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MARITIME REPORTER AND ENGINEERING NEWS

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May 2018

IMO

Kitack Lim & the charge toward the Decarbonization of the Maritime Industry

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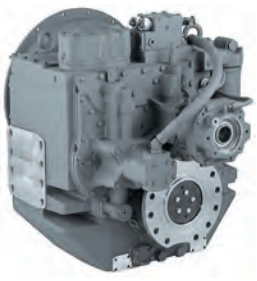

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The Future is Clear

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THE COVER

The Move Toward Decarbonization
While the plate of Kitack Lim, Secretary General, IMO is full – digitalization, autonomous shipping, ballast water management, cyber security, piracy, protecting the seafarer – arguably on top of his agenda sit emissionS reduction and the decarbonization of the maritime industry. Story starts on page 34.

© IMO

Voices

Darren LARKINS

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It was a predictably cold afternoon in London in mid-March when I had the opportunity to visit with Kitack Lim, Secretary General of the International Maritime Organization (IMO) in his office. Early for the meeting, as I sat in the lobby at 4, Albert Embankment waiting for my appointed time, a group of about 50 young school children were offered a warm place to sit in the IMO lobby and wait for their school bus, which was running more than an hour late picking them up from a nearby field trip. But the IMO staff didn't simply offer the children a comfortable place out of the elements to quietly wait; a pair of staff came over to talk to the children, explaining to them about the IMO, its mission and the importance of the maritime industry to the world. I had to leave before the story was done … in retrospect perhaps I should have taken notes! But to me this was a simplistic and appropriate back-drop to the three hours I had with the Secretary General ahead.

Having served this industry for 26 years, I know full well the laundry list of gripes and complaints regarding the IMO – for that m atter, most any legislative body ruling the maritime market – because invariably discussion and mandate from these chambers usually cost ship owners money. In fact, the meeting with the Secretary General was timely, as it was just a few weeks ahead of IMO's Marine Environment Protection Committee (MEPC 72) meeting which adopted an initial strategy to reduce Greenhouse Gas emissions 50% by 2050 (see story, page 40).

Regardless of your perception of the organization, Kitack Lim is passionate about all matters maritime, both knowledgeable and inquisitive, grilling me as much as I was him as he was genuinely interested to learn from different points of view.

Without question this Secretary General sits atop IMO at a transcendent period in the history of maritime. "It has been said that the next 10 or 20 years will see as much change in shipping as we have experienced in the past 100 years," he said, as the speed of technology is racing to, through and around the world maritime sector. As we traverse the new technology revolution that is centered on digital, Kitack Lim's plate is overrun with agenda items, each and every one which could arguably be number one – decarbonization, digitalization, autonomous ships, ballast water management, cyber security, piracy, protecting the seafarer – take out the dart board and take your pick. For the Secretary General, however, the choice is clear: "Climate change is the biggest issue facing the maritime industry," he said. Climate change is the pick because the issue, as a whole, ties together so many other topics. In Lim's first 27 months at the helm of the world's leading rule maker for maritime, climate change issues have been aggressively discussed and moved forward unlike any other period in maritime history.

The full interview with the Secretary General starts on page 34, and the timing and position of this meeting could not have been better, as starting on page 66 we offer the first glance at MarTID: The Maritime Training Insights Database. There are thousands of surveys in the maritime market, but this one is particularly near and dear to me because we actively participated in the creation and communication of MarTID starting almost two years ago.

In 2017 World Maritime University, Marine Learning Systems and our company, New Wave Media signed a Memorandum of Understanding as partners for a new initiative to help study global maritime training practices. MarTID is the result: a non-commercial initiative to provide objective, comprehensive data on how maritime manages and conducts training for shipboard competencies and the effects of drivers, such as technology, on this training. Key findings and insights from the report are featured starting on page 66, while the full report can be downloaded at: **https://magazines.marinelink.com/NWM/Others/MarTID2018/**

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Trending Now

The path to decarbonization

Photo: Tuukka Ervasti

Wind Power: Viking Line Cuts Emissions

As the commercial maritime community is collectively pressed by international and regional regulation to cut emissions, news from **Viking Line** proves action as Viking Grace -- which is already fueled by LNG -- has become the first passenger ship in the world to use a rotor sail for wind-assisted propulsion.

What is a Rotor Sail?

The rotor sail was developed by Finland's **Norsepower Oy Ltd.** The cylindrical rotor sail installed on Viking Grace is 24m in height and 4m in diameter and uses the Magnus effect for propulsion. As the rotor is spinning, the passing air will flow with a lower pressure on one side than the opposite side. The propulsion force created by this pressure difference drives the vessel forward. The rotor sail operation is automated and the system will shut down in response to any disadvantageous changes in the direction or force of the wind.

What will it do?

In total it is expected to cut fuel consumption and reduce emissions by up to 900 metric tons CO2 annually. Viking Grace is already operating on wind assisted voyages between Turku, Finland and Stockholm, Sweden. The LNG-fuelled ferry has been in operation since 2013 when LR helped Viking Line handle the complexities of the LNG tanks on the stern deck as well as its regulatory, class and operational requirements.

In addition to the rotor sail solution installed on board Viking Grace, Viking Line plans to use wind propulsion in the company's new vessel, due to be operational in 2020. Built in China, the passenger ship will be equipped with two mechanical rotor sails supplied by Norsepower, doubling the wind power potential. **Lloyd's Register (LR)** approved the structure and the risk-assessment related to the installation of the sail in line with its Guidance Notes for Flettner Rotor Approval.

Photo of the Month

Cap San Antonio Fully Loaded and enroute to the next Brazilian port. Herbert Boettcher took this photo for Hamburg Süd when he traveled on the container ship Cap San Antonio from Europe to South America and back to Hamburg. Boettcher started with his worldwide long time project Seamotion in 2004. Boettcher is a German professional photographer working worldwide for shipping companies to create photos of merchant ships with his unique visual language. He has been working as a graduate designer for more than 20 years and has already received numerous awards for his applied and free photographic work.

Visit his website:
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Coast Guard R&D Center

The U.S. Coast Guard Research and Development Center (RDC) in New London, Connecticut, is the service's only command conducting research, development, test and evaluation (RDT&E) support for all 11 statutory missions.

About the Author

Dr. DiRenzo is the Director of Research Partnerships at the Coast Guard RDC. A retired USCG officer who had afloat command, he is also RDC's Project Manager for the Center's Artificial Intelligence Disaster Response project.

Since its commissioning in 1972, RDC has been involved in over 2,000 projects and initiatives that have significantly benefited the Coast Guard and the components of the Maritime Transportation System.

As the demand for research and development capability grows within the service, RDC has adapted an approach to project engagement built around three words: meaningful, relevant and impactful (MRI). This focus has ensured that the Center has an exceptionally high transition rate drawn from its nearly 70-strong project portfolio. In addition to this concerted effort focused on transition, the Center has established a rapid prototyping and testing capability to field solutions to the fleet quickly. This was done in conjunction with Borders and Maritime Security (BMD), a division of the Department of Homeland Security (DHS) Science and Technology (S&T) Directorate, and has placed a renewed emphasis on partnership engagement. The joint effort with DHS, S&T and BMD is officially designated the Science and Technology Innovation Center, or STIC. This capability is a collaborative effort dedicated to leveraging innovation, prototyping and rapid integration of high-technology readiness level (TRL) solutions to answer the operational challenges of the Coast Guard and DHS. It was conceived as a response to former DHS Secretary Jeh Johnson's "unity of effort" initiative. The STIC, with six active projects, recently completed field testing of a tracker designed to support units in pursuit of suspected narcotics smugglers who have jettisoned their loads. The tests were completed in San Francisco Bay and exceeded expectations.

The emphasis on partnerships took a quantum leap forward with the first ever Memorandum of Understanding (MOU) between RDC and the Air Force Research Lab. The MOU established a framework for immediate joint collaboration for engagement; including long-duration UAS, pilot laser strike protection, and overseas technical engagements involved in advanced capabilities for force protection. In addition, the MOU allows greater opportunity for RDC and AFRL to work together on projects of mutual benefit. Several RDC efforts stand to profit from this partnership, including 3-D printing, Arctic operations, modeling and simulation, cyber research, and satellite technology to include CubeSats. Capt. Greg Rothrock, commanding officer of RDC, and Major General William Cooley, commander of AFRL, signed the document in a ceremony hosted at AFRL headquarters.

"RDC is very excited about this new affiliation with AFRL," Rothrock said. "Establishing an MOU is just the start of what we see as a long-term relationship to collaborate where we can on common research that benefits both the Coast Guard and Air Force."

RDC has also seen some unique partnerships within its own service. One

U.S. Air Force photo by R.J. Ortez

U.S. Coast Guard Capt. Greg Rothrock, Coast Guard Research and Development Center commanding officer, and Air Force Maj. Gen. William Cooley, Air Force Research Laboratory commander, shake hands April 12, 2018, at Wright-Patterson Air Force Base, Ohio, after they signed a MOU which allows USCG RDC and AFRL to work together on tasks of mutual benefit.

USCG Photo courtesy of Research and Development Center

Vice Commandant of the Coast Guard, Adm. Charles Michel, inspects a Maritime Object Tracker Technology (MOTT) while Tim Hughes explains the history and capabilities of the device, during a technology demonstration at Coast Guard Research and Development Center, Thursday, Feb. 15, 2018, in New London, Connecticut.

example is the Search and Rescue Hoax Location Systems and Methods project. It was the first-ever RDC project done in conjunction with Coast Guard Investigative Service, or CGIS. This project addresses the issue of serial hoax callers; individuals who conduct false emergency calls that cost the service time and money while potentially impacting the ability to respond to real emergencies. The project used a three-part approach to evaluate and demonstrate different technologies that would assist CGIS and other partners with locating, identifying and prosecuting hoax callers within the Coast Guard domain. The hoax call project laid the groundwork for future collaboration with CGIS.

Other research focus areas are employing the same MRI focus. RDC has several projects that assess and evaluate unmanned aircraft systems (UAS) and unmanned maritime (surface/subsurface) vehicles (UMVs) for a range of capabilities. This is being done because the use of autonomous systems has grown exponentially in private industry, both in the United States and overseas. Specifically, RDC is engaged with a series of testing and assessment from advanced short-range UAS and unmanned maritime systems (UMS) to a very exciting Long-Range/Ultra-Long Endurance (LR/U-LE) UAS program.

The Arctic continues to be a focus of the Center's portfolio, supporting research in Coast Guard Districts 17, 9 and 1. The Center has sent a team to the Arctic for the last few years to embark on the 420-foot medium icebreaker USCGC Healy. With private and public partnerships, they conducted a wide range of experiments that included the evaluation and testing of maritime communication solutions for use in the Arctic and the development and testing of the next generation Arctic navigation safety information system. Significant growth in maritime traffic in this region has prompted RDC to research responses to oil in ice, which is a complicated pollution response event.

The Coast Guard is known worldwide for its expertise in search and rescue, or SAR missions.

In support of this critical capability, RDC continues to explore more effective and efficient ways to complete this mission. From conducting survival modeling, to testing new alternatives to pyrotechnic distress signals, to leveraging the latest technology – like evaluating the potential use of Cubesats as a SAR tool – RDC and its partners are at the forefront of research.

When looked at in its totality, the USCG RDC's portfolio is wide-ranging, touching every single aspect of the service … what better way to be meaningful, relevant and impactful!

USCG Photo courtesy of Research and Development Center

Mr. William Bryan, Department of Homeland Security Under Secretary for Science and Technology, receives a personal demonstration of the Coast Guard Hailing Acoustic and Laser Light Tactical System (HALLTS).

Scrapping Risks

A Belgian ship owner was recently fined €750,000 and two of its senior executives were banned from working in the shipping industry for a year after the company was convicted of the illegal export of vessels for scrapping … The prosecutor had sought jail time.

About the Author

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Traditionally, when a ship reached the end of its economic life, the owner sold it, often to a cash buyer, for scrapping with little consideration of the next step. Many ships ended up on a beach in south Asia (India, Pakistan, or Bangladesh) where they were cut apart and the metal was sold for scrap. The working conditions were sometimes dangerous and hazardous to the workers' health. In addition, little was sometimes done to protect the environment. For many ship owners these days, scrapping is (or should be) a matter requiring business considerations beyond the offered cash price.

A Belgian ship owner was recently fined €750,000 and two of its senior executives were banned from working in the shipping industry for a year after the company was convicted of the illegal export of vessels for scrapping in south Asian yards. The prosecutor had sought jail time for the executives, but the court expressed reluctance for such a measure as this was the first known criminal prosecution for illegal scrapping.

Basel Convention

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, which entered into effect on May 5, 1992, obligates its member states to reduce the international movements of hazardous wastes to prevent transfer of hazardous waste from developed to less developed countries. Its members consist of virtually every nation, excepting Haiti and the United States. Rather than become party to the Basel Convention, the United States relies on domestic legislation to accomplish the same goals. The definition of hazardous waste in the

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Basel Convention is complex, but quite broad. The consensus seems to be that ships that have reached the end of their economic life are or should be treated as hazardous waste under the Convention.

Hong Kong Convention

The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 was negotiated under the International Maritime Organization (IMO) and signed in Hong Kong on May 19, 2009. Parties undertake to give full and complete effect to the Convention's provisions in order to prevent, reduce, minimize, and, to the extent practicable, eliminate accidents, injuries, and other adverse effects on human health and the environment caused by ship recycling, and enhance ship safety, protection of human health and the environment throughout a ship's operating life. The convention enters into force 24 months after the date on which the following conditions have been met: (1) not less than 15 states have ratified, approved, or acceded it; (2) the combined merchant fleets of member states constitute not less than 40% of the world's tonnage; and (3) the combined maximum annual ship recycling volume of the member states during the preceding 10 years constitutes not less than 3% of the world's tonnage. To date, there are six member states.

OECD Council Decision C(2001) 107/FINAL

The Organization for Economic Cooperation and Development (OECD) promulgated a Council Decision aimed at facilitating trade in recyclables in an environmentally sound and economically efficient manner by using a simplified procedure for trade between member states, as well as a risk-based approach for exports outside the OECD area, whether for recovery or final disposal. This decision of March 30, 1992 and its amendments are specifically intended to be in harmony with the Basel Convention.

Thus, member states are obligated to adopt waste export procedures that are consistent with the Basel Convention. There are 35 member states, including the United States, Canada, Mexico, most European nations, Australia, New Zealand, Japan, and South Korea.

The United States adopted regulations in 1996 specifically designed to meet its obligations under the OECD Council Decision. In 2016, these regulations were rolled, without substantive change, into its general regulations under the Resource Conservation and Recovery Act (RCRA).

EU Regulation 1257/2013

The European Union (EU) Regulation on ship recycling and its associated Directive incorporated the Basel Convention and the Hong Kong Convention, making compliance with both mandatory for ships of EU nations and their owners and for other ships that become subject to EU jurisdiction by transiting through EU nations en route recycling. Raising the stakes, the regulation imposes civil and criminal liabilities for noncompliance. This is the regulation that the Belgian shipowner was convicted of violating.

US RCRA statute and regulations

The US Resource Conservation and Recovery Act (RCRA) is the principal federal law governing the disposal of solid and hazardous waste. Among other things, it prohibits the export of hazardous waste from the United States unless the receiving nation has been properly advised of the planned export and approved such proposal. The statute includes civil and criminal enforcement mechanisms, including severe penalties for knowing endangerment. RCRA is administered by the Environmental Protection Agency (EPA), which has adopted specific regulations concerning transboundary movements of hazardous waste for recovery or disposal. As discussed above, these EPA regulations meet US obligations under the OECD Council Decision and are in harmony with the Basel Convention.

Ship Recycling

Commercial vessels, almost without exception, contain hazardous materials, including but not limited to such items as asbestos, polychlorinated biphenyls (PCBs), and lead and other heavy metals. Thus, the recycling of a ship constitutes the disposal of hazardous waste under international, European, and US federal laws and regulations. The US government recently ceased efforts to export its vessels for scrapping in foreign countries. The Maritime Administration (MARAD) has withheld authorization to transfer US-flag vessels to foreign owners where there is evidence that the transfer is for scrapping.

Heavy Lifters

Cranes, Heavy Lift Shipping, Engineering & New Technologies

About the Author
Yahaya Sanusi is Deputy Head of Transport Engineering at AAL, and has worked in shipping for more than 20 years. Prior to joining AAL, he worked at Thyssen Nordseewerke shipyard, Macor Neptune, and Beluga Shipping.

Compared to new technologies, conventional engineering in shipping is a relatively simple science: computable and generally predictable. However, heavy lift shipping presents challenges that go far beyond what is required with standard unitized cargoes. The transportation of project cargoes – often highly valuable components of multi-billion-dollar projects – requires expert planning to ensure they are loaded and transported safely and efficiently.

Last year AAL shipped two giant cyclone vessels (22m x 11m x 10m and weighing over 500mt each) to Petronas' $27 billion RAPID project in Malaysia. For such a project it's essential to gauge the ratio between the weight of cargo to crane capacity, and also the displacement of the ship. Once these ratios approach unity and especially if they are combined with many other cargoes, detailed planning is required to have an optimal solution. In this respect the two cyclone vessels presented a number of challenges. They were loaded onto the AAL Fremantle, one of our 19,000dwt S-Class vessels, in Mailiao, Taiwan, using its combined 700mt cranes to safely lift and stow the cargo into one of its three giant, box shaped holds and weather deck respectively. Two weeks later they were safely delivered.

The Human Element

AAL believes the most important factor in the safe loading of complex cargoes is not the specification of our equipment - important though this is - but the human element.

Lifting equipment can be broadly similar across the heavy lift industry, at least amongst specialist carriers. A high-quality carrier should invest in effective engineering equipment when lifting, loading, securing, transporting and unloading the extraordinary cargoes seen in the multipurpose sector, but it is the human element that separates one cargo carrier from the next, especially when a few centimetres can make all the difference, or when it comes to the effective use of vessel to give maximum intake.

AAL operates one of the youngest and most advanced fleets in the sector. AAL's 21 multipurpose vessels offer superior infrastructure with side-mounted heavy lift cranes, large and even deck space, removable and height-adjustable 'tween decks, large box shaped cargo holds with independent dehumidifiers, strengthened tank tops as well as appropriate lifting and lashing equipment. With our mix of 31,000 dwt A-Class, 19,000 dwt S-Class and 33,000 dwt W-Class vessels, we also lead the 'Mega MPP' vessel segment (30,000+ dwt). However, the key to success is in-house technical and engineering team.

New Tech: Theory and Reality

The heavy lift shipping industry has slowly implemented many new technologies in many aspects of their work. But if one looks at the technical aspect, there can be discrepancies between the theory

Photo: AAL

and the reality.

While new technologies such as 3D-simulation, finite-element analysis and motion response analysis are slowly working their way into the daily operations of multipurpose shipping, understanding of how these technologies contribute to the safe handling of project cargoes fluctuates across the industry. In such cases engineering capacity can be lost in trying to implement these complex calculations, without comprehension of the benefits. Multipurpose shipping is already a highly specialized sector and new technologies must be thoroughly understood before their implementation disrupts the accepted standard. Continuing without this can result in additional costs and resources, and may also affect the safety of the operation.

On the other hand, as more general cargo carriers muscle in on the multipurpose sector, we're seeing the industry's best practice methods become diluted. Crews of general cargo carriers may not necessarily have the right knowledge and experience to safely transport the multi-billion-dollar cargoes common to the industry. For instance, some such crews and vessels might stick to the 1 m initial stability during the lift, as opposed to considering other relevant stability criteria, or confuse the requirements between damage and intact stabilities.

The new IMO Resolution MSC.415(97) is an important milestone in heavy lift shipping. When it takes effect in January 2020, for the first time there will be international legislation setting stability criteria for lifting procedures, so it is important for crews transporting project cargoes to understand and adhere to best practice methods and calculations.

Emerging technologies

Exciting technological developments lie ahead. Just like autonomous cars are now being tested on our roads, the first autonomous ship will be tested in 2019. Today conventional ships with deckhouse aft are limited when transporting tall cargo in case visibility from the command bridge is impaired. But the authorities must rethink. As long as safety standards are met, surely, they must accept new technologies such as proximity sensors and infrared cameras to replace the naked eye.

There are other interesting technologies, such as big data analytics, virtual reality, expert systems or artificial intelligence. All have hardly touched our industry yet, but I am sure they will find applications in the future, along with the already available 3-D simulation and, to a certain aspect, intelligent stowage planning.

The engineering tools and methodologies used in shipping have remained relatively the same for the last 15 years. If shipping is to keep step with technology, then we need to evolve, including our physical tools. However, while the equipment used is important, investment in the right people is still the key to maximizing the value of a carrier's engineering capabilities. It takes time to train young people to become experts. If we want to maintain or even push up the standard we must be prepared to invest to keep the industry interesting and attractive for young and brilliant people to join the industry.

Riding the Digital Wave

A smart shipping survey conducted in January 2018 found that, while the majority of maritime industry executives believe digitalization and big data will transform the sector, only 8.7% currently see it as a major part of their operations.

About the Author

Martin Wallgren was appointed to the position of chief information officer (CIO) for the GAC Group in 2017. Prior to joining GAC at its Dubai head office, Wallgren was the CIO for the Stena Group in Sweden.

Unpredictability and disruption have made the past decade anything but smooth sailing for the global shipping industry. Volatile trade patterns and policies, low freight rates, fluctuations in commodity prices and within global demand have all contributed to a highly competitive environment which requires careful navigation by shipowners. To survive – and thrive – in such challenging times, shipowners cannot afford the luxury of complacency. They must adapt to become the fittest that will survive the latest evolution of the market at large.

Digitalization for Today

More and more shipping companies are embracing big data and digitalization to achieve operational and commercial efficiencies and drive growth.

A look through recent headlines in the maritime media reveals a growing number of stories about large sums being invested in digital strategies. The *Journal*

Trailblazers: While digitalization is still in its infancy in maritime, there are some clear leaders, such as Rolls-Royce, guiding the way.

Photo: Rolls-Royce

of Commerce has reported that, over the last five years, more than $500 million has been ploughed into digital and technology start-ups aimed at transforming the maritime industry. CMA CGM has introduced a host of initiatives and measures to drive the use of innovative technologies across their business. Maersk and IBM have announced a joint venture seeking more efficient and secure ways to conducting global trade using blockchain technology.

Shipping has been slow in adopting digitalization, compared to other industries. A smart shipping survey conducted in January 2018 found that, while the majority of maritime industry executives believe digitalization and big data will transform the sector, only 8.7% currently see it as a major part of their operations.

That may change soon, as measures taken by industry giants signal the pressing need for a real, tangible consideration of the benefits of digitalization across the shipping and logistics industries. Regardless of business size, digitalization is a must for those who want to thrive in the current competitive landscape, and it has already reshaped the way in which some businesses operate.

Soon, the entire sector will be playing catch-up. But it is the early adopters who will see the greatest transformative benefits, and they are the ones that will emerge as industry leaders of the coming decade.

Data Insight

Data is now a commercial driver and a commodity in its own right. That is something that shipping and logistics companies need to understand.

With more than 300 offices in more than 50 countries, GAC (Gulf Agency Company) collects an immense amount of data from its day-to-day operations. It is wide-ranging in scope and scale – from insights into purchasing decisions and trends, to more macroeconomic data surrounding the emergence of different trade routes as companies adapt to changing demand. It is valuable information which enables us to provide tangible market intelligence on emerging trends to our customers – giving them what they need to respond with informed commercial decisions. Data also allows us to tailor solutions to individual customers according to the markets in which they operate.

That is the very essence of big data – the smart application of hard facts and insight gained from operating on the frontline changing the way that business is done.

The rapid evolution of new technologies has paved the way for greater efficiencies in shipping and logistics. Supply chains can be further streamlined and greater efficiency achieved by committing to integrated operating models that provide previously unrealized transparency and access to valuable data. The potential of those integrated models span companies or sectors is vast.

Platforms

GAC has pioneered a digital platform based on five core drivers: data-based decision making; ensuring easy engagement and connectivity with customers; sharing data with peers and key stakeholders; collecting and analyzing sensor data; and ensuring a customer-focused and well-maintained IT system.

Focus groups are held regularly to equip the company's IT team with service-related knowledge to help improve our group's offering. As its digital platform evolves, GAC will be able to adopt changes faster and spread them through the group to provide informed guidance on business developments.

But building new data platforms and changing products or services is not enough. To fully embrace and benefit from digitalization, the shipping industry must change its mindset to keep pace with the changing business environment in which they operate.

There are a lot of technologies ready to be implemented in the business, but we need people with the right skills and attitude to implement the new way of working.

As shipping catches up with on the adoption of digitalization already seen in other industries, it's vital to define a clear digital plan as an integral, complementary part of our overall business strategy. And while this may present a challenge, companies who fail to do so risk finding themselves out of step with changing markets and customer expectations.

It is well documented that the shipping and maritime sector has much to gain from big data and digitalization – but only if it is willing to step up and embrace change to unlock the benefits. It's about going from opinions to facts and with the new insights make the right actions.

