AN EXCITING START

DAMEN LANDS IN MANGALIA

SUSTAINABILITY SPECIAL

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Reflecting on the twelve months since I last welcomed you to the pages of the Damen Magazine, I find myself having to repeat the message of the previous two editions; our industry is still wrestling with challenging conditions.

The near future, however, certainly holds promise. Though it will be some time before its effects are fully felt, the offshore energy industries appear to be experiencing the first throes of a recovery. Other markets too continue to bear promise. Amongst these, the passenger-related sectors, both cruise and ferries, are notable.

Having taken operational control, in July last year, of the yard now known as Damen Shipyards Mangalia, we stand ready to support all three of these sectors. Indeed, we have already booked contracts within each of them, bringing the yard to capacity by summer this year.

The Mangalia yard covers 980,000 m$^2$ and boasts three drydocks totaling 982 metres as well as 1.6 kilometres of berthing space. With this expansion we place Damen in a robust position for the future. Which brings me to the focus of our magazine this year; sustainability.

The maritime industry has consistently demonstrated its innate capacity for creativity in the face of a challenge. I have full confidence that it will rise once again to meet the growing calls for sustainability. In any case, it has already made significant strides in this direction.

For our part, Damen has long worked towards sustainability, and often in concert with other industry stakeholders. We remain a family business and, as such, we take a long-term view ahead, always keen to ensure the success of Damen for the next generation. Such a philosophy aligns naturally with sustainable goals.

As these pages will no doubt show, we have already enjoyed considerable successes in this direction. This encompasses the continual evolution of both our products and the processes by which we create them, towards ever-cleaner operations.

I hope you will enjoy reading about these and the many other stories from Damen within this magazine.
Focus on Sustainability

This edition of the Damen Magazine has a focus on sustainability. The symbol seen here will indicate that an article features information related to this topic, both within the Sustainability Special section on pages 22 to 50 and throughout the magazine. The symbol will be accompanied by the relevant UN Sustainable Development Goals icons to further depict how Damen’s activities are contributing to sustainability in the maritime industry.

South African economy benefits from navy newbuild project

On Saturday, 23rd of February 2019, Damen Shipyards Cape Town (DSCT) hosted a keel laying ceremony marking the start of construction on the first of three Multi-mission Inshore Patrol Vessels (MIPVs) for the South African Navy. These vessels will aid in protecting the country from threats such as trafficking, illegal fishing and piracy, as well as support job creation and enterprise development.

The coin laid at the DSCT event was a commemorative medal made in honour of the late President Nelson Mandela’s 1993 Nobel Peace Prize win.

The coin was placed under the helm by the Minister of Defense and Military Veterans, Nosiviwe Mapisa-Nqakula.

Homeland Integrated Offshore Services extends fleet of Damen 3307 Patrol Vessels

Damen Shipyards Group and transnational integrated offshore company, Homeland Integrated Offshore Services of Lagos have signed a contract for the delivery of two additional Damen 3307 Patrol Vessels. This further increases the total number of these vessels in the Homeland fleet with the first of three vessels ordered in 2014 and the most recent deliveries being those vessels over the course of 2018.

Like their sister-ships, the two latest additions will be able to accommodate up to eight security personnel together with their equipment alongside the six crew and fifteen seats for crew transfers. Damen is also supplying training and maintenance services with integrated knowledge and technology transfers.

This latest order demonstrates Homeland’s continuing commitment to maintaining its leadership position in servicing Nigeria’s offshore oil & gas sector by investing in state-of-the-art equipment that rivals that to be found anywhere in the world.

led by Managing Director Oluseyi Eku, the company works with many of the international oil companies (IOCs) operating actively in the region.

In response to this latest order he commented: “We work closely with our clients to achieve their strategic objectives by providing exceptional services to enable them to focus on their core operations.”
On 15th February, Concordia Damen held a celebration to mark the naming of Dragages-Ports’ Samuel de Champlain to dual-fuel capability combining LNG and MGO.

The liner, measuring 110 x 11.4 metres, has the ability to carry additional cargo to the next port of call. The liner’s efficiency is not limited to increased capacity. Its diesel-electric burning MGO, and so the contract included the change of generators to dual-fuel models and the installation of on board LNG storage facilities. The project was a complex one and not without its challenges.

“The Samuel de Champlain conversion has been the subject of much interest within the dredging industry and the maritime industry in general,” says Fabien Guillemot, Commercial Manager at Damen Shipyards Dunkerque.

On arrival the ship was placed in the yard’s drydock and not without its challenges.

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“LNG isn’t new, of course, but this ground-breaking conversion of an existing vessel opens up new possibilities for everyone. With environmental regulations set to tighten ever further in the foreseeable future, the success of this project is evidence for owners of ships operating in coastal waters and emission control areas that there is an alternative to scrapping old vessels and building a new one.”

The Samuel de Champlain will now return to her regular duties of dredging the Loire and Seine rivers.

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Damen delivered a turnkey package that included engineering, procurement and support. The previous propulsion system of Dragages-Ports’ Samuel de Champlain was diesel-electric burning MGO, and so the contract included the change of generators to dual-fuel models and the installation of on board LNG storage facilities. The project was a complex one and not without its challenges.

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Albwardy Damen has received an award for the design of the new Damen Mulubuster 8020 shallow draught, multi-purpose vessel. The award was presented at the MASTECH international marine technical conference, held on board the iconic QE2 floating hotel in the UAE.

Albwardy Damen has been developing the Mulubuster 8020 for the past two years in close consultation with a number of oil majors and vessel operators. The vessel will also be available in 60 and 70 metre versions under development. Following its successful installation of the first offshore project in Taiwan; the Southern Weather Observation Tower for the Taiwan Power Company, HHC is now looking ahead to the next phase of its cooperation by supplying them with fast crew transfer and support services. The two vessels for HHC will have some additional, small changes to meet the company’s specific demands as well as optimise them for local Taiwanese requirements and conditions.

“We are pleased to announce our order of two Damen FCS 2710 CTV vessels, which will be the latest and most state-of-the-art design of CTV in Asia,” added Mr. Polin Chen, assistant to the president at Hung Hua Construction. “Being the first private company to invest in offshore vessels in Taiwan, we, Hung Hua, are confident and determined to build up local capacity for Taiwan’s offshore wind industry. We have full confidence in Damen’s impressive track record, quality and reliable services. That’s why we chose Damen, and soon we will be expanding our fleet by up to eight CTV vessels.”

Naviera Integral signs for fifteen FCS 5009

Towards the end of 2018, Mexican offshore contractor Naviera Integral signed a contract with Damen for its fifteenth FCS 5009 vessel. The 55-metre FCS 5009 has been a valuable workhorse for Naviera Integral. The Axe Bow has enabled Naviera’s newest addition to come with all the latest updates to the class and will also feature DP2 and FF111 capability and Damen’s connected ship technology, which will ensure maximum efficiency and minimum downtime. Damen and Naviera Integral have worked together for over twenty years and the new vessel will bring the number of Damen vessels operated by the company to twenty-four.

A-ROSA signs contract with Concordia Damen for River Cruise Vessel

River Cruise specialist A-ROSA has signed a contract with Concordia Damen for a newbuild River Cruise Vessel. The new ship, which will be delivered spring 2021, will operate in the northern Rhine region, including trips from Cologne to Amsterdam, Rotterdam, Antwerp and Bruges. The innovative River Cruise vessel will take A-ROSA’s city trip concept to the next level of luxury and sustainability.

In total, the vessel will present 140 cabins, including two-person cabins (21m²) with a balcony and separate living and sleeping areas.

To cater for the entire family, the vessel will feature a number of generous family cabins, 28m². On the sun deck, next to a large, adult swimming pool, will be a smaller, children’s pool with shallow water. The design also features a separate children’s eating area in the restaurant so young guests can dine with their friends.

For adult guests, in addition to a high quality restaurant serving five course meals, there will be a spa and wellness area with sauna, whirlpool, treatment rooms. The staff receive their own generously spaced cabins along with, for the first time, their own rest and relaxation area where they can unwind before and after working hours.

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Further to the existing CoC (Concordia Code) system, the newbuild will feature a number of additional features and will be 100% sustainable throughout the entire life cycle, with a strong focus on environment, social responsibility and health security. Damen’s design will contribute to the highest environmentally friendly standards and meet the latest requirements of the newest rules and regulations, including the new ‘Greenhouse Gas Conventions’.

In November 2018, Damen Shipyards Curaçao (DSCu) commissioned its floating docks, named C-dock and D-dock respectively. The commissioning of the docks is an historic milestone for DSCu and one of which the yard is extremely proud.

Both docks arrived at the Caribbean island of Curaçao at the end of April last year as part of a wider investment programme at the yard, following its takeover by Damen in 2017. "At Damen we have been extremely successful with shallow draught workboats," says Pascal Slingerland, regional director Middle East for Damen. "The new Mulubuster is a combination of the functionality found on both Shoalbusters and Multi Cats, but on a much larger and even more versatile, shallow draught workboat.”

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Damen Shipyards Mangalia holds keel-laying for CEMEX Go Innovation

Towards the end of 2018, Damen held a keel-laying ceremony for the CEMEX Go Innovation, a Damen Stan Launch & Recovery, at the Damen Vlissingen yard in the Netherlands. The vessel is the first Damen MALU – the next generation of marine aggregate dredgers.

Damen has designed the future-proof vessel for long-lasting sustainability, safety and performance. The MALU will extract sand and gravel from the seabed at up to -55 metres.

Particular attention has been paid to the extraction of mineral deposits from the seabed at up to -55 metres. The keel-laying was the first to take place since Damen began the operational management of the shipyard now known as Damen Shipyards Mangalia in July this year.

On the 24th of October the ¡VAMOS! Technology Demonstration Day took place at the Magcobar flooded mine pit, in Silvermines, Ireland. In total 35 visitors participated in the field demonstration to raise awareness of the innovative nature of the ¡VAMOS! technology with stakeholders and local communities.

Featuring a total of sixteen partners from nine EU countries, ¡VAMOS! seeks to address the EU’s need for raw materials, by making possible the extraction of mineral deposits from mined water-bearing areas. To reach this aim, the partners have developed a system whereby a remotely operated mining vehicle is launched from a waterborne carriage. Damen Dredging Equipment, being one of the main industrial partners within the ¡VAMOS! Consortium designed and built the launch & recovery vessel plus the slurry system on board of the mining vehicle.

"The ¡VAMOS! team have successfully demonstrated their ability to use the prototype mining system in very hard rock. State-of-the-art electronics and visualisation have been used to control the operations. All this was done with great consciousness and care for safety, the environment and involvement of local stakeholders," said Sander Steenbrink, general manager corporate research and development at Damen, who took part in the demonstration.

The shipyard has its own Training Academy and participates in the government’s ‘YES’ youth development programme, employing young artisans from previously disadvantaged communities and training them through the apprentice programme. Currently, DSCT is increasing employee numbers due to the prestigious Multi Mission Inshore Patrol Vessel project, where it will deliver three Stan Patrol 6211 vessels for the South African Navy. Benny emphasises: “We are very proud to be participating in such a project.”

Damen Shipyards Cape Town aims to provide turnkey solutions for clients in Africa, says Benny Bhali, sales and marketing executive at DSCT. Over the last 12 years, the yard has built over 30 vessels for Africa. Benny outlines DSCT’s philosophy: "We are building vessels in Africa for Africa. We want to support African shipowners in creating a sustainable, successful business."

Benny: “Damen is a centre of knowledge and innovation. DSCT often provides advice to companies about projects. Before they are a Damen customer and tendering for a project they come to us.”

DSCT’s efforts led to an initiative to launch annual dredging and fishing seminars. The Africa Ship Leasing Fund also shows how Damen supports local businesses. “The fund helps customers provide sustainable employment and develop long-term businesses.”

Damen also supports the South African Government’s local content requirements, far exceeding the required 60%.

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IN THE PREVIOUS EDITION OF THE DAMEN MAGAZINE WE HEARD FROM THE GROUP’S EXECUTIVE BOARD THAT MANY MARITIME SECTORS WERE EXPERIENCING DIFFICULT TIMES. THIS CONTINUES TO BE THE CASE, THOUGH THERE ARE SIGNS THAT THE FIRST GREEN SHOOTS OF RECOVERY MAY BE EMERGING. DESPITE THE CHALLENGES, DAMEN HAS CONTINUED TO INVEST DURING THESE TOUGH TIMES, TAKING ON NEW YARDS AND EXTENDING ITS PORTFOLIO IN PREPARATION, AS ALWAYS, FOR THE LONG-TERM.

IN THIS ARTICLE WE HEAR FROM CHIEF EXECUTIVE OFFICER RENÉ BERKVENS, CHIEF COMMERCIAL OFFICER ARNOUT DAMEN, CHIEF OPERATIONS OFFICER JAN-WIM DEKKER AND INTERIM CHIEF FINANCIAL OFFICER TOM TOUBER ABOUT DAMEN’S RECENT AND FORTHCOMING ACTIVITIES.
IN SUMMARY, HOW HAVE THE PAST TWELVE MONTHS BEEN FOR DAMEN?

Arnout: The last twelve months have really been challenging. There’s still a little sign of renewed activity in the oil & gas industry. Though we can see the beginnings of recovery, there are still too many vessels idle so it’s not translating into new orders. Prices are under pressure in other markets too, but we are seeing some signs of improvement in some areas. Our yards have continued to invest in sustainability initiatives, such as the electricity reduction programme in the production processes.

Tom: As well as supply new sustainable solutions to our clients, we are looking closely at our processes and are exploring ways to reduce our environmental impact. This includes looking at segregating waste for recycling and incorporating sustainable technologies into our products.

What opportunities does the current market present?

Tomek: 2019 will be a year of consolidation and limited investment. There are still plenty of challenges ahead, but we see opportunity in this. We continue to see growth in the yachting market, as well as in other sectors such as cruise tourism and wind energy. The industry is becoming more sustainable and we are well positioned to benefit from these trends.

Amout: Although 2019 will be a challenging year, we expect 2020 will show a return to healthier figures. They won’t be outstanding, it’ll take longer than that, but they will be improved. Still, there are still no signs of a recovery in all markets, and we are looking towards the future with caution.

Jan-Wim: Even as some of our main markets continue to struggle, we are preparing ourselves to hit the ground running at the start of each new year. The industry is diversifying, and we are well positioned for this evolution.

What about the future?

Arnout: Though we can see the beginnings of recovery, there are still plenty of challenges ahead. Competition is fierce and we need to be smart about where we invest in order to remain competitive.

Tom: We are constantly analysing our approach to sustainability, with a focus on reducing our carbon footprint and waste. In addition, we are exploring new technologies and services, such as remote monitoring, that can help us improve efficiency and sustainability.

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Tom: We are constantly analysing our approach to sustainability, with a focus on reducing our carbon footprint and waste. In addition, we are exploring new technologies and services, such as remote monitoring, that can help us improve efficiency and sustainability.
THE WORLD OF DAMEN

YARDS & COMPANIES

ANGOLA
Damen Services Luanda

ARGENTINA
Damen Area Support South America

AUSTRALIA
Damen Services Brisbane

BAHAMAS
Damen Services Nassau

BANGLADESH
Damen Services Dhaka

BRAZIL
Damen Services Rio de Janeiro

CANADA
Damen Services Victoria (BC)

CHINA
Damen Area Support Shanghai

CUBA
Damen Shipyards & Engineering Cuba

CURAÇAO
Damen Services Curacao

DUBAI
Damen Services Dubai

FINLAND
Damen Engineering Helsinki

FRANCE
Damen Shiprepair Brest

GERMANY
Van der Velden Barkemeyer

INDONESIA
PT. Damen Schelde Indonesia

JAMAICA
Damen Services Jamaica

MOZAMBIQUE
Damen Services Beira

NIGERIA
Damen Services Port Harcourt

NETHERLANDS
Niron Staal Amsterdam

POLAND
Damen Engineering Gdansk

PORTUGAL
Damen Shiprepair Aveiro

ROMANIA
Damen Shipyards Galati

RUSSIA
Damen Marine Engineering Galati

SAUDI ARABIA
Damen Shipyards Dammam

SINGAPORE
Damen Shipyards Singapore

SOUTH AFRICA
Damen Shipyards Cape Town

SWEDEN
Damen Oskarshamnsvarvet Sweden

TRINIDAD & TOBAGO
Damen Services Trinidad & Tobago

TURKEY
Damen Shipyards Antalya

UNITED KINGDOM
Brixham Marine Services

UNITED STATES OF AMERICA
Damen Area Support North America

UNITED ARAB EMIRATES
Albwardy Damen - Dubai

VIETNAM
Damen Song Cam Shipyard

YARDS & COMPANIES

Damen newbuild yard
Damen shiprepair & conversion yard
Damen Technical Cooperation / Business Cooperation
Damen Service Hub
Damen company
Offices, engineering, parts manufacture, etc.
"We have perfect infrastructure, facilities and resources," says DSMa Managing Director Chris Groninger. "We're currently very busy showing the world what we can do, and we're already firmly on the map. When client delegations come to look around our site – which these days is increasingly often – they're always impressed. If they're considering spending a large amount for their vessel they want to be sure of everything and their visits here fill them with confidence."

HUGE CAPACITY AND CAPABILITIES

Situated in a non-tidal port, DSMa has at its core three drydocks with a total length of 982 metres. These are well served by cranes – one 1,000 tonne and two 480 tonne gantry cranes and nine other jib cranes of 16-20 tonnes – together with heavy transporters, able to transport superblocks of up to 800 tonnes.

Nearby are areas for storing and cutting steel of varying thicknesses, two huge halls for section building, each including a panel line, modern, covered blasting and painting facilities, complying with the latest environmental requirements, and dedicated workshops for mechanical works, steel outfitting and piping. Moreover, the yard has its own galvanising shop. At the moment, DSMa is investing in further optimising its facilities for final outfitting, such as electrical, carpentry, heating, ventilation and air conditioning work.

DAMEN EXPANDS IN ROMANIA

The yard that is now DSMa opened in the mid-70s. Between 1976 and 1997 the yard, which was then called 2 Mai Mangalia Shipyard, built and repaired a wide range of vessels. With Romania changing into a market economy, in 1997 Daewoo from Korea, in a joint venture with the Romanian Government, took control of the yard, which was renamed Daewoo Mangalia Heavy Industries (DMHI). The yard subsequently expanded its facilities and focussed completely on the newbuilding of large commercial vessels. Between 1997 and 2017, DMHI delivered over 200 vessels, ranging from Handysize to Capesize bulkers, from feeders to Post-Panamax container vessels and from smaller chemical tankers to Suezmax crude oil tankers.

After a long negotiation process, Damen finally completed the acquisition of the shareholdings of the yard from Daewoo Shipbuilding and Marine Engineering in July 2018. Damen now has operational control of DSMa, in a joint venture with the government, which holds 51% of the shares.
WE ARE MAKING OUR BUSINESS MORE SUSTAINABLE BY INVESTING AND EXPANDING INTO NEW ACTIVITIES.

Damen’s first venture in Romania was Damen Shipyards Galati (DSGa), which joined the group in 1999. Situated in the east of the country, 230 kilometres north of Mangalia and on the banks of the River Danube, DSGa is fully owned and operated by Damen. DSGa is another large site, covering 55 hectares, has a workforce of 2,500 and builds a wide variety of complex vessels.

NEW FOCUS

With Damen at the helm, the yard plans to continue its current repair activities. “The yard traditionally services the Greek fleet, not only with regular repair and maintenance jobs, but also with refits like scrubber retrofitting,” Mr Groninger says. “In contrast to many Damen locations – including Damen Song Cam – where standard vessels are the norm, we will build small and all DSMa. These will be highly complex vessels, with concurrent engineering and production activities.”

