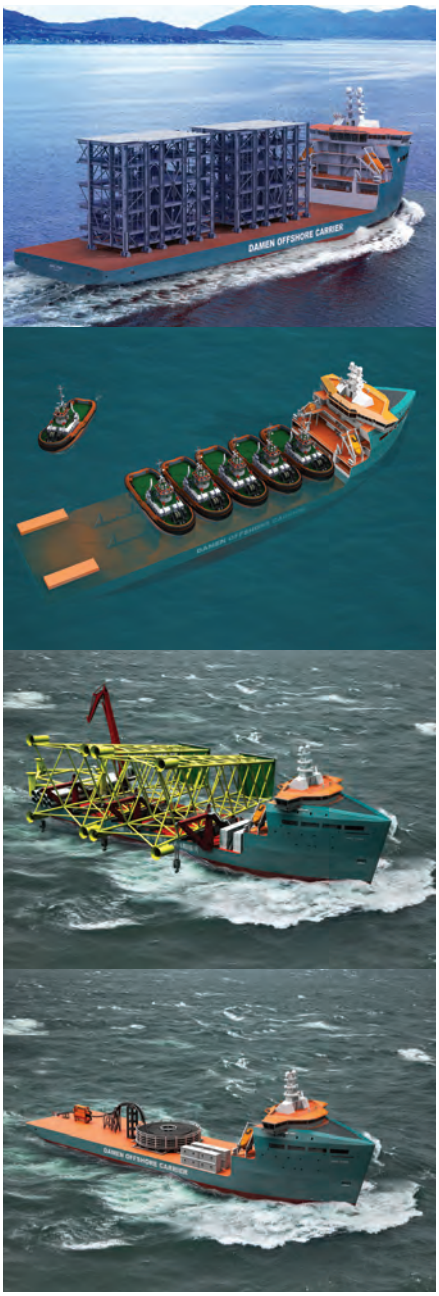
The vessel is suited for a replenishment role and could be used for bunkering fuel and other consumables to vessels/installations working in the field as well as for crew exchanges. The DOC can comfortably accommodate 30 people, which can be expanded when in installation mode.

Transport & Installation

The offshore wind and tidal energy markets are other focus areas. The Damen Offshore Carrier can be used in a feedering solution for offshore wind farms, transporting nacelles, transition pieces and monopiles. Its 2,300 m^2 platform with 20 t/m^2 load capacity can be used for a wide variety of offshore installation work such as cable laying, subsea installation, reel laying, floatover installation and other methods. For these purposes the vessel can be outfitted with all necessary installation equipment. This can be either a modular solution at a particular stage in the vessel's operational life or an integral solution part of the initial shipbuilding process.

Submersible

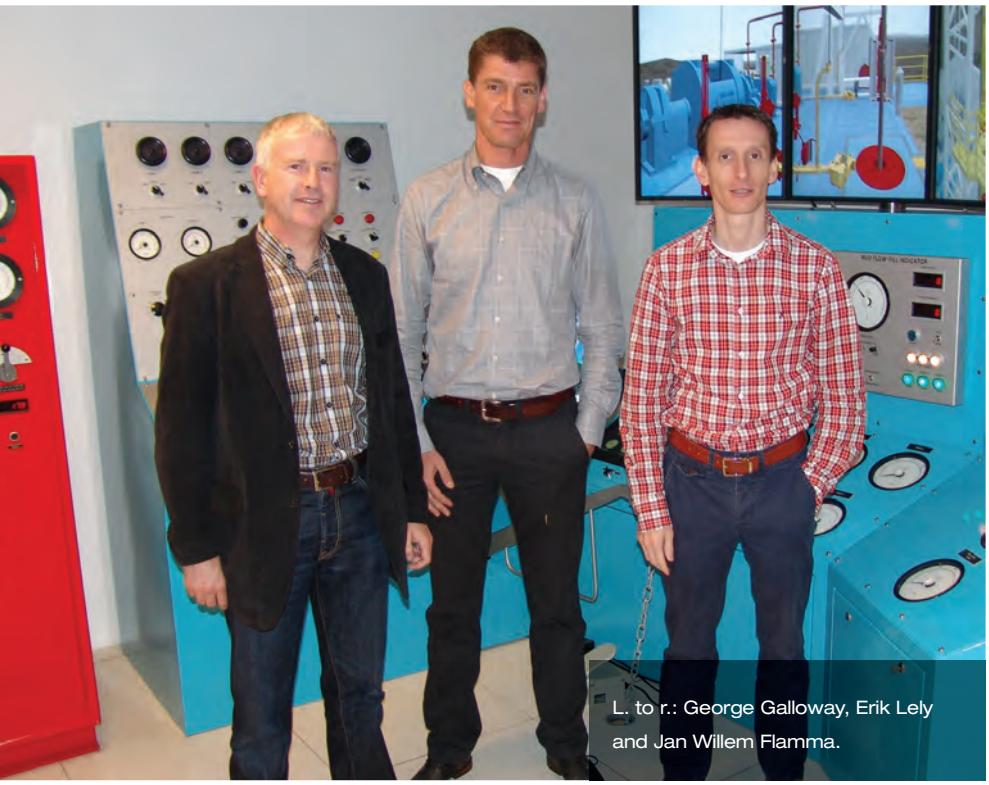
Yet another option is the DOC as a semi-submersible vessel, equipped with buoyancy casings. Additionally, the DOC can be fitted with a Damen Deep Dredge giving owners a deepsea dredging and mining solution up to 200 m water depth.