Voices Darren Larkins, CEO, SSI

LARKINS

> *The U.S. has always been a strong market for us* **and naval shipbuilding in the U.S. is on a bit of a tear,** *as well as here in Canada.*

Maritime Reporter & Engineering News recently visited Larkins at SSI's Victoria, B.C. office where the new co-owner brought us up to speed on the company's advanced technologies and how SSI is helping shipbuilders to embrace them.

BY ERIC HAUN

Photos: SSI

SSI CEO Darren Larkins, together with President & CTO Denis Morais, acquired ownership of the shipbuilding software development company from founder Rolf Oetter effective March 1, 2018. The two longtime employees have been managing SSI for the past seven years and have been entrenched in all aspects of the company's day-to-day operations for even longer. Larkins, SSI's fifth employee in 1999, said he and Morais have done "pretty much everything that SSI does at some point. "This gives us the unique ability to address the customers' requirements to a greater degree than potentially larger companies where the management has no direct engagement with the customer or hasn't lived through the day-to-day of the customers and worked with them."

Shipbuilding has been difficult of late. When you look at the market, what do you see?

We haven't had a lot of presence in some of the major Asian markets which to a degree have been hit fairly substantially by the downturn. Our success has been fairly diverse into naval, luxury, some commercial – a lot of things like fast ferries, aluminum shipbuilding and so on. We've had, to use a financial metaphor, a diverse portfolio of customers and that has helped us. We've actually been doing really well over the last couple years because the naval segment, especially in the U.S., has been on a bit of an uptick, and the other segments we've been in haven't been hit too much. But absolutely, the commercial market in Asia specifically has been very depressed. I think it is going to turn around slowly, but not in the next few years, or to the levels it was at a few years ago. I just don't see that happening.

You mentioned naval shipbuilding. Where else are you looking for opportunities?

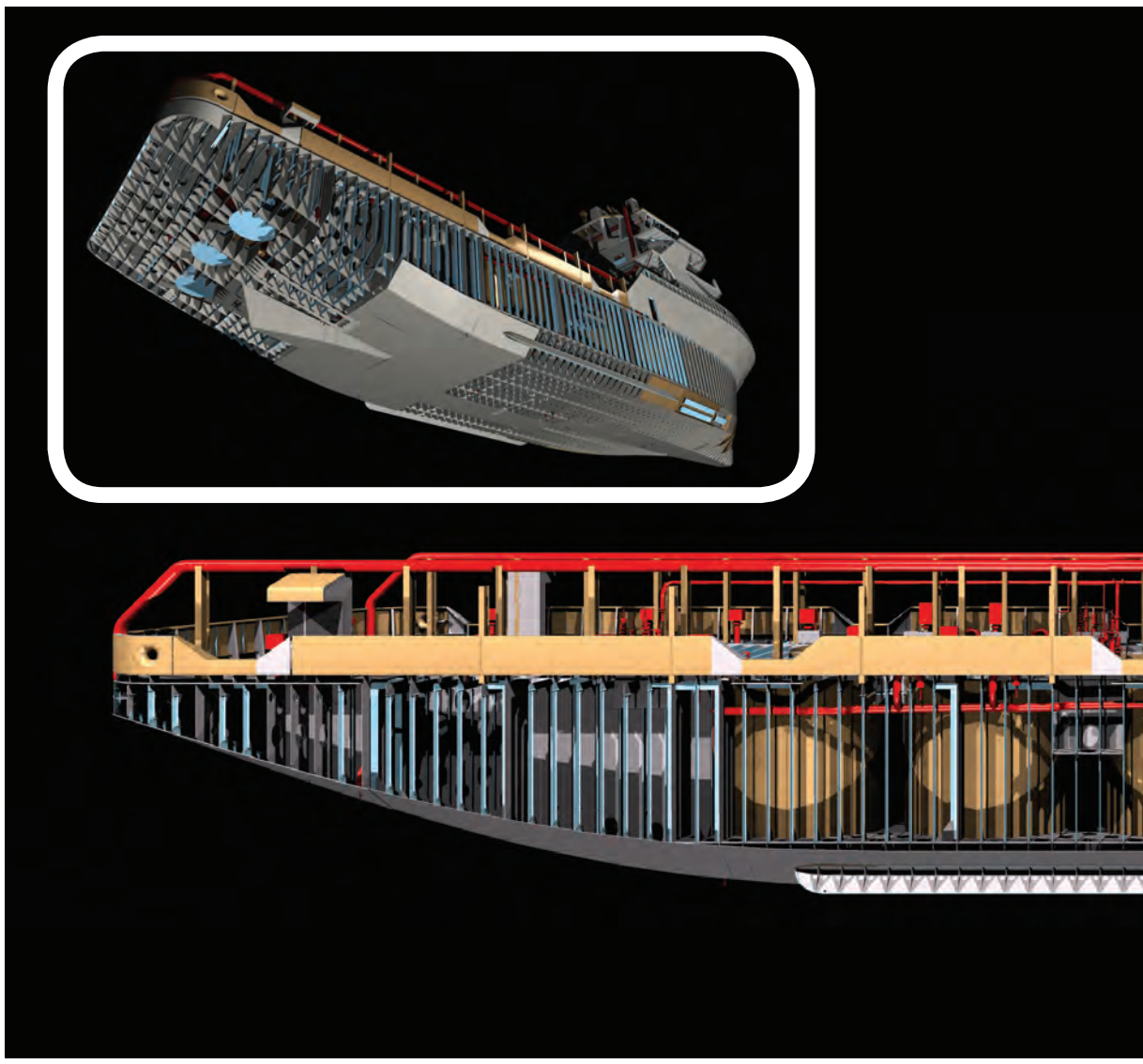
In Australia, similar to the success we've had here in Canada. There are a number of Canadian Navy and Coast Guard programs that have been awarded or are ongoing for the next 30-40 years, and we've been very successful with all of the noncombat packages and all of the work being done at Seaspan - Vancouver Shipyards and so on. These sort of investments in shipbuilding technology and shipbuilding capability might not exist without that local investment. Rather than going offshore and buying a design from an established shipbuilder in Europe or Asia, they're investing locally. That sort of thing is also happening in Australia. We've had a lot of success in the past in Australia so we have a good base there to leverage with a lot of the current aluminum shipbuilders as well as BAE Australia. There's a lot of good work going on there.

Japan is actually another market where we see some things going on. They obviously were hit by the depressed shipbuilding market as much as some of the others, but at the same time, their quality and the ability to build more complex ships has kept them afloat. Naval fits really well into that. That's somewhere we're looking as well.

Defense or naval shipbuilding around the world, whether it be in places in eastern Europe like Turkey, doesn't generally have the same level of volatility as some of the other sectors. Wherever naval shipbuilding is happening is where we have our eye – on that particular segment. There's some other things we're looking at as well.

How has SSI helped to forward the digitalization trend in the maritime sector?

A number of things in terms of new products – I say new, but we've been working on this for years now. In the past, and even in many shipyards today, there's a lot of technology or digitalization, if you will, going on within design and engineering, but in an isolated sort of way. But the connections outside of those departments into the rest of the shipyard are still quite often paper drawings, maybe electronic 2D drawings, but the buck stops there in terms of progressing that. We're trying to convince many shipyards to take it one step further and integrate all of the rest of the shipyard processes and departments – and I say integrate, but really seamlessly make them part of the design engineering process so information, awareness of change, even driving production machines automatically based on approved changes within engineering and our Enterprise technol-

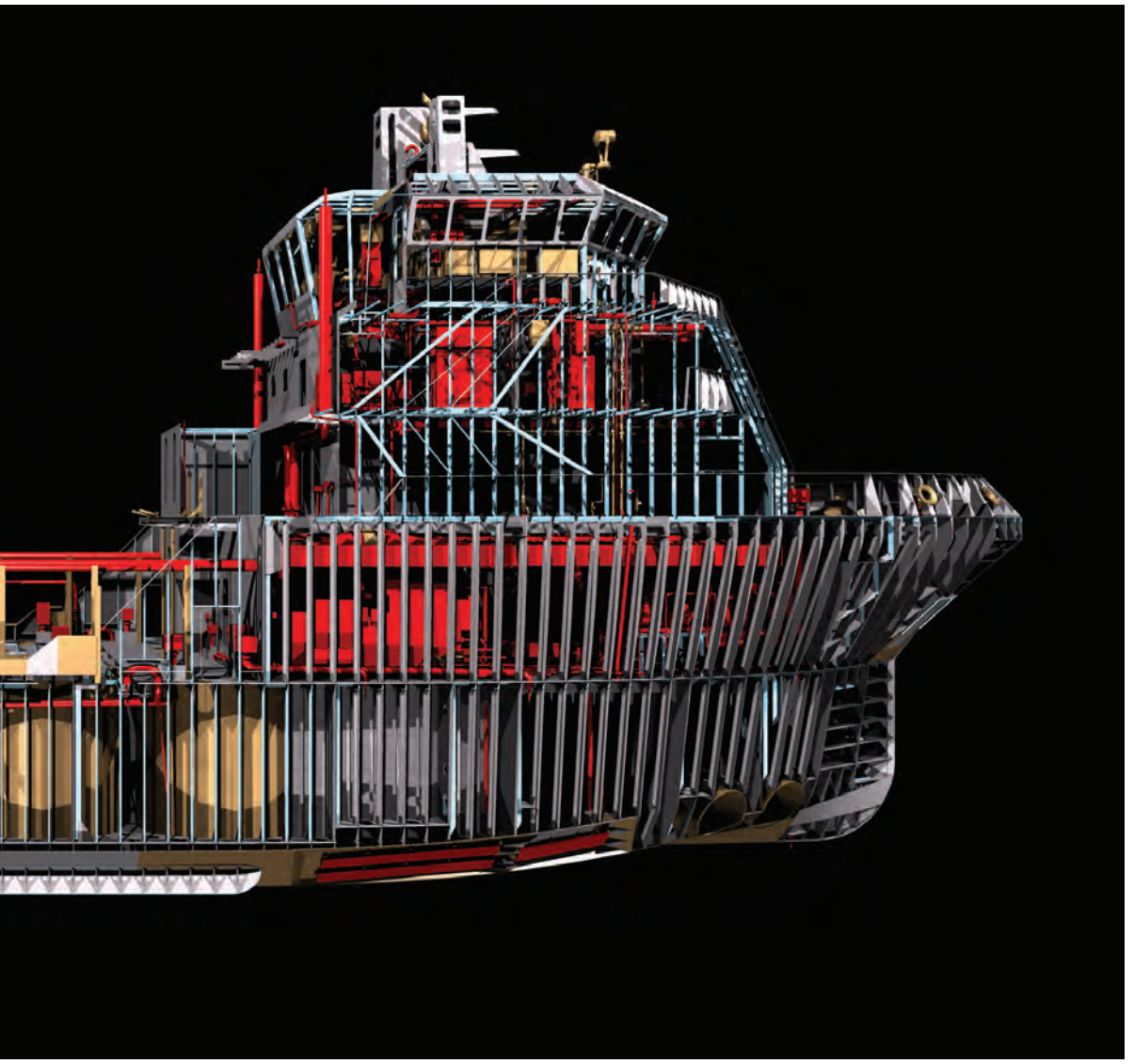


Photos: SSI

ogy platform is essentially that. It's not software that an individual user sits down in front of and sees, it's software that allows our design engineering solutions to be connected into the rest of the shipyard such that information is simply available at their fingertips when they need it. That's a big thing for us is, whether you call it democratization of technology or empowering users, it's the ability for normal people to be able to have whatever they need to be able to do their job at their fingertips rather than going hunt and find it, or having to ask somebody to simply reference a 2D drawing that doesn't give them all the information they need because going and trying to get a 3D model with detailed information just isn't available. If you have that ability you're pretty much guaranteed that the information is not out of date, that it's an approved revision. That goes to the second point: we're dedicated to creating software that is easier to use. It's software that does not require a degree in using the software to get things done. You simply need to know shipbuilding and know a little bit about some of the products and technology. That's where the democratization comes in. If you want to be able to interrogate the 3D model and get a piece of information, you shouldn't have had to go through a two-month training course on how to use the software. It should be ready, right there, when you need it. And all of our technology is intended to be very easy to pick up and use.

The shipbuilding industry can be conservative, reluctant to change. What are some of the hurdles you've faced and how have you overcome them?

Slowly, I'd say. Conservative: I think that's not necessarily a negative description. I think pragmatic. The types of sales we do is not a typical sales job that you might see in other industries. We have to walk customers through how what we do is going to improve what they do in some way. So, it's not simply a matter of knowing the latest buzzwords or having sexy videos on the internet. Each one of us, the management team and even our product owners have spent time in the shipyards, and our sales people are engineers or naval architects and so on, so people that really understand the business that the customers are involved in. And I think that's the only way – I wouldn't even say overcome it – but to recognize shipyards aren't going to invest in something that they don't feel is a low risk of disruption in terms of their current project. Because not only are they conservative, shipyards are very much focused on the current project and even the current block within the current project in terms of cutting steel and meeting payment milestones and those sorts of things, so they're very reluctant to take on new risk. I think the biggest way to do that is to show them that you understand exactly what their pain is and what their risks are and the challenges to overcome. We've done that by working



quite often with people/partners in the individual regions. Our senior partner for Europe, for example, has had 40 years of experience in naval architecture design, he owned a design company, he knows the shipbuilding industry in and out, rather than a typical CAD/CAM reseller that is good at sales of technology but really not that great at understanding the customers' challenge. A key to the shipbuilding industry is to be part of the shipbuilding industry not an outside technology provider that doesn't understand what's going on day to day.

What's new from SSI in the last 6-12 months, and what can we expect to see in 2018?

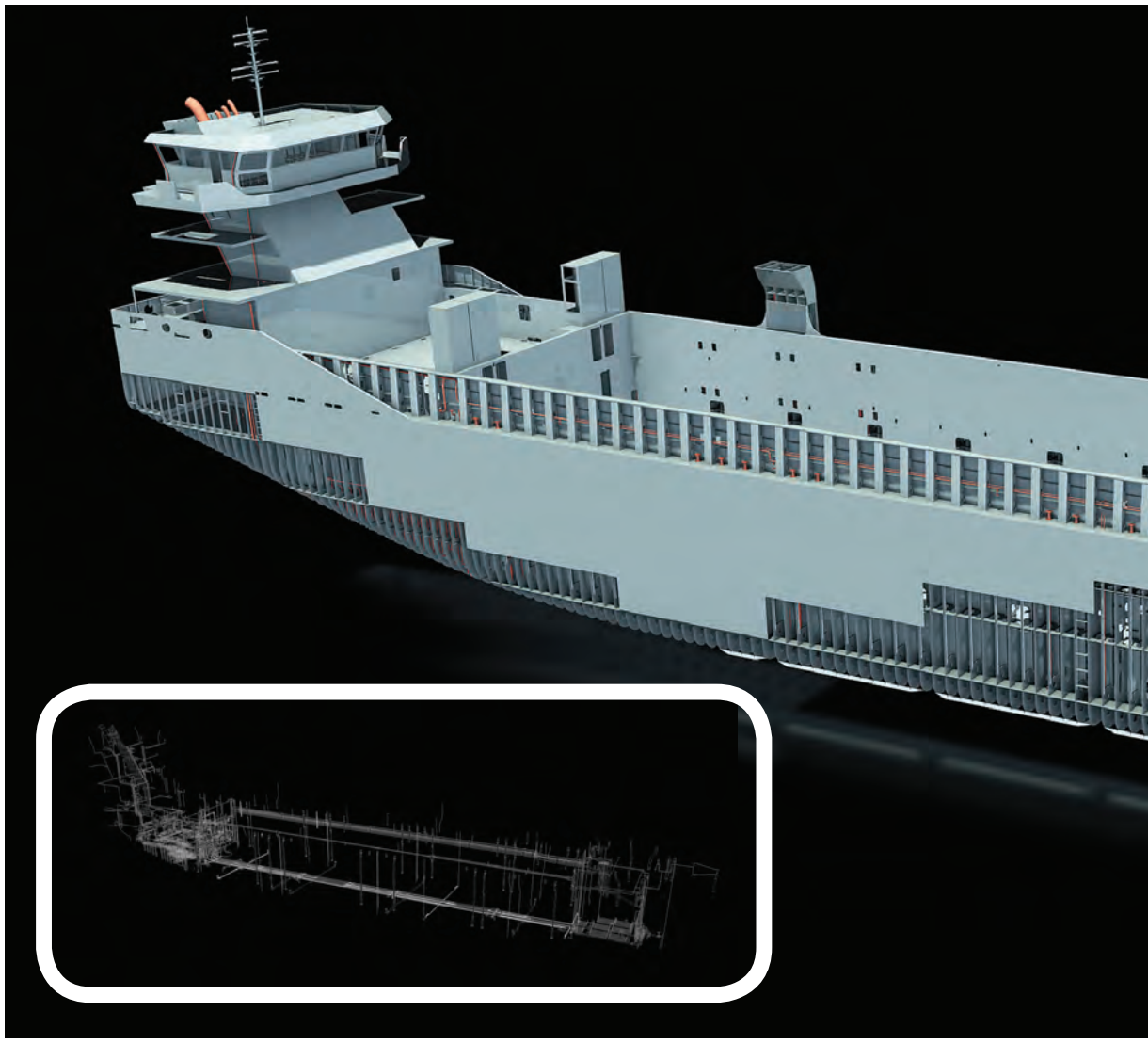
Our focus has largely been on the EnterprisePlatform technology. We continuously evolve even the core ShipConstructor products. We've had several releases; our 2018 R2 product came out maybe four months ago, and in the next few months we have our 2019 product coming out. And the focus in all of that has been more on that whole digitalization and EnterprisePlatform concept, making information available. We're advancing the core toolsets based on specific user requirements, but nothing groundbreaking in terms of those areas. We have a fairly broad portfolio of products already that answer a lot of the needs our customers have, so now we're helping them communicate internally with the rest of the shipyard. The EnterprisePlatform is where a lot of the innovation is happening.

In terms of the product, the 2019 version is our big release for 2018. A lot of that is focused on the SSI EnterprisePlatform and updates to our MarineDrafting technology, which is the ability to create 2D representative drawings from the 3D model. That's been a big push for us over the last few years as well, making that product really work for the shipbuilding industry and the specific needs of different markets. For example, Japan is a focus for us. They are very heavily dependent on 2D still, so finding a way to get them to adopt 3D, like our modeling technologies, but still be able to get the type of 2D drawings they need out of it. So, we're focusing quite a bit on our MarineDrafting product as well.

You mentioned earlier your diverse customer portfolio. What's hot at the moment? Where are you looking?

Naval shipbuilding, again. The U.S. has always been a strong market for us and naval shipbuilding in the U.S. is on a bit of a tear, as well as here in Canada.

But other than that, we think Japan is ripe for opportunity, specifically for us because, like I said, they're focused on a lot of 2D processes and 2D workflows. And our connection with AutoCAD and Autodesk technology – because those have typically been the go-to tool for 2D



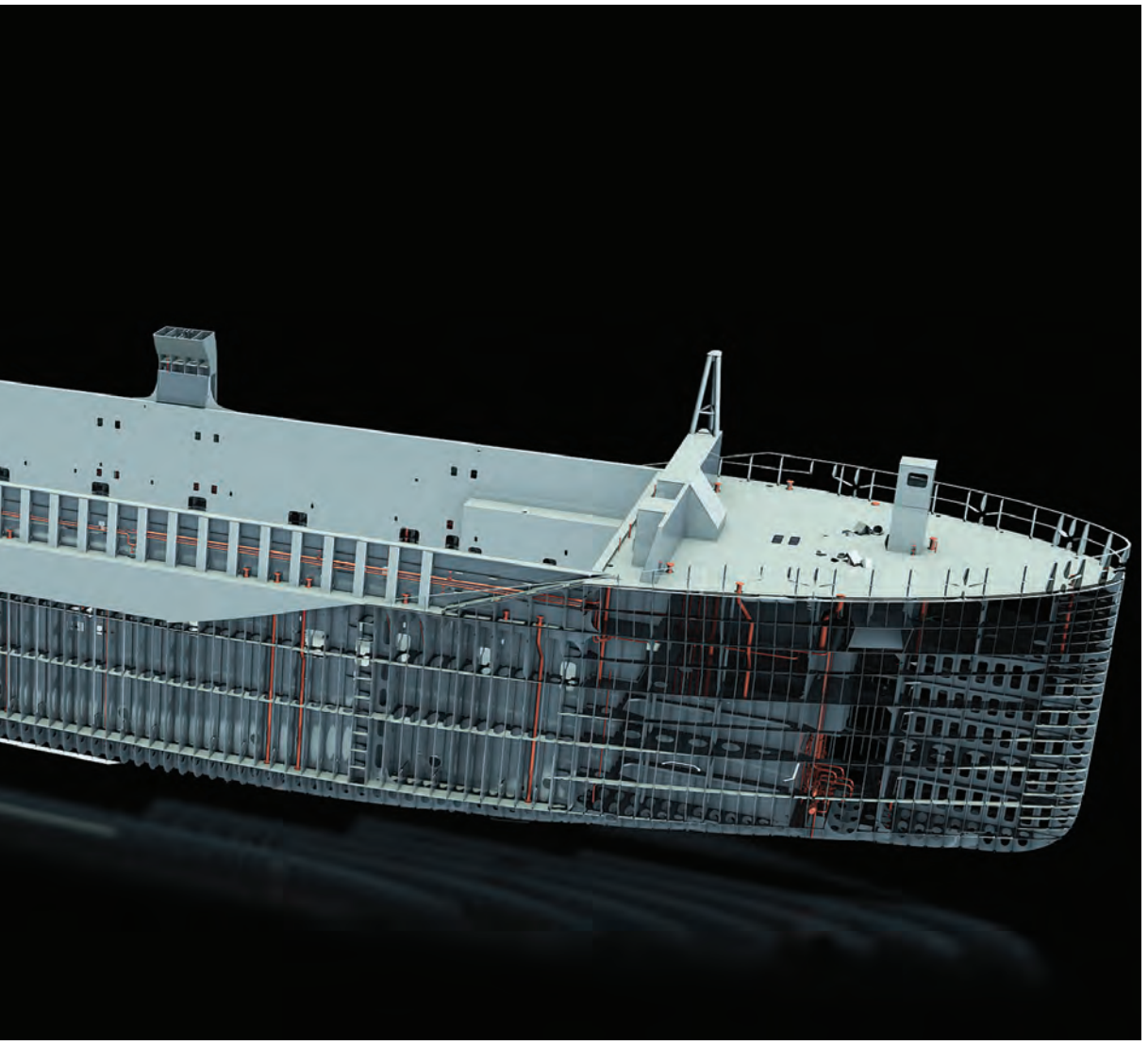
Photos: SSI

drawings and 2D technology – so we think we can offer them a bridge between 2D and 3D. They know they want to go to a 3D paradigm, they know they want to change their processes, but everything they do is so heavily entrenched. And it's not just their shipyards. Their supply chain, the people delivering drawings to them have a strictly 2D process. We're looking at being able to basically create a bridge between what they do traditionally and to be able to move into some of the newer technologies out there. It's something they know they need to do; they need to move not just to 3D technologies, but once you move to 3D things like PLM, which is basically the ability to manage in a very reputable, process-driven, information-driven way all the activities in the shipyard, you need to move to some of the newer technologies like 3D, like product models, to be able to make that next transition. They know where they need to go, and we think we can offer them a step between where they are and getting there, rather than requiring them to completely disrupt everything that they've always been doing and are really good at and have built a differentiator of quality around their processes and the way they do things. We think that's a hot market for us in particular.

As you said, shipbuilding is not in a great state globally, so for us naval shipbuilding is an area where we haven't seen that much of a downturn. In fact, the company has seen a lot of success in that area. But other than that, there's no getting around the fact that the shipbuilding industry globally and some of the markets we looked at for growth maybe five years ago – like China, like Korea and so on – I wouldn't say have dried up in terms of those opportunities, but everyone is even more cautions than they have been in the past.

The breadth of SSI's offering is large, and I'd imagine some customers often don't take full advantage of the products it offers. What is SSI doing to help ensure customers reap the maximum benefit?

That's a great question, especially since we're doing something I think is fairly unique in the shipbuilding industry; we've just recently launched an online learning platform called SSI Learning, and part of that is something called SSI MyLearning. It's on-demand online training and education of our products and the capabilities in them. So rather than requiring the users to either go to one of our resellers or engage us to do high-cost training on site, or learning it themselves, and possibly not understating the full capabilities that they have in the software, we're offering a very low-cost – it's actually included for customers that have subscription, for the time being – access to our full training material, full curriculum certification in an online delivery mechanism. So, any user can go online and be certified on any one of our products in a matter of a couple days. That's a big push for us because our software is a lot more capable than some people think it is. I think that's typical of software, especially when you've been using it for five years, 10 years; you



assume you know what it can do, and a lot the time you may not have had any training on the software or been formally exposed to what it can do. So, this is one of our answers to ensuring that the end users are educated in terms of what they have, and it removes all of the traditional barriers that shipyards would have around not wanting to take people offline when they're working on active projects. It's something that can be done by individuals in whatever time they have because of the way that it's delivered. And it fits really well with markets where the cost of labor often doesn't equate well with the cost of training from software companies.

