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MARITIME REPORTER AND ENGINEERING NEWS

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NOVEMBER 2018

Admiral Karl SCHULTZ

26th Commandant, United States Coast Guard

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Master & Commander

Last month I was afforded the opportunity for a one-on-one with Admiral Karl Schultz, the 26th Commandant of the United States Coast Guard, effectively helping to transform this edition, by pure chance and unofficially, into the "Coast Guard" edition. Admiral Schultz has occupied the top spot at USCG for just under six months, and it is always my mission to make the trek to Washington – particularly for the first interview during the Commandant's tenure, for a face-to-face interview in their office. Even in today's rapid fire barrage of sensationalist news and information, I proudly admit to being 'old school' in this regard, believing in the value of a personal visit, whether it be with the Commandant of the USCG, the head of the IMO or any business leader, anywhere, in the maritime sector. When you sit with someone, in their office, you get a much better feel for the person than you do when meeting them at one of the multitude of nameless, faceless conferences or events that dot our industry landscape, and I'm happy to say that Admiral Schultz did not disappoint.

Admiral Schultz takes the helm during interesting times, a transformational period in the global maritime and logistics industry, driven in part by the IMO's mandate to cut greenhouse gas emissions by 50% by 2050, and by an information and data fed revolution that includes concepts such as autonomous shipping. He freely discuses this, as well as the Coast Guard's recently released *Maritime Commerce Strategic Outlook* and so much more in our interview, starting on page 46.

In addition to our interview with Admiral Schultz, we also feature an interview with the head of a Coast Guard a half a world away in our discussion with **Shuichi Iwanami, Commandant, Japan Coast Guard**, starting on page 55. Commandant Iwanami delivers an overview and insight into the JCG from both an asset and a people perspective, discussing how the JCG has grown in both regards over the last two decades to address a number of growing and evolving safety and security situations, saying "As the situation surrounding Japanese territorial waters remains tough, the JCG is required to play a wide variety of roles, indicating that its duties are getting ever more diversified, complicated and internationalized."

Rounding out our Coast Guard coverage, apart from Dennis Bryant's breakdown of the *Maritime Commerce Strategic Outlook* starting on page 10, we offer an interview with Bruce Baffer, Rear Admiral USCG (ret.), who leads Fincantieri Marine Group's team effort to win the highly sought U.S. Coast Guard Polar Security Cutter shipbuilding contract. The program was rebranded last month to the Polar Security Cutter name to more accurately reflect the importance of these proposed ships to national security interests.

To overstate the obvious, Russia has a commanding lead in the Arctic region with a fleet of icebreakers and ice capable vessels approaching 50. At the same time, China has shown increasing interest in the region with presence and stepped up patrol with its own ships over the last decade. With an increasing commercial shipping presence to and through the north, including both cargo and passenger ships, as well as a vast array of still undefined natural resources up for grabs in the region, the time is now to rebuild a U.S. icebreaker fleet that has fallen into sad disarray.

Courtesy of his Coast Guard career, Baffer has a unique insight and knowledge of the topic, and together with Philly Shipyard, Vard and Aker Arctic has helped to build a strong team with icebreaker design and construction insight that is positioned to build the next generation of U.S. icebreakers, when and if the program is fully funded and given the green light. Our interview with him begins on page 44.

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THE COVER

Meet the New Boss

As Admiral Karl Schultz, the 26th Commandant of the United States Coast Guard, settles into his office, Maritime Reporter & Engineering News visits with him to discuss the path forward on a multitude of topics critical to the global maritime community. Story starts on page 46

Coast Guard photo by Petty Officer 1st Class Jetta Disco.

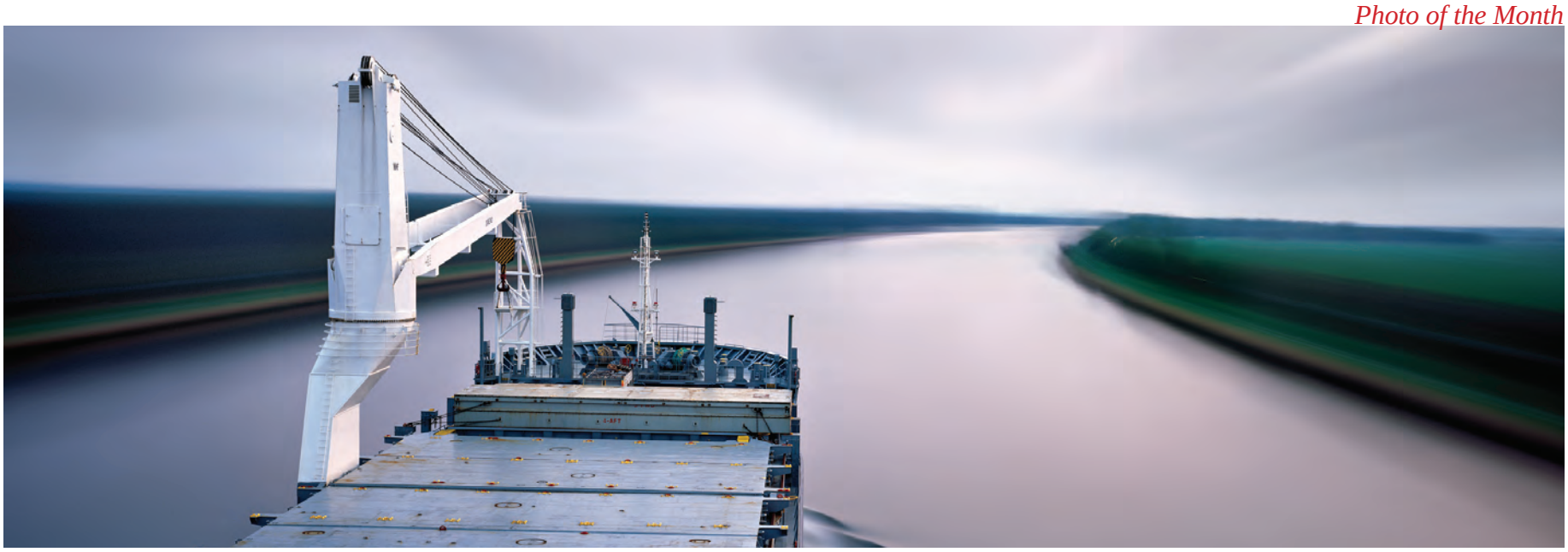
In this Edition

Voices: Joey Farrell

The 'Natural Born Salvor.'

By Lisa Overing

Photo of the Month



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Passing the Kiel Canal in Germany.

Herbert Boettcher worked out the photo on a heavy lift vessel during his trip through Europe, the Asian part of Turkey and his passing the Suez Canal. He flew back home from Egypt. Today, this vessel sails with the Name Maple Lotta.

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.

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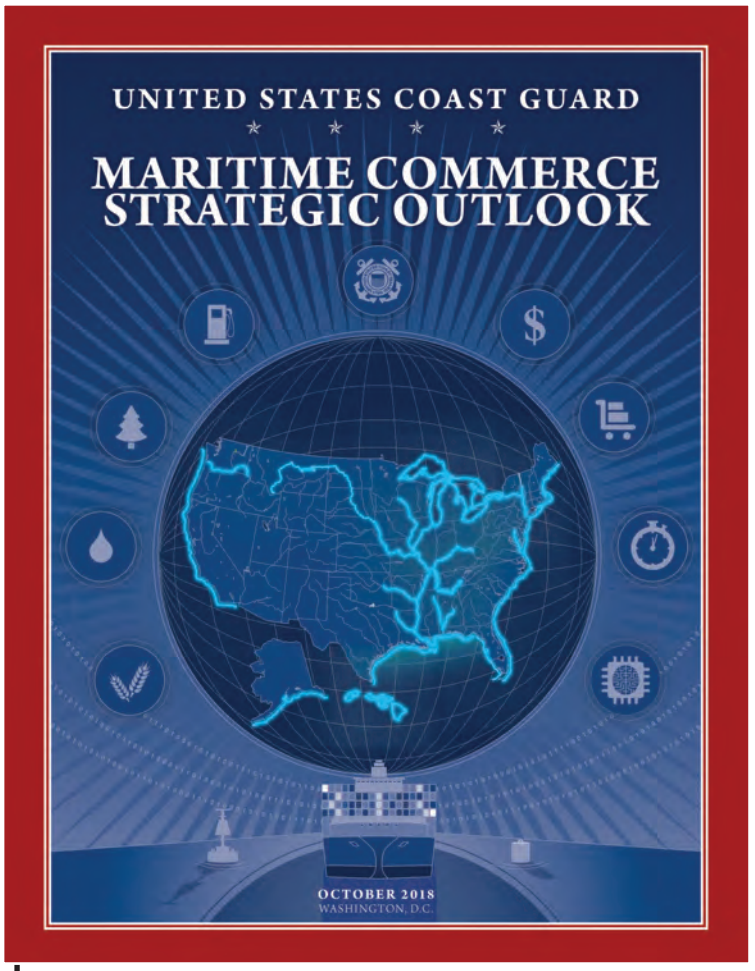

The Forward Facing Coast Guard

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The U.S. Coast Guard has published its Maritime Commerce Strategic Outlook. This forward-facing document should be read by everyone in the Coast Guard and by those associated with the U.S. maritime sector. It is intended to guide the Service's efforts in securing the strategically critical maritime transportation system (MTS) and the marine environment. To accomplish this, the Coast Guard must be Semper Paratus – Always Ready, as it has been for most of its 228 years. The Coast Guard must also be relevant – ready and able to accomplish the tasks important to the MTS and marine environment. Finally, the Coast Guard must be responsive – performing its important tasks when (or before) they are most needed. Three major lines of effort have been identified for meeting the challenges ahead: (1) Facilitating Lawful Trade and Travel on Secure Waterways; (2) Modernizing Aids to Navigation and Mariner Information Systems; and (3) Transforming Workforce Capacity and Partnerships.

Facilitating Lawful Trade and Travel on Secure Waterways

The Outlook states that the Coast Guard's role in enabling the uninterrupted flow of maritime commerce requires a multifaceted approach that includes managing risks to critical infrastructure; ensuring the efficient delivery of Coast Guard services; supporting uniform and consistent vessel and facility standards; and promoting resiliency and unity of effort among all MTS stakeholders. As the lead federal agency protecting the MTS and the primary regulator of the maritime shipping industry, the Coast Guard advances American prosperity through securing ports and waterways that enable commerce and ensuring vessels are subject to uniform, consistent standards. It must seek a balance between risks and costs to support the efficient flow of commerce while reducing the risk of disruption to the MTS. To meet this challenge, the Coast Guard will work to mitigate risks to critical infrastructure; build resiliency within the MTS; and enhance unity of effort in the MTS.

Modernizing Aids to Navigation and Mariner Information Systems

The Coast Guard must build the information, digital, and physical infrastructure to manage emerging sources of risk within America's waterways brought about by the introduction of new technologies and operating constructs. It has a responsibility to ensure America's waterways and maritime industry employ innovative, state-of-the-art systems that ensure America's competitiveness as a global trading partner. It must also reduce or mitigate risk for mariners, vessels, and maritime resources. The Coast Guard intends to support American waterways to become the most technologically advanced maritime transportation system in the world by developing a workforce best able to meet the needs of modern electronic, autonomous ship systems and new and emerging alternative fuels and propulsion systems. It intends to deliver enhanced marine safety information to provide mariners with real-time, accessible, and relevant voyage planning data that will result in more efficient, economical, and safer transits, while accelerating the integration of modern navigation systems such as e-ATON into its system of buoys and beacons.

Transforming Workforce Capacity and Partnerships

Given the increased demand on America's waterways, the Coast Guard must have a transforming workforce capability and strengthen linkages and partnerships to facilitate, safeguard, and advance maritime commerce. It intends to leverage new technology to beneficially change the way the service conducts compliance and oversight through expanded use of condition-based monitoring, data, and analytics. A Coast Guard mission-ready total workforce will possess the technical expertise to effectively audit and validate the new systems. It will work to recruit, develop, and retain capable prevention and response professionals who can thrive in an environment characterized by constant changes in technology and tools. It will also judiciously leverage the use of third-party organizations while ensuring that its own workforce retains the necessary competencies, proficiency, and technical expertise and is provided the doctrine, strategies, training, and education needed to manage and conduct proper oversight. This is undoubtedly the most difficult to the three lines of effort facing the Coast Guard. Constant change is challenging and unsettling to both institutions and individuals.

Summary

I agree with the new Maritime Commerce Strategic Outlook but have a few comments. The Outlook emphasizes maritime commerce (as the title implies) but gives short shrift to other traditional missions of the Coast Guard such as search and rescue (SAR), national defense, and recreational boating. It also does not explain what role, if any, will be played by the Coast Guard Auxiliary. It is possible, even likely, that the drafters of the Outlook viewed the document narrowly, not covering the full expanse of Coast Guard missions, but this is a significant document and is clearly intended to guide Coast Guard efforts for the near and mid-term. Other than the above, the Outlook goes a long way toward providing Coast Guard members and employees and those who work with or are impacted by the service with a better understanding of where this national treasure is headed.

One is either the agent of change or the subject of change. The U.S. Coast Guard has chosen to be forward-facing and an agent and facilitator of the changes necessary to move the nation's marine transportation system into the future.

https://media.defense.gov/2018/Oct/05/2002049100/-1/-1/1/USCG%20MARITIME%20COMMERCE%20STRATEGIC%20OUTLOOK-RELEASABLE.PDF

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U.S. Flag Vessel Safety

Congressional and Agency Actions to Implement Changes to U.S.-Flag Vessel Safety Requirements Three Years after the M/V El Faro Incident

About the Author

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October 1, 2018 marked three years since the tragic sinking of the M/V El Faro – ranking as one of the worst maritime disasters in U.S. history and resulting in the highest death toll for a U.S. commercial vessel sinking in almost 40 years. Following this incident, both the National Transportation Safety Board (NTSB) and U.S. Coast Guard spent considerable effort to investigate this incident. The NTSB released its final report on December 12, 2017 – with more than 70 safety recommendations – and the Commandant's final agency action ("Commandant's Action") – published with 31 safety recommendations – was published shortly thereafter on December 19, 2017. The Commandant's Action can be found at: https://media.defense.gov/2017/Dec/21/2001859858/-1/-1/0/EL%20FARO%20 FINAL%20ACTION%20MEMO.pdf. Shortly after the release of these reports, questions immediately arose as to what action the Coast Guard and Congress would take to implement changes and how long it would take. To the Coast Guard's credit they immediately took steps to implement many of the safety recommendations emanating from the Commandant's Action. Congress did not move quite as fast but recently enacted legislation in the form of the Hamm Alert Safety Alert of 2018 (the "Act"), named after the wife of a M/V El Faro crewmember who initiated a petition urging Congress to take immediate action to ensure safety changes are made to prevent such an occurrence from happening again.

Coast Guard Action

RADM John Nedeau, Assistant Command for Prevention Policy, released a statement on the Coast Guard Blog for Maritime Professional exactly three years after the incident noting that the Commandant urged industry to move with a sense of urgency as a result of lessons learned. In this regard, RADM Nedeau outlined four lines of action taken by the Coast Guard, as follows.

1. Examination of U.S.-flag Vessels in the Alternative Compliance Program ("ACP") – In October 2017 the Coast initiated a review of U.S.-flag vessels enrolled in ACP and similar programs. While finding that that there were some improvements in the fleet the Coast Guard found numerous fundamental safety deficiencies resulting in removing inspection certificates for five vessels. The Coast Guard plans to continue to conduct risk-based, targeted oversight and increase its evaluation and scrutiny of the U.S.-flag fleet.

2. Third Party Oversight Review Team (T-PORT) – The Coast Guard initiated its roll-out of this program in January 2018. It is directed at improving its oversight system for classification societies that perform delegated work. Among other things, this program has developed more rigorous procedures and detailed policy for both third parties and local Coast Guard marine inspectors, started work towards a single U.S. Supplement to the classification society rules and Safety of Life at Sea Convention ("SOLAS"), and created a new oversight of third parties office. It expects to complete its policy changes by the end of 2018.

3. Marine Inspector Improvements – In 2018 the Coast Guard initiated actions to substantially improve its marine inspector training program including to prioritize the filling of vacant marine inspector positions.

4. Updated Safety Standards – In 2018 the Coast Guard initiated action to propose safety changes to International Maritime Organization ("IMO") which will be followed by improvements to U.S. safety regulations.

A full copy of RADM Nedeau's statement can be found at http://mariners.coastguard.dodlive.mil/2018/10/01/10-1-2018-remembering-el-faro/

Congressional Action

On October 11, 2018 President Trump signed the Save our Seas Act of 2018 into law. https://www.gpo.gov/fdsys/pkg/BILLS-115s3508enr/pdf/BILLS-115s3508enr.pdf. Title II of this law contained the Act which focuses solely on marine safety and implementing changes in light of the M/V El Faro incident. The Act adopts many of the recommendations contained in the Commandant's final agency action. However, while the Act codifies many of the corrective actions undertaken by the Coast Guard, it is more complementary in nature to the

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Congress recently enacted legislation in the form of the Hamm Alert Safety Alert of 2018, named after the wife of a M/V El Faro crewmember who initiated a petition urging Congress to take immediate action to ensure safety changes are made to prevent such an occurrence from happening again.

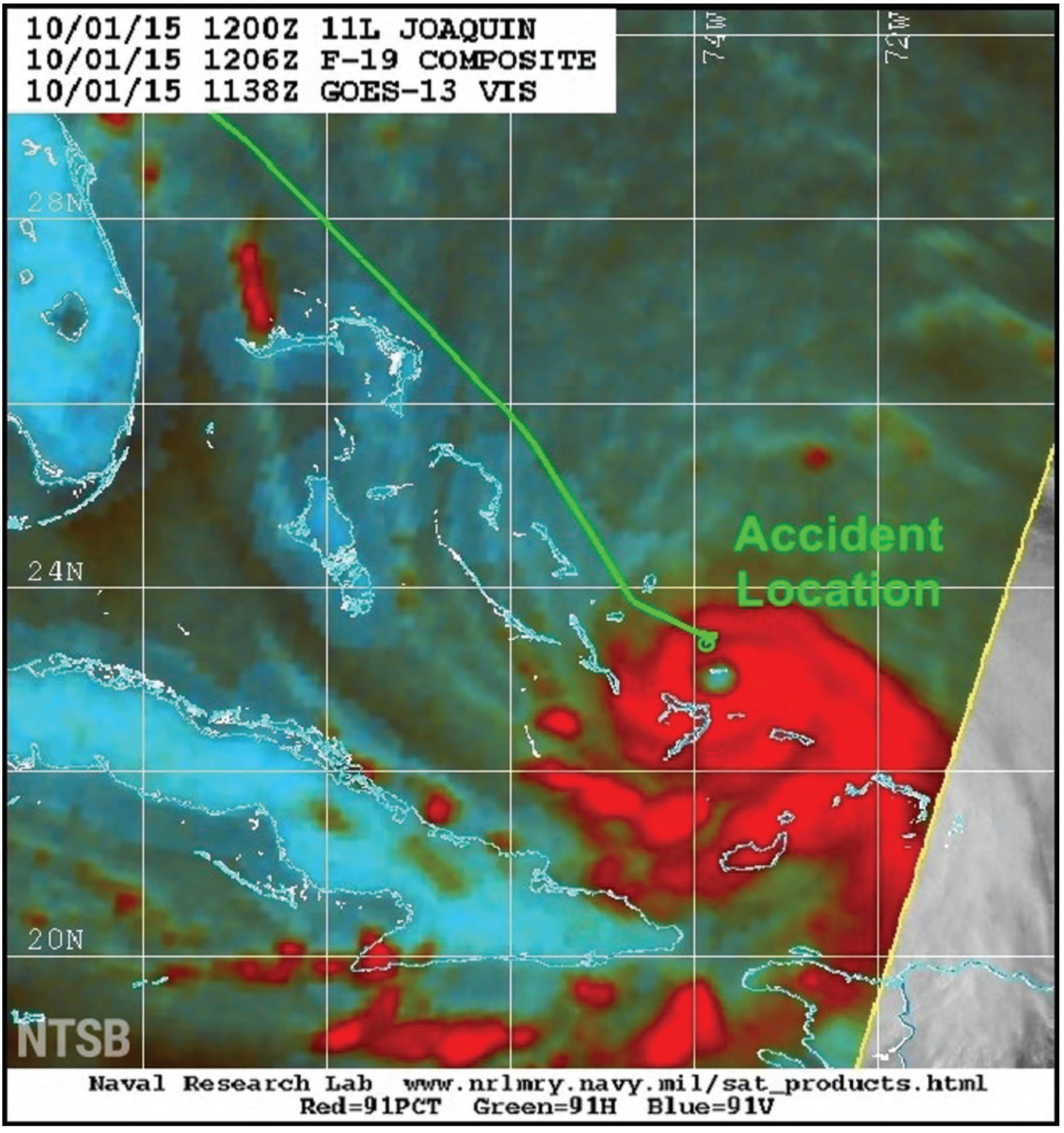

Image: NTSB

actions taken by the Coast Guard to date as discussed above, and does not impose many new major obligations on the Coast Guard or industry that were not already underway. The following are the key provisions of the legislation.

