International Tug & OSV
INCORPORATING SALVAGE NEWS
July/August 2017

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July/August 2017
Volume 22 Issue 4

International Tug&OSV
INCORPORATING SALVAGE NEWS

FRONT COVER

SD Tempest: *Serco's Damen-built ART 80-32 was specifically procured to support the arrival of the Royal Navy's new aircraft carrier* **HMS Queen Elizabeth**. *It has an 80-tonne bollard pull and features a propulsion system consisting of three azimuthing thrusters and controllable pitch propellers. The Royal Navy picture shows the tug assisting the carrier into the Forth estuary ahead of its sea trials.*

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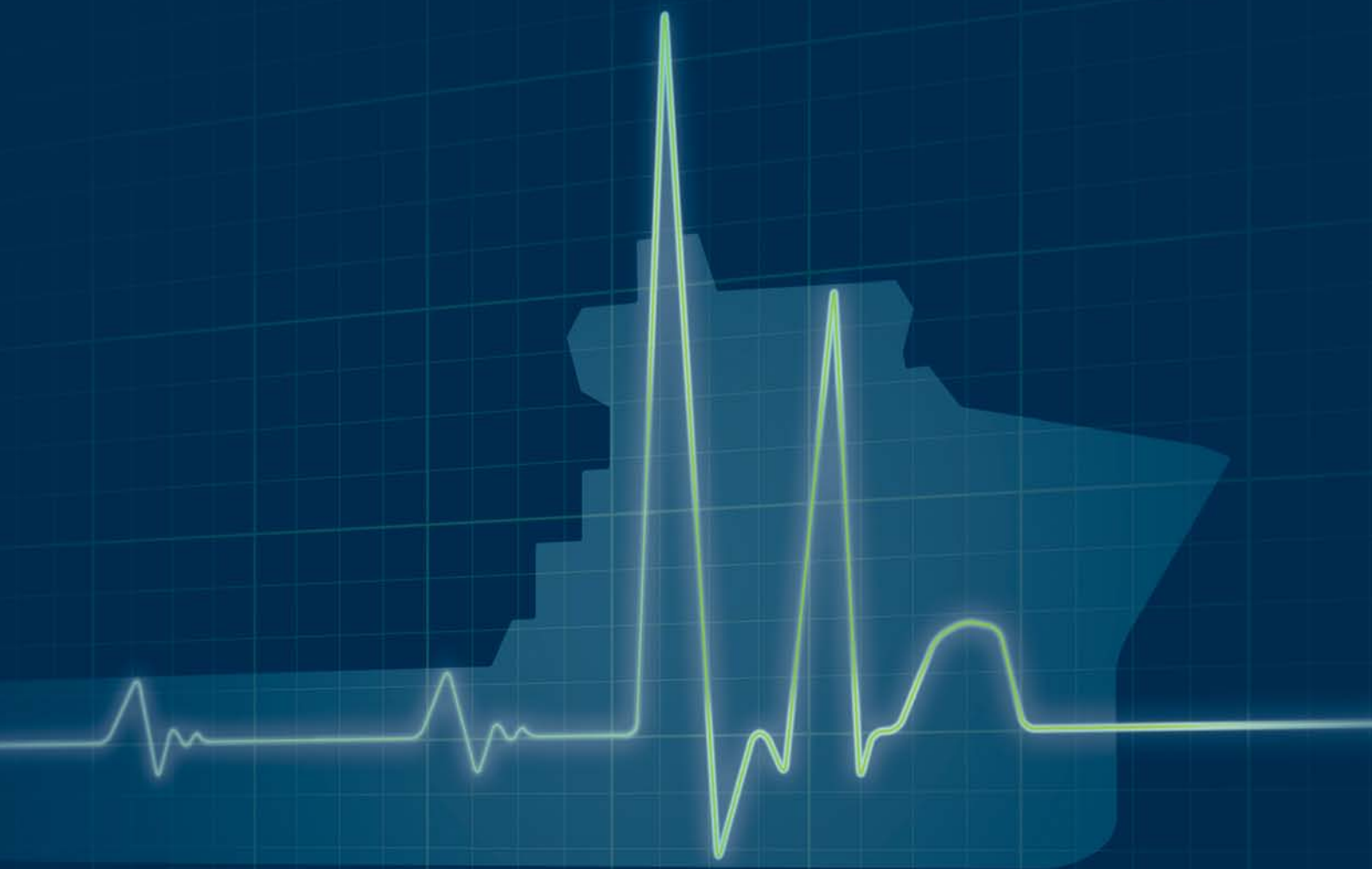
A VESSEL'S PERFORMANCE DATA IS ITS PULSE



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Technology marches on

Truly landmark moments are, by their nature, few and far between, while history-making, industry-changing and revolutionary are epithets that are often awarded to developments or events that, quite frankly, aren't. However, the remotely-controlled manoeuvres successfully carried out by the tug ***Svitzer Hermod*** *in Copenhagen harbour are all of the above. The impact that remotely-controlled and autonomous vessels will have on all aspects of our industry and all those working in it, is huge.*
The involvement of Lloyd's Register in the project is of major significance, as confidence in the safety of these vessels is just as key to their development as their undoubted economic benefit to operators. There is still a great deal that needs to be achieved before crewless tugboats, ferries and globe-crossing cargo vessels are just seen as part of everyday life, but the demonstration by engineering giant Rolls-Royce and global towage operator Svitzer in Denmark shows that the future is here, and the future is now.

Technological advance is, of course, at the heart of our Tugnology *conferences and this year's event in Rotterdam at the end of May was no exception, with in-depth papers reflecting present and future advances, particularly in operational safety and efficiency. As usual, several companies took the opportunity to unveil their latest products, notably Veth Propulsion's new L-drive built around a permanent magnet motor, and the world's first class-approved ship's propeller produced by 3D printer by a consortium including Netherlands-headquartered shipbuilder Damen, both of which feature in this issue's special section on propulsion. Other special features focus on South America, including an operator profile on towage firm Hidrovias do Brasil, and the latest news and views from classification societies.*

Ongoing technological advance and change is also the theme of an article by Robert Allan, executive chairman of Vancouver-based naval architects Robert Allan Ltd, marking the company reaching the milestone of its 1,000th tug design, with a fascinating look back at 87 years of innovation.

Our latest A-Z Guide to Tug and OSV Shipbuilders and Repairers *is also included with this issue, offering the most up-to-date information available on yards across the world involved in our sector. Meanwhile, in our latest Insider View article, Miguel Galdos Urquia, owner and general director of Spain-based robotics engineering specialists Martec, looks at the likely impact that Industry 4.0, the drive for automation and 'big data' exchange, will have on all aspects of the shipbuilding industry and we also celebrate the 90th anniversary of family firm Damen Shipyards.*

And finally, a special thank you goes to Tom Woolley, managing director of Targe Towing, who has provided us with an at-the-scene expert insight into the complex and highly skilled operation by 11 tugs to assist the UK's new aircraft carrier ***HMS Queen Elizabeth*** *out of dock for the first time.*

John McCready, Editor

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ITS 2018 Marseille call for papers now open

The call for papers for next year's *International Tug, Salvage & OSV Convention and Exhibition* (*ITS*) in Marseille, France, is now open and the deadline for paper idea submissions is 11 August 2017. Submissions can be made online at www.tugandosv.com

The paper selection committee will meet after the deadline to discuss all the paper ideas and start the process of finalising the conference programme.

Garth Manson, managing director of The ABR Company Ltd, publishers of *IT&O*, which organises the hugely successful *ITS*, said: "As the saying goes, time flies when you're having fun, but it is still hard to believe that *ITS* is now in its 50th year. We are delighted to be celebrating this landmark event in 2018 by holding our 25th *ITS* convention in France for the first time, in the beautiful southern port city of Marseille."

The event, held every two years in a different location around the globe, is the world's largest gathering of tug, towage, salvage and OSV experts. Since 1969, more than 8,000 delegates and 1,200 exhibitors from 50-plus countries have taken part in the conventions, with a repeat attendance rate of over 75 per cent.

The second largest city in France after Paris, Marseille has been a crossroads of trade and migration since being founded by the Greeks in around 600 BC. At its heart is the Vieux-Port (Old Port), which was the most important trading centre in the region and the main port of the French Empire.

Today, Marseille is France's largest port for commerce, freight and cruise ships – more than 890,000 visitors arrive by cruise ship each year – while fishmongers still sell their catch along the boat-lined quay. With its beaches, history, architecture and culture (24 museums and 42 theatres), coupled with its wonderful Mediterranean climate, Marseille is one of the most visited cities in France.

▲ *Marseille's historic harbour at night is just one of the city's many attractions*

ITS 2018 will take place at Parc Chanot convention centre in central Marseille which is easy to access, with just five metro stops on a direct line from Saint Charles TGV station. Marseille Provence international airport is only 30 minutes away from the venue, with links to more than 100 destinations, 38 of them on direct routes.

The convention's accompanying exhibition is expected to attract 100-plus exhibitors and numerous social events will provide excellent opportunities for networking with industry leaders and decision makers.

For more information about *ITS 2018 Marseille*, including details of how to register, and early bird and other discounts, log on to our website www.tugandosv.com

No daily commuter crush for kayak-to-work COO

When UK-based Keynvor MorLift's (KML) newly-appointed COO commutes across the Penryn River to the firm's Falmouth Wharves headquarters, he swaps one of the world's lightest and simplest water craft for some of the most robust and versatile.

Robin van der Bij's kayak is dwarfed by KML's fleet of specialist tugs, crane and rock barges, and landing craft which he now deploys, with their equally specialist crews, wherever they are required for near-shore marine construction, marine salvage and recovery, heavy lifting, towing and sub-sea or surface device installation.

Van der Bij started his civil engineering career in near-shore marine construction with Van Oord and other Dutch marine organisations; his appointment to the KML team has brought that career full circle. In the interim he became a specialist in sea defence and flood protection, was contracts manager at Seacore, formed his own design and build eco-home construction company and built a successful firm, LM Handling, specialising in offshore and sub-sea heavy lifting equipment sales and rental around the world.

Van der Bij said: "Keynvor MorLift, which is Cornish for Ocean Sealift, is a great business with a fantastic variety of marine work. On the one-hand it has had a wide diversity of national and international 'blue chip' clients. On the other, we are working closely with local clients on vital local projects, installing rock armour protection to vulnerable stretches of coastline, and heavy-duty piled jetties for boat hoists."

Van der Bij's new role comes with an added bonus: as an all-round water-sports enthusiast he is delighted to have exchanged the carbon footprint of regular global travel for a daily commute from Flushing to Falmouth in his orange kayak.

▲ *Robin van der Bij on his way to work*

Crew-free tugboat operation makes history

Rolls-Royce and Svitzer celebrate successful trial of groundbreaking remotely operated workboat in Copenhagen harbour

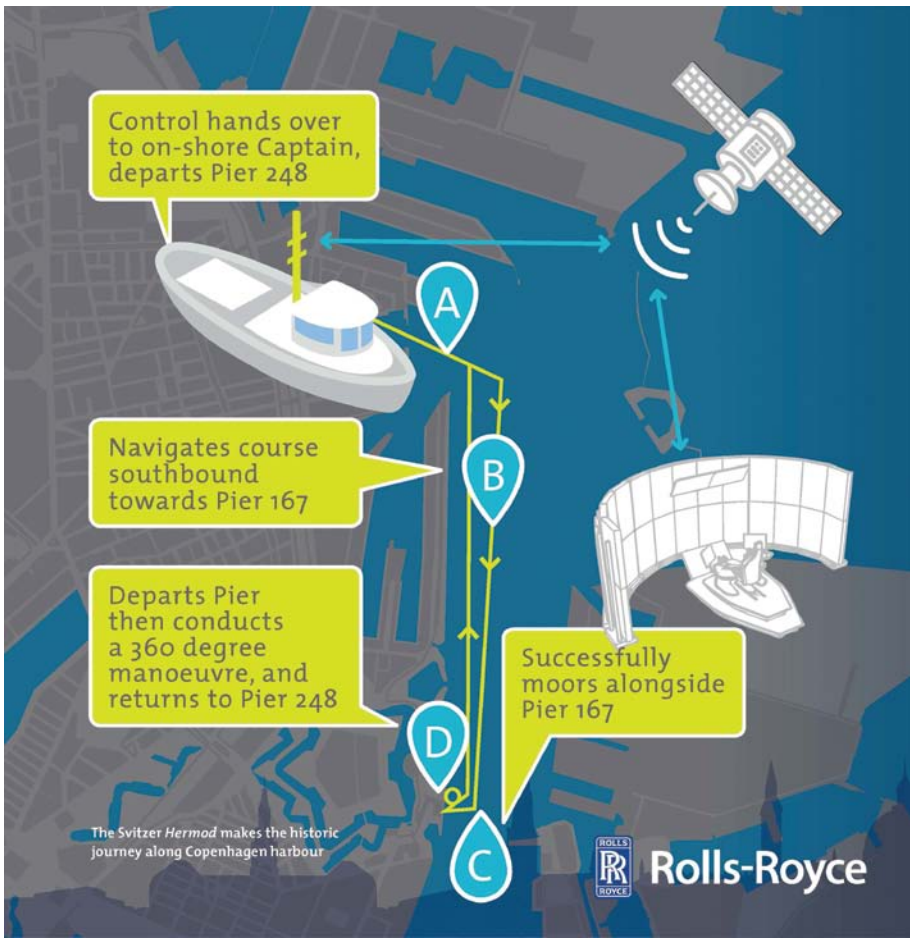
Engineering giant Rolls-Royce and global towage operator Svitzer have successfully demonstrated the world's first remotely operated commercial vessel in Copenhagen harbour, Denmark.

Earlier this year, one of Svitzer's tugs, the 28m-long ***Svitzer Hermod***, safely conducted a number of remotely controlled manoeuvres. From the quay side in Copenhagen harbour the vessel's captain, stationed at the vessel's remote base at Svitzer headquarters, berthed the vessel alongside the quay, undocked, turned 360 degrees, and piloted it to the Svitzer HQ, before docking again.

The companies have also signed an agreement to continue their co-operation to test remote and autonomous operations for vessels. The primary systems involved will be autonomous navigation, situational awareness, remote control centre and communication.

Mikael Makinen, Rolls-Royce president – marine, who witnessed the event, said: "It was an honour to be present at what I believe was a world first and a genuinely historic moment for the maritime industry. We've been saying for a couple of years that a remotely-operated commercial vessel would be in operation by the end of the decade. Thanks to a unique combination of Svitzer's operational knowledge and our technological expertise, we have made that vision a reality much sooner than we anticipated."

Svitzer chief technology officer Kristian Brauner said: "Disruption through innovation is happening in almost every industry and sector, and technology will also be transforming the maritime industry. As the largest global towage company, Svitzer is actively engaging in projects that allow us to explore innovative ways to improve the safety and efficiency of towage operations to benefit our customers and our crews. With its direct impact on our customer performance, operational cost and environmental footprint, vessel efficiency remains a main driver now and going forward. We are proud to be partnering with Rolls-Royce in this high-level research and development of systems for remote operation."



◄ **Svitzer Hermod** *makes history*

Svitzer Hermod, a Robert Allan Ltd design, was built in Turkey at the Sanmar yard in 2016. It is equipped with a Rolls-Royce DP system, which is the key link to the remote controlled system. The vessel is also equipped with a pair of MTU 16V4000 M63 diesel engines from Rolls-Royce, each rated 2,000kW at 1,800 rev/min.

The vessel also features a range of sensors which combine different data inputs using advanced software to give the captain an enhanced understanding of the vessel and its surroundings. The data is transmitted reliably and securely to a remote operating centre (ROC) from where the captain controls the vessel. The ROC was designed to redefine the way in which vessels are controlled. Instead of copying existing wheelhouse designs the ROC used input from experienced captains to place the different system components in the optimum place to give the master confidence and control. The aim is to create a future-proof standard for the control of vessels remotely.

Lloyd's Register's (LR) marine and offshore director, Nick Brown, said: "Working on this project with Rolls-Royce and Svitzer and supporting them on the safe demonstration of ***Svitzer Hermod*** is truly a landmark moment for LR and the industry. With autonomous ships likely to enter service soon, we have already set out the 'how' of marine autonomous operations in our ShipRight procedure guidance, as it is vital these technologies are implemented in a safe way and there is a route for compliance. Lack of prescriptive rules was no barrier for 'de-risking' the project and we provided assurance against LR's Cyber-Enabled Ships ShipRight Procedure, while considering the safety implications associated with the first closed demonstration."

Throughout the demonstration the vessel had a fully qualified captain and crew on board to ensure safe operation in the event of a system failure.

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Tugs assist huge carrier out of dockyard

Eleven tugs assisted the Royal Navy's new aircraft carrier *HMS Queen Elizabeth* from the Rosyth dockyard in Fife for the first time to begin sea trials.

In a delicate operation lasting nearly four hours, ***Queen Elizabeth*** moved from the basin at Rosyth where it has been under construction since 2009, into the Forth estuary. It then waited for low tide to pass beneath three iconic Forth bridges – two road, one rail – and begin six weeks of sea trials in the North Sea.

Lead tugboat was Serco's ***SD Tempest***, a Damen-built ART 80-32, which was specifically procured to support the arrival of ***Queen Elizabeth*** and its under-construction sister carrier, ***HMS Prince of Wales*** – the largest warships ever to be constructed for the Royal Navy.

With a bollard pull of 80 tonnes, ***SD Tempest*** is the most powerful tug in Serco's fleet. The 31.95m long, 12.6m wide, 495gt vessel has a crew of four and features the Rotor®tug propulsion system consisting of three azimuthing thrusters, which provide omni-directional manoeuvrability, designed by Robert Allan Ltd in Canada, making it one of the most manoeuvrable and capable tugs in the UK. It has controllable pitch propellers installed instead of the usual fixed pitch propellers found on other vessels in its class.

Serco also specified a number of modifications to enable ***SD Tempest*** to support the new aircraft carriers, including a double drum render/recovery aft winch for redundancy and a foldable mast for safe working under the flight deck overhang. Like Serco's previous Royal Navy support tugs, ***SD Tempest*** is fitted with grey fendering to match the colour of Royal Navy vessels and prevent marking the hulls.

There was just 35cm either side of the gigantic hull as the carrier squeezed through the lock at Rosyth, and a mere 50cm separated the keel from the lock bottom as the tugs assisted ***Queen Elizabeth*** into the Forth. Other tugs involved in the operation included ***Kittiwake***, Targe Towing's new Sanmar-built 2400 ASD, the contract for which was signed at our *Tugnology* conference in Rotterdam in May (see page 27).

▲ *Tugs assist* **HMS Queen Elizabeth**, *the UK's largest ever warship, from Rosyth dockyard*

Tom Woolley, managing director of Targe Towing, said: "With only inches to spare either side of the Rosyth Lock, ***HMS Queen Elizabeth's*** exit had to be a precise manoeuvre whose execution would be challenged by unavoidably dynamic circumstances. The skill of the three pilots and ship's support team, and the proficiency of the seven tug masters for that part of the manoeuvre, had to be of the highest order."

He described the operation: "Serco's ***SD Tempest***, on the centre lead, gave forward motion. Targe's ASDs ***Cramond*** and ***Dalmeny*** either side of the bow, pushing stern-in due to the massive flight deck overhang, and our Aberdeen-based ATDs ***Cultra*** and ***Carrickfergus*** pushing either side of the stern, controlled sideways movement. ***Hopetoun***, positioned on the stern, was ready to halt the forward movement if required with her massive 120 tonnes bollard pull, and our new RAmparts 2400 ASD ***Kittiwake*** knitted to the transom platform to act as a stern thruster as the four shipside tugs peeled off in turn while the carrier entered the direct exit.

"The four side tugs then passed through the alternative lock to greet the ship on the outside, together now also with Kotug's ***SD Salvor***, Forth Estuary Towage's ***VS Fidra***, Briggs Marine's Multicat ***Forth Constructor*** and Forth Bridge Construction Company's ***Carron***. They pinned the carrier to the outside fenders while ***Kittiwake*** let go from the stern and reconfigured on the starboard bow. The

◄ *It took four hours to manoeuvre* **HMS Queen Elizabeth** *into the Forth estuary*

channel transit was accomplished with six tugs fast: ***Tempest***, ***Fidra*** and ***Kittiwake*** towing forward and ***Hopetoun***, ***Cramond*** and ***Dalmeny*** controlling the stern. Meanwhile, ***Salvor***, ***Carrickfergus*** and ***Cultra*** escorted passively.

"It was all rather majestic as this magnificent ship glided down the channel to the inner Firth of Forth, where she anchored to await the low tide for the transit under the bridges with five tugs in attendance.

"At the early morning briefing, we had been asked to keep a tug in attendance once the ship re-anchored in the outer Forth.

"That unanticipated event created something of a logistical challenge in terms of getting the tugs back to the terminals and harbours of their regular customers. However, in the event, the ship proceeded to sea without anchoring – which sent a positive signal that confidence levels on board were high.

"Preparation is the key to success. More than 30 simulations at the South Tyneside College bridge simulator over many months, the briefings and 'can do' attitude and teamwork built up over the months paid off brilliantly well. I would also pay tribute to the port authorities and major customers and their representatives on the Forth and in Aberdeen who flexed their schedules to accommodate this major strategic event."

The 65,000-tonne warship is the Royal Navy's first aircraft carrier since ***HMS Ark Royal*** was scrapped in 2010. It will be several more years before ***HMS Queen Elizabeth*** becomes operational.

New harbour tug design aims for versatility

Glosten, a Seattle, US-based marine consultancy, has unveiled the HT-67 – a new 67ft (20.4m) ASD Z-drive harbour tug designed for versatile service on inland and near coastal waters.

Outfitted with a tow winch and pin box/stern roller assembly, the tug can tow astern as efficiently as a conventionally shafted tug of equal horsepower, and handle barges unassisted on arrival and departure.

Capt Peter Soles, a marine consultant at Glosten, said the HT-67 was developed with input from experienced towboat operators.

He said: "Our goal was to develop a nimble harbour-size tug with exceptional barge handling capabilities.

"We sought input from veteran ASD captains at multiple points in the design process. We now have a design that is practical, adaptable and user-friendly – both for captains in the wheelhouse and crew members on deck."

The HT-67 boasts a steel hull with an aluminium house, and single curvature hull plates for ease of construction (estimated at US$4.9m). The hull can also be ice strengthened or fitted with push knees without substantially altering the design.

Propulsion engines may be Cummins QSK19-M, 750hp at 1,800 rev/min, or MAN LE 434, 750hp at 1,800 rev/min, for a combined 1,500hp. Both engine types are EPA Tier 3 compliant. Z-drive units may be either Schottel SRP 190FP, or ZF Marine AT 5000 WM-FP. Both units utilise fixed pitch propellers in 19A nozzles, fitted in either bottom or top-mounted round wells. A top mounted configuration affords the option to remove and replace Z-drive units pier side, without dry docking.

▲ *The new HT-67 harbour tugboat design from Seattle-based Glosten*

The HT-67 can also be configured with Nautican nozzles on ZF Marine Z-drives for superior bollard pull and fuel efficiency.

The vessel meets US Coast Guard Subchapter M design requirements for towing vessels.

Soles said: "This design offers a lot of capability and versatility in a small package. It is highly responsive and the right size for working in confined waterways, whether you are towing, working alongside, or assisting."

First Spain-built SOV on water

The first service operation vessel (SOV) built in Spain has been launched at Gondan's shipyard in Figueras.

The event was attended by representatives from the Norwegian shipowner Østensjø Rederi and Dong Energy, which will charter the vessel.

The 81m-long vessel, which has a 17m beam, is the first of two SOVs that Gondan will deliver to Østensjø Rederi, a long-term customer with which it has had 13 shipbuilding contracts in the past 10 years.

Both vessels are being built according to the same UT 540 WP design by Rolls-Royce Marine. They will be equipped with an Uptime 23m-long heave compensated W2W gangway, a cutting edge 3D compensated crane and a CTV landing system with bunkering facility.

▲ *The SOV being built for Østensjø Rederi sitting off Gondan's shipyard in Figueras, Spain, after its launch*

In addition to the gangway, an onboard-fitted 11m daughter craft will allow the safe transfer of maintenance technicians to the offshore wind turbines.

Yard more eco-friendly

VT Halter Marine, based at Pascagoula, Mississippi, US, has begun the construction of a large state-of-the-art integrated blast and paint facility that will allow the complete indoor and environmentally-controlled surface preparation and final painting of vessel sections prior to vessel construction, while ensuring particles from the facility are not released into the environment.

CEO Paul J Albert said: "The addition of this new facility will further enhance our capabilities and quality to be more efficient and competitive."

The facility, located on the northeast corner of the Pascagoula shipyard, will accommodate vessel sections as large as 32m wide x 24m long x 12m high, and that weigh up to 500 tons (455 tonnes) each.

Tugs assist with platform lift and tow

▲ *Tugs assist cargo barge **Iron Lady** to transport the decommissioned Shell platform*

Kotug International's offshore division successfully assisted Allseas with the transfer and transport of Shell's *Brent Delta* topsides after the record-setting removal of the structure by *Pioneering Spirit*, the world's largest heavy-lift vessel.

Kotug was mainly involved in the assistance of the cargo barge ***Iron Lady*** during the transfer of the topsides from ***Pioneering Spirit*** to ***Iron Lady*** and the ensuing tow of the barge to the Able UK decommissioning yard on Teesside in the north east of England.

After ***Pioneering Spirit*** safely lifted the *Brent Delta* platform, it was seafastened and sailed to a location off the coast of Hartlepool, UK, where it was transferred to the barge.

The transfer was assisted by Kotug, which operated and oversaw four harbour tugs which took over ***Iron Lady*** in order to bring it under the Brent Delta platform in the slot of ***Pioneering Spirit***.

Subsequently, the same four harbour tugs towed the barge carrying the topsides out of the heavy-lift vessel's slot and into the River Tees, for the remaining part of the transport to the decommissioning yard.

With the entrance channel to the Able UK decommissioning yard being narrow and tidal restricted, this final part of the journey required in-depth towage expertise and powerful, versatile tugs. Kotug and Allseas chose to deploy two Rotor®tugs and two ASD tugs in order to create maximum redundancy and manoeuvrability in the tug configuration.

Kotug tow master, Bas van Hoorn, said: "We have worked for Allseas in previous offshore projects and we were honoured to be selected for this ground-breaking project as well. The towage operations were carefully prepared in close co-operation with Allseas, with extensive calculations and risk assessments to determine the safest and most efficient towage plan for ***Iron Lady***. Thanks to great collaboration with the tug crew, Tees pilots, Allseas team, both on board and ashore, and Shell, we can look back on a job well done."

Design overhaul will mean vessels are easier to build

▲ *What the new Rolls-Royce family of vessels will look like*

Rolls-Royce has revealed a radical overhaul of its vessel design philosophy which aims to optimise construction and operations without reducing the use of space on board. In the process it will ensure that a Rolls-Royce designed vessel, whether it is an OSV or an expedition cruise ship, is instantly recognisable world-wide.

The new design incorporates key features in each design. These are a knuckle line that slopes down towards the bow and links the new designs with its older UT and NVC designs; a vertical side area and vertical upper stem which simplify the design and decouples the hull form from the superstructure and a topside sheer line with a small convex curvature.

These features will be present in all the designs in some form but can be modified depending on the vessel type.

Martijn de Jongh, Rolls-Royce chief designer – marine, said: "We have evaluated the profile of the vessels to omit any unnecessary aspects, such as excessive large windage areas, for instance. They will be easier to build as well."

Certain ship types may require more design modifications than others. Rolls-Royce naval architects will continue to have the freedom to adjust and apply design characteristics to suit each particular vessel, incorporating the four 'must use' elements.

A major feature of the approach is the decoupling of the hull design from the superstructure and other design elements, giving designers and naval architects significantly more flexibility. This minimises complex double curvature plating, common to many vessels, which is difficult and time-consuming to fabricate. The use of flat plate or single curvature plating will be increased, simplifying construction and reducing the time each vessel takes to build.

Depending on the vessel type and operational and construction requirements, the forward topside will be based on five distinct hull forms. This will allow the designs to be applied across a range of vessels from offshore vessels involved in subsea work in harsh environments to expedition cruise ships. All will have a canopied superstructure featuring a curved front with the bottom edge of the bridge wings and windows leaning down towards the bow. A UT 540 wind farm vessel due for delivery from Spain's Gondan shipyard this October is typical of how the new family of UT vessels will look.