If you're paying a few thousand dollars a year for a skilled naval architect in Vietnam or countries like that, often paying an equivalent amount to have that person trained, the cost benefit is not necessarily there, but in an online delivery mode I think it makes a lot more sense for these shipyards. The reason I say it's unique is because we take that approach where we want everything to be easy to use and not require an advanced degree in CAD, but simply require a good working knowledge of shipbuilding to be able to operate the software. We're one of the few products that can deliver that sort of online, self-directed, self-guided training in all of our products. Like I said, as long as you understand shipbuilding, everything you're exposed to in the training you can understand. You don't need an additional set of context or rulebooks or core training on how to do 3D CAD. You're simply doing shipbuilding in a virtual way.

How is SSI investing today?

We've grown and are still hiring more people in what a lot of people call a depressed shipbuilding market. Recently we've hired a number of new individuals mostly in product development. Again, we're fairly lean on the sales side of the business because I think shipbuilders want to talk to people who understand how the products are going to solve their day-to-day challenges and issues. So, we invest a lot on the product development, R&D and technical sales, if you will. But those are people who truly understand how to use the software or have worked in the industry. We've hired a handful of people even in the last few months on our product development teams and are hiring more.

It shouldn't be a surprise, but we believe in technology. We're investing in a lot of infrastructure so that our employees have the best tools that they can possible have to do the things that they need to do: a lot of virtual infrastructure, virtual testing and automated testing infrastructure and so on.

We've also invested in direct offices in Dubai and in India because we see those as being markets where we want to directly engage with the customers, so we've hired teams there. Again, the majority of people we've hired are people with shipbuilding backgrounds, who've worked in the industry, who can take what they know and help other people implement their software.

Ron Huibers, Volvo Penta

Photos: Volvo Penta

Powering Ahead

As Volvo Penta continues its strategic penetration of the commercial maritime sector, *Maritime Reporter & Engineering News* checks in with Ron Huibers, President, Volvo Penta of the Americas.

BY GREG TRAUTHWEIN

Update us on Volvo Penta's push into the North American commercial marine market.

Historically, we have been strong in the marine commercial markets outside of North America. Five years ago, we made the strategic decision to leverage this global experience and supplement our marine leisure business with an increased focus on the commercial segment here in the Americas. Since then, our commercial marine business has increased by roughly 10 percent annually. Our current lineup for the commercial marine market includes a variety of engines based upon the regions' needs (D1 – D16 in Canada and Central America) and (D4-D16 in the U.S.), ranging from 225 to 800 in the U.S. horsepower with inboard or IPS drives. We also offer both diesel and gasoline sterndrives, and marine diesel gensets. In some cases, customers are using our engines to power pumps on fuel barges as well. About 20 percent of our commercial marine business is newbuilds. We've seen a surge of repowers in California.

The commercial marine sector is large. Where does Volvo Penta best fit?

Our "sweet spot," I would say, is displacement vessels from 15 to 90 feet. We have had good success with pilot boats, tugs, commercial fishing vessels, passenger and vehicle ferries, and patrol boats for law enforcement and military operations. Since many of these projects have a relatively long lead time, our efforts to build market share over the last few years are now starting to bear fruit.

Ten percent commercial marine growth is impressive. What measures is Volvo Penta taking to further strengthen its position in the North American commercial marine segment?

We recognize that the prime imperative for commercial marine vessel operators is to minimize downtime and maximize productivity. To that end, we have put a great deal of emphasis on strengthening our commercial marine dealer network to ensure prompt service 24/7/365 with the highest possible first-time-fix rate. We also have established new Volvo Penta Power Centers in key regions. We now have 10 commercial marine Power Centers, in the U.S. and Canada. These large "super dealers" provide a critical liaison link with dealers and builders in their regions. They too have decades of experience serving the marine commercial industry. We have beefed up our technical training programs for dealers. Last year we set a new record for the number of trained technicians, both in our training center in Chesapeake and in key regional centers across the Americas. In 2018 we'll do even more. To supplement in-person training, we also offer a broad array of e-learning courses to help competence development for our dealer technicians. The 1 million square foot national parts distribution center recently established by the Volvo Group in Byhalia, Miss., is another key element in our commercial marine strategy. In most cases, Byhalia provides overnight delivery of critical parts anywhere in North America.

Where do you see growth in the coming 12-24 months?

We see a market opening up in the U.S. offshore wind industry as it already has in other parts of the world. The Department of Energy reports there are 28 offshore wind projects currently under development. As these coastal wind farms come into service, they need a fleet of vessels to transport crew and spares to the turbine towers. As you know, the offshore wind industry in Europe is far more mature and advanced than in North America. Volvo Penta has captured a large market share of the offshore wind support vessels in Europe. This gives us a leg-up when it comes to offering proven, fast and fuel-efficient solutions to the market. Our IPS technology is a perfect fit for these highly specialized vessels.

We are seeing share growth in ferries, water taxis and passenger carriers, as more and more municipalities take advantage of their waterways to relieve congested roadways. Military vessels are another area of strategic focus for us.

Does Volvo Penta have any endeavors in the development of its systems fit for true autonomous operations?

Certainly, truly unmanned autonomous ships are still a long ways off, but in the short term we will doubtless see movement toward more shore-based monitoring and control over onboard systems in real-time. We believe connectivity will become a standard feature built into marine engines over the next few years. The Internet of Things (IoT) is already becoming commonplace in land-based transportation, spearheaded in many ways by our Volvo Group colleagues, and we will see it gaining traction in the marine space. Commercial operators will want to be able to pull data off the engines and drive train, as well as other mission-critical systems on the vessel in real time, for analysis, condition-based maintenance and trouble-shooting. This movement will also be driven by lower-cost satellite data connections for vessels operating beyond the reach of land wireless networks. You can be certain that we will be at the forefront of this trend.

When I visited Volvo Penta's global R&D center 18 months ago there was a push regarding joystick controls. What progress has been made?

Volvo Penta was an early pioneer in introducing joystick docking and maneuvering to the marine marketplace.

Joystick control is gaining momentum in commercial marine vessels. The benefits are obvious, but the marine industry is conservative, and it will take time to overcome the traditional wheel-and-throttles mindset.

Interestingly, last year we won an Innovation Award from the National Marine Manufacturers Association for our new patented Joystick for Inboard. This was the first-ever joystick for twin inboard shaft installations that includes both docking and driving modes and integrates all five steering components – thrusters, rudders, gear shift, slip and throttle. Since the steering system is all-electric, it eliminates hydraulics.

How is increased regulation in maritime affecting Volvo Penta?

When it comes to emissions mitigation, we are able to call upon the vast engineering resources of the Volvo Group, which has been a world leader in emissions technology. For instance, Volvo was an early pioneer in developing SCR technology for over-the-road heavy trucks. Already, Volvo Penta's SCR-based land-based industrial engines are fully compliant with EPA Tier 4F requirements. Volvo Penta's marine engines in Europe are currently meeting the latest EU standards, which in many cases are more stringent than America. We take a proactive, not a reactive, stance in this area, and we are committed to being ahead of the curve when it comes to meeting new deadlines for new regulations.

What about electric and hybrid propulsion?

We are actively pursuing these technologies, which we believe will become the wave of the future, both in land transportation and marine propulsion. The primary barrier to widespread penetration of electric and hybrid systems until now has been battery capacity, which continues to improve dramatically. As with emission-reduction technology, our close relationship with our sister companies in the Volvo Group gives us access to the latest improvements in automotive-scale energy storage technology. Volvo Penta has supplied hybrid systems for several high-profile vessels in Europe, and I'm sure you will see more of the same in the Americas. The potential savings in fuel and lower maintenance costs present a compelling argument, and I predict momentum will continue to build in this area.

What do you consider the biggest challenge to expanding Volvo Penta's penetration in the commercial sector, and how are you addressing it?

This is a tough question. We know we have the right technology, backed by industry-leading engineering and quality, and we are continuing to invest in developing an aftermarket service network that is second-to-none in the industry. We are growing our market share in the Americas' commercial marine sector steadily. Still, we may be perceived by some as a relative newcomer in the commercial marine marketplace, and the only way to overcome that hurdle is to call attention to our growing pool of customers.

German Shipowners get

Back to Basics

The situation for the shipping companies based in Germany has been, much like the rest of the world in 2017, mostly tight. Currently, the German shipping companies are undergoing changes against this background. They are concentrating more and more on their core competences. Maritime Reporter & Engineering News' *man in Germany,* ***Peter Pospiech****, recently talked to* ***Alfred Hartmann****, President of the VDR (Association of German Shipowners), for his exclusive insights on the size, shape and direction of German shipowners.*

Photo: Hartmann AG

Mr. Hartmann, in 2017 the situation for the German Shipping companies has been mostly tight. What does this mean for the German maritime navigation?

If we are talking about the market situation in shipping the focus is mainly on container traffic – about freight rates, merger and alliances. There is no doubt about that container transport is an important part of the branch – but this is not the whole shipping business. If the freight rates for the container transport getting better, it can look totally different in the tanker, bulker or offshore vessels. Even in the container shipping existing not only lines, but also a lot of ship owners who rent their ships to others – and facing momentarily a growing market power of the lines. The total picture of all vessels and owners based in Germany is mostly tight – particularly for smaller companies. During the last five years we lost more than 1,200 vessels. These vessels are not gone from the market, but they keep going with favorable capital costs and, based on this, increase the competitive pressure. Not only jobs on board will be lost, but also increasing the job employment losses in the shipping companies. With this we estimate that the German-location will lose high-grade know-how and economic significance.

How do you assess this difficult situation related to the growing requirements with regard to environmental and climate protection for ship owners?

In this difficult situation companies facing new burden because of the increasing requirements to environmental and climate protection. We would like to operate our vessels more cleaner and with fewer emissions. But environmental protection does not come for free. An actual example is the ballast- water convention which came into force in September 2017. In future all merchant vessels must treat their ballast water on board in special systems. With this microorganism can't anymore spread in alien maritime areas.

Basically it's a sensible idea but on the cost with substantial investments and implementation problems. For the time being the ballast water convention is the most expensive environmental regulation which the shipping industry had to shoulder. In the coming years it will become increasingly clear if all owners will be able to bear the investment of up to two millions EURO per vessel. Otherwise the convention could be an involuntary scrapping program.

Besides water cleanliness, it is also about clean air and less greenhouse gases. German shipowners appreciate that the community of states see the International Maritime Organization (IMO) in a leadership role to push the subject environmental protection. We stay behind the IMO global timetable after which all ships, with beginning of 2019, collect their CO2-emissions and report them via

the flag states. These will then be used to derive targets and measures – worldwide and binding for all market players.

Vessels already today feature the best climate balance sheet compared to all transport vehicles. It would be an important climate protection contribution heavy traffic to shift from road to ships, wherever it can – particularly in the European short sea shipping.

During the last years shipping invested a lot in more efficient machinery and modern vessel design. By larger and more efficient vessels the CO2-footprint of transported goods becomes continuously smaller.

To get by the end of the century a climate-neutral sea transport, shipping needs to get a further innovation offensive in research and development, particularly with regard to alternative fuels and propulsion systems. The worldwide governments must pursue with the branch and provide financial resources to enforce the necessary technological revolution.

Beside the CO2 subject our shipping wants to contribute also in other air pollutants. It is our understanding that we use in our vessels only fuels which comply with the statutory regulations. It was during the 1980s, when the federal government with a support program pushed the change from heavy fuel to diesel fuel. Since 2009 shipping is again on the course away from conventional heavy fuel. In 2020 the limit value will be lowered by around 90 percent – and after this to 0.5 percent. In the high-traffic emission control areas stringent sulphur limit values are already in force. First special areas exist for nitrogen oxide. With these ECAs shipping contributes to lower the burden by ship's exhaust gases.

Because of its excellent environmental balance shipping focuses more and more on LNG.

But ships conversions or new builds, which are able to use LNG, are complex and expensive. Compared to conventional fuels ship's engines, storage tanks and supply lines one can calculate with additional costs of around 20 to 30 percent. That's the reason why we appreciate the support program. It helps the German ship owners to bear the considerable additional costs – and not to forget: it's a true win for the environment

A great help was the LNG support program. Which further measures are necessary to strengthen the German shipping location in the long term?

The LNG support program was one of the most important political measures for the German shipping location. This also includes realignment for training and employment. The German flag is more attractive than ever: just to mention the flexible specifications for crewing, the refunding to employers social security contributions and the full wage tax deduction. What's more is the educational support by the foundation "Schifffahrtsstandort Deutschland" – this is paid by the vessel owners.

In the course of dealing with the significant market crisis we could stabilize the training figures and stop the strong decline in shipping employment. These measures are certainly not all to

A challenge is the ship financing. Domestic banks as partners have broken away. German ship owners are looking for new partners in foreign countries.

German Captain and his officers on duty.

Photo: Pospiech

strengthen the German shipping location. A challenge is the ship financing. Domestic banks as partners have broken away. German ship owners are looking for new partners in foreign countries.

The structural changes in the global market require from the maritime economy a high degree of adaptability. What, in your opinion, must be done in order to meet these demands?

German vessels have always been on the move globally. But now also the companies are gaining ground – not only at financing. The same trend we see at the management. Big corporations fill their leading positions much more often with foreign manager. The more international the shipping companies management is positioned, the less the company depends on the German location.

Also, typical German company structures are in a change. Project planning, financing, property, charter, crewing and operating are done less often from a single source.

In fact, owner focus on their core competences. German shipping companies enjoy worldwide a good reputation with the management of vessels – so that reputable foreign companies give their vessels for operation at the German location. The quality is right, but the price pressure in Germany is huge.

The new extended business areas of our companies make it also necessary to think about further devel-

One of the Hartmann-Reederei special vessels.

Photo: Pospiech

opments of the special conditions. That includes an extended scope of the tonnage tax – for instance for services in the future market offshore wind for the so called third party management – the operation for third parties, without having properties of the vessel.

Finally the location needs a comprehensive strategy to keep the owners as a central part of the maritime cluster in Germany. If we lose our skills to operate vessels, we also will lose successive the value and innovation strength.

On the other hand we have, here in Germany, with the right policies great chances.

Because by using the potential of digitalization and belonging furthermore to the forerunner in green shipping, the location is well positioned for the future international competition.

The German Maritime Center and the Digital Hub Logistic in Hamburg as well as the Maritime Competence Center MARIKO in Leer are only a few examples of many of our strong maritime cluster. We must strengthen in cooperation our know-how of our shipping companies, the universities and research facilities as well as the other maritime stakeholder. The political framework must be further adjusted. With all this shipping companies in Germany will be successful in the future and secure jobs and value.

The maritime economy has just outpaced a crisis decade. When does the economy pick up from your point of view?

The shipping companies made an important contribution from the supply side. More and more older ships are getting scrapped. Relatively few new vessels have been ordered lately, especially smaller units. We note that freight rates during the last months getting slightly better. Whether this will be sufficient, we will see. But the tendency is there.

German Chief A. Kagelmacher checks the temp at the stern tube.

Photo: Pospiech

Clutching at Compliance

LNG looms as the bridge to a 'zero emissions' future for shipping

BY BARRY PARKER

The advent of industry wide tightening of allowable sulfur emissions is getting nearer. Suddenly, with the deadline now little more than one year away, the countdown clock will very soon be ticking much louder. Simply stated, the cap on allowable sulfur content in marine fuels, presently at 3.5% in many geographical regions, will be reduced to 0.5% in January 2020. The 0.1% sulfur cap, already in effect since 2015 in coastal Emissions Control Areas (ECAs) in Europe and North America, will remain.

As carriers struggle with deciding which is the best way forward to compliance, liquid natural gas – or LNG – has emerged as an attractive option, because it is "…virtually sulfur-free…" as oil major Shell explained in their brochure, IMO 2020: What's next?, a document aimed at marine fuel customers.

LNG as the White Knight?

In late 2017, the use of LNG as a fuel has seen a groundswell of support, and gained status as the next wave. The liner giant CMA CGM announced that a series of nine 22,000 TEU newbuilds, set to deliver from two Chinese yards in 2019-2020, will be dual fueled – with a plan of consuming LNG. Closer to home, Harvey Gulf International Marine, already owning six dual fueled vessels (which can burn LNG) along with an LNG bunkering terminal in southern Louisiana, announced a venture, Quality LNG transporters (Q-LNG) which will be building an Articulated Tug Barge (ATB) to transport LNG for charterer Shell Trading, to fueling stations around Florida and the Caribbean.

Separately, Tote Maritime, already an owner of two newly built LNG fueled container vessels, announced that two existing Ro-Ro vessels would also be converted to dual-fuel capabilities. Owners of vessels presently burning the most typical grades of the fuel widely used in slow speed marine diesel engines, Intermediate Fuel Oil (IFO; a blend of higher sulfur "residual" fuel and lighter distillates) are faced with three difficult choices to meet the new rules:

- Consume diesel fuel/gasoil with a low sulfur content;
- Consume heavy residual fuel, with exhaust gasses cleaned with a scrub ber; and/or
- Switch to an alternative fuel, such as Liquid Natural Gas (LNG) or, perhaps, methanol.

Location, Logistics & LNG

One uncertainty surrounding all choices is price inputs to any business case for one choice over another. These are tied closely to questions of fuel availability.

Images: Skangas

pable vessels calling (or hoping to call) at certain ports?

LNG fueling makes sense where trade routes are fixed and known well in advance. Not surprisingly, the first steps have been taken in environmentally hyper-conscious regions. While many ports are studying LNG fueling, its actual availability is limited. The World Ports Climate Initiative of the International Association of Ports and Harbors (IAPH) notes that LNG bunkering facilities are already available, or planned, at ports in Scandinavia and Northern Europe and some Asian ports.

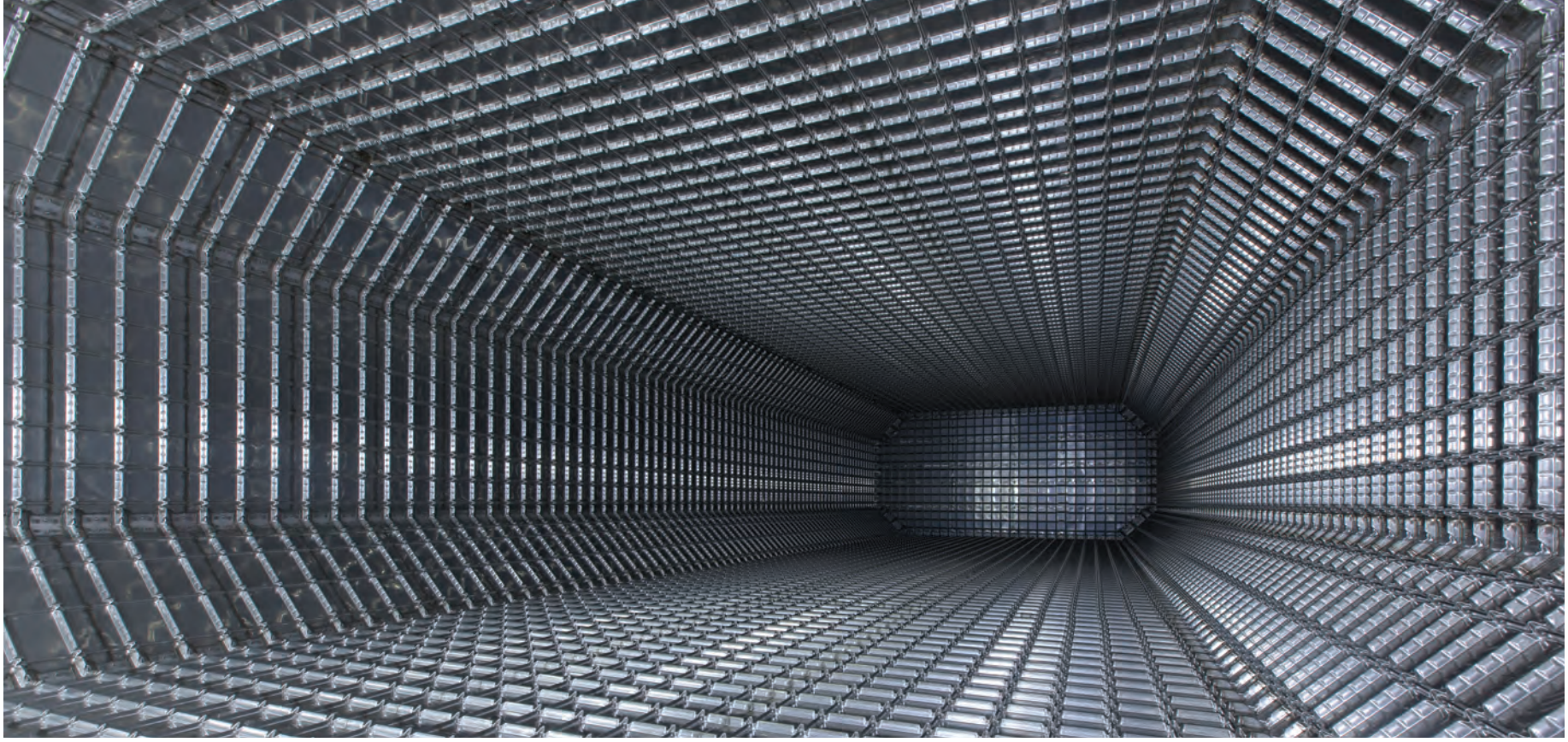
In the United States, Jacksonville, Fla., seems to be at the epicenter of the LNG-fueling map, but Harvey Gulf's foray into LNG bunkering happened first in the port of Fourchon, La. Multiple ports along the U.S. West Coast – where political and regulatory pressure to achieve so-called 'zero emission' operations is tremendous – are said to be looking at ways to provide fuel for LNG consuming vessels.

An inchoate business/logistical model that seems to be emerging is that of a waterside liquefaction operation (where gas is cooled and transformed into LNG), tied to a terminal that handles local landside distribution, on-site marine fueling, and trans-loading into LNG barging across a broader distribution network. Importantly, the barges can also be used for marine bunkering operations. Integral to this new model is a long term supplier of gas.

Existing facilities in the U.S. & Scan-

When prices of low sulfur fuels reflect scarcity, capital investment in scrubbers or in LNG propulsion (slightly more expensive than conventional diesel engines) look more attractive, with shortened payback times and/or increased incremental savings over time.

The path towards January 2020 presents many other uncertainties, including whether oil suppliers can (a.) make low sulfur fuels available at strategic bunkering locations and more importantly (b.) whether they can produce sufficient quantities of low sulfur distillate fuel in the aggregate. For owners choosing to install scrubbers (after an investment analysis), there are many questions about the slope of the installation learning curve, and the efficacy of adapting a landside technology to the maritime environment. For owners choosing to build LNG fueled vessels, the most immediate question centers around availability of the fuel itself. It is here that the conundrum of 'chicken and egg' suggests that LNG fuel must be available as a precondition for LNG propelled vessels to enter a particular trade lane. Or, instead, does the fuel supply respond to LNG ca-



Images: Conrad Shipyard

The GTT Membrane tank for the Clean Jacksonville bunker barge.

dinavia typically see LNG delivered by truck to vessels at a fueling dock. A more complete model, the recently completed Tornio Manga LNG Terminal on the Gulf of Bothnia in Finland, will receive gas in small tankers and has plans to provide LNG for vessels in the future. In North America, Harvey Gulf Marine's pioneering LNG fueling installation at Port Fourchon, part of a larger liquefaction and distribution project, will be serving the company's fleet of LNG fueled OSVs (several of which are on charter to Shell) and those of third party customers.

LNG bunkering barges are a movable link in the fuel supply chain, solving the 'chicken and egg' dilemma as they can move to where the ships are. In service now, a handful of these LNG bunker barges replenish their fuel inventory at a liquefaction facility and then move to where the customers are.

Seacor Holdings, for example, has acknowledged that LNG bunkering "…is starting to come into the market…" according to Chief Operating Officer Eric Fabrikant. Fabrikant says that Seacor looks closely at non-commoditized sectors of the market, and described LNG bunker barges as "a nascent space."

Early Adopters

Among the oil majors, Shell has taken early and big steps in LNG fuel supply. Rotterdam is the base for its 6,500 cbm bunker tanker Cardissa, which takes on LNG at the Gas Access to Europe (GATE) terminal, which in turn takes delivery of LNG in large quantities from oceangoing tankers that bring gas from the Mideast and Asia and then store it. A second vessel will be working out of Rotterdam, and placed on charter to Shell Western LNG BV. With Wartsila supplied cargo handling systems and tanks, the 3,000 cbm vessel that will be owned through French / Belgian consortium and then chartered by the oil major. Its smaller size will afford the additional flexibility to bunker vessels operating on Europe's inland waterways. The barge is being built in Romania and will be outfitted in the Netherlands.