SUSTAINABLE BUSINESS

As with other Damen shipyards, DSMa is committed to minimising its ecological impact and has ISO 14001:2015 environmental management certification. This is complemented by its ISO 9001:2015 quality management and OHSAS 18001:2007 occupational health and safety certification, and all are based on processes of employee involvement and continual improvement.

“We are making our business more sustainable by investing and expanding into new activities,” says Mr Groninger. “Tourism and our shipyard are the two main economic drivers in Mangalia, so it’s important we succeed and thrive long term. We employ 1,850 people, we want to recruit a further 500 to 1,000 in the next year, and we could end up with between 3,500 and 5,000 employees. In a town of 40,000, we’re very much at the heart of the community.”

To help meet its recruitment targets, DSMa is increasing cooperation with vocational colleges in Mangalia and across Romania. The company operates an on-site training centre and provides dormitory accommodation if needed by trainees and employees.

EUROPEAN MARKETS

DSMa is already benefiting from Damen’s global sales network and reputation for efficiency and quality. Current projects include the construction of the hull of the CEMEX Go Innovation, the first of Damen’s new design of Marine Aggregate Dredgers. Recently, DSMa produced 1,450 tonnes of steel assemblies for the drilling rig Stena Dom, which was refitted at Damen Verolme in Rotterdam.

“We’re particularly well placed to serve clients in Europe,” says Mr Groninger. “We offer competitive costs, quality, reliability and flexibility – and we use European steel. In fact our steelwork can be tracked and traced in both directions to the steel mill and to the individual welder. Whatever the vessel or structure involved, and whatever the client’s specific requirements, we can do everything here.”

Before heading up DSMa, Mr Groninger was managing director of Damen Cam Shipyard in Haiphong, Vietnam, and before that, financial director at Damen Shipyards Gorinchem. Mr Groninger says, “In contrast to many Damen locations – including Damen Song Cam – where standard vessels are the norm, we will build small and all DSMa. These will be highly complex vessels, with concurrent engineering and production activities.”

1,000 HIGHLY SKILLED EMPLOYEES READY TO DOCK VESSELS UP TO 360 METRES

“I'm trusted to get on with keeping the yard busy and making it a success. We know what is expected of us and everyone gives their best because they feel they are integral to the business. I treat my colleagues at the yard in the same way, trusting them to fulfil their roles while my job is more the long-term planning and general oversight.

“We are in interesting times. The market is uncertain, not least with Brexit and the uncertainty it generates, particularly for the fishermen, who are important customers for us. They cannot invest until they know where they will be able to fish and that has an impact on the yard. There is also uncertainty over the future of pulse fishing which a lot of our customers use. This is also affecting many of our clients, particularly the smaller ones. The workboat maintenance sector is going well, however. Another of my priorities is the fact that more than 35 of our colleagues are over 60 years old, so we are keen to recruit new staff. Our location is rather remote, particularly for young people who prefer the cities, but we hope to attract them to this pleasant corner of the Netherlands.”

Eric Moerkerk was appointed managing director of Damen Maaskant Shipyards Stellendam (DMSS) in September 2018, following fourteen months as deputy director. “One of the best things about working for Damen is that it is a family company,” says Eric. “While results are of course important it has a much more collegiate, friendly atmosphere and much less top-down direction. My previous employer was a publicly quoted company and the culture was tough and far more short-term, focused on the financials. Here, the senior management team is highly approachable and communications are generally very good both ways, again because of the feeling that the company is itself a family and everyone can talk to anyone else.

Being the managing director here at DMSS feels rather like running the business as an owner,” he continues. “I am trusted to get on with keeping the yard busy and making it a success. We know what is expected of us and everyone gives their best because they feel they are integral to the business. I treat my colleagues at the yard in the same way, trusting them to fulfil their roles while my job is more the long-term planning and general oversight.

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Sustainability as a movement is gathering pace around the globe. It’s something that affects all industries and the maritime world is no exception. Our industry, widely known for innovation, has actually been working towards sustainability for some time.

Damen has made numerous contributions to this; evolving our product portfolio towards greater efficiency, exploring ways to make our processes cleaner and always looking to maximise the lifecycle of our vessels.

Now is a fitting time for the Damen Magazine to take a closer look at what Damen and its partners are doing in their work towards greater levels of maritime sustainability. We believe that the interests of environmental sustainability are best served by a business that is able to sustain itself; to deliver products that are not only clean and efficient, but also relevant, today and tomorrow.
SUSTAINABILITY IN THE CRUISE INDUSTRY

SUSTAINABLE SOLUTIONS
Some governments are bringing in their own hefty regulations to tackle the issue, says Robin Brouwer, Damen Cruise VP Design and Proposal. “For example, Norway is heading for zero emissions in a couple of years from now – cruise ships will only be allowed into the protected areas of the fjords if they have zero emissions.” While environmental laws are getting tighter, the subject goes further than legislation, says Robin. “Sustainability is also starting to become a selling point for vessel owners. Passengers want to sail on cleaner ships.”

The stricter environmental regulations are pushing the cruise industry to find alternative fuels. Of the various options available, LNG is playing a dominant role; approximately 30% of newbuilds are being built with LNG propulsion systems. “This is not a solution for the long term, however. Cruise ships often operate in remote areas where the LNG supply chain is lacking, but also LNG is not emissions free,” says Andrea. So what is Damen’s solution to the subject of improving sustainability in cruise ships?

“We can couple our vast amount of knowledge building complex vessels with a large research and development team to create solutions to make the cruise industry more sustainable.”

SMART INTEGRATION
Numerous solutions relating to sustainability already exist; in fact, a lot of progress has been made in the last decade as cruise ships have become around 30% more energy efficient. “We don’t want to reinvent the wheel – our job is the smart integration of sustainable technologies. This is our core business.” Robin is talking about currently available solutions such as waste heat recovery, shore connections, LED lighting and the use of batteries, all of which contribute to make a cruise ship cleaner and greener. “Hydrodynamics – hull form optimisation — is also something that we are very good at, and we believe that the Damen Air Cavity system (DACS), reducing fuel consumption, will also be very relevant for the cruise industry. Looking ahead, together with industry partners, we are investing in the possible application of high-power fuel cells and even 100% hydrogen-based operations.”

In addition to Damen’s extensive network of suppliers, Danish ship design company KNUD E. HANSEN (part of the Damen Shipyards Group since 2012) will also provide valuable input into Damen’s cruise ambitions. KNUD E. HANSEN has a lot of knowledge with HVAC systems, Robin points out. “This is very interesting because HVAC systems are a major energy consumer that can be made more efficient through advanced digital development and automation.”

IN FOR THE LONG-TERM
An often overlooked aspect of sustainability throughout the whole maritime sector is the subject of prolonging operational lifetime. After all, keeping a vessel active while simultaneously updating its green credentials is surely more sustainable than sending it to the breaker’s yard for scrap? Indeed, Andrea confirms, the lifespan of cruise vessels is typically very long. “Up to 35 to 40 years, in fact. This starts with the financing process during the contractual/design stage and continues with engineering and construction. And then, during the operational lifetime, an owner will need refit, refurbishing work and major conversions. And it is our role at Damen to support the vessel’s entire sustainable and productive lifecycle. We are the long-term partner.”
IMO TIER III
READY FOR THE FUTURE

Explained IMO Tier III

The International Maritime Organization’s regulations regarding nitrogen oxide emissions have got steadily stricter over the last two decades. This started with the so-called IMO Tier I controls in 2000, and continued with IMO Tier II in 2011. IMO Tier III entered force in 2016, but only in North American and US Caribbean waters. For the European market, Tier III regulations will come into effect in the North Sea and Baltic Sea Emission Control Areas from 1 January 2021. This means that all vessels with an engine output greater than 130 kilowatts, with a keel-laying date after 2016 for US waters and 2021 for North Sea and Baltic Sea waters entering these areas must comply with IMO Tier III regulations.

Explained NOx reduction

The Damen Marine NOx reduction system is an advanced active emissions control system using SCR (selective catalytic reduction) technology for NOx reductions up to emissions standards according to IMO Tier II, suitable for marine diesel engines and fuels. It has been designed and optimised for the specific sailing profile of a vessel, and is able to operate on both high and low loads in ambient conditions from -30°C up to 45°C. Its robust design is suitable for high sulphur fuels (DMA ISO 8217:2017) capable of using both automotive (AUS32) and marine quality urea (AUS40). Combined with 45dB(A) silencers, the system limits the emissions of NOx and noise, thus contributing to a healthier and more sustainable environment.
DAMEN PRODUCT DIRECTOR FERRIES, HENK GRUNSTRA, ON DAMEN’S MOVE INTO THE WORLD OF ELECTRIC PROPULSION FOR MARINE-BASED PUBLIC TRANSPORTATION.

The electrification of ships is no longer just a prospect for the future; electrification is here. Right now, as part of its E-Cross Ferries programme Damen is constructing electric ferries of all sizes, from passenger only to those able to carry vehicles. These cutting-edge vessels feature the entire spectrum of current propulsion options – from diesel-electric with on board power generation to fully electric using a shore-based power source.

“This is not to say we’ve got this covered; electrification is one steep learning curve. Electrification of ships is new, but with the E-Cross series, we’ve made a good start,” says Damen Product Director Ferries Henk Grunstra.

Firm foundations in ferries

Certainly ferries present a good starting point – the predictable nature of their operations, working to a regular route and schedule – allows a shipyard to tailor the propulsion exactly to the vessel’s operational profile. This predictability is critical for developing vessels with electric propulsion.

“During the design process for one electric ferry, the client came back to us and said, ‘Actually, we’ve decided we want to change the route, it’s now this.’” he says gesturing. “The change was a 31% extension of the route. So we went back to the drawing board to see what we could do. The answer was not quite so simple as you might imagine. The new profile required completely different batteries, in turn requiring an almost completely different boat. It’s early days for this technology right now. The slightest change to the plans sets off a chain reaction that can threaten cost increases and jeopardise redundancy.”

Neither of which outcomes is much of an option. Increased costs are likely to make electrification less popular in both public and private sectors, while redundancy is critical in a vessel that is, essentially, a lifeline for communities, as Henk explains.

“If there’s a storm and it takes out the power, then people still need to get to hospital.”

The predictability of a ferry operation, however, brings its own challenges. Marine-based public transport invariably requires a customised approach. Each operation is unique – it has its own route and its vessels their own capacity and size requirements, for which the right-sized batteries must be selected.

“For example, we approached a project in Canada with a view to using docking solutions we had seen successfully applied in Norway, but it turned out that they just were not suitable for this project. Although the operations of each ferry are predictable and routine, they are also unique to the route that they serve.”
Setting standards in strange territory

At first glance, such uniqueness may appear strange territory for Damen, a company that has made its name in standardising ship production. However, closer inspection reveals that even in a world with such tailored requirements, there is room for the Damen philosophy to bring advantage.

“We can standardise the process by which the ferry is built – the calculations we make in order to develop the right vessel can be standardised,” continues Henk.

The standardisation of processes can involve borrowing relevant technology from other sectors. Electrification has already made progress in land-based public transportation. The charging systems used for buses can be adapted, for example, for maritime usage.

“It’s not simply a case of taking a charging system and hooking a boat up to it. It needs to be ‘marine-ised’. It will need to handle higher voltages for one thing. Of course, we always test this technology thoroughly; no matter how successful it’s been on other applications we want to be sure it works well on our vessels, but essentially, we are applying proven technology to innovative solutions.”

In doing this, Damen is effectively taking on a role that exceeds that of ‘just’ shipbuilder and becoming an integrator.

Starting at the beginning

“Our aim with delivering the E-Cross is to provide support throughout the entire process, beginning with an advisory role at the very outset. We’ve had experience of this already, having served as a consultancy for BC Ferries in Canada, assessing for them what battery charging options were available. It turned out that, at present, it is not feasible to have onshore charging. On the basis of this we are building for them hybrid diesel-electric vessels that are prepared for conversion to full electric once the infrastructure exists.

“The role of integrator also involves looking into things such as civic regulations and what power is available from the grid as well as helping to select the right equipment and translating the operational profile of the vessel into a match.”

Capex Vs Opex

Standardising the process will speed up construction and ensure the reliability of E-Cross Ferries. It will also, ultimately, exert downward pressure on costs – particularly as Damen is expecting demand for electric ferries to be high in the coming years.

“We anticipate that political initiatives and growing environmental awareness will equal significant demand for electric ferries in the coming years. Eventually, as with anything, repeated product deliveries will result in a smooth flow of cost-effective equipment. And, as we intend to build a lot of these types of vessel, we will find ourselves in a good position from a procurement perspective. From this base, we will be able to deliver a competitive offering to the market,” states Henk.

The costs of an electric ferry operation are impossible to define due to all the variables already discussed above. However, there is often a case to be made that, although initial capital outlay can be considerable relative to a conventional ferry operation, the operating expense can be significantly lower over the lifetime of the vessel.
Damen Shipyards and Arriva combine their strengths.

Arriva has been running this ferry service for more than fifteen years already with its existing conventional diesel-driven vessels and therefore has great experience with the route and operation.

Arriva is Europe’s largest transport provider, taking a leading stance in reducing its environmental impact, incorporating new technology as soon as it is developed to help reduce emissions.

The company’s customers are at the heart of everything it does. Arriva strives for excellent satisfaction levels and has won a UITP Transport Achievement Award for “putting people first” and improving the overall transport experience for clients, employees and customers in Copenhagen.

Damen combined strengths with Arriva in this project, using its shipbuilding knowledge, creativity and dynamism to help its client find an ecological and economical solution. The Damen E-Ferry 2306 is a customised design, specifically developed for the Movia tender in cooperation with Arriva. The design is based on Damen’s E-Cross philosophy (see page 28) and overall experience with providing optimal passenger experience combined with efficient propulsion.

Different modes of transport form a lifeline for Copenhagen’s citizens. As a result, the city’s politicians wanted a greener public transport service, on water as well as on the road. Copenhagen’s public transport authority Movia issued a tender to upgrade the current ferry service and route to a greener alternative.
The cabin is slightly raised and features generous windows fore and aft, and together with CCTV feeds from strategic points on the vessel, supplies optimal visibility for the captain when manoeuvring. Inside the wheelhouse, the dashboard is fitted with an optimised human machine interface (HMI), offering minimum distraction while providing the exact information needed to pilot the vessel with maximum efficiency.

Given the demands of its operation, each ferry carries two drivetrains to provide a good level of redundancy should any unexpected problems occur.

**Moving Forward**

Propulsion was a major factor in the design of the vessels. Movia requested a cleaner, greener use of energy from its ferry service, and Damen had a number of options available. Engineers considered biodiesel engines, hybrid vessels with generators on board, and full electric solutions, ultimately deciding full electric was the optimal choice for the twelve year operation of the ferries, based on several factors.

This zero emissions, fully electric solution is quiet in operation and is much more maintenance-friendly than a diesel option. Combustion engines contain a lot more mechanical parts that can fail, and the oil used for lubrication of these moving parts makes the system very dirty in comparison with an electric motor.

At the same time, Damen investigated the shore solutions for supply of electric power. Movia’s stipulations required at least 60% of the power to be drawn from a green source, so Damen ensured this shore option was available for recharging purposes.

The next decision to make was how often the vessels could charge their power supply – how could the ferries operate all day on a minimal battery pack and recharge without disrupting their schedule?

To answer this question, Damen Civil – another branch of Damen’s complete service provision – investigated full civil solutions such as accessibility to the local grid, the regulations surrounding civil power supply, and the practical limitations of the jetties as potential charging points. The ferry route takes one hour to complete, and at each end there is a small window in which to prepare for the beginning of another route. Damen saw this as a window of opportunity to take advantage of a fast-charging system.

Design and proposal engineer Bastiaan Vink explains the logic; “By charging every hour, the ferries replenish their relatively small battery pack at the beginning and end of each route. The combination of a fast-charging system and a small battery pack allows them to recharge in as little as seven minutes without disrupting their schedule.”

**Full Integration**

Completing the project wasn’t as simple as putting boats in the water – meeting the tender’s criteria for an environmentally-friendly source of propulsion for the vessels raised a number of complex variables that required investigation. Martin Verstraaten, Damen Sales Manager, took his team to Copenhagen to get a good understanding of the full scope of the project. “In Copenhagen, we conducted an extensive safety and reliability investigation to get an exact understanding of the conditions and requirements of the project. We made sure we were aware of every component and contingency.”

Examples of these components include the floating jetties that serve each stop on the ferry route; new vessels supplied to operate the route had to be compliant with these jetties and had to account for all aspects of accessibility and safety. A more aesthetic component was Damen’s careful consideration of the passenger experience: Damen fitted large windows along the vessels’ sides, and rows of skylights in the roof, in order to allow plenty of daylight to enter the passenger hold. Each boat features unique interior décor, including an image of a local landmark, adding to its individual personality.

The hulls were designed to achieve low resistance in order to save on the energy required from the battery packs and the propeller was optimised for electrical propulsion using software that measures the torque of the engine and the speed of the propeller.

In the fully-electric solution, power comes from battery packs on board. Bastiaan Vink, design and proposal engineer at Damen, was heavily involved in the process. “Choosing the battery packs depends on multiple variables such as the length of route and time in operation, the torque of the engine and the average weight of the vessels under operational conditions.

“We used computational fluid dynamics (CFD) in the design of the hulls to ascertain the levels of resistance they would face in the water and the propulsion required to overcome the resistance to a highly mobile and manoeuvrable degree. The hulls were designed to achieve low resistance in order to save on the energy required from the battery packs and the propeller was optimised for electrical propulsion using software that measures the torque of the engine and the speed of the propeller.”

This foresight helps to minimise the number of battery packs the vessel needs to carry on its route, which in turn saves on weight and allows it to operate more efficiently, also saving on cost.
The charging and operation of the ferries is a total integrated solution provided by Damen. In the earlier stages of the project, Damen acted as a consultant for a full ship and shore solution to the ferry service, considering the requirements of the project and proposing a balanced solution to meet each of the criteria. Damen Civil was able to analyse the physical capabilities and limitations of Copenhagen’s jetty route in order to determine the optimal solution for the project.

As the vessels dock bow-first, engineers realised a drive-on charging system would much better suit the vessels than a connection lowered from above. In a new system developed in-house, Damen installed a charging point in the bow of the vessel and created an automated charging system based on the jetty and connected to the on-shore power source. In this system, the vessels can drive onto the charging pin bow-first, automated fast-charging replenishes the battery power in around seven minutes, and the vessel is then able to reverse straight off the pin and begin its route.

During development of the charging solution, engineers used a hardware in the loop (HIL) process to run tests on how it would perform in operation under various conditions. The team then used software to construct a digital model of the vessel, and conducted test runs on the computer in order to tailor battery management software that keeps track of charge and release performance.

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The charging point system is close to completion, and Damen can install remote monitoring capabilities on all of the vessels, informed by a network of on-board sensors. Damen’s Remote Monitoring Department is able to set up personalised dashboards for every employee, tracking a variety of factors from battery lifecycle to sailing patterns to swell dynamics. Through access to this data, clients can track the performance of their vessels. Similarly, Damen is able to use this remote monitoring capability to identify potential areas for improvement and use the data to inform future projects.

The route extension significantly impacted the scope of the project, affecting the duration of each route, the power demands on each vessel, and the charging facilities installed to supply that power. We investigated ten scenarios for a fully-integrated solution to the route extension, ultimately deciding the project expansion required an innovative charging solution to be installed at the port area terminal, Martin states.