Tug operator visits shipyard

▲ *Orhan Gürün, chairman of Sanmar Denizcilik, left, and Gianni Andrea de Domenico, chairman of Rimorchiatori Napoletani*

Italian tugboat operator Rimorchiatori Napoletani's chairman, Gianni Andrea de Domenico and technical officer, Carmine Malvone, visited Sanmar Shipyards after ordering two Sirapinar Class tugs from the Turkish shipbuilder.

After the technical meetings and on-site inspection, de Domenico said: "We are very happy with the quality and construction of the vessels, which continues as planned.

"The vessels are being constructed at Sanmar Shipyard Tuzla, but we also had the chance to visit Sanmar's new shipyard in Altinova. We were highly impressed with the new shipyard. We had the chance to see different tugboat series under construction.

"We hope to co-operate with Sanmar on future projects."

The Sirapinar Series builds on the success of the RAmparts 2400-SX Boğaçay series, of which more than 30 have been constructed with bollard pulls ranging from 60 to 75 tonnes. The hull of the new 22m tugs, available in 45 to 60-tonne bollard pull versions, is similar to the larger model and can run astern at high speeds, while maintaining good control and directional stability in all directions.

Measuring 22.4m overall with a beam of 10.85m and maximum draft of 4.67m, the vessels destined for Italy will be built to RINA class and Italian flag requirements and will be powered by pairs of 1,500kW Caterpillar engines. These will turn Schottel azimuthing Rudderpropellers to give a minimum of 50 tonnes bollard pull.

The vessels are scheduled to be delivered by the end of 2017.

Crew member lost as tug sinks

The US Coast Guard (USCG) spent more than four days searching for a missing crew member of the *Crosby Commander* tugboat, which sank in the Gulf of Mexico off Marsh Island, Louisiana.

The USCG said its search had covered 3,753 square nautical miles and lasted approximately 98 hours before it was suspended.

Coast Guard Sector New Orleans received a report on the morning of 29 May that ***Crosby Commander*** was taking on water with four people aboard.

Three of the four crew were able to evacuate to a life raft before the 85ft (26m) vessel sank. One crew member remained missing.

The survivors were rescued by the motor vessel ***Andi Nicole*** and reported in good condition. Built in 1979, ***Crosby Commander*** was owned by Crosby Tugs of Galliano, Louisiana. Two other Crosby tugs, ***Crosby Trojan*** and ***Crosby Trinity***, were involved in the search.The cause of the incident is under investigation.

▲ *A file picture of* **Crosby Commander** *operating on the US Gulf Coast*

In brief

Shibata Fender Team has celebrated its 10th anniversary with a celebration and business gathering in Berlin attended by sales agents, partners, friends and colleagues from around the world. Started by a handful of experts in a small office in Hamburg the company, now part of the Shibata Industrial Company of Japan, has offices and production sites in America, Europe and Asia and has successfully completed more than 4,500 projects worldwide.

Offshore energy support vessel operator Seacat Services and offshore wind manufacturer and service provider Siemens Gamesa Renewable Energy have signed a two-year charter deal to support early operations and maintenance at the 336MW *Galloper* wind farm off the UK's Suffolk coast.

The Shipowners' Club has reported resilient results for the year ending 31 December 2016, with a combined ratio of 98.6 per cent, an increase in gross tonnage of 0.8m to 25.4m and an overall surplus of US$14.7m, including a return on the investment portfolio of US$11.8m.

Norway-headquartered Navico – the world's largest manufacturer of marine electronics and parent company to the Lowrance, Simrad and B&G brands – has finalised an agreement to acquire Naviop, a global leader in marine monitoring and control systems.

The Chamber of Shipping of America awarded 43 Bouchard Transportation vessels with its Jones F Devlin Award, recognising their safety achievements in 2016. Between them, the vessels have operated a total of 364 years with no lost-time injuries.

Workships Contractors, managers of the DSV ***Offshore Beaver***, has announced that the vessel has been sold to Seisund AS of Torangsvag, Norway. It will transfer to working in the Norwegian aquaculture industry.

The recently established Nautican research and development and manufacturing facility in Summerside on Prince Edward Island, Canada, is ready to ship its first integrated propulsion unit to a customer in Alaska.

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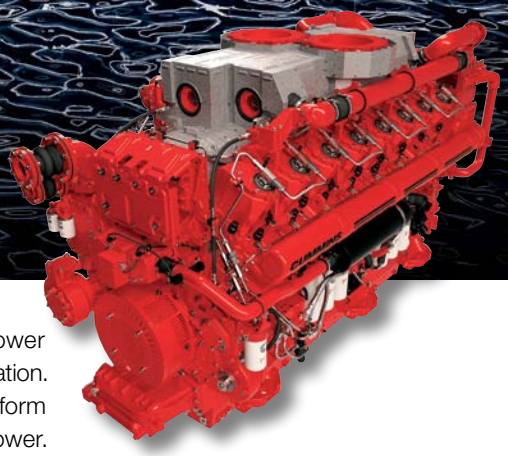

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New chairman warns of testing times ahead

The European Tugowners' Association (ETA) has appointed Leendert Muller as chairman for a period of two years. Muller, managing director of towage and salvage specialist Multraship, was confirmed as chairman at ETA's annual meeting in Trieste, Italy, on 8 June. He succeeds Tug Malta's chief executive, Mario Mizzi.

ETA is the only association that represents the tug sector at a European level, and is composed of 84 full members in 24 countries, who own or operate a combined fleet of more than 850 tugs in European ports. Its membership ranges from major towage companies operating more than 100 tugs worldwide to family businesses and port authorities with very small-to-medium-size tugboat fleets.

Muller, who has served as ETA deputy chairman since 2015, said: "The fleets of ETA members provide a vital service, the importance of which can sometimes be underestimated. These vessels help keep world trade and the world fleet moving.

"The next two years are going to be very testing for ETA members. In Europe and elsewhere, tug owners and operators will face a variety of challenges, including political, economic and environmental issues. The challenge for ETA members is to continue to invest in technology and manpower so that their vessels can operate safely and efficiently in the best interests of their customers.

"I am confident that, together, we will achieve that aim."

Outgoing chairman Mario Mizzi said: "My last two years as chairman of ETA was a very positive and interesting experience. Several initiatives have been taken to reinvigorate the activities of the association in line with its mission statement, to increase ETA's relevance for all our members and above all to be a stronger voice with European Union and pertinent maritime institutions."

▲ *ETA's outgoing chairman Mario Mizzi, left, with his successor, Leendert Muller*

In addition to electing Muller as chairman, the meeting also appointed Capt Kimmo Lehto of Alfons Håkans as deputy chairman for the next two years. He has been a member of the ETA executive committee since 2011 and heads its nautical technical committee.

ETA secretary general Anna Maria Darmanin added: "Our 54th annual meeting, which took as its theme 'Safety is our Business', had the biggest turnout in its history, with more than 160 participants. We were very pleased to welcome two new countries, Cyprus and Slovenia, bringing our total to 24."

Sea trials 'exceeded expectations'

▲ *A RAmparts 3200-CL tug fitted with two Perkins 6TWGM auxiliary engines*

Perkins marine diesel auxiliary engines have been supplied to four RAmparts 3200-CL tugs built by Cheoy Lee Shipyards Hong Kong.

Multico Power Drive, the distributor for the company's marine engines in Singapore, has supplied two Perkins 6TWGM engines to each of the tugs ***Hawksbill***, ***Flatback***, ***Loggerhead*** and ***Limin***. Each tug is 32m LOA and built to Lloyd's requirements with special notations.

The Perkins 6TWGM is part of the 1006 Series. It is a turbocharged vertical inline six cylinder, six litre engine and is one of a family of engines that range from 39.5 to 161mkW. The engines come with a 500-hour service interval and offer clean, quiet and smooth operation, with excellent fuel economy.

The Fastram combustion system incorporates an enclosed breather system, designed to make the engines more environmentally friendly with low noise, rapid startability and low emissions.

MT Lim, deputy general manager at Multico, said: "The 6TWGM was a perfect fit for their requirements in terms of auxiliary power needed, the space available and the delivery time. The operators of these tugs need the reliability that Perkins has to offer, and they are pleased with the result."

Caterpillar, which acquired Perkins in 1997, has played a significant role in the project, also supplying the propulsion and power on board the RAmparts 3200-CL tugs. In addition to the Perkins 6TWGM auxiliary engines, each tug is equipped with a pair of Cat 3516 diesel engines rated at 2,682bhp at 1,600 rev/min.

During sea trials the tugs met and exceeded performance expectations with a full running speed of 13.4 knots and a bollard pull of 72 tonnes.

The tugs have an operating crew of up to 10 people, with cabins for the master and chief engineers, as well as four double cabins for the remaining crew.

Business gains a global partner

Prince Edward Island, Canada-based engineering firm Aspin Kemp and Associates (AKA) and Germany-based engine and turbomachinery company MAN Diesel & Turbo have finalised an agreement whereby MAN steps in as a 40 per cent shareholder in AKA.

Through this new partnership, AKA is looking forward to building its innovative potential with MAN in a broader market for power and energy solutions. AKA co-founder Jason Aspin remains a controlling shareholder and CEO. Fellow co-founder Neale Kemp has retired.

Aspin said: "It's really been critical to go to the next level where we can take the innovation that we've developed. It's been important to find a global partner who has a stronger brand and is able to allow us to compete with larger organisations across the world."

Russian gas project needs 19 newbuilds

▲ *A Damen pusher tug 2612SD*

Damen Shipyards Group has secured an order with German heavy lift company Combi Lift to build a total of 19 specially customised shallow-draft vessels that will be used to transport oversized and heavy lift cargo for the Gazprom Amur gas processing plant project in the Russian Far East.

The multiple vessel order comprises four 2608SD Multicats, four 2612SD pusher tugs, seven 8916SD Stan pontoons and four 8605SD side floaters.

Combi Lift's role in the project will be to transport more than 176,000 tonnes of cargo from different production locations, over the sea to Russia and along the Amur and Zeya Rivers to the end-destination. The demanding scale of the work and local geographical conditions have both had an influence on the designs of the Damen vessels.

For example, the project involves some significant heavy river transportation. Included in Combi Lift's scope of work is the lifting and transportation of 12 columns, each weighing 900 tonnes. Furthermore, certain stretches of the Amur and Zeya rivers can be very shallow and this can be compounded with severe weather and winter ice.

Due to the specific demands of the local environmental conditions and the project itself, Damen is making a number of adaptations to these vessels from its standardised portfolio, for example, reducing their overall weight and lengthening/widening them to achieve reduced draft and increased buoyancy. Furthermore, a raisable wheelhouse will be mounted to give a clear and safe overview of the deck and cargo.

Damen sales manager, Remko Bouma, said: "We have experience in Russia having delivered many vessels here in the past."

Construction of the vessels will take place at Damen Yichang Shipyard in China and Damen Shipyards Gorinchem and Damen Shipyards Hardinxveld in the Netherlands.

Operator expands support fleet working in Australia

Netherlands-headquartered tug operator Kotug has acquired a new addition to its range of infield support vessels (ISVs) in Australia and East Timor as part of its ongoing investment in offshore support.

Coral Knight will be bare-boat chartered exclusively to Australian Maritime Systems to provide emergency towage services and maintain aids to the navigation network at the Great Barrier Reef for the Australian Maritime Safety Authority.

The vessel will continue to be operated out of Cairns, Queensland, to provide level 1 and 2 emergency response, entailing a dedicated 24/7 vessel and crew to provide emergency towage plus first strike emergency response and a platform to support the maintenance of aids to navigation.

The company's offshore services in Australia also include an exclusive contract to provide all towage operations for Shell's *Prelude FLNG*, as well as towage assistance at ConocoPhillips' *Bayu Undan FSO*, for which it employs three ISVs, with a fourth vessel currently being built.

All vessels are owned by the Kotug group and operated by KT Maritime Australia, a joint venture between Kotug International and TK Australia.

▲ *Infield support vessel* **Coral Knight** *is the latest addition to Kotug's fleet in Australia*

Tug named after river

Named after a river that flows into the Azov Sea, the MPSV12 project Arc 5 Arctic-class multi-purpose shallow draft tug-salvage vessel *Beysug*, *pictured left*, was recently rolled out on to an open slipway at the Nevsky Shipyard at Shliesselburg in the Leningrad region of Russia.

Ordered by the Russian Federation's state contracting authority for marine transport and designed by Marine Engineering Bureau, the vessel will have a wide range of functions including search and rescue, salvage, dive support, towing in ice and open water, fire-fighting, dealing with oil spill pollution and transporting up to 12 passengers.

Offshore giants complete merger

Norwegian offshore vessel companies Solstad Offshore, Farstad Shipping and Deep Sea Supply have completed their merger into one company – SolstadFarstad.

Lars Peder Solstad, CEO of the merged company, said it was time to prepare for the future. He said: "We are operating in a tough market. As a merged company, we are better equipped to meet the challenges and the possibilities that will arise.

"With the merger, we may benefit from synergies through operation of a larger fleet, our collective competence and experience, and hence ensure profitable operations in the future."

Through the merger, the company becomes world leading in the high-end market for OSVs. SolstadFarstad owns a fleet of approximately 150 vessels, and has offices in Norway, Australia, Brazil, Singapore, the Philippines, the UK, Cyprus and Ukraine.

In addition to the offshore activity, the company holds significant activity within the renewable energy segment and aqua culture. The company DESS Aquaculture Shipping was established in June 2016 as a joint venture between Marine Harvest and Deep Sea Supply. The company has two well vessels and one harvest vessel under construction, all with long-term contracts with Marine Harvest.

Although SolstadFarstad is now one company, Solstad said it will be 'business as usual' until further notice.

He said: "We are now entering a phase of implementation of management and systems, mapping and establishment of a new organisation, as well as starting the process of streamlining the operations in accordance with the new operational model. The new organisation model will be set in September."

► *Lars Peder Solstad, CEO of SolstadFarstad*

The headquarters of SolstadFarstad is in Skudeneshavn, Norway, and the intention is to maintain operations from the offices in Ålesund, Fosnavåg and Grimstad.

Solstad said: "Internationally, we will maintain presence in the countries where we are already established, by having one office in each country."

SolstadFarstad has a new graphic profile, but its vessels will keep their respective names, funnel marks and colours.

Confidence rate at three-year high

Shipping confidence reached its equal highest rating in the past three years during the three months to the end of May 2017, according to the latest Shipping Confidence Survey from international accountant and shipping adviser Moore Stephens.

The average confidence level expressed by respondents to the survey was up to 6.1 out of 10.0 from the 5.6 recorded in the previous survey in February 2017. Increased confidence was recorded by all main categories of respondent to the survey, which launched in May 2008 with an overall confidence rating of 6.8.

A number of respondents expressed cautious optimism about the industry's fortunes over the next 12 months, based largely on perceived increased levels of ship demolition and a rationalisation of over-ambitious newbuilding plans.

This helped increase expectations of major investments being made over the next 12 months. However, concern persisted over political uncertainty, over-tonnaging in certain trades, depressed oil prices and a potential dearth of quality seafarers.

► *Richard Greiner, Moore Stephens partner, shipping and transport*

Richard Greiner, Moore Stephens partner, shipping and transport, said: "At 6.1, given geopolitical, economic and industry developments, this must be seen as a robust rating."

'We'll still have Paris'

Following the US decision to withdraw from the Paris Climate Agreement, the European Community of Shipowners' Associations (ECSA) and the International Chamber of Shipping have expressed support for the intention of the EU and China to intensify co-operation to achieve a global climate deal for shipping.

EU and Chinese leaders reaffirmed their commitment to implementing the agreement on climate change at a summit meeting in Brussels. They also looked forward to co-hosting, along with Canada, a major ministerial gathering in September to advance the implementation of the agreement and accelerate maritime clean energy transition.

ECSA secretary general, Patrick Verhoeven, said: "The withdrawal of the US from the Paris Climate Agreement should not jeopardise an ambitious global strategy to reduce the CO_2 emissions of shipping."

Training company rebrand part of major international expansion plan

◄ *Left to right, Capt Arie Nygh, MD of SeaWays Australasia, Neil Sadler, MD SeaWays Americas and Middle East and Steve Sandy, MD SeaWays Global at* Tugnology '17

Tugmaster and pilot training provider SeaWays Global has adopted a new company name and further rebranding as part of its business expansion plans.

Formerly known as SeaWays Europe, the company has established a strong presence in the region during the past 10 years and, following customer demand, is now aiming for further international expansion.

The new branding was used at the *Tugnology '17* conference in Rotterdam, where Capt Arie Nygh, managing director of SeaWays Australasia, was part of a panel of experts debating the challenges of tug safety.

SeaWays training programmes have a proven track record of delivering savings in fuel usage, towline use, maintenance cost and reduced incidents. It says training cost is an investment with initial outlay returned within a short time.

SeaWays Global managing director, Steve Sandy, said: "We are looking forward to this new and exciting opportunity and would like to thank our existing clients for their continued support, which has enabled our training programmes to be recommended around the world."

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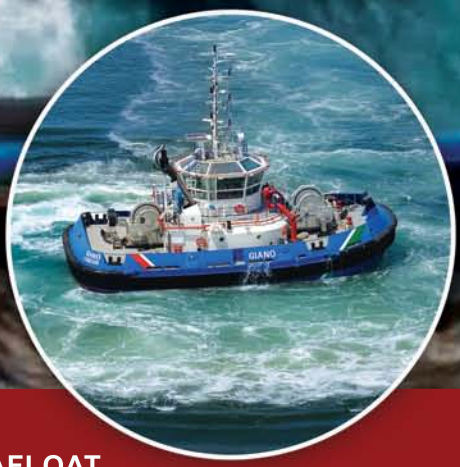

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Marintec South America
15-17 August 2017
Rio de Janeiro, Brazil
www.marintecsa.com.br

International Salvage Union AGM
Singapore
5-8 September 2017
www.marine-salvage.com

Offshore Marine & Workboats ME
Abu Dhabi, UAE
25-27 September 2017
www.seatrademaritimeevents.com

Europort
Rotterdam, The Netherlands
7-10 November 2017
www.europort.nl

International WorkBoat Show
New Orleans, USA
29 Nov-1 Dec 2017
www.workboatshow.com

Salvage & Wreck Removal
London, UK
6-7 December 2017
maritime.Knect365.com/salvage-wreck-removal

APM Maritime
Singapore
14-16 March 2018
www.apmmaritime.com

Offshore Technology Conference
Houston, USA
30 April-3 May 2018
2018.otcnet.org

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MARSEILLE **25-29 June 2018**
25th International Tug, Salvage & OSV Convention and Exhibiton
The world's largest gathering of tug, salvage and OSV experts.
Parc Chanot Convention Centre, Marseille, France
Register online at
www.tugandosv.com

SMM
Hamburg, Germany
4-7 September 2018
www.smm-hamburg.com

OSV firm takes tough action

New Orleans-based Tidewater, one of the leading providers of OSVs to the global energy industry, and several of its subsidiaries have filed for Chapter 11 bankruptcy in Delaware as part of a previously announced restructuring support agreement with certain creditors.

The company intends to stay in business throughout the bankruptcy and restructuring procedure and says it has sufficient liquidity to maintain uninterrupted operations.

Tidewater, which has a fleet of more than 300 OSVs, expects its pre-packaged plan of reorganisation to eliminate around US$1.6bn of outstanding debt, which will substantially deleverage its balance sheet and better position it to weather the continuing downturn in the offshore energy industry.

President and CEO, Jeffrey M Platt, said: "After much thought and successful negotiations with certain of our economic stakeholders, we decided that commencing the Chapter 11 cases was necessary to create financial stability which would allow Tidewater to remain a formidable competitor given this unprecedented industry downturn.

"Throughout the Chapter 11 process, we anticipate meeting ongoing obligations to our employees, customers, vendors, suppliers, and others. We will continue to provide our customers with dependable, high-quality services."

Tidewater later announced a fourth quarter net loss for the period ending March 31, 2017, of US$94.9m, or US$2.01 per common share, on revenues of US$160.7m. For the fiscal year ending 31 March 2017, the company's net loss was US$660.1m, or US$14.02 per common share, on revenues of US$601.6m.

► *Tidewater president and CEO Jeffrey M Platt*

In the prior fiscal year's fourth quarter, ending 31 March 2016, the company's net loss was US$81.8m, or US$1.74 per common share, on revenues of US$184.2m. For the fiscal year ended 31 March 2016, the company's net loss was US$160.2m, or US$3.41 per common share, on revenues of US$979.1m.

Tidewater's story began in 1955, when a group of investors led by the Laborde family of New Orleans pioneered the development of the first OSV tailor-made to support the new and growing offshore oil & gas industry.

Vessel prices start to edge higher

Values of second-hand OSVs edged slightly higher in April despite the continuing low level of sales and uncertainty in the market, according to data provider and analysis company VesselsValue.

The London-headquartered company's latest monthly market overview shows values for older, smaller tonnage AHTS vessels have softened slightly – between 0.3 and 8.1 per cent – but remained stable for larger tonnage. The month saw six AHTS sales, five of them with undisclosed prices.

Charlie Hockless, senior offshore analyst at VesselsValue, said: "AHTS values have shown little change. The small fluctuations are due to current instability in the market, coupled with few disclosed S&P transactions. This is a contrast to 2014-2015 where values declined significantly."

PSV values for all sizes and ages of the type consistently showed a slight firming – between 0.5 and 1.8 per cent – although there were only two sales, both with undisclosed prices. Hockless added: "PSVs have shown resistance to the decline in values in 2017, due to a number of firm prices."

Society launches unmanned marine code

Classification society Lloyd's Register (LR) has launched a goal-based code that takes a structured approach to the assessment of unmanned marine systems (UMS) against a set of safety and operational performance requirements.

With current and expected developments in autonomous and remote systems, LR envisages that, within the near future, UMS will enter into widespread use through many maritime sectors.

The LR *Unmanned Marine Systems Code* provides an assurance process in order to certify the safe design, build and maintenance of UMS against an established framework that minimises the effort required by an owner or operator to achieve certification and which is acceptable to flag states, local regulators and other parties. While initially targeted at small non-convention sized UMS, it is scalable to larger, more complex vessels as technology and regulation develops.

Upgrade to include new hybrid crane

Rolls-Royce has signed a deal with Brazilian ship owning company CBO to equip an existing PSV with a new patented dual draglink subsea crane (DDC), the first installation of a subsea crane designed to use either fibre or steel wire rope.

The hybrid DDC subsea crane will be installed on ***CBO Manoella***, which is currently being retrofitted from a PSV into an ROV support vessel (RSV). The active heave compensated crane is designed for continuous operation in a tough and corrosive offshore environment with the focus on efficient and safe load handling.

▲ *An illustration of the hybrid dual draglink subsea crane from Rolls-Royce*

Speaking to *IT&O* at Nor-Shipping in Oslo, Runar Hjelle, Rolls-Royce general manager sales – America offshore deck machinery, said the new crane was being targeted at the offshore and subsea installation sector where operators could benefit from reduced cost and improved performance through the option of using fibre rope.

He said: "For example, a subsea crane that is operating in active heave compensation (AHC) traditionally on the winch down to 3,000m water depths would typically need to change the whole length of wire on the winch every three or five years, depending on where it is in operation.

"On our DDC subsea crane, the AHC is done by the horizontal elbow and we do not have the issues related to CBOS (cycling-bend-over-sheaves) and building up of heat in the fibre rope.

"The operational life time of a typical fibre rope in our DDC subsea crane will be 15 years. And in addition the fibre rope is lighter compared to wire and is very easy to inspect for damage. Any damage is reparable since the rope can be spliced together – this is a huge cost saving for our customers.

The crane to be installed on ***CBO Manoella*** has a lifting capacity of up to 50 tonnes and an operating depth of up to 3,000m. It will be equipped with wire rope when it embarks on its first subsea assignment off the coast of Brazil. However, the possibility of changing to fibre rope provides flexibility in a challenging market. Because of the low weight of the fibre rope, the vessel's deck load capacity can be increased by approximately 100 tonnes – another benefit of using a low-weight fibre.

Marcelo Martins, CBO technical director said: "This is one of two vessels CBO is now retrofitting from PSVs to RSVs, and we are very satisfied about the flexibility of the crane from Rolls-Royce. A hybrid solution, with use of either fibre or wire, makes the vessel better prepared to take on a larger variety of future subsea tasks."

The cable tractions control unit (CTCU) forms the crane winch and is located at the crane's main boom. This solution saves space compared to a solution where the CTCU is mounted below deck, and also makes it a better choice for retrofits.

Delivery from Rolls-Royce will take place in third-quarter 2017. It comprises a complete DDC crane system including the CTCU, cabin and control system.

JIP proposal on target for *ITS*

Project manager Thijs Hasselaar is hopeful that he will be able to present the final proposal from the joint industry project (JIP) on bollard pull at the *ITS* convention and exhibition in Marseille, France, next year.

Organised by The ABR Company, publishers of *IT&O*, *ITS 2018 Marseille* will take place at the Parc Chanot Convention Centre from 25-29 June.

Interviewed at the *Tugnology '17* conference in Rotterdam following a meeting of JIP members, Hasselaar said: "If we agree on certain definitions, I should be able to present the proposal. With the technical work I think we're there, or almost there.

"The first draft is already on the table. Most technical input has been investigated and there is a broad consensus about the general objective of the JIP in that whatever you do to test bollard pull should be repeatable in service."

Hasselaar, who is project manager trials and monitoring at MARIN, said the meeting in Rotterdam, which was attended by more than 30 JIP members, was presented with a lot of technical work and conclusions, and came up with recommendations. He expected to have a completed draft at the next project meeting which is due to take place in November.

For more information about *ITS 2018 Marseille*, including how to register to attend and submit an idea for a paper, log on to our website at www.tugandosv.com. The deadline for paper synopsis submissions is 11 August 2017.

In addition to the BP JIP meeting, another JIP meeting was held alongside the main sessions at *Tugnology '17*. The MARIN JIP on developing low-noise tunnel thrusters was launched in December 2015, and the meeting in Rotterdam convened to assess progress made towards objectives.

► *Bollard pull JIP project manager, Thijs Hasselaar*

Excessive noise from tunnel thrusters presents a real issue for the comfort and safety of crews, and is exacerbated by today's increasingly powerful propellers. The last systematic study on tunnel thruster performance dates from the 1960s, but did not consider noise, and so the current JIP presents a valuable opportunity to investigate propeller design more completely.

Previous work as part of the JIP had identified a range of new design ideas, some of which were, according to Do Ligtelijn, consultant ships, propulsion and cavitation at MARIN, "pretty wild". Following extensive testing, the project is now doing further work on the most promising concepts. Research so far has reinforced the importance of hull forms to tunnel thruster noise levels, something that will be investigated further as the project progresses. The JIP is due to conclude in 2018.

In brief

US-based HydroComp has won the 2017 New Hampshire Small Business Exporter of the Year award from the US Small Business Administration in partnership with the New Hampshire Bankers Association. Founded in 1984 by managing director, Jill Aaron and technical director, Donald MacPherson, HydroComp is a pioneer in the very specific area of applied hydrodynamics.

Fleet Xpress, the service from Inmarsat, has secured commitments covering in excess of 10,000 ships within 12 months of launch, in an extraordinary level of service uptake, surpassing expectations. The milestone has been reached as a result of contracts with individual ship owners, commitments from strategic partners, and transitioning agreements with existing Inmarsat customers.

Visedo, the Finnish manufacturer of heavy duty electric drive-trains, is focused on hastening the transition to hybrid and electric marine vessels across the Asia Pacific region with the opening of a new office in Hong Kong, with the aim of expanding into emerging markets across China, East Asia, Southeast Asia and the Pacific.

Evoqua Water Technologies is upgrading its SeaCURE system production facility in Caldicot, UK, to meet market demand for ballast water management systems, as ship owners look to comply with the entry into force of the Ballast Water Management Convention on 8 September.

Damen Shiprepair & Conversion, part of Damen Shipyards Group, has acquired the Keppel Verolme shipyard in Rotterdam from Keppel Offshore & Marine. The shipyard, including its 250 staff, will continue operations under the Damen flag.

A proposal to revoke Jones Act rules that allow foreign-flagged vessels to transport some types of equipment from US shores to US rigs, have been withdrawn after lobbying from the US oil & gas industry.

Marlink has extended its global network by adding new Ku-band capacity to Sealink VSAT services covering the Northeast Passage region.

New series winch installed

▲ *The JonRie Container Master 220 on the Marine Towing tug* **Independent**

JonRie Marine Winches' new Container Master series 220 double drum escort winch has been installed on *Independent*, a new ASD tug for Marine Towing of Tampa on Florida's Gulf Coast.