Elsewhere in Europe, the world's first LNG bunkering vessel, the 5,000 cbm Engie Zeebruge went into service in Belgium in early 2017. The vessel (jointly owned by Mitsubishi Corp, NYK and two European gas companies) boasts customers that include United European Carriers, who also operates LNG fueled vessels calling in North Europe. In Scandinavia, the 5,800 cbm Coralius was delivered this past summer and will be serving the Skagerrak/Kattegat area and also the Baltic Sea.

The vessel is owned by shipowner Anthony Veder and Sirius Shipping, and will be on charter to Skangas, a distributor serving Norway, Sweden and Finland. Skangas Chief Executive Officer Kimmo Rahkamo offered in a prepared statement, "It is a valuable add-on to our existing bunkering methods of trucks and terminals along the coast." Initially, the vessel loaded LNG at the Skangas production facility at Stavanger.

In the U.S. marketplace, the first strides have been taken by TOTE Maritime, which serves Jones Act routes linking the Pacific Northwest with Alaska, and Jacksonville with Puerto Rico. TOTE has deployed two NASSCO-built 3,100 TEU containerships, both with capability to be fueled by LNG, in the Puerto Rico (Jacksonville/San Juan) trades. Its Alaska division has announced plans to retrofit two roll-on roll-off vessels for LNG propulsion at the Seaspan Shipyard in Vancouver, with BC. MAN Diesel & Turbo undertaking the conversion. The retrofit to LNG propulsion, delayed partly due to scheduling changes in the wake of the El Faro sinking, will be completed by 2021.

Initially, the vessels are being fueled by LNG produced in a Georgia facility and then trucked to Jacksonville, in specially designed containers, where the carefully choreographed LNG bunkering operations take place under U.S. Coast Guard (USCG) supervision.

In the coming months, fueling will be conducted from a newly constructed 2,200 cbm LNG barge built at Conrad Shipyard. In late summer, TOTE Maritime's fuel provider, JAX LNG, has received a Letter of Acceptance (LOA) from the USCG for the operation of its waterfront LNG facility (which will include a small liquefaction plant) and the approval to conduct barge-to-ship LNG bunkering operations. According to TOTE, "Barge-to-ship LNG bunkering is scheduled to commence in early 2018."

The Way Forward

When it comes to LNG bunkering, financial complexity matches logistical complexity. JAX LNG is a newly formed company owned by Pivotal LNG (a wholly owned subsidiary of Southern Company Gas), and NorthStar Midstream, LLC (under leadership of Tim Casey from K-Sea Marine and backed by funds that are managed by an infrastructure group within Oaktree, and Clean Marine Energy LLC). The principals of the latter include the van Reesema family, best known for their investment in the Jones Act tanker American Phoenix.

The barge Clean Jacksonville, in turn, is owned by Wespac Midstream, part of the Oaktree family, and Clean Marine Energy LLC. Mr. Casey, in a prepared statement, revealed the longer term game-plan for the Jacksonville JAX LNG business, saying, "The facility will include a marine dock to load bunkering barges that will deliver marine LNG up and down the East Coast of the United States."

The Northeast Florida hub of the U.S. to Puerto Rico trades is also emerging as the fulcrum for the LNG bunkering business around the Caribbean. Crowley Maritime, also based in Jacksonville, will soon be placing two LNG powered container/ RoRo vessels built at VT Halter, into service.

These will be served by another liquefaction plant, Eagle LNG (backed by Texas-based Energy & Materials Group and gas supplier Ferus). Gas for this project, which could come on stream in 2019 if all approvals are in order, and for possible future facilities, will come from Exxon. In the interim, when the two vessels begin service in 2018, Crowley will be fueling from two cryogenic tanks, at the Talleyrand Marine Terminal in the port.

The recurring themes of the new business model are clear. A Ferus news item explains, "The produced LNG will be transported to markets in the Caribbean and Latin America for power generation.

It will also be delivered to local and regional markets, including marine bunkering and high horsepower applications for domestic consumption." Crowley has already been supplying LNG, in tank containers, to Puerto Rico, through its Carib Energy subsidiary, acquired

When prices of low sulfur fuels reflect scarcity, **capital investment in scrubbers or in LNG propulsion** (slightly more expensive than conventional diesel engines) look more attractive, with shortened payback times and/or increased incremental savings over time."

in 2013. Carib Energy is positioned to take on project management activities throughout the markets served by Crowley. While Crowley has not yet ordered LNG transporting barges, it is important to note that its wholly-owned naval architect, Jensen Marine, has created an ABS approved design for an ATB combo capable of transporting 4,000 cbm of LNG.

In the not too distant future, barges based in Jacksonville may also be supplying LNG to a new generation of cruise vessels that will deliver in coming years and will serve European and Caribbean markets.

A deal already announced has fuel for two of Carnival Corporation's new LNG powered cruise ships (set to deliver in 2020-2022) supplied by Shell Trading through the new LNG ATB being built by Q-LNG and the Harvey Gulf connection. Carnival brand AIDA, operating out of northern Europe is already using LNG, supplied by Shell. Once further approvals are in place, barges based in Rotterdam and Zeebruge will form part of the supply line for AIDA, and for Costa Cruises (also a Carnival brand) which also has placed orders for LNG powered vessels.

Once stalled by low energy prices and the utter lack of infrastructure outside of a handful of shorter niche routes, LNG as a fuel is gathering a full head of steam in global markets. Further propelled by the looming 2020 deadlines, that momentum – regardless of what the price of oil settles at – is unlikely to be lost. If LNG isn't the final solution for shipping, certainly it is the vehicle that will take the waterfront ultimately to where they want to go. That ship sailed a long time ago.

Photo: IMO

Kitack Lim

Secretary-General, IMO

As the International Maritime Organization (IMO) celebrates its 70th anniversary, Kitack Lim, Secretary-General, sits in his London office with a sense of satisfaction that in his two plus years at the helm of IMO tremendous strides have been made toward significant greenhouse gas emission reductions, punctuated by the recent MEPC meeting where the target was set for a 50% reduction in CO2 emissions by 2050. But the Secretary- General's sense of satisfaction is tempered with the fact that his job has just begun and his plate is full. **Decarbonization**, ***Digitalization***, **Autonomous Ships**, ***Ballast Water Management***, **Cyber Security**, ***Piracy*** and **Protecting the Seafarer** … the list is long of agenda-topping items that the IMO must simultaneously digest in this historic and fast-changing period.

BY GREG TRAUTHWEIN

A Royal Welcome

IMO Secretary-General Kitack Lim accompanied Her Majesty Queen Elizabeth II during her visit to IMO. Inset: Her Majesty, Queen Elizabeth II, comes to Albert Embankment to open officially the building in 1982.

When Kitack Lim took the top spot at IMO as Secretary-General in 2016, he suffered no delusion regarding the job ahead. The collective global maritime industry was entering a transcendent period, still emerging from the global economic trauma of 2008 and diving headlong into an era of disruption, an era highlighted with social and financial pressures on maritime to reduce emissions, to digitalize operations to keep pace with a whirlwind of tech and logistic challenges, all the while maintaining safe and secure operations for the crews and the environment. In prioritizing his responsibilities, Lim is today laser focused on IMO's top three challenges: Climate change, Digitalization in the shipping industry (including autonomous ships), and Seafarer issues.

Global Climate Change

"Climate change is the biggest issue facing the maritime industry," Lim said, impacting everything from ship design to engine and fuel choice, as well as operational procedure. "Climate change has a huge impact on the ship itself, the ship management and the shipping industry as a whole."

In Lim's first 27 months at the helm of the world's leading rule maker for maritime, climate change issues have been aggressively discussed and moved forward unlike any other period in maritime history. Most recently, in mid-April, the initial strategy on the reduction of greenhouse gas (GHG) emissions from ships was adopted as a key item on the agenda of the IMO's Marine Environment Protection Committee (MEPC 72) (see related story on page 40).

While the new accord is historic, on the more immediate horizon shipping companies must devise a strategy to deal with the strict new fuel rules set to enter force in 2020. While there has been much debate regarding the rapidity of the conversion to low sulfur fuel, namely the concerns surrounding the availability of sufficient fuel supply, Lim said there will be no delay in enacting the new rule. "The entry into force of the 0.50% sulfur in fuel oil limit cannot and will not be delayed," he said. "Legally, there is no mechanism to amend the date and for any revised date to enter into force before January 1, 2020. However, IMO Member States will work in the relevant IMO technical bodies to address any issues that might arise with regards to ensuring consistent implementation."

Cutting to the heart of the matter, fuel availability, Lim said "a comprehensive study on availability of fuel oil was carried out by experts and overseen by a steering committee and it concluded there will be enough compliant fuel oil," and the study was taken into account when IMO member states made the decision to go with the 2020 date for implementation.

Digitalization & Autonomous Shipping

"It has been said that the next 10 or 20 years will see as much change in shipping as we have experienced in the past 100 years," said Lim, succinctly summarizing the speed of technology across the maritime sector. "The integration of new and advancing technologies in the regulatory framework is a key strategic direction for IMO," Lim said, "but we need to balance the benefits derived from new and advancing technologies against safety and security concerns, the impact on the environment and on international trade facilitation, the potential costs to the industry, and their impact on personnel, both on board and ashore."

The driver in the new maritime economy is data and digitalization; Artificial intelligence, automation, e-navigation and autonomous shipping are all being driven by digitization, which in tandem are inextricably linked to environmental

Photos: IMO

> "Climate change is the biggest issue facing the maritime industry.Climate change has a huge impact on the ship itself, the ship management and the shipping industry as a whole."
>
> **Kitack Lim, Secretary-General, IMO**

issues, such as ship design, and fuel and energy efficiency.

"This will lead to new generations of ships that bring step change improvements in all the areas that IMO regulates," said Lim. "E-navigation and cyber security are already on IMO's agenda. We will be looking at the subject of autonomous vessels in the coming months, starting with a comprehensive scoping exercise to review current regulations and how they may or may not apply to autonomous vessels."

Autonomous ships, in particular, are gaining wide traction as several large corporations and organizations are not only studying autonomous ship, but launching prototypes and planning for real-world production. While the technology side of the autonomous vessel equation is developing rapidly, there remain many key issues to resolve, from the regulatory to finance and insurance, to name a few. "The value that IMO provides is as a forum gathering together all those with an interest in shipping," said Lim. "IMO's Maritime Safety Committee (MSC) will this year begin a scoping exercise to determine how the safe, secure and environmentally sound operation of maritime autonomous surface ships may be introduced in IMO instruments. The strong interest in this topic was evident on the lengthy discussion that it attracted, not only during the MSC meeting last year, but the extensive media coverage since."

Lim said the scoping exercise is a starting point and is expected to touch on an extensive range of issues, including technical issues, the human element, safety, security, legal liability, interactions with ports, pilotage, responses to incidents and protection of the marine environment. In addition, the scoping exercise could include identification of whether IMO regulations preclude the operations of these type of vessels or have no applicability, and what actions would need to be taken in order to ensure that the construction and operation of maritime autonomous surface ships are carried out safely, securely, and in an environmentally sound manner. IMO's Legal Committee is also expected to include an item on its agenda, to undertake in parallel a regulatory scoping exercise and gap analysis of conventions emanating from the Legal Committee – such as those covering liability and compensation – with respect to autonomous ships.

Disruption

Hand-in-hand with digitalization comes disruption, as many non-traditional maritime companies eye the industry for opportunities. "Digital disruption will arrive in the shipping world very soon; and, when it does, IMO must be ready," said Lim. "This means the rules for shipping must be based firmly around goals and functions rather than prescriptive solutions. This is the only way to make sure that measures adopted by IMO are not rendered obsolete by the time-lag between adoption and entry-into-force."

"Artificial Intelligence capabilities are accelerating rapidly and will have an important impact not only on our work but society as a whole, and are already incorporated in many products – for example, Amazon's shopping recommendations and Tesla's self-driving cars," said Lim. "Advancements in technologies such as robotics, automation and big data will usher structural changes and fully autonomous ports and unmanned ships are already a reality, albeit in a very small scale. IMO will continue to remain relevant and in touch with these developments. We are addressing autonomous vessels and the readiness of our regulatory framework."

Another key area for digital technology is e-navigation, harmonizing marine

IMO Leadership Through the Years

Mr. Ove Nielsen (Denmark),
1959 to 1961

Mr. Jean Roulier (France),
1964 to 1967

Mr. Colin Goad (United Kingdom),
1968 to 1973

Mr. Chandrika Prasad Srivastava (India),
1974 to 1989

#IMO70

In 2018, IMO celebrates 70 years since the Convention establishing the Organization was adopted. The World Maritime Day theme for the year is:
"IMO 70: Our Heritage – Better Shipping for a Better Future".

Mr. William A. O'Neil (Canada),
1990 to 2003

Mr. Efthimios E. Mitropoulos,
2004 to 2011

Mr. Koji Sekimizu, (Japan)
2012 to 2015

navigation systems and supporting shore services with the ultimate goal of improving safety of navigation and reducing errors by equipping users, on ships and ashore, with modern, proven tools, optimized for good decision-making. "There are many ways in which e-navigation can offer enhanced safety, better environmental protection, improved traffic management and commercial benefits," said Lim. "There is no doubt that both the technological advances and the advantages they can bring are continuing to evolve."

The Seafarer

While Kitack Lim's plate is full with a number of watershed issues surrounding ship technology, the Secretary General is clearly passionate about seafarer issues, particularly ensuring that seafarer social and human rights are a top priority. "My ambition is to create a psychological link between the IMO and the seafarer," he said. This ambition is rooted in his view that there is a changing paradigm in the shipping industry regarding the relationship between the seafarer and the company where they work. "In the past, the ship operating company made a direct contract with the seafarer, creating a link between the seafarer and the company," Lim said. "The seafarer would think, this is my company," and that bond was instrumental in creating a greater sense of community, connection and security for the seafarer.

But today things have completely changed, with the emergence of middlemen, namely ship management companies, international registries and even classification societies. These three entities, particularly the ship management company, have largely been delegated direct day-to-day roles that directly impact the seafarer, and lost is that psychological connection between the seafarer and the shipping company.

"We need to look harder at the role and responsibility of the ship management company," said Lim, noting that it is not well known or understood publicly, highlighted particularly when accidents occur. "We need to reassess the impact of these three players in terms of IMO (rules) implementations."

As should be expected from the leader of the lead rule-making body for international shipping, Lim believes in collaboration and inclusion, with clear communication. "We need to talk, all of the relevant players, from the IMO to the ILO to NGOs, we need to communicate" on issues and look after the seafarer, a critical piece he believes in not only caring for the seafarers of today, but critical too in attracting the younger generation to a life at sea.

"I am concerned about their morale," particularly in cases where an accident occurs and they see a captain arrested. Lim concludes that it comes down to basic human rights, and in some regards, due to the changing paradigm, "mariners do not feel protected."

The Secretary-General is also concerned about abandonment of seafarers which unfortunately has become a more common occurrence. Indeed, in 2017, reported abandonment cases (55) were nearly triple that in any single recent year over the past five years. While the reasons for abandonment vary, the impacts are devastating on seafarers and their families – loss of wages, inadequate food and medical attention, and an inability to be repatriated and return home to loved ones. The IMO, the International Labour Organization (ILO), the ITF and the industry have all been working to help eradicate this problem, but statistics show that it persists.

Hand-in-hand with seafarer issues is training and education, particularly as approximately 80% of ship accidents are attributable to human error. "Today's world depends on a safe, secure and efficient shipping industry; and shipping depends on an adequate supply of (well-trained and cared-for) seafarers," said Lim. "Seafaring is a job that demands highly trained and qualified personnel, as ships are more complex and sophisticated than ever before. Environmental pressures, the need to operate at optimum efficiency in difficult economic times and the quest for ever higher levels of safety are all factors which raise the bar with respect to the skill and competence levels of seagoing personnel."

As the level of technology on ships evolves rapidly, Lim contends that standards of crewing and operation must keep pace, as the modern ship's officer needs to be far more than a navigator or an engineer, and the modern ship's crew needs to be far more than a mere worker.

"A modern ship is a highly technical workplace operating on the tight margins of commercial viability – which means that, as well as a highly-advanced technical skillset, shipboard staff now also need to have management and communication skills, IT knowledge, and be able to handle budgets and so on," Lim said. "This places special demands on maritime education and training. Maritime education and training must be of high and consistent quality, throughout the world. Maritime education and training also needs to be skills-based, competence-based and to utilize the latest technology – simulators reflecting modern ships and up-to-date bridge layouts, for example."

Cyber Security

With Digitalization Promise Comes Peril

As maritime enters the digitalization era and the prospect of safer, more efficient operations, caution must be taken to ensure that Cyber Security measures are in place to help avoid a catastrophic collapse of commerce at sea. "A ship's onboard information technology and operational technology systems can be hacked just as easily as systems ashore," said Kitack Lim, Secretary-General, IMO. "Such security breaches have the potential to do considerable harm to the safety and security of ships, ports, marine facilities and other elements of the maritime transportation system." To lead the way, IMO has taken the initiative to raise awareness across the industry on how to tackle risks by promoting a maritime cyber risk management approach. In addition, it has developed and agreed guidance on cyber security, issued jointly by the Maritime Safety and Facilitation Committees (MSC-FAL.1/Circ.3 Guidelines on maritime cyber risk management). As digitalization and cyber security strategies evolve rapidly, it is important to note that the guidelines are a living document rather than a static mandate, updated and evolved as need and experience require. "IMO has a remit and responsibility to identify which aspects of cyber risk management are uniquely maritime and work on these while at same time promulgating information that is of more general application, for example on supply chain security and best practices for cyber risk management in general," said Lim.

IMO Mandate: Cut Emissions 50%

"We are confident this will give the shipping industry the clear signal it needs to get on with the job of developing zero CO2 fuels, so that the entire sector will be in a position to decarbonize completely, consistent with the 1.5 degree climate change goal."

Peter Hinchliffe
Secretary General,
International Chamber of Shipping

Photos: IMO

The Path to Decarbonization: Cut Emissions 50% by 2050

The adoption of an initial strategy on the reduction of GHG emissions from ships was one of the key items on the agenda of IMO's Marine Environment Protection Committee (MEPC 72), which was held at IMO Headquarters in London, April 9-13, 2018.

The International Maritime Organization (IMO), the United Nations shipping arm, agreed in mid-April to cut carbon emissions from ships by at least 50% by 2050 as compared to 2008 levels, another notch in the belt of Kitack Lim, Secretary-General of the IMO, who has helped to usher in a new era for shipping in addressing global climate change.

The adoption of an initial strategy on the reduction of GHG emissions from ships was one of the key items on the agenda of IMO's Marine Environment Protection Committee (MEPC 72), which was held at IMO Headquarters in London, April 9-13, 2018.

European Union countries along with the Marshall Islands, the world's second-biggest ship registry, had supported a goal of cutting emissions by 70 to 100 percent by 2050, compared with 2008 levels. Opposition of more aggressive reductions from delegates of select countries, namely the U.S., Saudi Arabia and Brazil, helped to achieve the 50% reduction number. Shipping accounts for 2.2 percent of world CO2 emissions, according to the IMO.

The new mandate is significant as the collective maritime industry rapidly traverses a number of historic and fundamental changes to its business model simultaneously, from aggressive new stands on greenhouse gas emission reduction, to the adoption and outfitting of expensive new ballast water management technologies, to the digitalization of the industry, which encompasses a range of technological changes including autonomous shipping.

Photos: BIMCO

"The IMO has done something no one has done before: set an absolute target for emission reductions for an entire industry. It is a landmark achievement in the effort to reduce emissions, and something that every other industry should look to for inspiration."

Lars Robert Pedersen,
BIMCO Deputy Secretary General and delegate at the IMO meeting.

A CRUISE SHIP THAT MOVES THOUSANDS OF PASSENGERS

And a large-scale project where we were on board from the beginning

Why does the world-renowned Meyer Werft shipyard team up with Viega time and again for numerous projects of this scale? In addition to the extremely reliable piping systems made from copper, copper alloys or plastic materials, Viega also supplies the know-how to go with them. **Viega. Connected in quality.**

Meyer Werft shipyard, Papenburg, Germany

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Maritime Emission Reduction & the Scrubber Solution

BY GREG TRAUTHWEIN

Image: Wärtsilä

Earlier this year in New York City the Exhaust Gas Cleaning System Association (EGCSA) held its annual meeting to discuss the business, technologies and future of scrubbers as a solution to the looming IMO 2020 fuel rules. At the meeting, *Maritime Reporter & Engineering News* was afforded the opportunity to pick the brains of several leading executives to help understand the challenge and promise that scrubbers provide.

In October 2016 a landmark decision was handed down from the International Maritime Organization (IMO) which set January 1, 2020 as implementation date for a significant reduction in the sulfur content of the fuel oil used by ships. The new rule sets a global sulfur limit of 0.50% in 2020 versus 3.5% allowed today. Despite reservations from shipowners regarding the availability of the new fuel, which at the time of the announcement did not exist, and resistance to the capital expenditure of fitting emission scrubbers, which reportedly can tip the CapEx scale at $10 million per ship, the rule is set to enter force without fail.

"The entry into force of the 0.50% sulfur in fuel oil limit cannot and will not be delayed," said **Kitack Lim**, IMO Secretary-General, during an interview with *Maritime Reporter & Engineering News* in his office at IMO headquarters in London in mid-March. A comprehensive study on availability of fuel oil was carried out by experts and overseen by a steering committee and it concluded there will be enough compliant fuel oil. "The study on the "Assessment of fuel oil availability" concluded that the refinery sector has the capability to supply sufficient quantities of marine fuels with a sulfur content of 0.50% m/m or less and with a sulfur content of 0.10% m/m or less to meet demand for these products, while also meeting demand for non-marine fuels."

For further insight on scrubbers as a solution – the misconceptions and the facts – *Maritime Reporter* interviews:

- **Stian Aakre,** Wärtsilä;
- **Nick Confuorto,** CR Ocean Engineering;
- **Nils Homburg,** Saacke Marine Systems; and
- **Marcel Somers,** Alfa Laval.

There seems to be a fair amount of misunderstanding in the marketplace regarding scrubbers. What do you find to be the biggest misconception?

Aakre, Wärtsilä

There are several. I think the biggest one is that you move the pollution from the air to the water, which is not true. You remove something that is a pollutant and turn it into something that is not a pollutant, namely you remove the SOx … which is a pollutant … and create sulfate, which is not a pollutant, and you release the sulfate to the water.

Confuorto, CR Ocean Engineering

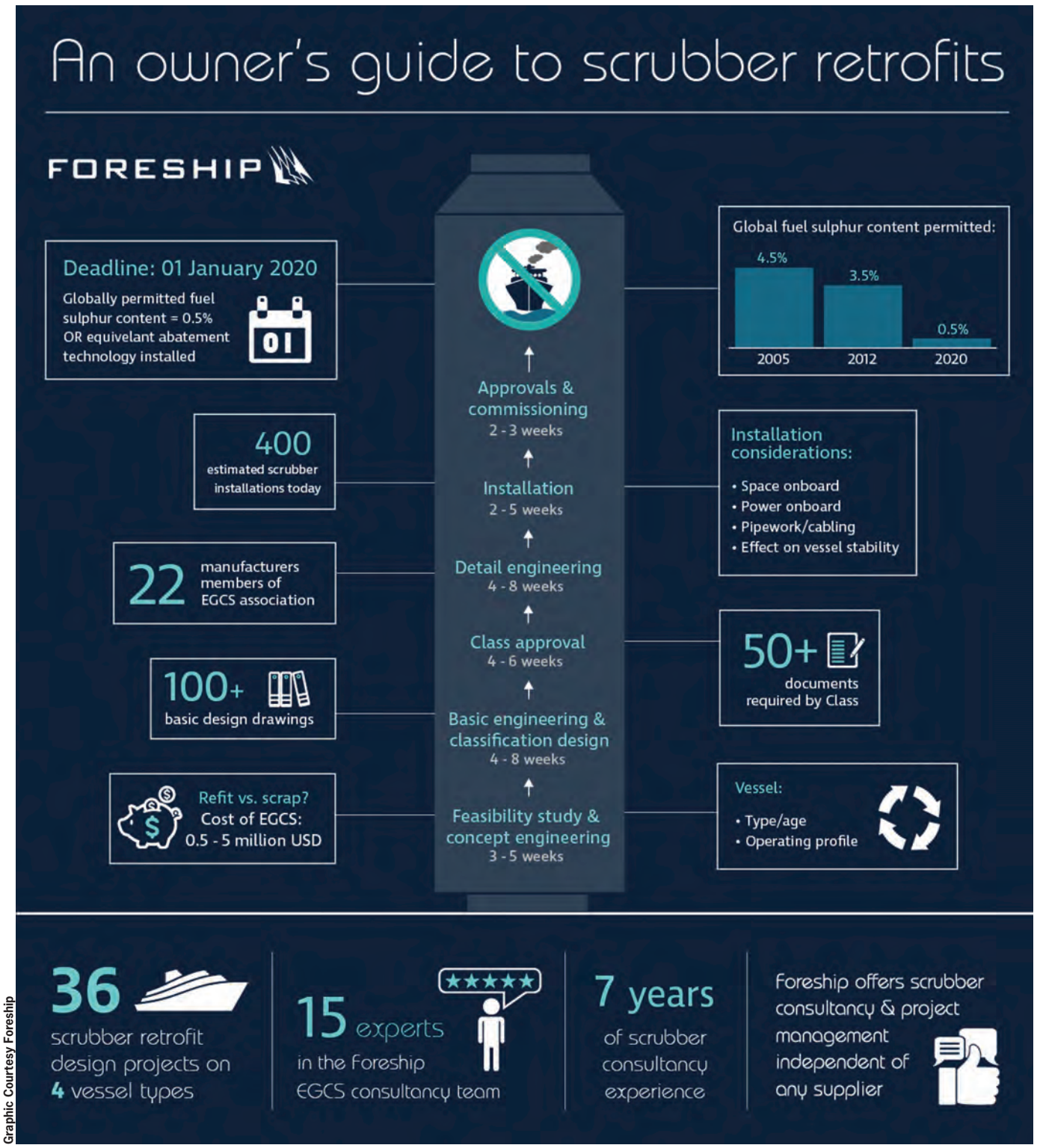
A Wärtsilä V-SOx Scrubber being installed on board the MV Tarago.