"This really is an ideal platform for a wide range of solutions, we have made the DOC as versatile as possible," says Bouma. "The whole idea is to maximise uptime while reducing cost."

Currently the DOC is 27.5 m wide. Already Damen is considering a larger version of 32.5 m wide. The vessel has a Green Passport and a Zero Dumping certification and the fuel tanks are protected with cofferdams. The first DOC 7500 can be delivered in 2014.

The Well Academy responds to needs of global drilling industry



L. to r.: George Galloway, Erik Lely and Jan Willem Flamma.

Following an intensive period of preparation, The Well Academy, founded by George Galloway and Jan Willem Flamma, has opened its doors in the Netherlands. Within a special Scenario-Based Well Control training programme, complete drilling teams are trained here to respond effectively to non-standard situations during the drilling of wells. Against the background of the Macondo incident in the Gulf of Mexico, this training course is a response to the wishes of the drilling sector to improve the level of training of its personnel.

The beating heart of The Well Academy in Apeldoorn, Holland, consists of an advanced, full-size rig floor simulator of the type DrillSim 5000, developed by the English company Drilling Systems. "We purchased this simulator to enable us to respond immediately to the wishes of the drilling industry," explained George Galloway. "Although the sector already operates very safely, studies have shown that the training of drilling personnel still leaves room for improvement, above all in respect of the ability to respond correctly in non-standard situations. In that area, there was above all a shortage of practical training courses. The study referred to above, in which I was personally involved, was undertaken by the Netherlands Oil and Gas Exploration and Production Association (NOGEPA), with support from the Dutch national Mining Inspectorate, following the Macondo incident. Shortly behind NOGEPA, the worldwide-active Association of Oil & Gas Producers reached the conclusion that drilling personnel needed better training."

Soon after the announcement of the results of the study, George Galloway saw an opportunity to purchase a drilling simulator. During that same period he also met Jan Willem

Flamma, and they together decided to found The Well Academy, and to develop a special Scenario-Based Well Control training programme.
The simulator was installed in Apeldoorn in May of this year, and all the required parameters were input. The initial try-outs were held in September, with teams from oil and drilling companies and government representatives. Since that time, the The Well Academy has been up and running.

The advanced, full-size rig floor simulator at The Well Academy in Apeldoorn.

Human intervention

The Scenario-Based Well Control training programme lasts three days, and in addition to a theory component also includes a series of practical exercises on the drilling simulator. For these exercises, a special room has been equipped with a view across the drilling floor, and all the equipment needed to carry out the drilling process. Galloway continued: "Using the simulator from the control room, we can create a wide range of situations that could eventually result in a blow-out. Our aim with this training programme is to ensure that the drilling team recognises the signals early, as soon as something goes wrong, and then correctly interprets those signals before carrying out the best intervention to keep control of the situation and hence avoid the blow-out."