The winch was designed for a larger capacity rope and is a concept used on the Panama Canal for many years as a redundant line tethered to the ship also acts as an escort bridle, making the tug more stable in prop wash during long escorts.

The twin drums also afford less loading on each rope under braking. Both drums feature JonRie's Constant Tension systems. All winches on the tug feature independent drives for each drum and JonRie's standard foot pedal for hands-free operation.

Also featured on each drum is JonRie's side light with dimmer tension read-out system. The tension meters also include an adjustable alarm pilot light so that if a preset tension is exceeded the master will be alerted. The winch has the capacity to spool 600ft (183m) of 9in (228mm) hawser, 18-ton line pull and a line speed of 100ft/min (30.5m/min).

Seafarers urged: complete survey

Global maritime charity Sailors' Society is inviting working seafarers to participate in a survey exploring seafarer health and the root causes of illness and injury.

Conducted by Yale University in the US, the research study will look at seafarer health relating to the work environment and job tasks.

Sailors' Society supports seafarers and their families around the world in times of need. The results of the anonymous survey will be used to inform the charity's work supporting good health.

Sandra Welch, Sailors' Society's deputy CEO and director of programme, said: "Positive mental and physical health is vital to maintaining a rewarding and secure working life on board.

"We will use the results to further our understanding of the issues that can arise and help us to improve our welfare services for the hundreds of thousands of seafarers that we reach out to each year."

The survey, which closes on 2 August 2017, can be completed in confidence and can be accessed at: www.sailors-society.org/survey

Motion-control safety solution business sold

Rolls-Royce Marine Deutschland has sold its Intering business to Hamburg-based Hoppe Marine. The trade and asset sale is part of Rolls-Royce's ongoing commitment to concentrate on areas of its core business.

With this acquisition, which was completed on 8 May, Hoppe Marine says it now offers the world's broadest expertise in tailor-made, optimised solutions for anti-heeling and passive roll damping systems, under the well-established brands of Intering, Flume and Hoppe.

Marc Rohde, managing director of Hoppe Marine, said: "We are delighted to announce the agreement with Rolls-Royce. With the acquisition of Intering, Hoppe Marine can further consolidate and expand its leading-edge competence in the field of anti-heeling and passive roll damping solutions (motion control), a sector which is of key importance for safe and efficient cargo and passenger shipping, but also for navy and coastguard ships as well as for safe working conditions on offshore vessels."

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18. **PSA & Rodman**
19. **Balboa**
20. **Taboguilla & Melones**
21. **Santarém**
22. **Santana**
23. **Vila do Conde/Barcarena**
24. **São Luís** (PDM / Itaqui / Alumar)
25. **Pecém**
26. **Suape**
27. **Salvador & Aratu** (LNG terminal)
28. **Vitória** (Tubarão / Praia Mole)
29. **Sepetiba/Itaguaí/Sudeste**
30. **Angra dos Reis** (Petroleum oil terminal)
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32. **Paranaguá**
33. **Itajaí & Navegantes**
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People in the news

Martin Bjuve

Volvo Penta of the Americas has appointed Martin Bjuve as vice president for customer support and training. He will provide strategic direction and management for support and product training for dealers and customers across the US, Canada, Mexico, Central America and the Caribbean. Bjuve has served as vice president and CFO at Volvo Penta of the Americas since 2013. Before moving to the US, Bjuve was CFO for Volvo Penta Europe Region, based in Gothenburg, Sweden. He holds an MBA from the University of Karlstad, Sweden.

Henrik Madsen

Seismic player **Polarcus** made several changes to its board of directors at the 2017 annual meeting, appointing Henrik Madsen to the board for a term of two years. Madsen is the former chief executive of DNV GL, where he led the company to a $2.4bn turnover and developed it to become a key player in strategic innovation and risk management for the oil & gas and energy sectors. He is also a member of the World Council for Sustainable Development and has been appointed as a board member of the UN Global Compact. Peter Rigg was re-elected as the chairman of the board for a term of one year while Nicholas Smith was re-elected as a director for a term of two years. Erik Mathiesen, Tom Henning Slethei, and Peter Zickerman were re-elected as directors for a term of one year each.

International offshore vessel owner **Siem Offshore** has named its head of chartering as the new chief executive. Former CEO Idar Hillersøy has tendered his resignation for personal reasons. He will be replaced by Bernt Omdal, the current head of chartering, who has more than 20 years of experience within the maritime industry, including chartering, operations, and shipbroking. The company also named Tore Lillestø as COO.

Harke Jan Meek

The **International Marine Contractors Association (IMCA)** has named Heerema Marine Contractors' Harke Jan Meek as its new president; he succeeds TechnipFMC's Bruno Faure, who has completed his two-year term of office, but remains on the board of the association. Meek, chief commercial officer at Heerema Marine Contractors, now becomes IMCA's new president and chairman of the board, and Iain Grainger, vice president commercial at McDermott International Inc, becomes the new vice president. Frits Janmaat, who has been an IMCA council member since its formation in 1995, has stepped down from the board on his retirement from Allseas, and is replaced by Pieter Heerema, vice president of projects at Allseas.

Grant Johnson

Seattle-based **Foss Maritime** has appointed Grant Johnson as vice president of health, safety, quality and environment. He arrives at Foss from TechnipFMC, an international energy services provider, where he served in a number of capacities. Johnson previously held various positions with BP's Alaskan, Shipping and US Gulf of Mexico businesses, and began his career working as a US Coast Guard licensed engineering officer aboard commercial, military sealift and government vessels in domestic and international trade.

Crowley Maritime Corporation has appointed industry veteran Paul S Manzi as vice president of safety, security, quality and environmental stewardship, with effect from 1 July. Manzi, who will be based in Jacksonville, Florida, succeeds Charlie Nalen, who is retiring after 36 years with Crowley. Manzi joined the company last year as director of health and safety. Prior to joining Crowley, he served in a variety of health, safety and environmental roles with BP.

Anastasios Papagiannopoulos

Anastasios Papagiannopoulos, CEO of Common Progress, has been elected president of **BIMCO**, the world's largest international shipping association, with 2,100 members in more than 120 countries. Following Papagiannopolous's election, BIMCO confirmed that Sadan Kaptanoglu, managing director of HI Kaptanoglu Shipping, has been elected as BIMCO's first female president designate.

Markus Battenfeld, former product manager at Transas, has joined the team at **Nautitec** in the new position of project manager. The appointment is the next step in the company's mission to broaden its activities and improve service in the field of port consulting, as well as tailor-made high-end training solutions.

Alfonso Castillero

Alfonso Castillero has been appointed chief commercial officer of the **Liberian International Ship & Corporate Registry**, the US-based manager of the Liberian Registry. He will be responsible for managing development and implementation of global sales, marketing, and service assurance strategy. Together with the registry's business development group and regional managers, he will further enhance co-ordination of business development and service initiatives.

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Major towage deal signed

▲ *KotugSmit tugs assist container ship* **MOL Triumph** *into Hamburg*

Mitsui OSK Lines (MOL) and Kotug Smit Towage have agreed a long-term towage contract for the ports of Rotterdam, Antwerp, Ghent, Terneuzen, Flushing, Bremerhaven, Hamburg, London and Southampton. With this strategic partnership, both organisations aim to boost their operational performance by benefiting from smart collaboration and sharing operational knowledge and valuable information.

Masao Fukushima, MOL's chief executive representative, Europe and Africa, said: "This partnership embodies many years of mutual trust and shared values in terms of loyalty, commitment and goodwill.

"The strong relationship between both our organisations at all levels, from global headquarters, across different divisions to the operational levels in local ports, resulted in a good dialogue about optimisation of operational performance and efficiency."

Kotug Smit CEO, René Raaijmakers, said: "This partnership with MOL underlines our principal belief that harbour towage is about professional co-operation between all people involved. We also express our commitment to follow our customers' business. To move forward and deliver on our promise of meeting and even exceeding our customers' expectations, we challenge ourselves every day, encouraging further expansion and co-operation in European ports."

MOL has the world's largest ocean shipping fleet and operates bulk carriers, tankers, car carriers, cruise ships, ferries and coastal liners, and containerships that deliver a variety of finished products as part of the largest and most diverse global network of liner and logistics services.

Kotug Smit Towage was established in 2016 following the merger of the European harbour towage services of Kotug and Smit, a subsidiary of Boskalis.

Firms to promote eco-lubrication

Thordon Bearings and Drydocks World-Dubai (DDW-D) have signed an agreement under which they will work together to promote the conversion of vessels' oil-lubricated propeller shafts to Thordon's Compac open seawater-lubricated bearing system.

The agreement will create an action plan in which a specialist team of personnel from both companies will offer support to ship managers and owners looking to ensure vessels are fully compliant with environmental legislation prohibiting the discharge of oil from the oil-to-sea interface of ships' propeller shafts.

Terry McGowan, president and CEO of Canada-headquartered Thordon Bearings, said: "Seawater-lubricated propeller shaft bearing systems are less complicated and time-consuming to install than oil-lubricated systems, providing clear commercial advantages for the customers. There are fewer components, fewer pipe-runs and no air equipment is required with a seawater-lubricated system."

Under the terms of the agreement, Thordon Bearings will also provide equipment, training and guidance to DDW-D personnel and support it carrying out propeller shaft conversion projects.

Two new-design tugs being built for expanding fleet

Silverburn Group, which has specialist knowledge of the Caspian Sea and Russia's inland waterways, is continuing to expand its fleet to service existing and recently signed contracts and has contracted TB Shipyards in the Netherlands to build two new-design Ice Class tow/pusher anchor-handling tugs for oil field support and towage.

Construction of the first tug is well underway with delivery expected in the third quarter of this year, followed by the second delivery a few months later. The company says its new vessels will feature significant improvements to crew comfort, fuel efficiency and emission levels, providing lower environmental-impact, while being more cost-effective for its customers.

OSV firm wins Med charter contract

International OSV company, UAE-headquartered Topaz Energy and Marine, has won a charter contract for its multi-purpose supply vessel, *Topaz Resolve*, to support geophysical and geotechnical survey operations in the Mediterranean Sea for a European oil major.

Topaz Resolve started operating from Limassol, Cyprus, for an initial period of one month.

The vessel is a multi-functional ROV, dive and survey vessel and is equipped for deep and shallow water operations, in DP2 or by 4-point mooring. The 50m vessel, which was built in late 2015, is equipped with a 25-tonne offshore subsea crane and features the latest technology in navigation and communication, and can accommodate up to 56 people.

Three tug order

Damen Shipyards Group will deliver three newbuild tugs to Kotug Smit Towage (KST) for its European harbour towage operations.

The agreement encompasses two ASD 2913 tugs and an ATD 2412 twin fin tug. One of the 80-tonne bollard pull 2913 vessels has been fitted with a fire-fighting system. KST has also commenced the charter of a Damen-built ASD 2810 hybrid tug.

Four new tugs part of major 20-year deal

Svitzer is ordering four more ASD tugs from Sanmar Shipyards in Turkey to service the multi-hundred million US dollar Tangier Mediterranean Special Agency (TMSA), Tangier Med 2 Port in Morocco.

Svitzer has been awarded a 20-year concession to provide terminal towage services at the new container transshipment terminal, which will be operated by APM Terminals (APMT) and is scheduled to open in 2019 under the terms of a 30-year concession.

The four newbuilds will be 90-tonne bollard pull RAstar 2900 SX terminal tugs with escort ability and accommodation for eight crew members. All the FiFi1-classed tugs will be equipped with a render/recovery winch and three of them with an aft winch. Delivery is expected to take place in the third quarter of 2018.

The ASD design is from Robert Allan Ltd, measuring 29.4m in length with a moulded beam of 13.4m and an overall draft of 6m. The tugs are powered by a pair of MTU 16V4000 M73L engines, delivering 2,700kW each to the Schottel SRP 560 azimuth drive 3,000mm propellers. The render/recovery winch is supplied by Ibercisa. As well as towage, the other services the tugs will be required to provide are pollution response, fire-fighting and salvage operations within the port.

Svitzer has previously placed orders with Sanmar Shipyards for 15 ASD tugs, employed in the fulfilment of various towage contracts. It says Sanmar was chosen for its outstanding safety performance, construction quality, swift delivery time and price.

Two self-righting, unsinkable pilot boats will also be provided together with a workshop and storage area within the port. In the future, two more tugs and two more pilot boats may be required.

▲ *The RAstar series design* **Svitzer Hermod**

The Tangier Med Port complex is strategically located on Africa's northwest coast near the mouth of the Mediterranean Sea on the Strait of Gibraltar. It is the second-busiest container port on the African continent.

The contract will significantly add to Svitzer's top line between 2018 and 2036 and calls for a total of nine vessels by the end of the contract. The project is important for Maersk's transport and logistics division, as Svitzer, APMT and Maersk Line will work in an integrated approach to further improve efficiencies at the location.

Svitzer CEO, Henriette H Thygesen, said: "Securing this major contract not only supports our global strategy to keep long-term terminal towage services partnerships at the core of what we do, it is also a great example of what we can achieve as part of an integrated transport and logistics division."

Operator buys tugboat that 'perfectly meets needs'

UK-based Targe Towing signed a contract with Sanmar Shipyards at *Tugnology '17* in Rotterdam for a Boğaçay class tug.

Targe managing director, Tom Woolley, said: "We are delighted to be working with Sanmar on this project. The Boğaçay class represents a tug that perfectly matches our operational needs as well as demonstrating our shared commitment to quality in every sense of the word."

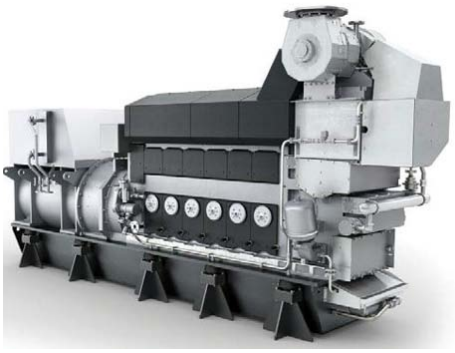
Targe operates tugs out of the North East of Scotland Ports, providing dedicated towage to Aberdeen, Dundee and Peterhead. Targe has recently had its contract with BP for the Hound Point Marine terminal on the Firth of Forth extended to include marine services alongside the existing towage provision, which it has held for the past 23 years. Purchased on very short delivery from stock, ***Boğaçay XXVI*** – since named ***Kittiwake*** – was delivered to Aberdeen just two weeks after the contract signing.

Measuring 24.4m in length with a moulded beam of 11.25m and an overall draft of 5.1m, the tug is powered by a pair of Caterpillar 3512C main engines, each developing 1,765kW at 1,800 rev/min 0driving Rolls-Royce type US205 FP azimuth drives with carbon shafts turning 2,400mm diameter propellers inside high efficiency nozzles with stainless steel inner surfaces. Auxiliary generator sets are also by Caterpillar – a pair of 86ekW C4.4s.

The port side main engine also powers the pump that feeds the external fire-fighting system, with an FFS-supplied monitor of 1,200m^3/hr capacity. The machinery combination delivers a bollard pull of 60 tonnes and a free-running speed of 13 knots. The main winch, manufactured by DMT, is mounted on the fore deck.

► *Sanmar board member Cem Seven and Targe Towing managing director, Tom Woolley*

Contract to supply gen sets



▲ *A MAN 8L21/31 variable-speed gen set*

Cemre Shipyard in Turkey has ordered four MAN 8L21/31 variable-speed generator sets, in connection with the construction of a wind service operation vessel for Louis Dreyfus Armateurs, the French shipowner.

The newbuild will also feature MAN's energy saving electric propulsion system (EPROX) that will significantly reduce the vessel's CO_2 emissions and fuel consumption.

The engines will be prepared for IMO Tier III and set up so they can be retrofitted at a later time with MAN's state-of-the-art SCR system. This is to cater for the possibility that IMO Tier III NO_X emission limits are introduced without obligation within NO_X emission-control areas (NECAs) in the North and Baltic Seas before 2021.

Lex Nijsen, head of four-stroke marine at MAN Diesel & Turbo, said: "This new order confirms our solid foothold within the segment for small-bore, medium-speed engines powering specialised vessels.

"I welcome this new reference and feel that it highlights the diversity of our product portfolio."

The variable-speed generator sets will be assembled and tested at MAN's Aurangabad facility in India. Salt Ship Design of Norway, with a strong reputation in offshore and specialist vessels, is providing the full design and engineering package for the new vessel, which is scheduled for delivery in the fourth quarter of 2018.

The new WSOV will be used for operations and maintenance work on German offshore wind farms, *Borkum Riffgrund 1* and *2*, as well as *Gode Wind 1* and *2*. The vessel will operate for Dong Energy.

Support vessel order start of long-term collaboration

A Piriou WFSV

Piriou has secured an order for two wind farm support vessels (WFSV) for UK operator Wind Energy Marine. Built by Piriou Vietnam, the vessels will be delivered in the first half of 2018 and will be operated in the North Sea.

Vincent Faujour, CEO of Piriou, said: "These orders are very satisfying, especially as they are the first two vessels ordered by a very new client."

Andrew Bagshaw, managing director of Wind Energy Marine, said: "We are delighted to have the opportunity to work with Piriou in what we expect will be a long-term collaboration. Over time we plan to grow our fleet of vessels, which will be equipped with the latest vessel management systems designed to improve safety and vessel reliability."

Designed by BMT Nigel Gee, BV-classed and MCA CAT 1 certified under the new HS-OSC code, the vessels have a top speed of 25.5 knots and low fuel consumption and provide safe and fast transfer within a range of 150 nautical miles from a safe haven.

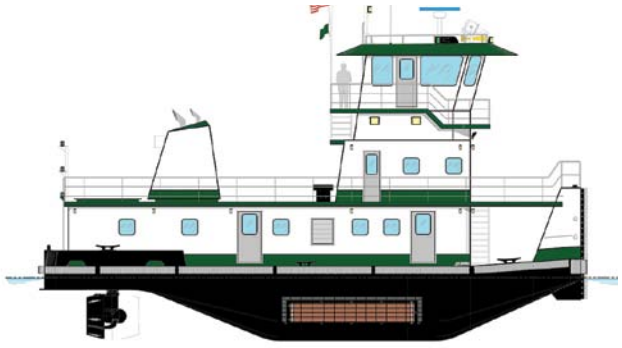
Long-standing friends in three tug designs deal

▲ *Toasting the three new tug designs deal*

Turkish shipbuilder Uzmar signed a contract with naval architects Robert Allan Ltd at the *Tugnology '17* conference in Rotterdam for three exclusive new-design tugboats that it will build on spec.

The first to be built will be a new RAve 3200 UZM, the second a 25m DRAfter triple screw shallow draft workboat and the third a RAmparts 2300 ship-handling tug.

Robert Allan Ltd's president and CEO Mike Fitzpatrick, speaking at a signing ceremony held in the exhibition area at the *Tugnology* conference, said: "I think this is a very significant announcement at this time. It's a sign that regardless of any politics that are going on at present, Turkish shipyards are alive and well and are going to continue that way in the future. This is an excellent sign and we're very happy to be here with our very good friends and good clients at Uzmar shipyards."



Trust in firm's decision wins first order

Barbour JB Shipyard of St Louis, US, has laid the keel for a new harbour tug that will be powered by Veth Z-drives.

The tug, *pictured left*, will have a length of 68ft (20.7m) and beam of 28ft (8.5m) and will be powered by twin 750hp Cummins diesels and Veth VZ-700 Z-drives.

While this is the first Veth Propulsion product purchased by Southern Illinois Transfer, it was president and owner Kurt Johnson's history with Twin Disc that drew him to the Z-drives.

He said: "We've always used Twin Disc reduction gears. Their choosing to partner with Veth says a lot – we're certain they wouldn't associate their name with an inferior Z-drive."

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OSV first to replace generator with batteries

Eidesvik Offshore's **Viking Princess**

Wärtsilä has signed an agreement with Eidesvik Offshore to install a hybrid system with batteries on board its vessel *Viking Princess*. It will become the first OSV in which batteries reduce the number of generators on board. The new energy storage solution will improve engine efficiency, generating fuel savings and reducing greenhouse gas emissions.

Viking Princess provides supplies to oil rigs in the North Sea and Barents Sea. The five-year-old vessel runs on four LNG-powered Wärtsilä engines. Depending on the ongoing task and weather conditions, the engine load varies between 90 and 20 per cent. The new energy storage solution replaces one of the vessel's four generators and can provide balancing energy to cover the peaks, resulting in a more stable load on the engines. In essence, the technology is similar to that in hybrid cars: it keeps the engine load from dipping and re-routes the surplus to charge a battery, which in turn can fill in when needed.

The operating profile of OSVs is variable, and there is significant potential for fuel savings through improved engine efficiency. Wärtsilä says in the dynamic positioning mode, when the battery is used as power redundancy and the engine runs at its most efficient load, the fuel saving potential is 30 per cent. Consequently, ***Viking Princess*** may cut CO_2 emissions by 13-18 per cent a year, depending on operating conditions.

Vermund Hjelland, vice president technical development, Eidesvik Offshore, said: "Eidesvik and Wärtsilä have had a long and fruitful co-operation since 2003, when ***Viking Energy***, the world's first LNG-driven supply vessel, was launched. The co-operation was developed further with the instalment of batteries to support the generators of ***Viking Lady*** in 2015. Now ***Viking Princess*** becomes the first OSV where one of its generators will be fully replaced with batteries.

"We are grateful to both Wärtsilä and the NCE Maritime Clean Tech, who made this important and progressive co-operation possible."

Enova SF, a Norwegian state enterprise owned by the Ministry of Petroleum and Energy, supported the project with NOK6.5m (US$774,600) to accelerate sustainable energy production in the maritime sector. Wärtsilä will install the new hybrid system in September.

Cato Esperø, sales director, Wärtsilä Norway, said: "The hybrid energy system is a forward-looking solution that not only reduces fuel consumption and emissions, but also contributes to safer and more efficient operations. There is an increasing focus in shipping to reduce emissions and we believe that ship owners will continue to install hybrid solutions – on both their new and existing vessels."

Deal covers battery conversion

Energy company Statoil has awarded long-term service contracts to five supply vessel operators covering seven ships that will all be converted to hybrid battery operation with the possibility of shore power connection.

Four of the contracts have a duration of five years with five one-year extension options – Skansi Offshore's ***Sjoborg***, DOF's ***Skandi Mongstad*** and ***Skandi Flora***, and SolstadFarstad's ***Far Searcher***.

The other three contracts are for three years plus three one-year extension options – Ugland's ***Juanita*** and Havila's ***Havila Foresight*** and ***Havila Charisma***.

The total value of the combined contracts, including options and conversion to battery power, is NOK3.1bn (US$372m). Part of the conversion cost will be underwritten by the Norwegian NO_X Fund

The seven vessels will operate from Statoil's Norwegian supply bases at Mongstad, Dusavik, Florø and Kristiansund serving the company's North Sea operations.

Tug ordered for work at new terminal

Saqr Port, part of Ras Al Khaimah (RAK) Ports, UAE, has signed a contract with the Damen Shipyards Group for the delivery of an ASD 2913 tug. The vessel will be built a short distance away at Albwardy Damen in Sharjah and will be delivered in time for the opening of the new bulk terminal at Saqr Port in mid-2018.

Saqr Port is the major bulk-handing port in the Middle East and a vital part of the regional economy. Located at the foot of the Hajar Mountains, it serves the fast-growing quarry industry in the emirate of RAK. Each year 55m tonnes of bulk materials are exported through the port to countries around the Arabian Gulf, and RAK Ports are currently adding new deepwater berths capable of handling Capesize vessels.

Damen's regional sales team worked closely with Saqr Port to determine the class of tug that would be most suitable for its requirements. The need was for a vessel that is both compact and powerful, so as to be able to handle the large carriers at the new terminal and work within the confines of the harbour. At the same time, the proximity of the Hajar Mountains means that the port can experience sudden and very strong winds. The ASD 2913 was ultimately selected due to its having all the necessary attributes, including 80 tonnes of bollard pull within a 29m hull, plus high freeboard and a raised quarterdeck for safe operations in rough seas.

The contract was signed at the beginning of April by Capt Cliff Brand, RAK group general manager, and Kommer Damen, in recognition of RAK Ports' valued status as a long-standing customer of the Damen Shipyards Group. The RAK Ports fleet already includes an ASD 2411 and a 2310, as well as five Damen Stan Tugs.

▲ *A Damen ASD 2913 tug*

Pascal Slingerland, sales manager Middle East for Damen, said: "We are delighted to be building for the UAE, in the UAE. Albwardy Damen continues to go from strength to strength, providing a comprehensive newbuild and repair service to the UAE and the wider Arabian Gulf, and it is our pleasure to be working with our near neighbours at Saqr Port."

Alongside this latest order, Albwardy Damen – until recently known as Damen Shipyards Sharjah – is also currently building three large Rotor®tugs and a self-propelled jack-up barge, as well as some smaller ASD tugs and cutter suction dredgers.

Capt Michael Magee, harbour master at RAK Ports, said: "The port is delighted to have agreed a deal with Damen to build the 2913 locally. Damen's proven quality product and their flexibility, with respect to build location, secured them the contract.

"The 2913 with 80 tonnes bollard pull will complement the seven tugs currently at Saqr Port, and give additional power to receive Capesize vessels."

● Shipbuilder reaches milestone, page 67

AHTS to work at turbine test site

Bourbon has been awarded a contract for the mooring installation of the first floating wind turbine in France at the experimental test site of Sem-Rev, managed by École Centrale de Nantes (ECN), which is part of the European Floatgen project.

The mooring installation will take place during the second and third quarter of 2017 based on a method jointly established by Bourbon and Ideol's engineering teams in collaboration with ECN. The wind turbine will be installed at the Sem-Rev site near Le Croisic, France, by the end of the year.

Bourbon's subsea services team will be responsible for the project management, mooring installation and engineering, bringing a wealth of experience in mooring operations. An AHTS vessel and ROVs will be used for the pre-tensioning of the mooring system.

Patrick Belenfant, Bourbon's senior VP subsea services, said: "This project demonstrates Bourbon teams' commitment to offer integrated solutions in all offshore and subsea marine services areas and work towards the development of tomorrow's energy resources. We are proud to be part of this project and to support Centrale Nantes at Sem-Rev."

Long term partners announce new Gulf of Mexico operational alliance

US-based Edison Chouest Offshore (ECO) and its family of companies have announced a 30-month alliance agreement with BP, the largest energy investor in deepwater Gulf of Mexico over the past decade.

ECO and BP have enjoyed a business alliance for more than eight years, and the new alliance will continue to include Chouest affiliates ECO (vessel services), C-Port (multi-service terminal facilities in Louisiana's Port Fourchon) and C-Logistics (logistics co-ordination, expediting and tracking cargo movement).

ECO president and CEO, Gary Chouest, said: "We will continue to work with BP to uphold the superior standard of service and safety culture that both companies have adopted, and is second to none in our industry."

Items in the alliance agreement include a three-year extension for utilisation of BP's Gulf of Mexico preservation and maintenance facility, which was designed and built by ECO, and a 95m new generation, purpose-built PSV, currently under construction at ECO's Houma shipyard, LaShip, specifically designed for the delivery of supplies to BP's offshore production platforms in the Gulf of Mexico.

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Astilleros Navales Ecuatorianos - ASTINAVE EP - with more than 40 years of trajectory and experience, is the leading shipyard in Ecuador in boat construction and maintenance; project development for electronic solutions and port activities, offshore and industrial services, for domestic and foreign trades.

Built with 100 percent skilled labour, to high international standards, the oldest shipyard in Guayaquil and located on the banks of the majestic Guayas river, works building two boats Isla San Cristobal and Isla Isabela, as patrol boats OPV 5009, these are part of the APOLO project, which strengthens the operations of the Ecuadorian Navy through the plan "Neutralisation of illegal activities and timely assistance to emergencies in aquatic spaces."

The vessels will be assigned to the Coast Guard Command, equipped with state-of-the-art technology and modern communication, detection, speed and continuous monitoring system, recognition and control of threats that increase safety in inland waters, territorial sea and exclusive economic zone, sovereignty at sea, search and rescue.

In compliance with International Maritime Organisation (IMO) regulations, the coast guards are equipped to cover the entire Ecuadorian territorial sea, flexibility and autonomy for the neutralisation of illegal activities such as: smuggling of merchandise and fuel, drug and people trafficking, illegal fishing and common delinquency.