> "I think the biggest misconception is that scrubbers are a new, unproven technology, but the reality is completely opposite of that. **Scrubbers have been used more than 50 years on land and on ships.** Today we have 400-500 scrubbers on ships and they seem to be working as designed."
>
> **Nick Confuorto, CR Ocean Engineering**

I think the biggest misconception is that scrubbers are a new, unproven technology, but the reality is completely opposite of that. Scrubbers have been used more than 50 years on land and on ships. Today we have 400-500 scrubbers on ships and they seem to be working as designed. It's time to move on to the next step, and that's moving existing projects through the pipeline.

Somers, Alfa Laval
What Nick says is true, and its important to realize that flue gas scrubbers on boilers are the same technology. This technology has been around since the 1960s.

There are an estimated 60,000 vessels in the world fleet that may be prospects for scrubbers. By vessel niche, who have been early adopters



Graphic Courtesy Foreship

Homburg, Saacke Marine Systems
The quickest uptake has been with the cruise and the passenger ships, as public pressure is highest in this segment. Also, this is a money issue. Financing for this segment is easier right now, as the cruise sector is doing quite well.

Aakre, Wärtsilä
It's clear that the cruise industry has been the early movers. Once one of the big cruise companies start to move, you see the others follow in form. After the 2020 decision by the IMO, you are starting to see movement in other sectors, namely container shipping and bulk carriers.

Somers, Alfa Laval
I would just add a few details. Correctly stated, the cruise lines have a green image (to uphold), driven by ECAs. Therefore cruise vessels operating in the ECAs took up scrubbers first in 2015 with the reduction in Sulfur to .1%.

When talk turns to scrubbers, talk turns to cost. What is your rebut for those that say "scrubbers are too expensive"?

Homburg, Saacke Marine Systems
If people do the math, they will see short payback times with the fuel price as it is now (and projected to be in the future). As we saw (during a presentation we saw earlier today, we expect a much larger price gap between the fuels (as we get closer to 2020.). As prices escalate quickly for the new fuel, even on small scrubber systems I think you will see a payback time of around 12 to 18 months. The more fuel you are burning, the more money you will save and the faster the payback time.

Confuorto, CR Ocean Engineering
That is the perfect reply to that question. Cost is important of course, but payback is even more important. When a client can payback the investment in 1 year, that is the key.

Aakre, Wärtsilä

Of course there is a capex and an installation cost. The customer needs to do their own math – we are happy to help – and they must find a compelling business case to buy a scrubber. If they cannot, than of course they should not buy a scrubber.

I think it is safe to say that shipowners are confused as to the fuel of the future, and selecting the best product or process to meet ever stricter emission regulations. When you are talking to an owner about a newbuild or a refit project, what is the compelling case for both?

Aakre, Wärtsilä
For years now it has been all about the amount of fuel that you burn inside the ECA, but with the 2020 fuel rules and the 0.5% sulfur cap, the talk turns to 0.5% fuel price, fuel quality and fuel availability. ***We just heard today about the projected fuel price of $715 per ton*** … if that turns out to be true, that will be a very good case for installing scrubber technology. It is difficult to project what fuel price and availability will look like in 2020.

So Looking at the market today, how many scrubbers does your company have installed and working?

Aakre, Wärtsilä
By our reference list including our orderbook, we have about 300 scrubbers on about 170 vessels. By 2020, I think the production capacity of scrubbers will be the bottleneck. Manufacturing issues (surround the scrubber tower) can be solved, but then you have to produce (all of the extra equipment, from the valves to the pumps to the automation systems.) Internal capacity with the supplier will limit production, and I see demand now growing faster than supply.

Confuorto, CR Ocean Engineering
We have 20 scrubbers on ships, and all but one are already certified. We have four in design and the projection for 2018 is significant, the inquiry level is very high and if only a portion of this hits, we will have a fantastic year.

Somers, Alfa Laval
I can't give you any projections, we are stock listed company so you can read all of the public information. I don't have the exact figures but I believe we have about 150 scrubbers sailing right now, all of them operating as expected.

Homburg, Saacke Marine Systems
We have two scrubber installations running and we have five processing. We see very positive prospects in the coming year, a big upswing in the past year.

We heard today (in the conference) that scrubbers are not an acceptable solution for ships sailing into the waters of and ports of the state of California, a situation which is somewhat surreal given the global nature of the business. That said, how do regional and local laws impact your business?

Homburg, Saacke Marine Systems
Multiple layers of local regulations in different parts of the world are causing confusion on the side of the ship owners, and are in part responsible for the hold up in adoption of the technology. Unifying regulations is the most rational. Shipowners want to design their ship for universal use; the more universal the rules, the better adoption.

Somers, Alfa Laval
I see local regulations becoming more prevalent. If scrubbers enter market as they are predicted, I think it will hurt those with local restrictions like California, because the vessels will simply avoid these harbors (and find someplace new to call). They will do economic harm to themselves.

Confuorto, CR Ocean Engineering
The issue is going to be how many of these will come up. I foresee California changing that stance in the future. Scrubbers are hitting their emissions goal, and if they cannot regulate equipment, I think there will be some legal challenges. Even with these types of regulations, the seas are enormous and the coast control is only a very small drop in the bucket.

Greek Minister of Maritime Affairs and Insular Policy

Kouroumplis

As the maritime market steers toward Athens, Greece and Posidonia 2018, *Maritime Reporter & Engineering News* interviews Panagiotis Kouroumplis, the Greek Minister of Maritime Affairs and Insular Policy. As the Minister of Shipping for the country with the largest merchant fleet and a millennia-old maritime tradition, Kouroumplis carries his responsibilities with pride and humility.

BY GREG TRAUTHWEIN

Born in Aetoloakarnania in 1951, Kouroumplis holds a Law degree and a PhD in Sociology from the University of Athens. But the story of his life was irrevocably altered much earlier at the age 10 when lost his eyesight from the explosion of a hand-grenade, a remnant of WW II. But instead of using his misfortune as a crutch, he turned it into a platform. After attending the School for the Blind in Athens, he became a pioneer of the Greek disability rights movement and was the first blind person to be elected member of the Hellenic Parliament. To this day often cites his own disability to encourage the young to become masters of their own fate.

The Job

The Ministry for Maritime Affairs and Insular Policy operates is a quasi ''one-stop shop'' for maritime and shipping issues, with aims at:

- **Safeguarding** the effective operation and development of greek shipping, the protection of human life at sea and the marine environment,
- Organizing and supervising **maritime education and training,** regulating and resolving maritime labor issues in full compliance with applicable international standards,
- Overseeing the **administration, operation and development of ports,** the organization and management of pilotage services, formulating and implementing a national ports policy,
- Organizing and carrying out **maritime surveillance** for ships, small boats, ports within the waters under the Hellenic jurisdiction
- Formulating **national insular policy** (note that Greece hosts more than a hundred inhabited islands).

"Moreover, the Hellenic Coastguard is integrally linked to the administrative structure of the Ministry to perform its institutional mission comprising of both shipping related and operational tasks, amongst which I would discern the huge efforts invested in border control missions and in rescuing hundreds of thousands of migrants and refugees in the Aegean Sea during the past years," said Kouroumplis.

Greek Shipping Today

Greece has one of the longest and strongest histories as a seafaring nation, and today the shipping industry is one of the most dynamics aspects of the Greek economy, and Greece remains one the world's largest shipping nations. Traditional fleet profiles including mainly bulk carriers and tankers, but in recent years this has expanded to include high-tech specialty ships, such as LNG and LPG carriers

As of March 2018, 723 large ocean-going vessels (greater than 1,000 gt) of 74.53 million dwt fly the Greek flag, and the Greek-owned fleet is still first place internationally, with a fleet of 4,148 ships (over 1,000 gt) of 341.92 million dwt, representing 16.4% of the global overall capacity in dwt. "The significant contribution of shipping to the national economy is clearly depicted in the foreign currency inflow which for 2017 amounted to 9.13 billion euros (in accordance with the "Transportation" Title of the official "Services Balance" issued by the Bank of Greece) and also in the significant number of jobs created in the country and the multiplying effects through economic added value on other sectors of the Greek economy," said Kouroumplis.

The Greek shipping cluster is a top performer within the Greek economy, a cluster composed of 1,389 shipping companies (696 in the field of ship management and 693 in the field of chartering/brokerage and other shipping activities) operating in Piraeus, resulting in $2.8 billion entering Greece in shipping foreign exchange for their operational costs. These companies offer direct employment to more than 16,467 employees and are a driving force for the entire maritime cluster.

The Market

While a clear leader, the Greek market has not been immune to economic forces which have conspired to mire maritime in one of its deepest and longest slumps.

"It is well known that the increase in global capacity has impacted the supply and demand for maritime services and consequently caused large fluctuations in freight rates," said Kouroumplis. "Despite such challenging times for the shipping industry, the figures of Greek shipping remained virtually unaffected. It is noted that in 2017 there was a recovery in bulk carrier orders which was not accompanied by a similar increase in tanker orders. This is explained by the increased demand for ores, food and containers, while the existing tanker capacity proved to be sufficient to meet demand."

According to Kouroumplis, the best way to stay in business in such a challenging environment is to invest in quality shipping, channel investments to innovative new types of ships and grasp the opportunities inherent in such times. "It is worth noting that according to Allied Shipbroking figures, until Christmas 2017 Greek shipowners purchased 289 second-hand oceangoing vessels worth around $4.6 billion and sold 190 ships to third parties at a price of $2.6 billion. Additionally, in the same year about 65 old Greek ocean-going vessels were sold for scrapping" said Kouroumplis. "On its part, the government exerts every effort to retain a 'level playing field', meaning not enabling distortions of fair competition either through regional or protective measures, as well as not allowing unscrupulous operators to distort market conditions, compromise safety and endanger the marine environment."

Emerging Regulation

As the IMO helps to steer the global maritime industry toward 'decarbonization', the Greek industry must also continue its investment in new ships and technology to keep place. "Our country's standing policy is the recognition of the IMO's regulatory primacy over regional measures for the global application of a level playing field by analogy to the international seagoing shipping activities for all ships regardless of the flag they fly," said Kouroumplis.

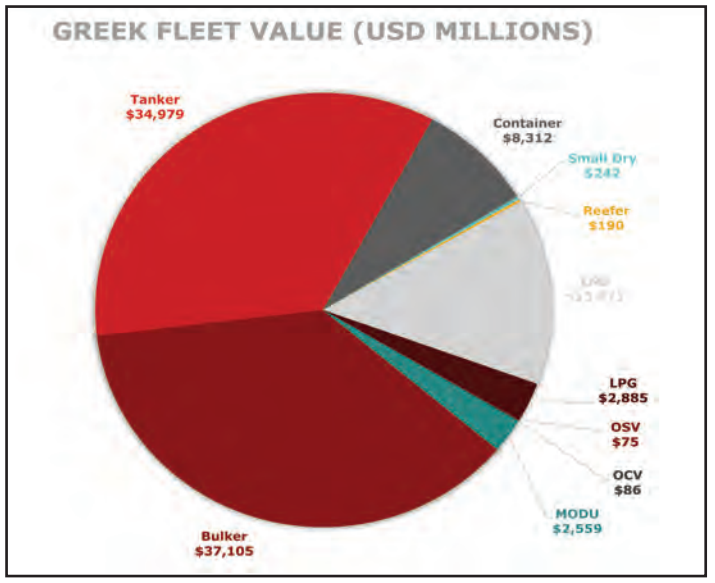
Specifically he cites the recent MEPC decisions regarding the adoption of an initial strategy on the reduction of GHG emissions from ships as "an important milestone" in the IMO's efforts to achieve fair solutions for an internation-

Top Greek Spenders (past 12 months)

Group/Company	Total # of Vessels	Total Value USD m
Star Bulk Carriers	14	$290.2
Navios Group	12	$194.3
Olympic Shipping and Management SA	2	$111.6
Ionic	4	$110.0
Unisea Shipping	7	$102.1
New Shipping Ltd	4	$100.0
Allseas Marine SA	2	$99.5
Centrofin	4	$90.0
Technomar Shipping	7	$71.9
Eastern Mediterranean Maritime	3	$69.0

Top Greek Owners

Group/Company	Live # of Vessels	Live Total Value USD bn	On Order # of Vessels	On Order Total Value USD bn	Total # of Vessels	Total Total Value USD bn
Angelicoussis Group	109	$5.32	20	$2.32	129	$7.64
Economou Group	140	$5.75	12	$1.88	152	$7.64
Ceres Group	17	$2.00	4	$0.75	21	$2.75
Thenamaris	84	$2.40	2	$0.09	86	$2.49
Tsakos Group	94	$2.30	3	$0.09	97	$2.39
Dynacom Tankers	59	$1.90	6	$0.35	65	$2.25
Navios Group	119	$2.11			119	$2.11
Dynagas Holding Ltd	6	$1.23	3	$0.86	9	$2.09
Minerva Marine	68	$1.52	6	$0.50	74	$2.02
Costamare	69	$1.94	1	$0.04	70	$1.98

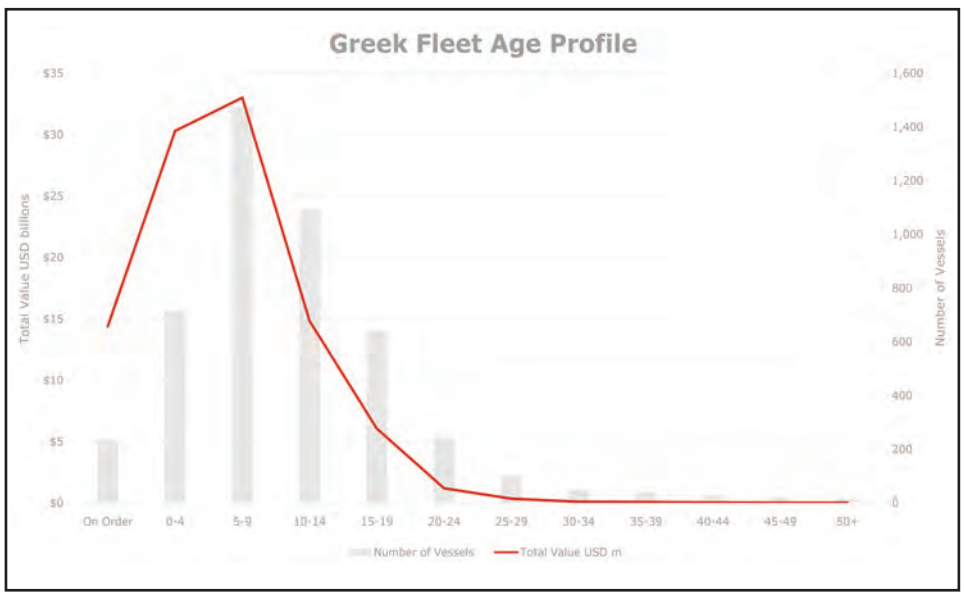


Greek Fleet Value

Type	Live # of Vessels	Live Value $ m	On Order # of Vessels	On Order Value $ m	Total # of Vessels	Total Value $ m
Bulker	2,165	$34,697	82	$2,408	2,247	$37,105
Tanker	1,409	$29,162	111	$5,817	1,520	$34,979
Container	415	$8,002	8	$310	423	$8,312
Small Dry	124	$242			124	$242
Reefer	48	$190			48	$190
LNG	60	$8,959	25	$4,911	85	$13,871
LPG	136	$2,725	4	$161	140	$2,885
OSV	49	$49	2	$26	51	$75
OCV	5	$86			5	$86
MODU	11	$1,792	2	$767	13	$2,559
Grand Total	**4,422**	**$85,903**	**234**	**$14,400**	**4,656**	**$100,303**

Greek Fleet Age Profile

Age Group	Number of Vessels	Total Value USD m
On Order	234	$14,400
0-4	716	$30,307
5-9	1,476	$33,015
10-14	1,092	$14,824
15-19	642	$6,048
20-24	244	$1,175
25-29	100	$339
30-34	49	$89
35-39	39	$65
40-44	29	$24
45-49	19	$12
50+	16	$5
Grand Total	**4,656**	**$100,303**



> "In 2017 the core of the Greek shipping cluster was composed of **1,389 shipping companies** (696 in the field of ship management and 693 in the field of chartering/brokerage and other shipping activities) operating in Piraeus, resulting in **$2.8 billion entering Greece** in shipping foreign exchange for their operational costs. Moreover, these companies offer direct **employment to over 16,467** employees and constitute the driving force for the entire maritime cluster.
>
> **Panagiotis Kouroumplis**

Greek Minister of Maritime Affairs and Insular Policy

al industry such as shipping.

"Our country honestly and actively supported the balanced compromise on ambitious and realistic targets, taking into account what is feasible for the shipping industry and what is necessary for the future of coming generations. In this context the vision under the identified "levels of ambition", namely to reduce total annual GHG emissions by at least 50% by 2050 compared to 2008, while, at the same time, pursuing efforts towards phasing them out, is absolutely shared by Greece," said Kouroumplis.

"Over the next five years, we look forward to the constructive cooperation with other IMO Member States and other stakeholders in order to effectively implement the Strategy and promote sustainable shipping. Of course, as in all decisions affecting the industry, the specific measures should be realistic and easy to implement, while full decarbonization is obviously dependent upon the eventual global availability of alternative fuels."

Challenges Ahead

No stranger to challenges, personal and professional, Kouroumplis is pragmatic in assessing the road ahead.

"The maritime industry is the backbone of globalization and international trade," said Kouroumplis. "The Greek maritime sector is one of the country's most important sectors and a major supplier of jobs."

The entire industry is faced with a number of challenges, from the machinery-based technology to reduce emissions to the digitalization trend which is rapidly changing the entire logistics chain. "In order to unleash its full potential and contribute to human wellbeing through growth and development all around the world, we need to advance collaboration, enhance standards and proactively engage with industry and policymakers when shaping the regulatory landscape, said Kouroumplis.

"On a more personal level, I consider being Minister of Shipping of a country with the largest merchant fleet and a millennia-old maritime tradition both a privilege and a huge responsibility. Especially since maritime and port policy are core elements in this government's plan, namely to leverage Greece's strategic location by turning it into an energy, transport and communications hub promoting growth and stability in our part of the world. In a sense I have been already compensated by working with some of the most able risk takers in the global business community. I will be truly satisfied when we achieve our policy goals."

AI-powered Situational Awareness Tech

Word from A.P. Moller-Maersk is that it will trial artificial intelligence (AI) powered perception and situational awareness technology on a containership.

The deal was signed with Sea Machines Robotics of Boston for Maersk to install computer vision, Light Detection and Ranging (LiDAR) and perception software aboard one of its new-build Winter Palace ice-class containerships.

Sea Machines said its solution uses AI to improve at-sea situational awareness, object identification and tracking capabilities, similar to advanced driver-assistance systems (ADAS) commonly found in automobiles to alert drivers of roadway hazards and prevent accidents. Sea Machines' system uses sensors to collect a continuous stream of information from a vessel's environmental surroundings, identify and track potential conflicts and display the knowledge in the wheelhouse.

According to Maersk, its goal is to prove the situational awareness technology aids seafarers, can remove the line of sight restriction from the bridge and provides the infrastructure for a future autonomous collision avoidance system.

"For this containership situational awareness program, we aim to prove the technology increases our safety, efficiency and reliability," said P. Michael A. Rodey, senior innovation manager, A.P. Moller-Maersk. "Autonomous vessels are not an end goal for Maersk nor is unmanned vessels; what is more of interest is the technology along the journey and the value it brings."

Sea Machines

OOCL, Microsoft Partner on AI Project

Orient Overseas Container Line Limited (OOCL) has partnered with Microsoft's research arm to apply Artificial Intelligence (AI) research to improve network operations and achieve efficiencies within the shipping industry.

The partnership, between OOCL and Microsoft Research Asia (MSRA), will apply deep learning research to shipping network operations with a projected $10 million annual operational cost saving. The collaboration is also expected to nurture over 200 AI developers over the next 12 months.

"With MSRA's efforts and expertise, we expect to save around $10 million in operation costs annually by applying the AI research and techniques for optimizing shipping network operations from our most recent 15-week engagement," said Steve Siu, Chief Information Officer of OOCL. "Moving forward, we will embark on an 18-month joint-partnership in research and development to apply deep learning and reinforcement learning in shipping network operations. Moreover, MSRA will assist us in training over 200 AI engineers by conducting machine learning and deep learning sessions at the Hong Kong Science Park over the next 12 months. We look forward to strengthening our partnership with MSRA to leverage AI research and innovations to drive digital transformation in the shipping industry and to exchange knowledge among our top developers so that we can better address customer needs with advanced technologies and predictive analytics."

OOCL said AI is key in its digital transformation vision. The company already has a talent base of more than 1,000 developers located in San Jose, Hong Kong, Zhuhai, Shanghai and Manila. It has fully embraced a hybrid cloud infrastructure with auto-switching and auto-scaling throughout its businesses and machine learning for several years. For example, OOCL processes and analyzes more than 30 million vessel data every month. By leveraging AI technology and machine learning, the company develops predictive analytics on vessel schedules and berth activities. MSRA is Microsoft's fundamental and applied research arm in the Asia Pacific region and a leading research community for core AI technologies including machine learning.

OOCL

Hatteland

Hatteland: New Display Tech is an Enabler

Hatteland Display showed its new 20-in. XRD (Xtreme Rugged Marine Display) at Sea-Air-Space. Hatteland Display's latest tested and approved naval displays join a suite of established innovations on its booth, including the unique Series X 55-in. Ultra High Definition Tactical Table and 32-in. Series X Multi Vision Display, both of which feature high quality 4K resolution, large format panels capable of displaying data from diverse sensors and systems at the same time.

Hatteland Display's new generation HM 20T22 XRD and other 20-in. variants are ready for installation on any type of naval vessel and are more than capable of withstanding the stressful environment they will be used in. While the HM 20T22 XRD's built-in ability to withstand high shock levels is a key requirement for customers, all HM 20T22 XRD variants are designed with features demanded by systems integrators and naval users.

Chartco

Chartco Launches Fleet Manager Portal

ChartCo launched its new FleetManager software, a web-based tool, that enables shore-based customers to access live ship management and tracking data in one place, at any time, on any popular browser, as well as via smartphones and tablets. FleetManager offers a range of environmental, piracy and regulatory overlays that can highlight potential sources of delay or hazard. It also provides the unique ability to link with ChartCo's e-navigation platform – PassageManager. This enables shore-based staff to view an active passage plan so that any deviations from the expected track can be interrogated in real time.

The basic FleetManager tool is available for free to existing ChartCo customers, simply by contacting a ChartCo Customer Service Manager for a username and password.

New App Helps Owners Comply with Fuel Rules

Bureau Veritas has introduced the first phase of My Fuel Consumption, a cloud-based and secure web application for desktop, mobile and tablet that aims to make compliance easy, with a digitized process throughout the various steps of IMO-DCS (declaration of fuel consumption) and EU MRV regulations (CO2 emissions). Phase 2 of My Fuel Consumption, planned for June, will enable owners to complete their declarations.

Bureau Veritas

Yaskawa Ups Investment in The Switch

Yaskawa Corporation said it will make a multimillion-euro investment to strengthen the R&D capabilities of The Switch and purchase new equipment at the company's factory in Lappeenranta, Finland.

The investment will enable drive train testing of up to 15 MW. The Switch will now become Yaskawa European's Environmental Energy Division, leading the Japanese company's global business in the marine, wind and turbo/industry segments.

The Switch produces a portfolio of technology enabling shipowners and operators to both optimize energy consumption and generate energy in a sustainable manner. During the past 10 years, the firm has delivered over 1,000 Power Drives to hundreds of vessels, alongside 35 permanent magnet shaft generators to next-generation ships that are future-proofing operations.

The Switch

The Switch has received orders for 35 permanent magnet shaft generators through WE Tech, which cut costs when powering onboard electric networks.

The new testing center will be one of the few in the world with the capacity to test advanced electrical drive trains up to 15 MW – an essential development for a firm focused on delivering the most high-powered, efficient technology to its global customer base.