To enable operators to track and analyse the performance of this complex system in action, Damen can install remote monitoring capabilities on all of the vessels, informed by a network of on-board sensors. Damen’s Remote Monitoring Department is able to set up personalised dashboards for every employee, tracking a variety of factors from battery lifecycle to sailing patterns to swell dynamics. Through access to this data, clients can track the performance of their vessels. Similarly, Damen is able to use this remote monitoring capability to identify potential areas for improvement and use the data to inform future projects.

First, the charging process to cope with the higher demands of an extended route. Damen increased the battery charging capacity from 450kW to 600kW per charger, to supply each vessel with the power it needs to complete the route – including in the case of one charging point being temporarily disabled – accounting for further redundancy in the system.

Damen will deliver the first five vessels according to contract, and the two additional vessels will be ready for delivery in May 2020. The charging point system is close to completion, and Damen looks forward to the beginning of its operation. Proud of the interdepartmental collaboration displayed throughout, Damen regards this project as an excellent showcase of its engineers’ entrepreneurial capacity and vision. “Based on large-scale, complex projects such as this, the development of Damen’s role beyond that of a shipbuilder towards that of a full solution integrator goes from strength to strength,” Martin concludes.
Electricity production in the United States still relies heavily on non-renewable energy sources. Fossil fuels and nuclear power generate more than 80% of the country’s total energy needs. Renewable energy sources do contribute to the US market, but at rates hovering just above the 17% mark. It must be noted that this relatively low figure masks the enormous potential of renewable energy in America. Considering the fact that there is currently only one offshore wind farm in operation in US waters (the 30 megawatts Block Island off the Rhode Island coast), offshore wind is a perfect example for such growth.

With their attention on the exciting future of the American offshore wind industry, Damen director business development & market intelligence David Stibbe and area manager North America Daan Dijxhoorn answer some of the most important questions.

**WHAT ARE THE MOST IMPORTANT DRIVERS OF THE OFFSHORE WIND SECTOR IN THE USA?**

**Daan:** Wind, of course, is the key driver. To this wind, the East Coast of the United States is a prime location for the development of offshore wind farms. Average wind speeds are the most relevant: from North Carolina all the way up to New England. Wind speeds increase the further north you go. Furthermore, the northern states of the Eastern Coast - Rhode Island, Massachusetts, New York and Connecticut - are also among the most densely populated and require a large amount of energy. In terms of energy production and supply, therefore, offshore wind has great potential.

**David:** It is also politically driven. Most of the north-eastern states are Democratic and have clear green strategies. Most notably, however, we have seen no slow-down since Trump has been in office as the White House has limited influence on the developments in the offshore wind industry.

**HOW DO YOU SEE THE AMERICAN OFFSHORE WIND SECTOR DEVELOPING?**

**David:** It is a market that is showing slow but steady growth. What is relevant here is that the American market can look at advances in the European market and supply chain. This means that the American offshore wind market will not have to undergo the steep learning curve that we experienced in Europe. They will have the advantage of multiple lessons learned. The issue of local content is a point that cannot be ignored, though – all vessels will need to be built locally.

**YES, THE JONES ACT – WHAT IMPACT WILL THAT HAVE?**

**David:** The Jones Act will be one of the first things developers have to deal with. A crucial fact, however, is that there are no existing vessels that match the requirements. Therefore the diverse range of vessels needed for the numerous phases of an offshore wind farm all have to be built. This situation is complicated even further because every state also has their own local content policy on top of the Jones Act. These local content regulations stipulate the use of local vessel operators and local shipyards as vessel builders.

**Daan:** Damen has embraced the Jones Act by forming cooperative relationships with local yards that have the capacity to build Damen designs. In fact, our procedures for building vessels in local yards – Damen Technical Cooperation – and our extensive experience in working with American yards is our unique selling point. We know how to deal with, and we have the flexibility to comply with, these local content regulations. This gives offshore wind developers wanting to use the same vessel designs that have proved themselves in the European market a lot of chances.

**WHAT VESSELS CAN DAMEN OFFER THE AMERICAN OFFSHORE WIND INDUSTRY?**

**David:** For all the types of vessel required – for construction, crew transfer, cable-lay, operations and maintenance tasks – the Damen portfolio has proven solutions.

**Daan:** It is also important to emphasise that we are adjusting our designs to meet the American regulations of ABS and the US Coast Guard. Listening to specific regulations such as the Right Whales Act in the north-eastern region is also key for our approach. Furthermore we are introducing our European clients to the US market. This can be seen as ‘matchmaking’ key stakeholders from Europe such as operators like Orsted and suppliers such as Vestas and Siemens to local operators.

**Offshore wind: an industry built on European foundations**

It is fair to say that the offshore wind industry has its roots firmly planted in Europe. The UK, Germany, Denmark and the Netherlands hold the top four positions with respect to installed generation capacity in the world. For example, there are currently more than 4,300 offshore wind turbines with a combined capacity of 16 gigawatts installed in European waters. The last five years, in particular, have seen a massive increase in installation and commissioning of new wind farms. The most important trends experienced in the industry are that offshore wind farms are getting bigger (in terms of number of turbines) and farther out to sea in deeper and rougher waters.

Additionally, the turbines themselves are increasing in power generation capacity. Ten years ago the typical capacity for an offshore wind turbine was 3 megawatts. At the time of writing, 8.25 megawatt turbines are currently in use at the UK’s Walney Extension wind farm.

In the future, it is expected that turbine manufacturer MHI Vestas will have its 10 megawatt (the world’s first double digit offshore wind turbine) ready for installation in 2021.

**Explainer: the Jones Act**

Otherwise known as the Merchant Marine Act of 1920, the Jones Act is a United States federal statute that serves to promote and maintain the American merchant navy. It states that all goods transported by water between United States ports must be carried on US flagged vessels that have been constructed in the US, and owned and crewed by US citizens.
LEADING THE CHARGE TOWARDS A GREENER FUTURE

AS SHIPBUILDERS AND SHIPPING COMPANIES FACE A TIGHTER SQUEEZE ON EMISSIONS QUOTAS, SKOON IS CREATING A GENUINE ALTERNATIVE TO RELIANCE ON DIESEL POWER.

In July 2018, Damen Shipyards Group formally announced a partnership with fledgling logistics company Skoon, and at World Port Days in September 2018, Skoon officially launched its first ‘Skoonbox’. These are encouraging steps for a company that goes against the current of traditional shipping. How so? Skoon is offering a genuine, viable alternative to oil-based marine power – and it’s a timely idea.
SKOOK’S CONCEPTION
Skook’s co-founder, Peter Paul van Voorn tot Voorst, conceived of a model for electrically-powered vessels while working part-time at Damen and studying Marine Technology at the Delft University of Technology. He was focused on the perennial problem of designing a future for ships that would make them cleaner, more comfortable and more efficient in their operation. His challenge was to find a solution to a three-stranded problem:

1. The technical issue of how to reduce emissions in the short term while ensuring the capacity for batteries to be used while not in demand by marine vessels.
2. The practical issue of introducing a solution that can easily be incorporated into the daily operation of vessels.
3. The economic issue of how to make such a solution financially competitive with current and future alternatives.

Emissions-reducing solutions for shipping include engines powered by liquefied natural gas or hydrogen cells, but these are expensive to implement and at present offer little scope for upgrade since installed. The introduction of a ‘battery box’ would require little imposition on the structure and operation of a ship’s propulsion and the removable batteries could be replaced following the development of newer, more efficient methods of energy storage.

As transport ships currently refuel while unloading and loading cargo, an alternative power solution would need to seamlessly replace the refueling part of this process. While cars can be charged overnight, ships never sleep – their structure doesn’t feature charging ports, and a static connection would hamper their mobility. By providing exchangeable batteries, the ship doesn’t need to wait around while charging, and it’s free to leave port as soon as the cargo is loaded.

The development and production of transport-grade shipping batteries is expensive – the cost must be offset somehow. The ingenious solution to this challenge is to make these essentially ‘mobile’ batteries compatible with onshore, as well as offshore, applications. Skook’s swappable batteries are also viable for use in land-based applications such as powering music festivals and construction sites. This versatility in application creates the capacity for batteries to be used while not in demand by marine vessels.

EARLY CONNECTIONS
As the Skookboxes came into a genuine possibility, Peter Paul got to work on the concept and studying the market independently. He knew that in order to get the business off the ground, he wanted a potential partner with an existing product on which to apply his theory and release it in a traditional marketplace.

“Given our aspirations for application and expansion,” he says, “we decided that Damen was an ideal partner. We could learn a lot from Damen’s experience and expertise, while Damen ships with Skookboxes could demonstrate proof-of-concept.” Furthermore, Damen’s seniority in the market and established reputation could help the company achieve exposure, which would create opportunities to grow Skook’s networks and stakeholder connections.

For Damen, the partnership with Skook creates further opportunity to add value for the customer in the shape of battery-compatible vessels straight off the production line, providing an easy way to meet upcoming emissions regulations and benefit from the clean energy model by future-proofing shipping operations.

In summer 2018, Skoon and Damen agreed a formal partnership. As Damen announced the partnership in its network, Skoon immediately felt the benefit. Companies heard of the initiative and began to approach Peter Paul, curious about Skoon’s idea and service, and the value it could offer to the shipping industry. This publicity certainly helped Skoon to gain visibility and contributed to business opportunities further down the line.

NOT PLAIN SAILING
The implementation wasn’t without its challenges. Replacing the fossil fuels market is a significant shift, and the Skook initiative is the first of its kind – it’s a completely new idea to use a swappable battery.

As Peter Paul explains, “One of our biggest challenges has been to explain the new system to people in order for them to understand the premise. It requires a new way of thinking.” A lot like the switching of fuel in cars from oil-based to electricity, the car needs charging every day rather than filling up the fuel tank every few days. The planning and operations are therefore different. It took time to explain these differences to the market on a case-by-case basis.

“GIVEN OUR ASPIRATIONS FOR APPLICATION AND EXPANSION, WE DECIDED THAT DAMEN WAS AN IDEAL PARTNER. WE COULD LEARN A LOT FROM THEIR EXPERIENCE AND EXPERTISE, WHILE DAMEN SHIPS FITTED WITH SKOOKBOXES COULD DEMONSTRATE PROOF-OF-CONCEPT.”

There has been a mixed response to the idea, but now is a good time in the market to encourage the kind of change. In 2020, new IMO regulations will come into effect requiring vessels to reduce sulphur emissions from 3.5% to 0.5%. In light of this, the industry is looking for ways to lower emissions in the most cost-effective way. One option is to refuel to blend fuel oil with lower levels of sulphurous components in order to achieve a compliant fuel oil; an alternative is for ships to install exhaust gas cleaning systems to remove SOx gases after combustion.

The industry also faces pressure from EU regulations regarding Non-Road Mobile Machinery (NRMM), which aim to progressively reduce pollutant emissions and to phase out equipment with the most polluting engines. Newbuild vessels will need to be fitted with compliant engines, and many existing engines will require emissions filters.

Through choice or through compulsion, these stipulations mean many companies are looking at switching to a ‘cleaner’ kind of energy, be that from electric power or carbon-free hydrogen engines. Batteries are expensive and the rate of technological development in the field could mean the hardware quickly depreciates in value, as improvements in efficiency make older hardware obsolete much more quickly.

This also means that customers will want to keep up with technological developments. This is possible through replacing the batteries every five years in order to ensure optimum performance. The old batteries will be given a second life on land, while the vessels continue with the latest energy storage technology. This is good news for battery suppliers, as they can rely on regular business from Skoon – and perhaps similar companies – wanting to maintain their stock.

SKOOK ON THE WATER
The first Skookbox was ready for logistical tests in January 2019, as Skoon announced the partnership in its network. A small-scale test was held in Hengelo, Netherlands. This was a critical step for the team to see if Skook’s technology, service and business model were viable. Damen was an ideal partner for Skoon because it already served the shipping industry and was focused on the perennial problem of designing a future for ships that would make them cleaner, more comfortable and more efficient in their operation.

As Peter Paul reflects, “The test was very positive and gave us an opportunity for us to learn how different stakeholders view the process from different perspectives. For example, container terminals look at vessel routes rather than actual vessels, and we discovered the Skookbox had been booked on a different vessel to the test vessel, which was also headed to Hengelo.” The challenge for Skoon is therefore to make it easy for the terminals to see these systems and how the process works in order for this practice to become scalable.

This will be achieved through the use of Skoon’s software platform, which enables container terminals to organise and track the logistics of Skookbox transfers. The software enables users to keep track of which customers have which hardware; and exactly where each Skookbox is and where it will be needed. This automation of the administrative part of the process is the key to connecting stakeholders to one another, and through these connections, forming the routes that allow vessels to exchange batteries at each end.

EN ROUTE
Looking to the future, success relies on adoption of the system, and Skoon’s strategy is to grow port by port, incrementally making the connections that create feasibility of the model. The main focus is to increase Skoon’s presence in ports close to densely-populated areas. These locations hold the promise as they rely on a lot of power for many other applications besides marine logistics. This means a higher chance of achieving a simple connection to a local power grid through which to charge the batteries and also the potential of access to nearby onshore applications for the batteries, such as the festivals and construction sites mentioned earlier. In this way, Skookboxes can become part of the overall infrastructure of the location.

Damen also plays a role here. In the words of Peter Paul, “Every customer Damen talks to in the world has an energy demand. Together, we can help to find a sustainable solution for their demand. Skoon can analyse the energy profile of the customer and determine which type of technology can best help them to meet their needs.”

They say “necessity is the mother of invention.” As the sober reality of climate change forces us to adapt our behaviour, we are driven to find new solutions to meet our present and future challenges. With Skoon, the future looks a little greener. If the swappable battery method can help save logistics firms save money over the long term, while keeping in line with international regulations, the Skookbox could be the silver lining in a turbulent future.
Underwater sound reduction

"If you cause your ship to stop and place the head of a long tube in the water and place the outside extremity to your ear, you will hear ships at a great distance from you."

The statement itself does not come as a surprise—the connected nature of water molecules relative to, say, air molecules, simply put, ensures sound can travel a lot further underwater. What is perhaps surprising about this is that, when Leonardo da Vinci said it, it was 1490 and ships did not yet have engines.

Significant shipping

Leaving aside for now complexities relating to different frequencies and hearing ranges and leaving things simple, it’s easy to imagine that underwater sound today is both more prevalent and loud. In fact, it’s been estimated that underwater sound has doubled every ten years for the past six decades.

There are numerous factors—military activity, offshore energy exploration and operations and, of course, shipping. Shipping is the most significant. It’s certainly not the loudest, but it is the most widespread and, as vessels ply their trade across oceans and seas, day and night, throughout the seasons, the sounds of shipping are unceasing.

The effects this has on marine life are poorly understood, though it’s clear that there are effects. Perhaps the most obvious impact is that sound can literally compromise marine mammals’ survival.

Moving down the chain

There is no doubt that the impact of underwater noise may go further down the food chain too. That, for example, fish larvae may be killed by the sounds of pile driving as offshore construction takes place, that certain creatures may suffer not only hearing damage, but also undergo behavioural changes as a result—even very straightforward changes like loss of sleep.

Damen is well positioned to assist with the development of quieter ships—it’s something the shipbuilder has been working on for many years already, as Damen’s R&D valorisation Edwin van Buren explains: “We have been conducting research into the underwater sound profile of four ships for many years. To begin with, this had little to with ecology, but with ensuring the quiet operation of, for example, naval ships and research vessels.”

Taking a different path

Many shipyards outsource the profiling of underwater sound to classification societies or specialist companies, but Damen has always chosen not to follow this path.

“Doing it in-house is cost-effective for our clients. It also gives confidence to some clients keen to maintain confidentiality about their vessels’ performance—for example, navies. Besides, it makes sense to measure underwater noise on our own vessels. In the same way we look at characteristics such as speed or bollard pull, for example. Adding underwater sound measurement to our scope gives us control over a wider part of the shipbuilding process.”

Continuing in the loop

To these ends, Damen R&D has developed a continual ship design feedback loop based on four stages: predict levels, adjust design accordingly, measure levels, update model.

Tjarko Keizer, principal research engineer at Damen, has been working on underwater sound levels on Damen vessels for almost a decade. “If I look back, it started in 2001 with the Irish research vessel Celtic Explorer. We made a good start, she’s still the benchmark in quiet underwater sound today.

“Then it was a while before we were called upon to design something with quiet performance in mind. In 2011 we started again with a new research ship for Belgium. After that it went fast—there was one after another. The latest has been the Baia Parta fishery research vessel for Angola.

“There were also the SIGMA vessels (modularly built corvettes and frigates)—this is what we developed the measuring system for initially. The system he refers to is the patented Damen Underwater Sound Measurement System. The system is a mobile, modular one that features a hydrophone, tetrahedral cage and long measurement cables on a reel, all of which are lowered overboard to the seabed, and a battery-powered data recorder, a laptop and a ship-tracking GPS system, operated on board a support vessel.

Location, location, location

It’s a relatively simple piece of equipment, though it usage is not without challenges.

“It’s difficult to find a suitable place for carrying out the measurements. Location is key. The sea floor must be firm. The water must be deep—between 50 and 100 metres. And there must be no background noise. Given that sound travels so much farther in water, this requires a remote area.

Norwegian good

“The Norwegian Fjords are good, as NATO navies have long known. Quite significantly, in fact,” rejoins Edwin. “The biggest part of the cut was cavitation.

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Norwegian good

“The Norwegian Fjords are good, as NATO navies have long known. Though given the right environment, we are able to use the system on location. We’ve used it in Indonesia, for example on the PKR (frigates for the Indonesian Navy) and also in the Black Sea to demonstrate the compliance of the Baia Parta with the contractually agreed underwater sound levels.

“We are planning to use it again soon on the RSV Nuyina, Australia’s Antarctic Supply and Research Vessel that we are currently constructing at Damen Shipyards Galati.”

The findings of Damen’s work on underwater sound, though not originally aiming specifically at improved ecological performance, did, however, turn out to improve the sustainability of its vessels’ performance.

Cutting cavitation

“Quite significantly, in fact,” rejoins Edwin. "The biggest part of the issue comes from cavitation caused by sub-optimally performing propellers. By identifying this and optimising the propeller and other related parts—nozzles, rudder, even the hull form—we drastically reduce the level of underwater sound. At the same time, the optimal performance of the propeller has a direct and significant impact on reducing fuel consumption and thus, emissions. This brings together two benefits for ship owners: attention to underwater sound also generates energy efficiency.”

Damen’s underwater sound research is developing towards greater ecological usage. Damen was recently approached by KNIVTS (Royal Dutch Association of Marine Technicians) to give a presentation on a chosen topic. Having realised the potential of what they could do in the field of underwater sound, Damen selected underwater sound as its subject.

“We approached ecological experts Ecomare—specialised in seals in the North Sea to cooperate with us on this. We placed our focus on two things—what is the effect of underwater sound, so far as we know, to marine life and, based on this, what technology have we designed to improve the situation inside and outside of our vessels.”

Regulation ready

Following this, Damen was invited to join a consortium organised by the International Fund for Animal Welfare (IFAW), Rijkswaterstaat and partners including marine biologists, government bodies and research institutes as well as industry representatives.

“Participation in the consortium enables us to anticipate changes in the market. Combined with the experience we already have, we are able to respond quickly. The technology is clear, the measurements are clear, what is not so clear is the economic feasibility. As in any project, it is challenges that drive the development of solutions. The need for this going forwards couldn’t be clearer. Advice for best practice as regards underwater sound is there already, it’s highly likely such recommendations will pass into regulation. And when they do, we’re ready."
As of September 8th, 2019, the IMO’s Ballast Water Convention will extend its reach. From that date, the regulations will apply not only to newbuild vessels upon delivery, but to existing ones too. Existing vessels will be required to comply by the time of their first IOPP certificate renewal following that date. As ever, Damen Green Solutions is readying itself to provide the necessary support.