Being ASTINAVE EP, a public company, attached to the Defence Ministry and aware of the responsibility that this condition demands, works permanently to maximize the operational capabilities of the Ecuadorian Armed Forces and other security institutions, with engineering, logistics and production of high national component, within international standards, that allow us to compete at regional and world level.

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ASTINAVE EP has contributed efficiently with the Defence, Maritime Industry and the development of technology, with the construction of more than 130 boats built, being its main characteristic the personalisation of each product and service for the client, subject to the methodology engineering to order, ensuring the achievement of the highest satisfaction and quality in every detail.

It has been a continuing effort to maintain leadership, currently the shipyard is preparing to build 7 ships for surveillance and patrolling jurisdictional Ecuadorian waters, an important project of the national shipbuilding industry that joins the next delivery of two type Coast Guard vessels BG-AST-5009, which will guarantee the country´s safety and protection of maritime interests.

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CPNV-SP Camilo Delgado Montenegro - General Manager

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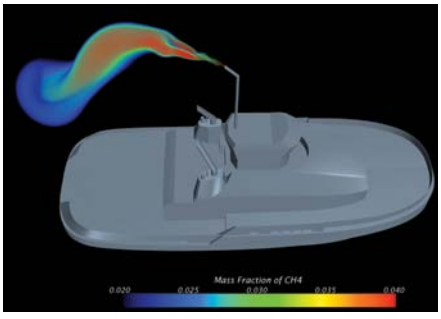
Extreme escort tug is in a class of its own

***Dux*, the first of Canada-based Robert Allan Ltd's RAstar 4000-DF class dual fuel extreme escort tugs built by Astilleros Gondan in Spain, has been delivered to Norwegian owner, Østensjø Rederi AS. Frequently one sees claims for new vessels as being state-of-the-art when in fact they are usually just more of the same. However, the new RAstar 4000-DF class ASD tugs are indeed first of class in many respects and, claim the designers, have no equal in the world of tugboats.**

The 40.2m x 16m vessel, having a 7m draft, is the first of a three-boat order from Østensjø for severe weather operations at Statoil's Melkøya LNG terminal at Hammerfest in the extreme north of Norway. The vessels will conduct approximately 300 LNG ship escorts annually, assist with berthing operations and will be maintained in readiness for emergency services such as long line towing, fire-fighting, and oil spill response. These tugs are yet another step in the development of world-leading escort tugs by this combination of owner and designer, a process which began in 1997 with the construction of ***Ajax***, another ground-breaking escort tug design.

Statoil's requirements for these vessels included an extremely high escort performance, high free running speed, low flash point oil recovery and storage, towing from both ends, and compliance with IMO Tier III emissions standards, all under harsh environmental conditions. To satisfy these requirements within a 40m overall length required innovative thinking and close collaboration between owner, designer, classification society, builder and major equipment suppliers.

Østensjø proposed a dual-fuel solution (LNG and diesel) to address the charterer's requirement to comply with Tier III standards. The gas fuel installation consists of a Wärtsilä LNG Pac (IMO-Type C) vacuum-insulated LNG tank with tank connection space (TCS) located in the LNG tank hold, and two Wärtsilä 6L34DF dual-fuel main engines, each with an MCR of 3,000kW at 750 rev/min. Each TCS contains the LNG tank connections (liquid and vapour), a pressure build-up evaporator, a main gas evaporator and the gas valve unit for each engine. The engines and engine room are configured to be 'gas safe'. All gas supply piping is double wall.



The outer annulus of gas supply piping is under-pressure ventilated at 30 air changes per hour and is equipped with gas detection and flow sensing.The LNG bunker station is on the main deck. LNG bunkering is possible either from a tank truck or a bunkering barge. A foldable drip tray at the bunker station and provisions for water flushing protect the hull from gas spills.

A vent mast serves as an outlet for small quantities of gas released by pressure relief valves and 'block and bleed' valves in piping. Although the outlet is normally required to be at least 10m away from potential sources of ignition such as engine exhaust outlets, the relatively small size of the vessel and need to keep the mast low for ship handling operations made this impractical. Instead, to keep the mast as compact as possible, Robert Allan Ltd developed a unique double wall vent mast. Ventilation air forced through the outer annulus mixes with any vented gas carried by the inner pipe at the outlet. The resulting mixture is carried safely away by the ventilation air flow. To prove the effectiveness and safety of this arrangement, Robert Allan Ltd used its powerful CFD capability to study the gas dispersion around the vessel for a range of gas release scenarios and wind conditions. The results of this study were applied in the risk assessment process conducted with classification society Bureau Veritas.

To connect to the relatively fast moving incoming tankers, the RAstar 4000-DF is capable of a free running speed of more than 15 knots. A detailed CFD study focusing on stern shape and testing various different nozzle geometries was conducted in order to ensure these high free running speeds could be achieved. Schottel's VarioDuct SDV 45 nozzle, which provides improved efficiency at higher speeds, was under development by the reputed propulsion specialists at the same time and the RAstar 4000-DF ended up being the first vessel to be fitted with this new nozzle profile. The Rudderpropeller units are of type SRP 3030 CP and have 3,400mm controllable pitch propellers.

The RAstar 4000-DF is designed to generate exceptionally high escort forces, and has been BV approved for a rated Fs of 167 tonnes indirect steering, and more than 200 tonnes braking at 10 knots. To achieve this, Robert Allan Ltd applied BV-approved CFD-based prediction methodologies during design, and verified the predictions through extensive self-propelled model testing at the Vienna Model Basin.

To operate under harsh winter weather and sea conditions and low ambient air and water temperatures, ***Dux*** has a number of special features. Its hull form is optimised for excellent sea-keeping. Both fore and aft winches are enclosed in insulated and heated winch rooms. Exposed working decks have heat tracing to reduce ice build-up and the wheelhouse is fitted with heated windows.

A Jason Engineering supplied foam-capable external fire-fighting system with water spray protection is fitted with capacity to deliver streams of water totalling 2,400m^3/hour at ranges in excess of 120m (Class FiFi1 standard). Two pumps of 1,500m^3/hour capacity are driven through step-up Kumera gear boxes driven off the front of the main engines. The monitors are rated for 1,200m^3/hour of water and 300m^3/hour foam. Other engine room items include three Volvo D7A TA ship service generator sets, each providing 129ekW at 1,500 rev/min.

For oil recovery purposes, the vessel is fitted with an inflatable oil boom on a separate hydraulic powered drum, a hydraulic-driven oil skimmer and floating hose stored in the cargo hold deployed by vessel deck crane, and four internal hull storage tanks for recovered oil and capable of dual service (two ballast and two reserve fuel oil) when not used for recovered oil. The vessel is also equipped

with an oil dispersant system complete with a 20.3m³ tank, pump and pipelines for mixing and two spray booms.

Karmøy Winch AS has provided a comprehensive package of deck machinery which includes a 300-tons brake holding load split drum hawser winch on the foredeck alongside a set of stainless steel retractable escort tow pins. Also forward are two vertical anchor windlasses and a 5-tons capstan.

Aft, Karmøy has supplied a single drum towing winch with a capacity of 1,000m of 64mm steel wire and a brake holding load of 300 tons. Additionally there is a combined Karmfork and tow pin set, a tugger winch and capstan. Also fitted on the aft deck above the aft winch room is a Palfinger PK 65002 knuckleboom crane.

The tug is heavily fendered for the expected high swells with components supplied by Lion Rubber. Bow fendering consists of a 1,000mm diameter cylindrical fender extending well aft along with a lower course of 400mm thick W-fender specially designed to limit fender contact pressures to 20t/m². Sheer fendering is 400mm x 400mm D-fender. Stern fendering is 400mm thick W-fender.

All accommodation is arranged to be generous and comfortable for a crew of eight to the very high standards of fit-out for which Gondan has justifiably earned a fine reputation. The main deck features a large sized mess and galley, the master's cabin, a large office, and a wet gear/locker room with toilet. The lower deck includes four MLC-compliant en-suite cabins for up to seven crew, plus a gym, laundry and galley store. The wheelhouse is fitted with a single control console with winch operator position, and provides the master with excellent all-around visibility and clear sightlines.

Dux and its sisters embody the years of experience of the designers and the careful work of the builders in providing the highest standard of acoustic and vibration isolation techniques. The result is an extremely quiet ship throughout. Noise level measurements on trials were around 50dBA for the mess and master's cabin and even better in the lower deck crew cabins.

On trials, the vessel exceeded all

performance expectations, achieving an ahead bollard pull of 107.5 tonnes, astern bollard pull of 103 tonnes, and a free running speed ahead in excess of 15 knots. Tanks are provided for 33m³ of LNG (gross capacity), 313m³ of diesel fuel oil, 45m³ of freshwater, 254.4m³ of recovered oil and 20m³ each of foam and dispersant.

The innovative RAstar 4000-DF escort tugs, custom designed for Statoil's Melkoya facility, raise the bar significantly for both ASD escort tugs and also LNG-powered terminal tugs. They will play a critical role in ensuring safe and efficient movement of LNG carriers at the Melkoya facility.

Andy Smith

First of new type sails straight off to work

The Damen-built *Voe Vanguard* has sailed from the yard straight into work at the *Walney* wind farm extension project in the Irish Sea. Designated by the builder as a Renewables Service Vessel (RSV) 3315, the new type has been developed in close co-operation with the Scottish operator Delta Marine.

Since taking delivery of its first Damen vessel 12 years ago, the Shetland-based company now has four Damen Multicat vessels in its fleet, as well as one it manages. David McNaughtan, Delta's general manager, says the decision to invest in a vessel specifically tailored for renewables was taken around four years ago. "We knew that at Damen we get a good project and good quality back-up."

The RSV 3315 is based on the highly successful Multicat design. The vessel can undertake all duties normally expected of a Multicat but has the addition of a spacious, unobstructed deck, DP2 and dedicated 4-point mooring.

The 33m x 14.5m vessel is diesel-electric, power coming from two Caterpillar 3512C generator sets, each of 1,727ekW. These supply two forward Rolls-Royce type 105 thrusters and two aft thrusters of the swing-up type from the same manufacturer. There is also a Veth stern tunnel thruster. In all there is a total of 3,481hp of propulsion power, resulting in a maximum bollard pull of 41.5 tonnes and a free running speed of 10 knots. In addition the vessel has an 85.5ekW Caterpillar C4.4 harbour generator set.

"We were particularly interested in having a DP2 capability. This vessel is suitable for offshore wind but also for tidal projects, where she can stay in position using her DP in some pretty strong currents," said McNaughtan.

The DP system is provided by Kongsberg

with joystick. A DGPS and spottrack reference system are from the same company. Three Raytheon Anschütz gyro compasses and a Simrad AP 70 autopilot form the backbone of the navigational electronics alongside a Transas Navigator Pro chart system. Other leading items are from Furuno, while the communication set-up is from Sailor, including Inmarsat C.

Delta and Damen adapted the traditional Multicat design by moving the wheelhouse forward and leaving the aft deck open. Additionally, it was important to make sure the vessel was under the 500-tonne mark to keep the costs down.

Voe Vanguard has been built to Bureau Veritas classification and MCA Workboat Class VIIII and has heated and air-conditioned accommodation for a crew of 15 in six twin-bunk and three single cabins. Tankage includes 130m^3 of fuel oil, 47m^3 of 'technical' water and 34m^3 of freshwater.

Jos van Woerkum, managing director of Damen Shipyards Hardinxveld said: "We have been working on this vessel together since 2013. Delta Marine gave us a sketch and outlined their requirements and I think Damen has built exactly what they wanted. I always say we can do a lot if we do it together!

"I think the Renewables Service Vessel 3315 has the potential to be the next success for Damen once she proves herself in the market." **AS**

Twin-screw duo setting off from Pacific North West

Nichols Brothers Boat Builders (NBBB), located in Washington state, has completed the first of two 36.6m x 10.7m twin-screw tugboats for Kirby Offshore Marine (KOM). *Mount Baker* will join KOM's fleet shortly, while the sister-ship *Mount Drum* will be delivered in November. These vessels are the third and fourth vessels NBBB has delivered to KOM in the last year, the earlier boats being a pair of ATB tugs.

These latest vessels are of a design by Jensen Maritime Consultants of Seattle, Washington. They are fully ABS classed, including UWILD notation, and compliant with USCG Subchapter C, as required at delivery.

Mount Baker is powered by two Duramax heat exchanger cooled Caterpillar 3516C EPA Tier 3, IMO Tier II main engines, each developing 2,447bhp at 1,600 rev/min. Reintjes reverse/reduction gears type WAF 873 having a ratio of 6.44:1 turn two Nautican fixed-pitch three-bladed stainless steel propellers of 2,640mm diameter with fixed nozzles. Each nozzle is fitted with triple rudders.

These vessels also have two John Deere 6090AFM85 generator sets for electrical service. Bollard pull is predicted to be 65 tonnes and the free-running speed around 8 knots.

All above main deck, the accommodation comprises the galley and adjoining mess room, which can seat the entire crew of eight in the port aft quarter of the deck house. Grouped around a couple of heads are two single officers' cabins and three twin berth cabins.

Deck machinery includes a Markey TESD-34, double drum towing winch, both drums being fitted with 760m of 57mm diameter wire, and a Markey bow capstan. The tow pins arrangement is from M&S Marine. Up in the wheelhouse is a suite of Furuno electronics and leading tank capacities include 486m^3 of fuel oil and 64m^3 of fresh water.

Kirby Offshore Marine is the largest US operator of coastal tank barges and towing vessels participating in the regional distribution of refined petroleum products, black oil and crude oil, as well as the distribution of petrochemicals between Petroleum Administration and Defense Districts.

NBBB has more than 50 years' experience in vessel construction, specialising in steel and aluminium newbuilds, repair and major conversions. **AS**

PSVs first to offer bulk scavenger capacity

The sister vessels *MMA Brewster* and *MMA Plover* are claimed by the owners, MMA Offshore of Australia, to be two of the world's most advanced and sophisticated PSVs. Purpose built to support the INPEX Ichthys Project, the PSVs have unrivalled chemical carrying capacities in the PSV market. Built by Vard Vung Tau Shipyard in Vietnam to a Vard Norway design and DNV classification including FiFi1 and DP2, the vessels measure 81.7m LOA x 18m beam with a maximum draft of 6.95m.

Each ship is powered by three Caterpillar 3516C generating sets. These drive a pair of Rolls-Royce Azipull propeller systems and four transverse thrusters from Brunvoll (three forward). There is a harbour set and emergency generator, also by Caterpillar, bringing the total installed power to 8,425hp. The vessels have a maximum speed of 14.26 knots and an economical speed of 10 knots. The DP2 system has been provided by Kongsberg and the external fire-fighting components have been supplied by FFS AS.

Greg Reece, group business development manager – international at MMA, explained to *IT&O* that ***Plover*** and ***Brewster*** are the first two ships in Australia (and two of only three OSVs in the world) that have been constructed as per IBC-2 regulations.

The vessels have SF/IBC dual load lines which allow the vessels to operate under SF load line when carrying <800m^3 of chemicals and IBC loading line when carrying >800m^3 of chemicals.

Reece said: "The vessels have significant bulk storage capacities including monoethylene glycol, triethylene glycol, hydrochloric acid, caustic soda, H_2S scavenger, liquid mud, brine, dry bulks, base oil, diesel and LFL product. ***Plover*** and ***Brewster*** are the only two PSVs in the world fully approved to carry H_2S scavenger in bulk."

There is a removable mezzanine deck for ROV operations and there are dedicated surveyor interface panels on the bridge, in the ROV room and on the main deck.

The living quarters are well equipped and comprise 15 single and 12 twin berth cabins all with en suite head/shower facilities. In addition to the galley and mess, there is a recreation room, gymnasium, hospital, office space, changing room, laundry and drying room.

Vard is one of the major global designers and shipbuilders of specialised vessels. Headquartered in Norway and with approximately 9,000 employees, the company operates nine strategically located shipbuilding facilities, including five in Norway, two in Romania, one in Brazil and one in Vietnam which built these two PSVs.

With its head office located in Fremantle, Western Australia, and international headquarters in Singapore, MMA Offshore is one of the largest marine service providers in the Asia Pacific region. It owns and operates more than 40 vessels throughout Australia and internationally. **AS**

Purpose built for walk-to-work projects

Fujian Southeast Shipbuilding in China has delivered to Vroon Offshore Services the walk-to-work (W2W) subsea support vessel named *VOS Start*. Dutch flagged, the vessel was built to ABS classification with notation including DP2 and FiFi1.

Measuring 80m x 18.4m with a maximum draft of 5.8m, the vessel was brought to Damen Shiprepair Oranjewerf in the Netherlands to be fitted with a motion-compensated gangway system and an active heave-compensated crane. ***VOS Start*** has been purpose-built to support offshore operations in today's renewable industry and W2W projects in the oil & gas industry.

The vessel is due to be delivered to its first charterer, MHI Vestas Offshore Wind, for the supply of offshore logistics support, accommodation and W2W services during construction of the *Walney* offshore wind farm extension. The wind farm is located in the Irish Sea, with installations of the turbines and commissioning scheduled to commence in the second or third quarter of this year.

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The ship's main engines are a pair of 2,400kW MaK power plants and these turn Caterpillar/Berg azimuth thrusters with controllable pitch propellers. At the bow, there are two Wuhan Kawasaki super-silent 800kW electric tunnel thrusters and a 700kW retractable thruster from ZF. These items can be joystick-controlled through the Kongsberg DP-2 system.

Offshore wind parks consist of as many as 100 individual wind turbines, connected by infield cables to transformer stations. The construction and commissioning of an offshore wind park requires many visits to each individual turbine. Such operations demand a vessel like ***VOS Start***: offering accommodation for the client teams (up to 60 people), numerous office spaces for engineering and project managers, a warehouse to store materials and tools and an onboard workshop to prepare for day-to-day tasks. The facilities for crew (27) and client personnel include a cinema, gymnasium and various dayrooms, lounges and even a library. Most important is an access system from Barge Master of Rotterdam that guarantees safe transfer for the teams and their material to and from the wind turbines.

Other deck items include a 50 tons AHC crane from the Dutch specialists SMST and a 3 tons @ 10m crane from Wuxi Hua Hai. A variety of tugger winches and capstans are by MacGregor. The various components of the external fire-fighting system are from FFS AS.

Vroon Offshore Services (VOS) is a leading maritime offshore-services supplier which has been active in this business since 1964. International, with offices in Aberdeen, Den Helder, Genoa and Singapore, the company excels in the provision of diverse services and solutions for key offshore support needs, including platform supply, emergency response and rescue, anchor handling tug supply, walk-to-work and subsea support. In addition, VOS offers a wide range of complementary offshore services, such as seismic/survey support, maintenance, engineering and scientific support. **AS**

Popular ASD series heads to India for role with new customer

Cheoy Lee, the Hong Kong and mainland China based all-round shipyard, has been majoring in tug construction for some years having now achieved more than 100 completions of Robert Allan Ltd designs.

Popular among the models is the RAmparts 3200CL ASD terminal tug and the latest two examples are a pair of fire-fighting ASD tugs, ***Lotus Star*** and ***Daisy Star,*** delivered this year to India-headquartered terminal operator, Polestar Maritime Ltd.

Measuring 32m overall with a beam of 12.4m, the latest versions of this successful design to Lloyd's Register classification feature an all-Niigata propulsion set-up comprising two Niigata type 6L28HX main diesel engines each developing 1,654kW at 750 rev/min. These are connected via idle slipping clutches to Niigata ZP 31B azimuthing thrusters with HP nozzles mounted aft in ASD configuration. The resultant bollard pulls are 60 tonnes ahead and 55 tonnes astern, while the maximum free-running speed is 12 knots. Other engine room equipment includes two 120ekW Cummins generator sets and the external fire-fighting system, supplied by FFS, is main engine driven to FiFi1 notation with a pump of 2,740m^3/hr.

Below deck is an accommodation area buffered from the engine room by switchboard-cum-control room to port and by a sanitary block to starboard. Two single cabins share a single en suite toilet and shower room.

There are an additional two twin cabins and a further two singles. Master and chief engineer each enjoy the benefits of en suite single cabins on main deck alongside the separate galley and mess room.

Most of the leading wheelhouse electronics have been provided by Furuno, including two radars, navtex, GPS, Inmarsat C and echo sounder. The autopilot is from Raytheon.

The Jebsen & Jessen hydraulic deck machinery is powered by an electric driven power pack and comprises a double drum towing winch/windlass located forward; aft is a towing winch alongside a 60 tonne disc type towing hook from the same manufacturer.

Polestar Maritime Ltd is a new customer for Cheoy Lee but has a 70-year history in Indian shipping. The company curently focuses on the niche market of harbour tugs, coastal towing and assistance and marine services at ports. **AS**

Deliveries in brief

Jawar Al Khaleej Shipping (JAK), a provider of specialist services to the offshore oil & gas sector in the Arabian Gulf, has taken delivery of a Damen fast crew supplier (FCS) 5009 and an ASD 3213 tug for operations at the Al Basra and Khor Al Amaya oil terminals, which together handle more than 90 per cent of Iraq's crude oil exports.

The 53m FCS 5009, ***Jawar Abu Dhabi***, was built at **Damen Shipyards Antalya** in Turkey. With a capacity of 80 passengers, 240m^2 of deck space and a top speed of 25 knots, the vessel provides high-speed transport for personnel and equipment around the area.

The 85-tonne bollard pull ASD 3213, ***Jawar Faw***, was ordered to manoeuvre the VLCCs that berth at the oil terminals located on the Faw Peninsular. The new tug is a product of the **Damen Song Cam Shipyard** in Vietnam, as was sister vessel, ***Jawar Basra*** – delivered in 2015 – and a further ASD3213, ***Jawar Um Qasr***, due for delivery later this year.

The new arrivals have joined the extensive JAK fleet of support vessels that serve the offshore industry in the Middle East. The two oil terminals are a vital part of Iraq's economic infrastructure and are currently expanding their facilities in expectation of increased exports.

Boluda France has taken delivery of two ASD multi-operational tugs designed and built by Piriou. The new arrivals are part of the operator's continuing strategy of expanding and modernising its tug fleet and follow on from the delivery of four similar vessels in 2015 and 2016.

VB Tornade is operating in the Channel port of Le Havre while ***VB Volcan*** has started work in the port of La Réunion, the French island in the Indian Ocean. Both vessels have 70 tonnes of bollard pull and are highly manoeuvrable and perfectly adapted for the operational requirements of their home ports.

Both ports are focusing on their increasing containerised traffic and their capacity to handle the largest container ships, as well as to develop new activities such as renewable marine energies.

Built by **Piriou Vietnam**, each vessel is 30.3m x 10.4m with a maximum draft of 5.3m. They are powered by two 5,290hp ABC engines driving twin Schottel azimuth thrusters.

"We have invested in state-of-the-art units and equipment in anticipation of the technological development and growth of port activities. The Port of Le Havre currently receives the largest container ships and oil tankers in the world and will probably become a logistics hub for French offshore wind in a few years' time. Our new, powerful and manoeuvrable Escort and FiFi1 class tugboats are fully equipped for seagoing operations and will enable us to deal with all challenges," said Denis Monserand, CEO of Boluda France.

The Royal Thai Navy's planned tug replacement programme is underway following the delivery of a Robert Allan Ltd designed RAmparts 3200 ASD tug. ***HTMS Panyi*** was built in-country by **Italthai Marine** before being handed over to the customer in Bangkok.

The 32m x 12.4m tug, named after the fishing village of Ko Panyi built on stilts, is in service handling the Royal Thai Navy's larger vessels, including flagship helicopter carrier ***HTMS Chakri Naruebet***. Other roles include support operations such as fire-fighting and oil recovery in navy and other ports and along the coastline.

Main propulsion consists of a pair of MTU 16V4000M54 diesel engines, each rated at 1,685kW at 1,800 rev/min, driving twin Schottel SRP1212 fixed pitch Z-drive units. This gives ***HTMS Panyi*** a free running speed ahead of 12.7 knots, while bollard pull ahead is 56 tonnes.

Deck machinery consists of a ship-assist hawser winch forward and a tow-hook on the aft deck for coastal towing. Ship-assist work uses a specially designed staple accommodating a fairlead. A capstan and deck crane are also located on the aft deck.

Berths for 20 crew, as well as mess/lounges and fully-equipped galley, are located in the deckhouse and lower accommodation deck, while the wheelhouse is designed for maximum all-round visibility.

ALP Maritime's latest Future class DP2 anchor-handling salvage tug has been delivered to the Netherlands-headquartered operator by **Niigata Shipbuilding & Repair** in Japan. ***ALP Defender*** is the second of four identical Ulstein-designed vessels in the series, measuring 88.9m x 21m with a maximum draft of 8.5m.

Main engine power comes from four MaK 9M32C engines each producing 4,500kW. These are linked to four tunnel thrusters – two bow thrusters rated 1,500kW at 228 rev/min and two stern thrusters rated 1,050kW at 316 rev/min. The propulsion package is completed by two 5,000mm diameter controllable pitch propellers from Berg and high-performance Becker thrusters.

It is a combination that gives the vessel a bollard pull of 309 tonnes, a maximum speed of 19 knots and a service speed of

12.6 knots. Three Caterpillar auxiliary gen sets provide 940ekW each, with an emergency set giving 200ekW at 1,800 rev/min.

The towing winch, two gog winches and a tugger winch are all supplied by Rolls-Royce. The 550m^2 deck area has a maximum load of 10 tonnes/m^2. Accommodation for 35 personnel includes 25 single berth and five double berth cabins.

ALP Defender joins sister vessel ***ALP Striker***, which entered service late last year. The final two vessels in the series, ***ALP Sweeper*** and ***ALP Keeper***, are currently under construction.

The first two of six new AHTS vessels have been delivered to Maersk Supply Service by **Kleven Verft** shipyard in Norway. However, further deliveries of Maersk's new Starfish fleet have been pushed back to 2018 and 2019.

Maersk Master was the first of the new vessels delivered, entering service in March, with the second launched at the end of June. All six vessels in the series are of a Salt 200 AHTS design by Salt Ship Design and are identical in layout and specification.

Power for the 95m, DP2 vessels comes from five Wärtsilä engines – two W8L32s, two W6L32s and a single W9L20 – delivering 23,000bhp. These are linked to five 1,580bhp tunnel thrusters – three at the bow end, two at the stern – with twin controllable pitch main propellers. This combination gives the AHTS a bollard pull of 230 tonnes and a top speed of 16 knots.

Deck equipment includes a 450-ton anchor-handling winch, two 500-ton tow winches, a pair of 170-ton secondary winches and four tugger winches.

In addition to their anchor-handling role, the Starfish series have Ice Class 1, oil recover and FiFi1 classification. Free deck capacity on each vessel is 940m^2 – including 102m^2 covered area – and 2,500 tonnes. There is also accommodation for 52 personnel.

Family-owned towing and dredging company Herman Senior has added a seventh vessel to its all-Damen fleet in the shape of ***Panda***, a Multicat 2712 designed for towing, anchor handling, dredge support and offshore wind support.

It is the company's second Multicat, while the rest of the fleet is made up of Shoalbusters. At 27.7m x 12.45m and a depth of 3.9m, ***Panda*** is larger than the

original Multicat, ***Yogi***. This gives the new arrival greater deck and crane capacity and increased accommodation and cargo capacity. Additionally, the vessel benefits from unrestricted navigation and V-Sat communication. Main engines are two Caterpillar C32 TTA ACERT engines providing 1,790kW at 1,800 rev/min linked to twin Reintjes gearboxes and 1,900mm diameter Promarin fixed-pitch propellers – a combination giving the vessel a free running speed of 10 knots and a bollard pull of 33 tonnes.

Built at **Damen Shipyard Hardinxveld**, ***Panda*** has heated and air-conditioned accommodation for seven people, consisting of two double and three single cabins, a galley and sanitary facilities.

Piriou has delivered a 41m fast personnel and supply vessel to first-time customer Jana Marine Services, a Saudi Arabian provider of marine services to the offshore oil and gas industry.

The versatile ***Jana 17***, now operating in Arabian Gulf waters, is an aluminium hull vessel designed by Piriou Ingenierie and built at the company's Vietnam shipyard. Roles include rig crew transfer, with capacity for 80 passengers; transportation of supplies thanks to a deck load capacity of 50 tonnes/103m^2; and in-field support, with 80m^3 fuel capacity giving the vessel a 21-day endurance capability .

Powered by three 1,342kW engines coupled to fixed-pitch propellers, ***Jana 17*** has a top speed of 25 knots and excellent fuel consumption at lightship and full load conditions, according to Piriou. The vessel has a crew of 10 and has joined Jana Marine Services' 17-strong fleet of OSVs.