With the move to create the Environmental Energy Division, Yaskawa EU (YEU) has formed the third of its business divisions, alongside Drives Motion Control and Robotics. The company will now strengthen its direct sales force in Europe, as well as work in closer cooperation with Yaskawa's System Engineering Division in Japan.


Carsten Pedersen Hurtigruten

Hurtigruten Invests

Norwegian cruise ferry operator Hurtigruten signed a Letter of Intent with Rolls-Royce for an major environmental upgrade program to hybrid power. The main engines on up to nine cruise ships will switch from diesel to gas power and the upgrade will also include installation of a hybrid battery system.

The deal comprises the supply of equipment to six existing passenger cruise vessels, with an option for a further three. The ships will completely change their power system with the installation of new Rolls-Royce LNG-engines as part of a new hybrid system. The upgrade will enable the former diesel-powered ships to reduce CO2-emissions by at least 25 percent. Hurtigruten was recently awarded licenses by the Norwegian Government for seven out of 11 coastal ferry routes. The year-round service, on the renowned passenger and cargo route from Bergen in the southwest to Kirkenes in the north, has 34 stops. One of the key requirements from the Government of the route's operator was a reduction in CO2-emissions.

Optimized Maintenance

Wärtsilä and Viking Line signed an Optimized Maintenance agreement for the Wärtsilä LNGPac system onboard passenger ferry Viking Grace, the first Optimized Maintenance agreement ever made for Wärtsilä LNGPac, a complete gas handling system for ships fueled by liquefied natural gas (LNG). Viking Grace was the first passenger ferry to utilize LNG as a fuel source. The agreement also includes Condition Based Maintenance (CBM) and online support for the Wärtsilä LNGPac system. Additionally, Wärtsilä extends its existing Optimized Maintenance agreement for Viking Line's Viking Grace ferry for another five years. Viking Grace can accommodate 2,800 passengers, and it sails between Turku, Finland and Stockholm, Sweden in the Baltic Sea.


Wärtsilä

New Offshore Decommissioning Barge

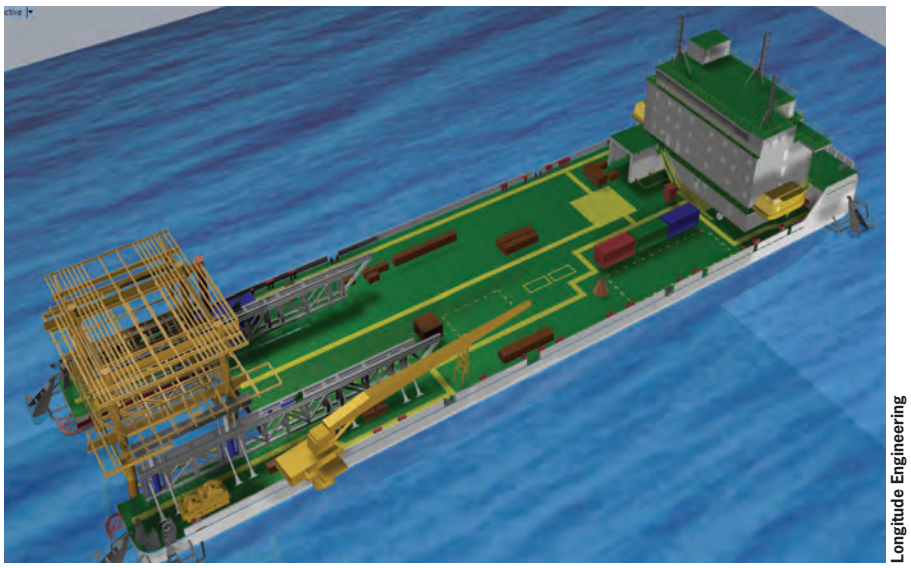
Longitude Engineering reportedly has developed a cost effective decommissioning barge concept for the removal of small oil and gas platforms for the PTT Exploration and Production (PTTEP), a subsidiary of the Thai state owned oil company. The aim was to develop a viable and cost-effective alternative to conventional 'reverse installation' through the use of heavy lift crane barges for the removal of the topsides and jackets. The focus being the removal of 90-100 of PTTEP's minimum facilities platform assets in the Gulf of Thailand, which have topside weights up to 800 metric tons and jacket dry weight up to 1000 metric tons. "By developing this time and cost-saving solution, we hope to create a wider awareness among contractors within the region in order that they may adopt similar methods in the removal of multi -platform fields," said Jean-Baptiste Meier, Longitude's lead engineer. Longitude's contract was to deliver the conceptual naval, structural, mechanical and electrical engineering, along with outline operational procedures, schedule and capex and opex costing for the new removal concept.

The solution is a barge concept that uses reverse float-over and on-board lifting methods to remove both the topside and substructure using the same vessel.

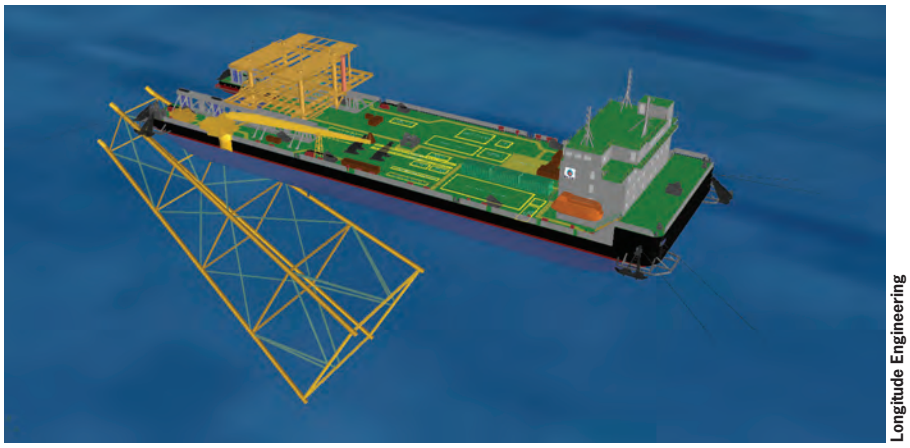
For the development of the primary float-off lifting system, Longitude partnered with Bosch Rexroth, to develop a heave compensated hydraulic lifting and skidding system.

The resulting vessel design can accommodate the removal of different types of topsides and jackets, without modifying the barge, from removal preparation stages, lifting, topside skidding and securing to underwater disposal for the substructure and load in to a disposal yard for the topside. It also has the ability to accommodate 60 operational and marine crew for a period of up to 40 days.

PTTEP is currently in discussion with Thailand's Department of Mineral Fuels (DMF), the government body regulating offshore oil and gas operations, which will sanction the decommissioning work, for the start of their removal program which is due to commence in the coming years. With the implementation of new decommissioning regulations, all concessionaires must submit the decommissioning plan with cost estimation to DMF for financial security placement at the first stage.



Longitude Engineering



Longitude Engineering

Dave Skentelbery, CEO,
Grand Bahama Shipyard

Grand Bahama Shipyard

Carnival Elation
at Grand Bahamas Shipyard

Grand Bahama Shipyard

Skentelbery Drives Grand Bahama Shipyard

We visited Grand Bahama Shipyard CEO Dave Skentelbery, who updates us on his shipyard and the cruise shipping industry.

BY GREG TRAUTHWEIN

How do you see the market today?
In terms of the cruise ship market, it is very healthy. As a business, we are growing the amount of work we do on each of those projects. We're doing more complex scopes of work. I think we're truly demonstrating our capability as a project management company to the cruise lines.

How do you evolve to more complex jobs?
It's investment in people and facilities. It is our ability to be able to project manage larger scopes of work where we have the capability to do, you know, a wide range of shipyard work. We have the capability to take on more complex scopes of work.

So how, specifically, are you investing?
We have a very clear investment plan where we are looking every year to improve the capability of the facility. As with any shipyard, that means improving workshops, improving cranes, and improving the ability to carry out the logistics that are required for cruise ship refit. In terms of the people, we're investing in both training and developing existing people, and recruiting new talent.

How long have you been in marine?
I've been in the marine business for 44 years. I went to sea at 16, I was a navigating officer apprentice, and served a short time as ship's master and then came ashore, working for a company that operated telecom cable layers. I was operations director, running its business in China and in Singapore. In 2000, I went for a career change and ended up in ship repair, first with Cammell Laird and then the A&P group in the UK. In 2010, I left the A&P Group when we sold our shareholding, and I went into business on my own, which took me to India where I helped develop a new yard. After developing the yard I ran it for two years. Two years ago I came to Grand Bahama Shipyard as CCO, and I've been acting CEO since June 2017.

Looking at the industry you joined at the age of 16 and the industry today, what are the true transformational changes?
I think the maritime industry at this moment suffers from a lack of training in the 1980s and 1990s. And today there's not enough people; there is a gap in the talent.

The equipment in the shipyards hasn't changed greatly. We're still taking ships out of the water, scraping their bottoms, blasting them, painting them, and putting them back in. It's not rocket science. But I have seen, and certainly in this cruise industry, more attention to becoming a project-led industry than a production-led industry. I think project management needs to become the core of your company.

Why is that?
In theory, you could subcontract out every bit of work, but somebody's got to be a project manager. So project management, in my opinion, should be the core competency – certainly of a shipyard like the Grand Bahamas where we're doing larger and more complex projects. Don't get me wrong, production is extremely important. But the project management, the planning, the risk management, the commercial management, has all got to be in place for the production management to do the right thing.

So what is your biggest challenge today and how are you addressing it?
I've got a really good team around me; experienced and capable of taking the company forward. The challenges are getting the cruise companies confident that we can do bigger, more complex scopes of work, safely, environmentally friendly and in a timely manner.

Is there a recent project that you think best exemplifies this?
Carnival Elation, from September 2017.

Nice, that was our January 2018 cover.
That was the biggest one we've ever done. And its success was the planning, as well as the cooperation between the client, ourselves and all the subcontractors. But it was the planning that made it a success.

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1. Next-Gen LNG Carrier

Mitsubishi Shipbuilding Co., Ltd. held the christening ceremony for a next-generation LNG (liquefied natural gas) carrier under construction for a joint venture of Mitsubishi Corporation and Nippon Yusen Kabushiki Kaisha (NYK Line). Diamond Gas Orchid is the first "Sayaringo STaGE" type vessel, Mitsubishi Shipbuilding's newest carrier that is designed to achieve significant improvements in both LNG carrying capacity and fuel performance thanks to a more efficient hull structure and an innovative hybrid propulsion system. After completion in late June, the Diamond Gas Orchid will go into service transporting LNG for the Cameron LNG Project, a project in Louisiana in which both Mitsubishi Corporation and NYK Line are jointly participating. The Bahamas-flagged Diamond Gas Orchid measures 293.5 x 48.94m, with a 27m depth and a 11.05m draft. Deadweight capacity is approximately 73,800 tons, and the total holding capacity of the tanks is 165,000-cu. m.

The Sayaringo STaGE succeeds the Sayaendo, a vessel acclaimed for its improved Moss-type spherical tanks that deliver a high level of reliability. The adoption of apple-shaped tanks in the new Sayaringo STaGE offering has enabled an increase in LNG carrying capacity without changing the ship's beam, while incorporation of a hybrid propulsion system has significantly boosted fuel efficiency compared to the Sayaendo. STaGE, an acronym deriving from "Steam Turbine and Gas Engines," is a hybrid propulsion system combining a steam turbine and engines that can be fired by gas. Efficient use of the engines' waste heat in the steam turbine results in substantial improvement in plant efficiency, enabling high-efficiency navigation throughout a full range of speeds.

2. TUI Cruises' New Flagship

TUI Cruises' new 315m flagship was delivered from Finnish shipbuilder Meyer Turku. The fifth Mein Schiff cruise ship to be built by Meyer Turku for German owner TUI Cruises, the new Mein Schiff 1 is based on a new design created as an evolution from the existing Mein Schiff series. The ship is 20m longer than previous ships in the series, ship combined with a substantial redesign of the passenger spaces and a number of new features like the new Diamond, which now spans the almost 50m breath of the ship, a sun deck area, a covered sports center, and an elevated jogging track. At the shipyard, new Mein Schiff 2 is already under construction, and TUI Cruises recently ordered a third sister ship to New Mein Schiff 1 & 2 for delivery from Turku in 2023, which will be called Mein Schiff 7.

3. Van Oord's LNG Vessel

With a two-day event on the quay of the Biesboschhaven Zuid harbor in Werkendam, Van Oord launched its first LNG-powered vessel: the Werkendam. The site was chosen especially as Van Oord celebrates its 150th anniversary, and Werkendam is the cradle of the company. On April 13, school children from the surrounding area were given a guided tour of the new crane vessel. Business relations are also being welcomed on board during a special network meeting. On April 14, the naming ceremony was held. The Werkendam crane vessel is the first LNG-powered vessel and a new generation of dredging vessels. Werkendam was built at the Neptune yard in Hardinxveld-Giessendam. The construction of the 68 x 11m took 12 months, and the vessel is fully powered by LNG, with gas oil as a back-up. With the storage tank on the aft deck, the Werkendam can store enough LNG on board to sail and operate for 14 days without having to refuel. The crane vessel will be used mainly for the execution of Dutch projects of the subsidiary Paans Van Oord.

4. USS Portland

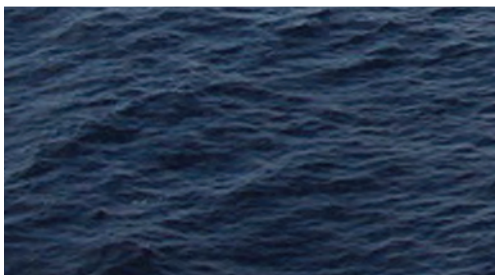
The U.S. Navy commissioned its newest amphibious transport dock ship at the Port of Portland, Marine Terminal 2 in Portland, Ore. Built by Ingalls Shipbuilding in Pascagoula, Miss., USS Portland (LPD 27) is the 11th ship in the San Antonio class designed to support embarking, transporting, and landing elements of more than 800 Marines with both a flight deck, which accommodates CH-53E Sea Stallion, and MV-22 Osprey tilt-rotor aircraft, and a well deck, which can launch and recover landing craft and amphibious vehicles. San Antonio-class ships support a variety of amphibious assault, special operations or expeditionary warfare missions, operating independently or as part of amphibious ready groups, expeditionary strike groups, or joint task forces. Portland's keel was laid on August 2, 2013, and the vessel was launched February 13, 2016. The ship was delivered on September 18, 2017, and was commissioned for the Navy on December 14, 2017, but her official commissioning ceremony wasn't held until April 21, 2018.

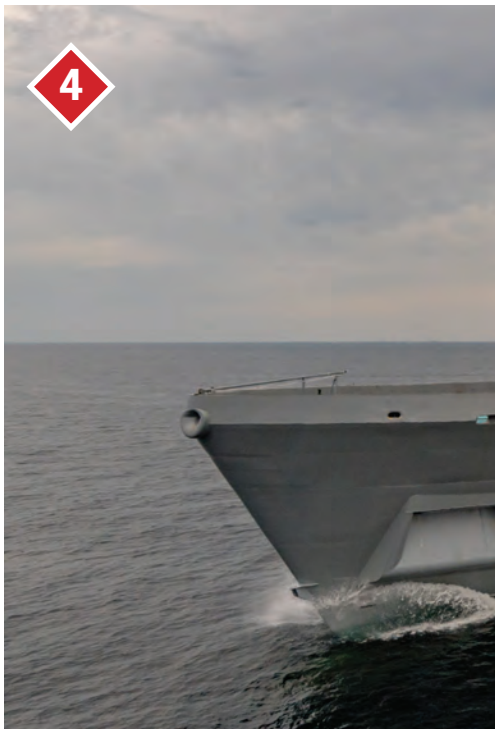
5. Zero-Emission Vessel

Norwegian tourist vessel owner and operator The Fjords has taken delivery of an innovative newbuild that sets high marks for environmentally friendly passenger transport. The new 42m carbon fiber all-electric catamaran, Future of The Fjords, offers completely emissions-free transport through the Western Norwegian landscape. Starting in mid-May, the 400-passenger vessel will sail sans emissions as it makes around 700 yearly round trips along the UNESCO World Heritage listed fjord route between Flåm and Gudvangen.

Future of The Fjords and diesel-electric hybrid sister ship Vision of The Fjords launched in 2016 are both designed and built by Norwegian shipyard Brødrene Aa, with hulls that mirror the zig-zagging mountain paths they sail beside. The $18.6 million vessel is propelled by two 450kW electric motors, enabling cruising speeds of 16 knots along the 90 minute voyage. In another first, The Fjords has, in partnership with Brødrene Aa, developed a unique charging solution called the Power Dock.

This 40 x 5m floating fiberglass dock will sit in the water at Gudvangen, housing a 2.4 MWh battery pack. This charges steadily throughout the day via connection to the local grid network, which does not have the capacity to charge the Future of The Fjords directly. The solution allows the vessel to stably, efficiently and cost-effectively 'refill' in just 20 minutes.The dock also stores consumables, fuel for sister vessels.





1
DIAMOND GAS ORCHID
NYK


Mein Schiff 1
Meyer Turku


27
U.S. Navy Photo


3
Paans Van Oord
WERKENDAM
Van Oord


5
The Fjords

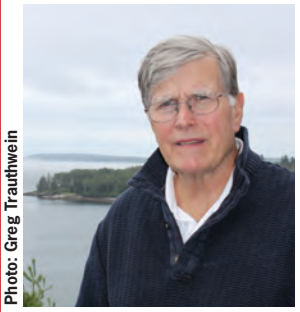


Photo: Greg Trauthwein
Pyne


Vigor
McCreary


Vigor
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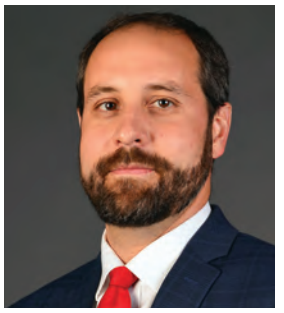

HII
Crooker


Glosten
Fanberg


Sonardyne
Lynch

Kirby'S Pyne to Retire

Houston-based tank barge operator Kirby Corporation announced that Joseph H. Pyne will retire as Executive Chairman of the Board, effective April 30, 2018. Pyne will continue to serve as Chairman of the Board in a non-executive role. Pyne began his career with Kirby in 1978, and has held numerous executive positions including Chairman of the Board since April 2014, Chairman of the Board and CEO from January 2014 to April 2014, as Chairman of the Board, President and CEO from April 2013 to January 2014 and from April 2010 to April 2011, and as President and Chief Executive Officer from 1995 to April 2010, Executive Vice President from 1992 to 1995 and as President of Kirby Inland Marine from 1984 to November 1999.

Vigor Hires McCreary, Blount

U.S. shipbuilder Vigor has hired Richard McCreary as VP of Business Development and Bill Blount as International Business Development Manager. McCreary brings to the role long history in shipbuilding and ship repair, having serves as Executive VP for VT Halter in Mississippi for five years, CEO of Marinette Marine from 2005 to 2011, and recently finished a six year tour with BAE Systems in Alabama. Blount has 26 years of maritime leadership experience, including time as the Commercial Manager and later CEO of Donald L. Blount and Associates.

Klauser named CEO of Palfinger

Palfinger AG completed the search for a new CEO. With Ing. Andreas Klauser (53), currently Global Brand President of Case IH and Steyr as well as CNH Industrial board member, an experienced and internationally accomplished top manager was found. Subject to the finalization of the contracts, Klauser will assume the position of Chief Executive Officer on June 1, 2018.

Crooker Named VP at Ingalls

Eric Crooker has been promoted to vice president of contracts and pricing for Huntington Ingalls Industries' (HII) Ingalls Shipbuilding division. Effective immediately, Crooker will have overall responsibility for contracts, estimating and pricing, and export/import licensing and compliance for the Ingalls shipyard and will report to Tom Stiehle, Ingalls' vice president, business management, and chief financial officer.

Glosten Taps Fanberg as President

Seattle-based naval architecture and marine engineering consultancy Glosten has appointed Morgan Fanberg, PE as president. Fanberg, who has over two decades of experience with the firm, will succeed Glosten's fifth president, John Springer III, PE.

Sonardyne Hires Lynch

Sonardyne International Ltd. UK, has appointed Derek Lynch as its new Global Business Manager for Marine Vessel Systems, with immediate effect. Lynch brings with him more than 25 years of experience working within the offshore energy, maritime and naval sectors.

Retlif Celebrates 40

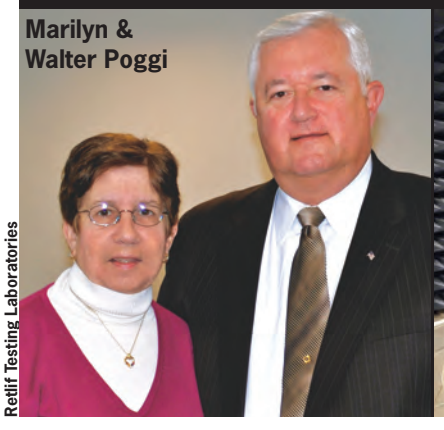
Retlif Testing Laboratories is celebrating its 40th year of operations which will be marked with recognition events throughout 2018. In conjunction with its milestone anniversary, Retlif President Walter Poggi announced expanded ballast wastewater testing to reduce risks associated with the spread of aquatic invasive species in U.S. coastal waters, lakes and rivers, as well as expanded nuclear RS-105 EMP testing services. Mr. Poggi also reaffirmed the company's pledge to uphold the highly-personalized service that has been its hallmark.

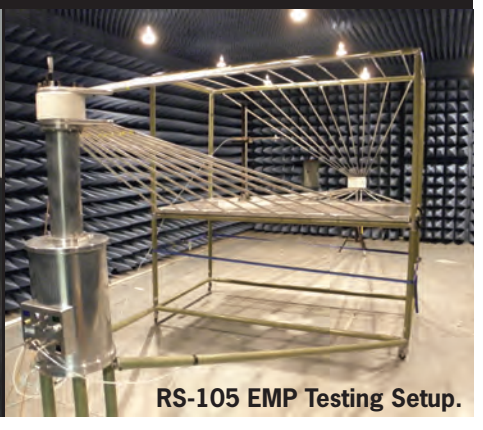
"The mission of Retlif on our 40th anniversary is the same as it was in 1978." Mr. Poggi stated. "We are strategically focused not only on the results of our testing, but also on product approvals and the expansion of our clients' marketplaces regardless of product or industry."

Founded in 1978 by Walter and Marilyn Poggi, Retlif provides EMC/EMI and environmental simulation testing services, approvals and certifications to clients within diverse industries including maritime.

The company expanded from humble beginnings at Flowerfield (St. James, NY) to multiple locations, including its state-of-the-art HQ and testing facility in Ronkonkoma, NY. Retlif's strategic growth plan has enabled expansion through key geographic acquisitions, now including laboratories in New Hampshire and Pennsylvania, as well as a regulatory office in Washington DC.

Retlif's expansion and success stems from its cross-industry focus, continual investment in leading edge equipment and technologies, along with its continual education and training of engineers and technicians.


Marilyn & Walter Poggi
Retlif Testing Laboratories


RS-105 EMP Testing Setup.

Massterly Names Management

Massterly, the world's first company specializing in autonomous shipping, has appointed Tom Eystø as Managing Director and Per Brinchmann from Wilhelmsen as chair of the Massterly board.

CSSC Nanjing, MacGregor JV

MacGregor, part of Cargotec, and China State Shipbuilding Corporation's (CSSC) Nanjing Luzhou Machine Co., Ltd. (LMC) celebrated the opening of its first joint venture in Nanjing, China on April 10. CSSC LMC and MacGregor have established a solid foundation of trust through 30 years of successful cooperation. This joint venture turns the first page for a new era of a long-term strategic cooperation. The joint venture's business model and organisational structure were developed during 2017, and the business license was obtained in March 2018.

Mulherin Receives the Nimitz Award

Matt Mulherin, former executive vice president of Huntington Ingalls Industries and president of Newport News Shipbuilding, was recognized by the United States Navy League as a 2018 recipient of its annual Fleet Admiral Chester W. Nimitz Award. Mulherin, who retired from the company in July 2017 after a 36-year career, was honored at the Navy League's annual Sea-Air-Space banquet.

Mulherin began his career in 1981 working third shift as a nuclear test engineer and over the next three decades earned positions of increasing responsibility. He assumed the role of president in 2011. During his career, Mulherin supported several shipbuilding and maintenance programs, including the construction and overhaul of nuclear-powered Nimitz-class aircraft carriers. In 1999, Mulherin began working on the design for the next-generation aircraft carrier, CVNX. The program evolved into what is known today as the Gerald R. Ford program. The design and delivery of the first ship in the class, USS Gerald R. Ford (CVN 78), is credited

MacGregor

Sonardyne

L to R: YANG Lianghu, GM, Binjiang Investment; WANG Hongqi, President, CSSC Nanjing Luzhou Marine; SUN Wei, VP, CSSC Group, Michel van Roozendaal, President, MacGregor, Alexander Nürnberg, SVP, MacGregor

Mulherin (center)

as one of his greatest accomplishments. Mulherin also led the company through the highly successful ramp-up of the Virginia-class submarine program to two ships per year and laid the foundation for Newport News to support production of Columbia-class ballistic submarines. However, his legacy extends well beyond ships.