• No later than 60 days after enactment, publish flag-state detention rates of each type of inspected vessel and identify any recognized classification society that inspected or surveyed a vessel that was subject to a major control action attributable to a major nonconformity.

• Direct the General Accounting Office to conduct an audit of the Coast Guard's oversight and enforcement of safety management plans required under the International Safety Management Code, and report to Congress in 18 months on the program's effectiveness and provide recommendations.

• Require that all inspected freight vessels carry enhanced distress signals and location technology, and require companies to maintain records of all incremental weight changes made to inspected freight vessels.

• Direct the Coast Guard to work with IMO to require a high-water alarm sensor in each cargo hold of a freight vessel, and amend SOLAS to require that all voyage data recorders be installed in a float-free arrangement and contain an integrated Emergency Position Indicating Radio Beacon.

• Direct the Coast Guard, subject to the availability of appropriations, to identify and procure equipment to provide search-and-rescue units with the ability to attach a radio or Automatic Identification System strobe or beacon to an object that is not immediately retrievable.

• Require the Commandant of the Coast Guard to establish enhanced training programs for Coast Guard marine inspectors, and take other actions to improve the marine inspection program of the Coast Guard.

• Direct the Coast Guard to review its policies and procedures for making major conversion determinations, the effectiveness of certain international and domestic vessel safety requirements, and the reliability of self-locating datum marker buoys.

• Direct the Commandant of the Coast Guard to (1) conduct an assessment of its oversight of recognized (third-party) organizations and the impact on compliance by and safety of vessels inspected by such organizations, (2) establish within the Coast Guard an office to conduct comprehensive and targeted oversight of all such recognized organizations, and (3) review its procedures for delegating to recognized organizations to ensure that these authorities are being conducted in a manner that ensures safe maritime transportation.

• Create a single United States Supplement to rules of recognized classification societies for classification and inspection of vessels.

• Task the Commandant with working with the IMO to ensure that vessels receive timely and graphical weather forecasts.

• No later than December 19, 2018, and every two years thereafter, direct the Commandant to report to Congress on the Coast Guard's implementation of each action outlined in the Commandant's final action memo dated December 19, 2017.

In conclusion, both the Coast Guard and Congress should be commended for taking action relatively quickly following release of the NTSB report and Commandant's Action in order to enhance the safety of the U.S.-flag fleet and both the Coast Guard and third party oversight programs. It is also clear that there will be increased scrutiny by both the Coast Guard and third party auditors during inspections and examinations of the U.S.-flag fleet. Owners, operators, and third party auditors should take heed of these developments and take appropriate action to ensure compliance with applicable requirements. It is important that all industry stakeholders learn from this tragic incident to do whatever we can to prevent a similar accident occurring in the future.

The Role of the Marine Chemist in Preventing Maritime Vessel Explosions

Image: Used with permission, National Fire Protection Association

With advances in technology, increased regulatory requirements for training, and an industry that has been committed to improving working conditions, especially those associated with confined space entry and fire prevention, why are we still seeing maritime related fires and explosions that often include serious injury or loss of life?

History

Following the First World War, as cargo vessels, particularly tank ships, were being converted to carry larger cargos, the incident rate of fires and explosions during shipbuilding, repair, and conversion began to rise. Vessel owners, shipyard owners, and their insurance underwriters became increasingly concerned over the fire and explosion hazards associated with shipyard employment, and NFPA (National Fire Protection Association) shared their concern. In 1922, NFPA's Marine Committee adopted a series of standards known as the Regulations Governing Marine Fire Hazards. Appendix A of those regulations addressed the control of gas hazards on vessels during repair activities and would eventually become NFPA 306 (Control of Gas Hazards on Vessels). With the adoption of these requirements, the maritime industry needed people with specific technical knowledge and skills who could ensure that these fire prevention requirements were followed. The American Bureau of Shipping (ABS), which establishes and maintains minimum standards for construction and operation of ship and offshore structures, already had a cooperative relationship between ship owners and shipyards, and it agreed to initiate procedures for certifying specialists (then called gas chemists) who would use and essentially enforce the standard on a daily basis. The first 25 gas chemists were certified by ABS in 1922. This arrangement worked for a while, but it was an activity that was outside the ABS mission. By the early 1960s, ABS was seeking a successor to manage the program. That's when NFPA stepped in. To this day NFPA continues to oversee the Marine Chemist Program through the Marine Field Service and Marine Field Service Advisory Committee (MFSAC).

NFPA's Marine Field Service reflects the partnership that NFPA has forged with the marine industry and the government, one with a shared goal of eliminating confined space accidents, fires and explosions on vessels during shipbuilding and repair without any expense to a governmental agency. In fact, neither the Marine Field Service nor the Marine Chemist Program would exist without the support of the marine industry. When NFPA's Marine Field Service was created in 1963, marine industry stakeholders agreed that those who use the services of marine chemists should contribute to the costs of NFPA's certification program in proportion to their use. A surcharge for every survey completed by a marine chemist is paid into a fund administered by the Marine Gas Hazards Control Program (MGHCP), which is comprised of representatives from the American Bureau of Shipping, the American Petroleum Institute, the American Waterways Operators, the Chamber of Shipping of America, and the Shipbuilders Council of America. The MGHCP fund supports marine chemist training programs and other efforts to continuously improve the program.

Making sure the work can be done safely is the job of NFPA-certificated marine chemists. They safeguard maritime and shipyard workers against a vast array of potentially harmful chemicals and their interactions. Only when a marine chemist has certified an area as safe can entry and hot work proceed. Both the U.S. Coast Guard and the Occupational Safety and Health Administration (OSHA) require a marine chemist certificate before a range of repair tasks can begin. Despite the importance of marine chemists to some of the industry's most dangerous locations and tasks, the group is virtually unknown to those outside the maritime transportation, shipbuilding, and vessel repair industries. In part, that's because there are only 97 certificated marine chemists in the country. This tiny group of safety professionals is responsible for overseeing work on thousands of vessels and maritime facilities. Marine chemists can be employees of a shipyard or vessel repair facility, work independently, or belong to a group operating under one business name. Chemists are not restricted to a single port; they can cover a large geographic area and can even fly offshore for work on oil and gas drilling and production platforms. Regardless of how and where they're employed, marine chemists essentially work on behalf of shipyard employees, the Coast Guard marine inspector, the marine surveyor, and the vessel crewmembers by ensuring that confined spaces meet the requirements of NFPA 306, Control of Gas Hazards on Vessels before entry or hot work proceeds.

This unique collaboration of marine industry representatives started the program, audit the program, maintain the program and pay for the program. It works so well that governmental agencies (OSHA and Coast Guard) wrote it into their regulations. So why are explosions with loss of life continuing to occur on marine vessels? In nearly all the incidents it is because industry is not following the program they created and the regulations that were written as a result of their creation. Only they can prevent the loss of life from these catastrophic incidents, such as the explosion that occurred on a towboat on January 19, 2018 which took three lives and injured 5 others. OSHA regulations were not followed. A Shipyard Competent Person did not test or inspect the area for hot work which should have resulted in a marine chemist being called in as a Competent Person does not have the authority to permit hot work in spaces that contain or have contained flammable or combustible materials. As a result of this lack of initial testing and inspection by trained individuals, fatalities occurred.

Industry must adhere to the processes and requirements that they themselves initiated, or they risk the loss of life.

About the Authors

This article was authored as a collaborative effort by the Marine Gas Hazards Control Program. The MGHCP is comprised of senior representatives of the shipping industry, shipbuilding and repair and insurance industry.

Sources:

https://www.osha.gov/laws-regs/regulations/standardnumber/1915 (OSHA Regulations)

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Class Delivers the Smart Shipping Vision

About the Author

Howard Fireman, is the Chief Digital Officer, American Bureau of Shipping (ABS).

Shipping's digital transformation is all around us, impacting the smallest vendor to the largest owner, across flag, class and shipyards, right up to the primary regulator.

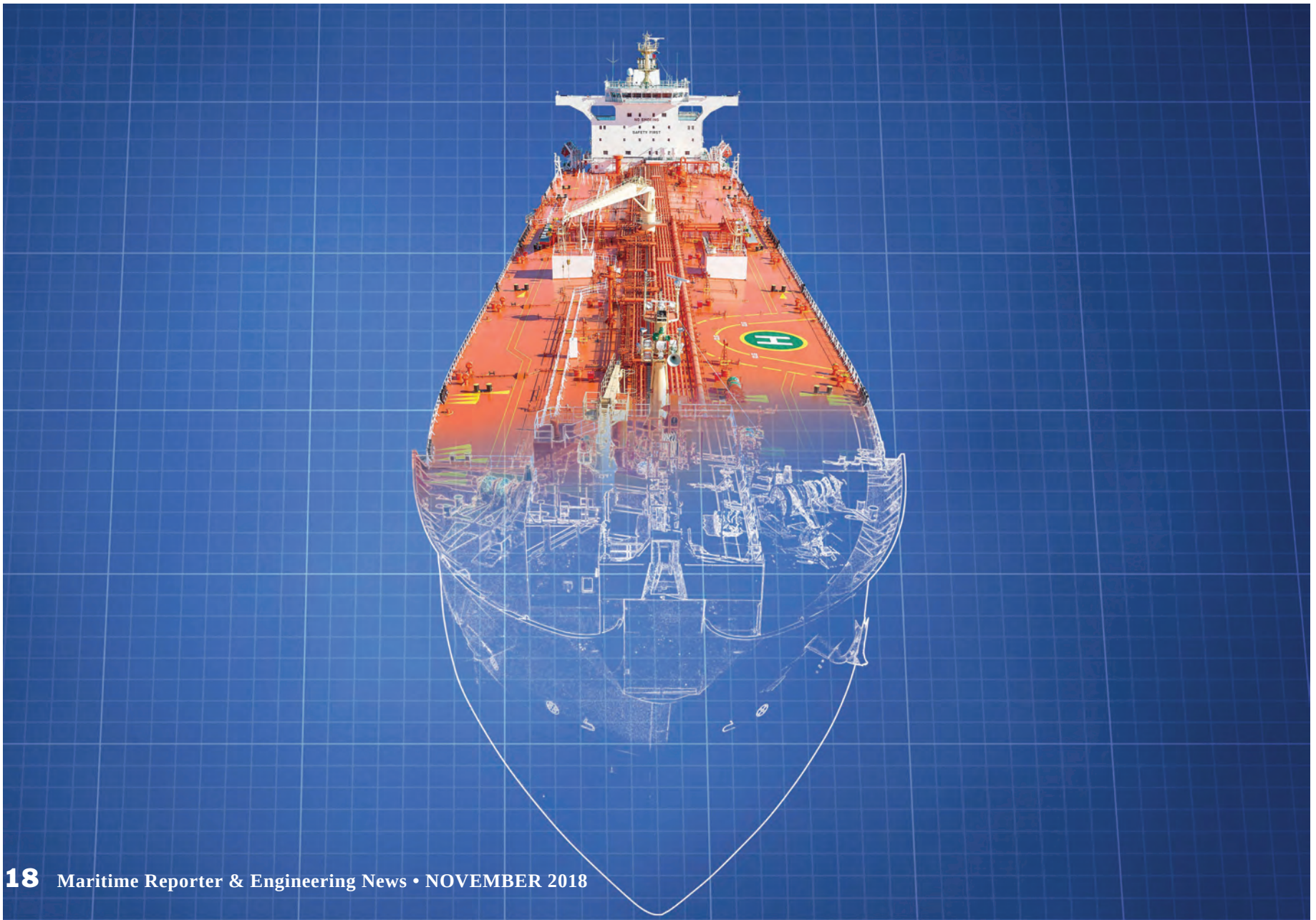
In these early days, there are many competing visions of the digital future. But the central question for ship owners and operators should not be whether their partners are delivering the required solutions; it should be whether they themselves are undergoing the digital transformation of their operating models that will be required to benefit from a data-enabled maritime community.

In trying to assess the impact of digitalization, it's important to recognize that shipping is a highly diverse industry composed of multiple market sectors, which have their own competitive pressures and are evolving at different depths and speeds.

There are, however, common threads. Many digital pilot projects are ongoing across the maritime industry, driven by desires to achieve community goals such as lower maintenance or fuel costs, the optimization of spares and components, the digitalization of processes and improvement of day rates.

Most early maritime adopters are coming from the energy-related sectors, where assets have high degrees of technical complexity. As more mainstream companies embrace the digitalization of their businesses, they must work to align their digital strategies with their desired business outcomes; investment decisions should be driven by core business requirements and market positioning, and so support their overall strategy.

Because digital and data strategies cut across broader industry goals – such as performance optimization, regulatory



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Because digital and data strategies cut across broader industry goals **– such as performance optimization, regulatory and environmental compliance, and cyber security –** it is essential that partners and suppliers align them with their desired business outcomes.

and environmental compliance, and cyber security – it is essential that partners and suppliers align them with their desired business outcomes.

The Class Journey

The digital revolution will have a major impact on how class delivers its primary services. Our objective is the same as it has always been: to set standards for safety and excellence in design and construction. However, the process of how we deliver those services will be transformed, right from plan reviews to the services provided throughout the life of the asset.

A digitally enabled class strategy integrates four key elements to deliver services: connectivity, decision-making, efficiency and unlocking the power of data.

It is underpinned by a simple premise: supporting clients from vessel design through to operations and maintenance requires class to develop and deploy a lifecycle strategy for data. Data use cannot be limited to operations alone, because lessons learned along the way should impact the next generation of vessel designs.

We need to be focused on creating new solutions that streamline the connection to client data, leading the way to a digitally enabled relationship.

We believe that the class experience – for clients and other stakeholders – is about to change significantly. Some operators are just beginning to understand what it means to treat data as a valuable asset, while others already appreciate its importance. Even though the concept of 'big data' has been on our radar screens for more than a decade now, for most, meaningful engagement has only just begun.

Exhaustive research with shipowners, vendors and shipyards is required to understand their data challenges. Any interface offered by class must offer access to everything an owner or operator needs to know – such as fleet status, operating statistics, certification, which ships are due for survey, as well as comments from the engineering department.

Creating Value

What is clear is that a non-integrated approach to digital investment will not work. A lifecycle strategy will require class to work in partnership with vendors and clients, using a more connected model. Only then can industry use data to improve asset and performance management, maximizing the skillsets of all parties.

Ultimately, this process will allow class surveys to transition from today's calendar-based approach to something that is more data, or necessity-driven. Not too many years ago, it's fair to say, some owners viewed class as a potential 'inhibitor' of operations, offering restrictive interpretation of its own rules. Now, many understand that a partnership with class supports, not restricts, their operations and helps them to work smarter.

There are multiple elements to the digitalization of class, but the fundamentals are simple: improve connectivity to provide a single portal for survey and compliance information; provide surveyors with new inspection and data-driven decision tools; provide crew and superintendents with voyage and operational support; and create a data platform that helps class to build new applications in a collaborative way.

The first goal for survey and maintenance is to make decision making more reliable and efficient. At our recent annual meeting, we held a live demonstration of a surveyor in the field working with a support engineer back in the office. The surveyor had a technical issue on board the ship.

Using a wearable device, the surveyor shared her view of the problem area with the support engineer. The support engineer captured an image of the problem area, recorded it (capturing it for reference in the next survey), shared rules, drawings and advice in real time. Soon, this type of technology-driven service will become standard practice, much like screen sharing with a virtual help desk.

Supporting Operations

Efforts to improve class's digital efficiency are already underway; e-certificates are already being delivered on-demand in a secure environment. To support environmental compliance and manage maintenance activities during daily operations requires reliable, automated data capture with replication to the shore for further analysis and interpretation.

The enterprise resource planning tools required for this will need to capture large volumes of transactional data, which then can be used to create actionable information to better manage vessels. To drive more effective decision-making, class is focused on delivering business-intelligence tools across applications that support everything from compliance and performance efficiency to health, safety, quality and environmental management.

The emergence of mobile and cloud-based apps is supporting that transition, but they need to be market-specific for areas such as merchant shipping and workboat sectors and able to enhance operations onboard and ashore.

A Condition-Based Future

The future lies – and where ABS is already delivering new services – is in condition-based classification (CBC). This transition reflects the owner's focus on improving asset reliability and availability to meet commercial goals, while continuously enhancing safety.

CBC uses data and analytics to generate a lifecycle-maintenance program. It is moving towards planned and, ultimately, preventative maintenance regimes that help to detect the anomalies that can contribute to operational failures before they happen.

It is a phased journey, with the first step aligning the vessel-maintenance cycle and the class cycle to replace the calendar-based schedule with a condition-based process.

The next phase entails data gathering from multiple sources and data cleansing to improve the quality of the analysis. The last part is important because a significant amount of data that is collected from vessels today is not effectively used; cleansing identifies data-quality problems. Once these problems are understood, it is possible to develop applications to filter data and fix issues.

The third phase is developing models to enable predictive maintenance based on the detection of anomalies and machine-learning algorithms. When shipowners align their digital strategy to achieve key performance indicators it allows them to use advanced data analytics, machine learning and artificial intelligence to identify potential operational issues and reduce the disruptive and expensive failures that can result in lost revenues.

We recently announced a two-year CBC project with the US Navy's Military Sealift Command; similar projects are advancing with merchant shipping and offshore clients. As it develops, CBC will provide an opportunity to not just improve the maintenance and performance cycles, but also make the quantum leap of designing smarter ships by using the lifecycle approach to data.

Another Step Forward

Class is already moving into the world of the cloud-based platforms, which can be used to build and deliver digital applications. In a maritime world that is increasingly defined by platforms, we are working closely with clients on specific business issues to provide targeted solutions.

A key to the success of maritime digitalization is the question of data ownership. We are very clear that the data belongs to the client, and it will be used under license; they need to be completely confident that they can share data in a protected format that will be anonymized to gain insights that will benefit all industry stakeholders. For ABS, it is not a case of 'give us all your data and we will sell you services'. We don't think the role of class is to be the 'Maritime Amazon'.

Modern industry stakeholders, who have already started down the path to digitalization, believe we should focus on building solutions that solve their problems in innovative ways. Longer term, there will be varied solutions, but owner issues will remain similar; connecting to the industry allows us to tailor outcomes.

The journey is going to be fast paced and exciting. A digitally enabled class will be more effective, efficient, informed and flexible. It will allow class can adapt to meet the needs and expectations of industry as they evolve, while using the transformation we are undergoing to predict and anticipate them too.

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Communicate or Stagnate

About the Author

Lars Fischer is the Managing Director of the Asia Pacific headquarters of Softship. He is responsible for Singapore's commercial and technical staff of 25 and for the group's sales & marketing strategy worldwide. www.softship.com

It's likely that you are reading this article in your office. And for most of us, that means a large, open-plan space arranged with desks, monitors, break-out rooms and other features designed both to keep us productive and to facilitate communication and collaboration. We have New York City to thank for the emergence of the shared office back at the turn of the last century. But it is relatively recently that "Bürolandschaft", or office landscaping, became popular encouraging workers to sit more organically based around flows of communication.

Ask any office planner – or corporate boss for that matter – why they favor open-plan over separate cubicles or offices. Increased collaboration is likely to top the list. When people share the same space, they are more likely to share ideas and ask for input. Even with today's social media dominance, people are social beings at heart and want to interact in-person. Data has to flow through a company, and sharing the space facilitates that. Open-plan is also, of course, much cheaper both in terms of construction cost and because more employees can occupy less square meters, but it also delivers flexibility. We might not know what the next office trend will be, but a large shared-space doesn't close down the options.

Building efficiencies

In many aspects of our family, social and workaday lives, we have in-built efficiencies. Open-plan offices is just one example; so is the fact that we use our smartphones to connect to the world wide web and a variety of social sharing platforms; and that our laptop applications all interconnect to allow data, images and other information to be shared seamlessly and without fuss.

The question is, therefore, if this is part and parcel of our normal lives, why are most shipping companies woefully under-integrated?