Damen launched the InvaSave 300 back in 2017 in preparation for the Ballast Water Convention coming into force the same year. The IMO-certified system is an external ballast water treatment unit designed primarily for use in ports and harbours. InvaSave treats ballast water in a single pass using mechanical filtration and ultraviolet radiation to remove and eradicate invasive organisms, to IMO-D2 standards, from inbound vessels. It can provide ballast water of the same quality to outbound vessels. Demonstrating the potential InvaSave has, Damen was recently asked to assist a vessel that had experienced a failure of its on board ballast water treatment systems.

“Its versatility extends way beyond its mobility, however. Who would have imagined, for example, that a port-based treatment system could serve the offshore industry?” asks Damen Green’s Philip Rabe. “Consider FPSOs – they are at sea for years at a time and need ballast water exchange only very infrequently. Nonetheless, they are required to comply with the regulations. InvaSave provides a solution without the need for costly conversion – and without taking up valuable onboard storage space.”

SHOWING SUITABILITY WITH SERVICE
In order to demonstrate the effectiveness of the system Damen has developed the InvaSave Service. Philip explains:

“With the InvaSave Service, we don’t only supply the InvaSave equipment for customers to treat ballast water, we come to you, operating the system ourselves, to actually treat ballast water in a certified and compliant manner. It’s part of Damen’s goal to go beyond merely supplying products and to be an innovative maritime solutions provider.

“We recognise that InvaSave is an innovative concept and that, despite proving its effectiveness via certification and awards, operators may like to see its results first-hand before committing to its use. Therefore have taken it upon ourselves to prove the product!”

BALLAST WATER TREATMENT ON TOUR
Damen initially launched the service back in 2017 and now things are in full swing. The company has built four InvaSave units and has successfully operated them in north European ports.

“We have now conducted several projects, in different ports, for clients who would otherwise have been stuck with no ballast water management solution available. The InvaSave Service clearly demonstrates the validity of the InvaSave business case.”

In order to further develop the InvaSave network, Damen is also participating in projects with other partners.

“For example, we are part of the EC-funded INTERREG Europe Blue Port Services project. This initiative aims at bringing together maritime stakeholders from throughout Europe to cooperate on issues relating to the management of ships’ effluents – including ballast water.

“With this we are performing demonstrations of the InvaSave in various ports. We are demonstrating what the system can do to a wide audience and, at the same time, playing our part in developing a consensus on best practice for reception station and maritime effluent management.

GROWING RELEVANCY
“The InvaSave Service and other demonstrations of the product have demonstrated what we believed from the start – that there is clear relevancy for port-based ballast water treatment. This relevancy will only grow in the coming months and years and we look forward to expanding the InvaSave network further.”
Damen Trading goes green

A glance through the pages of this magazine will quickly demonstrate that Damen – and the maritime industry as a whole – is making strides towards greater sustainability. As Damen approached the topic with increasing focus, it quickly became apparent that some of its operations already had a natural inclination towards sustainability.

One such example is Damen Trading. A part of Damen Marine Services (DMS), Damen Trading is the shipyard group’s brokerage service, specialising in the sale, purchase and charter of used vessels.

Unburdening with brokerage

When DMS started operations in 1974, Damen Trading & Chartering followed soon after. Its role, back then, was to promote the sale of used vessels from the DMS charter fleet. However, it soon demonstrated its potential, building a strong network, and slowly began to emerge as an independent brokerage service.

The first vessel sold by Damen Trading outside of the DMS charter fleet was the Susanne, a Polycat 2000 that was bought from a Dutch operator and sold on to Angola in 1986. Susanne was the first of over 500 vessels to date, traded to 77 countries around the world.

The new entity very quickly made a name for itself, gaining a lot of experience, notably in tugs and workboats, but also in coasters, crew boats, patrol boats and passenger ferries amongst other vessels.

Senior sales manager Michel Radjiman: “One of the main drivers is to unburden our customers. When they come to us, looking for a new Damen vessel, we are able to take care of their old vessel for them – Damen and non-Damen boats alike. This can contribute to making a new acquisition very smooth, saving the customer a lot of time and energy. They don’t have to find a buyer or worry about arranging recycling, for example. It also helps make the investment in a new vessel more cost-efficient.

“For anyone who operates an existing vessel and who is considering a new Damen boat, Damen Trading should be top of mind.”

Forming the circle

The advantages of Damen Trading go beyond the benefits of client support, however, as Michel goes on to explain.

“Nowadays you hear a lot of people talking about circularity and sustainability – this is a good thing. I think our industry has already made some important steps in this direction and undoubtedly has more to offer. You will certainly see Damen doing more and more towards this. The subject is one that aligns well with our values as a family company with a long-term view on things.

“In fact, it’s this same long-term approach that has led to the development of Damen Trading. In my view, we are already contributing to increased sustainability in the maritime industry. What we are doing is ensuring that used vessels that may otherwise be sent for disposal, are getting a second life.”

In many instances, in a further boost to maritime sustainability, the Damen Trading process goes further than simply extending the lifespan of a vessel.

Good as new

“A lot of the vessels that pass through our hands, before we sell them, we upgrade them. This not only adds value, but, naturally, applying the latest technologies to existing boats advances their green credentials as well – a lot of modern equipment is either aimed at or contributes to, greater efficiency in operation.

Damen Trading has an excellent track-record in converting and prolonging the life of vessels that might otherwise have been destined for the scrap yard.

“The examples are many and diverse. We’ve had crew transfer vessels converted into yachts, patrol vessels turned to security vessels. We’ve even taken patrol vessels, considered to be at the end of their life, and refurbished them to the extent that we were confident in offering them for re-sale with a one-year warranty. They were like new when we finished with them.”

The road ahead

The service is only likely to get more sustainable as the vessels it handles in turn become greener. “Right now, we’re handling the sale of the Bis Viridis, a Damen RSD Tug 2513. It’s not called double green for nothing. As well as offering the extreme efficiency typical of the RSD Tug 2513, Bis Viridis is IMO Tier III compliant, courtesy of a modular conversion that can be applied to all Damen’s new generation of tugs. (see page 26) When it comes to sustainability, we’re really just getting started and we’re looking forward to the road ahead.”

NOWADAYS YOU HEAR A LOT OF PEOPLE TALKING ABOUT CIRCULARITY AND SUSTAINABILITY... THE SUBJECT IS ONE THAT ALIGNS WELL WITH OUR VALUES AS A FAMILY COMPANY WITH A LONG-TERM VIEW ON THINGS.
FOR ALL OF US, AND PARTICULARLY IN THE YACHTING MARKET, OCEAN POLLUTION IS A GROWING CONCERN.

SO WHAT MEASURES ARE AMELS TAKING IN THE FIGHT TO PROTECT THE OCEANS FROM THE RISING TIDE OF PLASTIC POLLUTION AND MARINE LITTER?

Damen’s yachting activities, including its Amels superyachts, Yacht Support craft and SeaXplorer expedition yachts, are focused at its two yards in Vlissingen in the province of Zeeland in the south of the Netherlands. The province, renowned for its beautiful 650 kilometres of coastline, is popular amongst tourists and surrounded by on-water boating and shipping activity.

“Owning a superyacht is fun, we’re in the fun business,” comments Victor Caminada, brand and communications manager, “but we’ve all witnessed a growing appreciation of the threat that ocean pollution is to the long-term sustainability of our industry. It’s our clients’ playground and the problem reaches all our shores, even right here in our own backyard.”

CLEAN BEACH COLLABORATION

Three times a month the Vlissingen team invites local residents as well as students and sustainability lecturers from the local HZ University of Applied Sciences to join them in cleaning up rubbish and plastic on Vlissingen’s coastline and inner harbour. Beach clean-ups are made logistically possible thanks to a collaboration with the local council and above all the harbour master who provide know-how, materials and responsible disposal of collected waste.

BETTER BINS

Initiatives to promote, sustain and facilitate clean beaches include the Amels-sponsored iconic ‘arty’ rubbish bin located next to one of the area’s most popular beach restaurants, run together with the environmental organisation Doe Mee, Verlos de Zee (Join us, save the sea).

At the Vlissingen city yard, a large floating rubbish bin called a Seabin filters out unwanted waste and plastic, generating improved water quality and collecting an estimated 1.5 kilograms of drifting waste per day. Located in the harbour on the doorstep of the yard, the Seabin minimises the plastic and waste that washes up on local inland water shores and beyond.

FISHING FOR LITTER

The North Sea provides plentiful fishing grounds, but the nets designed to trawl the latest catch more often than not also reel in unwanted marine litter. Fishing for Litter is an initiative that provides hardwearing bags for the collection of any marine litter caught in the net and facilitates and funds the deposit of the waste on the quayside at participating ports. Amels is proud to sponsor Fishing for Litter for the Vlissingen fleet of fishermen located next to the shipyard.

SEALS

An extensive eco-system of marine life depends entirely upon the ecological balance of the waters surrounding the shores local to Amels. There is no better measure than the presence of seals who will only thrive in waters of the highest quality. Sponsoring the local seal sanctuary Aseals guarantees care and rehabilitation to ensure as many seals as possible can be returned safely and healthily to the place they call home. On March 14th, two rehabilitated seals adopted by Amels were released back into the sea in Vlissingen.

SCHONE SCHELDE COVENANT

The Scheldt estuary, which forms a significant portion of Zeeland’s coastline, sees 40,000 ship movements a year and is home to a number of large industrial firms. In February 2019, 28 local parties including Damen signed an agreement acknowledging the joint responsibility to tackle litter waste problems at source thus preventing contribution to the global ‘plastic soup’ issues. The covenant marks a landmark decision locally in cooperation, responsibility and pro-active measures in the fight to sustain our local and global shorelines and oceans.
Zeeland, in the south west of the Netherlands, is in some ways the quintessential Dutch province. It is green and largely flat and boasts more than its fair share of colourful windmills. Look a little closer though and this is a place apart. Sandwiched between Holland, Flanders and the North Sea these islands and former islands have their own distinct history and traditions, a unique cuisine and a people that have forged an identity all of their own.

In cities such as Veere, Goes, Zierikzee and capital Middelburg, bell towers of Flemish gothic harmoniously chime over pantiled rooftops. Below, shuttered windows adorn immaculate gabled houses that lean precariously – and charmingly – over cobbled, hollyhock-filled lanes. Here, in this article, we talk to Damen Shipyards Group employees who have come to the Netherlands from other countries and made Zeeland their home and place of work. We find out just what it is that attracts them to the coastal south-west of the country.

Emerging triumphant
With their long traditions of farming, fishing and shipbuilding, the Zeeland people have become known for stubborn persistence and hard work. Characteristics attested to in the provincial coat of arms, which show a lion ferociously emerging from the waves, bearing the legend Luctor et emergo – I struggle and I emerge.

It’s not all about hard graft, however. Zeeland is a land blessed not only by sea, but also by Sun. Locals will never tire of telling visitors that the area boasts the most hours of sunlight in all the country. These days the winning combination of Sun, sand and peaceful countryside attracts many visitors from neighbouring provinces and countries looking for leisure. There is much to amuse both tourist and resident alike.

Made by the sea
The sedate, peaceful nature of Zeeland belies its historical greatness. During the Dutch Golden Age of the 17th century, Middelburg was second only to Amsterdam in importance and the Dutch East India Company (VOC) had offices in town.

In those days, the quays of Zeeland hummed with the bustle of international trade. Spices, cloth and porcelain arrived from distant shores as merchants, mapmakers and shipbuilders busily went about their work.

The character of the Zeelandic people is summed up by the words on the province’s ancient coat of arms: Luctor et emergo – I struggle and I emerge.
Djordje Kostic, a native of Montenegro, has been a resident of Zeeland for over 20 years now. He lives with his wife and two children in Vlissingen and works as a production coordinator at Damen Shiprepair Vlissingen.

“I’m happy in my job; it fulfills my passion for shipbuilding and repair. More than that though, I appreciate the family feeling at Damen. There’s a sense of solidarity with your colleagues, which makes for a pleasant cooperation. There are also plenty of opportunities for growth and personal development.”

Djordje is pleased that he was able to find his dream job in such a location. “I wouldn’t want to live anywhere else in the country. I came here originally to work in the offshore and petrochemical industry and my role was based in the Port of Rotterdam. The traffic on the roads and the general busyness there is so different to the relaxed pace of life in Zeeland.”

He is, however, used to urban life. “I was born in a large, busy city – a real contrast to my life here in Vlissingen. I find the pace of life here preferable. I am never stuck in traffic like I would back home or in the more urban parts of the Netherlands. Everything is close here, so I don’t lose precious time moving between work, home and leisure.

“The peace & quiet and abundance of space here means it’s a good place to bring up a family. Zeeland is the perfect place for being both active and relaxed. I like to do sports and there’s plenty of opportunity for that and, equally, it’s nice just to sit and read here, in lovely surroundings.

“The Zeeland coast is beautiful. My personal favourite area is the Boulevard and the Bellamypark in the centre of Vlissingen. Here you are really close to the water's edge and the ships coming from Antwerp and Zeeland Seaports pass very close to land. It’s easy to connect to the maritime heritage of the Netherlands here.”

A land of heroic deeds
As the name suggests, the sea is never far away in Zeeland (sealand). Maritime and naval tradition runs deep here. This was the home of famous Golden Age Admiral Michiel de Ruyter, renowned, amongst other things, for his daring raid on the Medway during the Anglo-Dutch wars of the 17th century. De Ruyter sailed the Dutch fleet up the Thames Estuary in England, into the River Medway, where he destroyed numerous English ships before capturing the flagship, HMS Royal Charles, and towing her back to the Netherlands.

Zeeland flexes its mussels
The sea has provided food to the local inhabitants since ancient times. Back then, Nehalennia, Goddess of the sea, was worshipped in these parts. Zeeland has become renowned for the bounty of the waves. Its mussels, oysters and lobsters symbolise the menus of Belgium and the Netherlands’ finest restaurants. These days, Zeeuwse mosselen – Zeeland’s mussels – are available year round. In July, however, Middelburg still celebrates the start of the season with a festive street party featuring diverse mussel-based dishes, washed down with plenty of wine and beer to the sound of live performers, both modern and traditional.

In this way, both the salt-water ecosystem and the region’s time-honoured fishing traditions have been preserved.

Zeeland is a land apart
Outside of the towns and villages Zeeland offers some wonderful opportunities to explore nature.
“THERE ARE LOTS OF LOVELY SECRETS TO DISCOVER HERE.”

Yunzhu Jin first came to Zeeland, from China, to attend the Hogeschool Zeeland University of Applied Sciences in Vlissingen. During studies for her MBA in Business Administration, she carried out an internship at Damen Schelde Naval Shipbuilding (DSNS). Prior to her working for 9 years at Damen’s head office in Gorinchem, as sales support for the Asia Pacific region. During that time, she met her husband, Erik Luiten, who works at DSNS as a contract manager for weapons systems. Around the same time, Amels was looking to increase its presence in Asia, paving the way for Yunzhu to return to Vlissingen.

“Zeeland is a great location for me. In my role I travel to some of the busiest cities in the world, Tokyo, Hong Kong, Beijing, Shanghai. So when I come home I am happy to be in a peaceful, quiet place.” Yunzhu, who has a young son, also feels the region in a good place for family life.

“It’s not just that it’s beautiful and unspoiled, there are also some of the best schools in the country here. And the house prices are very good, too. You get a lot more for your money here than you do in the big cities of the Netherlands.

“Some people have this idea that Zeeland is very far away from everything. It can certainly feel that way as it can be very quiet and relaxed here, but, really, it’s a very convenient location. Rotterdam, Amsterdam, Brussels, Gent, Antwerp and Brussels are all easily reachable for a day trip. Though, actually, the cities of Zeeland have everything you need anyway. The shopping is very good and there are lots of excellent restaurants.”

The cuisine is something that particularly appeals to Yunzhu.

“The seafood is outstanding here. There are lobsters, oysters and mussels, all harvested from very pure coastline. It makes it very easy to leave the office and go for lunch with colleagues on the Boulevard.” Yunzhu first came to Zeeland, from China, to attend the Hogeschool Zeeland University of Applied Sciences in Vlissingen. During studies for her MBA in Business Administration, she carried out an internship at Damen Schelde Naval Shipbuilding (DSNS). Prior to her working for 9 years at Damen’s head office in Gorinchem, as sales support for the Asia Pacific region. During that time, she met her husband, Erik Luiten, who works at DSNS as a contract manager for weapons systems. Around the same time, Amels was looking to increase its presence in Asia, paving the way for Yunzhu to return to Vlissingen.

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“Despite all this, Zeeland is still relatively unknown, but there are lots of lovely secrets to discover here.”

Roberto Santoro has lived in Zeeland’s capital city, Middelburg, for the past three years. He moved to the area after taking on the position of design engineer combattant for Damen Schelde Naval Shipbuilding (DSNS). Prior to his locatig in the south west of the country, Roberto had lived for two years in the Randstad – the urban area that contains most of the country’s larger cities in the centre of the Netherlands.

“Zeeland is a distinct place,” he says. “Coming from Italy I expected the Netherlands to be this highly developed country with an extremely dense population, busy roads… That’s not Zeeland at all!”

Roberto’s decision to move to the Netherlands was career-based. “During my time as a naval architect in Italy, designing fast ferries, I worked on projects that gave me a taste of northern European culture and I liked the way it was structured. After my son was born, we decided to move and it was in the Netherlands I found an opportunity.”

He first worked as a yacht builder, but was attracted by the technical challenges available at DSNS.

“LIVING IN ZEELAND IS LIKE BEING ON HOLIDAY, BUT ALL THE TIME!”

As the season comes to a close, the NazaerKerstfestival (after summer festival) marks the turning of the seasons with music, drama and temporary works of publically displayed art. Then, as winter approaches, the lights go out in Middelburg for the Nacht van de Nacht (night of the night). People line up early, by bike or on foot, through the cobbled lanes. With winter in full swing, the cheer continues with Dickensian swing, the cheer is kept alive with Dickensian...}

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“As it was the work that brought me to Zeeland, but I’m very glad that it did.

What does he like about living in the region?

“The quality of life is very high here. With Middelburg being a small city, there’s less pressure on the municipality and so everything functions very well. Things are arranged very quickly and efficiently.

“And there’s no stress. In Italy I had a commute of just 1, maybe 2 kilometers, but it was on busy roads. It used to take me 40 minutes. 40 minutes of dealing with congestion and aggression. There’s no traffic here, I don’t even know if the horn in my car still works.

“I like the fact that I can step outside my door and I’m instantly surrounded by nature. In my spare time I like to cycle and the cycling network here is wonderful. I also enjoy nature photography and the landscape here is perfect for this. For example, the forest, dunes and unspoiled beaches at the Oostvaarders national reserve.