Dupont Promoted at Naval Group

François Dupont was appointed Director of the International Trade department at Naval Group. He will oversee all the areas in which Naval Group has prospective customers. He reports to Alain Guillou, Executive Vice President, Development.

Concordia Maritime Addresses Microplastics in the Oceans

Together with the Swedish Institute for the Marine Environment, Concordia Maritime initiated a preliminary study to determine the feasibility of gathering important information on the volume of micoplastics in the oceans. By installing a collection device on a tanker, water samples can be collected while it is under way for subsequent analysis by researchers. The aim is to draw conclusions as to the extent, distribution of microplastics and potential consequences for living organisms.

Thorco Bulk Renamed Trithorn Bulk

Danish dry bulk carrier Thorco Bulk has been renamed Trithorn Bulk with immediate effect. “This is a natural development for our company. We wish to further strengthen our corporate identity and position in the market by taking a name that truly expresses what the three of us, the trio from North of Denmark, has built together with Thornico,” Trithorn Bulk management explained on the company’s website. The name change includes no changes to the legal entity or to the ownership, status management and personnel. The company was established in 2016 by the global conglomerate Thornico and the three managing directors René Mikkelsen, Uffe Hansen and Marc Slinger. It primarily operates within the handy/ultramax segment, running on average 25-35 vessels.

Trithorn Bulk

Paul Allen’s Crew Finds Another Historic Shipwreck

The USS Helena (CL 50) is the latest in a string of historic shipwrecks discovered by Paul G. Allen’s expedition crew aboard the state-of-the-art research vessel Petrel.

The U.S. Navy’s storied St. Louis-class light cruiser began her World War II service at Pearl Harbor and took part in three significant battles during the Solomon Islands campaign before being sunk by Japanese torpedoes on July 6, 1943, during the Battle of Kula Gulf. All but 168 of Helena’s 900 crew survived the sinking and eventual rescue.

Allen’s team found the wreck 860 meters below the surface in the New Georgia Sound off the coast of the Solomon Islands.

The Petrel crew, who found USS Helena in late March, has discovered more than a dozen other lost naval ships, including the USS Indianapolis, USS Ward, USS Cooper, USS Lexington, USS Juneau and several Japanese warships.

“We do these missions as testament to the brave souls who served on these ships,” said Robert Kraft, director of subsea operations for Allen. “Each ship has a story that touches families and friends of those who perished or survived. It’s gratifying to hear those stories each time we announce a new discovery.”

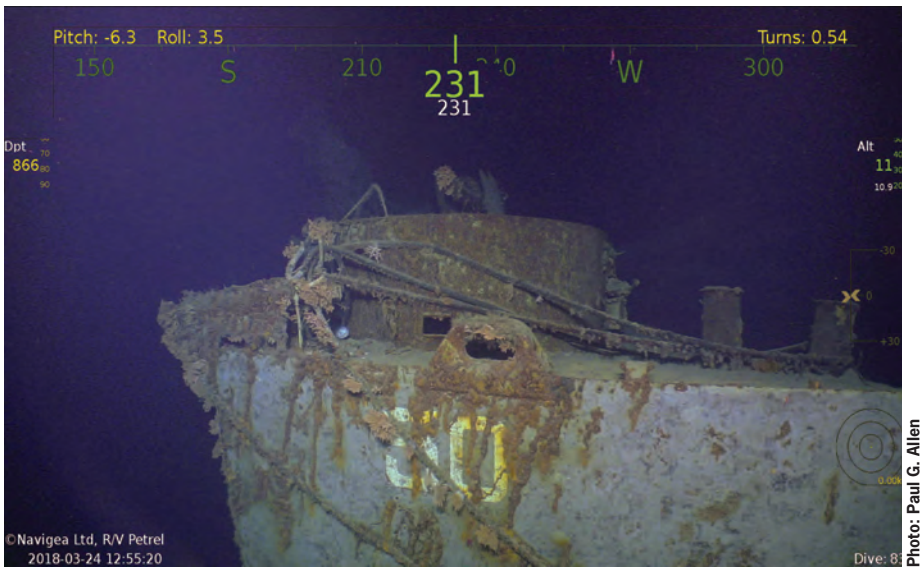


Photo: Paul G. Allen

World’s Largest LEGO Ship Constructed

Earlier this year, the world’s largest cruise ship, the 362 m long, 228,081 GRT *Symphony of the Seas*, set sail for owner Royal Caribbean. Now, there’s another type of world’s largest cruise ship, but this one doesn’t sail and it’s made entirely out of LEGO. A new ship model built to celebrate the launch of Dream Cruises’ new 18-deck, 151,695-ton cruise ship World Dream has been awarded a Guinness World Records certificate for the largest LEGO ship. Constructed using more than 2.5 million LEGO blocks, the ship model weighs over 2,800 kg and measures 8.44 m long, 1.33 m wide and 1.53 m tall. The giant model was built over two months by more than 1,000 cruise line guests and members of the public, with the help of LEGO certified professional, Andy Hung. It was officially unveiled at Kai Tak Cruise Terminal. The World Dream model isn’t the first giant LEGO ship. In 2016, employees of Danish shipping company DFDS A/S built the world’s largest supported LEGO ship, a 12.035-meter long vessel christened Jubilee Seaways.

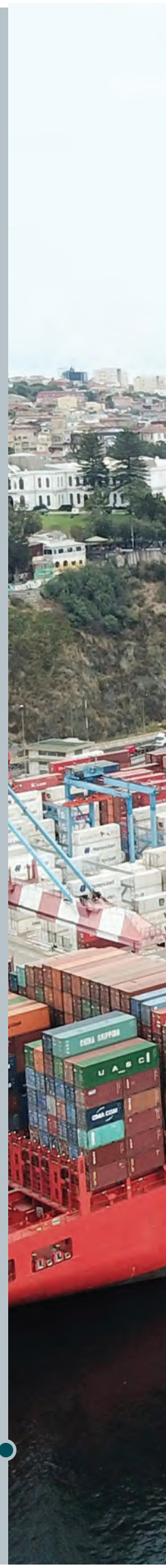
Photo: Guinness World Records

Fuels, Lubricants & Green Marine

IMO fuel rules entering force in 2020 mandate a drastic sulphur reduction. By 2050 the mandate is to cut greenhouse gas emissions of shipping by at least 50%.

Edited By Tom Mulligan

Marine fuels, lubricants and additives manufacturers play their part in establishing maritime's green credentials by introducing new environmentally acceptable technologies and products.



Hamburg Süd's Santa Catarina (at the front of the photograph), the first Hamburg Süd ship to make the switch from HFO to MGO in order to reduce SOx emissions, in the port of Valparaiso, Chile in January 2018.

Hamburg Süd & Electrolux: MGO in Port

Ship operator Hamburg Süd and Electrolux formed a partnership to apply their knowledge and experience to reduce sulfur dioxide emissions in ports. During its layovers in the Mexican port of Manzanillo, Callao harbor in Peru, and the ports of Iquique and Puerto Angamos in Chile in March of this year, the 7,114 TEU Santa Catarina used MGO instead of HFO to operate its auxiliary engines and boilers: these need to be running in port to supply the ship with electricity and heat. The two companies had already carried out a fuel upgrade in the past, thereby making a contribution to environmental and health protection. Due to the significantly lower sulfur content of MGO, the sulfur dioxide emissions for the Electrolux cargo in question is expected to decrease by more than 95 percent. In the jointly-funded project, Electrolux is bearing the additional costs for the MGO, while Hamburg Süd is assuming the extra operative expenses related to project planning and the switching of fuels. The joint sustainability project had already been initiated in a pilot phase that was run in the spring of 2017. Switching fuel from HFO to MGO is not mandatory in the four South American ports mentioned – unlike the situation in the North Sea and the Baltic Sea or the North American ECAs. "Sulfur dioxide emissions are a major environmental issue in some of the communities around port cities where we ship our products. With this partnership, we are showing how the industry can move faster than legislation to improve the air quality in ports, and we hope more companies will get on board," said Bjorn Vang Jensen, Vice President, Global Logistics at Electrolux. "This will support our ambition to improve the environmental footprint in the transportation chain."

Photo: Chevron

The MT Seriana on the Bosporus: severe corrosion problems were solved with Chevron's Special HT Ultra 140 BN cylinder oil.

The BOS Emulsifier with no moving parts: the critical component for producing optimized emulsified fuel for consistent fuel savings

The shipping industry is more than ever portrayed in a bad light due to increasing awareness of its contribution to global climate change, according to Dirk Kronmeijer, CEO of GoodFuels Marine. Kronemeijer is convinced that biofuels will play a significant role in drastically reducing the shipping industry's impact on global emissions and that tugs and offshore support vessels (OSVs) are in a very good position to lead the industry by example because of their high visibility in coastal areas.

Kronemeijer has said that the recently updated IMO standards for marine fuel sulfur content from 3.5 percent to 0.5 percent by 2020 is a significant step towards improving the fuels employed by the shipping sector and that, more importantly, this will bring into existence global emission control areas (ECAs), which previously were restricted to the North Sea and the U.S. coasts. In these ECAs, the world's most polluting fuel, HFO, can no longer be used without the employment of scrubbers. Although carbon emissions are being excluded from international maritime regulations until 2023 (supposedly due to a lack of accurate emissions data), market players and local governments are pushing to bring the date for regulatory change forward. The legal limit on sulfur and the expected carbon regulation will dramatically affect the marine sector's fuel consumption and heighten the applicability of low-carbon fuels.

Such fuels have already penetrated the fuel mix for other parts of the marine industry, particularly in the Netherlands. Sustainable marine fuels add a competitive edge to companies servicing public operations, as clients demand these fuels in order to reduce their carbon footprint.

GoodFuels Marine is active in the distribution of sustainable marine fuels and their adoption in the marketplace by presenting the case for companies employing ships (or any other machinery running on fossil fuels) to switch to a (partial) low-carbon fuel. By doing so, these companies can set an example for the future as well as benefit from increased chances of winning tenders, and portray themselves as sustainable companies. GoodFuels' marine fuel is an easy-drop-in fuel that can be used without any adjustments to equipment or engines and, as such, is a zero-capex alternative to decarbonization.

Kronemeijer said that regulation and incentives are essential for the broad adoption of low-carbon marine fuels to take place and that, as the IMO has agreed that a detailed carbon strategy will not be finalized until 2023, inclusion in the EU emissions trading system (ETS) will be an important first step towards establishing low-carbon shipping and send a clear signal to the IMO.

Shell: MILES Ahead

Shell Marine's Global Technical Manager, Dr. Sara Lawrence, has said that the technical, commercial and regulatory variables in play when considering a shipowner's optimum cylinder oil supply solution are continuing to rise. To overcome some of these challenges, the company last year introduced new two-stroke and four-stroke cylinder oils, opened a blending facility in Singapore, added new delivery ports, and introduced new technical services.

An additional initiative from the company this year is its Marine Integrated Lubrication and Expert Solutions (MILES) development, which combines purchasing options, services and an extensive range of lubricant products in a multi-faceted strategy for customers to address their most pressing operational concerns. MILES includes new and different delivery options and a coherent response to digital disruption in the maritime sector, Lawrence said. It not only takes full advantage of digitalization, but is also a proposition that addresses the challenges shipowners face from regulators and new engine technology, new fuels and new efficiency pressures. She said that MILES not only provides optimal volumes/port liftings recommendations, but can also be evolved to offer entire lubrication management for a vessel, combining stock levels and demand planning that includes a vessel's operating profile.

At the start of 2017, the company's Shell Alexia two-stroke cylinder oil portfolio covered fuel types from LNG to HSHFO, operating regimes from full load to slow steaming, and engines of all ages. It extended from Shell Alexia S3, a 25 BN oil for ECAs, Shell Alexia S4 (BN 60) and Shell Alexia 50 (BN 70) to the 100 BN Shell Alexia S6, which was developed to perform with HSHFO in conditions where oils are under extreme stress. Shell Marine introduced Shell Alexia 140 in 2017 to deliver added protection against cold corrosion for modern engines. The oil can be mixed with lower-BN oils to adjust base number as vessels move in and out of ECAs. The company has also secured a No Objection Letter (NOL) for use from MAN Diesel & Turbo, which also used the product as its first test oil for automated cylinder oil mixing (ACOM) ; Shell Alexia 140 has also been successfully used with Maersk Fluid Technology's 'blend-on-board' technology. Lawrence said that the approach of the IMO 2020 meant that cylinder oil optimization to deal with changing fuel composition was continuing. Post 2020, both LNG and HSHFO will 'have a place', she stated, but owner decisions taken to date suggest that low-sulfur fuels will be the shipping industry's mainstay.

Photo: Blue Ocean Solutions

Photo: Good Fuels

GoodFuels Marine is active in the development and distribution of sustainable marine fuels.

Chevron Combats Severe Corrosion

The M/T Seriana, a 110,000 dwt Japanese-built LR2 tanker operating in the Greek market under the management of Neda Maritime, began to experience severe corrosion in its MAN 6S60ME-C8.2 engine soon after its launch in 2015. Initially, a significantly higher than OEM-recommended feed rate of Chevron's Taro Special HT 100 cylinder lubricant was implemented by the owners in an effort to keep the wear rate within acceptable limits. However, wear rates were unchanged and over-lubrication resulted in liner polishing.

Understandably, Neda Maritime was concerned about the implications for the liner's lifespan and, following numerous scavenging space inspections as well as repeated on-board scrape down measurement analysis, the company consulted Chevron's technical specialists who recommended switching to a higher-BN cylinder lubricant, Taro Special HT Ultra, a 140 BN cylinder oil with high-performance lubrication properties. A high cylinder oil dosage, as well as being costly for operators, does not necessarily result in better engine operation, and the Chevron specialists instead analyzed the case with a focus on oil characteristics and chemistry. Initially the product was also used at a high feed rate before the feed began to be reduced following positive results from frequent drip oil testing using Chevron's DOT.FAST service.

Liner measurements from the M/T Seriana demonstrated that, within a period of about four months, the use of Taro Special HT Ultra had returned wear levels to normal. Ultimately, the feed rate was reduced by more than 30 percent and the overall engine condition was much improved. Through DOT.FAST drip oil monitoring Chevron demonstrated that switching to Taro Special HT Ultra provided both a positive technical outcome and gave cost savings of more than $20,000 a year for this vessel alone.

ExxonMobil: Mobil SHC Aware HS

ExxonMobil has introduced its Mobil SHC Aware HS (Hydraulic System) Series hydraulic oils formulated to offer excellent protection in challenging marine operating environments. The oils meet the U.S. Vessel General Permit2 (VGP) requirements for EALs, making them suitable for use in U.S. inland and coastal waters. ExxonMobil said the formulation of the new oils was designed to help offer a range of performance benefits, including protection across a wide temperature range, superior low-temperature start-up, high resistance to oxidation and thermal damage, and excellent shear stability, thus ensuring a long operating life.

The Mobil SHC Aware HS Series oils have passed the Eaton-Vickers 35VQ25 pump test and also meet Denison HF-1, HF-2 and HF-6 specifications: according to ExxonMobil, these OEM approvals highlight the hydraulic performance of the lubricants. The lubricants are especially suited for use in hydraulic equipment where VGP compliance is required and are suitable for a wide range of marine applications, including in hydraulic winches, ramps, hatches, doors, cranes and pumps, and other deck equipment. The new lubricants will be sold alongside the company's established Mobil SHC Aware H Series oils and will initially be offered throughout the U.S.

Total LubeMarine: Cylinder Fuel Oil Facilitates Fuel Switching

Total LubeMarine introduced its Talusia Optima product, a 100 BN cylinder lube oil designed specifically to facilitate fuel switching without the need to change lubricants when transiting both in and out of ECAs. The new oil also has increased neutralization capability in comparison to conventional 100 BN products and is also designed for use with all fuels with a sulfur content from zero to 3.5 percent.

The company reports that it has completed more than 8,700 hours of sea trials and has received NOLs from Winterthur Gas & Diesel (WinGD), Japan Engine Corporation (JEC) and MAN Diesel & Turbo. Talusia Optima is now in use as a lubricant for engines across a variety of ship types and has had a number of successes in addressing difficult cold corrosion issues not previously resolved by existing market products.

The new oil formulation is based on an innovative type of chemistry known as ashfree neutralizing molecules (ANM), which provides effective acid neutralization and cylinder cleanliness, and also has the potential to reduce feed rates, the company stated.

Blue Ocean Solutions: New Emulsified Fuel System

Blue Ocean Solutions said that when the new IMO regulations come into effect on Jan 1, 2020, it is expected that ship operating costs will increase by at least 10 to 20 percent. A proposed solution is the use of emulsified fuel systems: Blue Ocean Solutions introduced its BOS Emulsified Fuel System (EFS) in 2011, and this has been proven, according to the company,

Photo: Lubriplate

Lubriplate's BIO-BASED EP-2 grease: an EAL for high-performance extreme-pressure applications.

Photo: Shell

Dr. Sara Lawrence, Global Technical Manager, Shell Marine: new cylinder oils are needed to overcome technical, commercial and regulatory challenges in the maritime sector.

to perform reliably and significantly reduce fuel consumption and emissions on containerships, tankers, bulkers and cruise ships. The return on in investment, in most cases, is less than a year, and fuel operating expenditure has been reduced by about 2 to 5 percent.

In simple terms, an emulsified fuel is one in which water has been added to fuel oil in such a way that small particles of water are formed in the oil to produce a stable water-in-fuel emulsion. The main purposes of this are to improve combustion efficiency by achieving a better heat release rate and to reduce NOx emissions by cooling the combustion.

The key success factor in emulsified fuel is the ability to produce and maintain the optimum water content of 10 percent as water-in-fuel particles in a size range of 2 to 8 microns. BOS has achieved this with its patented BOS Emulsifier, which, unlike other commercially available systems, has no moving, cavitating or vibrating parts.

Installation of the system takes five to seven days and does not require drydocking: the basic components of the system can be retrofitted while ships are alongside in port, transferring cargo or passengers, and is achieved in a simple, fully-automated operation.

Fishing for Fuel Savings

The 305-foot factory trawler F/V Golden Alaska, powered by twin MAK six-cylinder engines and having a large boiler to support its fishmeal-fish oil processor and hoteling galley for its 80-person factory and crew personnel, uses a Fitch Fuel Catalyst on the output of dual centrifuges to provide a clean fuel burn and substantial cost savings. The vessel is now in its fourth year of operation and achieves about 18 months of service from each new catalyst core it instals. The beneficial results of the clean burn can be easily seen when the cylinder heads are removed from the main engines for service: significantly cleaner piston crowns and a very clean and pronounced pattern from fuel injection are observed and, during operation, less smoke is emitted from the main engines and the boiler, indicating better oxygenation and cleaner, more complete burning cycles.

According to the distributor of the Fitch Fuel Catalyst system, Power Fuel Savers, results from the Golden Alaska's current fishing season are showing fuel savings on its boiler of about 130 gpd and of 340-475 gpd during operating days on its main engines compared to a baseline established in the B fishing season of 2014.

Power Fuel Savers has confirmed that at least one major tug operator is now evaluating the Fitch technology for its fuel savings potential and other benefits.

RSC Bio Solutions: Grease for the Extremes

RSC Bio Solutions' newest grease developed specifically for severe applications, RSC EnviroLogic Grease 2 WREP (Water Resistant Extreme Pressure), an environmentally acceptable lubricant, has been formulated to offer excellent water resistance and extreme-pressure performance. As an EAL, the product is compliant with the US EPA's Vessel General Permit and the International Maritime Organization's Polar Code. This blue Lithium Complex grease is formulated with polyalphaolefin (PAO) and hydrocarbon-related type base fluids; it meets or exceeds the performance requirements of a grease used on articulated tug barges; and it also qualifies as a wire rope grease.

In addition, the new grease offers anti-wear performance; a broad operating temperature range from below freezing to 204°; good oxidation stability, pumpability and shear stability; and sealing properties that keep out water and debris. The product is highly suited as a ferrous and yellow metal corrosion protection agent, and also provides steel corrosion protection, as demonstrated by its Salt Fog (B117) Test pass mark after 1,000 hours of 10 out of 10 and its Humidity Cabinet Test pass mark after 1,500 hours of 10 out of 10.

Bio-based Grease

Developed to meet the needs of the marine industry, Lubriplate Lubricants Company's LUBRIPLATE BIO-BASED EP-2 grease is an environmentally acceptable lubricant (EAL) that meets US EPA 2013 Vessel General Permit (VGP) requirements; passes the US EPA Static Sheen Test (1617); and passes US EPA Acute Toxicity Test LC50.

The product is classed as Ultimately Biodegradable (Pw1) and is designed to protect slow- to medium-speed bearings, articulated tug barges (ATB) notch interfaces, rudder shafts, wire rope, above-deck equipment, port equipment, cranes, barges, oil platforms, and water treatment and hydroelectric facilities.

The grease has high-performance extreme-pressure/anti-wear properties and is highly resistant to both fresh and salt water. The product is available in cartridges and 120 lb drums.

Photo: RSC Bio Solutions

RSC Bio Solutions' RSC EnviroLogic Grease 2 WREP (Water Resistant Extreme Pressure) is available in 35 lb / 15.875 kg pails, 14 oz / 396 g cartridges and 120 lb / 54.43 kg kegs.

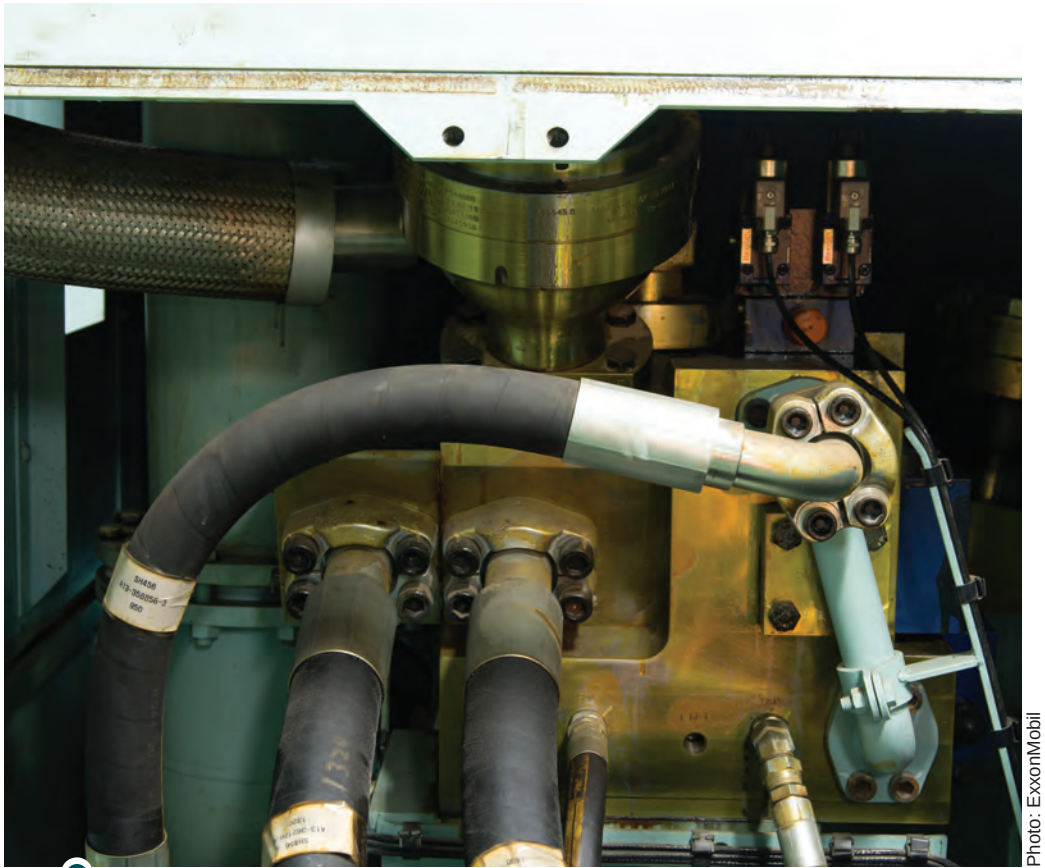


Photo: ExxonMobil

ExxonMobil's Mobil SHC Aware HS: hydraulic oils formulated to offer protection in challenging environments.

Photo: Power Fuel Savers

The 305-foot factory trawler F/V Golden Alaska: achieving clean fuel burn and substantial cost savings with a Fitch Fuel Catalyst system.