Most shipping companies will say that they have fully embraced the digital revolution, and that's largely true. Almost all will be using an accounting package to manage invoicing, budgeting and bill paying. For some, this will be a simple Excel spreadsheet, but for most it is likely to be a more sophisticated made-to-measure package. Most will also be running software packages to administer a range of other commercial and operational functions. But the issue is one of integration. While these individual packages perform a discrete set of tasks

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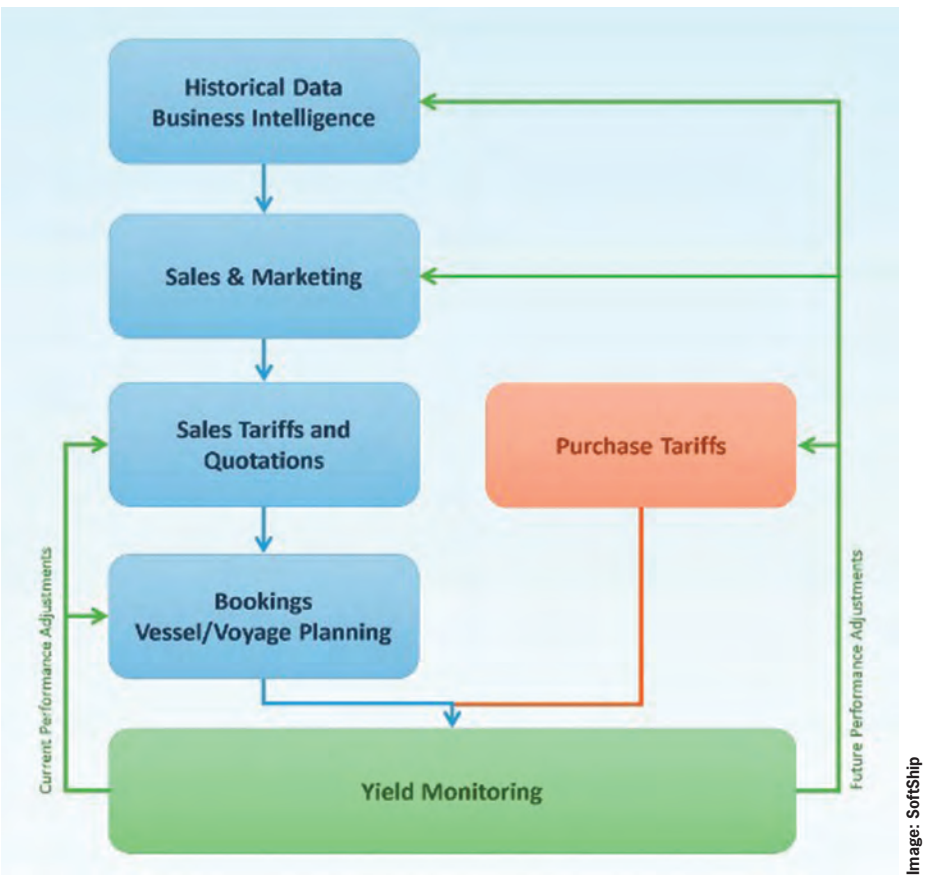

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perfectly well, they don't communicate with one another.

Achieving Integration

In a fully integrated shipping company, the tariff system captures all the complex information relating to individual customers, ports, terminals and cargoes – and this can be a hugely complicated matrix of individual prices, restrictions, discounts and incentives. When a customer requests a quotation, the quotation system should automatically look up the relevant tariff to create a bespoke and accurate quotation.

If the quotation turns into a sale, the system will, again, automatically create the required booking confirmation, bills of lading, manifest and more. And once the vessel has sailed, an invoice will be automatically generated and that information will be posted to "accounts receivables" via an interface.

During this process, if changes need to be made, a fully integrated system will automatically create manifest corrections, credit notes and invoices at the press of a button. In other words, information will flow seamlessly from one activity to another without the need to re-enter data. Retyping leads to errors, errors lead to delays and delays disrupt cashflow and cost money.

Reducing the argument to a monetary basis, it is widely understood that around 10% of global outgoing freight invoices are incorrect due to human error in transferring information from one system to another. Even for a small shipping company boasting a modest revenue of $100 million, that means $10 million in dispute and not being paid – and a subsequent hole in the cash-flow.

Finding a Solution

Evolution is probably the main culprit for the current state of affairs. Shipping companies have adopted digitization piecemeal and so have installed individual packages to perform specific tasks as required, or as budget became available. The resulting mix of sometimes bespoke and sometimes off-the-shelf packages has generated a maze of applications that sit alongside each other, but which don't integrate or communicate. A huge amount of data is re-keyed between disconnected departments within the same shipping company.

To scrap what is already in place and start afresh is a daunting and time-consuming task. Many shipping companies are simply not prepared to take two steps backwards in order to make three or more in the right direction. Coupled with this, most IT departments are struggling to remain compliant with an ever-increasing raft of external reporting regulations which are required just to keep the company trading. Internal integration will always play second fiddle.

But there is a solution. Modern shipping software is modular, meaning shipping companies need only select the applications they require to automate certain processes within their businesses. Each module seamlessly integrates with others to facilitate a flow of information across the company.

Data need only be input once, thus reducing duplication, errors and silo working. Data is then shared across the company and with relevant business partners. This significantly reduces the administrative burden and introduces efficiencies across the business. It also frees up staff to focus on more customer-oriented tasks.

A well-thought-out software application will retrieve variable costs per shipment from a cost database and apply these as estimated costs to the booking. Information on volumes taken from the customer at the time of booking are automatically married with this data to provide analysis and profitability assessments for each consignment.

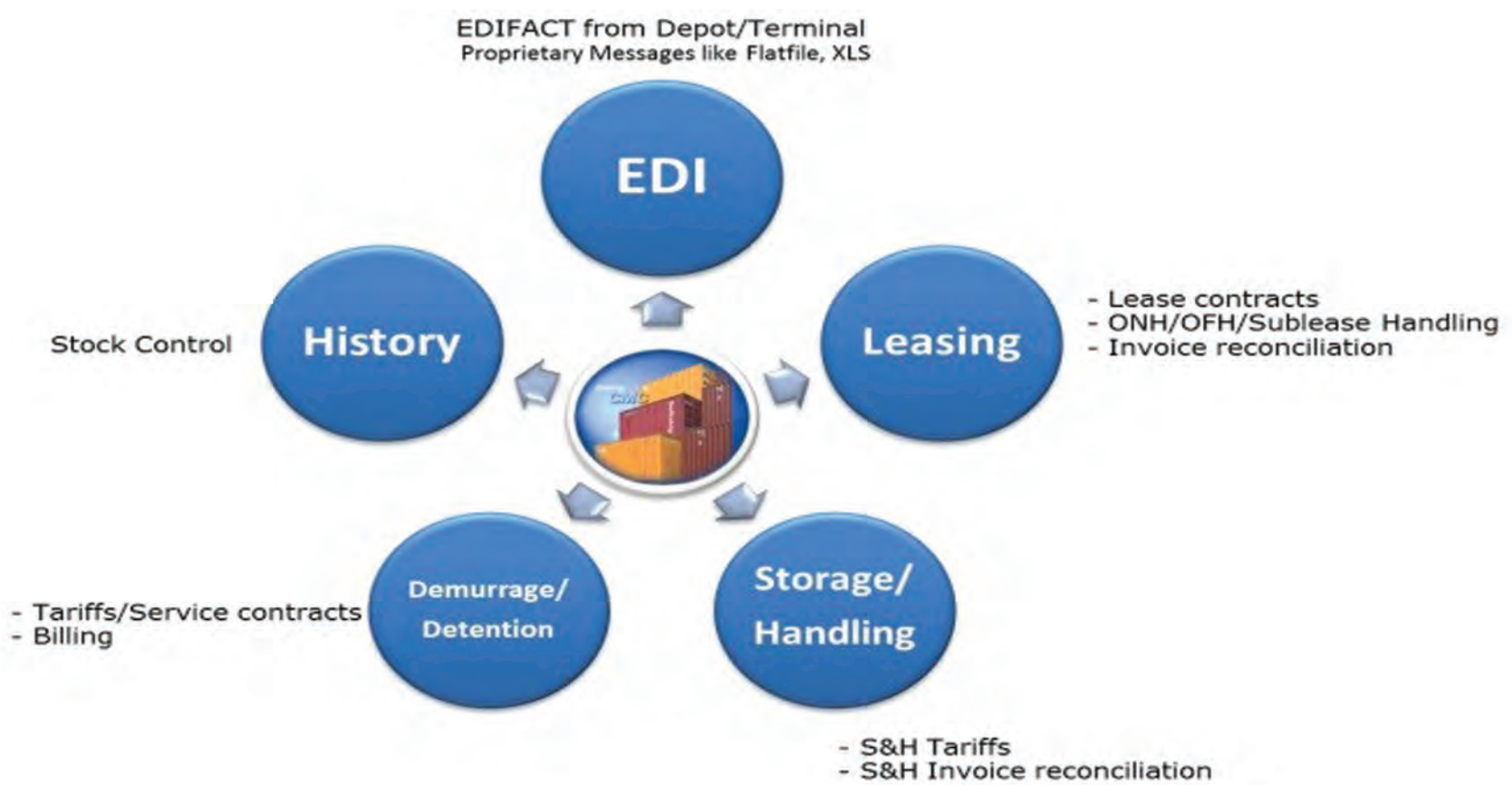
And, as the voyage progresses and actual costs become known, real-time updates allow profitability to be monitored throughout the voyage. Automating these processes enables a valuable amount of data to be captured, shared and reused throughout the company. It can also be analysed for performance reporting encouraging management to make smart and informed decisions.

More so, good shipping-oriented software will also manage and monitor voyage progress and port call activities. Schedules can be monitored and updated from arrival, departure and noon-reports automatically received from the vessel. Changes caused by unforeseen events can be simulated to provide estimates of the potential impact on the overall schedule. The operator can then simulate the "what ifs" and find the most appropriate countermeasures.

But while there is a good solution to achieve full integration within shipping companies, resistance remains.

Overcoming Resistance

Twenty or more years ago, digitization was the prerogative of the very large shipping company with deep pockets. They developed bespoke applications and recruited armies of technicians to look after them. But times have moved on and, today, it is a fairly simple process to buy specialist solutions that can be easily configured and customised to suit the individualities of each company and user. These packages are the means to make digitized companies into digitally-integrated companies. The beauty of these applications is that they are built to facilitate total integration between each of the core processes – connecting existing systems through a single overarching, fully connected and seamlessly networked entity. So, data flows seamlessly between ship operations, commercial, container logistics, accounting and management. Other than the obvious advantages of less data input, reduced errors and the ability to deliver heightened customer service, these packaged solutions are available at a fraction of the price of building a bespoke system. Effectively, they have levelled the IT playing field across the entire spectrum of shipping companies. Like the open-plan office, or the smartphone, or the laptop, many shipping companies are beginning to raise their heads from the day-to-day to see the advantages of having their various business functions communicate with each other. Like all good ideas, the concept is very simple, and with packaged software now widely available, achieving full integration is easily within reach.



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LNG Investment Projected to Grow

By Greg Trauthwein

Following years in the pricing doldrums, LNG is hot again, with business prospects for floating production and regasification looking strong through 2023. We talk to Jim McCaul of International Maritime Associates (IMA) for his insights, as he is fresh off of a 12-month stint investigating the market in depth.

"We wanted to take a fresh look at the market, to identify opportunities both in the production and regassification of LNG" is how McCaul, founder of IMA, best describes his team's 12-month effort to study and report on the industry. The culmination is a 150+ page study published by World Energy Reports, as well as a live 24/7/365 database of information that is available for purchase. "The market for the last three years has been dismal, but demand is rising and our projections show that in 2022-2023 the LNG market will be in a deficit. We're starting to see a lot more investment in LNG, but if you want to be in you have to start now."

Project Evaluation

The IMA study is the first professional effort to systematically look at the universe of FLNG and FSRU projects in the planning stage – and categorize the likelihood of each making the development investment hurdle. Many FLNG and FSRU projects are planned – but only some will ultimately will move forward to development. For example, IMA examines 29 floating liquefaction projects in the planning stage, and of these 29 McCaul estimates that three projects are 'strong' (a 75% chance of moving forward); eight or nine are 'fair' (50%) while the remainder are 'weak' (30% or less). The probability rating is based on how the project scores in terms of drivers of project health and stockholder overlay considerations. While the IMA report analyzes a number of economic and stakeholder considerations to arrive a its projections, McCaul said that government support is central to nearly every project. "If the government doesn't support it, that's a project killer."

Regasification Prospects Bright

McCaul and his team found that the regassification end of the business, or FSRUs, offer better business prospects moving forward. In total the IMA report identified 47 FSRU terminal projects in the planning stage with about half of them classified as 'strong' with the other half falling in the 'fair' or 'weak' categories.

Online FLNG/FSRU Database

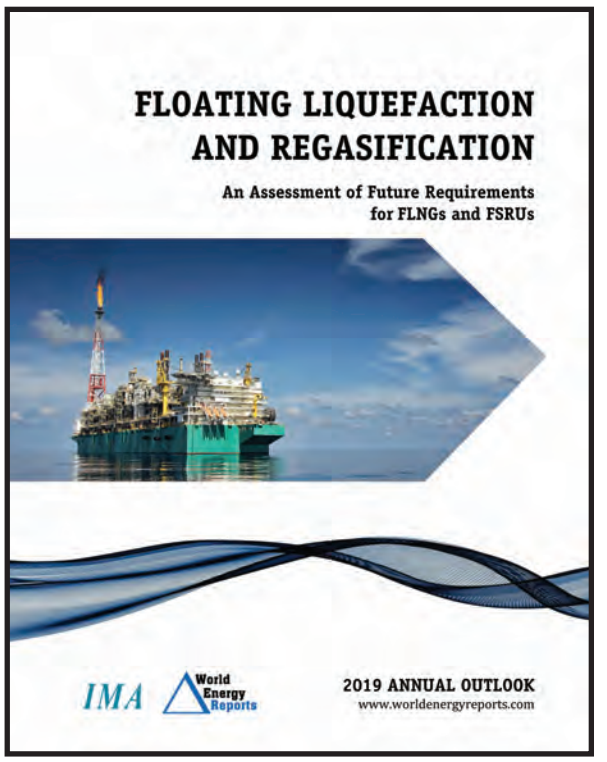
IMA does more than just provide a snapshot of the floating liquefaction and regasification sector. Its new online fully searchable LNG database updates all FLNG and FSRU project information on a 24/7 basis. As IMA receives new information about projects from its network of industry contacts, the database is immediately updated to reflect the latest situation.

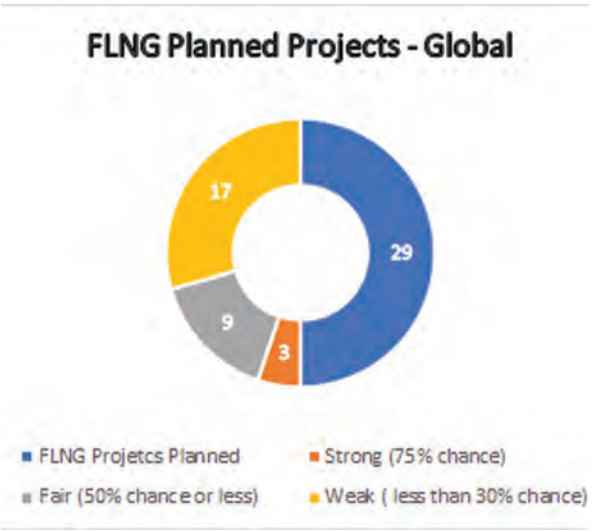
With access to the online database, users can access any FLNG project or FSRU terminal – in operation, under construction and planned – and immediately find the latest information on project status, along with any changes in timing and probability of the project investment decision. Contacts are also provided for follow up with key players. Database users are able to select any combination of data about projects and export the data to excel for evaluation – or use the sophisticated sorting and graphics capability provided with the database for making comparisons and benchmarking.

The search capability is user friendly and our IT staff is available to assist with any issues or questions at any time.

Meet the Team

The FLNG/FSRU study and database has been prepared by a small team of seasoned industry professionals with many years of hands-on experience in the offshore sector. The team's direct experience in planning and executing FLNG and FSRU projects provides the foundation for a "reality check" evaluation of the likelihood that projects in the planning queue will go forward to development. Jim McCaul, founder of IMA and co-founder of WER, is the principal analyst in the study. He has prepared more than 60 reports on the floating production business -- and over the past 30+ years has been engaged as adviser by numerous clients in the offshore oil and gas sector. Jim has been advisor on planned FSRU projects in Ghana, Jamaica, India, elsewhere. George Tilley, senior researcher, is a 30+ year veteran of the international oil and gas industry having worked in Brazil, Kazakhstan, India and Tanzania for BG Group. In his last assignment in Tanzania George was responsible for the commercial arrangements with partners and government for the proposed LNG project. Our other senior analyst in the study has 30+ years of experience as offshore field development engineer in offshore oil and gas projects and has been directly involved with planning FLNG projects in Tanzania, Cameroon, Congo-Brazzaville, Brazil and elsewhere.





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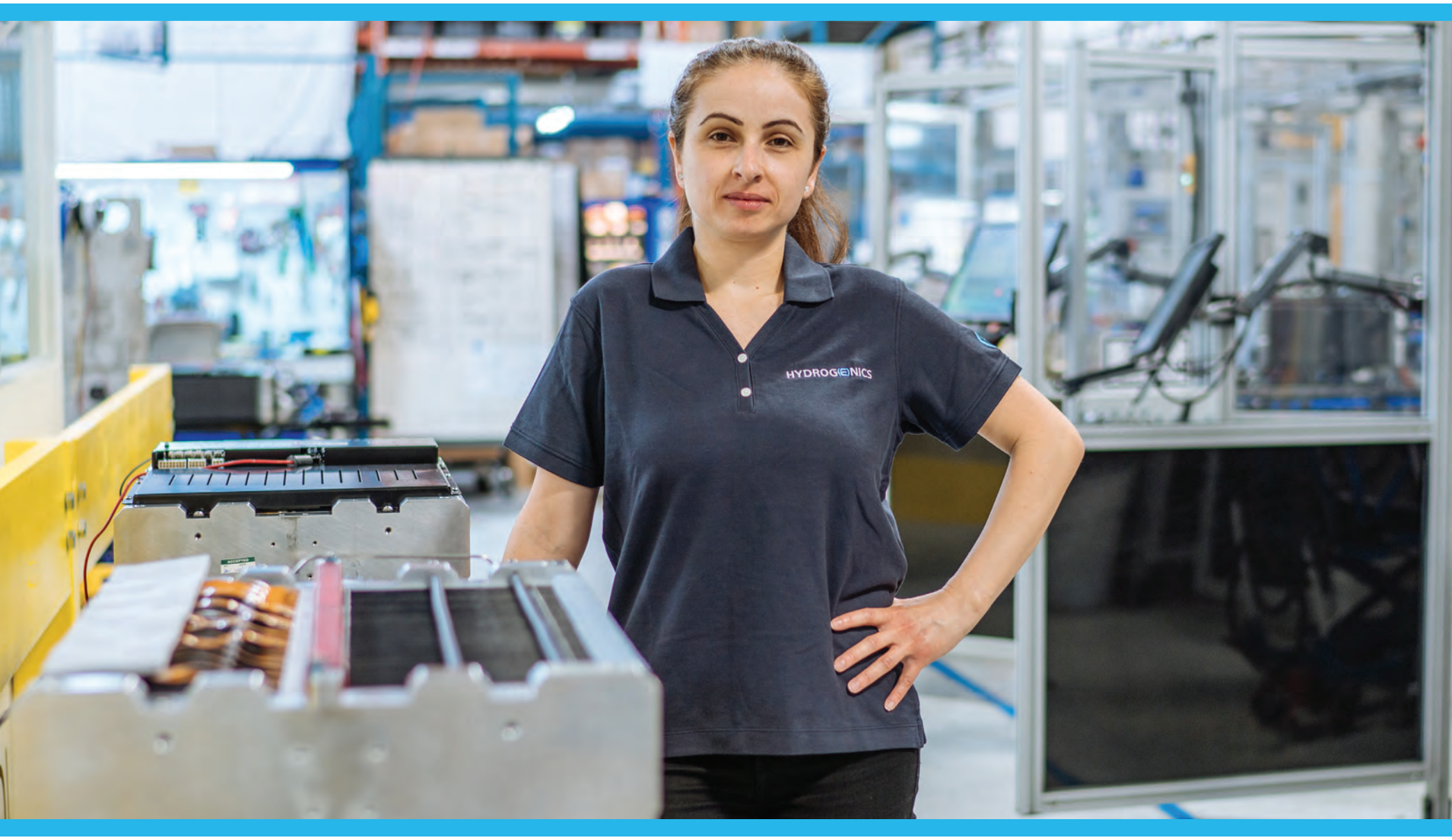

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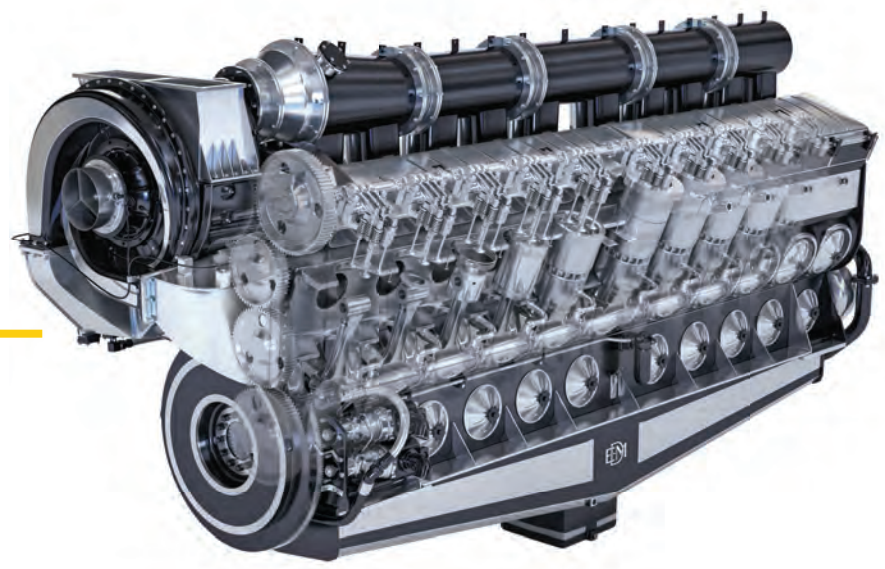
Joey Farrell

Boys are coaxed into cleanliness at bath time playing with boats. But it was never a game for Joseph Farrell, III, instinctively realizing he was ballasting and salvaging ships, unlike the typical Mr. Bubbles kid. The scion of Resolve Marine Group may have been born to lead the global emergency response company founded by his father with a single tug 38 years ago, but he's never taken dangerous wreck removal lightly.