“Living in Zeeland is like being on holiday. All the time.”
In 2018/19 Damen has delivered 175 vessels for all sectors of the maritime industry, all over the world.
RECENT DELIVERIES

- Damen Yacht Support Vessel Game Changer
- One of two Fast Ferries 4212 for Mabuhay Maritime Express Transport, Inc., Philippines
- Damen ASD Tug 2411 Al Maryah 1 for Abu Dhabi Port Company
- ASD TUG 3010 ICE Aleksandr Koshin
- Fast Crew Supplier 5009 for Naviera Integral, Mexico
- Stan Tug 1205 Triton
- CSD500 for Basra Gateway Terminal
Joke Bek is no stranger to the diversity and career progression that working at Damen offers. In 2012, she started working at Damen Shipyards Gorinchem, first as a trainee in Service Logistics and later as a business analyst. In 2016, Joke moved within the Damen Group to take up the role of engineering process manager at Amels. “The Yachting side of the company had always fascinated me. I was intrigued by the complexity and beauty of the yachts and how everything is brought together in one complete polished and luxurious package,” says Joke. “It’s a very motivating environment to be in. There is positive ‘buzz’ around the yard and everyone takes great pride in their work. Beyond Amels, the beautiful beaches, coastline and family-friendly towns make Zeeland a great place to be based. Naturally, my work is not without its challenges but that is in fact what drives me the most. We are in a period of growth at the moment that brings with it a number of changes both in how and with whom we work. This in turn demands adaptability but also creates new opportunities and new projects.

“In line with these changes, my role has taken yet another turn. I am currently the project manager for the new CAD PDM implementation at Yachting. It is a long term project that will see engineering move over to an entirely new, state-of-the-art, 3D software platform for the configuration of yachts. It represents an investment in our future, preparing the way for more consistent, efficient, accurate and future-proof practices across the entire company.

“Gone are the days when people stuck to the same specific job for their entire career. There is now a global trend for people to switch careers or companies far more frequently. By formalising procedures, standardising processes and documenting vital knowledge, Damen is safeguarding its future but also making it an even better company to work for. One that is willing to adapt and embrace the very best tools to provide its employees with everything they need to get the job done in the best possible way.”
The many vessels currently under construction at Damen yards demonstrate the diversity of the group's portfolio.
Every year Damen’s designers bring fresh, innovative designs to answer the ever-changing needs of the maritime industry.
Each year around 1,300 vessels call at the yards of Damen Shiprepair & Conversion for refits, maintenance, conversion or repair. We cater for all vessel types and sizes at our facilities at key locations.
WHEN ASKED WHAT DROVE DAMEN TO COME UP WITH THE NEW ASD TUG 2813, DESIGN AND PROPOSAL MANAGER ERIK VAN SCHA IkGIVES A STRAIGHTFORWARD ANSWER: “SAFETY, RELIABILITY AND EFFICIENCY”.

“To elaborate, there are two markets for 80-tonne bollard pull multipurpose ASD tugs; those over 30 metres and those under. The vessels over 30 metres typically spend most of their time offshore where their length is needed to ensure good seakeeping behaviour in heavy seas. For this market, we offer the Damen ASD Tug 3212.

“However, if your tugs are operating most of the time in locks and harbours you need something that, while maintaining sufficient propulsion power, is more compact and manoeuvrable. In the past we supported this sector with the ASD Tug 2913, but with the increasing size of container ships we needed to be able to offer operators a vessel with the necessary power but which was also more competitive. Shaving a single metre off the length of a tug might sound an unremarkable step, but doing so took the design below the critical 400 GRT threshold, without making any concessions on functionality or capability.

SAFE SAILING
Some of the results of creating a shorter tug might, initially at least, seem surprising. “In fact,” says Erik, “despite being shorter, as the hull form of the ASD Tug 2813 features less tapering and less beam amidships, the new design actually increases stability!” The hull form of the vessel forms a key part of the ASD Tug’s enhanced safety characteristics in general. For example, its smooth, rounded shape allows the water to flow effortlessly around the hull. This results in a continual, predictable availability of thrust.

“The freeboard’s 1.6-metre height gives the foredeck three metres clearance from the water under load, ensuring that it remains dry in most conditions, continues Erik. The shape of the aft deck also avoids the collection of water, which keeps things dry astern as well,” explains Erik. “Also contributing to the safety is the large single skeg. This makes the steering easy and stable, even with just the one thruster, and the freeboard has been well thought-out with the tumblehome up to 40 degrees.”

“The wheelhouse, which is also very compact, has been designed to provide maximum visibility. Large, tinted windows provide a complete, unobstructed view fore and aft, while sky windows give an optimal view of the assisted vessel. With the wheelhouse leaning inward, it makes the ASD Tug 2813 ideal for working under the flare of a container vessel.”

The glass used in these windows is the patented Damen Safety Glass. This glass is laminated and shatterproof, and so gives protection to those inside in the event of a towing line snapping. It meets the NEN-EN 356 standard for glass used in buildings, defined as ‘resistance against manual attack’. The test for this involves dropping a ball weighing 4.11 kilogrammes three times on to the surface of a window from a height of 6 metres.

“Safety is always a focus on Damen vessels and is only going to increase in importance as our tugs continue to evolve. For example, we are currently developing electronic stability protection for the entire range. This will clearly alert the crew when a vessel is approaching its stability limits during operations so that they can take timely action.” The vessel, like all in Damen’s next-generation range of tugs, is prepared for the more rigorous stability regulations that are coming into force next year, and it boasts numerous other features that make it easier to operate, allowing for a greater focus and further increasing safety.

“The user interface has been evolving continuously since it was first unveiled last year on the RSD Tug 2513,” says Erik. “We received a lot of helpful feedback about it, which we have consolidated and taken on board to deliver version 2.0.” The interface is ergonomically designed with user-friendly consoles, operating panels with controls, monitoring and alarm functionality as well as nautical information, main engine data feeds, and winch and auxiliary controls. All the data is presented in an easy to access manner, with the user able to select relevant information to be displayed as required.

THE NEXT-GENERATION ASD TUG 2813

THE ASD TUG 2813 HAS BEEN DESIGNED THROUGHOUT FOR THE BEST USE OF SPACE. THIS CONTRIBUTES EFFECTIVELY TO THE GOALS OF BOTH SAFETY AND EFFICIENCY.
"The ASD Tug 2813 has been designed throughout for the best use of space. This contributes effectively to the goals of both safety and efficiency. From a safety perspective, the main deck, which is optimised for various towing modes, gives excellent accessibility to the winches, bollards and fairleads. The aft deck is also open and clear with no obstructions. In the engine room the spacious, uncluttered theme continues. Here, the engines are mounted on shock absorbers and the piping system fitted in such a way as to ensure low vibration and noise levels. For maximum safety, all the equipment in the engine room can be controlled from the main deck. The crew can also monitor the alarms, analyse any problems and take the necessary action, all from a safe location.

**RELIABILITY AS STANDARD**

Erik says that the fact that the tug is a new design is no barrier to its claim to reliability. “Although it’s a new design featuring a lot of innovation, the ASD Tug 2813 is heavily on its proven Damen heritage and uses a lot of tried and tested technology,” he asserts.

To ensure the reliability of the tug, Damen has taken great care in the design process. Damen’s TugSim software allows us to calculate the escort forces on the towing line and so predict the effects that these will have on the performance of a tug. The findings are then incorporated into the design for optimal efficiency and predictable behaviour. “The theme of efficiency continues with the build,” says Erik. “We’ve streamlined this to use the minimal possible number of components, so construction takes less time.”

**ENERGY, ERGONOMICALLY & ENVIRONMENTALLY EFFICIENT**

"The ASD Tug 2813 is efficient in every way – starting with the design process. Damen’s TugSim software allows us to calculate the escort forces on the towing line and so predict the effects that these will have on the performance of a tug. The findings are then incorporated into the design for optimal efficiency and predictable behaviour. “The theme of efficiency continues with the build,” says Erik. “We’ve streamlined this to use the minimal possible number of components, so construction takes less time.”

The tug is also an efficient working space. It features a carefully planned layout that aims for smooth working logistics. Starting with the uncluttered, spacious deck, every detail has been taken into consideration. For example, when you enter the accommodation, the first thing you encounter is a changing room – forming a cross-over space between the living and working areas.

“In the accommodation areas we’ve given plenty of thought to crew requirements. Their living areas are spacious, in spite of the vessel’s compact nature, and constructed of durable, waterproof materials. Electrical sockets are well spaced to give easy access for charging mobile phones, for example, and each cabin has its own en-suite facilities.” The vessel also has very low noise and vibration levels, with COMF-NOISE 3 and COMF-VIB 1 notations, and a comfortable mess room provides a communal living space with settees, radio and TV.

Back on deck, the vessel is prepared to be fitted with Damen’s highly-efficient Recovery & Recovery Winch. This compact system contributes to the vessel’s spaciousness and facilitates excellent views from the wheelhouse. It has no gearbox, no additional clutches, no water-cooled disc brakes and no different speed/pull settings. This, combined with its control via the ergonomic human-machine interface, makes for a highly user-friendly operation.

**STRONG, STABLE & SUSTAINABLE**

Where the vessel’s efficiency truly reaches its peak, however, is in its sustainability. “By its very nature, such a compact vessel uses significantly less fuel at normal operating speeds and the smooth hull provides a high level of agility that contributes further to this. When the vessel performs in direct towage it requires less fuel for higher line forces.”

To meet Damen’s, and its clients’, goals of increased maritime sustainability, the design of the ASD Tug 2813 has once again gone into every conceivable detail to identify enhancements. “By creating a vessel that functions at the optimum size, less auxiliary power is required, once again reducing fuel consumption. All of these measures drive down fuel consumption, thereby considerably reducing both the OPEX and emissions. In the same way, the laminated Damen Safety Glass windows provide effective insulation and bring down the required use of air-conditioning capacity by a considerable 50%.” There are also options with the vessel that can further extend its environmental credentials. For instance, it can be supplied with its own sewage treatment system and bilge water separator if required. Another option is a Marine NOx Reduction System, which will ensure that it is fully compliant with IMO Tier III regulations.

This works by injecting urea into the exhaust. This triggers a chemical reaction with the gases that reduces the NOx emissions by substantially more than the 80% required to comply with the regulations. The vessel can also be supplied with Bureau Veritas Clean Ship Notation or Lloyd’s Eco Notation. The ASD Tug 2813 offers not only a sustainable performance by today’s standards, but also by those of tomorrow. It’s ahead of the game,” he concludes.

You can read more about the ASD Tug 2813’s ability to comply with IMO Tier III regulations on page 26 and about its crew comfort credentials on page 92.

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**THE LAMINATED DAMEN SAFETY GLASS WINDOWS PROVIDE EFFECTIVE INSULATION AND BRING DOWN THE REQUIRED USE OF AIR-CONDITIONING CAPACITY BY A CONSIDERABLE 50%**

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**AZIMUTH STERN DRIVE TUG 2813**

**Towing winch**
*Hydraulically driven two speed double drum, low speed pull 31 ton at 27 m/min, high speed pull 27 ton at 49 m/min, brake 200 tonnes*

**Beam overall**
7.39 m

**Length overall**
12.93 m

**Draught at sides**
3.20 m

**Draught amidships**
4.00 m

**Displacement (approx.)**
645 t

**Main engines**
5050 bkw (6772 bhp) at 1800 rpm

**Bollard pull ahead**
85.0 t

**Bollard pull astern**
80.0 t

**Rolls-Royce US 255/390/390 TP**

**Hydraulically driven enclosed double drum low speed pull 31 ton at 27 m/min, high speed pull 27 ton at 49 m/min, brake 200 tonnes**
The Stena Don, a harsh environment, dynamically positioned, fifth generation semi-submersible drilling rig capable of drilling in waters up to 650 metres deep, is owned and operated by Stena Drilling. 95.5 metres in length and with a beam of 67 metres, she was built by the Kvaerner Warnow Werft Shipyards in Germany in 2001 and, following the refit, has accommodation for up to 140 personnel. The installation of an eight-point mooring system was deemed necessary for her future drilling contracts. The Stena Don already had a DP3 system for maintaining position, but an anchor-based system is more effective in shallow waters and, by not having thrusters in continual operation, emissions can be significantly reduced and substantial savings on fuel costs made.

As well as the anchor chain lockers, the installation of the mooring system included fitting eight anchor winches and their fairleads plus the winch control cabins, new VFD switchboards and brake resistor units. The eight ultra-high-holding power anchors were delivered by Damen’s Anchor and Chain Factory. In addition to that the yard also strengthened the hull to comply with the new regulations regarding the mitigation of wave impact forces. All this extra weight then required the fitting of the two additional sponsors fabricated at Damen Shipyards Mangalia in Romania to maintain stability. Meanwhile, the POB (personnel on board) was upgraded to accommodate the CDU (central drilling unit) and the drillsite operations. The new DP5 system the vessel received also meant that a total of three thrusters were removed over the course of six days, after which she entered DVR, moored alongside the quay, and work on board immediately began.

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On 18th February 2019 the Stena Don exited the yard for the Maasvlakte and the reinstallation of its DPS thrusters. The official handover to Stena Drilling followed on 26th February, in line with the original schedule. The next day she departed for Bergen for inclination tests and additional assessments prior to starting work off the Shetland Islands.

This was a major project with limited time available, and it had its challenges.” said Jan Kees Pilaar, managing director of DVR. ”It was effectively a turnkey project with DVR handling every aspect including the engineering. However, we know Stena Don from previous projects and have an excellent working relationship with Stena Drilling, so the combination of familiarity with the vessel and the support of different specialist units within the Damen Group ensured a successful conclusion.”

“We are deeply impressed with how DVR, in close cooperation with our own first-class project team on site and all involved subcontractors, managed to successfully complete this very challenging project on time, on budget and without incidents,” added Fredrik Samuelsson, commercial project manager at Stena Drilling. “A lot of work had to be completed in a very short timeframe and this could only be achieved thanks to the professionalism and dedication shown by DVR throughout the project. The result is a very capable and highly versatile rig which will make us and our clients proud for many years to come.”

Despite the size and scope of this project, while it was going on DVR was undertaking a series of other projects including an upgrade for the 198-metre Saipem 7000, one of the largest semi-submersible crane and pipe-laying vessels in the world. In the world of offshore repair and refit, DVR really is a force to be reckoned with.
THE ART OF SHIPBUILDING
A PLACE OF WORK AND ITS WORKS OF ART

Every year in the Damen Magazine, we look at the work the Damen Shipyards Group and the Damen family do to encourage the arts and access to them. Each edition, the magazine speaks to a theatre, museum, gallery or other such institution with which Damen has a relationship. This year, however, we decided to do things a little differently and instead take a look at the works of art to be found at Damen’s headquarters.

The Damen family has a love of art, something that they are keen to share with others. Josien Damen: “We want to encourage access to culture wherever possible and this certainly includes our own employees in their place of work.”

To those ends, works of art are displayed at various public spaces and in a number of offices at Damen Shipyards Gorinchem. Here, Mrs Damen takes us on a tour of some of the paintings, sculptures and photographs to be found at Damen’s HQ.

**PIECE BY WILLEM HENDRIK MESDAG**

Mr Damen is very fond of the Haagse School and there are a number of examples in his office. This example shown here is by Mesdag.

“Mesdag often painted Dutch coastal scenes. The sombre colours used by the Haagse School painters are perfect for depicting the North Sea and its fishing fleets. He was also very good at capturing the dramatic Dutch skies and their clouds,” says Mrs Damen.

**FAMILIEBEDRIJF JAN LEEUWENBURGH**

In the reception of Damen’s HQ, at the entrance to the building, guests are greeted by a sculpture by Jan Leeuwenburgh. It depicts numerous people crowded into a small boat and is named, appropriately, familiebedrijf – family business.

“I like Jan Leeuwenburgh’s work very much,” states Mrs Damen, who is herself a ceramist. “There’s a lot of humour in it.”

This is the product of the artist’s simplified style. Leeuwenburgh is a local artist whose work has been influenced by the region – including the presence of the shipbuilding industry.

“His work is very special. It’s endlessly polished until it looks like stone,” continues Mrs Damen. “This piece to me represents the very extended network of the Damen family.”
DECKS AWASH – MONTAGUE DAWSON

Montague Dawson was a famous, British maritime artist. The example shown here is hung on the wall of Mr Damen’s office.

“He liked this painting because it’s so realistic. Look at the movement of the waves – I almost get seasick from it!”

The painting shows a barque in rough seas taking water on deck.

“Life was like that aboard such a ship. It was hard. It was rough. Dawson was really able to capture the moment.”

INDIË WAS ONS PARADIJS – ANNELIES DAMEN

This series of photographic images – which have been displayed throughout the Netherlands – were created by a member of the Damen family – Annelies Damen. The pictures are a tribute to Mrs Damen’s mother and can be found adorning the walls of Damen’s museum and archives.

Following Indonesian independence in 1949, many Dutch people were forced to leave the islands over the next two decades – including Mrs Damen’s family.

Each image, with names such as Mist, Joy, Farewell and Blossom show scenes from Indonesia, such as flowers, paddy fields and landscapes. In each of the images, in a watermark-like fashion, Mrs Damen’s mother can be seen.

The final image in the series shows the sea. “This is the sea they had to cross to come to the Netherlands. My mother never returned to Indonesia until she was in her 80s. It took her a long while to be able to go back.”

FLOWERS – ZHUANG HONG YI

In the office of Kommer Damen’s secretary, Eliza Erkelens, hang two pieces from Chinese artist Zhuang Hong Yi’s Flower series – Royal Blue and Sunrise.

Eliza explains, “The artist uses special materials, forms and colours to combine traditional Chinese influence with characteristics of western impressionism. He’s based in the Netherlands actually, but returns to his studio in Beijing a few times each year for inspiration.”

Eliza is very happy with the colourful images that adorn her office walls. “The pictures are very bright and cheerful – many people comment on them when they come into the room. I was really happy when they were placed here.”

STAAND OBJECT – VERA GALIS

Staan Object (Standing Object) stands at the entrance to ‘the tower’, the newest building at Damen Shipyards Gorinchem, which opened in 2009.

“We wanted to give something to the new building when it opened,” says Mr Damen. “We thought it would be nice to do something with a local artist.”

The local artist was Vera Galis. Vera works with metals, painstakingly making each piece of her sculptures by hand. Her work is displayed in public areas of organisations around the Netherlands. It uses space, light and reflection to create interaction between architecture and art. The building at Damen’s headquarters is itself a very light and spacious one so is a fitting place to show such an approach.

“When we commissioned her, Vera was asked her to do something that would fit with what we do. She was inspired by the nozzles on vessels being constructed in the production hall.”

NEW YORK CITY – A MARATHON FOR ALL

“We saw this James Rizzi piece in a gallery in Switzerland and were immediately taken with it.”

The Damens selected the image to hang in a communal seating area where colleagues go to talk or take telephone calls. The piece, from 1997, shows the cityscape of New York during a city marathon in the cheery, 3-D style for which the artist is renowned.

“I just loved the elaborate details of it, there’s so much going on, you can spend hours looking at it,” states Mrs Damen.

BOWL – OLAF STEVENS

This piece, to be seen in the library at Damen Shipyards Gorinchem, is made by local artist Olaf Stevens, husband of Vera Galis who made Staand Object (described above).

“Olaf has a very special technique, that he developed himself. He uses multiple layers of coloured glass, repeatedly heated and molded before the final cut and polish. This piece looks very simple at first glance, but if you look, the colours are beautiful.”

The bowl is a deep purple colour, inlaid with gold leaf, offering a subtle, pleasing contrast.
When it was first introduced to the maritime market, Damen’s Fast Crew Supplier (FCS) 2710 – the successor to the FCS 2610 – hit the headlines for many reasons. Stepless and safe crew transfers, increased passenger capacity and an optimised hull are all pieces of the puzzle that illustrate the evolving design. All in all, the new FCS 2710 packs a lot of vessel into its 24-metre load line. Despite all the media attention, there is one particular development on the FCS 2710 that deserves to be put into the spotlight: its on board vessel monitoring system.