Saam Smit Towage has added a new Damen ASD 2411 tug to its 11-strong tug fleet in Panama. Built for stock at **Damen Song Cam Shipyard** in Vietnam, the 70-tonne bollard pull ***SST Portobelo*** was transported to the Netherlands for finishing before making its way to its new operational home in the Panamanian port of Colón.

The 24.5m x 11.3m new arrival features two Caterpillar 3516C engines delivering 4,180kW at 1,600 rev/min and driving twin Rolls-Royce US255 thrusters linked to a 2,600mm diameter fixed-pitch propeller. This combination gives the vessel a free running speed of 13 knots.

As part of the contract, Saam Smit Panama traded in an older, smaller tug from its fleet in part exchange. The second-hand vessel will be refurbished and offered for sale worldwide by Damen subsidiary Damen Trading, which provides chartering and brokerage services.

Saam Smit's general manager in Panama, Walter van der Dussen, said: "Replacing a 55 with a 70-tonne bollard pull tug fits in well with the Saam Smit Towage Panama strategy of serving its customers with the right tugs, especially in view of the trend of larger vessels sailing into the Panama terminals."

Dutch marine services specialist Van Wijngaarden Marine Services has taken delivery of its second Shoalbuster 3512, the largest of Damen's Shoalbuster range.

At 35m long but with a draft of just 2.9m, ***Lingestroom*** – along with sister vessel ***Noordstroom***, which was delivered last year – are ideal for shallow water operations.

With a bollard pull of 61.8 tonnes, a deck area totalling 145m^2 – enough for seven 20ft and two 10ft containers – and an 11.3 tons @ 16.5m deck crane, it is a formidable all-round workboat with a crew of up to 11.

The vessel is powered by three Caterpillar C32 ACERT 4-stroke diesel marine engines delivering a total of 2,910kW at 1,800 rev/min. Each engine drives a Reintjes reverse reduction gearbox and also drives a Promarin fixed pitch propeller in a Van der Giessen Optima Nozzle.

Lingestroom was built at **Damen Shipyards Hardinxveld**. **John Oliver**

Salvage teams respond to pollution alerts

T&T Salvage of Galveston, Texas, US, responded to a disabled 700ft-long (213m) integrated tug and barge which had become separated due to heavy seas roughly three nautical miles off the Galveston Island Pleasure Pier, posing a major threat to one of the island's most populous beach areas.

In an attempt to prevent the barge from drifting closer to shore, crew members quickly deployed the barge's anchoring system; however, the sea conditions prevented the anchor from holding.

Additionally, during attempts to prevent the barge from running ashore, one of the propellers of the ITB tug became fouled with the tow wire. The vessel's response plan was quickly activated and T&T Salvage was called upon to render assistance.

T&T Salvage's response partner, G&H Towing, mobilised three tugs to the scene to gain control of the adrift barge and began towing it away from Galveston Beach.

T&T Salvage's supply vessel ***Holt T***, was dispatched soon after to transport a salvage team and additional salvage gear to offer further assistance to the disabled vessels. With severe weather ahead, the vessel crew and salvage team were challenged with seas upwards of 11ft (3.5m) and 40 knot winds.

Kevin Teichman, owner of T&T Salvage, said: "Our divers conducted an underwater assessment and survey, where we were able to identify that not only had the starboard prop been fouled by the tow wire, but rope was also bound tightly around the port wheel."

In close co-ordination with the US Coast Guard (USCG) marine safety unit (MSU) Texas City and the vessel's owner, the salvage firm quickly developed a plan to free the propellers from the lines and deliver the tug and barge safely into port.

▲ **Tutahaco** *is hoisted on to the barge*

Ricardo M Alonso, commanding officer of MSU Texas City, said: "Given the circumstances and offshore conditions, it was no small feat to regain control and render assistance to the vessels, ultimately keeping them both from nearing one of the most populated sections of Galveston Beach."

T&T Salvage also recently took part in the removal of the tugboat ***Tutahaco*** near Ormond Beach, Jacksonville, Florida, after the vessel was deemed a maritime threat to the environment when an inspection found significant amounts of oil, PCBs, lead and asbestos on the vessel.

USCG Lt Cmdr Christopher Svencer, who was in charge of the removal of the tug, said: "The ***Tutahaco*** was in dilapidated condition. Not only was it a threat to the environment, but also the community and that's our primary concern."

A single screw former US Navy tugboat, ***Tutahaco*** was built towards the end of World War II, and had more recently been used as a floating home. The USCG hired T&T Salvage to hoist the vessel on to a barge on which it was transported to All Star Metals in Brownsville, Texas, where the hazardous contaminates were removed.

Company lost time incident record praised

Salvage and wreck removal company Ardent has maintained a zero lost time incident record during its first two years of operating. The company celebrated its second birthday on 1 May.

In May 2015, Svitzer Salvage, part of the Maersk Group, and Titan Salvage, part of Crowley Holdings Inc, merged to form Ardent. The company continues to be 50 per cent owned by Svitzer (Maersk) and 50 per cent owned by Crowley.

CEO Peter Pietka said: "Despite the initial focus on implementing the merger and challenging market conditions, Ardent has successfully won and executed 125 contracts over the past two years.

"Salvage operations are inherently risk-filled and completing 125 contracts without a single lost time incident is a testament to the professionalism of our teams."

He added that Ardent is experiencing significant commercial momentum with several notable contract wins.

During the past month its teams have completed high-profile emergency response contracts on four continents.

In late April it signed for the removal of the sunken ***Fluvius Tamar*** vessel from the English Channel, the largest wreck removal contract awarded so far in 2017.

Ardent has also reorganised its business into two largely 'self-sustained' business pillars: the emergency management pillar, covering emergency preparedness and response; and the projects pillar, covering wreck removal, offshore decommissioning and subsea services.

Oliver Timofei is the director of emergency management and Jon Minshall has been appointed as director of projects.

Pietka said: "The new structure is intended to ensure that we, for both business areas, have 'fit-for-purpose' processes, resources and culture which will enable us to serve the respective customer segments even better than today."

► *Ardent CEO Peter Pietka*

The new structure also intends to ensure that Ardent can retain its focus on its original core business while increasingly offering adjacent services – not least within an offshore context.

Pietka said: "Whereas we have done well in the market place, it is also true that during the past two years a tremendous amount of focus has gone into internal issues related to the merger implementation and the recent organisational restructuring. We look forward to the next stage."

Image courtesy of Robert Allan Ltd

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Move Forward with Confidence

Salvors have completed their initial search of the passenger decks of the wrecked South Korean ferry *Sewol*. The two-month search found the remains of four missing passengers, but five more are still unaccounted for.

Decks three, four and five contained the vessel's passenger cabins and public spaces, and were considered the likeliest location of the missing bodies. The search will now move on to the vessel's cargo spaces and is expected to finish by the end of August.

The search team has examined thousands of bags of silt from within the hull, manually sifting the contents to retrieve 4,100 items belonging to passengers.

More than 300 died in the ***Sewol*** tragedy, the majority of them students, and the highly public accident became a political minefield for the administration of the then-president of South Korea, Park Geun-hye. Park has since been impeached, removed from office and imprisoned; although the formal charges against her were related to a corruption scandal, her government's response to the sinking played an important role in the proceedings.

Sewol was recovered from the waters off Jindo Island by Chinese state-owned Shanghai Salvage, so bodies of the missing could be retrieved and to find any new evidence into the cause of the sinking.

The salvage set at least two records: it was the deepest ever lift of a complete hull, and the wreck's roll-off unloading at Mokpo was the heaviest lift ever carried out with self-propelled modular transporters.

Emergency tow vessel prevents tug drifting to eco-sensitive shore

The US Coast Guard (USCG) co-ordinated assistance for the tug *Mauna Loa* which became disabled and began to drift towards the Washington state coast.

The 113ft (34.5m) ***Mauna Loa*** along with its 320ft (97.5m) barge, were met by the crew of the tug ***Lauren Foss***, who took it under tow to Port Angeles.

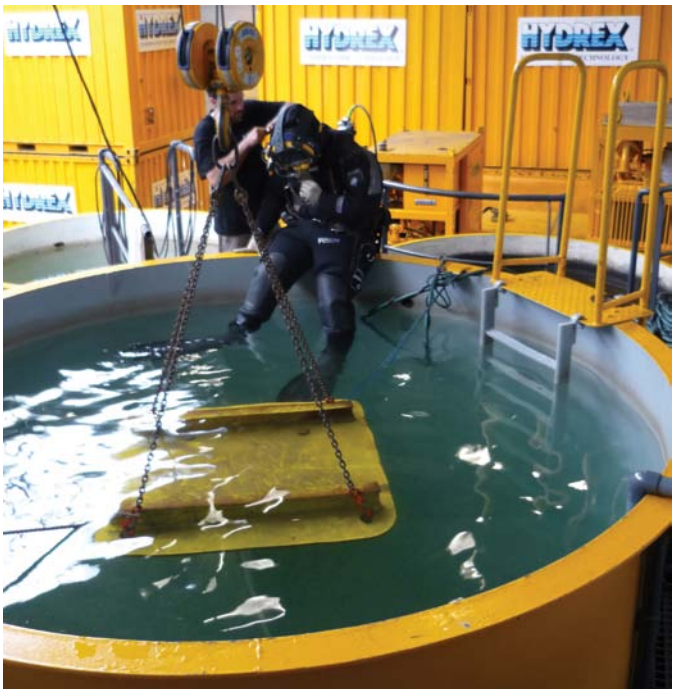
Watchstanders at USCG Sector Columbia River received the report from the master of the disabled tug stating that it had suffered engine failure and was drifting toward the coast. Watchstanders contacted the tug's owner who contracted the tugs ***Lauren Foss***, out of Neah Bay, and ***David Brusco***, out of Cathlamet, to intercept ***Mauna Loa*** before it could drift aground.

Due to increasing currents, a USCG guard station Grays Harbor 47ft (14m) motor lifeboat crew launched to act as emergency safety standby to pull the four crew members from ***Mauna Loa*** in case the en-route tugs were unable to arrive on scene before the stricken tug ran aground.

Lauren Foss is the current emergency rescue towing vessel (ERTV) based at Neah Bay. The ERTV is a State of Washington mandated programme funded by fees levied on vessels calling on Puget Sound.

The programme was developed to provide a resource to ensure that vessels that became disabled offshore were able to be intercepted before they endangered ecologically sensitive shores. The ERTV is continually stationed in Neah Bay to respond to similar incidents.

Diver technicians get ship back to work



▲ *Diver technicians in training at Hydrex's state-of-the art facilities in Antwerp*

After delays of almost two weeks following an unsuccessful repair to the hull of a 180m bulk carrier that ran aground offshore Las Palmas, Spain, Belgium-headquartered Hydrex Underwater Technologies was approached to get the vessel sailing again.

Hydrex production executive, Dave Bleyenberg, said: "The classification society said to the owner the repair would be more likely to get the green light if we were involved because it knew we had the needed certificates and experience."

Once Hydrex's involvement was approved, a small inspection team was flown to Las Palmas to perform a detailed underwater survey. The survey team was able to provide a full appraisal of damage as well as all required measurements needed for the repair.

By the time the main diver/technician team arrived at the site, the initial inspection team and local support base had already secured the necessary equipment and repair materials to complete the project. The dive team then set about removing the cofferdam that had been installed during the previous attempt to repair the damage. Two doubler plates were then installed over the damaged areas of the flat bottom. These were independently tested to verify the weld integrity and subsequently approved by the classification society.

Bleyenberg said: "The ship had been laying idle for almost two weeks while the first repair attempt was made. This delayed the delivery of the cargo, costing everyone involved precious time, money and consequential loss of reputation. That we were able to step in and resolve the issue swiftly allowed the owner to sail on to the next destination to unload the cargo without further delay and arrange for permanent repairs in drydock."

Hydrex sales officer, Steven De Keyzer, said: "Our diver technicians are trained and qualified to perform all class-approved repair procedures in even the harshest conditions."

Whether diver technicians operate from Hydrex's head office in Antwerp or from one of the company's global repair hubs, all are certified to internationally recognised commercial diver standards. They also receive further in-house training at the company's diver training centre in Antwerp.

Provisions are litigation time-bomb

Regular columnist Simon Tatham looks at what he describes as the alarming trend of taking advantage of the prolonged soft market to throw risk on to the shipowner

► *Simon Tatham*

There is one good reason why there are many more solicitors dealing with marine claims than in the offshore and energy sectors. In traditional shipping the parties are frequently in dog-fights over damage to cargo, demurrage, unpaid or disputed hire, general average and, of course, the occasional unexpected bump, towage or salvage. All good stuff to keep the legal community adequately fed and watered, and on our toes keeping up to date with the constant flow of new case law.

Conversely, offshore and energy-related contracts contain liability and indemnity provisions (commonly known as knock-for-knock) which broadly provide that the losses lie where they fall, irrespective of fault, along with provisions that protect against lawsuits from or against related parties (often referred to as owners' or charterers' groups). With operators often working in the same oilfield controlled by a government or oil major utilising high value assets, this not only brought down the cost of insurance, in particular liability insurance, but also reduced substantially the scope for litigation.

The English courts have upheld these contractual protections as expedient, although giving rise to some odd results when exonerating negligent behaviour.

These provisions were gradually adopted by BIMCO and found their way into HEAVYCON, SUPPLYTIME, TOWCON and TOWHIRE.

Recently, however, there has been an alarming trend, which is gathering pace, for the buyer or end user, taking advantage of a prolonged soft market, to throw risk on to the hapless shipowner. P&I Clubs are doing the same with wreck removal contracts, depriving the contractor not only of the change of circumstance provision, but forcing them to take on, and thus insure, risks that by rights, some would say, should remain with the party whose ship or unit has foundered.

Some of these provisions seen in the OSV and heavy-lift sectors create potentially very serious issues that are frequently not well considered. For example you might find a standard SUPPLYTIME 2005 with an un-amended clause 14, however supplemented by an additional clause providing that despite the knock-for-knock provisions the owners shall be liable for a sizeable first tranche of any loss suffered by the property or personnel of the charterers' group for each and every incident.

If that figure is, say, US$250,000, it might well be intended to reflect a charterers' group's own insurance deductible. Charterers will have to bring a claim for breach of contract or negligence in circumstances where the duty of care is not well defined, simply because it has until now not been necessary to do so because of the existence of knock-for-knock. Contrast this with the generally balanced provisions under the Hague Visby Rules for the carriage of cargo, or not dissimilar seaworthiness provisions found in charter-parties. Another example might be the imposition of terms that override the knock-for-knock provisions in the event of the gross negligence of the contractor. English law does not make a distinction between ordinary and gross negligence so the existence of such a provision in a contract, subject to London arbitration or the High Court, will create a challenge for the parties' advisors and the competent tribunal. An alternative extension of this might be to deprive the contractor of protection in the event of the gross negligence, not of his vessel crew but of the shore side management or supervisory personnel. As one offshore operator remarked to me the other day, such provisions are a litigation time-bomb waiting to explode, reminiscent of the complex litigation that used to take place in the context of proving or disproving 'fault and privity' before the limitation of liability regime eventually changed pursuant to the 1976 Limitation Convention.

Under the standard provisions a party is to be protected from claims arising from his act, neglect or default. In the same vein there is a temptation for parties to seek to deprive the contractor of that protection in the event of his wilful or criminal misconduct. Some may find this logical, at least until one reflects upon the alacrity with which coastal authorities will nowadays prosecute seafarers involved in marine accidents.

Finally, the rules of most P&I clubs do not tolerate meddling with the standard BIMCO regimes and their members therefore risk excluding themselves from cover where, without the club's approval, they have entered into 'unusually burdensome terms'.

Returning to the rather odd concept of gross negligence, as I understood this to be a concept recognised in Scandinavia, I once asked a Norwegian lawyer to explain how this differed from ordinary negligence. His answer was: "Well Simon, you see the difference is that when you encounter ordinary negligence you nod your head as you recognise a human being's mistake; however when confronted with gross negligence, you know this very well because you simply have to shake your head in disbelief." I am looking forward to an opportunity to explain that to an English judge.

● *Simon Tatham is a partner of Tatham Macinnes LLP and a founder member of the TugAdvise.com service. He has more than 30 years' experience of shipping law.*

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Crew member dies in tanker engine blaze

Greece-based international salvage firm Tsavliris was called to assist the LPG tanker *Gemini Gas* after it experienced a major engine fire, in which a crew member died, while 132 miles south east of Salalah in Oman.

According to the company's second quarter activity report, the 7,082gt tanker, laden with 4,400 tonnes of LPG, was en route from Khorfakkan, UAE, to Port Sudan when the incident occurred.

Tsavliris dispatched the 120-tonne bollard pull (BP) salvage tug ***Gladiator*** from Djibouti which towed the stricken vessel to Salalah where it was met by a Tsavliris salvage team from Greece. Electrical repairs were carried out by the team using portable diesel generators and power was restored.

The tug then towed ***Gemini*** to Duqm – with the salvage team and four armed guards, to deter pirates, on board – where repairs to the engine room were completed.

Meanwhile, in March the company dispatched the 3,200bhp AHT ***Dutch Power*** from Rotterdam to assist the 7,994gt motor vessel ***Scandinavian Reefer*** which was anchored in the North Sea around 45 miles off Flushing after suffering a serious mechanical failure.

A towline was attached to the stricken vessel and it was towed to Rotterdam where it was delivered to port tugs and moored.

In April, the company also assisted the 42,868gt bulk carrier ***Anastasia K*** which had grounded off Rosario, Argentina, while on passage from Rosario to Saudi Arabia via Bahia Blancá laden with 46,500 tonnes of grain.

Tsavliris' local salvage master boarded the vessel while two tugs, the 65-tonne BP ***Cooper Estibador*** and 76-tonne BP ***Ranquel*** were mobilised from San Lorenzo and Rosario respectively. Both tugs arrived on the same day and connected to the carrier's stern. Upon receipt of permission from the coastguard, refloating attempts commenced under the directions of the salvage master.

The vessel was refloated successfully and escorted to an anchorage area.

◀ **Gladiator** *alongside* **Gemini Gas**

Shipbuilding is on cusp of change

► *Miguel Galdos Urquia*

Miguel Galdos Urquia, owner and general director of Spain-based robotics engineering specialists Martec, looks at the likely impact that Industry 4.0, the drive for automation and 'big data' exchange, will have on all aspects of the shipbuilding industry

Despite the unique characteristics of shipbuilding, Industry 4.0, the current trend of automation and data exchange in manufacturing technologies dubbed the fourth industrial revolution, has the potential to transform the conventional shipbuilding process from A to Z, making it more effective in terms of technology and business. It will lead to significant changes of work organisation and procedures, shipbuilding practices and affecting, in short, all activities at a shipyard.

Intelligent assistance systems will result in new workflow and will provide new scope of working for all shipyard employees, affecting management as well as workers. It will also improve the overall quality of work and the final 'as-built standard' of newbuilding. It will be significantly easier to identify advantages regarding flexibility and efficiency of the process at all levels.

Additional services and business concept can be developed across the entire industry, and what is more, it will also benefit ships' owners.

However, the introduction and application of Industry 4.0 needs to be tailored to specific demands and requirements.

Martec, which has been dedicated to industrial automation for more than 25 years, has developed an innovative welding system called Scan Robot.

The welding automation of stiffeners, either on mini-panels or on panels, has already had a long history although, in most cases, it has been performed on panels with parallel stiffeners.

These systems, always based on copying systems through pneumatic/mechanical or electromechanical probes, can only be used if the stiffeners are mounted in parallel. However, when the work is on thin plates of 6-10mm of thickness, deformations produced by the welding tensions mean designs with crossed stiffeners are recommended, since their resistance is much greater, and eventually they are much less deformable. For that reason, the welding process is usually carried out manually.

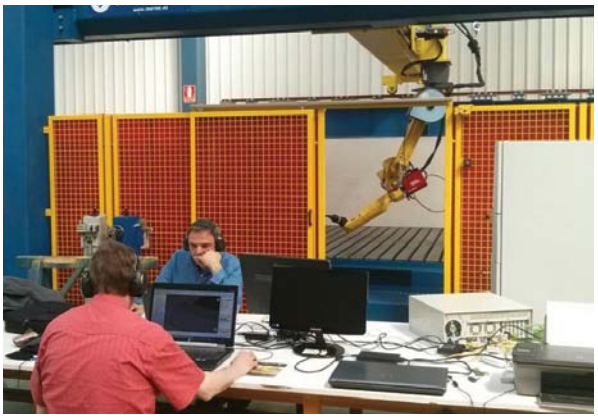
Manual work presents many difficulties: it is of a worse quality, increases deformations and the consumption of all consumables. It is also very hard for workers, who have to work on their knees and are exposed to the inhalation of harmful gases, as well as to the UVA rays of the welding arc. As a result, productivity is very low.

"The system provides sub-assembly images in three dimensions and traces them in the exact position at which they are found on the work table"

For approximately 20 years, attempts have been made to automate these processes through the use of industrial robots. Robots are mainly used in the automotive industry on parts manufactured with precision in repetitive processes (repeated parts). This means that the programming time (non-productive) does not represent a significant cost, since just a single program is used to manufacture many parts.

However, in the case of manufacturing sub-assemblies, these are different from each other and the manufacturing tolerances do not allow for an easy automation. Attempts made up to now are confined to the programming area 'off-line'. Based on CAD geometry and by means of simulation software, a welding program is designed and transferred to the computer for its application on site.

This program, made in this way, requires the co-ordination of the origin of the parts with the co-ordinates of the robot, so that the programmed paths can comply. Even then, the real part is unlikely to be exactly the same as the theoretical version and the arc welding process does not offer quality workmanship on tolerances greater than +/- 1mm on the welding course. To compensate for these deviations, a follow-up system with adaptive controls of different technologies has been used: from laser cameras fitted on the support of their proper welding torch, to follow up systems through the welding arc. The former are very accurate, but their mounting is not always compatible with the process, due to both the space required and their high cost.



◄ *The Martec system software under development*

These systems have always needed highly qualified personnel, which questioned the cost effectiveness or profitability of a system of such high cost that is also so difficult to handle.

Martec was required by Astilleros Balenciaga to develop a robotised system capable of resolving this issue efficiently, but also capable of being handled directly by a welder with a college level qualification.

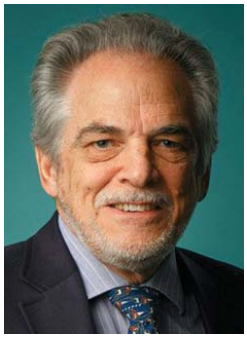
After a period of investigation and having carried out many practical tests of different solutions, Martec finally found a definitive solution based on a 3D scanning system provided with several artificial vision cameras. The system provides sub-assembly images in three dimensions and traces them in the exact position at which they are found on the work table.

Furthermore, the creation of a CAM type software was required, with which to create a base program on CAD files of the sub-assemblies. The parts can be located at any position so the scanning camera can provide both the position and the real geometry. Then the CAM software will import the CAD file and will overlap the real part on the computer screen. Thus, the robot will automatically recognise the state of the original.

However, since the geometry of the real part is not exactly the same as the theoretical one, it was also necessary to develop some algorithms to allow for the adaptation of the CAD basic program to the real geometry.

The robot system consists of eight axes, or nine depending on requirements. In summary, the result proved that when all the specified expectations were complied with, the system achieves a precision of +/- 1mm; is capable of being handled by a single welder; is ergonomic and safe for the operator; is capable of welding both horizontal and vertical welds; offers the possibility of programming both online and offline; multiplies the current productivity by three or four times; and is capable of welding approximately 180m per shift.

Firm that launched 1,000 tugboats



► *Robert Allan*

Robert Allan, executive chairman of Vancouver-based naval architects Robert Allan Ltd, marks the company reaching its 1,000th tug design milestone with a, sometimes very personal, look back at the past 87 years of technological advance

Over the past few years, as the design output from Robert Allan Ltd to the global tugboat community began to border on the prodigious, we were often asked: 'How many tugs has your company designed'? Until very recently we really did not have a good handle on that number, so the answer was usually either 'a lot' or 'many hundreds', neither of which were particularly illuminating. So a search was begun late in 2016 to review our archives and try to determine the tug tally much more precisely. Would we rival Helen of Troy?

It is unfortunately difficult to identify the first tug designed by this firm as the records from the 1930s consist primarily of the rather incomplete set of original drawings which are still in our possession. There is no formal internal listing of the design work done in those days which might provide a more complete record. However, there are the amazing resources of the archived *Harbour & Shipping* magazines at both the University of British Columbia (UBC) and at the Vancouver Maritime Museum. Our resident marine historian, Rollie Webb, was able to sleuth through those records and identify a 1934-built tug designed by Robert Allan, the ***Weaver Lake***, built for a Captain EC Merchant. In our archives there is an undated, handsome little ink on linen drawing of a 'shallow draft towboat' with dimensions at 41ft 8ins by 11ft (12.7m by 3.3m) that match ***Weaver Lake***. A query to the Vancouver Maritime Museum turned up a photo of ***Weaver Lake*** in the collection of Fred Rogers, which certainly reflects the drawing. So we can, with considerable confidence, declare her as our 'Eve' (Adam having been unceremoniously relegated to second place due to gender bias).

Interestingly, many of those early tugs, including ***Weaver Lake***, were shallow draft designs, most likely built for work on the Fraser River and its tributaries in its pre-dredged era. There are also some quite small workboats, some as small as 18ft-long (5.5m), which were described as 'towboats' which we did not count. Similarly, the many small boom boats designed by the firm are not included as real tugs for the purposes of this tally. The resulting count for tugs and towboats built in the 1930s is therefore a grand total of three.

"It was a very large and significant project for our office, and introduced me to the marked contrasts in efficiency and quality between domestic and Japanese yards. However, the most difficult part of the project was watching my father slowly succumb to cancer"

The 1940s were a time of the construction of many fishboats and, of course, the distraction of the war effort where both Robert Allans were engaged in design efforts with local shipyards. There are only four tugs in our files from that decade. However, this period contained what is certainly the most elaborate set of design drawings of the era for a 75ft (23m) shallow-draft steel towboat (with a lower deckhouse of steel and the upper two tiers of timber/plywood). The plans are unfortunately undated, but the business address shown on the drawings is for my grandfather's house on West 63rd Avenue near Laburnum, where the company really had its beginnings. He bought that house in 1945 for Can$4,500, so it is assumed the design was done sometime after 1945.

This design is done in extensive detail, probably as a working drawing contract, and best indications are that it was ***Sandy Jane*** built by Yarrows in 1946 for Yellowknife Transportation Ltd for service on the Mackenzie River.

The 1950s began with what we can firmly identify as our first steel coastal tug design. ***Black Bear*** was designed in April 1950 and delivered in October 1950 by Victoria Machinery Depot for the Black Ball Towing Co. Its registered dimensions were 42ft 7ins by 15ft 1ins by 6ft 3ins (14.5m by 4.6m by 2m), with a GRT of 32. Original machinery was a Gray Marine diesel of 330bhp. An interesting and highly innovative feature at the time was a hydraulically elevating wheelhouse, indicating that the tug was destined to work primarily on the river and needed to duck some bridges.

Black Ball Towing was absorbed by Gulf of Georgia Towing (named as owner on the drawings). When Gulf of Georgia Towing was bought by Seaspan the tug was renamed ***Seaspan Rebel*** then sold and renamed ***Nanaimo Rebel*** and finally ***Black Bear II***. At some point, it was extensively rebuilt. In 2003 it was owned by a numbered company in Kitimat. The registry on ***Black Bear II*** closed in 2011; vessel fate unknown.

The 1950s may have marked the real beginning of steel tug construction in British Columbia, but there were still a fair number of wooden tugs being designed and built. Notable among the latter was the ***Tugger Yorke*** for FM Yorke and Sons. Built in 1955, according to Nauticapedia it was still in service on the BC coast in 2013 having endured many changes in both guise and ownership over the years.

A milestone vessel designed in the last year of the 1950s was the ***Ocean Master***, an early large tug design and almost certainly the first internationally-built tug from this office. This 125ft (38m) tug was built by Van Der Werf Scheepswerf in Holland in 1961 for Great West Towing and Salvage Ltd, and appears to still be in active service in Canadian registry.