BY LISA OVERING

Images: Resolve Marine Group

Marine Systems, Inc.



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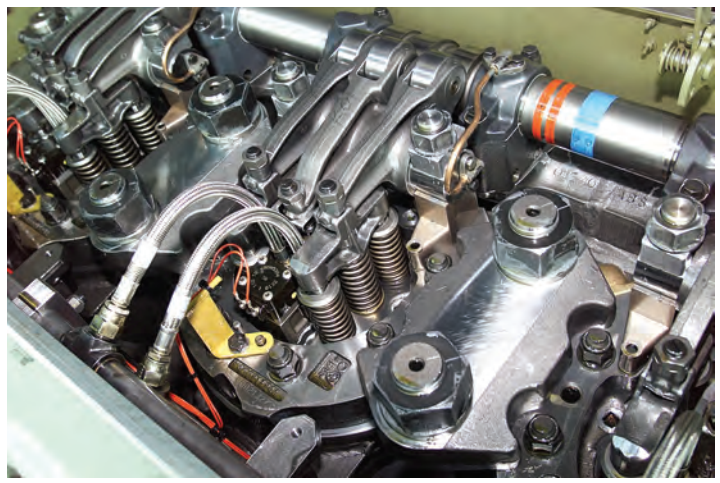

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Joseph Farrell, III, Resolve Marine

Images: Resolve Marine Group

Before turning 15, Joey had two close calls on and around ships that guide him today, at 34. Realizing one should always study what is seemingly intuitive, he applies proven, problem solving techniques when exploring submerged vessels and new business opportunities.

"When I was really young, around four or five years old, I fell through the deck of a barge, and got cut up," said Joey Farrell. "Then when I was 13 or 14, a ship was aground off Jamaica. There was sugar in the water and it was murky. During the dive inspection, I got sucked underneath the ship. It happened so quickly, afterwards I freaked out a little. After that, whenever I would dive around a wreck, I would feel around the corner to see if there is suction."

Growing up, Farrell heard stories of near misses, realizing salvage is serious business.

"It reaffirms what you knew and to minimize the risk in each scenario," he said. "As intuitive as it is, look into it. Resolve has an emphasis on personal safety and all staff have an operational background."

Naval architecture and engineering is integrated into daily operations for emergency response and wreck removal. There is an engineer on each team to assist in stabilizing every situation and avoid mistakes.

"Wreck removal is reverse engineering, deconstructing a ship," said Todd Schauer, director of operations for Resolve Marine Group. "Joey led the team that designed the system for the patented heave-compensated chain puller lift system on DB1, the heaviest salvage lift in the Americas."

Keeping Calm During Chaos

How do you run a business based on disasters? The difference between salvaging a vessel and the team blowing up can be 15 minutes. There is no wreck without an emergency; if Resolve doesn't respond within four hours of an emergency or fire, the mission becomes wreck removal or a salvage.

Surprisingly, the now huge, family-owned company does not reek of nepotism.

Joey Farrell is humble, calm and direct, with a dry sense of humor. He's the kind of guy to buy you a beer - or brew it for you, himself - at his own microbrewery, LauderAle, which offers 36 beers on tap. Located just outside Port Everglades in Fort Lauderdale, Fla., LauderAle is a great decompression spot for off-the-clock staff after a long day of emergencies.

"Joey is not sitting in an ivory tower, he is on the job" said Schauer.

Although his last name is not Farrell, Schauer prefers Resolve is privately owned, as the family has continuously reinvested in the company, propelling it forward, as other salvage companies merged or folded during his career.

"Resolve didn't have a single shackle in the Gulf of Mexico after Katrina," said Schauer. "Now we have a big facility and a fleet."

The ebb and flow of salvage business

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Images: Resolve Marine Group

doesn't work as well in a public or pure corporation with shareholders expecting quarterly dividends, people who don't understand risk, according to Schauer.

"We live and die by our projects," he said. "The carrots of big reward carry big liability."

With a diverse field staff including female divers, the company renowned for cleaning up the biggest messes in the world still chases every wreck removal, providing emergency response during disasters from the Value Jet crash to contracting with USCG for cleanup after Hurricane Harvey.

Environmental compliance: The Fnal Frontier

Integrated business units help support projects with a stable business model, like Resolve Marine Academy, which has trained nearly 50,000 crew in disaster response, including employees of Royal Caribbean and Shell. Remarketing salvage is now a company mantra, as salvage operations previously protected cargo. Now, salvage is dedicated to protecting the environment. With oil spill response for all ports in China and developing countries, Resolve supports readiness for OPA 90. The business has changed since the days of ballasting fuel tanks, washing cargo and pumping the residual overboard.

"Any island country with tourism doesn't want to see a drop of oil," said Farrell, adding "Shipping is getting safer all the time. OPA proved we can reduce accidents significantly by creating a standard. We take the place of the responder and charge to keep standards, understanding requirements because we are ready 24/7."

At the Helm

Behind the scenes at the last salvage company run by salvors, father and son don't always work together very closely. About 10 years ago, when Joey came aboard, his father started passing the baton.

"We have our differences, but it's as good as it gets," said Joey. "We don't have arguments, we talk it through."

Farrell graduated from Cornell University with an MBA and a masters in ocean engineering from Florida Institute of Oceanography. He received his license as 3rd assistant marine engineer, unlimited tonnage, and chief engineer 4000HP, from Massachusetts Maritime Academy. While he worked during summers at Resolve, Farrell's first job was as a lifeguard. He considered a career as a helicopter pilot, although now just flies for fun whenever he can. He enjoys developing programs for web applications, playing guitar, fishing, reading and investing. Hard work, a lot of hours, and thought into every decision energize Farrell's daily life. His turn-on is fixing problems, which bodes well leading a company that protects life, the environment and property at sea. "I like the methodology of a well-oiled machine," said Farrell. "I like productivity, stuff getting done - quicker, faster, cheaper, better - and going through the numbers to find a solution and data. I don't care for negativity or problems without proposed solutions."

His secret to success? He's not sure, but is grateful to increase scalability with the same ethics his father taught him. "Do I have success yet?" quipped Farrell. "I don't know. My goal is just to not screw this up."


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Work'bots'

The near-shore and inland workboat fleet is at the leading edge for autonomous vessel development

While the advent of autonomous workboats are not exactly mainstream, you better believe that in the not-too-distant future they will be a reality on waterways in and around the U.S. Today there remain more questions than answers, particularly on the legal, logistics and insurance side of the coin. But the technology is evolving at record pace, providing many in the industry with mixed emotions. Excitement. Controversy. Curiosity. Skepticism. These are just a few of thoughts, and emotions that arise to any mention of the topic of autonomous vessels.

By Joseph Keefe

It's happening now. Out ahead of the rulemaking process, autonomous technology providers already churn out not just prototypes and designs, but also countless workboats, many already in service. In the last 12 months, these firms have been collectively busy.

Vancouver-based naval architects Robert Allan Ltd., and Kongsberg Maritime are collaborating on the development of a remotely-operated fireboat that will allow first responders to attack fires more aggressively and safer than ever before. Separately, in Korsør, Denmark, Boston-based Sea Machines demonstrated the capabilities of its SM300 product aboard an autonomous-command, remote-controlled, TUCO Marine built fireboat. Marine firefighting is an autonomous application that appears to have legs.

Sea-Machines also partnered with Marine Spill Response Corporation (MSRC) to autonomously control a Munson boat to deploy and tow a spill collection boom working in tandem with a 210-foot MSRC spill response vessel. In direct competition with Sea-Machines, ASV Global is working on autonomous projects with a similar focus. ASV recently partnered with UK's Peel Ports Group to develop autonomous vessel technology for shallow survey operations. Spill response is also a big part of ASV's product development efforts.

Another stakeholder, Florida-based SeaRobotics Corporation recently delivered two 2.5 meter autonomous unmanned surface vehicles (USVs) to the Canadian Hydrographic Service, a part of Fisheries and Oceans Canada, bringing the fleet to four systems.

More recently, towboat operator KOTUG demonstrated a remote-controlled tugboat over a long distance, from Marseille, France to Rotterdam. A KOTUG captain took control of the tug via remote secured internet line and camera images, all based in Marseille.

In July, a major development saw shipbuilder Metal Shark join forces with ASV Global to introduce "Sharktech" Autonomous Vessels. Metal Shark is now offering Sharktech autonomous technology on its entire portfolio of aluminum vessels.

Metal Sharks' Josh Stickles explained, "A number of years ago we turned our focus to autonomous vessel technology as an area of future growth and since that time have been closely following the progress of leading autonomous technology developers. ASV Global (which was recently acquired by

Metal Shark: Metal Shark join forces with L3 ASV Global to introduce "Sharktech" Autonomous Vessels.

Image: Metal Shark

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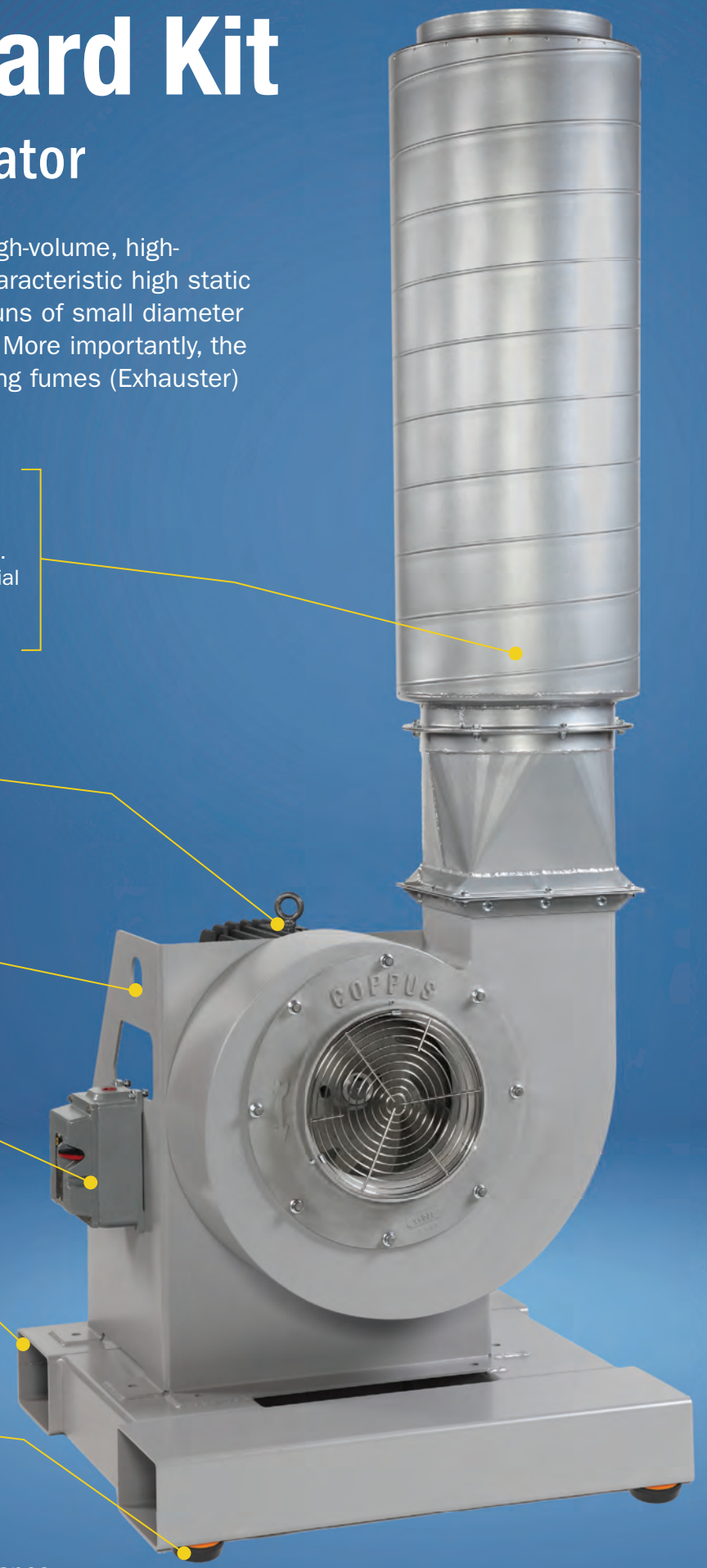

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L3), who we felt was fairly well ahead of others in terms of the maturity and overall market-readiness of their technology, happens to be located right in our backyard (Broussard, LA). Their engineers and our engineers were a natural fit for each other, and our proximity has allowed for a very collaborative approach."

Design & Regulate

Not so fast. The devil is always in the details. For example, classification society ClassNK recently released its Guidelines for Concept Design of Automated Operation/Autonomous Operation of ships. ClassNK isn't the only IACS member to address the advent of autonomous vessels. Outgoing IACS Chairman & DNV GL Maritime CEO Knut Ørbeck-Nilssen believes that IACS rules must "… allow for such new technologies to be used, in the interest of safety and in the interest of the working environment for those people."

As these rules evolve, flag states and registries will also have input. Tellingly, the U.S. Coast Guard led a delegation to the 99th session of the International Maritime Organization's Maritime Safety Committee. This meeting advanced discussions on vessel autonomy. Last year, the IMO agreed to assess how existing international conventions would address advances in autonomy.

ASV Global CEO Thomas Chance shrugs off potential regulatory pitfalls, saying, "The regulators are being careful to provide a balance of guidance without killing the industry. ASV Global operates in a very transparent manner which likely helps our situation. Finally, all of our clients have been very rational about where and when they operate."

But, naval architects and designers have many things to consider. If 'Dull, Dirty and Dangerous' is the catch-phrase that describes the best reasons to employ autonomous technology, there are also other reasons to explore this emerging, disruptive product. One main driver is lower capital and OpEx. An unmanned vessel does not need staterooms, heads, galleys, a wheelhouse, and other spaces found on conventional vessels. That vessel is much simpler, less expensive to build and maintain. With fewer (or no) crew, daily costs also shrink.

There are trade-offs. The end-user might pay a premium for the control system, but also achieve savings in other areas. Vince den Hertog, RAL Vice President, Engineering, agrees. "There are capital cost savings from dispensing with the deckhouse, wheelhouse, domestic systems or lifesaving equipment, but these are offset by a premium for electronics, communications, sensing and operator console equipment to operate remotely. In the end, the cost difference will not be prohibitive since the capital cost of the vessel remains driven mainly by hull structure and major equipment/machinery."

Metal Shark's Stickles takes a similar tack. "Take a look at the 38-ft. Defiant Sharktech autonomous vessel, for example. As configured, it's got expensive Pillarless Glass, expensive shock-mitigating seats, special flooring for sound deadening and vibration mitigation, climate control, an enclosed head, full galley, and the list goes on. We could offset a significant portion of the cost of technology today by eliminating crew amenities. A true unmanned vessel can be 'leaner and meaner.' So, efficiency is a key consideration."

Already on the Water

It sounds like a science fiction novel. Nevertheless, scores of these hulls are already in service, filling myriad roles. One firm has been putting autonomous solutions on the water for many years. ASV Global's chance said in August, "We have delivered more than 100 new build USVs; about 10x that of our nearest competitor in the diesel-powered category. We have also converted 15 manned vessels to optionally unmanned and integrated more than different 40 payload types."

Even with that success, ASV isn't sitting on its hands. Their recent collaboration with Metal Shark is a perfect example. Chance explained, "Metal Shark is a leader in the small to mid-sized security vessel industry, headquartered just 30 minutes down the road from ASV Global's US headquarters. The combination of ASV Global's autonomous control technology and Metal Shark's line of patrol craft make for a powerful solution."

To date, 60 percent of ASV Global's unmanned sales are defense-oriented, with the balance in the commercial arena. Already deeply immersed in Europe's most advanced mine countermeasure program, Chance also admits, "It is a bit of a challenge to predict where the next big thing will likely hit as there are many areas, both military and commercial, that are poised to capitalize on our

ASV Global CEO Thomas Chance said "The regulators are being careful to provide a balance of guidance without killing the industry. ASV Global operates in a very transparent manner which likely helps our situation."

Image: L3 ASV

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Oskar Levander, Rolls Royce Vice President of Innovation, Engineering and Technology, asked recently, "Given that the technology is in place, is now the time to move some operations ashore? Is it better to have a crew of 20 sailing in a gale in the North Sea, or say five in a control room on shore?"

game changing technology."

Conventional wisdom says that the arrival of autonomous vessels in the workboat sectors will be far easier to digest than that which might be planned for the 1,000 foot boxship. DNV GL CEO Ørbeck-Nilssen is measured in his approach to what might come next. "I think we should first of all start by clarifying that there is a big difference between autonomous shipping, autonomous vessels, and unmanned vessels. Autonomy and high degrees of autonomy make a lot of sense because you will have more information coming to you from sensors placed on various sorts of equipment … And having that information, you will be able to a certain degree to reduce, for instance, the number of officers attending the engine room. Maybe for a tanker, we have four officers, you could possibly reduce that to three or two officers. That is not unmanned, but that is a high degree of automation which makes sense."

Ørbeck-Nilssen continued, adding, "Unmanned vessels – that's a completely different story and I would say that it's not likely to happen because you have equipment on board that needs maintenance, you'll still need for emergency situations to have people there to be able to respond, so that will be maybe for the very niche applications. We will see some, say, highly autonomous maybe even unmanned vessels, but again, this is more for niche applications."

The Changing Workforce

Once just a vision, the autonomous vessel is here. What that means for labor is another thing altogether. ASV's Chance discounts the ultimate impact, saying, "The dirty little secret of the unmanned boat business is that it is not completely unmanned. We have talked about reduced manning, bridge aids on manned vessels, and about manning unmanned ships as they come in and out of port. There is also the maintenance of the vessels once in port. My guess is that the natural attrition of mariners due to retirement will more than offset the jobs lost due to automation."

Another firm at the heart of this rapidly developing business is Rolls Royce. Oskar Levander, Rolls Royce Vice President of Innovation, Engineering and Technology, asked recently, "Given that the technology is in place, is now the time to move some operations ashore? Is it better to have a crew of 20 sailing in a gale in the North Sea, or say five in a control room on shore?" But, while some firms focus on technologies, Lloyds Register (LR) tackles manning issues, and emphasizes changing seafarer skill sets.

In a report published in 2015, IACS

Vince den Hertog, RAL VP, Engineering, said, "There are capital cost savings from dispensing with the deckhouse, wheelhouse, domestic systems or lifesaving equipment, but these are offset by a premium for electronics, communications, sensing and operator console equipment to operate remotely."

Image: RAL

DNV GL CEO Ørbeck-Nilssen is measured in his approach to what might come next. "I think we should first of all start by clarifying that there is a big difference between autonomous shipping, autonomous vessels, and unmanned vessels."

member LR in conjunction with UK-based QinetiQ , and the University of Southampton, all say, "There are over 104,000 ocean-going merchant ships. The shortage of highly-qualified seagoing staff is an increasing concern, especially as ships become more complex due to environmental requirements."

As most radio officers are now considered archaic, job qualifications continue to evolve. The report also offers, "While new technology will create the demand for new skills, the smart ship efficiencies achieved may render some maritime professions obsolete, as with other technological evolutions. Only time will tell if the net effect will be positive or negative." Earlier this year, outgoing IACS Chairman & DNV GL Maritime CEO Knut Ørbeck-Nilssen also shared his outlook on autonomous vessels. As stakeholders leverage technology, one inevitable outcome is that fewer mariners will be needed. Reduced manning has always been a sore spot with North American labor unions. Leaving the labor aspect aside, the question of shipboard maintenance is of paramount concern. Not necessarily so for Ørbeck-Nilssen. "You will always have people on boats because of required maintenance. If you project five to ten years into the future, the systems will become gradually more complex because we are combining software and physical systems, so these cyber physical systems will be more and more demanding for seafarers to cope with." This, says Ørbeck-Nilssen, will require a much closer connection with shore operations. If so, tomorrow's mariner will be a much different person. "Naturally, seafarers will have to also change some of the competencies that they have, and be able to deal with shore organizations, and some of these more complex systems."

Metal Shark's Josh Stickles provides a different perspective. "You can sum it up well with 'dull, dirty, and dangerous.' However, a fully-autonomous solution isn't required in all cases. Crew reduction is a key capability of our technology as it exists today. Autonomous capability also allows for operations to become less weather-dependent. The result is reduced operating cost, loss of human life, and also a significant reduction in the long term health issues associated with extended time at sea."

With many stakeholders hesitant to couch autonomy in terms of mariner head count, its impact on marine business going forward cannot be denied. That said; autonomy creates other jobs that will displace more traditional seafaring roles. Stickles continues, "We agree and we haven't been shy about saying so. The largest and most imme-

diate potential impact of this technology is crew reduction and in some cases elimination. How much safer and more effective could we as an industry be if we could reduce the risk and loss of human life while performing our missions more efficiently? Imagine, for example, if a fleet of quickly-deployable, autonomous firefighting vessels existed during the Deepwater Horizon disaster. Such vessels could be sacrificial if necessary, to get in closer than humanly possible to deliver maximum firefighting force. Then, imagine fleets of inexpensive and quickly deployable oil skimmers and boom boats, working around the clock."