The launching customer of the first FCS 2710 was UK-based offshore crew transfer service provider High Speed Transfers, a relatively young company with a clear focus on the European offshore wind sector. The company deploys this first vessel – called HST Hudson – to transport up to 26 personnel to their offshore workplace with a combination of high speed and comfort. With regard to the subject of this article, though, the most notable feature of the HST Hudson is that it is the first new build vessel from Damen’s High Speed Craft portfolio to be equipped with vessel monitoring equipment.
Impact loads

This raises the question what were the motivations behind installing a vessel monitoring system on board a crew transfer vessel? “For this client, one of the most important aspects was to measure the impact of the boat landing on the turbine platform,” replies Thijs Muskens, design & proposal engineer at Damen. “These turbines are designed to cope with a certain load and it is the captain’s responsibility – and therefore our responsibility – to make the approach as smooth as possible and not exceed the impact threshold limit. Offshore wind majors are becoming increasingly data-driven and desire fact-based proof of impact loads for the vessels operating in a wind farm. This proof can be generated by the connected ship system.”

In addition to the actual landing on the turbine, comfortable transport from shore to the wind farm is another part of the process. To this end, another reason to gather data is to improve the comfort of this journey. “This is an important feature in our entire range of high speed craft,” he continues. “We want vessels like the FCS 2710 to be as comfortable as possible. In general, the technical personnel on board do not have that much experience at sea and, as a result, are more prone to seasickness than experienced crews. We want to postpone this for as long as possible and gaining insight into the perceived comfort can help us do so.”

Six degrees of freedom

A six degree of freedom accelerometer sensor is used to measure the amount of movement on the vessel. “These measure, amongst others, pitch, heave and yaw,” explains Thijs. “If the captain can see the acceleration levels during sailing, this can be linked to the general well-being of the passengers.” These data relating to accelerations have a dual purpose. “Of course, it is very useful for the captain to have on-the-spot feedback. But our customers also want to know the comfort levels on board, and, importantly, to be able to back this up with hard data.”

One of the difficult things to determine is an acceptable level of vertical acceleration. This is due to the subjective nature of the human experience. “Storing data and linking it to the experience of the crew can help with this,” says Matthijs Richelle, Damen Services development manager. “A future plan that we are experimenting with is a ‘smiley face-sad face’ feedback method to measure perceived comfort. By matching comfort levels to actual data parameters such as wave height and ship motions, we are trying to translate the human experience into numbers. Learning from the data is important – this will allow us to advise our clients on their sailing profile, for instance.”

Different questions, different answers

The offshore wind sector – indeed, the entire maritime industry – is becoming increasingly driven by data. Providing data on a vast array of parameters – including sea state, wind direction and number of transfers – is becoming the new industry standard. It should, therefore, be of no surprise to read that Damen is not limiting its work on the subject of vessel monitoring solely to its Fast Crew Suppliers. “Every product that Damen builds has different parameters in terms of performance and we want to answer the different questions that each product group has,” notes Thijs. “Speed and comfort are the most crucial factors for our high speed craft. Tugs are different though – then it’s more about towing force. For offshore transport, workability and fuel consumption are important. And for dredging, we propose looking at dredge production rates and performance. The most important point for us is to translate sensor data from performance indicators to create insight for our customers to optimise their operations. Moreover, we can also use these data to improve the designs of our vessels.”

Installed as standard

Vessel monitoring is certainly a powerful tool in the shipbuilder’s tool box. At its simplest, it is a method to observe what is happening with the operations of a vessel at any given time. “In effect it is a live representation of what is happening on the vessel,” says Matthijs to highlight how Damen is endeavouring to maximise to the full potential of vessel monitoring by taking this a step further. “What we are currently developing is a system that is based on the data gathered – an analytical tool that will assist onshore teams to improve and create insight into their offshore operations.” The possibilities are undeniably extensive and, in fact, Damen is installing data collection systems on all newbuild vessels with a compatible alarm monitoring system as standard. In terms of passenger comfort and sailing routes, for instance, concrete progress has already been made. Looking ahead to the impact that vessel monitoring will have on preventative maintenance, vessel performance analyses and simulation – and even ship design, the future is exciting.
THIS YEAR, DAMEN SHIPYARDS GROUP CHAIRMAN KOMMER DAMEN TURNED 75. HE HAS SPENT HIS WHOLE LIFE IN THE SHIPBUILDING INDUSTRY, GROWING UP ON THE FAMILY SHIPYARD BEFORE TAKING OVER THE BUSINESS HIMSELF. DURING A SUCCESS-FILLED CAREER HE HAS INTRODUCED THE RENOWNED STANDARDISED SHIPBUILDING PHILOSOPHY AND OVERSEEN THE DEVELOPMENT OF THE DAMEN SHIPYARDS GROUP INTO AN INTERNATIONAL SHIPBUILDING, REPAIR AND SERVICES NETWORK EMPLOYING OVER 12,000 PEOPLE. FOR DAMEN #7 HE TALKS ABOUT THE PAST, PRESENT AND FUTURE OF DAMEN.
**How would you describe your family?**

We are a very close family. My children are very close to each other and also to me and I am close to them. They don’t always think the same, though they are all very decisive. When it comes to the company, they cooperate very well and accept the differences between themselves.

**Would you encourage your grandchildren to follow you into shipbuilding?**

Yes, absolutely. I already try to influence them; I ask them to make me drawings of boats and I have a special archive for that — also for drawings my children made when they were young. It’s a nice industry, nice way of life, so I will encourage them. I cannot think of anything better as a profession.

**Can you describe the people you started working with in 1969 and do you see the same characteristics in Damen people today?**

When I started out there were only seven of us. We were all young people so we didn’t see any risks. We were very enthusiastic; we worked extremely hard and we were very successful. Today, some Damen people are a lot older — like me! If I look at Young Damen (company group arranging social and professional get-togethers for young employees and students) though they are more or less alike, there’s a lot the same. Happily.

**The standardisation of ships has clearly been a great success — one that demonstrably worked before when the Venetians standardised warship production in the Middle Ages — what is it that makes this philosophy so successful?**

It was the same with the Dutch in the 17th century. Around Amsterdam they were turning out ships every day for sailing to the Baltic, Far East and the West Indies. Cargo ships and naval vessels then were very standardised. I think it’s the best way to success — you can continue to improve and it’s much cheaper. You make less mistakes and everything is more predictable. Because of this, in contracts, you can easily accept conditions because you know exactly what’s going to happen.

**Do you think there are limits to standardisation?**

There are certain vessels that you can’t standardise, but I think almost every type you can. When you analyse your clients’ purposes and use of their vessel and their markets, you can design a standard vessel that will be better, cheaper, faster for delivery, with a higher re-sale value. And that, because the banks can predict its re-sale value, is easier to finance.

**What is your own personal favorite Damen vessel?**

I think the Stan Tug 1606. It is an extremely compact and powerful tug. Very economically priced and lasts for ever. We started building them in 1972 and they’re still practically the same boat today.

**Shipbuilding experiences cyclical peaks and troughs, what has kept you going when the industry has been experiencing difficult times?**

Respectfully. You don’t want to end your life being unsuccessful. That’s not how you want to be remembered. So that keeps you going.

**This year’s Damen magazine has a focus on sustainability. What does sustainability mean to you and to the industry?**

It is a challenging subject for our industry. For example, you can’t expect a ship owner to suddenly start using more expensive fuel. It would threaten his ability to compete in the marketplace and his business model would become unsustainable. So, you need regulations in order to have a level playing field. The technical solutions are there and I think we will see a lot of progress in the coming years.

I see huge growth in renewable energy — wind, tidal, solar — there will be enormous changes, but no one knows exactly what they will look like. In any case, it’s good that we do our part to ensure a clean environment. We are already ahead in many fields — we have electric ferries, we had the first hybrid tugs. We are fully invested in lowering emissions.

We also realise that the young employees of Damen are committed to improving the world. We see that worldwide and that’s another reason we want to adapt ourselves to sustainability.

**Could the Damen story happen today?**

It’s very difficult to say. When I started the company in the form it is in today, it was 1969, so quite a different time. But still, we have the same principles, building ships in series, trying to standardise and setting up a worldwide service organisation. So, if I should have the means to do it, I think it would be the same.

**Would Damen be the same company if it was not a family business?**

Certainly not. If we should have shareholders, they would be much more impatient about financial results and dividends. It is because we are a family company that we could make risky, sometimes loss-making, acquisitions.

**How did you ever have ambitions to do anything other than shipbuilding?**

I never thought about anything else. I grew up in a family of shipbuilders. We lived on the yard — literally. My father sent me to a drawing class when I was young and I think it would be the same.

**Did you ever have ambitions to do anything other than shipbuilding?**

Yes, absolutely. I already try to influence them; I ask them to make me drawings of boats and I have a special archive for that — also for drawings my children made when they were young. It’s a nice industry, nice way of life, so I will encourage them. I cannot think of anything better as a profession.

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We also realise that the young employees of Damen are committed to improving the world. We see that worldwide and that’s another reason we want to adapt ourselves to sustainability.
Damen is no stranger to pushing back the boundaries of engineering, but even by Damen’s pioneering standards this extraordinary new vessel – the Damen ThreeSixty - will make heads turn.

In the spirit of disruptive innovation, Damen decided to take a fresh look at the ferry sector, particularly sightseeing boats, which is largely known as one of the most traditional arenas in the maritime industry. Most people have had that holiday experience of sitting on a crowded vessel, craning to look left and right hoping to get a glimpse of the view; hoping they have chosen the right side to sit on, hoping there is not a 2-metre tall Dutchman sat nearest the small, misted-up window…

Out of the box into the perfect circle

In an hour-long, standing-only meeting, the Damen Ferries team asked the question: “What sightseeing experience would they like to have?” The answer was simple: everyone wanted the best view possible and the best way of making sure of this was by developing a circular vessel, with huge floor-to-ceiling windows. Not only will this give the ultimate, scenic view, it could also provide a revolutionary tourist attraction for any city, port, estuary or lake.

Henk Grunstra, product director Ferries comments: “Sightseeing boats that look like ferries have been the ‘norm’ for decades. We want passengers to have a different, improved visitor experience with the optimum view outside, with windows all the way around.”

Rather than sail in only one direction, the concept is that the Damen ThreeSixty will sail along a predefined course and will rotate at certain points so the view is constantly changing. “This will be a totally different experience for passengers. The concept could open up a new market for tour operators, as the vessel really adds value in terms of customer experience.”

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Entirely different passenger experience

As well as sightseeing, Damen believes the new vessel, which is being patented, is suitable for business meetings, conferences, seminars, networking events and parties, or it could be used as a stylish and unique floating restaurant or nightclub.

The past year the R&D department and Ferries team have been investigating the concept and the ThreeSixty’s dynamic behaviour. “It is important that the dimensions fit the wave pattern of the local area,” Henk stresses.

Currently, three sizes are available – 16, 18 and 20 metres, with a passenger capacity of up to 400 people. The ThreeSixty is a highly manoeuvrable vessel. “Once on location, it performs a ‘water ballet’.” Comprising a ‘flat-bottomed disc’ shape, the vessel has a fore and aft.

Fully-electric & intelligent control

Changes in technology have led to this revolutionary new concept being launched in 2019, explains Henk. The Damen ThreeSixty is a fully-electric vessel, offering the potential for emission free sailing. Lithium batteries power the four azimuth thrusters via a DC-bus distribution network. The electrically-driven rudder propulsion can be controlled by an autopilot system. This intelligent control system, in combination with the four-thruster setup, enables the vessel to rotate or sail a straight course by an easy to use, single joystick control in the wheelhouse. “Given the rotation capability and distance it will travel, it would almost be impossible for a captain to manoeuvre the vessel manually,” adds Henk.

Once at its docking station, the vessel will automatically click into place and the battery charging will start. For comfortable climate control the vessel is equipped with a heat pump and air-conditioning system. The interior design can be tailored entirely to the clients’ requirements.

The vessel’s silent, vibration-free operation ensures that the ThreeSixty is the perfect, neighbour-friendly vessel, even in built up urban areas. The vessel has been developed in accordance with Damen’s E3 initiative, ensuring environmental friendliness, efficiency in operation and economic viability. Henk emphasises: “Damen is famous for being a superb builder of our standardised vessels, but we also want to focus on new products in attractive growing markets so we can continue to be a fast mover. We want to show the world we are able and capable of developing vessels of any type. Vessels that make a difference.”
When a new ship is unveiled, it is only logical that a lot of attention is directed at its more technical aspects. These are different for every type of vessel that Damen builds. To put it simply, patrol vessels need to be fast, Shoalbusters need to combine shallow draught with bollard pull, and dredgers need to have reliable power. The subject of ship design goes so much deeper, however. In fact, the human element – namely the safety and well-being of a vessel’s crew – is a subject that Damen never underestimates.

André de Bie, design & proposal engineer Tugs, uses Damen’s range of New Generation Tugs to illustrate this point.

"Of course we have targets for bollard pull and performance, but the safety and welfare of the crew really is the basis of a good design," begins André. "From the shape of the hull and the layout of the deck, to the wheelhouse design and the functionality and organisation of the engine room. Even the colour of the interior. All these aspects are integrated into the total design."

Full vision
Taking the hull as the starting point, the first thing you notice is its round-bilged form. “This is the most efficient shape; an optimised hull can deliver the same amount of performance with less power. This leads to a reduction in vibrations, noise, fuel consumption and emissions and gives the captain a very predictable vessel.” For a tug captain, concentrating hard on the task of assisting an incoming container ship, for example, this predictability means one thing: safer operations.

Moving up to the superstructure, the wheelhouse can be best described as the nerve centre of the tug. Therefore, it is paramount to ensure that it is well equipped. This is achieved by having a high degree of tumblehome. This is the narrowing of the vessel as it rises above the waterline. For a tug, the larger the tumblehome, the closer it can get to the vessel that it is assisting without the risk of damage. The lines of sight from the wheelhouse are also very important; the captain should have excellent visibility of the deck and also the surroundings. “We have called this the Full Vision Bridge, as a captain must be able to see all the key points during manoeuvres.”

Reducing noise and vibration
Damen has also paid special attention to the glass used in the wheelhouse. “One of the biggest dangers a tug faces is the blast of sound – this could easily break a window. We have developed the Damen Safety Glass to prevent this.”

The glass to which André is referring is a shatterproof glass that can withstand multiple impact blows before actually penetrating. “This makes the wheelhouse a much safer working environment,” he adds.

Because the Damen Safety Glass has a twin-layered composition, it means that it is not only safe, but also quiet. “Noise levels are extremely important for both safety and welfare. When sound levels are low, then communication between the crew and over the radio is a lot easier and there is less risk of misunderstandings. This is one of the basics of safety. And in terms of crew welfare, noise levels are also closely related to fatigue.” Other design elements that tackle the double challenge of noise and vibration include flexibly-mounted main engines, large exhaust silencers, insulated floors and cabin-to-cabin insulation. The RSD 2513 even takes this a step further by having a flexibly-mounted superstructure to create a low-vibration working and resting environment.

Safety in control
Looking closer at the layout, and remembering a tug’s raison d’être, the effective positioning of deck equipment is definitely a priority. Again, the RSD 2513 serves as a prime example, André notes. “This is a safe working environment that is free of obstacles and with a smooth layout. It has a closed bulkhead and rounded corners. There are no tripping hazards and it is easy to clean and easy to maintain.”

On the subject of layout of controls and systems, optimising safety and ease-of-use has been at the forefront of the design. For example, there are four computers on board; one in the engine room, one on the deck level and two in the wheelhouse. “This redundancy means that there is no need for the crew to go below deck during an operation – they can read all the data and operate all the required equipment from the deck level. This is a very important safety issue that the crew do not have to go below deck.”

Integration
On the bridge, the results of this close attention to layout design are also evident. Allowing the captain to focus on the task at hand – controlling the propulsion – radio communication is operated by a switch on the thruster controls and winches can be controlled by foot pedals. The most frequently used and essential actions have designated buttons, and secondary functions are found in automation screens. Once again, this is a decision that has significant ramifications regarding safety – making controls more straightforward leads to less mistakes.

"The key point is that all these aspects have been integrated into one vessel in one integrated design process. This is, of course, linked to the strong point that we are the designer, the engineer and the ship builder in one company,” André concludes.

- PART 1: TUGS

Puttng Safety and Welfare in the Spotlight
While the first part of this article has highlighted the importance of ensuring high standards of safety and well-being of a ship’s crew, it must also be stated that there is another category of people that come into contact with a vessel. These are passengers, and Damen has numerous vessels in its portfolio that take on the job of transporting passengers from A to B.

These includes ferries and water buses for the public transport sector, as well as Fast Crew Suppliers from twelve to 50 metres that transport technical crews to their offshore workplace. Here, director business development & market intelligence David Stibbe discusses how the welfare of these technical crews has impacted the design and layout of the Fast Crew Supplier (FCS) 7011.

Technical crews
Damen’s range of Fast Crew Suppliers has recently been expanded to include the FCS 7011, a vessel designed carry up to 150 offshore personnel at speeds of up to 40 knots. “In making the basic design requirements for the FCS 7011, safety and speed were number one, but comfort was closely associated,” says David. “This was because of motion sickness. We have to make sure that technical crews feel physically well when they are on board.”

The FCS 7011 has been developed in response to a requirement from offshore oil & gas companies. They need a vessel to transport technical crews to offshore installations such as FPSOs and semi-submersible production platforms. These platforms are generally beyond the boundaries of the continental shelves, and therefore journeys of up to 150 nautical miles, taking five hours are not unheard of.

Research cooperation
“Comfort is a key topic for the offshore majors because they have to compete with each other to attract skilled personnel. As such, we have invested in a huge amount of research into this vessel in order to meet their needs. This has also included cooperation with TNO [the Netherlands Organisation for applied scientific research].”

A bullet point list of the results of this research would contain several items relating to the physical characteristics of the vessel. “Comfortable, fully-reclining seats and mid-ships accommodation, combined with an optimised hull form to eliminate slamming and minimise vertical accelerations,” David explains. “This is in addition to good air circulation and large windows with plenty of natural light.”

Seamless movement
On arrival at an offshore platform, the passenger disembarkation process also exhibits methods to maximise safety and well-being. First of all, he says, the FCS 7011 is equipped with a gyroscope to stop vessel roll when positioned adjacent to the platform. “And then there is the motion compensated personnel gangway, an Ampelmann S-type, specifically designed for this vessel to create a seamless flow of passenger movement.”

David’s conclusion is tellingly similar to André’s, and is clearly a major reason for Damen’s success over the decades. “All the key components of this vessel have been aligned early in the design process,” he says. “The end result is a fully-integrated solution.”
Recently, Damen Shiprepair Vlissingen in the southwest of the Netherlands has welcomed Portuguese naval vessel, Bartolomeu Dias. The vessel is no stranger to the yard, having been built originally – by the Royal Schelde (now Damen Schelde Naval Shipbuilding) – for the Royal Netherlands Navy (RNLN) in 1994. The vessel, then named Hr. Ms. Van Nes, was one of eight sister vessels. In 2008, the RNLN sold six of the vessels – two to Belgium, two to Chile and two to Portugal – while maintaining two for its own fleet.

“The Royal Netherlands Navy’s contract stipulated supporting the group of vessels after this sale,” explains Michiel de Vliegher, commercial manager at Damen Shiprepair Vlissingen. “It makes sense when you consider they have fifteen years of operational experience with the vessel.”

For Damen this setup means, essentially, having two customers to serve.

“There are two project teams – a Dutch and a Portuguese one. But the cooperation between all parties is good. Damen Shiprepair Vlissingen is used to working with various parties on a project and completing this to the satisfaction of all parties. This is where our project management really makes the difference. Essentially, the project is a mid-life upgrade, the first stage of which was carried out by the RNLN in Den Helder, the Netherlands.