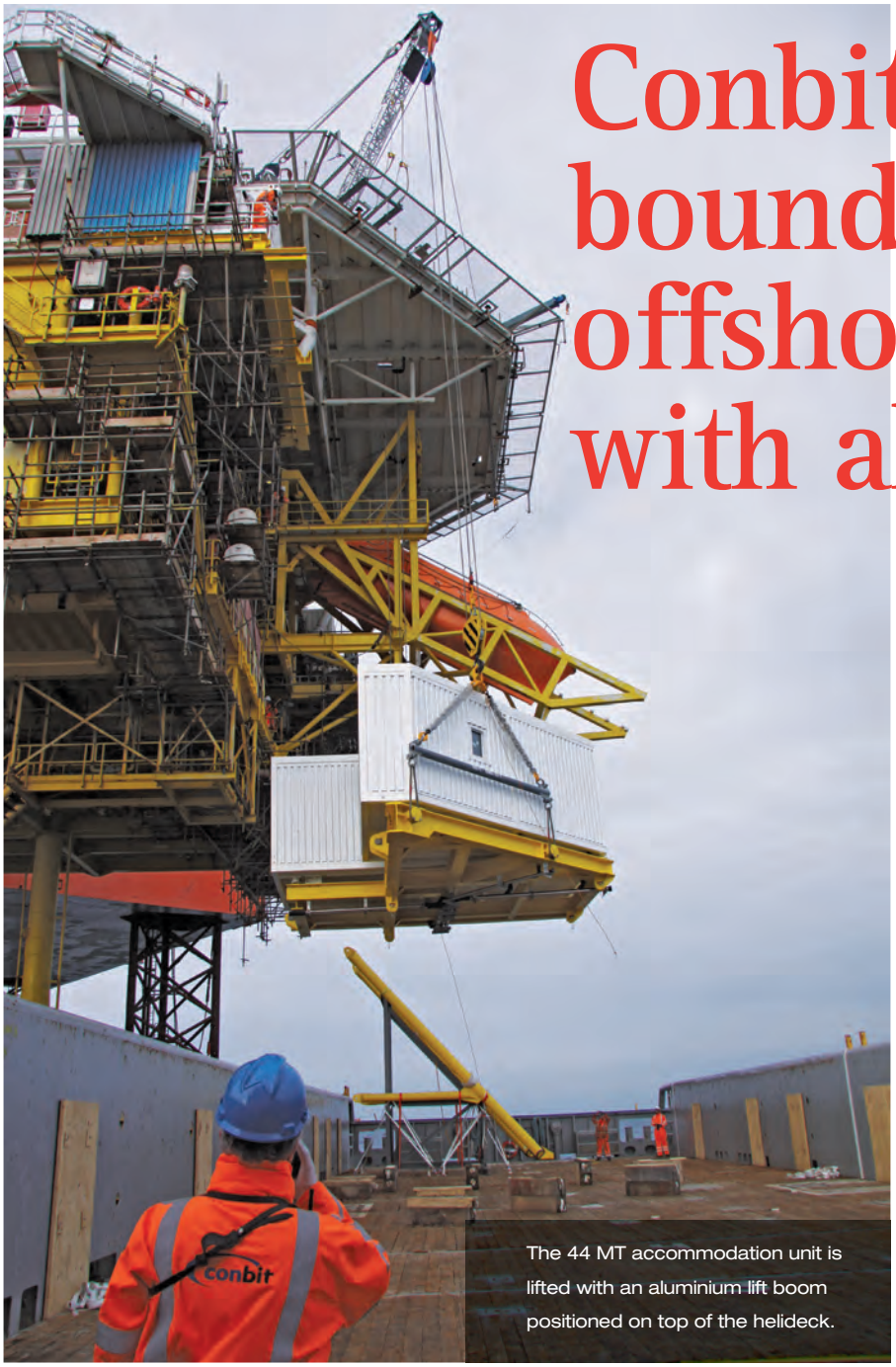
One other unusual feature was that the founders of The Well Academy also involved psychologist Erik Lely in developing the scenario training. "Erik is a specialist in crew resource management (CRM). Training of this kind was first introduced in the airline industry, following a major aircraft accident on the island of Tenerife. The training, specially focused on human interventions, has proven highly successful and has since also been successfully employed in the medical sector. We decided to take the initiative of now integrating CRM in our training course, too. CRM examines a variety of human aspects, for example, whether the course participants are sufficiently aware of the situation, what decisions they then take, and how they communicate with the rest of the team. This combination of elements makes our Scenario-Based Well Control training unique, in the world."

Much interest

The developments in Apeldoorn are being closely monitored by businesses operating in the drilling industry. "There is a great deal of interest in what we are doing, and we have already received several compliments from the sector." Galloway and Flamma are backed up by the International Association of Drilling Contractors (IADC) and the International Well Control Forum (IWCF). The latter organisation is responsible for accrediting people who have successfully completed standard drilling training courses. "We were also visited by representatives of a major drilling company from Houston. They were very enthusiastic about our training."

In the future, Galloway and Flamma aim to also use the drilling simulator for standard training programmes for assistant drillers, drillers, tool pushers and company men, as well as for well service and well intervention operations. "There is also a great deal of interest in well-awareness training courses for production personnel, in other words the people who work with oil and gas production wells on a daily basis. That is another area we aim to cover, in the future. Using our simulator, we can teach them to understand the behaviour of the wells, and to respond effectively in non-standard situations. For the time being, however, we are above all focusing on the Scenario-Based Well Control training. This programme is what makes us unique, and it could be a concept we will be able to roll out globally, in the future."

Conbit moves boundaries in offshore lifting with aluminium



The 44 MT accommodation unit is lifted with an aluminium lift boom positioned on top of the helideck.

During the summer of 2012, Conbit lifted its heaviest load ever. To lift accommodation units on the K6-P platform of Total E&P Nederland BV, Conbit used an aluminium lifting construction. This unconventional method for lifting a load exceeding 40 tonnes saved using a heavy crane vessel. By completing this challenging project, Conbit proved the effectiveness of special lifting techniques. In total, approximately 120 metric tonnes were lifted during three main jobs.