For more information

Blue Ocean Solutions	www.blueoceansoln.com
Chevron	www.chevron.com
Electrolux	www.electroluxgroup.com
ExxonMobil	www.exxonmobil.com
Good Fuels	www.goodfuels.com
Lubriplate	www.lubriplate.com
Panolin	www.panolin.com
Power Fuel Savers	www.powerfuelsavers.com
RSC Bio Solutions	www.rscbio.com
Shell	www.shell.com
Total Lubmarine	www.totallubmarine.com
Renewable Lubricants	www.renewablelube.com

Panolin's Word of Warning: Not All EALs are the Same

According to Brandon Richards, CEO of PANOLIN America, Inc., not all EALs are the same. He noted that in early 2014 there were several reports about problems with overheating of stern tube bearings of new-build vessels on sea trials in the Far East occurring when EALs were used. Such problems were noticed in different vessel types, with different EAL makes, and with different shipbuilders; apparently they were not occurring in vessels filled using mineral-based stern tube lubricants. In addition, over the past year or so, there have been instances occurring of the leakage of some EALs from the stern tube, this time on vessels that had switched to using EALs, having previously been in service without a history of stern tube problems when using mineral oils. On dry dock investigations, problems of wear and blistering of the stern tube seal lips became apparent and, in some instances, 'stinking' black sludge greeted the service engineers: this had to be scraped out of seal cavities and the seal oil feed pipes had to be blown through with compressed air to try to remove it. These problems are now being seen in the shipping industry worldwide.

DNV-GL's recently announced Joint Development Project to investigate these increases in stern tube bearing failures in collaboration with several marine insurers and the UK's University of Sheffield is expected to show whether EALs are causing the problems. What is clear is that this is a complex investigation: five base oil types that are generally considered to be 'biodegradable' (but with vastly different thermal performance capabilities) and several 'blends' of these lubricants available from many oil companies (plus numerous 're-brands') makes the identification of the lubricants that do work and of those that don't a huge task.

The current problem is one for vessel owners with EALs in their stern tubes: the owners that have to use EALs to carry cargo within US waters and the Polar Regions and the owners that choose to use EALs as part of their corporate social responsibility for the environment. The questions is have they chosen the EALs that work or the EALs that don't?

Panolin's 30 years of EAL experience, put into the development of its stern tube lubricant Stella Maris, a non-emulsifying saturated synthetic ester with selected additives having the required demulsibility, has resulted in a lubricant that shows good compatibility with bearings and seals when seawater ingress occurs.

MarTID

Maritime Training Insights Database
2018 Training Practices Report

In 2017 **World Maritime University** (Malmö, Sweden), **Marine Learning Systems** (Vancouver, BC, Canada) & **New Wave Media** (New York, NY, USA), publishers of *Maritime Reporter & Engineering News*, signed a Memorandum of Understanding as partners for a new initiative to help study global maritime training practices. MarTID (the Maritime Training Insights Database) is a non-commercial initiative to provide objective, comprehensive data on how maritime manages and conducts training for shipboard competencies and the effects of drivers, such as technology, on this training. Key findings and insights from the report are featured on the ensuing pages, while readers can download the full report at:
https://magazines.marinelink.com/NWM/Others/MarTID2018/

To lead things off we have invited our two hard-working partners, the driving forces behind the creation and execution of this inaugural survey, to share their unique insights on the importance of this survey: **Dr. Michael Ekow Manuel**, Associate Professor/Nippon Foundation Chair, Head of Maritime Education & Training (MET) Specialization, World Maritime University; and **Murray Goldberg**, Chief Executive Officer, Marine Learning Systems.

Safe, Efficient and Sustainable Maritime Ops

Dr. Michael Ekow MANUEL
Associate Professor /
Nippon Foundation Chair
Head of Maritime Education &
Training (MET) Specialization
World Maritime University

The maritime industry is one of the earliest and most international of industries. As a derived demand of trade, it has always had dimensions of internationalism related to the level of global trade. In the last century, globalization and the growth in global trade saw the maritime industry become even more international. In tandem, the industry has evolved in a direction that requires that related seafarer training be globally shared.

In the early 50s to late 70s, seafarer training was localized and related to the aspirations of individual nations and what these nations thought relevant. This meant that ships sailed the oceans with seafarers trained in very different training regimes. In 1978, the first major Convention recognizing the necessity of global minimum standards for the training of seafarers was agreed – the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW).

However, due to the uniqueness of ship types, trades routes, ports and company objectives etc., the requirements of STCW do not necessarily satisfy the competence aspirations of all stakeholders. This has led to an ongoing situation where shipping companies, in particular, see the need to train their seafarers in competencies over and above those required by the minimum standards set by the STCW Convention. While this may be argued to be laudable and premised on good human resource management practices such a situation leads to a globally diverse expression of training needs, practices, measurements and philosophies. Best practices are not self-evident, some approaches that have worked – or not worked – are not known to the wider global community and mistakes are unnecessarily repeated and resources wasted.

It is in light of the negatives of such siloed training and the fact that a significant percentage of accidents at sea are attributed to the "human element", that the World Maritime University, in 2017, signed a Memorandum of Understanding with Marine Learning Systems and New Wave Media, which would see the three partner institutions initiate a database to help give insights into current training practices on ships and elsewhere, their drivers, and associated human, financial and time resources etc. evolve. The initiative's mission is to help ensure safe, efficient and sustainable maritime operations on clean oceans and provide the insights necessary for good policy-setting decision-making, benchmarking and industry practice optimization relating to training of seafarers. The database is to be informed by periodic surveys.

The team is happy to report the completion of the inaugural survey which ran from November 6, 2017 through to January 31, 2018 and wishes to thank the stakeholders who took the time to respond to this particular survey. Many lessons have been learnt; the surveys will get even better and more insightful in the coming years. The reports of the surveys and associated future analyses are being made available to the global maritime community at no cost.

The team looks forward to the engagement and response of maritime stakeholders in future surveys.

It's the Era of Data-Driven Training

Murray Goldberg
Chief Executive Officer
Marine Learning Systems

The world is experiencing a data explosion; we live in a world which is increasingly built of, and upon data. Data changes what we do, and how we do it. It changes every decision we make. Data changes everything, and the maritime industry is not immune to those changes.

This will have a profound effect on the maritime world in general and on maritime training in particular because we can now be data-driven.

Borrowing from Wikipedia:

"… The adjective data-driven means that progress in an activity is compelled by data, rather than by intuition or by personal experience…".

This, to a degree, is new territory for the maritime industry.

The maritime historical context is one of time-honored traditions built upon experience and intuition.

As difficult as change sometimes is, the move toward data-driven training practices is one clear case of change for the better. Maritime operators and training centers have as their greatest responsibility the safe and efficient performance of their trainees. Supporting that safety and efficiency through best-practice training means constantly evaluating and re-evaluating how we train, what we train, and the effectiveness of that training.

It means making decisions every day that will affect the quality of future training outcomes. When we base those decisions on data, rather than intuition, we make better decisions - ones that can be defended based on past data and verified using future data.

Having said that, we must not forget the critical role played by thoughtful intuition and deep experience. Even in the era of data-driven approaches, these will always be a central component of best practice.

Their role, however, has changed. Instead of basing decisions on intuition and personal experience as we have in the past, we will now use these to guide the questions we ask of our data. Data and the computers that analyse that data are, for the most part, only as useful as the questions we ask them. So instead of immediately implementing a training change because our intuition tells us it will improve outcomes, we will first vet that intuition by critically examining the data to see if it supports our intuition. In some sense, data is the oracle that can tell us the truth of our intuition. So intuition, combined with data, is a tremendously powerful duo in our quest for the best possible training outcomes.

This all comes down to the favorite saying of a former mentor of mine: "If we don't measure it, we can't manage it". It is with this in mind that we, the MarTID partners, present to you, our community, our inaugural MarTID report.

It is the "measure" with which we can better "manage" our training. We believe it is a step forward in helping us break down training silos, and sharing best practices.

It is our hope that it will enable the benchmarking of training efforts, and help in the creation of a local and global roadmap toward maritime training excellence.

MarTID 2018: "And the Survey says ..."

Joseph Keefe
Editor
Maritime Logistics Professional &
Marine News
New Wave Media

MarTID Results at a Glance

- **A Global Response:** Europe 36%, Asia Pacific 25%, N. American 22%
- **Training Budgets Rise:** Nearly 60% expect to spend more in 2018
- **$819:** Average spent, per seafarer, for training in 2017
- **New Tech, Regulation, Safety:** Top 3 drivers for training budgets
- **Train & Track:** 86% of repondents track training in some form

The inaugural edition of MarTID, the Maritime Training Insights Database report sheds new light on maritime safety and training practices, what works, and what doesn't. More importantly, its analysis and data emanates from you.

The first Maritime Training Insights Database (MarTID) Report initiative has been two years in the making. This initiative was developed with the intent of being a shared commitment to safe, efficient and sustainable operations in the maritime industry. Importantly, the detailed 50-page report provides valuable insight, not based on so-called third-party experts, but input from the stakeholder respondents themselves. **That means you.**

Making MarTID

The MarTID survey is focused on training done by maritime companies outside the context of shore-based education and training leading to Standards of Training, Certification and Watchkeeping (STCW) Certificates of Competencies. In other words, this is a survey seeking data on how maritime operators continue to train their seafarers, post-STCW certification. The results collected will be used to provide objective and comprehensive data on how the industry manages and conducts training for shipboard competencies.

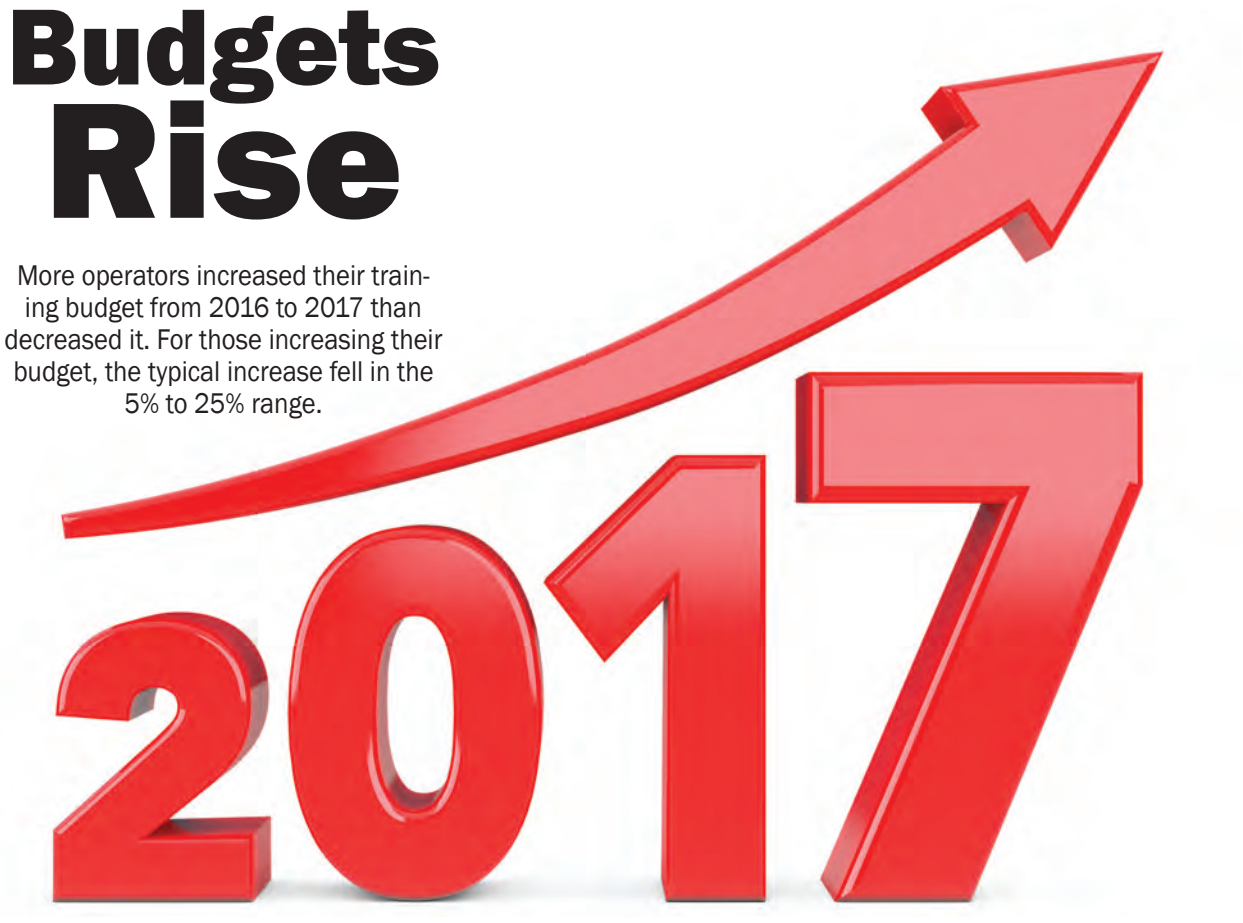
The aim for this initiative is to provide insights that will aid in enhanced policy-setting, decision-making, benchmarking and optimization of training practices by industry and regulatory authorities at all levels, leading to the sustainable development of productivity and safety of vessel operations.

The MarTID project is completely non-commercial, and reports are free and distributed widely. It is supported by the generous contributions of the three partnering organizations – the World Maritime University (WMU), New Wave Media and the Marine Learning Systems group. All three stakeholders agree that best practices can be achieved only if this effort is based on real data. Your data – protected and anonymized.

Specifically, the report provides information on:

- **Industry spend on training,** resources used and future trends;
- Methods, tools and techniques for training;
- The purposes and goals that training serves within organizations;
- How training is tracked and measured within a company;
- New initiatives undertaken by operators; and
- Common challenges and anticipated training trends.

Because the origin of the underlying data is just as important as the vehicle that delivers it, it is also critical to define who the respondents represent. To that end, MarTID would not have been possible without the tremendous response

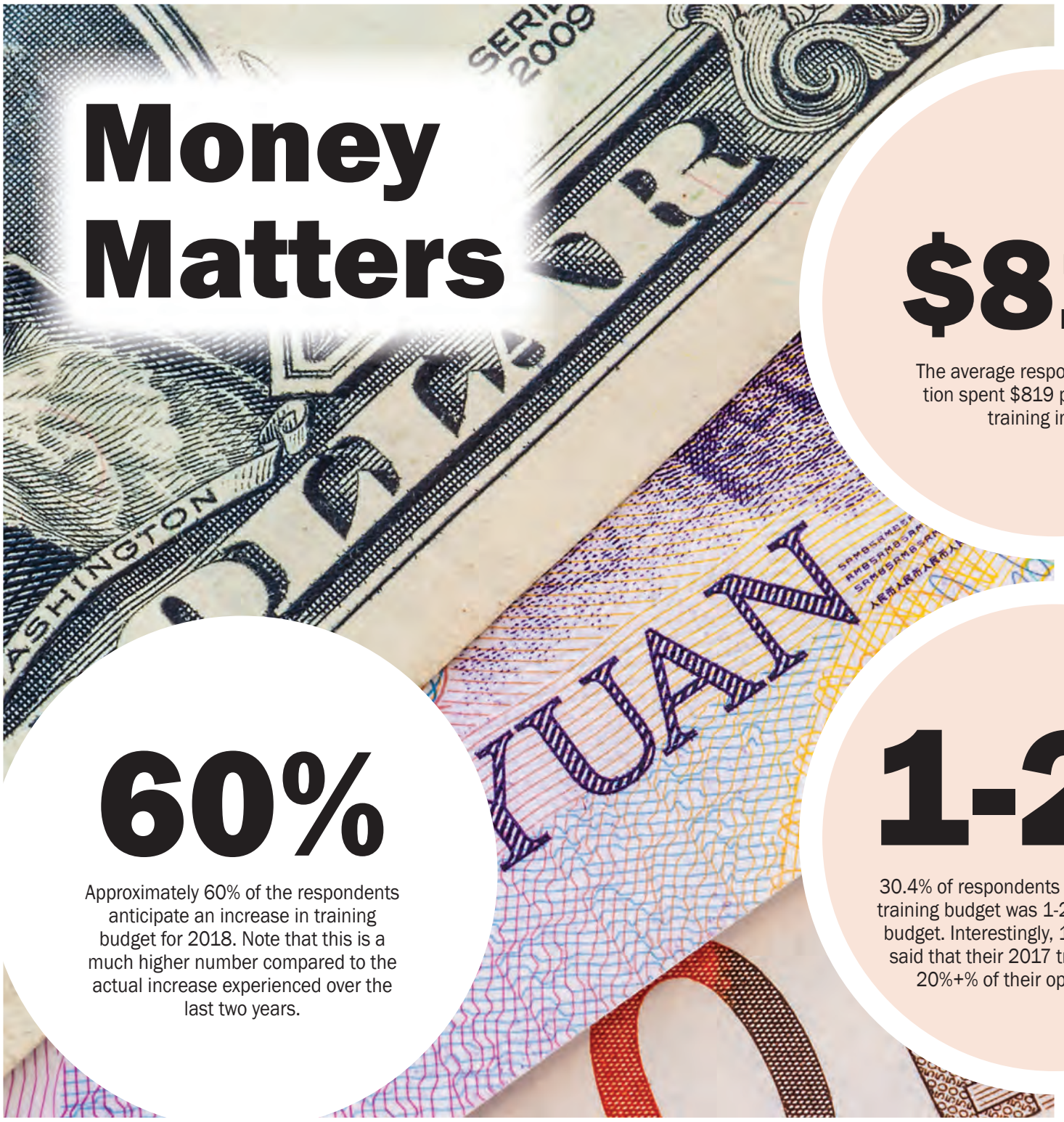


Simulation Rules

Though training practices are a mixed bag of methods, from in-person to simulation to eLearning, simulator training is the standard when it comes to training bridge officers with over 86% of companies using simulators to train them. 60% use simulators when it comes to training their engineering officers. **Investment into simulation training is increasing.** Of the companies that currently make use of simulation training, the majority, more than 60%, plan to increase the use of simulation for training officers in the next 5 years. **None anticipate a decrease in use of simulation for officer training.**

Resolve Maritime Academy

Money Matters



$819

The average respondent organization spent $819 per seafarer for training in 2017.

60%

Approximately 60% of the respondents anticipate an increase in training budget for 2018. Note that this is a much higher number compared to the actual increase experienced over the last two years.

1-2%

30.4% of respondents said that their 2017 training budget was 1-2% of their operating budget. Interestingly, 13% of respondents said that their 2017 training budget was 20%+% of their operating budget.

and participation that came from the global maritime community.

Who provided the data upon which the report was compiled? You did. Respondents included Training Instructors (23%), C-suite maritime personnel (18%), managers (15%), owners of company CEO's (12%), vessel masters (8%), deck and engineering personnel (8%) and a raft of other maritime stakeholders with a wide range of credentials (16%).

Education, training and human resource development is critical for the sustainability of any industry endeavor. That's because, in the maritime industry, there is broad agreement that a significant percentage of maritime accidents involve human factor causes. You already know that. So, too, did our respondents. In terms of experience, the average respondent had worked in a training-related role in their current organization for 8.4 years. Overall, a respondent had an impressive overall 12.7 years of maritime training experience on average.

Without a doubt, maritime stakeholders invest significant resources into creating best practice and innovative training programs. At the same time, the industry as a whole knows very little about the training approaches and successes of other vessel operators and training centers outside their sectors and/or companies. That's because this data is typically siloed and guarded. This type of siloed approach, rather than a collaborative effort, results in stakeholders pursuing their own path and sometimes repeating the mistakes of others. On a global scale, it means that we cannot benchmark our training approaches and learn from the successes of other industry players. It also means that industry training approaches will only advance by isolated individual effort and not by continually improving on the global state of the art. All of that can and will end with MarTID. Even if you didn't contribute to and participate in the inaugural effort, there's always the next survey and report. And, you can benefit immediately by using the current report to your advantage.

MarTID's core principles include ethical integrity, objectivity and confidentiality. Each of the partner organizations is donating their time and resources to make this initiative possible. Like the efforts to promote greater transparency throughout the supply chain, the sharing of safety-focused information also benefits the entire industry. Secure and anonymized MarTID data provides insights into training practices, budgets, priorities, challenges and perspectives.

Why MarTID? Why now?

Vessel operators and maritime training centers are pouring significant resources into creating best practice and innovative training programs. Often intended to bridge the gap between standard certifications and what actually happens in the real world afloat, these unique efforts fall outside the realm of traditional licensing and credentialing. That doesn't make them any less important.

In fact, in-house safety and competency training programs often go far beyond the typical STCW course. It is also true that in-house programs tend to be viewed as proprietary assets, in-

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Quotable

Select comments received from respondents on the MarTID Maritime Insights Training Database.

"The increase in technology is a good thing for our vessels. *However this must be regulated to ensure that varying providers of equipment provide systems with familiarity across interfaces.* ***Too many options and changes mean that our seafarers have to learn to operate varying systems each time they change vessel."***

"We are not prepared for new ship technology. *[Even] the STCW minimum requirements are not [being] well adopted."*

"A mindset of 'learning as an investment' instead of 'training as an expense' needs to be implemented. *Organizations need to accept that with the deficit of seafarers and continued global demand for shipping, [the] experience gap needs to be filled by new methodologies at the school, followed up on-board and [supplemented by] companyspecific training."*

3:100

The average ship-owning and operating company has less than 3 people dedicated to training (both management and delivery) per 100 seafarers in their company.

Photo: Tärntank Ship Management AB

The table below shows the average fleet size of MarTID respondents for each type of vessel.

SHIP TYPES	AVERAGE
Oil tanker	34.6
Chemical Tanker	18.9
LNG Carrier	11.7
LPG Carrier	15.4
Other Tanker (Asphalt, Bitumen, etc.)	3.2
Ore/Bulk/Oil Carrier (OBO or O/O or B/O)	8.5
Ore Carrier	10
Bulk/Container Carrier	30.6
Other Bulk Carrier	36.7
Container Ship	43.7
Barge Carrier	1.0
Vehicle Carrier	33.4
Other Specialized Carrier	2.5
Refrigerated Ship (Reefer)	0.3
Ro-Ro Passenger	6.3
Ro-Ro Container	6.9
Other General Cargo (Non-Specialized) Ship	1.2
Cruise	5.5
Other Passenger Vessels (Water Taxi, etc.)	9.5
Fish processing and catching	5.2
Offshore Drilling and Exploration	10
Offshore Support Vessel	5.5
Barge (Lash/Seabee, Deck, Hopper, etc.)	346.8
Tug (Towboat, Pusher, Salvage, etc.)	22.1
Research/Survey Vessel	4.5
Dredger	1
Other Vessel Types	5.3

tended not just to create a safer marine environment but also to achieve competitive advantage in the marketplace. As this siloed approach continues, it yields fruit, but also suffers from a lack of standardization and the absence of benchmarked victories. That's where MarTID comes in. Every year following the survey, a series of reports will be published broadly. These reports will provide both high-level and deep-dive information covering both broad trends as well as deep coverage of emerging issues and successes. The reports will grow to be a highly valuable and anticipated source of information each year – but only if there is broad industry buy-in from stakeholders like you.

The Maritime Training Insights Database (MarTID) is an initiative of The World Maritime University, Marine Learning Systems and New Wave Media. Intended as the ideal vehicle to collect data through a survey instrument, it will focus on the dominant training practices now being undertaken in the global maritime industry. In a world where mariners – despite being bombarded with the crushing weight of regulatory training and certification requirements – still seem to find trouble in way of collisions, allisions, oil spills and all manners of casualties, it is past time to stop and assess this important part of the global maritime industry. MarTID is already leading the way forward.

Looking Ahead

This initiative, founded and run by the three partner organizations, requires community involvement to succeed. This year's survey and report, the first of many annual efforts to come, was a resounding success because of stakeholder input. You will be hearing a lot about MarTID in the coming weeks and months. Take the time to download this year's report and then, when the next survey window arrives, get ready to contribute, collaborate and reap the rewards of doing so.

Look for more information and coverage on MarTID in the May print 2018 edition of Maritime Reporter & Engineering News, starting on page 66. Beyond this, you can access, read and even download the first annual MarTID report by clicking HERE.

The annual collection and analyses of training data will help the maritime community gain insights that can lead to enhanced policy-setting, decision-making, benchmarking and operational optimization by industry operators and regulatory authorities at all levels. This year's product proves that out. It is hoped that the survey data and its analyses will become an important, if not the definitive source of knowledge for the global maritime community and its quest for absolute safety. Join us on the journey.

World Maritime University
www.wmu.se/

Marine Learning Systems
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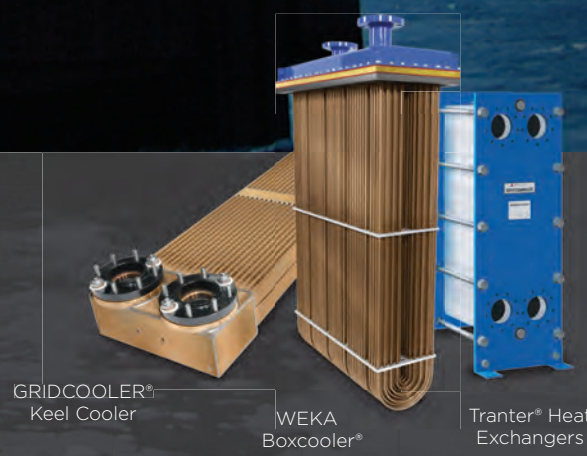

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