Tech-based developments don't provide the panacea for all problems. Indeed, one promising application for autonomous workboats is for spill response missions. For example, two emerging issues have spill response managers concerned. First, experienced personnel are leaving the field and recruitment is difficult. Secondly, spill prevention presents a downside: businesses can't stay in a field if there's no work.

The Spill Control Association of America (SCAA) keeps a close eye on these developments. Devon Grennan, SCAA's president and CEO and President of Seattle-based Global Diving & Salvage had this to say: "We have tenured professionals exiting the industry faster than the next generation can gain experience." Because of that, SCAA has a Future Environmental Leaders committee focusing on recruitment. Autonomous vessel providers, of course, might just have another equally appealing solution.

Looking Ahead

Just as advances in waterborne shipping – for more than 50 years – could only be measured in the size of the tonnage being produced, so too will the ship of the future be measured by the number and quality of bells and whistles that make it float. Vince den Hertog, RAL's Vice President of Engineering, takes a measured approach. "Philosophically, we are also on the same page as far as setting realistic expectations for our clients and ourselves. We see autonomy being an incremental process and are both focused on practical solutions using best available technology, not autonomy for its own sake within a more futuristic vision."

Sea-Machines CEO Michael Johnson has his own vision. "I want stakeholders to know that autonomous is not synonymous with unmanned. While companies like Rolls Royce are projecting about the unmanned ships of the future, we see it somewhat differently and foresee a world where autonomous control increases the capability, safety, and productivity of manned ships."

Whatever your take on autonomous vessels, it isn't too late to get on board. But, you might have to wait until the next port call to do so. That's because, without a doubt, 'that ship has already sailed.'

World First: The world's first autonomous, remote-controlled fireboat, owned by Sea Machines' partner TUCO Marine.

Image: Sea Machines/TUCO

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Autonomy & the Seafarer

While the technology to facilitate autonomous shipping matures, many questions remain, led by the size, shape and role of the Future Mariner. The MarTID 2019 Survey aims to shed some light.

The Maritime Training Insights Database steering group has announced the upcoming launch of the 2019 MarTID survey, which this year focuses on the trend toward autonomous vessel operations and its impact on training current and future mariners. MarTID is a non-commercial, joint initiative of the World Maritime University, Marine Learning Systems and New Wave Media. Its core principles include ethical integrity, objectivity and confidentiality. It was launched in 2018 with the completion of the inaugural survey and publication of the 2018 Training Practices Report (which can be found at www.MarTID.org).

This MarTID initiative is an important one, the first of its kind in the world. There is broad agreement that roughly 80% of maritime accidents involve human factors causes. As such, vessel operators and maritime training centers are pouring significant resources into creating best practice and innovative training programs. The MarTID database, which will grow in breadth and depth annually, shines a bright light on the training approaches and successes of global vessel operators and training centers, such as:

- What are the global trends in training budgets?
- What is the average training amount spent per seafarer?
- What training technologies are considered effective and which training models are growing in their adoption?
- How confident are vessel operators and training centers in the training methods they employ?

All of these and much more are answered in the 2018 Training Practices Report. With the information in the annual MarTID reports, training leaders are able to benchmark their own results, learning from the successes and failures of others, rather than independently inventing and designing their own training approach in isolation.

The 2019 MarTID Survey

The 2019 survey, to be launched in the fall of 2018 and closed early in 2019, is designed to further the mission of MarTID: to provide a global picture of maritime training that is not currently available. While last year's survey was designed to collect a broad set of foundational training data, this year's survey will be shorter and consist of two foci.

The first section of the survey will focus on collecting benchmark data tracked annually, revealing trends in core training issues. These include training budgets, training models, training staffing, the use of technology, major training initiatives, and seafarer demographics.

The second section will focus on this year's special topic: the impact of autonomous vessel operations on maritime training. It would be hard to identify a maritime industry topic which is receiving more attention than the move toward an increasing level of autonomous operations. Differences in data collection, decision support, bridge manning levels, and human involvement in navigation will all greatly impact the need for and the type of training required. This trend has already begun to impact operations and the need for training. If the automobile industry is any predictor of how quickly this might move, then it is incumbent upon maritime training professionals to consider the emerging needs deeply and without delay. The 2019 MarTID survey will enable this process with data upon which decisions can be made and will explore the perspectives of vessel operators/managers, maritime administrators, maritime training experts and seafarers. The 2019 survey will be followed by a series of publicly-available reports, broadly published. These reports will provide both high-level and deep-dive information covering both broad trends as well as deep coverage of the 2019 special topic.

Take the Survey

Although this initiative has been founded and run by the three partner organizations, it requires community involvement to succeed. You will be hearing more about the 2019 MarTID survey in the coming weeks and months, but right now, we need your help. Specifically:

- *If you work at a vessel operator/manager or maritime training facility, please make your senior training administrator aware of this important survey by sharing this article with them.*

- *If you are a senior training administrator of a vessel operator/manager or training facility, a maritime administrator, or a seafarer, we need you to complete a survey on behalf of your organization.*

***Pictured:** Rolls-Royce Marine has been on the leading edge of technology development for autonomous shipping.*

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Image: Fincantieri Marine Group

Fincantieri Marine Group:

The Quest to Build Next-Gen USCG Icebreakers

As the U.S. Coast Guard moves to rebuild its icebreaker fleet we spoke with RADM Bruce Baffer (Ret.), head of Fincantieri's effort to win the contract to build the Polar Security Cutters.

By Greg Trauthwein

The case for the U.S. to build a new class of icebreakers is strong. While news of global climate change and the shrinking ice caps at both poles is daily headline fodder, maritime navigation in and around the Arctic and Antarctic remains one of the most difficult and dangerous operating arenas on the high seas. There is increasing commercial ship traffic in the North, from tankers to cruise vessels, as well as a vast yet still fully undefined quantity of natural resources to potentially be discovered and recovered. But make no mistake, the driver for the U.S. to build its first heavy icebreakers in more than 40 years is a matter of political interests and defense. It is no secret that Russia holds a commanding lead operating in the region, with a fleet of icebreakers approaching 50. In the last decade, China too has increased its activities in the region. At the same time, U.S. presence in the region has dwindled .

"All you have to do is Google "Polar Star and Deep Freeze" and every year you get those answers" of why the U.S. needs to rebuild its fleet of polar icebreakers starting now, said Baffer, head of Fincantieri Marine Group's efforts to win the Polar Security Cutter contract. Even the term 'rebuild' the icebreaker fleet is somewhat of a misnomer, as there's not much to the 'fleet' today, as Baffer knows all too well. "My last job was to keep Polar Star running, and we spent all summer putting it back together," following its annual trek to Antarctica to resupply McMurdo. "When (Polar Star) is down to McMurdo, every night would be a whole new adventure in damage control, and they spend all night putting it back together. They get it done because that's what Coasties do. But it's just a matter of time. It's not 'if' it is going to break down in the ice, it's a matter of 'when.' And we don't have a second icebreaker ready to go get it."

A Matter of National Security

While Polar Star's primary mission is the resupply of the McMurdo Station in Antarctica, the need for a new fleet of ice capable ships transcends this mission and is a matter of national security, according to Baffer.

"Driving the program right now is national sovereignty and competition for resources – economic resources – in the Arctic," said Baffer, part of the reason the icebreaker program was re-branded as the Polar Security Cutter. With both Russia and China increasing their presence in the region, to put it simply there is a need for 'presence' lest the U.S. cede its interest in a northern border, ironic at a time when political focus is keenly trained on border control.

There is economic and political interests in the Arctic's natural resources, as well as a burgeoning eco tourism industry that is blossoming, including the world's first icebreaking cruise ship on order for France's Ponant.

A Matter of Experience

Since the U.S. last built an icebreaker more than 40 years ago, finding the right team – designer, builder, outfitters – is central to ensuring success. Baffer, who notes Fincantieri's global reach and long history building icebreakers, does not underplay the significance of this contract and is naturally biased for his team's approach.

"This is going to be the heavy icebreaker of the Western world; this will be the flagship, and Fincantieri has built a lot of icebreakers," said Baffer.

There is obvious interest among the Coast Guard, ship design, ship building and ship outfitting communities to get the Polar Security Cutter project in motion, and as U.S. Coast Guard Commandant Admiral Karl Schultz notes in his interview starting on page 46, the numbers attached to the program are 6-3-1 … six ships altogether, three 'heavy' icebreakers and perhaps most importantly, one now given the condition of the Polar Star.

The technical proposals have been submitted, the cost proposals were being submitted at press time, and according to

The 40+ Year-Old Polar Star

The whole ship is just obsolete. System by system, you can't buy repair parts; everything has to be custom-made. And then the actual repairs are challenging too, as you can't go through the hull, everything has to come in from the top down. It's full of lead paint, asbestos, and PCBs, so just the environmental hazards that are still present on that ship make it very difficult to do major work.

Bruce Baffer, Rear Admiral USCG (ret.),
Head of Polar Security Cutter Program, Fincantieri Marine Group

Baffer the Coast Guard is looking to get this awarded and started just as soon as possible.

"Certainly the schedule is aggressive and it's driving a lot of the program decisions," said Baffer, who added that he believes a GAO report on the project unfairly criticiaes the Coast Guard and the Navy over the schedule.

"The schedule is aggressive, but it's something that the government has been right up front with from the beginning with industry." The FMG team includes Philly Shipyard, Vard and Aker Artic, offering a cumulative base of shipbuilding, ice breaker design and construction, and government contract experience that is enviable.

Starting at the top, Baffer counts Fincantieri, a European-based multi-national company with ample icebreaker and government shipbuilding work as a primary strength of his team's effort.

Philly Shipyard is a large shipyard accustomed to building Jones Act ships with the heavy machinery and the available capacity to deliver on an aggressive schedule. "We can focus the whole shipyard on icebreaker production, one right after another," said Baffer. "So much of the technology around icebreakers is foreign-based right now. We haven't built a heavy icebreaker in the U.S. since the mid-70s."

"We designed our whole team to be responsive to that schedule need, both in production and also design," said Baffer. "One of the things about icebreaking is there's not that many design experts in the world that are real experts. Now we've got Vard and our other design partner is Aker Arctic, and between those two, that's pretty much the (icebreaker) brain trust worldwide."

U.S. Coast Guard photo illustration by Petty Officer 1st Class Jetta Disco.

> ***My philosophy – my strategy –*** *(regarding the need to build U.S. Coast Guard icebreakers)* ***is talk about a 6/3/1****. We need a minimum of six (6) icebreakers – that's consistent with my predecessors – that's based on the high latitude study. Within that 6/3/1, a minimum of three (3) heavy, or Polar Security Cutters,* ***and then the one (1) is we need one now!***

Admiral Karl Schultz

Commandant, United States Coast Guard

Maritime Reporter & Engineering News was offered the opportunity to interview Admiral Karl Schultz, the 26th Commandant in the history of the United States Coast Guard, in his office in Washington, DC. Just five months into his tenure, his plate is predictably full with a number of challenges, including: Attracting and retaining future U.S. Coast Guard personnel; addressing a number of assymetric threats, including cyber attacks; and ensuring captial and operating budgets are adequate to safely and efficiently carry out a global mission envelope, to name but a few. But while the job ahead is complex, Admiral Schultz sees success in fulfilling his "Three R's" to ensure that this United States Coast Guard is Ready, Relevant and Responsive.

BY GREG TRAUTHWEIN

I understand you have three guiding principles, the '3 R's'. Can you explain?

I will tell you this, Greg, coming into this transition, it was an advantageous position. I was well-led on my predecessor's senior leadership team, so there were not any big, major course changes. So the guiding principles are in the three basic premises I talk about at Coast Guard, that is Ready, Relevant and Responsive.

The first "R" is Ready, meaning that the Coast Guard is ready to serve the national security and the interests of the nation.

The second "R" is Relevant. The Coast Guard is one of the five armed services. We are a law enforcer, we are a commonsense regulatory agency, we are a first responder. (A role that has been prominent in the last three years with multiple responses in the aftermath of ever strong hurricanes.)

And then the third "R" is Responsive; which I think is our hallmark trait 228 years into our service history. We bring responsiveness to all mission execution, whether it is law enforcement and stopping close to 500,000 pounds of illegal drugs coming to American streets, or whether it is the regulatory role

That to me was a common framework where I could articulate what this Coast Guard is all about, moving forward.

Attracting and retaining quality people is a perpetual problem for this industry. Is it an issue for the Coast Guard, too?

With unemployment below 4 percent, it is a very competitive space. The Coast Guard has to be an employer of choice. When I talk about a "ready" organization, that's a commitment with the men and the women of the Coast Guard, too. I expect them to come to work ready to do the nation's work on the maritime front lines.

What do they expect from their Coast Guard? They expect a rewarding experience and a trusted organization. (With healthcare, retirement system and opportunity) we've got to be attractive to folks – we've got to be investing in technology. These are bright young men and women; the caliber (of the people) is not a problem as we are getting great men and women, and we are meeting our recruiting goals. But it is competitive. We've got to make sure we've got a brand that people want to be part of. I've got to figure out a way to train and retain them and that all comes down to the quality of the experience.

That sounds like a solid plan. What about diversity in your ranks?

We absolutely need to be a Coast Guard that is more representative of the society that we represent. We've got some good news stories, like at the Coast Guard Academy, the cadet corps is made up of about 40 percent female cadets. That's a great news story there. If you look across our officer ranks, there's 20 percent females across the

People

1

2

3

4

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***"When I talk readiness I talk people** – people are part of the readiness conversation, and readiness is my number one priority" said Admiral Schultz, noting that attracting more women and more under-represented minorities is a priority for him and his leadership team, creating a Coast Guard that is more representative of the public it serves.*

1
Capt. Charlene L. Downey, U.S. Coast Guard Sector Los Angeles-Long Beach commander, receives the American flag during her retirement ceremony June 2018. U.S. Coast Guard photo by Petty Officer 1st Class Mark Barney

2
Coast Guard Commandant Adm. Karl Schultz and Vice Commandant Charles Ray visit with Dr. Olivia Hooker in White Plains, New York. In February 1945, during World War II, Hooker became the first African-American female admitted into the Coast Guard. Coast Guard photo by Petty Officer 1st Class Jetta Disco.

3
Crews from Coast Guard Station Fire Island and EMT personnel from Suffolk County conduct a medevac of a man in Babylon, NY. The man was diving 20 miles southeast of the Fire Island Inlet when he surfaced and had symptoms characteristic of the bends. U.S. Coast Guard photo courtesy of Station Fire Island

4
Coast Guard Commandant Adm. Karl Schultz visits with Coast Guard members attending the National Naval Officers Association (NNOA) in Portsmouth, Virginia. U.S. Coast Guard photo by Petty Officer 1st Class Jetta Disco.

5
Family and friends met aboard the Coast Guard Cutter Bertholf's flight deck to reunite with Bertholf crewmembers following the cutter's return home to Alameda, Calif., after a 90-day deployment. U.S. Coast Guard photo by Petty Officer 1st Class Matthew S. Masaschi.

entire 7,000 plus officer community. So as women come out and get their commissions, we have to figure out how to retain them in our ranks, and we have a women's retention study that will be coming out in the new calendar year.

And then with African American cadets, we just graduated the largest number in the academy's history – 18 – last year, class of 2018. But we have to keep moving forward. That whole cadet core is more and more comprised of under-represented minorities and reflective of the society we serve. In fact, the class that will graduate four years from now is about 38% under-represented minorities. So that's encouraging, but we've got work to do there. I'm committed to that – the senior leadership team is committed to building our diversity. And that's really all about inclusivity.

Excellent. Let's move from people to technology, as today is a transcendent time in the maritime world because you have an amalgamation of regulation, particularly when it comes to emissions, and technology, particularly when it comes to autonomy and the use of digital information and the way that people run their ships from Point A to Point B. With that as a backdrop, what do you see – what are the defining drivers that will most significantly impact the Coast Guard during your tenure and in the future?

I think there are two components to that: a complexity piece and a capacity piece. On the complexity piece, clearly, you can't enter that conversation without talking about cyber. All the shipboard operations, ships themselves, are much more computer based in their applications. Look at the NotPetya cyber attack on Maersk, and domestically the Port of LA/LB where they had a malware intrusion. That can shut shipping down.

We have a role in that space, and we're building out cyber capabilities with our Coast Guard Cyber Command here. We have to have the cyber professionals with the knowledge, so we just cut the ribbon on a cyber lab up at the (U.S. Coast Guard) Academy, a $1.5 million cyber lab with more than 30 kids in the new cyber major, so we're growing some of our own. But there's going to be a lot of demand, and I think there's a national or global shortage of cyber professionals. So even as we train these young kids, industry is going to be looking to pick them off because they're bright, talented folks.

And then there's the capacity piece. Just l ook at the size of the ships: it used to be a container ship would come into Savannah and offload all of its cargo. That same ship comes to Savannah today, offloads some of the cargo, bounces up to Port of Virginia, bounces up to New York and then it sets sail back across the Atlantic or back down through the Panama Canal. Ships are bigger.

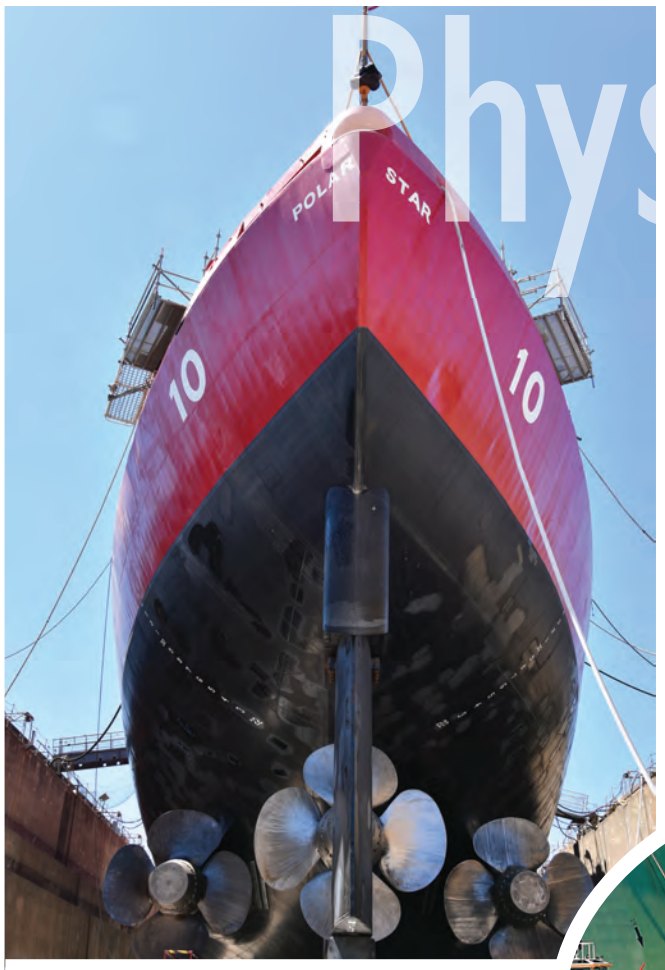
We just brought onboard 5,000 Subchapter M-regulated towing vessels, so there's a capacity piece there. Third party compliance, third party oversight and alternative compliance programs: that's the way all the flag states are going, including the United States.

That's great, but I think we learned some lessons from El Faro that we need to oversee those third party organizations.

We need to still issue the certificates, but at the end of the day, the Coast Guard has to rise to that occasion from the training standpoint, from the size of our workforce and from a skill set. We've also had (separate) conversations looking at autonomous ships.

What does that mean from a regulatory standpoint? (Autonomous ships) are light years different but it's exponentially accelerated. We have to be in that space. The nation looks to its Coast Guard; I think globally the maritime community looks to the United States Coast Guard for leadership there. That will challenge us.

Physical Assets



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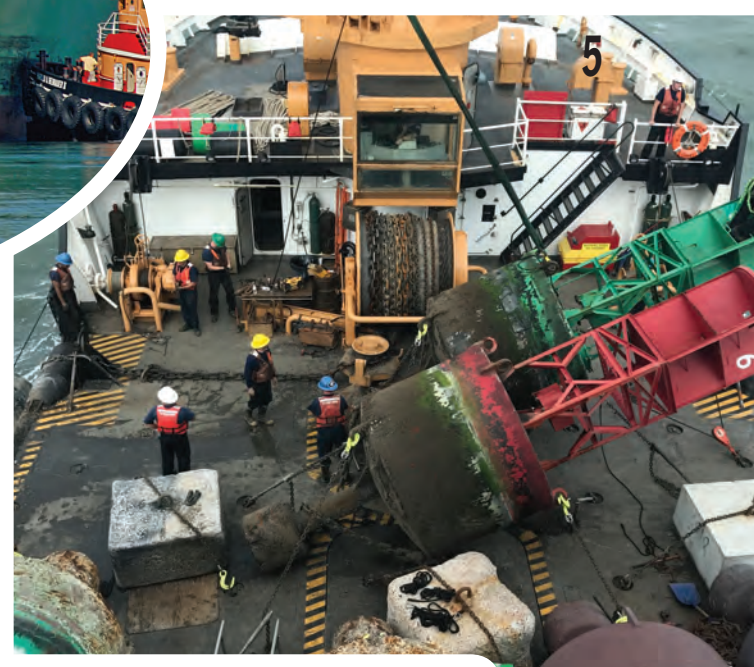

5

"We have had some good, steady progress on the capital budget, (and in fact) 2018 was a banner year – the biggest budget we ever had, around a $2.6-billion line for acquisitions. ***I think for us to be continually successful on the acquisition side, we have to be at about $2 billion a year.***

1
Coast Guard Commandant Karl Schultz tours the Coast Guard Cutter Polar Star while in maintenance and repair at a dry dock facility in Vallejo, Calif., Aug. 2, 2018. The Seattle-based Polar Star is the Coast Guard's only remaining operational heavy icebreaker. Coast Guard photo by Petty Officer 1st Class Jetta Disco.