At the end of 2011, Total E&P Nederland BV awarded Conbit the contract to install two living quarters and a lay down area extension. This work was part of an upgrade project for the K6-P platform. This gas platform is located in the North Sea, 100 km northwest of Den Helder. The two, almost identical, living quarters were both to be installed below the helideck. The lay down area extension needed to be installed on the north side of the platform.

Evaluation

The contract covered both the ngineering and the installation works. Outsourcing the entire project to one company meant that interface problems were avoided. Engineers and technicians were able to consult each other during the project and achieve an optimal solution.

Safety and efficiency have been key aspects throughout the project. For each part of the job, a method statement was created, supported by structural calculations. Conbit has its roots in structural engineering, which proved very beneficial during the preparation phase.

During the load test a rope access technician supported the water bag over the side of the helideck and assisted with emptying the bag

Two offshore lift winches with a capacity of 15 metric tonnes each were used for this job.

All work procedures and calculations were evaluated together with the client. Hazards were identified during the early stages of the project, while input from technicians and people working on the platform proved extremely useful during these evaluations.

First task

The installation of the aluminium crane booms was the first task for the technicians. The team used a mobile compact crane to install the lift boom. The mobile compact crane had sufficient capacity to assemble the aluminium lift boom with a capacity of 30 tonnes at 5.5 metres.

At the end of May, the moment of truth arrived. All the preparations were finalised and the accommodation unit was ready to be shipped to the K6-P platform.

Conbit is renowned for its temporary, special lifting solutions, often involving stand-alone winches. The hydraulic winches used for this job were custom built. In offshore environments, the lifting speed is critical for a safe operation. The speed must be faster than the interval of the waves, which influence the supply vessel carrying the new living quarters. This needs to be taken into account, even in perfect weather. The winches used for this job can lift at 36 metres a minute and have a capacity of 15 metric tonnes.

Once the lift arrangement was installed, a load test was performed. A water bag containing 30,000 litres of sea water was used to resemble the required load on one lift line. Rope access technicians were required to help empty the water bag over the side of the helideck platform.

Waves

As soon as the load test was successfully completed, a weather window approached. All project participants, including many personnel from Total E&P Nederland BV, did their utmost to meet this new deadline. The new accommodation unit was loaded onto the supply vessel Island Earl and secured to the deck. After the 'go ahead' was given by the OIM, it took the supply vessel 6 hours to sail to the K6-P platform.
A final test was carried out in the early hours of Monday 11 June.

At that time, the Island Earl arrived with the new accommodation unit. The Conbit team was eager to begin the actual lift and started to lower the hooks attached to the lifting arrangement on the helideck. The personnel on the supply vessel fixed the heavy crane hooks to the lifting configuration of the accommodation unit.

The accommodation unit's lifting configuration included a spreader beam, 4 chain slings and two master links. This configuration was well prepared by the engineers in the Conbit office.

The next step was to get tension in the lift configuration and read the heave cycle of the vessel. By watching the waves, the winch operator knew when to lift. During the early hours of Monday morning, one big wave (high crest) was followed by two smaller waves and another big wave in a repeating cycle.
The winch operator started lifting at the point when the wave height reached its peak, so the load was high enough for the next wave.
The first moments of such a lift are always tense.

The supply vessel carrying one accommodation unit and the brace frame.

After the unit was well above the deck level of the Island Earl, the supply vessel moved to a save place.

Impressed

The entire team, including the client, was very impressed by the smooth vertical movement of the load. Once it had arrived just below the helideck, the accommodation unit was provisionally secured. By that time, the supply vessel was already at a safe distance. Some horizontal movement of the load was required to manoeuvre it into its final position.

For such activities, rope access is a very useful technique. This often saves time and is therefore often safer. By midday, the new living quarters were in their final position.

The operation would be repeated for the other unit two weeks later. Once both accommodation units were installed, the Conbit team used the same equipment to lift a lay down area extension onto the K6-P platform too. Conbit showed that by using temporary lifting solutions and creative ideas, large objects can be lifted safely and efficiently, even at sea. By working closely together with the people from Total E&P Nederland BV, this project could be added to the long list of successful projects completed by Conbit.

Stand: OSEA 1C5-12

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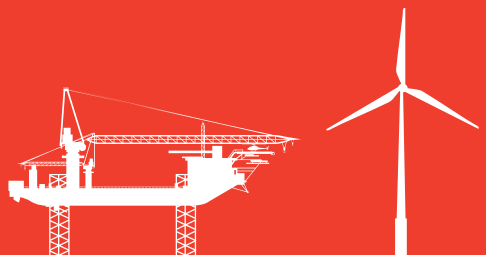

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