This stage included her being outfitted with a new, state-of-the-art mast and preparations for the second stage, for which Damen is serving as subcontractor. PNS Bartolomeu Dias arrived at Damen’s yard on February 14th.

“Our scope includes executing the mutually agreed technical specifications, mainly consisting of all the dock-based work – steel works, underwater sections, cosmetics, overboards, valves, piping,” states Michiel. "Onboard a complete propulsion overhaul will take place, carrying out replacement of 45 kilometres of and cabling works, overhauling of HVAC systems and tending to the cosmetics." We are well positioned for such a project. Not only do we have the experience and knowledge in-house, we can also count on the support of DSNS who, as Royal Schelde, originally built these vessels. Having seen the high quality of this vessel 25 years down the line, I would say they did an excellent job!" The vessel was originally constructed as part of the RNLN’s Karel Doorman class of frigates.

The class was also known as the “M-”, or Multi-purpose, class. Each vessel was named after a famous Dutch admiral. Upon commencing service with the Portuguese Navy, the vessel was renamed Bartolomeu Dias after the Portuguese nobleman and explorer; the first European to lay anchor in South Africa.

Upon completion of the phase of works conducted by Damen Shiprepair Vlissingen, the Bartolomeu Dias will undergo towage back to Den Helder. There, she will receive new weapons and communications systems and trials, being the final stage before returning to service, in 2020, for NATO operations.
The Lake District in North West England is an area of superlatives. In terms of raw geography, it is home to the country’s highest peak, as well as the largest and deepest lakes. As one of England’s oldest national parks, it holds a special place in the hearts and minds of all who have ever visited. On the international stage, the Lake District gained recognition in 2017 when it was designated a World Heritage Site by UNESCO. The area’s natural beauty, combined with a rich cultural heritage, has made the Lake District National Park a hugely popular tourist destination, attracting around 19 million visitors each year.

Playing a major role in the region’s tourist industry is Windermere Lake Cruises, a company with origins dating back to 1845. Today the company operates a fleet of sixteen lake cruising vessels: three traditional ‘steamers’ – each with a capacity of more than 350 – in addition to traditional and modern launches.

**MOTIVATIONS FOR GROWTH**

“With more than 1.63 million passenger journeys made every year, Windermere Lake Cruises is officially one of the most popular ‘paid for’ attractions in England – attracting visitors from all over the UK and internationally,” states the company’s chairman, Bill Bewley. Furthermore, the number of visitors is growing every year, most notably from China, increasing by 286% since 2016.

To accommodate this consistent and extensive growth in visitor numbers and to enhance the sustainable transport offering on Windermere, Mr Bewley explains that it was time to increase the size of the fleet. Assisted by James Fisher PLC, Windermere Lake Cruises first approached UK-based shipyards. “However, it soon became clear in the procurement process that the shipyard with the depth of experience to undertake this project within the cost and time scale requirements was Damen,” he adds.

**MINIMISING WASH**

Regarding design, Windermere Lake Cruises had clear-cut ideas about what was required from a new vessel. In response to their 364 days-per-year flexible operations, the vessel should be able to operate in all weathers and be capable to operating from smaller jetties. Comfort, of course, was paramount: “We want to increase the quality of experience of our customers, creating 21st century quality, comfort and accessibility.”

The content of the subsequent vessel design and construction contract with Damen for Windermere Lake Cruises’ seventeenth vessel reflected these specific details. “We set out requirements and worked with Damen to ensure that the whole project could be fulfilled in the best way possible, with a particular emphasis on minimising wash.

“Damen then undertook extensive computer-based modelling to simulate wash characteristics of the vessel and amended the hull design accordingly. For the interior design and outfitting, Damen offered us the resource department that work on superyachts, which will give our passengers the four-star level of comfort.”

The vessel’s propulsion system is diesel-electric with azimuth pods: “It is a 21st century propulsion system for a 21st century vessel,” he smiles.

**AN EYE FOR DETAILS**

Steel for the new vessel – to be called Swift – was cut on 9th April 2019, with an eye to be fully operational in mid-2020. “It has been designed in a contemporary style, but one that remains sympathetic to the style of our other vessels Swan and Teal.” Furthermore, it will be equipped with a number of features not present in our existing fleet. The top deck, for example, is designed in such a way that it can be open in good weather, but fully enclosed at the touch of a button when the weather is cooler in winter. This new vessel has been designed to provide improved accessibility with the provision of an onboard lift and facilities being available to all passengers. And, with a seating capacity for 300 passengers, the Swift will not only be the largest vessel to be ‘launched’ on the waters of Windermere for over 80 years, but it will also provide Windermere Lake Cruises with the necessary fleet expansion to successfully manage its growing passenger numbers for years to come.
Our employee is a particular sort of person,” he states. “With a different set of characteristics to someone yard-based. It’s absolutely critical that our people are team players. They must think and work like a team, always. We need good communicators. More than that, particularly at the moment; when he have not reached our full geographical potential, we need people who are comfortable working within an extremely dynamic environment. We are responding — quickly — to projects all over the world.

“To say we are looking for people who are prepared to travel is an understatement. We are looking for people who are prepared to travel, at a moment’s notice and almost continually. Things can change at any minute in our world. Effectively, we are an emergency service and we need people who are up for adventure.”

Trust is a word Joseph uses a lot when describing his employees. “That is very important in our environment. We have to be able to give people the responsibility to own the work they are doing and have full confidence that they will do it safely and to the highest possible standard.”

Where in the world

The entity’s plan for growth, he says, includes reducing its current 24-hour response time by setting up at strategic locations around the world. These locations will be served by teams combining existing project management with local labour, thereby facilitating an effective operation alongside the further development of the maritime industry in these key areas.

“Our idea is to set up mobile installations at strategic locations, notably where there is already a Damen presence — a Service Hub or repair yard for example, or a concentration of Damen clients. We’ve conducted an in-depth analysis of this and established the areas where we could position ourselves to help our clients better.”

“This summer we will be active in Curacao and the American regions. We expect Harbour & Voyage to also grow rapidly in these areas.”

Not surprisingly, these tend to be areas where a high volume of maritime traffic is already present — the Mediterranean and Black Sea region, the Mediterranean and the Caribbean, for example. The Panama Canal.

“This is definitely a growth area for the future and one that we are well positioned to serve. In our team we have a number of ORE specialists able to conduct work on scrubber piping installations. Now, with Damen Shipyards Mangalia, we are looking to train local workers in Romania in this work so that they can serve projects in Argentina, France, Lithuania and South Africa recently, for example and we already have a presence in the Middle East where we have worked closely with our colleagues at Albevardi Damen.”

Logical planning at a whole new level

Once established, these new teams will continue the good work for which Harbour & Voyage Repair has become so renowned.

“Cruise ship repair projects are challenging at the best of times, they require a precision approach to logistics in order to get the vessel underway again on time for its next scheduled call, with work usually taking place with crew resident on board. Harbour & Voyage Repair have taken this to another level.”

“A recent project saw us undertaking the refurbishment of the air-conditioning system of a cruiseship, while they were embarked on a cruise, filled with passengers. The logistics of undertaking this work, in literally thousands of cabins, while avoiding interruption to the cruise itinerary really called on precision planning. Like I say, we need to work together as a team at all times!”

Seeking sustainability

A further stimulus for the expansion of the service is the increasing awareness of sustainability in the maritime industry. Here, Harbour & Voyage Repair finds synergy within the Damen Shipyards Group — working closely with Damen Green Solutions on projects related to ballast water treatment systems and the installation of scrubbers.

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Breaking out of the Lowlands

Traditionally, the company focused its attention on its local region — conducting the vast majority of its work in the ARA — Amsterdam, Rotterdam, Antwerp — area. “That is still true of today, actually,” points out Managing Director Joseph Quak. Joseph also has a long history in the port repair, having worked in the field for Damen in Den Helder for many years before the establishment of the dedicated Harbour & Voyage Repair service.

“The ARA still counts for 80% of the work we do. But that’s changing. The change, he says, was kick-started when the company became a part of the Damen Shipyards Group. “Becoming part of the Damen name. It stands for reliable quality and reliability, we have to take the time to do things in a good way, making sure we set ourselves up in a controlled manner with a long-term view on the future.”

Ready for adventure

This he explains, involves numerous factors, amongst which is identifying the right sort of professional employee. Joseph has a clear vision when it comes to the type of person he is looking for to work for Damen’s Harbour & Voyage Repair service.
Fast, talented response

“There’s a bit of a juggling act with a lot of what we do. Alongside precision, our clients are also looking for speed. The point of port repair is to get a vessel safely underway again without the time-costly experience of a drydocking. I’m very proud of our track-record in providing timely solutions in a manner that exceeds expectation.”

He offers a number of examples, including one very recently that saw a vessel in Le Havre requiring fast hull repairs in order to be able to sail again. “Our inspection suggested we would need eleven days to do it. The port authority was convinced that was not enough time. In the end, we did it in seven days. We’re a 24-hour operation, we don’t stop until the work is done.

“Another example recently was the replacement of a valve on a crossover tank in South Africa. With Damen’s facilities in Cape Town we were able to pre-fabricate the part and, upon the vessel’s arrival, replace it within just three hours.”

“WE’RE GETTING FASTER ALL THE TIME. ONCE UPON A TIME, CLEANING A SHIP’S HULL WAS A MAJOR JOB. NOWADAYS, WE CAN COMPLETE ONE SIDE OF A 300-METRE VESSEL IN UNDER FOUR HOURS.”

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So far so good then, for this relatively new Damen entity, but how does Joseph intend to measure that things continue to head in this direction during the upcoming drive for expansion.

“We will know from our clients whether we are doing things in a way that suits them. At the moment, it’s clear they are happy with our work. We can see this in the way we attract new clients and returning clients alike. I intend to make sure that, wherever in the world someone calls upon Damen Harbour & Voyage Repair, they can count on getting the high standard of service they expect from our name, now and in the future.”
In November 2018 a ceremony took place at the ASTIMAR 20 naval shipyard in Salina Cruz, Mexico, that not only marked a major milestone for the Mexican Navy, but also a potentially global paradigm-shift in the way that advanced naval platforms will be built in the future. The flagging and launching ceremony was in itself a justified cause for celebration, but what made it unique was the fact that it took place just 20 months after work began on building the vessel. For the building of top-end sophisticated naval vessels, this speed is unheard of and indeed it is acknowledged to have set a new world record for the modern era.

Of course, this was no ordinary project. The ARM Reformador (Reformer), is a Mexican version of the Damen SIGMA 10514, a proven design that is already in service with a number of navies. There, the class is designated the POLA, the acronym for the Patrulla Oceánica de Largo Alcance, which translates as Long-Range Ocean Patrol Ship. The ARM Reformador is so-named as it marks a new stage in the process of reforming the operational capabilities of the Mexican navy and strengthening the Mexican naval industry.

107 metres in length and with a beam of 14 metres, the ARM Reformador will be able to sail at speeds of more than 25 knots and spend more than 20 days continuously at sea. “This vessel will be capable of carrying out various missions such as safeguarding Mexican sovereignty, international security cooperation, long-range search and rescue operations and humanitarian aid,” said Frank Verhelst, project director at Damen Schelde Naval Shipbuilding (DSNS). “ARM Reformador will also enable the Mexican state to increase its surveillance coverage and the protection of its maritime interests beyond its Exclusive Economic Zone.”

The power of SIGMA combined with local shipbuilding

This vessel has been built using modular construction techniques, with six modules accounting for the entire structure. Four of these have been built in Mexico and two at DSNS in the Netherlands. These last two were then transported to ASTIMAR 20 for the final integration under Damen supervision. “In this way the vessel is being built for Mexico, in Mexico, by Mexicans,” said Horacio Delgado, sales manager in charge of the project. “Damen remains the main contractor though, bearing final responsibility for quality and performance. The key to success in these multi-yard projects is excellent process control and a fully-developed build strategy from the outset that forms the framework for the project from which everyone works,” continues Frank.
Damen, with its long track-record of working alongside third-party shipyards outside Europe to build complex vessels, has been transferring knowledge to the Mexican shipbuilding industry via its globally successful Damen Technical Cooperation (DTC) programme. The POLA project, however, has taken the DTC concept to the next level by applying simultaneous modular construction on two continents. This format has already been proved a success by DSNS in the construction of two SIGMA 10514 PFR frigates for the Indonesian Navy, with the transfer of skills enabling the construction of all six modules for any future vessels to take place domestically.

The excellent cooperation between Damen and the Mexican Navy is due in part to the synergy developed through the previous building together of ten Tonchonclast class patrol vessels, based on the Damen Stan Patrol 4207, and the logistic supply vessel Isla Maria Madre, derived from the Damen Stan 1106 design and safeguard planning and production.

The three pillars of modular building
The success of the POLA project and others like it rests on three pillars: process control, global coverage and building strategy. Total process control at every stage is vital for projects that span continents yet depend on real-time coordination. Digital platforms for information availability and visualisation of progress play an important role. Global coverage is all about optimising local yards yet maintaining a flexible approach so that a SIGMA vessel can be built anywhere, and a complete building strategy from the outset ensures that everyone knows how they fit into the overall picture, what their goals are and when they need to deliver them.

The multiplier effect of technology transfers
The transfer of technology is not just about the picture, what their goals are and when they need to deliver them.

The multiplier effect of technology transfers
The transfer of technology is not just about the picture, what their goals are and when they need to deliver them. Administration practices also underwent some modifications. Damen has additionally worked with local suppliers to the project, sharing the information and skills necessary to manufacture and deliver materials and components to the required specifications.

In recognition of this, Admiral José Antonio Sierra Rodríguez, Director General of Naval Construction, was recently quoted as saying, “I would like to say that the benefits that we must recognise are those that the country obtains from acquiring the technology, developing the infrastructure and training personnel. This vessel is an extension of our country, representing Mexico as it travels the world flying its flag.”

For Mexico, in Mexico, by Mexicans
He has every reason to be proud. This project has been a triumph of cross-border cooperation, and everyone at Damen and within the Mexican Navy who contributed to its success has a right to share in that pride.

In November 2019, the ARM Refomrador will begin sea trials before going into active service, representing a critical step in the reformation of the Mexican Navy’s operational capabilities and the Mexican shipbuilding industry.
The large RoPax industry segment saw a peak in demand around thirty - forty years ago - roughly the lifespan of this type of vessel. This means that soon many of these ships will be coming to the end of their service and will be earmarked for replacement. Damen intends to use its experience in shipbuilding, coupled with new facilities to offer the marketplace a superior solution as part of its new Cruise, RoPax and Offshore (CRO) division.

MANGALIA GETS UNDERWAY
Damen sales director RoPax and RoRo Chiel de Leeuw explains the thinking behind Damen’s move into the production of RoPax vessels.

“With this, we are able to fully service this sector,” explains Chiel. “Our newbuild activities are added to a portfolio that already includes global services and repair, maintenance, refit and conversion, which means we will now serve our clients throughout the full lifecycle of their vessels.

“With our commencing operations in Mangalia, the timing is perfect for this move. The new facilities are ideal for the construction of large, complex RoPax vessels, with docks as wide as 60 metres, a total of three graven drydocks, 1.6 kilometres of berthing space and lots of crane capacity and workshops distributed over approximately 1 million m².”

The new venture has been quick to secure its first contract and the Mangalia yard is all set to begin work on two 148-metre LNG-hybrid RoRo vessels for Seaspan Ferries Corporation in Canada (for more information see page 7).

CLEAN CONTRACTS
“As with many projects that Damen is working on these days, sustainability is a key focus on these vessels. They will feature LNG hybrid propulsion, reducing NOₓ and SOₓ emissions to a minimum, while onboard batteries will optimise energy storage and usage when the engines are not fully loaded,” states Huib Slings Product Director RoPax and RoRo.

STANDARDISED, BUT DIFFERENT
It is Damen’s intention to offer engineered to order vessels for this segment, due to the many variables experienced by the sector. Huib oversees product design and definition by translating technical requirements from vessel owners into product specifications and by facilitating the engineering-to-order process. He explains:

“Specificity plays a role in preparing each vessel for optimal performance according to the route of its operation. Damen operates as a full service provider, focussing on developing a better design for a specific route in order to lower the cost of ownership over the lifetime of each vessel. With variables such as route length, water depth and swell, typical weather conditions and tidal forces all contributing to the demands on a vessel, set routes can provide some predictability as a basis for calculating the most efficient design for a vessel.”

However, as Chiel explains, this in no way represents a departure from Damen’s philosophy of standardised shipbuilding.

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The approach Damen is taking to market with its new RoPax and RoRo initiative, as with cruise and offshore, varies somewhat from its usual methods of operation also. Instead of its usual geographical approach with regionally focused commercial managers, with these segments, Damen is taking a product-centred perspective.

“The complexity of such large, bespoke projects demands a long-term focus and the development of an in-depth understanding of the market and customers business,” explains Chiel.

Chiel was well positioned to support the move, having previously worked as sales manager for north west Europe where his Scandinavian focus brought him into contact with numerous ferry projects.

Given the nature of the order specifications, each project is time-consuming and requires a lot of project management work, collaboration and coordination. The process of building each project together with designers, engineers and customers, is intense and time-consuming, and requires a certain degree of initial investment.
MARKET FOCUS | ROPAX

To meet the demands of the work, the RoPax Product Management Team, responsible for product development, is rapidly growing, drawing talent from many countries including Spain, Argentina and Finland,” says Huib.

The complex process of product development comprises myriad input streams such as mobilisation of internal departments on Research and Development, external validation of designs, project planning and coordination, support of the whole tender process, and production of cost-price calculations. The team is in direct contact with the shipyard in Mangalia and with suppliers around the world, developing the most technically appropriate proposal to create the most efficient product definition tailored to the requirements of each client for each specific route.

FINANCING FERRIES
Damen Customer Finance, together with the customer, aims to find the most suitable financing solution. A large, complex vessel like a RoRo or RoPax vessel is a capital-intensive project, for which the correct financing approach can make all the difference, whether it is related to a promising business model or is supported by a government entity. To that end, Damen closely cooperates with Atradius Dutch State Business, the Export Credit Agency of the Netherlands with an AAA-rating. It should ease discussions to find a financing solution that is beneficial to the client’s needs.

For the RoRo market, Damen has assigned Customer Finance manager Herman van Bueren to support clients. “We’ve over 40 years’ experience in enabling our clients to arrange attractive, tailored financing packages. During that time we have developed long-standing relationships with national and international commercial banks, export credit agencies, investors and multilateral institutions.”

Herman’s outlook is very positive. “The current legislative climate is favourable for the financing of sustainable vessels,” he says. “As Damen applies its expertise in sustainability to the propulsion of its RoPax vessels, this encourages more favourable terms from financiers, and the benefits end up in the pockets of the clients.”

**R&D**

Damen participates in numerous R&D and innovation programmes, both in-house and in collaboration with industry partners. Amongst these programmes are several that aim at innovating for the RoRo and RoPax segment.

This includes, for example, the steps Damen is taking towards greater sustainability in the maritime industry. Increasing environmental awareness, combined with increasingly stringent regulations is a further stimulus for new ferries. To these ends, Damen is working towards several solutions, across a broad spectrum, including ballast water treatment systems, an air cavitation system, emissions scrubbers, electric and LNG propulsions systems.

Damen is also working on remote monitoring, by which condition-based maintenance can be carried out to ensure maximum uptime. Furthermore, studying AIS information contributes to developing the most efficient design as well as efficient sailing, further increasing sustainability.

The shipyard group’s work with hardware in the loop (HIL) has already demonstrated its effectiveness in different sectors, including offshore, allowing testing to take place digitally before investment in real world construction.