2
Coast Guard Cutter Waesche prepares to refloat from drydock in Seattle, Wash., May 22, 2018. The Waesche is a 418-foot Legend-class National Security Cutter homeported in Alameda, California. U.S. Coast Guard photo by Petty Officer 1st Class Ayla Kelley.

3
While providing a security perimeter, a Coast Guard 25-foot response boat is flanked by two tugs as the Liquid Natural Gas tanker Berge Boston is moored to the pier at an LNG facility here. USCG photo by PA2 Luke Pinneo

4
The Coast Guard Cutter Cheyenne is a 75-foot river buoy tender homeported in St. Louis, Missouri. The Cutter Cheyenne services buoys and day beacons along the Mississippi, Missouri and Kaskaskia rivers. U.S. Coast Guard Photo.

5
The Coast Guard Cutter Cypress crew works to correct aid to navigation in the Savannah River after Hurricane Matthew Oct. 12, 2016. The Cypress is a 225-foot buoy tender built for maintaining aids to navigation. U.S. Coast Guard photo courtesy of Coast Guard Cutter Cypress.

As far as addressing those challenges, is there anything specifically that you see a need to address these increasing technological challenges?

I would say budgetarily. We have made good progress on our recapitalization side of our budget, but the operations and support side – which is the people side – has been flat-lined since the Budget Control Act of 2011, we've lost 10 percent purchasing power over much of the last decade.

And when I talk about a marine science technician, a prevention workforce, that's a people business. If you're not investing in your people – either in the number of people, the training for those people, the advanced school for those people – it gets challenging. So I think what I've talked about is a little different than the previous leadership. When I talk readiness I talk people – people are part of the readiness conversation, and readiness is my number one priority. That eroding fiscal operating budget has put us at a point where we need to be paying attention to readiness.

Can you discuss how the Coast Guard is evolving to facilitate the flow of commerce on the waterways, in the ports, in the harbors?

Yes, and your timing is interesting because we just rolled out a new Maritime Commerce Strategic Outlook. As you know, Greg, in your familiarity with the industry over decades like myself, it is about a $4.6 trillion of revenue-generated activity annually that happens on America's waterways. So that's your 361 ports, it's your 25 thousand miles of navigable channels, your 95 thousand linear miles of coastline, and 23 million jobs. There is a lot of activity in that space.

And at the end of the day we are focused on three lines of effort: Facilitating lawful travel and transportation on secure waterways, so there's a homeland piece of the secure waterway, there's the economic piece there, and then there's a modernizing piece. You know, we have 50,000 aids to navigation out there, a constellation of aids to navigation that enable water movement up through the heartland waterways. We are moving into things like electronic aids to navigation, but we're dealing with a regulated community that has an appetite for how quickly you can change. So we've got to modernize the aids to navigation system, we've got to look at marine information systems and modernize that. And then it's partnerships – we do none of this work alone.

So I think we play a pivotal role on enabling that giant economic engine. I think it aligns well with the President's focus on infrastructure and prosperity, so we're trying to communicate that a bit through our new Maritime Commerce Strategic Outlook.

Budget struggles are ubiquitous as we discussed earlier. Can you update our readers on how you see the budgeting process today?

I mentioned previously that we've had some good, steady progress on the capital budget, (and in fact) 2018 was a banner year – the biggest budget we ever had, around a $2.6- billion line for acquisitions. I think for us to be continually successful on the acquisition side, we have to be at about $2 billion a year.
The proposed '19 budget has us a little bit below that, but if we can maintain that trajectory, then we can keep the momentum.

Important also is that operating budget. We have been flat-lined for eight-plus years. The President, in his first Presidential Decision Memo, talked about strengthening the support for DOD, for the military forces, the armed forces. We are one of the armed forces, even though we don't sit in DOD (and I don't think we should sit in DOD), but we would love to benefit from that injection of resources.

So DOD in '17-'18, as I understand it, got about a 12% push in their operating expense budgets, while we received about a 4% in that same period. In the '19 budget, that increment is less than 2%. The Coast Guard needs about a steady 5% rate increase annually in our operating assistance support money. That gives you a healthy Coast Guard; that keeps me from losing sleep over the readiness of the organization.

I know there are multiple ship, boat and air wing capital expenditure programs, but one program I wanted you to drill down a bit more on was the icebreakers. There's obvious intense interest among my readers on the status of the icebreakers, recently renamed the Polar Security Cutter?

We have not built an icebreaker domestically in more than 40 plus years. We are running the nation's sole, heavy ice breaker, the Polar Star, a 42 year old ship. She makes an annual sojourn down to McMurdo Station (Antarctica) to break the ice, bring in the replenishments so they can get through to the next winter. That's a strategically important place for the United States. The rest of the year, that ship gets back home and we basically send it to a shipyard for multiple months. She just sailed here in the last 48 hours on her way back to Seattle. The crew will have a little bit of time to turn the ship around and she'll be sailing sometime in November for her annual trip to McMurdo. So that ship is gone from its home port last year, somewhere north of 250 days. We are stretching the life of that ship out until we get the first of these Polar Security Cutters – the heavy icebreakers – down at the waterfront.

We are hoping to do an award for detail design and construction in 2019. Polar Security Cutter I think is a more apt name. As we are an operating agency in the Department of Homeland Security – there's not a lot of other thinking in the Department of Homeland Security that thinks about heavy icebreaking in the Arctic. But when you think about the security of the nation – the national interests up there – presence equals influence. We have Russia with a fleet of approaching 50 icebreakers there, and I believe they are deriving 20 plus percent of their economy out of the Arctic. They're going back to military bases they haven't been in years; they are very focused there. The Chinese have been up in what I'll call the North Slope every year since 2016 and on-and-off since 2009, paying attention to what we're doing up here. (We're not up there much). We also have the Healy – which is our medium icebreaker here – doing research there and supporting a couple customers such as the National Science Foundation and NOAA.

The Arctic, in my mind, is a competitive space, with many untapped natural resources, and we need to assert our sovereign right there. That's a presence piece, and right now, we're not there.

My philosophy – my strategy – is talk about a "6-3-1 Approach". We need a minimum of six icebreakers – that's consistent with my predecessors – that's

Extending the "Coast" Guard

When talk turns to the United States Coast Guard, to those not in the know the assumption is activities are confined to water and air patrol in and around the physical coastlines of the United States. But as Admiral Karl Schultz, Commandant of the U.S. Coast Guard, explains, the modern United States Coast Guard is mobile and global, a part of the Department of Homeland Security tasked to work around the world to help intercept potential threats before they show up on the doorstep of the country.

"The appetite for Coast Guard services in that space is unprecedented – which is a good problem to have as a Commandant – but we have to translate that into resource dollars," said Admiral Schultz. "We are supporting the combatant commanders on a daily basis. I think we are best positioned where we are in DHS, I think that's a good fit and we are 15 years into that relationship. But there's a high demand for our services there."

He explains.

- **North:** We are the face of the U.S. government in the Arctic, which is an increasing accessible and competitive space. We conduct presidential security in the Capital region, with a National Capital Region Air Defense Mission, that keeps the air bubble for low, slow flyers around the Capitol region on a daily; that's 24/7/365 zero-fail mission. We support detention operation in Guantanamo with a port security unit. We support military war efforts abroad.

- **South:** In the south it's the drug enforcement, counter narcotics missions. It's humanitarian assistance and disaster response in the Caribbean basin, and paying a lot of attention to maritime migration.

- **Pacific:** Here the Coast Guard does a lot of international maritime training with the Indonesians, the Malaysians and the Philippines, which are building their coast guards (to, in part address an) "assertive China."

- **The Middle East:** "In the CentComm area I've got 250 Coast Guardsmen that work for the NavCen commander – that's the Fifth Fleet under US Central Commander – and there on the Arabian Gulf, six patrol boats. We've got an international training element there, the MET: Maritime Engagement Team – that trains the coalition partners in the region. We've got a high end tactical, what we call Advance Interdiction team, that is interchangeable with Navy SEALS.

"Your Coast Guard under that national defense umbrella is globally deployed every day supporting the geographic combatant commanders, supporting the secretary from border security, pushing the borders out," said Admiral Schultz. "When you look at the conversations we as a nation about the Southwest border, the work that the Coast Guard does 1500 miles from the United States off the north coast of Columbia, the coast of Ecuador, and the deep Caribbean basin, it's those drugs that arrive in the Central American quarter, and Mexico to an increasing degree, that have the corrosive effect on the local governments. They create instability that drives the violence that forces folks like ourselves with kids to send them off as smugglers who try to get to the United States. If we can stem the flow of those drugs here, that's a place that's less political, there's no violence – we take a thousand kilograms of drug off the water, hundreds of miles out near the Galapagos, you've sort of broke that chain of the violence and instability. So I think that part of our work is very important to that conversation. Sometimes you don't hear that, but to me that's the push factor – that's the away game – and I think the Coast Guard is absolutely a key part of the Department of Homeland Security's efforts there."

The San Francisco Bay Harbor Safety Committee, in coordination with the Coast Guard and local industry partners, evaluates the region's capability to respond to an emergency involving an ultra-large container vessel in San Francisco Bay Wednesday, May 21, 2014. The drill was conducted in the vicinity of Anchorage 9, and involved multiple tugboats simulating an emergency tow of one of the largest container ships currently calling on California ports. (U.S. Coast Guard photo by Petty Officer Adam Stanton)

Members of the U.S. Coast Guard's Gulf Strike Team rescue an elderly couple after floodwaters from the Waccamaw River took over their apartment complex in Horry County, South Carolina, Sept. 19, 2018. As a result of Hurricane Florence, certain rivers flooding from the north continue to pose a threat to communities throughout the Carolinas. U.S. Coast Guard photo by Petty Officer 1st Class Jon-Paul Rios.

based on the high latitude study of 2012. Within that 6-3-1, a minimum of three heavy, or Polar Security Cutters, and then the one is we need one now. If we don't start awarding a contract soon, I'm not so sure we can bridge the life span of the Polar Star much beyond a handful of years. The nation really needs to pay attention up there, and the Coast Guard's the right agency on that.

Who inside or outside the Coast Guard do you consider the greatest influence on your leadership style?

As I think back, I had access to about six different commandants over an extended period of time, different leaderships teams, you know, during my time in and out of Washington. I derived a lot from being around that many different senior leaders here in Washington, its vice commandants, the commandants. In terms of personal leadership – what makes me tick – my dad probably a little bit. He was a school teacher and he's an active guy in his community. He would go to work every day as a teacher, a coach, and try to make a difference in young people's lives. I think I've always enjoyed the people side of the Coast Guard. The thing that really gets me most excited is when I get a note from somebody that says, "Hey, remember me? I was a seaman on this ship you commanded. I'm now an officer in charge of station so-and-so. If you hadn't helped me work across that rough spot in my career I wouldn't be here." Those are the things that I derive the most personal satisfaction: the ability to push some next-generation of leaders through and help shape their careers.

One more question and I'll let you get to your important business. From the time you entered the Coast Guard to today, how's the Coast Guard most the same? How's the Coast Guard most different?

It's the same in that we are not a whole lot bigger. Also unchanged: we don't look that much more like the America we represent. So that's why the conversation about a more diverse Coast Guard, a Coast Guard more representative of the society we serve – is important to me. We are a better Coast Guard with diversity – cultural diversity, educational diversity, geographic diversity, gender diversity – I think all that contributes to the best ideas surfacing. And folks that come in the Coast Guard want to look up in their respective enlisted rating. As an officer, they want to see folks that look like them that are rising to the upper echelons of Coast Guard leadership. That's going to take us some time, but I'm committed to that and we need to put a foot on the gas on that one.

What's different is I think our brand, our national brand is stronger than it was when I entered the Coast Guard. I think the brand of the Coast Guard today is the highest I ever remember. I think the work we do is more valued, it's better understood today than before. We have always had good quality folks, but the men and women joining the Coast Guard today are motivated. I had the privilege of mentoring a couple boot camp sessions at Cape May, and the last time there were 99 recruits. When we went around and talked to those 99 kids, there were 99 compelling reasons why they wanted to serve their nation in the United States Coast Guard. I said to myself, "Man, these kids want to serve." So my challenge is to make the Coast Guard a rewarding experience for them.

Voices

Shuichi Iwanami, Commandant, Japan Coast Guard

Iwanami

As the Japan Coast Guard celebrates its 70th anniversary, *Maritime Reporter & Engineering News* offers insights on the current status and future direction of the JCG courtesy of an interview with Shuichi Iwanami, Commandant, Japan Coast Guard.

BY GREG TRAUTHWEIN

**Note: At the time this interview was conducted, Shuichi Iwanami was still Vice Commandant for Operations.*

Photo: Japan Coast Guard

Could you please tell us the history and future development of the Japan Coast Guard (JCG)?

The JCG, in 2018 celebrates the 70th anniversary of its foundation. When it was founded, the Japanese waters were in an eclipse period. Lighthouses were destroyed during World War II, while many ships that had been sunk with sea mines were left unsalvaged. Numerous maritime crimes including Illegal migration and smuggling had been committed everywhere. In such times, the JCG set about on a mission of reconstructing Japan. All service members have since started to work together to tackle those issues which attracted national and international attentions.

The world is in the midst of turbulent times now, as represented by drastic changes in international political environment, increasingly serious natural disasters and among others, the developments of situations in North Korea. As such, Japanese territorial waters have been subjected to ever difficult situations. Under such circumstances though, the JCG is determined to continue to work restlessly to appropriately address these situations and hand over a safe and orderly ocean to future generations.

Could you please tell us what the JCG is focusing on now?

The environment surrounding Japanese territorial waters is becoming ever more of a challenge with, among others, Chinese Government ships invading the sea areas of Senkaku Islands, North Korean illegal fishing vessels operating around Yamato Bank in the Sea of Japan and numerous wooden boats which are believed to come from Korean Peninsula drifting and casting ashore. To deal with such issues appropriately, it is urgently needed to enhance three capacities of the JCG. They are; maritime law enforcement, maritime situational awareness and oceanographic research capabilities. As such, the Governmental Policy was approved in December 2016 by the Ministerial Council to strengthen the service capabilities of Japan Coast Guard. In December 2017, the Council further agreed that the promotion of the JCG service capabilities enhancement be continued and confirmed that it is necessary to foster international cooperation to maintain free and open maritime order based on the rule of law.

The 3rd Basic Plan on Ocean Policy approved in May 2018 by Prime Minister Shinzo Abe's Cabinet explicitly stipulates that Japan will constantly strengthen the Coast Guard system and, to detect national security threats immediately, upgrade its Marine Domain Awareness (MDA) capability. The JGC will, in accordance with these policies, continue to work to keep up with changes of the time, and reinforce its systems and capabilities steadily, while carefully examining the priorities of implementation.

Meanwhile, JCG will continue to enhance the safety at sea in accordance with the '4th Marine Traffic Vision', the maritime traffic safety policy formulated in April 2018 and promote the integration and public dissemination of information on activities at sea. Development of modern technologies including the VHF Data Exchanging System (VDES), will also be continued.

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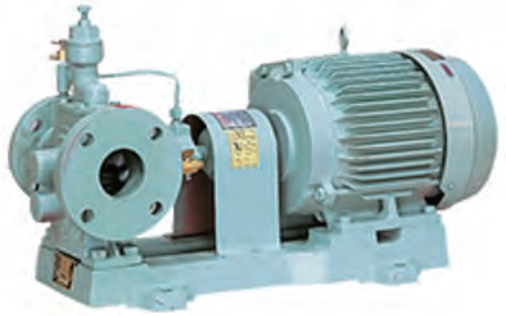

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"As the situation surrounding Japanese territorial waters remains tough, the JCG is required to play a wide variety of roles, indicating that its duties are getting ever more diversified, complicated and internationalized."

Shuichi Iwanami, Commandant, Japan Coast Guard

Could you tell us what shipbuilding plans (ship types and sizes) the JCG has on the table now?

The Government of Japan approved the Policy on Strengthening the Coast Guard Capabilities at the Ministerial Council on Dec. 21 2016. In accordance with this Policy, the JCG has been advancing its efforts to enhance its systems and capabilities, including the acquisition of additional PLH and HL fleet.

What do you think is important in cultivating human resources under your command?

As the situation surrounding Japanese territorial waters remains tough, the JCG is required to play a wide variety of roles, indicating that its duties are getting ever more diversified, complicated and internationalized. To address these trends, the Policy on Strengthening the Coast Guard Capabilities was adopted in December 2016 by the Ministerial Council. Based on the Policy, we are steadily beefing up the surface and air fleet. Reinforcement other service infrastructures, including human resource development, is another important mainstay to be urgently implemented.

Automation and autonomy have been advancing among commercial vessels. What actions is the JCG taking to raise efficiency and ensure safety, among others, through automation?

In ship autonomy and automation, I understand that various maritime sectors—such as shipping, shipbuilding and ship machinery and equipment manufacturing—are increasingly interested in maritime autonomy from a viewpoint of safety, efficiency and productivity. The JCG has already introduced remote control vehicles and other technologies in oceanographic surveys and so on.

Autonomous underwater vehicles (AUVs) are capable of collecting precise topography data by sailing underwater on the programmed routes close to the sea bottom and autonomously conducting surveys. An AUV was set to service operation in fiscal 2013. It has since been helping us improve our oceanographic research capacity for protecting Japan's maritime interests.

In fiscal 2016, autonomous ocean vehicles (AOVs) made their debut. They can operate by the power of waves and are able to conduct unmanned oceanographic observations for a long period of time, depending solely on solar energy. Through the continuous and long-term meteorological and hydrographic observations by AOVs, we can not only upgrade our basic information on the safety of ship operations, but also can obtain the long-term observation data we need to enrich low-water mark (LWM) information in order.

The JCG held a workshop in May 2018, inviting experts in the operation of autonomous ships to commence discussing what measures are needed to be taken to address the changes in operational environments of the emerging autonomous surface vessels.

At a time when safety at sea is becoming more and more important, what does the JCG give importance to regarding cyber security? What measures do you implement to protect ships and other assets from cyber attacks?

First, we give importance to ensuring IT security for our network system from the threat of cyber attacks so that we can always appropriately fulfill our duties. Second, the measures we have taken include isolating the main service system that we use for day to day business routines from the internet to keep it from being attacked from outside. For security reasons, I should refrain from making any more comments on this matter.

Could you please tell us what is the top priority for the JCG?

We endeavor to detect as soon as possible phenomena that could develop into situations having major impacts on safety and security at sea as well as the security of our country, and to maintain a system so that we can take necessary actions immediately. If any such situations took place by any chance, in order to prevent them from worsening further and to prevent the impact from growing, we try to share information and cooperate with relevant organizations to take efficient and effective actions.

Looking ahead 20 years from now, how will the JCG do with its fleet? Please tell us long-term prospects.

I believe that it is important to continue to enhance our systems and capabilities steadily, while keeping up with changes of situations of the time. We will therefore seek to implement all possible measures to protect Japan's territories and territorial waters and to ensure the safety and security of Japanese nationals.

In accordance with the Policy on Strengthening the Coast Guard Capabilities approved in December 2016 by the Ministerial Council, we have decided to reinforce our systems and capabilities for conducting oceanographic surveys by means of acquiring additional large survey ships and other efforts.

Looking back at the history of the JCG, what do you count as two or three of its greatest successes?

The Spy boat case in the Southwestern sea of Kyushu. As an example of success in taking actions against major incidents, I can first of all count the case where JCG encountered the spy boat crisis in the southwestern sea of Kyushu in December 2001. In the incident, a fishing boat of unidentified nationality was spotted in the Japanese EEZ in the southwestern sea of Kyushu. Refusing our halt orders, the boat attempted to escape and JCG launched a chase and tried to stop it by firing warning gun shots and taking other actions. However, as the fleeing boat returned the gun and missile fire, we started the self-defense counter-attack firing. While we were doing so, the boat detonated itself and sank. As the result of half a year salvaging work, the boat was identified as a spy boat of North Korea, which possibly had engaged in the illegal drug smuggling. In the incident, I believe we disclosed the nature of North Korea's spy activities through this law-enforcement operations and could make a great success of deterring subsequent similar activities.