The last couple of years of the '50s marked the beginning of a transformation of the BC towing industry, with a federal shipbuilding subsidy providing significant financial incentive to owners to replace their aging wooden fleets with new steel tonnage. The ***Lorne Yorke***, designed in 1959, was billed as: 'The first modern twin-screw tug in BC' at its launching. It is difficult to know how 'modern' was judged and by whom, but the

◄ **Weaver Lake** *from the Fred Rogers collection*

vessel was a fine tug and praised by her crews for its seakeeping ability. Robert Allan Ltd designed about 14 tugs in the 1950s.

The boom in new steel tugs (and many new steel barges to be towed by them) continued in earnest throughout the 1960s, and Robert Allan Ltd was at the forefront of these developments. In 1963 the company graduated from my grandfather's basement and under my father's direction settled into 'real' offices at West 72nd Avenue and Granville Street.

The year of 1969 saw very significant output from what was then a company of about eight to 10 people. It also marked the first exchanges between Robert Allan Ltd and the firm of CH Cates & Sons, a relationship which would have a lasting and dramatic impact on the future of our design firm.

This period also saw the boom in the new era of 'under tonnage tugs'. It is difficult to identify exactly how many of these <15grt '41-footers' were built by the likes of John Manly Ltd and Vito Steel Boat & Barge Ltd, but we can identify at least 14 from Vito and perhaps 10 from Manly's. A grand total of 106 tugs were built to our designs in that decade.

Notable tugs from the 1960s include: ***Jacques Cartier*** (1961), ***Evco Wave/Spray/Breeze*** (1962), ***La Reine***, ***Harmac Fir/Cedar/Pine/Spruce*** (1963), ***Gibraltar Straits***, ***Haida Brave***, ***Capt Cook***, ***Harold A Jones*** (1964), ***Island Chief/Island Master***, ***Irving Birch***, ***Irving Maple***, ***Le Mars*** (1965), ***Island King*** (1966), ***Irving Beech*** (1967), ***Jose Narvaez*** (1968) and ***Hecate Crown*** (1969).

As the 1970s dawned, the focus of our business shifted north, although there were still many tugs built locally in that decade. I joined my father in the business at the beginning of 1973 when our staff totalled about 12. Tugs for the Mackenzie River System and Ice Class vessels for the Beaufort Sea consumed much of our talents in those years, but there were some coastal highlights too, notably the 114ft (35m), 2,600hp ***Jervis Crown***, a very favourite of my own early career (1976) as my father, though watching carefully, let me have a relatively free rein with this design.

This decade also spawned the series of 76ft (23.4m), <150gt tugs which are all still in service today. Vito built four tugs for Gulf of Georgia Towing, the ***Cindy Mozel*** for Captain John Mozel, and the slightly smaller ***Comox Crown*** for Crown Zellerbach.

The early 1980s were dominated by projects for the Beaufort Sea and in particular with the design of ***Ikaluk*** and ***Miscaroo*** for Gulf Canada Resources Inc. These 260ft (79m), 14,900bhp icebreaking supply vessels were the only high Ice Class OSVs of their kind anywhere in the world at the time, and are still operating effectively in Sakhalin today. It was a very large and significant project for our office, and introduced me to the marked contrasts in efficiency and quality between domestic and Japanese yards. However, the most difficult part of the project was watching my father slowly succumb to cancer throughout the duration of the project, which he was unable to see fulfilled.

Those heady days of 1981-82, however, soon led into the doldrums of the balance of the 1980s, a period of very little activity in the maritime world, and we simply hung on by our fingernails for much of that period.

▲ **Charles H Cates II**: *First of a new generation of ASD harbour tugs*

There were however, some notable bright spots in the '80s, not least of which was the development of the first Z-drive tugs for CH Cates & Sons. Cates 2 ***Charles H Cates II*** was built in 1983, followed by the Cates 1 in 1986 and the Cates 3 in 1990.

As the 1990s dawned, the era of the Z-drive tug really began in earnest, at least in North America – it had begun 20 years earlier in Europe. The small but mighty Cates tugs attracted a lot of attention and shortly thereafter enquiries for similar tugs came in from many places in North America and Europe.

The lessons learned from working closely with Terry Waghorn and later with Claire Johnston of Cates stood us well in this emerging technology. We had learned what works best in terms of hull form for these agile tugs and applied those lessons to ever-larger ASD type vessels. In 1993 a series of 4,000hp, 100ft (30.5m) ASD tugs were built by East Isle Shipyards (as part of Irving Shipyards) of Prince Edward Island, Canada. These were highly successful boats, some of which were bought by operators in Europe. That connection to major European owners, and in particular to Østensjø Rederi of Norway, opened many doors for Robert Allan Ltd and led to the opportunity to design several major and innovative tugs for the emerging tanker escort tug market. The business for new tugs was on a turn and we were fortunately well placed with fresh ideas to serve the burgeoning market.

In about 1995, I had a phone call from a university student in Turkey. Ali Gürün wanted to talk about escort tugs. Several months later, he called again and advised me that his family owned a small towing company and wanted to build some new

◄ **Tugger Yorke** *with RF Allan at the aft window*

tugs. An amazing and enduring relationship was born between our companies and to date Sanmar has built more than 150 tugs to our designs, in the process establishing itself as probably the premier tug-building shipyard in the world. That connection quickly led to relationships with other shipyards in Turkey, notably Uzmar and Med Marine, and soon we were seeing more than 40 to 50 tugs a year being built in Turkey alone.

The development of ever-larger container ships, major LNG terminals, expanding bulk carrier ports such as Port Hedland in Australia, and of course, the rapid evolution of tanker escort technology created a whole new generation of high-performance specialised tugboats. Since 2000, Robert Allan Ltd has had more than 720 tugs built to our designs worldwide. When added to the historical database the total number of tugs delivered stands, at time of writing, at 1,005!

And so to crown the 'KiloTug', the 1,000th tug delivery in the now 87-year history of this firm. That honour, most fittingly, goes to ***Dux***, the first of three ultra-high performance dual-fuel escort tugs built by Gondan Shipyard in Spain for Østensjø Rederi of Norway.

Johannes Østensjø was the first owner in Europe to purchase a Robert Allan Ltd designed tug and our subsequent work with that fine company has always been extra special, including tugs of truly innovative and specialised designs with both VSP and Z-drive propulsion.

Dux and its two sisters will be the first dual-fuel escort tugs in the world.

It remains to thank in particular those many clients who have shown their continued faith in our design work and who have supported Robert Allan Ltd for many years. Special mention in this regard to: Cheoy Lee of Hong Kong, Østensjø Rederi of Norway, Kotug and Smit of the Netherlands, Svitzer of Denmark, PSA Marine of Singapore, and Uzmar and Sanmar of Turkey.

▲ *1,000th delivery: the RAstar 4000-DF* **Dux**

And finally a special tribute and hearty thank you to Terry Waghorn and to the late Claire Johnston of CH Cates & Sons, whose vision of the 'perfect tug' and whose initial trust in our design capabilities helped to spawn the whole modern Z-drive tug movement. Claire gave me a visionary graphic of the 'tug of the future' to commemorate the 100th Anniversary of the Cates organisation in 2000; it states: 'Let us Not Restrict Our Imagination'. I hope we have honoured that objective!

Wire rope specialist offers turnkey solutions

Gaylin Group of companies, of which Rigmarine is part, say three recent contracts have substantiated their collective status as a major global specialist provider for turnkey wire rope supply and installation packages.

The group says progressive development of deeper water exploration, supported by newbuild state-of-the-art deep-water construction and OSVs, has transformed the spooling industry. From mundane spooling of 25-ton wire to critical logistical and operational scopes of work, the sector now demands hours of planning, top of the range tensioning equipment and, of course, industry-leading knowledge and expertise.

Mike Duncan, managing director at Gaylin, said: "All of our international service centres are equipped to provide a varied work scope from the rental of spooling machines and operators only to a full project managed package. Typically, this is in the marine or lifting industries, or both, and will involve the handling and installation of anchor mooring wires, abandonment and recovery (A&R) wires, mooring systems and crane wires, all presenting their own spooling challenges, and few companies excel at this activity."

◄ *A Gaylin Group 250-ton capacity back tension spooling machine*

Recently, a number of extensive fibre rope spooling and tensioning projects have been executed by the group, each of which, Duncan said, brought with them their own challenges, but also a satisfying level of achievement and knowledge to all involved.

Two presented a simultaneous challenge to install A&R wire rope packages aboard vessels in Malaysia and Azerbaijan respectively. One docked at Johor Port required 109mm by 3,000m, 160-ton capacity rope. In Baku, aboard another, 112mm by 3,000m rope of 155-ton capacity was the order of the day.

Duncan reflected on the scale of both projects, recalling local mobilisation of engineers and machinery from Gaylin's offshore marine base in Johor and Rigmarine's Azerbaijan facility. Each location provided an engineering team of at least 12 people, including project management, as well as two spooling machines of over 200-ton capacity.

He said: "Due to irregular reel dimensions in the Caspian Sea, re-engineering of the 200-ton spooling machine was required in a short time frame to avoid mobilisation of a specific machine from Europe. This saved the client in excess of US$50k alone."

A winch test system was provided to the same project with specific components, such as a 500-ton triplate, 500-ton wide body load measuring shackles and synthetic grommets. Both projects were completed within budget, on time and without incident.

Finally, and most recently, Rigmarine mobilised a team from its new UK operation, comprising a project manager, mechanical fitter, machine operator and two qualified wire rope technicians, to assist with the installation of more than 6,000m of 90mm diameter AHTS wires, all of which were provided by Rigmarine Europe UK.

A bespoke all-weather socketing and rigging facility, in addition to a 250-ton self-contained back tension spooling machine, supported the team. Also part of the package was a rigging and test equipment loft, including water bags and load cells to test the vessel cranes.

Duncan said: "As a group we offer a wide range of spooling plant from 5-ton to 400-ton capacity and in all we operate in excess of 30 units located in several key geographical regions. Having the machinery is one thing, but ensuring we can provide excellent support to our clients via our experience and competency is another.

"Many wrongly believe it's all about investing in the kit and forget about the ability to safely use it. All of our equipment is in accordance with European and international standards such as LOLER and PUWER, and all of our technicians go through tailored and rigorous training courses."

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Mixed fortunes in a changing marketplace

The Brazilian shipbuilding industry has for the past several decades depended heavily on the oil & gas industry – specifically on state oil company Petrobras. Additionally, the local content requirements in place over the past 15 years, which oblige oil & gas operators to procure a certain level of goods and services from Brazilian suppliers, meant many new shipyards were created to fulfil Petrobras' demand for OSVs and platforms.

However, in the fallout from the Petrobras corruption scandal, a large number of contracts were terminated and most shipyards are now struggling to survive. About 30,000 jobs in the industry have been lost over the past 12 months, while newbuild OSVs are laid up with no prospect of work.

There is some cause for optimism, though: the inland shipbuilding sector is not dependent on oil & gas, and there are some signs of an upturn in business.

Most of the shipyards building inland vessels are in the northern region of Brazil, on the banks of the Amazon River – mainly in the cities of Manaus, in the west, and Belem, at the mouth of the Amazon.

Estaleiro Rio Maguari (Rio Maguari Shipyard) is based in Belem and is the Brazilian shipyard that has delivered the highest number of vessels in the past five years, according to the company's commercial director, Fábio Vasconcellos.

He said: "We have delivered around 300 units of inland and oceangoing barges – including deck, tank and hopper barges – as well as pushboats and harbour tugs. Our lower labour costs and privileged location mean we can offer better prices for all our vessels. For customers from South and Central America, we offer a very good option on price and quality against shipyards in China and the Gulf of Mexico shipyards. People don't have to go to the other side of the world to look for their barges and tugs."

◄ *Estaleiro Rio Maguari's 45-tonne bollard pull tug* **Waldemaro Schmidt**, *top, designed by Interocean for use on Brazil's inland waterways. Bottom, the company's latest 1,200hp river pushboat, designed by Canada's Robert Allan Ltd*

Alongside the inland vessel market, Vasconcellos sees another good market opportunity in vessel repair. He explained: "Because of the new inland fleet built in the past five years, the harbour tugs operating in our area and the OSVs that are already operating or are planning to operate in our regions in the short term future, we believe the ship repair industry offers good opportunities and we are planning to invest in this area in the short term."

Taking a slice of Argentine pizza

Commercial tugboat operations in Argentina have been at a low rate in terms of work throughout 2016. Although grain ports have been operating at an acceptable rate, those involving container traffic have been largely inactive, while cruise market operations have significantly decreased.

In anticipation of an increase in demand, the Buenos Aires-based harbour towage company Remolcadores Unidos Argentinos (RUA) is upgrading its fleet. Company president and CEO, Dr Carlos Alfonso Ruiz Moreno *(pictured right)*, said: "Within our fleet revamping and upgrading programme, the company has completed building ***RUA Don Jose***, a new ASD tug of 5,000hp, with 65 tonnes of bollard pull. Also, rebuilding has commenced of another similar vessel. Both tugs have been developed by a national shipyard, in support of Argentina's workforce at a time it needs it the most."

The future still looks uncertain, however. Moreno continued: "As for 2017's expectations for our activity in particular, we are not quite certain. New multinational players have been incorporated into the big picture, but the market remains the same or even worse. In other words, the pizza is one and the same, but now we have to divide it into more slices.

"The tugboat market in Argentina is up to capacity, with a revamped fleet. This will increase competition – which will, in turn, atomise the business and end economies of scale. Let us hope the country grows and adopts robust sustainable and political measures for the long term. This will be the only way in which an oversized market, in terms of players, could ensure work for everyone."

Expanded canal celebrates successful year

The expanded Panama Canal marked its one-year anniversary on 26 June, with commemorative plaques presented to the vessels that transited the waterway on the day. In its first year of operations, the expanded canal has continually set records and exceeded all expectations.

Panama Canal administrator Jorge L Quijano said: "The countless accomplishments set over the past year have surpassed even our own expectations for the project."

More than 1,500 Neopanamax vessels have transited the expanded canal. Container vessels represent about 51 per cent of traffic, followed by LPG and LNG carriers (32 per cent and 9 per cent, respectively). Panama Canal tonnage has increased by 22.2 per cent, comparing with the 2016 fiscal year.

On average, 5.9 vessels transit the expanded canal daily, against original forecasts of two to three a day for the first year of operation. More than 90 per cent of the global LNG fleet can now transit the waterway for the first time in history.

► *Panama Canal administrator Jorge L Quijano*

The Panama Canal Expansion is the largest enhancement project since the canal's opening in 1914. It included the construction of a new set of locks on the Atlantic and Pacific sides of the waterway, creating a third lane of traffic and doubling the canal's cargo capacity.

While the expanded locks are 21m wider and 5.5m deeper than those in the original canal, they use less water due to water-saving basins that recycle 60 per cent of the water used for each transit.

In brief

Chilean port, towage and logistics services provider SAAM saw net income for the first quarter of 2017 drop by 44.8 per cent to US$8.1m, from US$14.6m in the corresponding period of 2016. Operating results were also down, by 20.5 per cent to US$23.4 million. The company attributed the results to a sluggish regional economy, greater uncertainty in the international market and consolidation among shipping companies putting pressure on rates for services used for foreign trade. Despite a less active market, SAAM's towage division reported stable results for the quarter.

Radio Holland has created a third operating base in Brazil – at Rio Grande – to serve a growing number of local customers and international ship owners calling at Brazil's southern ports. From its new base, Radio Holland also provides services in Uruguay, Paraguay and Argentina; the company already has offices in Rio de Janeiro and Santos. It has been present in Brazil for more than three years, headquartered in Santos.

The IMO has announced that International Maritime University of Panama (UMIP) has been selected to host the regional Maritime Technology Co-operation Centre (MTCC) for the Latin America region, under an ambitious project, funded by the European Union and implemented by IMO, to help mitigate the harmful effects of climate change. UMIP joins MTCCs in Africa, Asia and the Caribbean.

ACO Marine has supplied its 100th Clarimar MF wastewater treatment system in a development that confirms market acceptance of a new technology introduced little more than two years ago. ACO Chile will supply the unit, a Clarimar MF-3, for retrofit installation to ***Lautaro*** (ATF-67), a 1973-built 58.3m tugboat operated by the Armada de Chile.

SeaBird Exploration, a global provider of seismic survey vessels, has signed a letter of intent with an unnamed client for a 2D seismic survey in South America. The project is expected to start early in the third quarter of 2017, using the 76m ***Northern Explorer***, built in 1986 and rebuilt in 1998.

Tugs tailored to local market

Tried and tested in the complicated narrow waterways of the Netherlands, the EDDY tug concept is now proving its suitability for the South American market. For over a year now, an EDDY 3065 harbour tug has been successfully operating in Venezuela, performing ship-assist operations, mainly to oil tankers.

EDDY partner Baldo Dielen said: "Valuable experience obtained with a smaller, but more powerful, harbour tug – an EDDY 2475 (24m long, with a bollard pull of 75 tonnes) – on Dutch waterways, with their numerous locks and bridges, demonstrates that this tug concept is also highly suitable for conditions in South America.

"One of the key characteristics of this tug type is that it operates highly effectively in confined spaces. Due to their characteristically forward-aft in-line thruster arrangement, EDDY tugs are capable of generating towline tension continuously, and in any direction. When operating in locks, the tug can move very close to the vessel, the master being completely free in selecting the best angle of attack for each situation, including remaining parallel to the lock's side.

▼ *EDDY 2475 in locks, showing its capability to effectively generate towline tension at any angle*

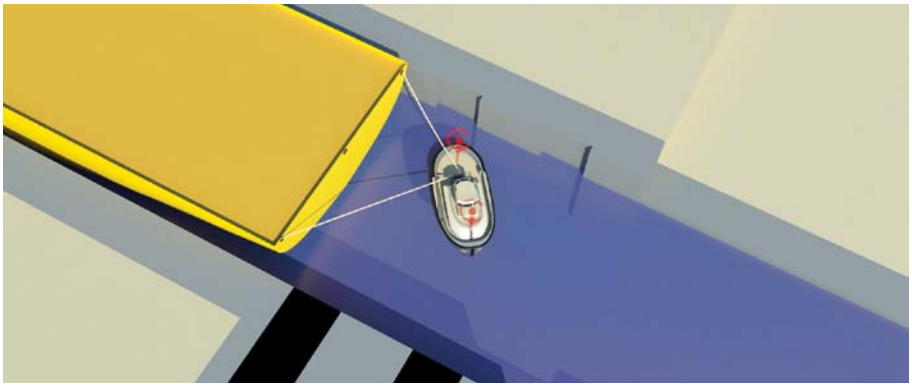
▲ *EDDY 2475 tug demonstrating its twin-towline ship-assist capabilities in locks*

"These tugs can thus keep the assisted vessel under full control at all times."

Such manoeuvres can be executed either with a single towline, or in a twin-towline configuration. The required space for EDDY tugs is much lower when compared with ASD or tractor configurations of the same size. In addition, propeller wash can be directed in such a way that it dramatically reduces interference with the assisted vessel's underwater body, resulting in better control over the vessel.

Towline tension can be continuous, even when repositioning the tug, which enhances operational safety. This is a valuable feature not only for critical operations in locks, such as those on the Panama Canal, but also for narrow river operations and for small, congested port basins that are not unusual in South American countries.

Dielen added: "From a builder's viewpoint, EDDY tugs are developed for simple construction and require significantly less steel and only a minimum of equipment. Construction of these tugs is thus not only economical but also well within the capabilities of local yards in South America."



Integrated operation connects the continent

In the seven years since its foundation, São Paulo-based logistics operator Hidrovias do Brasil has built up a significant presence on the Paraná/Paraguay and Amazon rivers, shifting millions of tonnes of grain and ore around South America, using its specialised fleet of pusher tugs and barges. Contributing editor Joceline Bury reports

▲ *A pusher tug with barges on the Paraná-Paraguay waterway, part of the company's southern logistic corridor*

Integration is the name of the game for Brazilian logistics operator Hidrovias do Brasil SA, set up in 2010 with the aim of providing innovative solutions to the movement of vast quantities of grains and fertilisers, iron ore and other products across South America, using the continent's mighty waterways.

The company was founded as a start-up by the Brazilian infrastructure fund Pátria Investimentos (Holding). Its other shareholders include Canada's AIMCO; Temasek, a sovereign fund from Singapore; the International Finance Corporation (IFC – the financial branch of the World Bank); BNDESPar, manager of interests in companies held by BNDES, and other partners represented by Pátria Infraestrutura.

Speaking to *IT&O* at *Tugnology '17* in Rotterdam, chief operating officer René Silva said: "We are a young company, set up just seven years ago, but we are well capitalised and in that time we have had strong growth and now run two main operations: one on the Paraná-Paraguay waterway and the other on the Amazon.

"We have been operating on the Paraná-Paraguay river for nearly four years, and the northern operation started in 2016. Integrating the northern and southern operations is a huge logistical challenge – and operating in the Amazon rainforest is, of course, particularly challenging."

The company's southern operation – also known as the southern logistic corridor – was the first to be set up, and is now divided into four main segments:

- Vale Project (iron ore): over a 25-year period, 3.25m tonnes of iron ore a year will be transported through the Paraná-Paraguay waterway – South America's second-longest, after the Amazon, at 4,880km. For this operation, the company uses eight 7,200hp pusher tugs and 144 jumbo barges for the navigation of more than 2,500km, from Corumbá, in central-western Brazil, to the River Plate Basin.
- Grãos Sul: comprises the river transportation of almost 1m tonnes a year of grains and fertilisers, leaving Paraguay and travelling about 1,500km to Argentina and/or Uruguay. Currently this operation involves three 5,000hp pusher tugs and 36 Mississippi barges.
- Limday: Jointly with Uruguay-based logistics provider Christophersen Group, 1.2m tonnes of cellulose is transported each year through the Uruguay River from Nova Palmira to Fray Bentos, Uruguay. The 10-year agreement is already in operation and relies on two pusher tugs and four barges, all dedicated and exclusive.
- TGM (Graneles Montevideo port terminal): a terminal – built in partnership with Christophersen Group – at Montevideo Port for moving about 2m tonnes of grain and 500,000 tonnes of wood chips a year, with the capacity to also include 300,000 tonnes of fertilisers annually.

The construction of the shallow-draft pusher tugs used in the southern operation was a world first. Built by Uzmar in Turkey to a design by Canada's Robert Allan Ltd, they use a diesel-electric propulsion system supplied by Wärtsilä and ABB that allows the process to be 100 per cent automated. The benefits are fuel economy, more power control and operational safety. In addition, the pushers are azimuthally propelled to provide more flexibility for manoeuvres.

Hidrovias do Brasil's northern operation was created to meet an important demand for transportation and outflow of grains from the central-western region through the northern arc of Brazil, establishing a new route that profits from the country's waterway potential to move loads and generate regional and agribusiness development and competitiveness, as well as substantially contributing to Brazil's balance of payments.

With investments of about BRL1.5bn (US$450m), the operation in the state of Pará moved about 1m tonnes of grain in the region

► *The northern operation's cargo transshipment station at Miritituba*

► *Hidrovias' latest operation involves moving around 1m tonnes of grains a year via its terminal in Vila do Conde*

in 2016. It is expected to move 3m tonnes in 2017 and reach the total operational capacity of 6.5m tonnes in 2020. In a second phase, the annual capacity will be increased to 8.5m tonnes of grain.

The project involved the construction of a cargo transshipment station, located in Miritituba, and a private use terminal in Barcarena, employing five main pusher tugs, seven sets of 20 barges, one auxiliary pusher tug for Boiuçu Strait, and four additional pusher tugs for harbour manoeuvres.

With its strategic location, the northern operation is a logistics alternative of great importance since it reduces harbour movements in other Brazilian regions, as well as directly contributing to the reduction of truck traffic, logistics costs and time required for the outflow of production to the main markets for Brazilian agribusiness.

"Hidrovias follows overseas market trends to introduce best practices, focusing on achieving on-time, on-budget implementation and operational excellence. We are always looking for diversification of corridors and cargoes"

Bruno Serapiao, president and CEO, Hidrovias do Brasil

The company's development has continued with the acquisition in December 2016 of two maritime vessels, which provide logistics services as part of the bauxite chain in the north of Brazil, with the capacity to move approximately 6m tonnes a year.

The transaction involved BRL700m (US$210m) in investment and marked the expansion of Hidrovias' services portfolio and its entry into the cargo handling segment through cabotage. The two new vessels, ***HB Tambaqui*** and ***HB Tucunaré***, are capable of transporting 36 per cent more bauxite than any other vessel. For this operation, a long-term contract has been signed with Alunorte, which involves the transportation of bauxite between Porto Trombetas and Vila do Conde, in the state of Pará.

Early in 2017, Hidrovias signed a 10-year agreement with the Cerrado Agricultural Alliance and Sodrugestvo Trading to provide cargo transshipment services, and river transportation and port operations, respectively. This operation involves the handling of up to 400,000 tonnes of grain a year in the northern region of Brazil.

In addition to this new operation, the company has implemented a project that allows the import and the loading of fertilisers, taking advantage of the return of the transport of the grain in barges. The new operation takes place at the northern corridor, from Barcarena-Vila do Conde to Miritituba-Itaituba, and has the potential to move around 200,000 tonnes by the end of 2017, and more than 1m tonnes per year. In April 2017, a contract was signed with Mosaic Fertilizantes to handle 135,000 tonnes of fertilisers.

Hidrovias has been a pioneer in the implementation of this new route to import agricultural products in an interconnected, sustainable and more competitive way than the routes usually used by the ports of south and southeast Brazil.

Silva is particularly proud of a record delivery, completed in May of this year, that underlines the company's focus on innovation and operational excellence. He explained: "The company transported 55,000 tonnes of soy from Paraguay to Uruguay. The convoy covered 1,490km of waterways, which have some restrictions on the number of vessels allowed for navigation.

"We developed a strategy to carry the cargo more efficiently and cost-effectively, with 32 barges 66m wide and 420m long, coupled simultaneously. The logistics process began with loading 20 barges in the Asunción Zone, Paraguay, with 12 more added at the confluence of the Paraguay and Paraná rivers.

"After this, the convoy went to San Lorenzo, Argentina, where it was necessary to split the convoy into two groups of 16 barges each, to reach the final destination, Nueva Palmira, in Uruguay.

"With this logistics operation, Hidrovias do Brasil obtained a reduction of about 55 per cent in operational costs."

Asked about challenges and opportunities facing the company in the near future, company president and CEO, Bruno Serapiao, said: "Hidrovias follows overseas market trends to introduce best practices, focusing on achieving on-time, on-budget implementation and operational excellence. We are always looking for diversification of corridors and cargoes, looking at opportunities within Latin America. The company is aware of other countries' activities and practices that offer security to invest capital abroad."

Looking to the future, Serapiao said: "Currently Brazil still has some issues due to its strong reliance on road transport, which increases logistics costs and reduces the competitiveness of the sector.

"However, there is an encouraging factor. In the past few years, we have noticed investment in new terminals for private use, which will improve the flow of production in ports.

"This in turn has motivated a series of other investments in the chain – such as new warehouses, the prospect of investment in bigger railways, and work on the modernisation of ports, as well as the introduction of more high-tech equipment."

Key facts

Company name: **Hidrovias do Brasil SA**
Company HQ: **São Paulo, Brazil**
Website: **www.hbsa.com.br**
Established: **2010**
Number of employees: **700+, working in offices and on operational services**
Fleet: **292 barges, 15 pushboats and five auxiliary vessels deployed in two operations, northern and southern**

Southern operation:
Pushboats: diesel-electric; 7,200hp (3 x 2,400); Z-drive (3 propellers)
Mississippi barges: 60.96m x 10.67m x 4.27m; full capacity (convoy) – 51,000 tons (grain)
Jumbo barges: 61m x 15m x 4.27m; full capacity (convoy) – 40,800 tons (ore)

Northern operation:
Pushboats: diesel-mechanical; 6,000hp (3 x 2,000); Z-drive (3 propellers)
Auxiliary pushboats: four 1,200hp vessels for port operations; one 1,500hp vessel navigating on the Straits of Boiuçú
Mississippi barges: 60.96m x 10.67m x 4.27m; full capacity (convoy): 51,000 tons (grain)
Bauxite carriers: *HB Tambaqui* and ***HB Tucunaré***

New engines go on show

MTU has unveiled new diesel and gas marine engines that both meet IMO Tier III and EPA Tier 4 emission regulations.

The Germany-based company, part of Rolls-Royce Power Systems, is developing the fifth generation of its Series 4000 diesel engine incorporating a variety of technical advances in the turbocharger system, the combustion process and the fuel injection system, in addition to a new SCR system.