**ROPAX AND RORO REPAIR AND SERVICES**

Damen has served the RoPax and RoRo market previously, having constructed vessels upwards of 100 metres on numerous occasions at Damen Shipyards Galati, in Romania. Additionally, the shipyards group operated numerous, strategically-located ship repair yards from which is already serves the RoPax and RoRo market with repair and maintenance services.

Many of our repair yards are ideally situated to serve our clients’ requirements,” says Chiel. “Damen Shipyrepair Dunkerque and Damen Shipyrepair Brean sit close to cross-channel ferry routes, for example, while Damen Verolme Rotterdam, Damen Shipyrepair Rotterdam and Damen Shipyrepair Amsterdam are well located for North Sea services.

“Backed up by our Harbour & Voyage Repair team and our international network of Service Hubs, along with globally available service engineers, we are confidently able to offer support to our clients, wherever they are in the world at whatever stage of their vessels’ lifecycle.”

**DANISH-DUTCH DESIGN DUO**

Via Damen Shipyards Group member, Denmark-based KNUD E. HANSEN, Damen is able to offer a design team well versed in such vessels. KNUD E. HANSEN has extensive experience in the design of RoPax vessels.

Damen’s relationship with the accomplished design company goes back a number of years, and has borne products from numerous collaborations such as Ice Class ferries for the Canadian government. The acquisition of the yard in Mangalia offers both parties the chance to collaborate on larger vessels, in which KNUD E. HANSEN’s experience and expertise will play a vital role.

“KNUD E. HANSEN has a long track record in providing newbuild as well as refit design to all sectors of the maritime industry, but it is most renowned for its work on passenger vessels,” says Chiel. “We are very fortunate to have such an experienced player as our partner for this new venture.”

**“IN ORDER TO QUICKLY AND EFFECTIVELY ESTABLISH A PRESENCE IN THE MARKETPLACE, WE’VE ASSIGNED A TEAM TO QUICKLY BUILD A NETWORK AND A KNOWLEDGE BASE. THE DEPARTMENT WILL BE SUPPORTED BY DAMEN’S GLOBAL INFRASTRUCTURE, SYNERGISING KNOWLEDGE WITHIN THE DAMEN GROUP AND THE WIDER SHIPBUILDING INDUSTRY.”**

**“WE’VE OVER 40 YEARS’ EXPERIENCE IN ENABLING OUR CLIENTS TO ARRANGE ATTRACTIVE, TAILORED FINANCING PACKAGES. DURING THAT TIME WE HAVE DEVELOPED LONG-STANDING RELATIONSHIPS WITH NATIONAL AND INTERNATIONAL COMMERCIAL BANKS, EXPORT CREDIT INSURERS, INVESTORS AND MULTILATERAL INSTITUTIONS.”**
YEARS YOUNG
ON ITS FIFTH ANNIVERSARY, DAME"S SONG CAM SHIPYARD LOOKS FORWARD

Accessing a Wealth of Shipbuilding Know-How
During this time, it became clear to Damen that Vietnam was host to a wealth of shipbuilding knowledge – enough, in fact, to warrant a joint venture with the Song Cam shipyard. The plan was to open not just any yard, but a state-of-the-art, ultra-efficient production line, outfitting standardised Damen hulls produced at Song Cam shipyard, at a rate previously unseen.

Damen Song Cam Shipyard got off to an auspicious start, when on March 20th 2014, at a time appointed by favourable lunar conditions, the country’s Vice Minister of Transport, Mr Nguyen Hong Truong, cut the ribbon on the new facility.

Thus began a new operation at the 43-hectare site on the Cam River. The credentials of the new yard were notable: direct access to the open sea and sufficient space for a 120 x 85-metre outfitting hall, plus extra room for extensive carpentry and painting workshops. The new facilities were second to none; the joint venture made sure from the start that the vessels it produced would be of the highest possible standard.

Damen Shipbuilding Philosophy - Optimised
To ensure utmost efficiency, Damen Song Cam insourced expertise including for electrical engineering and commissioning for electrical, hydraulic and HVAC systems. Furthermore, the yard implemented a system whereby the work is taken directly to the vessel being outfitted. Platforms alongside enable workers to get as close as possible to the boat, while ample storage space is provided at the same level for tools, equipment and components to avoid workers having to go up and down repeatedly.

In this way, the yard quickly achieved the capability to complete a Damen Tug in just one year, at a rate of 30 vessels per year – Damen Song Cam Shipyard is celebrating its fifth anniversary this year.

Damen’s association with Vietnam goes back further than this. Before the yard opened its doors, the shipyards group had built 226 vessels in the country over a period of twelve years at five partner yards. One of these yards was Song Cam.
equivalent to approximately 1 million man-hours. “We could, at this stage, achieve 40 vessels per year, over 1.3 million man hours, but we are a little constrained by current market activity,” says Joris van Tienen, the yard’s managing director.

BROADENING HORIZONS

Damen Song Cam has, up to now, focused on the production of tugs and fast crew supply vessels. This has already broadened as Damen has expanded its tug portfolio with the next generation series. However, both the harbour towage and offshore crew supply markets have experienced a slow-down in recent years. Damen Song Cam has the answer to this.

“We will broaden our portfolio to include more of Damen’s product groups. In this way, we will minimise market dependency. We have already started on this journey with, for example, this year’s inclusion of the Fast Ferry 4212, the hull of which is supplied by our partner 189 Shipyard. Other options being considered include fishing and aquaculture vessels.

“In this way, we expect to facilitate a steady rise towards completion of 40-50 vessels per year, especially as our traditional markets begin to show the first signs of recovery now.”

As the yard’s portfolio broadens and its output increases, it expects to recruit more personnel. Currently, Damen Song Cam employs 650 persons, with further roles indirectly resulting from the yard’s activities: 950 in hull production at Song Cam Shipyard and 120 working for suppliers. Here too, there is a shifting pattern as the yard evolves, with a decrease in the amount of expats and an increase in the number of local employees.

HARVESTING INVESTMENT

At this stage, Damen has constructed over 300 vessels in Vietnam and, this year, Damen Song Cam will deliver its 100th vessel – yard number 513305, an AAD Tug 2013 for Italian client Moby. In order to facilitate its evolution, Damen Song Cam continues to invest in the future. The latest investments include the addition of a second floating jetty in 2017 and a new warehouse in 2018.

“We’ve made investments over the past few years and now it’s time to make sure they deliver, not just for us, but for the relevant Damen product groups and business units and Damen’s entire commercial newbuild activity around the world.”

SAFETY FIRST – NOW & ALWAYS

One thing that will not be changing is the yard’s approach to safety; Damen Song Cam has an excellent track record in safety and Joris fully intends to keep it that way.

“We are very proud of our achievements in providing a safe workspace for our personnel and suppliers. We have realised 2.3 million safe man hours. We are fully aware of the importance of this and safety remains – and will always remain – our number one priority in all that we do.”
DREDGING FOR AGGREGATES
A TOUGHER BUSINESS

Tarmac Marine is a subsidiary of Tarmac, the UK’s largest supplier of building materials with a history that dates back over 150 years. With over 120 quarries in its portfolio producing every conceivable type of aggregate it is not surprising that, even within the company, not everyone is aware that it also operates four trailing suction hopper dredgers.

“The City of London and the City of Westminster are sister ships,” explains Keith Marshman, Marine Fleet Manager for Tarmac. “They were delivered in 1989 and 1990 respectively. 100 metres in length and with a deadweight tonnage of 5,989 they are capable of dredging down to 40 metres. They operate in the North Sea off the coast of England and land their cargoes within Tarmac’s network of Thames wharves to supply London and its surrounding region.

“Given the work they do, the ships take quite a battering with both the equipment and the vessels themselves having a very high wear rate. A lot of repairs are required year-on-year, mainly to the cargo handling equipment, but also elsewhere. With the ships needing to be operational almost continuously it is essential that the repairs not only take up as little time as possible, but also that they be of the highest quality so as to avoid any unplanned downtime.

“Tarmac has had a relationship with Damen Shipyards Amsterdam (DSAm) that stretches back 20 years or more,” continues Keith. “In recent times, currency factors meant that Tarmac had to source its repair works closer to home but, in August 2018, the City of London returned to DSAm. There she underwent a wide range of repairs. As well as general steelwork, her dredging equipment had new seals, pipe elbows, screening towers, a new discharge bucket and wear plates, along with many more minor repairs and servicing.

“It was a very quick turnaround, just nine days! We normally allow two weeks for these annual overhauls, so this was a great result. We are always very confident with Damen Shipyards and once again they delivered on Damen’s philosophy of always doing their best to keep to their quoted timescale for a project. “We considered sending the City of Westminster to DSAm as well,” he continued, “but unfortunately they didn’t have any capacity for our particular window, and we wouldn’t use another Damen yard at short notice as we have an in-house safety audit process that we have to undertake for partner yards and there simply wasn’t time. However, we hope to send her and the others there in the future, as long as the numbers add up. For the City of Cardiff, it is a long trip to make, but in the past the whole fleet used to dock in Amsterdam, so it could happen again. We know that we can always rely on DSAm for workmanship, safety and fast delivery times.”
LONG LIFE AND PROSPERITY

CHIEF COMMERCIAL OFFICER ARNOUT DAMEN, WITH MANAGING DIRECTOR HIGH SPEED CRAFT WARD LEENDERS AND PRODUCT MANAGER TUGS DIRK DEGROOTE, TALKS ABOUT DELIVERING DAMEN’S GOAL OF LOW TOTAL COST OF OWNERSHIP OVER THE LIFETIME OF A VESSEL.

When it comes to purchasing a vessel, Damen’s chief commercial officer Arnout Damen urges buyers to look beyond the initial outlay. “There are Damen vessels still in operation today that were built in the 1970s. Given a lifespan as long as this, it makes sense to consider the costs of the total operation, not only the capital costs. It often transpires, especially with a Damen vessel, that the total cost of ownership, over the lifetime of the product, can easily offset the cost of initial investment.”

LOW OPEX AS STANDARD

The reasons that this applies notably to Damen vessels are many and varied. For one thing, Damen takes care to ensure the high quality of its facilities, wherever in the world it builds, ensuring high quality welding and painting, for example. Perhaps though, the key element here is the process of standardised shipbuilding.

“With standardisation, we develop a product and improve it over successive generations, with the result that it proves its reliability. Everyone knows what the vessel’s capabilities are because there are other examples of its kind, performing consistently and providing a benchmark. That being the case, Damen vessels have a high resale value.

“This is not only good when you want to sell your boat, but also for the buyer – with the product offering a tangible performance, the banks also know what they are looking at and are happier to finance the investment.”

AXING FUEL CONSUMPTION

The features of Damen’s standard vessels also play their part in reducing the cost of operations over the lifecycle of the vessel. Again, examples are legion, but the attention that Damen pays to designing efficient hull forms plays its part in considerably reducing fuel consumption.

“You can see this with Damen Tugs. Their smooth lines create less resistance and stimulate lower fuel usage. Also, vessels that have the Sea Axe Bow (the patented Damen hull form developed in collaboration with the Technical University of Delft in the Netherlands) feature improved seaweeding and less resistance in the water. As a result, the Axe Bow is proven to offer reduced fuel consumption of up to 20%.”

COOL YOUR KEEL

Dirk Degroot, product manager Tugs, agrees with the assessment that standardisation drives low total cost of ownership. “Our tugs draw on the experience of the entire Damen fleet and incorporates the improvements of successive generations, so reliability is assured. Low maintenance is also a feature. As an example, on the ASD Tug 2312 we have incorporated fresh water keel cooling channels. It’s a simple system without the need for box coolers or IMPA (Impressed Current Anti-Fouling) anodes. It’s a system that has already proven itself the world over on Stan Tugs, so we have absolute confidence in optimising it for higher power on ASD Tugs.

“I tend to see that the clients really see the return on their investment with a Damen vessel during their fifth year – at the five-year survey. Our aim is that this should be a time of simple maintenance, not a massive overhaul and my experience is that the quality of the vessel, at this stage, can already offset the expenditure of the initial capital investment.”

GLOBAL SUPPORT

Ward agrees. “For all systems and sub-systems we apply A-brand materials and components. This not only reduces maintenance, it makes it more predictable. And, if maintenance is necessary, our use of high quality materials ensures the easy availability of spare parts.”

“Indeed, a good part of our work towards lower OPEX is not about minimising costs, but maximising performance. The longer the vessel can operate comfortably, the more income it generates for the customer. This is where our focus lies.”

Within this area of focus are numerous elements – widening windows of operability based on weather windows and increasing safety and on-board comfort to name a few. (You can read in detail about safety and well-being on board Damen High Speed Craft and Tugs on page 92.)

DIGITAL DEVELOPMENT

The increasing digitalisation of the maritime industry, new tools are becoming available that assist with reducing fuel consumption, lowering maintenance requirements and maximising vessel uptime. Damen has been quick to embrace the new technology, implementing such things as remote monitoring with Damen Digital.

Arnout: “Damen Digital includes the remote monitoring of fuel consumption patterns to promote efficient sailing. It also paves the way to extending periods between maintenance, based on accurate monitoring of such things as fuel and oil quality and parts performance. Similar practice has already had much success in the automotive industry where the additional in-depth knowledge provided by remote monitoring has brought a lot of success in cost-saving and maximising uptime. We are maintaining a close eye on digital developments as we foresee digitalisation will further increase opportunities to bring OPEX down in the future.

“We are always looking to further develop our performance, collecting valuable feedback from our clients and industry and incorporating it into the continual development of our products. We operate on the basis that there is always room for improvement. However, we are proud of what we have achieved to date and I feel confident in saying that you can earn more money with a Damen boat. It’s not the cheapest, but it is the best,” concludes Arnout.

“In that respect,” rejoins Arnout, “our international network of Service Hubs and globally available fleet of engineers also play their part in making sure that Damen clients face the absolute minimal downtime in their operations.”

INCOME GENERATION

Ward: “Indeed, a good part of our work towards lower OPEX is not about minimising costs, but maximising performance. The longer the vessel can operate comfortably, the more income it generates for the customer. This is where our focus lies.”

Within this area of focus are numerous elements – widening windows of operability based on weather windows and increasing safety and on-board comfort to name a few. (You can read in detail about safety and well-being on board Damen High Speed Craft and Tugs on page 92.)
On 5th of March, the Royal Netherlands Navy (RNLN) Joint Support Ship (JSS) Zr.Ms. Karel Doorman entered dry dock no.4 at Damen Shipyards Amsterdam (DSAm) to begin her first five-year maintenance programme. This was to be no ordinary maintenance and repair programme, but then again, the Karel Doorman is no ordinary ship. The 205-metre vessel is the largest and most complex vessel in the RNLN, and she was built by Damen, largely at Damen Shipyards Galati, Romania, under the supervision of Damen Schelde Naval Shipbuilding in Vlissingen.

In August 2013 she was transferred to Vlissingen for the completion of her outfitting, commissioning and sea trials before being handed over to the navy in September 2014. She was designed and built to take on a wide-ranging role and sea trials before being handed over to the navy in September 2014. She was designed and built to take on a wide-ranging role and sea trials before being handed over to the navy in September 2014. She was designed and built to take on a wide-ranging role. 

FIVE YEARS ON DAMEN SHIPREPAIR AMSTERDAM PERFORMS KAREL DOORMAN REFIT

A complex vessel for a multi-purpose role

She was designed and built to take on a wide-ranging role including maritime support, replenishment at sea, supply storage, loading and unloading of supplies, transport of equipment and personnel, and technical and logistical support. 2,000 lane metres of cargo capacity allows her to carry an exceptional quantity of cargo. She was designed and built to take on a wide-ranging role. 500 kilometres or more. Other delivery systems include two deck cranes and transport of equipment and personnel. Senior management at the Den Helder naval base will not be subject to works by the DSAm team and their subcontractors, and that is her military systems and anything else of a sensitive nature. These were all removed at the RNLN base at Den Helder for their own, separate, maintenance programme before the vessel came to Amsterdam.

The orders cover everything from the cleaning of all the tanks and servicing all the valves to painting the exterior hull and topsides and removing all the electrical equipment for servicing and replacement where necessary. The elevators and the helideck cranes are also undergoing maintenance and the rudders have been removed and their bearings and aft seals inspected. And that's just the beginning. However, one major area will not be subject to works by the DSAm team and their subcontractors, and that is her military systems and anything else of a sensitive nature. These were all removed at the RNLN base at Den Helder for their own, separate, maintenance programme before the vessel came to Amsterdam.

Taking planning to a new level

With so many components and systems requiring specialist attention it is not surprising that there are 119 different companies and organisations involved in the works, as well as the ship's very helpful officers and crew. With so many stakeholders on board, often overlapping in the areas that they need to access, the use of integrated master planning to model every activity taking place is vital to ensure that everyone is in the right place at the right time, working smoothly and efficiently alongside each other. One team, one task, is the underlying philosophy that keeps everyone focused on what they need to do. DSNS, with all its accumulated knowledge and expertise that ensures that the Netherlands retains the capability to build its own next-generation vessels and keep them in top condition, now and in the future, in its own yards. It also ensures that the wider Dutch naval sector remains innovative, efficient and diverse, as evidenced by the many companies involved with the Zr.Ms. Karel Doorman, which boosts exports.

As well as its excellent planning skills, DSAm also has the advantage of experience gained in 2018 from a lifetime extension programme undertaken on the RNLN's 20-year old, 164-metre, amphibious warfare ship HNLMS Rotterdam, also built by DSNS. As a dress rehearsal for the much larger Zr.Ms. Karel Doorman it provided valuable experience and insights into the equipment and issues that the DSAm team would be facing in the coming year.

The Zr.Ms. Karel Doorman is scheduled to leave Damen Shiprepair Amsterdam in July this year, having spent five months in the dry dock having every inch of her inspected and checked. From there she will return to Den Helder where she will undergo another six months of work, including replacing the ‘special systems’ that were removed at the start, before starting another, no doubt busy, five years.
A new project is getting underway at Damen Shipyards Mangalia. The yard has signed contracts for all three of the sectors of Damen’s new CRO (cruise, RoPax and Offshore) venture. Amongst these is the contract for a new 115-metre Mega Yacht for Oslo-based Seadream Yacht Club, Damen’s first newbuild cruise ship contract. Seadream will operate the 155-metre Mega Yacht on luxury voyages all over the world.

SVP sales and marketing Damen Cruise Andrea Trevisan said, “We are delighted to sign this historic contract with which the Damen Shipyards Group enters the cruise market. We feel very honoured that SeaDream has chosen Damen to deliver this special project and are looking forward to a long-term cooperation with this unique ultra-luxury brand.”

“The Mega Yacht, a purpose-built ship, will be prepared to operate in destinations, including polar and tropical, around the world. As such, the vessel will boast ice class Polar Code 6 credentials.”

“We were drawn to Damen Shipyards for their excellent reputation and proven track-record as innovators in the shipbuilding industry,” said Atle Brynestad, Owner, Chairman and CEO of SeaDream. “Damen Shipyards understood our vision from the very beginning, making them a natural fit for this venture. We are looking forward to working closely with the Damen team to bring this dream to reality.”

The Mega Yacht for Seadream will be completely constructed and outfitted, including the interior, at Damen’s Mangalia yard. Damen will commence construction of the vessel in October this year, with a scheduled delivery date of September 2021.
The charge towards electrification.

The spark has been lit.

The Damen E-Cross philosophy encompasses so much more than just the vessel. E-Cross represents a holistic approach covering the entire process of establishing and operating an electric ferry service, efficient, economic and clean. E-Cross is dedicated to bringing communities together safely, reliably, comfortably and with minimal impact upon our environment.