Partnerships and cooperation with Coast Guards of other economies: Since around 2000, the JCG has been working hard to provide assistance to the maritime security organizations of coastal countries in Southeast Asia and other regions so that they can enhance their respective capabilities. We have also been focusing on partnership and cooperation enhancements among Coast Guards through the Heads of Asian Coast Guard Agencies Meeting (HACGAM), etc. In the meantime, maritime security bodies have been newly established in many economies, while the number of attendees at the HACGAM has been increasing every year. Partnerships and cooperation among those governments have grown notably in terms of actions against international crimes, maritime accidents and

disasters, etc.

Looking back on your career at the JCG, could you please tell us what has been the most influential moment?

One of the most impressive things that I have experienced is the emergency medical transport case on Feb. 28 1990 in which a severely scalded child from Sakhalin, former USSR. In Sakhalin, an infant suffered a serious scald by hot water spilled on his entire body. As it was beyond help of the local medical institutions, the infant's mother asked a Japanese businessman who happened to be in the city on business for medical treatment in Japan. As the Cold War was still on continue, it was worried that if JCG airplane flew near the border airspace of Sakhalin, it could be intercepted by scrambled Soviet fighter jets. On the following day, at a request from the Ministry of Foreign Affairs of Japan, a JCG plane crossed the border between Japan and USSR for the first time since the end of World War II and landed at Yuzhno-Sakhalinsk Airport to race the child to Hokkaido. Because of all-out efforts made in Japan, the boy successfully came out of the jaws of death.

I was in charge of coordinating this emergency medical transport operations when I was young. I leaned what was believed impossible could become possible if we held passion and many people helped us.

Could you please tell us what you think has not changed and what has changed greatly over the last 20 years?

We are facing more and more cases having major impacts not only on safety and security at sea, but also on national security as well as regional peace and stability. They include foreign government vessels invading Japan's territorial waters; growing number of foreign ships conducting marine surveys; foreign fishing boats illegally fishing in Japanese EEZs and drifting/casting ashore: and pirates/ armed robberies/terrorist organizations acting ever more extensively.

To deal with such threats, Japan's maritime security system has been strengthened in the last 20 years. The number of JCG staff members has increased from approximately 12,200 to 14,000; patrol vessels, from 354 to 372; and aircraft, from 69 to 83. In addition, information and communication devices, weapons and other outfits have been upgraded in quality, while legislation has also been developed for law enforcement at sea.

Over the last 20 years, maritime security organizations have been established and reinforced in many Asian economies. In order to support them, we have been providing assistance so that they can enhance their capacities, while partnerships and cooperation with them are promoted in rapid manner.

In contrast, the JCG has upheld the spirit of 'justice and humanity' since it was established, which means never to tolerate illegal activities, but will do its utmost to save lives and provide humanitarian assistance to people regardless of nationality. This sprit has been inherited by all JCG service members.

Japan Coast Guard *By the Numbers*

As of April 2018, the JCG surface fleet consists of **457 vessels** as below:

Types of ships	Number
PLH (patrol vessels, large, with helicopters)	14
PL (patrol vessels, large)	48
PM (patrol vessels, medium)	38
PS (patrol vessels, small)	33
FL (firefighting boats, large)	1
PC (patrol craft)	69
CL (craft, large)	169
HL/HS (hydrographic survey)	13
LM/LS (Aids to Navigation service vessels)	6
Others	66

The JCG has 6,187 maritime service members, 225 of whom are women.

AET Grows in Brazil

By Claudio Paschoa

With the ongoing development of deepwater pre-salt plays and a decreased demand on local content in tankers and other vessels, Brazilian national operator Petrobras and other super-majors have been looking abroad for better rates and reliable operators of shuttle tankers. Claudio Paschoa, Maritime Reporter's correspondent in Brazil spoke to Peter Liew, Global Director – Mid Size Tankers, Crude Shipping, about AET Tankers' history and its operations in Brazil.

Image: AET Tankers

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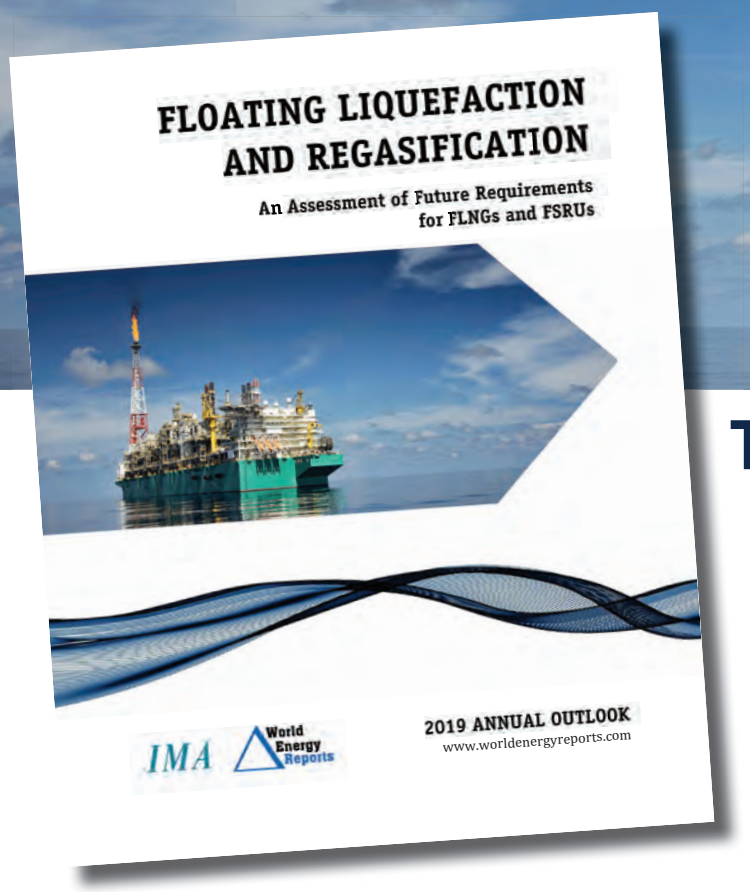

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Image: AET Tankers

AET (formerly American Eagle Tankers) was founded in Houston in 1994 primarily to conduct lightering operations in the Gulf of Mexico. The company's fleet grew to 32 vessels (mainly Aframax tankers but also two VLCCs) by 2003, when acquired by MISC Berhad. MISC transferred its crude tankers to AET in 2004, expanding the AET fleet to more than 50 vessels. The company was renamed and rebranded as AET in 2007. The fleet continued to grow to include clean vessels, DP shuttle tankers, "first-in-class" modular capture vessels, and a fleet of chemical carriers. Today, AET remains a wholly owned subsidiary of Malaysian maritime energy logistics group, MISC Berhad. The company is headquartered in Singapore, with commercial offices in Houston, Kuala Lumpur, London, Montevideo, Panama and Rio de Janeiro with a specialist offshore lightering unit in Galveston, Texas.

AET owns a fleet comprising 14 VLCCs, 6 Suezmaxes, 1 Panamax, 41 Aframaxes, 4 DP shuttle tankers, 13 chemical carriers, 5 LR2s, 3 MR2s and 1 LPG tanker. Its current orderbook includes 2 LNG dual fueled Aframaxes and 2 LNG dual fueled DP Shuttle Tanker (DPST) vessels with Liquefied VOC (LVOC) as well as 5 DP Offshore Loading Shuttle Tankers, all chartered to energy majors.

Brazil Operations

AET entered the Brazilian market in 2010 when it won a long-term contract to operate two DP shuttle tankers (DPST) in the Brazilian Basin for Petrobras. In 2012, AET incorporated AET Brasil Serviços Maritimos in Rio de Janeiro to manage its Brazilian activities. A year later, AET Brazil began ship-to-ship (lightering) activities offshore Vitoria, in the state of Espirito Santo, under an exclusive contract. Combined with the lightering operations that AET performs in Uruguay since 2011, the company has performed more than 400 STS transfers in the region, since then, with the aid of three specialist lightering support vessels (LSVs) the company owns and maintains on station. In May 2018, AET was awarded a contract for a further four DP2 Suezmax Shuttle Tankers for charter to Petrobras in the Brazilian Basin. In August 2018, AET was awarded a contract by Shell to time charter a newbuild DPST also for operations in Brazil. This will bring AET's Brazilian DPST fleet to seven vessels, which places the company in the top three DPST operators in Brazil. Currently, AET operates two 105,153 dwt DPSTs, Eagle Parana and Eagle Paraiba in Brazil. These were delivered as newbuilds in 2012 and have been operating in Brazil since delivery. The four further specialist DP Suezmax shuttle tankers in Brazil will be 152,700 dwt and are currently being built by Samsung Heavy Industries (SHI) for delivery in 2020. The new vessel currently being built for charter to Shell will be similar to the four earmarked for Petrobras.

"Our DPSTs currently under construction are compliant to IMO NOx Tier 3 requirement and are being built in accordance with Petrobras' and Shell's latest technical requirement for DPSTs. Each will be fitted with a fully compliant ballast water management system, high power thrusters and generators fully capable of operating in harsh weather conditions. The design has been optimized with electric driven cargo pumps to improve the fuel efficiency. The switchboard has 4-split bus configuration which enhances the DP capability," said Peter Liew. Operating DP vessels is a niche and highly skilled activity. Entry barriers are high and it takes time to build the capabilities required to perform flawless operations. Most oil and energy companies would prefer to charter these assets from owners and operators who have the scale and experience to ensure such capabilities are sustained.

"The 2010 Petrobras contract signaled AET's entry into the shuttle tanker market and this allowed us to demonstrate our expertise and enhance our reputation in a more sophisticated arena of the petroleum logistics industry. Harnessing this experience, we continued to innovate and re-engineer our business and operations to ensure the services we deliver remain relevant to the evolving landscape and our customers' changing needs. I am delighted that Petrobras has recognized AET's capabilities and expertise in DP2 shuttle tanker operations with the award of this new contract," said Captain Rajalingam Subramaniam, President & CEO, AET during the announcement of the new contract with Petrobras.

Tanker Crewing

AET invests heavily in crew management and training, including the training of DP certified crew. In 2014, the company achieved its first "homegrown" DP certified officer. Since 2015 AET employs Brazilian crew through a local manning agent and, in 2017, recruited its first Brazilian seafarer through its jointly owned ship management subsidiary, Eaglestar. AET, and its parent company, operate a maritime academy in Malaysia where many of its officers are recruited, trained and developed. A network of crewing and manning offices around the world ensures an adequate supply of well-trained, experienced and capable seafarers. AET affirms it is committed to growing the number of Brazilian seafarers it employs on its Brazilian based vessels and is increasing the number year-by-year. Currently AET employs 30 Brazilian seafarers in their DPSTs operating in Brazil.

Tanker Requirements for Petrobras

To meet with the highly complex construction of a DP vessel with added functionalities, AET has carried out a detailed analysis of all shipyards in the world that have the capability to meet their customers' technical requirements, which include high operational safety standards. It is notable that AET and SHI have worked together on a range of shipbuilding projects for 22 years. These are the basic DPST requirements demanded by Petrobras:

- *Suezmax DP 2 with DWT 152,000 to 154,999 MT*
- *Stringent design for environmental conditions with wind speed up to 25.7 m/s*
- *3 bow thrusters, 3.1 MW each, at least 2 Azimuth thrusters. 2 stern thrusters, 2.2 MW each, at least 1 Azimuth thruster*
- *Minimum 4 sets of generators*
- *4 independent position reference systems*
- *Telemetry system*
- *Ballast water treatment system - Electrolysis indirect type.*

Expectations for Brazil

AET recognizes the Brazilian Basin as one of the world's foremost areas for DPST operations, alongside the North/Barents Sea and the U.S. Gulf. According to AET, central to its strategy is to seek long-term contracts in niche, high entry barrier sectors that generate a secured income stream and which complement their traditional petroleum transport activities. As the search for oil reaches increasingly deeper waters, the need for offtake tankers in the form of DPSTs will increase. Having established a firm footprint in Brazil and a reputation for safe, reliable and quality operations, AET believes they are well positioned to continue to expand their operations to meet the increasing demand in this region.

AET has provided a variety of maritime logistic solutions in Brazil along the years and their customers include other IOCs operating in Brazil. With the recent influx of major O&G players, attracted by the increased pre-salt oil tenders, it is expected that the demand for more DPSTs will increase in the near future. AET points out that it is committed to expanding its business in Brazil, and consequently to training and

Tankers being built for Petrobras Main Particulars

Length	279 m
Breadth	48.8 m
Draft	17.2 m
DWT	152,700 mt (Suezmax)
Cargo capacity	162,000 m3
Main engine	WinGD 5X72
Cruising range	18,000 nm
Aux diesel engines	4 sets
Thrusters, bow	3 sets, 3.1 MW each;
Thrusters, stern	2 sets, 2.2 MW each
Propeller	CPP
Rudder	High lift rudder
Bow loading system	MacGregor
DP system	Kongsberg
BWTS	Electrolysis + filtration

"As a company, a core pillar of our strategy is to seek specialized, niche activities where we can foster long-term, mutually beneficial relationships with strategic and likeminded partners. Oil output from Brazil has continued to increase over the years and more so now that oil price has begun to reset itself."

Peter Liew, Global Director – Mid Size Tankers, Crude Shipping

Image: AET Tankers

employing local seafaring talent and will continue to do so to ensure they have a sufficient supply of quality seafarers for their growing Brazil operations. AET has an office in Rio de Janeiro, which is manned by a combination of Brazilian staff and an international team. AET's Brazil office is headed by a Commercial/Country Manager, with more than 30 years' shipping experience in general management, commercial management, chartering services, contracts, technical ship requirements and tanker operations, who is responsible for developing and managing all AET operations in Brazil.

"As a company, a core pillar of our strategy is to seek specialized, niche activities where we can foster long-term, mutually beneficial relationships with strategic and likeminded partners. Oil output from Brazil has continued to increase over the years and more so now that oil price has begun to reset itself. Similarly, oil exploration offshore Brazil, in particular deep water, pre-salt, exploration, has also continued to intensify in recent years, with a couple of new large fields' production expected to come online in the coming year. All these give us strong confidence that there will be an ongoing and increasing demand for the services of DP shuttle tankers and other maritime logistics solutions in the region. We are, and will continue to invest in Brazil. We have a growing office in the country which is headed-up and largely manned by local people. We are also training and employing Brazilian seafarers to work onboard our vessels," said Peter Liew.

Moore Stephens says that

Vessel Ops Costs to Rise

In a report released in mid-October, International accountant and shipping consultant Moore Stephens said total vessel operating costs in the shipping industry are expected to rise by 2.7% in 2018 and by 3.1% in 2019. Responses to the firm's latest annual Future Operating Costs Survey revealed that drydocking is the cost category likely to increase most significantly in both 2018 and 2019, accompanied in the latter case by repairs and maintenance.

Moore Stephens contacted key players in the shipping market internationally over a 28 day period in September 2018, asking them to complete a short web-based questionnaire, also providing information on their business type, headquarters' location and sector most relevant to their operations to help sharpen the analysis. According to Moore Stephens, the survey represents a broad cross section of industry and that their analysis is representative of the shipping industry as a whole.

Significantly, the predicted overall cost increases were once again highest in the offshore sector (which is arguably the sector least able to absorb these added costs), where they averaged 4.1% and 4.2% respectively for 2018 and 2019. By way of contrast, predicted cost increases in the bulk carrier sector were 1.8% and 2.6% for the corresponding years. Operating costs for tankers, meanwhile, are expected to rise by 2.4% in 2018, and by 2.9% the following year, while the corresponding figures for container ships are 4.2% and 3.8%.

Overall, the cost of new regulation was identified as the most influential factor likely to affect operating costs over the next 12 months, at 23%, up from equal third place at 15% last year. 18% of respondents identified finance costs in second place, down from 20% and first place last year. Competition ranked in third place at 15% as it had last year. Meanwhile crew supply fell to 12% compared to 19% and second place in last year's survey.

Richard Greiner, Moore Stephens partner, Shipping and Transport, says, "The predicted 2.7% and 3.1% increases in operating costs for 2018 and 2019 respectively compare to an average fall in actual operating costs in 2017 of 1.3% across all main ship types recorded in the recent Moore Stephens OpCost study." Greiner continues, "One year ago, expectations of operating cost increases in 2018 averaged 2.4%, so the increase now in that expectation to 2.7% must be regarded as sobering – if not unexpected –news. Projected increases in operating expenditure are part and parcel of the workings of any industry, and must be factored into budget projections. But these latest predicted increases, whilst a cause for concern, should not unduly surprise or concern shipping, an industry which has seen – and in many cases endured – much larger increases during the past decade."

New regulations were included this year for only the second time in the life of the survey among the list of factors which respondents could cite as most likely to influence the level of operating costs over the next 12 months. This has proved to be a timely addition, with respondents ranking it [regulations] in first place. The Ballast Water Management Convention (BWM) and Sulphur 2020 are the major items on the list of incipient shipping legislation, but the industry is becoming more tightly regulated generally in terms of both safety and environmental responsibility, so compliance with evolving national and international regulation is likely to remain a significant item in operating cost analyses and projections for the foreseeable future.

The fact that drydocking emerged as the cost category likely to increase most significantly in both 2018 and 2019 is unsurprising, given the need to comply with the existing and emerging regulatory framework within which the industry is being obliged to operate. The same may be said of repairs and maintenance, where any previous delay in attending to items of a non-critical nature will need to be addressed.

Estimates relating to the likely increase in the cost of lubricants over the two-year period, meanwhile, are towards the higher end of the survey scale, which is

Expected cost increases for year ending 31 December 2018

Mean	Bulkers	Tankers	Container Ships	Offshore	Total
	%	%	%	%	%
Crew wages	1.2	1.4	1.2	1.8	1.3
Other crew	1.4	1.4	1.9	1.8	1.5
Lubricants	1.9	1.5	3.1	2.2	1.9
Stores	1.6	1.2	2.2	2.2	1.6
Spares	2.2	1.4	2.5	2.1	1.9
Repairs & maintenance	2.0	1.5	2.7	2.9	2.0
H&M insurance	1.5	0.9	0.5	2.4	1.3
P&I insurance	1.1	1.0	0.0	2.5	1.2
Management fees	1.0	0.9	0.5	1.9	1.0
Dry docking	1.7	2.1	2.6	2.6	2.1
Total costs	**1.8**	**2.4**	**4.2**	**4.1**	**2.7**

Expected cost increases for year ending 31 December 2019

Mean	Bulkers	Tankers	Container Ships	Offshore	Total
	%	%	%	%	%
Crew wages	1.8	1.7	2.1	2.4	1.9
Other crew	1.6	1.5	2.1	2.5	1.8
Lubricants	2.2	1.9	2.2	2.4	2.1
Stores	1.9	1.5	2.2	2.6	1.9
Spares	2.4	1.7	2.5	3.0	2.2
Repairs & maintenance	2.3	1.9	2.5	3.1	2.3
H&M insurance	2.0	1.2	1.1	2.3	1.6
P&I insurance	1.4	1.2	1.0	2.2	1.4
Management fees	1.2	1.1	0.5	1.9	1.2
Dry docking	2.1	2.2	2.6	3.1	2.3
Total costs	**2.6**	**2.9**	**3.8**	**4.2**	**3.1**

in line with a predicted rise in oil prices this year and next.

Expected increases in the price of hull and machinery insurance are up on estimates made 12 months ago but, due to the highly competitive nature of the market, cannot be regarded as an entirely reliable bellwether. Estimates of protection and indemnity cost increases are also up, perhaps reflecting increased management costs and the possibility that the market's recent benign large-claims experience may not be repeated over the next couple of years.

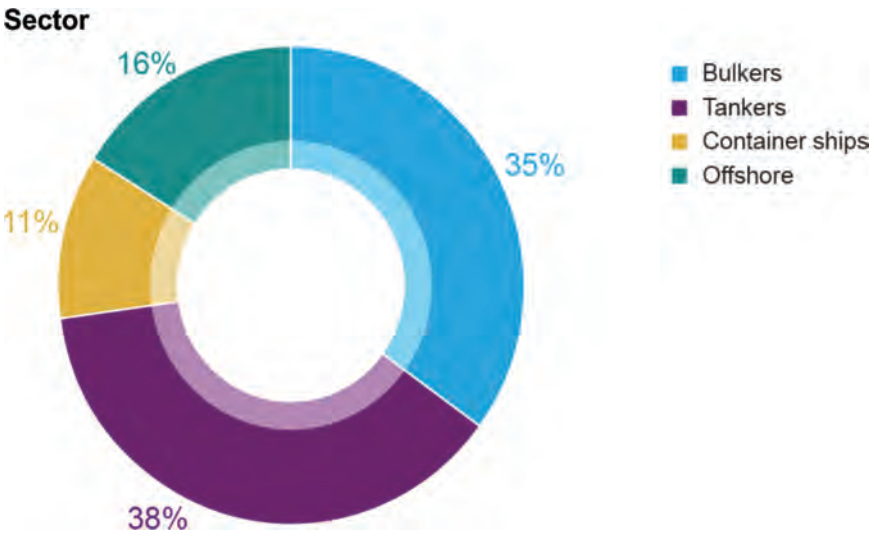
One could argue that the level of predicted operating cost increases for 2018 and 2019 ought to be manageable in a competitive, viable industry environment. Nobody doubts shipping's essentially competitive nature, but the issue over viability is less clear-cut.