As well as meeting the latest, most stringent international emission standards, MTU says the new engine benefits customers by providing them with an optimally matched system.

The company's new gas engine for workboats will be available from next year initially as a 16-cylinder engine with a power range of 1,500-2,000kW. This will be followed by an 8-cylinder version with a 750-1,000kW power range.

Thanks to its dynamic acceleration behaviour, reliability, environmental compatibility, and its cost-effective operation, the engine is ideally suited for use as the main propulsion in tugboats as well as push boats, ferries and special purpose vessels.

The combustion concept provides an efficient use of fuel and ensures that IMO III exhaust emission standards are met without the need for additional exhaust gas after-treatment. To meet EPA Tier 4 regulations, a compact oxidation catalyst is mounted on the engine.

Both new engines were among MTU's display alongside other Rolls-Royce products at Nor-Shipping in Oslo, Norway, in May and June.

IMO Tier III concept unveiled

► *Volvo Penta's IMO Tier III solution is available for inboard engines and the Volvo Penta inboard performance system (IPS) package, reducing NO_X emissions by about 75 per cent*

A new engine and after-treatment concept to comply with the forthcoming implementation of IMO Tier III standards has been launched by Volvo Penta, enabling a global solution for commercial marine operators.

Launched at Nor-Shipping 2017 in Oslo, the solution is based on the company's own experience, plus expertise from the Volvo Group in leading selective catalytic reduction (SCR) technology, resulting in a system that is dedicated to heavy-duty marine operations.

New emissions restrictions for vessels entering the Baltic Sea and North Sea will be implemented in 2021.

The IMO Tier III regulation will stipulate a reduction in NO_X emitted of around 70 per cent – depending on engine size – when compared to current Tier II levels.

Volvo Penta's chief technology officer, Johan Carlsson, said: "Our new concept is designed with features and components to withstand the toughest marine environments. In complying with IMO Tier III requirements, Volvo Penta will meet international emissions standards, offering a truly global solution."

Volvo Penta's solution for IMO Tier III is optimised for marine use, and uses SCR technology for the exhaust after-treatment for the Baltic and North seas follows the NO_X designation by IMO for North American and Caribbean regions, and applies to most engines with an output of more than 130kW. All these areas are also designated sulphur emission control areas.

Retrofit gearbox offers lower operating costs

Power train specialist Reintjes has announced its new BAE HybriGen Zero system: a hybrid step-up gearbox for retrofit, offering reduced operating costs, emissions and maintenance costs.

The system features a front-engine mounted gearbox combined with a permanent magnetic electric generator up to 300ekW. With its high torque, this electric motor/generator can also be used as a starter to substitute the air-starting system, while the usage of the power take-off provides the option of switching off the onboard gen sets during operation.

The system comes with a BAE Systems electric motor as well as the gearbox with Reintjes integrated multi-disc clutch, flexible coupling on input side, bell housing for direct generator mount and shaft for direct engine connection.

Maritime screens go large in ultra high-def

The world's largest and most advanced display system for ECDIS and bridge system applications was on show at the recent Nor-Shipping event in Oslo. Hatteland Display's state-of-the-art Series X 55in Ultra High Definition Chart and Planning Table, unveiled earlier this year, *pictured above*, was installed and operational throughout the show as well as at the company's 'pop-up' showroom elsewhere in the city.

As the largest stand-alone Type-approved 4K resolution display system for ECDIS and bridge applications, Hatteland Display's flagship system is designed to open up new possibilities for safer and more efficient navigation and control.

Featuring the most screen space available in any maritime display, it enables technology developers to provide multi-data interfaces to ensure users have access to everything they need from diverse sensors and control systems all in one place.

With its ultra-high-definition 4K resolution providing unmatched clarity and premium panel technology delivering high brightness and contrast, IBS/ECDIS manufacturers, systems integrators and electronic navigation chart producers can further develop their solutions with enhanced interfaces providing more detail and functionality for navigators.

The system is a strong foundation for new approaches to ergonomics and user-friendliness on maritime bridges, supporting navigators to improve safety and voyage planning.

Trond K Johannessen, president and CEO of Hatteland Display, said: "Our maritime display technology is evolving fast in order to accommodate the ongoing development of solutions that meet new regulations and improve the safety and efficiency of vessel operations. With our new large format displays, we are giving the maritime technology industry a new platform to re-imagine the bridge in order to provide a safer, more comfortable environment that enables crews to work more effectively."

Hatteland Display has integrated the same high-end 4K panel technology in the 32in Series X Multi Vision Display, a new large format solution for installation in integrated bridge systems.

Approved for harsh maritime environments where reliability and long lifetime are key factors, the new 32in Series X MVD is a robust, flexible and ergonomic solution, offering the same multi-data possibilities as Series X 55in displays.

Integrated bridge system for Starfish series

A new fleet of six state-of-the-art AHTS vessels are being equipped with the latest high-end integrated bridge system featuring products by industry leaders Transas and Alphatron (JRC).

Maersk Master is the first of Maersk Supply Service's (MSS) Starfish series to enter service, joining the MSS fleet earlier this year from the Kleven Verft shipyard in Norway, where it was built.

The vessel's integrated bridge system is fully compliant with Lloyd's Register NAV1 and IBS Class requirements. The system comprises a range of Transas navigation sub-systems within the integrated bridge system concept, including two Transas Navi-Radar 4000 with JRC scanners, Navi-Sailor 4000 Dual ECDIS, bridge navigational watch alarm system, bridge alert management system, Navi-Conning 5000, track control system incorporated with the Raytheon Anschütz NP5400 autopilot, and Navi-Planner 4000 voyage planning and data management system.

▲ **Maersk Master** *is the first of the Starfish series to be fitted with the integrated bridge system*

The whole integrated bridge system consists of five workstations with eight displays, six at the forward bridge position and two at the aft bridge position. Thanks to the multifunction display concept, any task can be launched on any workstation, depending on the operator's choice. The workstations are interconnected via a redundant local area network, as per the Lloyd's Register requirement to the vessel's class. They are all powered via uninterruptible power supply systems.

The integrated bridge system is interfaced with almost every electronic sensor and system available on board, such as DGPS, GPS compass, gyro compass, echosounder, speedlog, AIS, weather system, autopilot, navtex, winch system, machinery alert system, VDR and others.

Following ***Maersk Master***, the second vessel in the series was due to be delivered by the end of June. However, deliveries of the remaining four Starfish AHTS vessels have been put back from this year to next year and 2019 as MSS looks to postpone deliveries of further newbuilds as part of its strategy to ride out the continuing downturn in the maritime oil & gas sector.

All six DP2 Starfish vessels will be identical, measuring 95m LOA with a 25m beam, 23,000hp from five medium-speed engines with a hybrid propulsion system and 230 tonnes of bollard pull.

Partnership takes practical steps

Alphatron Marine has added the Transas marine simulation system to its AlphaBridge integrated bridge solutions in training centres and showrooms around the world.

The move follows the strategic partnership between Transas and Alphatron Marine parent company JRC unveiled earlier this year.

Announcing the latest development, Alphatron Marine said in a statement: "By adding the Transas simulator to the integrated AlphaBridge solutions, we are bringing technology, expertise and content together."

The company, headquartered in the Netherlands, is a leader in bridge technology across the maritime sector, including in harbour and offshore applications, while Transas is primarily focused on navigation systems.

The integration of Transas technology in Alphatron Marine's training centres and showrooms as well as its AlphaBridge products is designed to make life and work on a ship's bridge easier and more comfortable and reduce the chance of errors occurring.

The combination will enable practical know-how sharing and support the decision-making process, offering an insight into AlphaBridge and its capabilities.

Offshore operator makes the connection to efficiency

Maritime operator Smit Lamnalco is installing broadband and satellite communications antenna systems provided by US-based technology company KVH on up to 100 of its offshore vessels following a successful field trial.

The Netherlands-headquartered company has chosen KVH's mini-VSAT Broadband service with a usage-based monthly airtime package; TracPhone V3-IP Ku-band antenna system and Integrated CommBox™ Modem belowdecks unit; and CommBox network and VPN solutions as well as VoIP service. It has already taken delivery of 20 of the systems, with the remainder due to be delivered and installed "over the next few years".

Patrick van Woudenberg, group IT manager for Smit Lamnalco, said: "We are extremely happy with the performance of KVH's systems and services based on our test, and are proceeding to upgrade our vessels with this complete solution. KVH is a great partner for us, and their knowledgeable technical staff helped design a solution that we can replicate across our fleet to standardise the connectivity on our vessels and improve our operational efficiency."

For KVH, vice president of global channel management, Mark Guthrie, said: "We are proud to be Smit Lamnalco's choice for their impressive fleet, and the successful field test validates the high quality of our products and services. Our solution provides many benefits of broadband connectivity, for everything from communications to crew welfare, and Smit Lamnalco sees the advantages of this approach."

All the hardware is protected by KVH's OneCare™ support programme and warranty and the solution also comes with the myKVH™ portal, which provides vessel location, connectivity details, vessel tracking and control of onboard data usage.

Smit Lamnalco is a global provider of towage and associated marine services to the oil & gas terminal industry. It has a total fleet of more than 250 vessels and employs almost 3,000 people worldwide.

3D-printed propeller fast becoming a reality

The world's first class-approved ship's propeller produced by 3D printer is about to become reality as a consortium – including the Netherlands-headquartered shipyard group Damen – continues development of the project.

The first WAAMpeller – fabricated from a bronze alloy using the Wire Arc Additive Manufacturing (WAAM) process – is due to be printed this summer, with further testing continuing into autumn.

Damen has recently joined the consortium which also includes the Port of Rotterdam's RAMLAB, marine propulsion company Promarin, engineering software specialist Autodesk and class society Bureau Veritas.

Damen displayed a scale model of the new WAAMpeller at *Tugnology '17*, where *IT&O* spoke exclusively to two of the company's engineering team involved in the project; principal research engineer Don Hoogendoorn and project engineer Kees Custers believe that 3D printing in the maritime industry will develop rapidly as understanding of the technology grows and, just as important, costs fall.

They said that previous cost estimates for 3D-printed components of €300/kg were acceptable in the aerospace industry but too expensive for marine applications. However, one of the benefits of the WAAMpeller joint project is to show how the technology can become more cost-effective.

Custers said: "In three years, we have gone from thinking it wasn't feasible to it being feasible for some components, so who knows how it will change more in the future?"

Hoogendoorn added: "Our aim is to build more effective, more cost-efficient and more environmentally friendly vessels. The WAAMpeller project contributes to this goal because it not only marks an important advance in 3D printing, but it also has the potential to yield significant results in optimising future vessel designs. 3D printing technology brings with it an excellent opportunity to improve ship structures in terms of both performance and fuel consumption."

► *Kees Custers (left) and Don Hoogendoorn with the scale model of the WAAMpeller at* Tugnology '17

The propeller will be based on a Promarin design – typically found on a Damen Stan tug 1606 – which has a 1,300mm diameter and weighs approximately 180kg. Using Autodesk software in the construction process, RAMLAB is fabricating the WAAMpeller.

Bureau Veritas will be involved in the certification of the completed product in what will be the first time that a metal 3D printed maritime component will be approved by class. Once the propeller has been printed, Damen's role will continue with full-scale trials that will include bollard pull and crash test scenarios.

Damen's initial involvement in the project began early last year as a result of one of its in-house student research programmes. Three students from Delft Technical University were investigating the potential of 3D printing, which brought Damen into contact with the other members of the consortium.

While 3D printing of entire ships remains unlikely for the foreseeable future, the process does offer the hope of designing and developing more complex components that are lighter, improve fuel efficiency and are cheaper to produce than by more traditional manufacturing methods.

Hoogendoorn said: "We should use the right technology for the right purpose."

And Custers offered this hope for the future: "Complexity does not have a price tag any more."

Hybrid power system is 'truly a giant step forward'

Technology group Wärtsilä has received its first order for the recently introduced Wärtsilä HY hybrid power module that combines engines, an energy storage system and power electronics. The contract has been signed with Italy-based Rimorchiatori Riuniti, the biggest owner and operator of tugs in the Mediterranean Sea region.

The Wärtsilä HY will be dedicated to a project for a new 80-tonne bollard pull harbour tug, and represents the newest and most advanced level of integration related to hybrid technology for marine applications. Specific operational features embedded in the control logic of the unit will enhance operational safety and environmental considerations when operating in waters adjacent to heavily populated areas.

"This first ever Wärtsilä HY installation will mark the beginning of a new era in marine propulsion technology. Our unmatched in-house expertise and capabilities in both engines and electrical and automation systems, together with our competencies in digital developments, have enabled Wärtsilä to lead the way in taking marine propulsion to the next level. This is a truly giant step forward," said Giulio Tirelli, director of marine engineering at Wärtsilä.

For Rimorchiatori Riuniti, group technical director Raffaello Corradi said: "We are proud to be the first in the industry to embrace this exciting and highly advanced hybrid technology. Wärtsilä is a company we know well, and it is no surprise to us that they are the first to introduce this level of innovation. For us, the Wärtsilä HY will provide operational flexibility, added safety and, of course, environmental sustainability."

Following the launch and first order of the Wärtsilä HY at Nor-Shipping, the equipment will be delivered during the second half of next year and the new tug is expected to be in service by the beginning of 2019.

The new system will provide a wide range of customer benefits through increased operational efficiency and flexibility, resulting in lower fuel consumption, reduced emissions and improved vessel performance.

When operating in Green Mode, zero emissions can be achieved, while smokeless operation is also achievable at all load points and in all operating modes thanks to a new patent pending automation procedure.

The Wärtsilä HY has received an approval in principle certificate from Lloyd's Register.

New Y-hybrid feature gives Z-drive the added X-factor

Propulsion specialist Schottel has developed a new hybrid feature that saves money, reduces emissions and offers more flexibility in vessel design and operation.

The Germany-headquartered company unveiled its Y-hybrid option at *Tugnology '17*, showing how the feature transforms conventional Z-drives into versatile azimuth thrusters.

Speaking exclusively to *IT&O* at the event, Hans Laheij, VP sales and marketing for Schottel, explained it was the company's "most flexible hybrid system".

With a Y-hybrid configuration, the main propulsion engine can be smaller than for a conventional configuration – for example, a V12 instead of a V16 – with the power difference substituted by enlarged gen sets or battery package and electric motors for the thruster's hybrid power intake.

"A tug can operate for 85 per cent of the time with an electric motor, with the diesel engine required only when you need full power," said Laheij.

That reduces fuel consumption and CO_2 emissions for the main diesel propulsion engines, also reducing their running hours and so increasing time between overhauls. In the increasing number of emission-controlled areas around the world, combining a Y-hybrid thruster with a battery will result in zero emissions.

▲ *Schottel's Hans Laheij (right) and Roland Schwandt promote the new Y-hybrid at* Tugnology

Additionally, FiFi1 Class vessels can, in hybrid mode, be propelled entirely by the e-motor, allowing the main propulsion engines to drive the fire-fighting pumps.

Having developed its new Y-hybrid feature, Schottel is making it available as an option for its Z-drives larger than 500kW for deliveries from late 2018.

"We are constantly looking at new developments for our customers and we are confident this will add value to their operations," said Laheij.

L-drive is small but perfectly formed

Billed as 'the most compact propulsion system in the world', Netherlands-based Veth Propulsion's revolutionary integrated L-drive promises high efficiency, low noise levels and outstanding manoeuvrability – all packed into the smallest possible space.

Building on the success of the Veth Z-drive azimuth thruster, the company – which prides itself on its innovative in-house R&D and design teams – came up with an even more efficient concept in the field of electric propulsion.

Martin van der Jagt, general sales manager, explained: "Most L-drives use an asynchronous motor, but we have used a permanent magnet (PM) motor – the smallest we could find, developed in collaboration with Visedo, the Finnish hybrid and electric drive-train specialist. We then integrated the PM motor into the thruster, creating an extremely compact profile. We also made the choice to house the PM motor inside the ship, which makes it much less vulnerable than if it were located underwater."

The new L-drive offers a number of benefits. Its compact design – 40-60 per cent more compact than an asynchronous motor – means it has extremely low mounting space requirements. It is also highly efficient: an L-drive has only one gear, whereas a Z-drive has two – and each gear transmission results in a 1 per cent efficiency loss. In addition to higher efficiency, an L-drive is also less expensive to install, and easier to maintain.

Manoeuvrability is outstanding, thanks to the 360-degree thrust, and because the integrated L-drive does not have a gear transmission in the ship, it generates less noise.

The Veth Integrated L-drive is available with power ranging from 300kW-1,325kW. Larger units are still being developed and will eventually also be available.

More powerful thruster ready for work after testing

Schottel's product portfolio has expanded following successful tests of its new underwater mountable thruster.

The 5.5MW SRP 800 U Rudderpropeller can be installed while the vessel is still in the water – particularly suitable for vessels that cannot be docked easily due to their size or area of operation.

The latest addition to the Schottel range is ideally suited for larger offshore vessels and similar applications.

Roland Schwandt, Schottel sales director, tug and offshore energy, said: "As a result of customer requests, Schottel decided to further develop the robust, well-proven Rudderpropeller technology in the power range up to 5.5MW."

Calculations for increasing the power went hand in hand with developments for greater installation flexibility and higher safety factors that exceed the strict requirements of the classification society. This includes the full load gear test for checking the gearing of the bevel gear set that has now been successfully carried out in the German test facilities.

The full load gear test was preceded by model tests at Potsdam Shipbuilding Research Establishment in Germany and CFD simulation.

The SRP 800 U has been optimised with a focus on maximum market coverage in terms of fit variability. The design of the interface to the vessel corresponds to that of models commonly available on the market and is thus ideal both for installation on newbuild vessels and as a retrofit option.

Hybrid tug concept abandons gen sets

Japan's Kawasaki is developing a hybrid tug concept that has no gen sets and switches off the main engine when the vessel is in standby mode – which accounts for most of its operation.

The company presented its latest thinking at the Electric & Hybrid Marine World Expo in Amsterdam, claiming that the concept will reduce fuel consumption while ensuring a smooth re-start through the propulsion motor with a battery.

Family firm celebrates 90 years in business

Damen is celebrating nine decades of operations in the shipbuilding industry. From small beginnings in the 1920s, the company has grown into a renowned maritime service provider employing 9,000 people.

With Dutch roots, the company's expansion has been global. This growth can be viewed in terms of its yards, service hubs and other subsidiary companies as well as a globally-operating client base. For 90 years, Damen's vessel designs have successfully served customers operating all over the world.

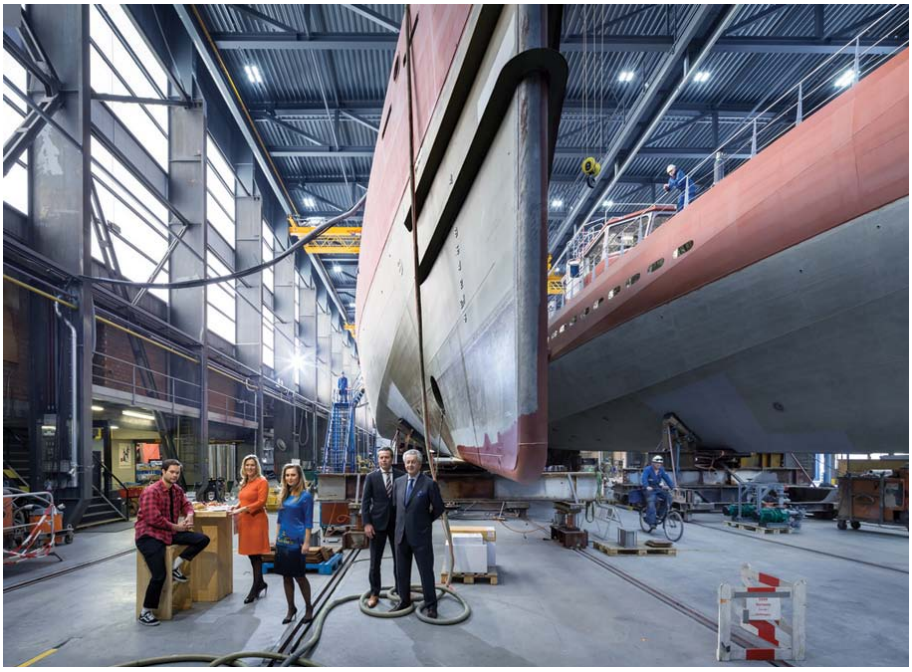
Damen was established by brothers, Jan and Rien Damen, in 1927. From facilities located on the banks of the River Merwede in Hardinxveld, in the Netherlands, they managed the growing firm into a well-respected business.

When Kommer Damen took over in 1969, he introduced numerous changes to the ship fabrication process. Advances such as modular construction techniques and series production of standard designs resulted in considerable increases in efficiency. Clients could benefit from shortened delivery times and flexible vessel configurations.

Subsequent growth since the late 1960s has been as swift as it was broad. The company's worldwide coverage developed with the acquisition of foreign yards and the establishment of dedicated service centres. The vessel portfolio has grown too – today the company's vessels serve an ever-evolving range of maritime sectors.

Looking back at Damen's success over the years, chairman Kommer Damen highlighted the contribution made by the company's personnel. He said: "I am honoured to celebrate 90 years of Damen. What started as a small team, has grown into a global company. And yet – we have achieved this while still retaining our family values.

"Damen owes its success to the commitment and dedication that has been invested by our past and present employees. It has always been important that our personnel enjoy their work and it is their passion that has made the company into what it is today."



▲ *Damen is very much a family business*

The company is marking its 90th anniversary in numerous ways during the coming months. For example, it has launched a dedicated website – www.damen90.com – that will highlight its maritime heritage and involvement in the shipbuilding industry since 1927. An interactive platform, this website will allow visitors to upload and share their own photos and recollections about the company.

An exhibition illustrating many of the key moments in its history will be on display at the company's headquarters in Gorinchem, Netherlands. This will also be the location for the Damen Workboat Festival, which will also focus on the 90 year celebrations. Open to clients and industry partners, this event will take place on 5 October 2017.

And, last but not least, the company's annual magazine will feature several articles taking a retrospective look at some of the most important and interesting milestones of the past 90 years.

With a view to forthcoming decades, Damen says it is essential to note that it is still very much a family-orientated business. Kommer Damen's four children all play significant roles in operations: Arnout Damen is chief commercial officer, Rose Damen is commercial director at Amels, Annelies Damen manages the corporate properties portfolio, and Bear Damen recently directed the company's corporate film.

Never a company to rest on its laurels, Damen has always been defined by its constant forward-thinking strategies. It is this progressive mind-set that has kept the company focused on new opportunities and market developments, says Arnout Damen.

He said: "This is an important year for Damen. It is an opportune moment to identify the key characteristics that will strengthen our future position in changing the global maritime market. Continued investment into building strong relationships with our clients will play a major role. It will be by understanding their markets, their activities and their needs that we can help make them a success."

◄ *The original Damen yard in the Netherlands*

Kotug's innovative heat recycling system is in the engine room of Kotug Smit tug **ZP Bison** *(below right)*

The heat is on for tugs on stand-by

International towage operator Kotug has been nominated for a leading maritime award for its innovative system that stores and regenerates heat on tugboats when they are on stand-by.

The Netherlands-headquartered company has developed its zero-emission heat recycling system to store and re-use waste heat from the main engines and generator. When a tugboat is on stand-by, it still requires energy to keep the engines at the right temperature and for climate control. This energy is usually derived from onshore power stations at considerable financial and environmental cost.

By using the latest phase change material (PCM) technology, Kotug's system is a cost-effective and eco-friendly solution as it reduced shore power consumption and associated CO_2 emissions by 50 per cent.

The heat recycling system was installed last November on Kotug Smit's ***ZP Bison***, an ATD 2412 tug that entered service in April 2015 operating in the German port of Bremerhaven. It includes a drum installed in the engine room of the vessel to collect the waste heat fitted with a remote monitoring unit to monitor the temperature change in permanent real-time.

Kotug's zero-emission heat recycling system has now been nominated for a Maritime Innovation Award. Presented annually by the Netherlands Maritime Technology, this year's award sees Kotug among a final shortlist of three from 24 entries – with the winner being announced at the Maritime Awards Gala in Rotterdam on 6 November.

Koos Smoor, manager fleet performance and innovation at Kotug, said: "This use of PCM technology is new in the maritime industry and has great potential not only for tugboats, but for every type of vessel as it can be tailored to different spaces and user profiles. Kotug is looking into more applications for temperature control purposes. We see beauty in solutions that combine the golden triangle of state-of-the-art technology, sustainability and cost reductions. This innovation is an answer to market demand as well as environmental requirements and actually reduces costs as well."

Water system goes with the flow

Water protection specialist Evoqua Water Technologies has unveiled its smallest and lightest SeaCURE ballast water management system.

Launched at Nor-Shipping in June, Evoqua says its latest version of SeaCURE maintains the high flow rate capacity of previous models but has significantly fewer components. This means it can be mounted on a 2m by 1.5m skid that fits through standard hatchways and reduces pre-installation work and the time required in drydock. The system uses electrochlorination cells that can be increased or decreased depending on the ballast water flow rate and treatment capacity.

Matt Granitto, business manager for Evoqua's ballast water business, said: "It is one of the smallest ballast water management solutions available, capable of treating flow rates of up to 6,000m^3/hour."

Storing battery energy will reduce impact of the *Sun*

Offshore vessel owner SolstadFarstad is upgrading its PSV *Far Sun* by installing a battery-based energy storage system to reduce its environmental impact in partnership with shipbuilding group Vard.

Later this year, the diesel-electric vessel will be fitted with Vard's SeaQ energy storage system – incorporating batteries supplied by Corvus. The environmental improvement will be most noticeable when loading and offloading during offshore operations, where fuel consumption and emissions will be significantly reduced, although optimal utilisation of energy storage will be beneficial across all operating modes.

Vard subsidiary Vard Electro is responsible for the whole project which includes engineering, steel fabrication, installation, integration, testing and commissioning. On completion, the ship will be awarded class notation Battery Power by DNV GL.

Børge Takken, of newly merged SolstadFarstad said: "We have always focused on new technology for more efficient and safe operation with a minimum of environmental impact from its operations. The upgrade of ***Far Sun*** incorporates the range of measures in this regard."

Far Sun was delivered by Vard in 2014 when the vessel immediately began a long-term charter contract with Statoil.

Eco Pilot climbs on board new tugs

French tug operator TSM is equipping its new-build vessels with C-Sense's Eco Pilot fuel consumption monitoring system.

The company, whose new tugs are currently under construction at Padmos shipyard in the Netherlands, had previously retrofitted Eco Pilot on much of its existing fleet, along with Boluda and Bourbon among a total of 80 other vessels, thanks to the system's ease of installation.

As well as monitoring fuel consumption, Eco Pilot also helps in certifying CO_2 emission levels and supports preventative maintenance.

C-Sense's Pierre-Alexis Dormegnies said: "Even assuming the actual low price level of gasoil, we estimate a payback period of between 12 and 18 months."

Energy storage key to a carbon-free future

ABB has launched its Shipping 4.0 concept with a high-level round table discussion on the 'Power of the Future'. Industry leaders and journalists met ABB experts to discuss the technologies and power sources that are shaping the maritime industry.

In response to the changing needs of the industry, ABB has also announced that the role of global product manager (GPM) for energy storage systems has expanded to include the development of fuel cell solutions.

The onboard DC grid allows the integration of energy storage and fuel cells into onboard power systems, putting ABB in the vanguard of the new generation vessels.

Sightseeing craft ***Vision of the Fjords*** is one of those vessels and Rolf Sandvik, CEO of The Fjords, which runs the vessel, said at the round table: "What we have done so far is with zero support from the government. We are doing it because we believe that people want a carbon-free future, and that technological advances will eventually bring costs down."

ABB is a leader in electrification products, robotics and motion, industrial automation and power grids. It serves customers in the utility, industrial, transport – including marine – and infrastructure sectors globally.

The round table agreed that while mechanical engines would continue to be the norm for some time, energy storage and, eventually, fuel cells offer compelling alternative solutions.

John Olav Lindtjørn, GPM for onboard DC grid, ABB Marine and Ports, said: "Battery cost and performance is improving continuously, driving a wider adoption onboard. Also, we see that fuel cells will come to play an increasingly important role, but combustion engines will likely be around for a while still, though their dominance is under threat."

> *"What we have done so far is with zero support from the government. We are doing it because we believe that people want a carbon-free future, and that technological advances will eventually bring costs down"*
>
> **Rolf Sandvik, CEO, The Fjords**

Shipping 4.0 is the theme for ABB's annual customer publication and it is designed to encourage debate on the most prominent issues facing the industry, including the pace of technology, the role of people and the force of regulation.

► *Juha Koskela, managing director of ABB's marine and ports business*

ABB Marine and Ports has announced Jostein Bogen as the new GPM for energy storage systems with responsibility to oversee the development of fuel cell systems.

Juha Koskela, managing director of ABB's marine and ports business, said: "We developed the onboard DC grid as we anticipated the important role energy storage and fuel cells have to play in the maritime sector. By encouraging debate around the topic and dedicating resources to these technologies, we are establishing ABB as a leading force in the green power revolution."

Headquartered in Zurich, Switzerland, ABB operates in more than 100 countries with around 132,000 employees.

EU rules target greenhouse gas emissions

Classification societies, Bureau Veritas and ClassNK, are among the first to gain accreditation from UK Accreditation Services (UKAS), in its pilot scheme to carry out assessments and verifications for compliance with the European Union's maritime monitoring, reporting and verification (EU MRV) regulation.

The regulation, part of the EU's commitment to reduce greenhouse gas emissions, requires operators to monitor and report on CO_2 emissions based on vessel fuel consumption. It applies to all merchant ships of 5,000gt or above on voyages that call at an EU port.

Reporting is on both a per voyage and an annual basis, and emissions monitoring plans and reports must be verified by an accredited verifier. Ship operators must achieve a number of milestones before the first monitoring period begins in 2018.

Patrick Le Dily, vice president, legal compliance and regulatory management, Bureau Veritas, said: "Bureau Veritas has a deep understanding of EU MRV and the challenges it brings.

"UKAS accreditation, combined with our worldwide organisation and network of EU Maritime MRV verifiers, enables us to help clients meet the deadlines for compliance through timely approval of monitoring plans and future verification of monitoring reports."

Meanwhile, the world's largest private weather service company, Weathernews Inc (WNI), and ClassNK welcomed more than 100 maritime industry representatives to their first joint seminar EU MRV, held at Glyfada Golf Gardens, Athens, Greece.

At the seminar, Takeshi Shimada, general manager ClassNK energy efficiency design index department, explained the EU MRV requirements and its service for shipping companies' compliance to

▲ *Patrick Le Dily*

▲ *Takeshi Shimada*

EU MRV and outlined ClassNK's verification scheme for the reports generated with WNI's solution.

Jesse Vecchione, operations leader of WNI Europe, presented his organisation's newly-launched emission status monitoring solution and its service model of fleet performance management.

Societies focusing on bunker fuel safety challenges

ClassNK Consulting Service (NKCS) has launched a bunker fuel oil analysis service.

It is important to understand the properties of bunker fuel oil in order to ensure the safety of vessels and to prevent equipment failure.

NKCS's service provides an oil analysis report for the properties of bunker fuel oil based on the ISO8217 standard with advice such as oil heating and purification.

Testing laboratories are located across the globe in Singapore, UAE, UK and US.

After sampled oil is received at one of these laboratories, an analysis report will be provided by email and online within 48 hours.

In addition to analysis based on the ISO8217 standard, the service can, on request, provide additional information such as asphaltene analysis, measuring the degree of oxidation, analysis using fuel combustion analyser, gas chromatography mass spectrometry and Fourier Transform Infrared spectroscopy.

Meanwhile, marine fuel expert, Bill Stamatopoulos, from Bureau Veritas' VeriFuel team, gave a lecture to around 100 final-year students and faculty members from the engineering department of the Merchant Marine Academy of Michaniona, Greece, on the latest developments in bunker fuels and the challenges they represent.

Stamatopoulos has been lecturing at the academy since 2004, responding to the need to update the next wave of engineers on the latest bunker-related challenges.

He says marine fuel issues are constantly evolving along with the increasingly complex relationship between environmental regulations, quality and operational safety.

Stamatopoulos said: "It's vitally important for the ship crew to know how to get the most out of their fuel – safely and without contravening the applicable fuel regulations.

"Training and competence development in bunker management must start in school, not on the vessel."

Regional growth plan rolled out

Classification society Indian Register of Shipping (IRClass) is boosting its presence in Southeast Asia with the opening of a new office in Malaysia.

IRClass, which is a member of the International Association of Classification Societies, recently gained authorisation as a Recognised Organisation (RO) from Thailand. It has also strengthened its presence further with the opening of the office in Malaysia after establishing its Hong Kong office last year.

Singapore is the regional headquarters for the Association of Southeast Asian Nations (ASEAN) and IRClass uses its base in the Lion City to co-ordinate its expansion into the region. It is aiming to get RO status from key ASEAN countries.

Managing director of IRClass, Suresh Sinha, said: "With a greater presence in the region, IRClass will be better positioned to offer its wide range of services and enable it to be in close proximity to national administrations, ship owners, shipyards and other stakeholders in the region."

► *IRClass MD Suresh Sinha*

To further solidify its presence in the region, IRClass aims to establish offices in Indonesia and the Philippines in the near future, as well as obtain RO recognition from these countries.

In brief

The International Association of Classification Societies (IACS) has published its inaugural *Annual Review*, detailing the activities and specific tasks it undertook and completed in 2016. Hard copies of the review are available upon request to the IACS permanent secretariat; to read it in an online magazine format, go to www.iacs.org.uk

Korean Register has signed an agreement with the government of Bangladesh to deliver services on behalf of the Bangladeshi flag administration, carrying out vessel surveys and issuing certificates in accordance with international conventions.

Marine engine passes classification tests with flying colours

▲ *A MAN 175D marine engine*

MAN Diesel & Turbo has announced that its MAN 175D marine engine programme has achieved another milestone. Following on from its multiple achievements during 2016 that saw it employed in a series of commercial orders in diverse applications both as a main propulsion engine and a generator set, the high-speed diesel engine has now received serial type approval from the main classification societies.

Testing took place in Frederikshavn, Denmark, in May in the presence of international classification societies, including ABS, BKI, BV, CCS, DNV GL, KRS, LR, NK, RINA and RRS.

In a statement MAN Diesel & Turbo reported that the engine performed perfectly, exceeding all class requirements, with subsequent inspection of the engine and its parts demonstrating both its robustness and durability.

As a result, the MAN 175D is now globally certified for marine propulsion in both diesel-mechanic and diesel-electric modes, and auxiliary operation for a power output of up to 2,220kW for the 12-cylinder version.

The marine engine supplements and completes MAN Diesel & Turbo's maritime product portfolio. The engine is available with an output spectrum from 1,500kW to 2,200kW and is optimised for propelling OSVs, tugboats, ferries and working vessels.

Technological advance will drive class survey changes

Classification society DNV GL predicts major changes to the way vessels are tested to assure compliance in the coming years, with conventional class surveys replaced as technological advances come on line.

Speaking to the maritime media at Nor-Shipping in Oslo, Geir Dugstad, director of ship classification at DNV GL, said the process of making certificates totally digital was already being piloted and would be available later this year.

He said the society's Direct Access to Technical Experts (DATE) service, which offers online access to around 400 experts, was now available as an app. In future answers to questions, many of which are similar, could be provided by a computer. Machine learning would accelerate the processing of technical queries.

Dugstad said likely alternative ways of assuring compliance included the use of inspection drones, camera tools, remote surveys, sensors on vessels and digital twin vessels.

DNV GL also presented the first results of an ongoing maritime data centre project which it has been engaged in with Japan-headquartered NYK Line, with support from engine manufacturer MAN Diesel & Turbo. The data centre collects operational data from NYK vessels on the classification society's recently-launched Veracity industry data platform for monitoring vessel performance and condition-based maintenance schemes.

◄ *NYK Line president Tadaaki Naito*

► *DNV GL CEO Maritime, Knut Ørbeck-Nilssen*

President of NYK, Tadaaki Naito, said: "In the maritime industry we are at the beginning of an era where we pursue information and communication technology (ICT) enhanced technical innovations with industry partners for organic collaborations.

"We need a secure, reliable, neutral, competitive and open ICT platform to share and utilise our data with industry partners, and proper business rules for accelerating data-driven innovations.

"We share the open platform concept with DNV GL and MAN, and are co-operating in the pilot process of proving the validity of the concept and building a real working platform."

Knut Ørbeck-Nilssen, CEO DNV GL Maritime, said: "As a classification society our main role is to assess the condition of the hull and critical components. With this pilot project we are able to test a sensor-based class concept where condition-based surveys may be performed. The project has also been a valuable testbed for data standardisation and quality, security and access rights."

Meanwhile, DNV GL has published a report, *Low Carbon Shipping towards 2050,* that looks at the potential for greenhouse gas emissions reduction from shipping, based on a new computational model that can evaluate scenarios and solutions for both vessel segments and the industry as a whole.

Society inviting partners to join wind farm data JIP

DNV GL is inviting industry partners to start a joint industry project (JIP) for improving the collection and assessment of site conditions data for offshore wind farms. Aiming to increase the efficiency of collecting site conditions, the new JIP will work with stakeholders from across the wind industry. The knowledge generated is planned to be ultimately incorporated in a DNV GL recommended practice.

The design of an offshore wind farm is dependent on the quality of the calculated site conditions used to derive the design parameters. To achieve an optimal quality in data collection and assessment, extensive and costly investigations are needed at a very early stage of the development, long before a final investment decision is made. A recommended practice will allow stakeholders to improve their planning, investigation and design.

Kim Moerk, executive vice president for renewables certification at DNV GL, said: "The development of this recommended practice will create an industrial consensus on an agreed set of practices to follow for the analysis of the system and its validation. This will allow stakeholders to increase transparency and reduce the risk in the early phases of the development."

DNV GL says incorporating the experience and objectives of stakeholders along the wind energy value chain will add significant value for all parties involved. They will be able to contribute and influence the development of the assessment criteria to ensure their concerns are covered, practices are acknowledged and the objectives of all stakeholders are met.

Companies interested in joining the JIP should contact the project manager, Helena Hunt, via Helena.Hunt@dnvgl.com

In the Spotlight

On a regular basis, we put one *ITS* Club member under the spotlight by asking them to answer a series of set questions. This time, we talk to Brandon Durar, president of winch manufacturer JonRie InterTech

How long have you been an *ITS* Club member?
I believe since 2002.

How many events organised by The ABR Company have you attended?
Seven *ITS* conventions and six (all) *Tugnology* conferences.

What is your most memorable moment from an *ITS* convention?
In Rotterdam 2006 it was just the time and place in the industry, with so many changes taking place in the tug community.

Which one person has so far had the biggest influence on you during your career?
Betty Johnson at Almon A Johnson Inc, deck machinery. Betty was instrumental in promoting and mentoring me to become the vice president and general manager of the company after serving as the director of engineering for many years.

What is the most important piece of advice you would give to anyone entering the industry today?
To quote Albert Einstein: 'Imagination is more important than knowledge'.

If you could invent one thing that would make life in your segment of the maritime world easier, what would it be?
I would invent a torque aligning staple system for the bow of an escort tug. This would allow for the maximum turning force for the tug and make for the safest operation, as the staple aligned to the force would create an uplifting force and thus prevent the tug from heeling over. The system would create a stable platform when used in escort operations.

What would you like to be remembered for within the industry?
To be known as an innovative winch designer and to have contributed to modern winch design in my 40 or so years on watch.

The *ITS* Club

ITS Club membership has many benefits, including a discount on registration for *ITS* conventions and *Tugnology* conferences, a discount on a wide range of *Tug & OSV* titles, and an airmail subscription to the magazine, ensuring that you never miss a copy. To become a member, go to www.tugandosv.com

Arctic oil spill response JIP is completed

Launched in 2012, the Arctic Oil Spill Response Technology Joint Industry Project (JIP) concludes this year after more than five years of state-of-knowledge reviews, technical assessments, and research experiments into oil spill response in Arctic and other ice-prone marine environments.

The JIP set out to foster the acceptance of new oil spill response strategies, with the ultimate goal of both building confidence in the already available response tools and extending their capabilities with new strategies, systems and a better understanding of operating windows.

The JIP was a collaboration of nine oil & gas companies – BP, Chevron, ConocoPhillips, Eni, ExxonMobil, North Caspian Operating Company, Shell, Statoil, and Total. Over the course of the five-year programme, it focused on six key areas of oil spill response: dispersants; environmental effects; trajectory modelling; remote sensing; mechanical recovery; and in-situ burning (ISB), covering the primary response tools and support functions that together make up an integrated response system.

The projects focused on priority areas where new research and technology development had the best chance of significantly advancing the industry's ability to respond to marine spills in the presence of ice. Projects ranged across dispersant effectiveness testing, modelling the fate of dispersed oil in ice, assessing the environmental effects of an Arctic oil spill, advancing modelling trajectory capabilities in ice and mapping of oil in darkness, low visibility, in or under ice, assessing best options for mechanical recovery, and expanding the opportunity window for ISB response operations.

The JIP represented the largest and most extensive research effort ever undertaken in the field of Arctic spill response and was developed and managed by expert technical working groups and a global network of recognised specialists in the different disciplines of oil spill response.

The results of the JIP represent a significant achievement in the field of Arctic oil spill response research. While the oil & gas industry is first and foremost committed to operating safely and responsibly and preventing spills from ever happening, achieving and continually improving response capabilities will always be a key priority. The JIP has advanced the available scientific evidence informing decisions on the most effective response strategies in the Arctic.

▲ *Sun setting behind the mountains of Van Mijen Fjord, Svalbard, at the end of a day of sampling under-ice turbulence*

As a result of past efforts and now this JIP, a range of operationally proven tools is available to suit specific regional environments, seasons, drilling and production programmes. The consolidation of a vast amount of existing knowledge in the six key areas will provide a robust baseline for future regulators, users and industry representatives concerned with assessing, approving planning, executing and providing oversight to ensure safe Arctic operations.

Five years of applied research have built on decades of prior knowledge to demonstrate the viability of multiple oil spill response technologies in Arctic conditions. This new knowledge baseline and toolkit will ensure the most effective and environmentally beneficial response is deployed to protect the Arctic and other ice-prone regions.

Third Arctic tug christened

◄ *Arctic class tug* **Nicole Foss** *was built at the Foss Rainier shipyard in Oregon*

The last of three state-of-the-art Arctic class tugs, *Nicole Foss*, was christened at the Foss Waterway Seaport in Tacoma, Washington, US. Built at the Foss Rainier Shipyard in Oregon, *Nicole Foss* is designed to operate in the extreme conditions of the far north, and will enter service in the third quarter of this year.

The vessel is Ice Class D0, meaning the hulls are designed specifically for polar waters and are reinforced to manoeuvre in ice. ***Nicole Foss*** complies with ABS A1 standards, SOLAS and Green Passport. It is fitted with two Caterpillar C280-8 main engines, a Nautican nozzle and rudder system to provide superior bollard pull and manoeuvrability, and Reintjes reduction gears. Markey Machinery supplied the tow winch, and the tug has a bollard pull of 100 tonnes.

The vessel incorporates several environmentally focused elements, including the elimination of ballast tanks, so there is no chance of transporting invasive species, and holding tanks for black and gray water to permit operations in no-discharge zones (such as parts of Alaska and California), as well as hydraulic oil systems compatible with biodegradable oil, and energy-efficient LED lighting.

Nicole Foss has been designed to withstand the rigours of Arctic operations but is suited to work across the globe as Foss competes for opportunities in the oil & gas industry.

In brief

London will host the 11th Arctic Shipping Summit on 29-30 November 2017. The event will gather experts and stakeholders from across the sector to discuss business development in the region, along with latest changes in regulations, technological advances, insurance guidelines and development of support infrastructure for safe and effective cargo transport.

ABB is to modernise 10 out of 14 medium icebreakers and high endurance multi-task Canadian Coast Guard ships to extend operational life of the vessels by another 20 years. These ships undertake major search and rescue operations and are instrumental in keeping northern Canadian shipping lanes ice-free.

Arctic Council member states signed the Fairbanks Declaration 2017 at their recent ministerial meeting in Fairbanks, Alaska. The document reaffirms the parties' commitment to maintain peace, stability and constructive co-operation in the Arctic.

Marine academy gains classification society recognition

ABB's Marine Academy has been recognised by classification society DNV GL for meeting its standards for maritime training. Operating in six locations around the globe, ABB's Marine Academy aims to reduce vessel downtime and improve safety through education.

ABB was awarded the DNV GL SeaSkill certificate following extensive audit by the classification society and it will be valid for the next five years.

With electrical systems playing a greater role on board, ABB is seeing a strong demand from the maritime sector to ensure the skills of crew members remain up to date.

Klaus Moldskred, sales and marketing manager with the academy, said: "The Marine Academy is an essential link between ABB and the maritime industry.

"Our commitment to improving safety on board does not stop with our equipment or service agreements; proper training for the crew is also vital."

A study by DNV GL indicates that up to 90 per cent of accidents at sea are caused by human error and ABB's courses are aimed at addressing this problem.

"We are delighted our Marine Academy has been recognised by DNV GL as a provider of high-quality maritime education.

"ABB is not just a provider of electrical systems; we also prioritise the training of the crew who use our equipment," added Moldskred.

Marine Academy centres are in Singapore, Rotterdam, Ulsteinvik, Genoa, Helsinki and Houston.

▲ **RT Borkum** *is a specialised training tug that will be employed by TTC*

Dedicated qualification will raise tug master standards

Specialist training provider Tug Training & Consultancy (TTC) is calling for a specific qualification for tug masters as a way of raising standards in tug operations.

The Netherlands-headquartered company believes that the current system means measuring tug master competence is too often limited to knowing pre-formulated tricks of the trade rather than fully understanding the physics and reasoning behind tug procedures.

TTC argues that while tug masters are required by law to have a STCW certificate of competence, this is generic – based only on the tonnage and sailing area of the vessel rather than its function, type, propulsion system, engine power, capabilities and limitations. At present, there is no certification for the very specific skill employed in the tug master role.

Speaking to *IT&O* at *Tugnology '17* in the company's home city of Rotterdam, TTC general manager Patrick Everts said: "Tugs, and the vessels and constructions around them, are thereby exposed to unnecessary risk when tug masters have not been taught how to calculate their own way through unexpected circumstances.

"Trainees need to be taught to think for themselves about the best way to handle every situation by considering the forces present and assessing the consequences of possible actions. Thus, a real instinct for controlling the vessel and its influence on other objects is developed. Operating the vessel safely thereby becomes second nature, which results in a greatly enhanced ability to deal with unexpected situations."

TTC has therefore embarked on a programme of working with authorities and other training institutes to develop a new qualification which requires tug masters to demonstrate full comprehension of every aspect of the job. This new tug endorsement will comprise everything from having a firm grasp on why a vessel behaves as it does, in all circumstances, to appreciating how their actions interact with what others are doing around them.

"Adoption of this qualification as a requirement will greatly improve safety and efficiency, with less risk to people, environment, vessels and property," said Everts.

Centre plans innovative simulator solutions

Kongsberg Digital and Simwave have formed a strategic partnership resulting in a contract for one of the most extensive Kongsberg maritime simulator deliveries to date.

Located in Barendrecht, in the Netherlands, Simwave is a new maritime centre of excellence with ambitions to offer the future generation and current maritime professionals the best possible training experience and fair assessment procedures next to the most advanced and specialised applied research.

Simwave has chosen Kongsberg as its sole simulation technology supplier and partner for the development of a state-of-the-art new facility. The partnership will also include development of new innovative maritime training solutions on Kongsberg's newly launched open ecosystem, Kognifai.

Simwave's approach to maritime training will enable clients to have full access to an advanced simulator park on their own terms. The facility will become a flexible platform for customers to train and assess crew, investigate projects and promote services by using state-of-the-art simulators customised to their own requirements. This includes the use of customers' own 3D mathematical ship and environment models based on K-Sim technology.

Customers will be able to hire its facilities as a turnkey solution, with Simwave experts tailoring the configuration to the exact requirements of the training programme or research project. Uniquely, it is making its facilities available 24 hours a day. Customers have the option to bring their own instructors and task Simwave to manage the technical facilities, or use its own experienced and certified educators to lead training or support research.

The facility staff will be an important aspect of its new approach to maritime training and simulation, with experts, such as senior pilots, database developers, applied researchers and mathematical modelling specialists available to advise customers on complex challenges. Alongside typical training courses, the facility is expected to become a tool for maritime development projects including port and expansion upgrades.

▲ *A state-of-the-art Kongsberg simulator*

Yard welcomes safety by the dozen

US shipbuilding and repair company Bollinger Shipyards received the 2016 Award for Excellence in Safety from the Shipbuilders Council of America (SCA) – for the 12th consecutive year.

The award is presented to member companies with the lowest recordable incident rates based on a quarterly injury and illness survey conducted by the SCA.

Bollinger president and CEO Ben Bordelon said: "This recognition of exceptional safety performance by the shipbuilding and repair industry is realised only through the continued effort of Bollinger employees who have made safety a priority. Bollinger remains committed to attain the highest level of safety and supports future safety innovations in the maritime industry."

The Louisiana-based company operates 10 shipyards strategically located throughout the state with direct access to the Gulf of Mexico, Mississippi River and the Intracoastal Waterway. Bollinger's products include tugs, inland waterways pushboats and offshore oilfield support vessels, while the company is also the largest vessel repair company in the Gulf of Mexico region.

The award was presented to Bollinger during SCA's annual general membership meeting in Washington DC in May.

Trainers get together for one-stop venture

A group of UK-based training providers have created a one-stop joint venture providing training courses, consultancy and other business support services to meet a growing demand from the international maritime industry.

Launched by ChartCo Training & Consultancy, based in Enfield, Essex, the initiative brings together Southampton-based Chiltern Maritime, Clyde Marine Training and Clyde Training Solutions in Glasgow, Viking Recruitment and its Maritime Skills Academy in Dover and Warsash Maritime Academy and Warsash Superyacht Academy in Southampton.

The collaboration enables comprehensive maritime education and training across the UK and a significant capability for course delivery worldwide, both ashore and on board vessels.

Trainer secures OPITO approval

Glasgow-based Stream Maritime Training (SMT) has secured approval from a world-renowned oil & gas accreditation body to deliver specialist maritime training for the North Sea and international offshore sector.

The fast-growing safety training company has been named an OPITO (Offshore Petroleum Industry Training Board) approved training centre for its Offshore Emergency Response Team Member course.

The announcement comes as refurbishment work on SMT's new 1,858m^2 headquarters at Glasgow Airport nears completion. Formed in 2014, the company specialises in providing fire-fighting, sea survival, rescue craft and health and safety courses to the maritime, oil & gas, renewables and construction sectors.

SMT currently runs around 40 accredited courses and work with more than 100 clients issuing around 700 certificates a month.

New code helps offshore operator to grow

UK-based offshore energy support vessel (OESV) operator, Seacat Services, has completed its latest investment in its fleet, launching two vessels with the capacity for 24 industrial personnel – the newly-accepted *Seacat Enterprise*, and the upgraded *Seacat Courageous*.

The vessels are among the first wave of OESVs to be certified under the new high speed – offshore service craft (HS-OSC) code, which now allows vessels under 500 tonnes to carry up to 60 industrial personnel. High speed utility vessel (HSUV) ***Seacat Enterprise*** is the first vessel to be both built and registered in the UK under this new code.

Ahead of an expected busy offshore wind construction phase, this increase in personnel capacity offers a significant advantage from a logistical perspective and enhances the versatility of the company's fleet. With the next raft of new construction sites in remote and deep waters – equating to significant time offshore – there is a growing market need for an increase in OESV size and complement of technicians.

Both ***Seacat Enterprise*** and ***Seacat Courageous*** are dual-classified under the recently introduced HS-OSC code and the existing Workboat Code, which means that they can be licensed to carry 12 'passengers' under Workboat Code rules, and, as an HS-OSC craft, carry a further 12 'industrial personnel'. In making this distinction between 'passengers' and 'industrial personnel', HS-OSC recognises the extensive safety training undertaken by offshore wind technicians and affords vessel operators greater versatility in meeting the demands of supporting large-scale construction projects.

It has also enabled the development of a new category of workboat for the offshore wind sector. ***Seacat Enterprise*** is the first UK-built HSUV, a highly capable 27m catamaran that is the most recent product of a long-term collaborative R&D programme between Seacat Services, South Boats IoW and Alicat Marine Design.

It features a substantially enhanced cargo and fuel carrying capacity that enables it to carry up to four 6m containers in addition to 24 personnel and ship's crew. This extra fuel capacity allows ***Seacat Enterprise*** to remain operational for significantly extended periods between port calls, enabling it to create operational efficiencies by supporting both larger vessels and other offshore assets.

Seacat Services' second HS-OSC-certified vessel, the 26m ***Seacat Courageous***, was originally launched in February 2015 as a 12-seater vessel, but thanks to a modular design has now been refitted and upgraded to become a 24-seater. The vessel features a 26,000ltr fuel tank, and a foredeck that can accommodate up to two 6m equipment containers.

Ian Baylis, managing director, Seacat Services, said: "The introduction of the HS-OSC code is a welcome development for the UK offshore wind sector as we gear up for the upcoming construction phase.

"These craft are part of our continuing investment in the fleet, and an ongoing programme of significant scheduled refits to our vessels that will ensure that each and every one of our boats continues to meet the very highest standards. This investment in technology has been matched by expansions to our support facility and shore-based teams.

"In short, we're well-placed to continue supporting the fast moving offshore wind sector and the 'industrial personnel' driving construction and operations forward."

◀ *The upgraded* **Seacat Courageous** *delivering engineers to an offshore wind turbine*

Data can signal when best to buy or sell

VesselsValue (VV), the leading online valuation provider, is launching daily discounted cash flow (DCF) valuations for OSVs. This new valuation type looks to increase VV's offshore coverage.

VV currently provides daily updated market and demolition values for AHTs, AHTS vessels, PSVs and MODUs (including drillships, semisubmersibles and jackups). The global OSV fleet's DCF value is currently 2.5 times higher than its market value, at US$79.9bn and US$30.9bn respectively.

A VV spokesperson said: "By comparing DCF values to market values, VV customers can look for buy/sell/hold signals. For instance, if you can purchase a vessel when the market value is lower than the DCF value, you could potentially earn more money over the course of its lifetime than you spent. Therefore, this is a buy signal.

"On the other hand, if the DCF value is lower than its market value, this implies you can sell the vessel for more than it will earn you for the rest of the vessel's life."

Decommissioning market boom

The offshore decommissioning market is expected to grow from an estimated US$5.91bn in 2017 to US$8.76bn by 2025, according to research organisation marketsandmarkets.com

Europe was the largest market, by value, for offshore decommissioning in 2016, driven largely by activities in the UK and Norway.

The UK offshore industry leads other regions in terms of well-developed and mandatory decommissioning guidelines. Authorities in the region are taking active steps to commit operators to decommission old infrastructure by providing expertise, policy support and financial incentives.

The US Gulf of Mexico is the second largest market, closely behind Europe, with a large number of platforms being decommissioned each year.

Based on depth, the report segments the market into shallow water and deep water. The application of offshore decommissioning in shallow water projects is estimated to lead the market, both in terms of market value and growth. The shallow water basins on the UK continental shelf and the Norwegian North Sea will play a major role in driving the offshore decommissioning.

Shallow water operations are typically less expensive compared to deep water operations and a majority of the old and ageing offshore installations are in shallow waters. Thus, the market for offshore decommissioning will be the largest in shallow water projects.

According to the research, leading players in the decommissioning market are: Amec Foster Wheeler of France; Aker Solutions and DNV GL of Norway; AF Gruppen, Tetra Technologies and Technipfmc in the US; DeepOcean Group and Heerema Marine of The Netherlands; John Wood Group and Able in the UK, and Allseas Group of Switzerland.

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If your company would like to appear in the next issue of International Tug & OSV Global Directory then contact Helen Stephen on +44 1225 868821 or email helen@tugandosv.com

13. FIRE-FIGHTING contd

14. HEAT EXCHANGERS

15. HEATING/VENTILATION/ AIR CONDITIONING

16. HYBRID POWER & PROPULSION

17. INSURANCE/ P&I CLUBS/UNDERWRITERS

18. LAW FIRMS/LAWYERS

19. LINE-THROWING APPARATUS

20. MARINE ELECTRONICS/SOFTWARE

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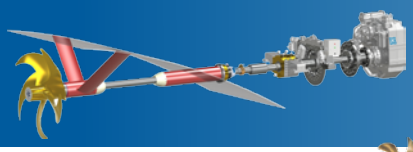

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24. SALVAGE EQUIPMENT

25. SALVAGE SUPPORT & INCIDENT RESPONSE

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