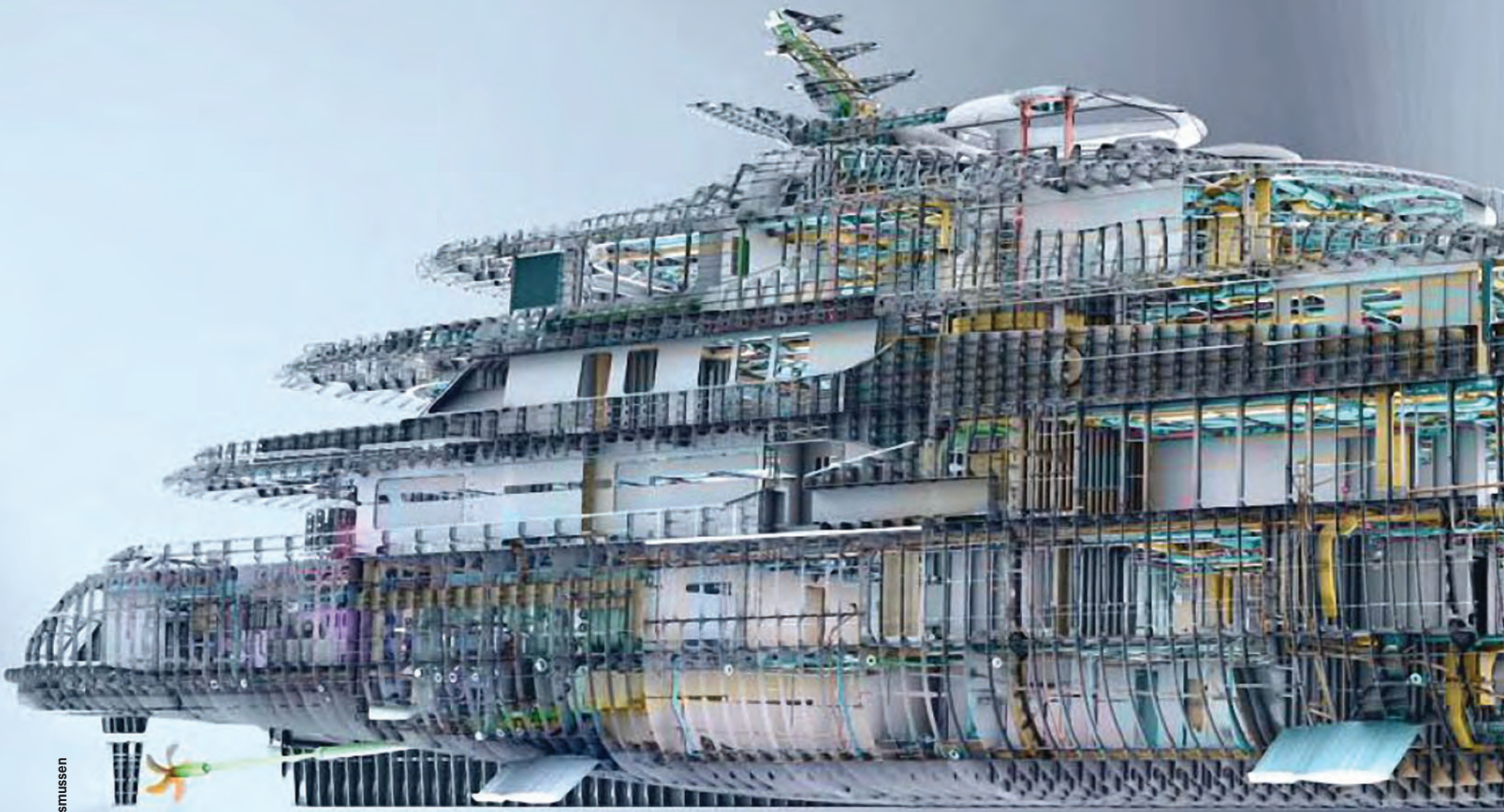
Shipping has held up well during a ten-year economic downturn, and investors continue to express confidence in the industry's potential for profit. Sadly, some good companies have gone to the wall over the past decade but, overall, the industry has become leaner by virtue of having let market forces function as they should. Yet market intelligence and common sense suggest that freight rates still need to improve significantly in order for shipping to start making the sort of money it should command in light of the vital role it plays in international trade and commerce.

Moore Stephens sums up their analysis by saying that the more money that shipping makes, the more comfortably it can meet its operating expenses. Increases in operating costs must be expected, and budgeted for. Those costs may change in nature, because new technology is already helping to reduce outgoings in some areas, while on the other side of the coin there is the evident need for technological investment to combat the likes of cyber-crime.

There are more Ifs involved in the shipping industry than there are in Kipling's poem. Shipping in the coming years will require good management, good judgment, good research, good advice and good luck. And it will require good husbandry. The Moore Stephens survey adds as cautionary footnote: "As Benjamin Franklin said, "Beware little expenses, a small leak will sink a great ship."

www.moorestephens.co.uk





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111 years of success by design

When Georg Abeking and Henry Rasmussen from Denmark established their boat and yacht yard 111 years ago, it is likely that neither of them suspected at that time that their small shipyard, headquartered in Lemwerder next to Bremen, would one day evolve into a world-renowned company known for building first class vessels.

Today the company, which has been transferred into a European Company (Societas Europaea, SE), is a company that designs and manufactures, among other things. Included in this mix are some of the world's most luxurious yachts. But today's Abeking & Rasmussen is far more than a yacht builder, producing many other type of ships, including pilot boats, government and naval boats as well as other special vessels up to a length of 125 m.

A&R counts building strong relationships with its diverse customers at the heart of its long-term success, whether it is a yacht, navy, coast guard or commercial customer. In addition, the yard has made a very special name for itself with their SWATH@A&R vessels.

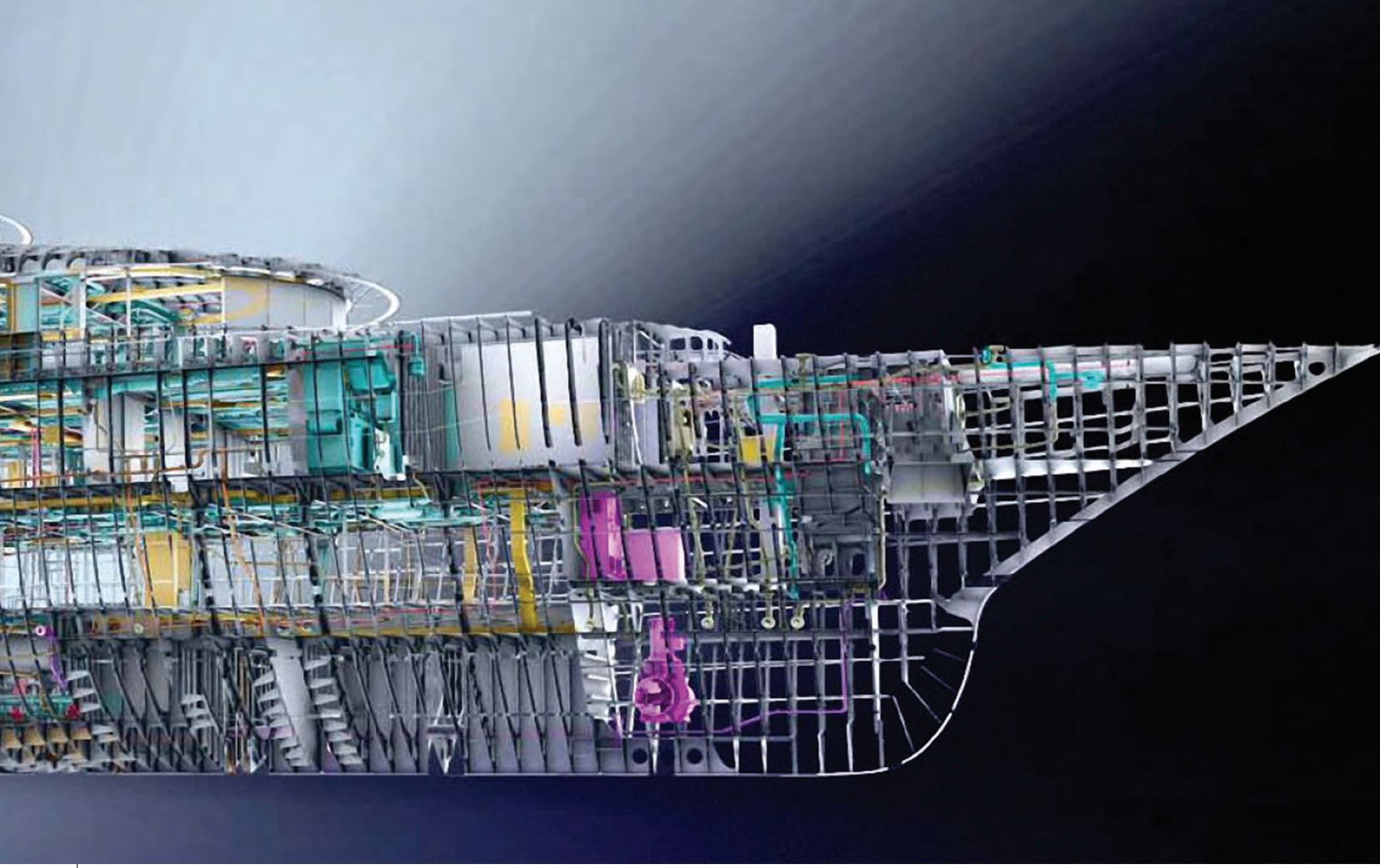
A&R is a success story with many chapters. It's a tale of the fruitful interaction of the naval, special ship and yacht-building divisions, whose R&D departments drive each other forward. And it is a tale of company management that has remained in the family for three generations. Managers who have steadily, yet proactively written the chapters of the shipyard's success story, and continue to do so for many more generations to come. A few months ago 57-year-old Carsten-Söhnke Wibel was appointed as managing director of A&R Special Vessels GmbH, which belongs to the company group. *Maritime Reporter & Engineering News* correspondent Peter Pospiech had the opportunity to talk with Wibel about his new position and the future of the company.

Mr. Wibel, tell us about yourself?

As Wilhelmshaven-born and a "Marine-child" it was clear early that I concentrated myself towards seafaring. I started at the Bremerhaven university, after sea service time with different shipping companies, to study marine engineering. Because of family reasons I changed to Hamburg, the university of applied sciences, and was awarded a diploma to lead marine propulsion systems of all kinds and sizes. Followed by appointments as technical ship's officer at the Hamburg based Bugsier-, Reederei- und Bergungsgesellschaft on their freighter as well as their port, sea and salvage tugs. Particularly formative for me was my time on board of the deep sea tug OCEANIC.

I was than employed of a Bremen based research and development company and joined in 2000 again the team of Bugsier as project manager "Küstenschutz" (Coast Guard).

My most important project during the following 18 years with Bugsier has been the emergency tug NORDIC – the worldwide most powerful emergency tug with an air independent self-con-



By Peter Pospiech

tained air support.

For more than 32 years I have been happily married with my wife Anke, who leads as a deacon the international well-known seamansclub “Duckdalben” in Hamburg. We are proud parents of two daughters, age 18 and 29. Since May 2018 I work now as managing director of A&R Special Vessels GmbH

What induced you to accept this new position?

Being a passionate graduated engineer for ship operation technology, innovative special vessels inspire me. And if one gets such an offer one can’t say ”No.” I enjoy the maritime industry very much – the experiences I gained during seafaring I would like to bear on in new ship projects to deliver ships crews the most suitable vessels for good, safe and effective work on board. In addition to this I would like to forward innovations which makes the maritime industry safer, more reliable and more environmentally friendly.

Particularly I would like to be part in the development of innovative and sustainable solutions.

Here, A&R is very active – from the development of new ship types to better production technologies and processes and further on up to new fuels as well as new propulsion systems.

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While perhaps best known for building magnificent Super Yachts, such as the ***Super Yacht AVIVA*** *(left),* ***Carsten Wibel*** *(above) said that* ***Abeking & Rasmussen*** *is well situated to build a variety of vessels for commercial, government and naval operates. Pictured above left is SWATH@A&R pilot boat* ***HOUSTON for Houston Pilots****.*

What skills do you need for this job?

Listen, listen and once again listen! Open your eyes and your ears, absorb lots of information by asking questions and recognizing where you can contribute your abilities.

A&R is a worldwide well-known ship yard with a long boat and ship building tradition. To what do you attribute this reputation and success?

Like the company founders, Henry Rasmussen and Georg Abeking, the A&R management has always remained faithful to deliver the highest quality work. Still today you find legendary yachts sailing, which have been built during Rasmussen's era, in the most beautiful regions of the world. Old-timer sailboat owners compare a handmade boat built by A&R with a Rolls Royce automobile. 450 longtime employees, including 42 trainees, are currently employed by A&R. Also, continuity of leadership. Since its founding 111 years ago, A&R is only on its third boss – each one with its own vision to lead a company. The current leader, Hans M. Schaedla, is the great-grandson of founder Henry Rasmussen. The employees identify greatly not only with "their" yard and their products, but also with the management.

It sounds like there is great dedication to, and innovation at the company.

There is an inventiveness paired with a love for shipbuilding, that is something we would like to continue in the future. All A&R vessels are characterized by an unmistakable signature of the company, which is state-of-the-art powered by our own research and development. One example aside from our yachts and sailboats, are the worldwide successful SWATH@A&R special vessels.

This abbreviation stands for Small Waterplane Twin Hull – thus a twin hull ship with a very low waterplane in the waterline. The international pilot transfer system has been revolutionized by A&R with these new vessel design. A&R did not invent the SWATH-design but consistently we have advanced the design. The special ship with SWATH technology lies calmly on the water, even under rough sea conditions –this is what counts. This includes also, aside from pilot boats, offshore supply vessels, luxury and expedition yachts and also military ships.

Twenty-six vessels in four different sizes between 25 and 60 meter length have been built, delivered and are in operation.

To date, what do you count as A&R's greatest success?

That is hard to say because basically whatever we begin will be successful. As we say: "If we do something, we do it right or not at all." From a 60-year-old wooden sailboat to any of the famous yachts we build to the SWATH@A&R vessels.

How is A&R's orderbook todau?

As a result of contractual obligations A&R may not pass any information of still-to-be-built new vessels. But it is visible that the yard enjoys good capacity for the coming years. Nevertheless there is still space on top: For example, if a cruising company today comes and would like to have a luxury expedition vessel with around 100 meters length and a capacity of around 120 passengers, there would be still enough production capacity in our new modern yard halls

What is the A&R strategy for continued success?

It is simple: we try to be better than others. We are working intensively, that's what we did already in the past, with research and development. That means: we concentrate on new propulsion systems and much more on new respectively alternative fuels. In other words: We develop in all directions!

Detyens Shipyards

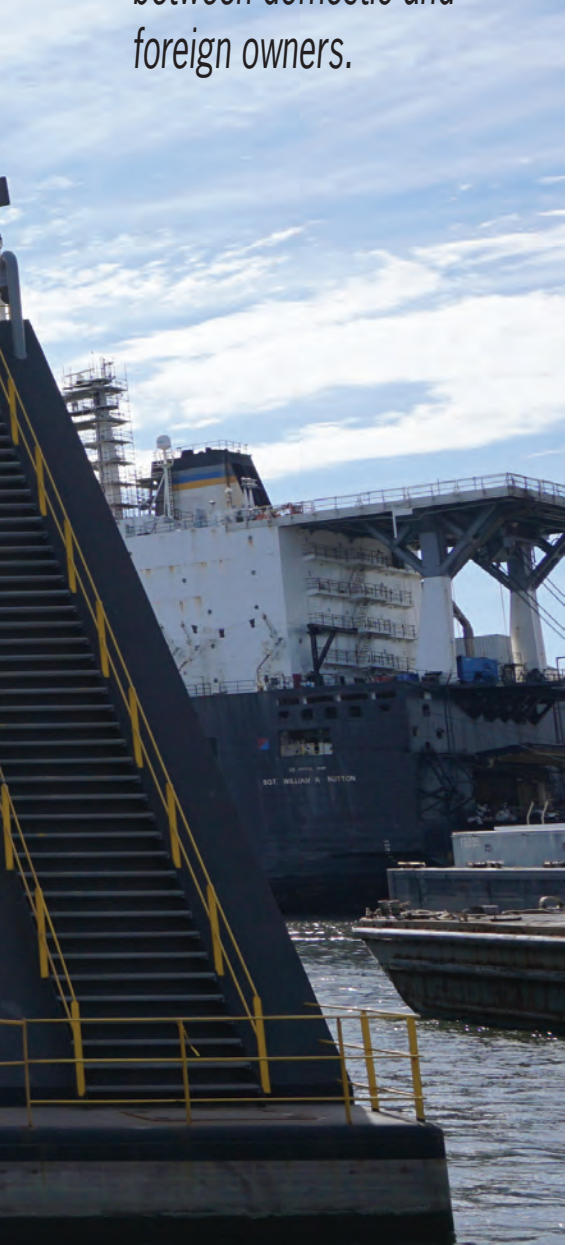
Detyens expands its facilities, grows its commercial ship repair operations, and invests in its employees, customers and facilities.

In a world driven by the dollar sign, **D. Loy Stewart**, ***Jr.****, owner and president of Detyens Shipyards missed the memo. Make no mistake, Stewart is steadfast to deliver on-time, excellent service to Detyens' broad array of ship repair clients, from government to commercial, both foreign and domestic. He understands that a ship in his yard is not making its owner – his client – money, and he is laser focused on keeping his clients happy, returning ships to service on time, on budget. But Stewart is driven by a calling larger than profit margin, building a successful U.S. ship repair business while sharing the rewards with his employees, their families and the local community.*

By Greg Trauthwein

Photo: Eric Haun

Walk into the Detyens shipyard in Charleston, South Carolina, and you are immediately struck by a number of things. The reception area is packed with memorabilia – photos, trophies, awards and letters – that stand as a testament to the shipyards' long-standing connection and commitment to its local community. Its owner, D. Loy Stewart, Jr. and his key staff are straight talking and genuine, confirmed by the golf cart tour through the yard, stopping innumerable times as employees reach out to chat with their boss. Then there is the shipyard, which is huge, amply equipped to lift most anything that needs a lift, anytime, packed with the diversity of heavy machinery and modern finishing tools to get most any job done. It is also packed with a diverse array of government and commercial ships – both foreign and domestic – large and small, in for a fix to keep commerce humming. Around nearly every corner, inside every shop, investment is evident. Current investment in two massive hull and machinery shops, shops once occupied by the Charleston Naval Shipyard to build U.S. Navy ships to support the WWII effort. Investment in a modern paint and finish building to ensure that the job is done efficiently and safely. Investment in people, Stewart's people, courtesy of a modern, free medical clinic on the shipyard's property, open to employees and their families. In addition, there's a bonus program for every shipyard employee based on performance throughout the year and



Detyens Shipyards is a pure ship repair yard *catering to government (50%) and commercial work, the latter evenly split between domestic and foreign owners.*


Detyens Shipyards, Inc.


DETYENS SHIPYARDS' MISSION STATEMENT
CUSTOMER BEFORE COMPANY
EMPLOYEE BEFORE OWNER
FAMILY BEFORE SELF
SAFETY SERVICE ABOVE ALL
Detyens Shipyards, Inc.
SEP
AUG
JUL
JUN
MAY
APR
MAR
FEB
JAN
DEC
NOV
OCT
BONUS POOL
236.5 HRS
Bonus Plan
VESSEL LEAVES ON SCHEDULE
CUSTOMER SATISFACTION

According to D. Loy Stewart, Jr. (left), when Detyens reached the deal to move its ship repair business to the old Charleston Navy Shipyard, it was like ***"We went from the country fair to Disney World, with the best facility that taxpayer dollars could build."***

delivered the week of Thanksgiving. This year each employee is scheduled to receive the equivalent of more than six weeks of pay.

"My grandad Detyens and my grandmother, with no money, started the shipyard in 1962 … out in the country with wooden drydocks and wooden piers," said Stewart. After 20 years in the business his grandfather sold the shipyard to his son and a partner, still operating in a remote locale with dated equipment.

Then in 1995 everything changes.

"My dad and two partners put together a proposal to reopen the Charleston Naval Shipyard (which was closed when the Defense Department's Base Realignment and Closure Commission announced the closure of the Naval Station Charleston), with Detyens doing the marine work," said Stewart. He explains the switch of facilities simply as: "We went from the country fair to Disney World, with the best facility that taxpayer dollars could build."

So started one of the most successful ship repair businesses in the U.S., a privately owned operation focused on what it knows best: ship repair.

"We simply decided we wanted to be the best ship repair facility in the country," said Stewart. We started slow, taking on only the work that we knew that we could deliver on time and on budget. We've built that business up to where we're running wide open. Our drydocks are occupied between 85 to 90% of the time, half government and half commercial work. On the commercial side, half is domestic, half if foreign."

Six years ago Stewart's father, battling health problems, decided to sell the business to his three sons, with Loy taking the helm as president right around the same time Detyens celebrated its 50th anniversary.

Looking Ahead

While Stewart is mindful of the company's history, he is adamant to plan for the future, which demands investment. To that end the company is moving its hull and pipe shop into massive buildings for formerly built Navy destroyers during WWII, and most recently have been used to build armored vehicles and as warehouse facilities. The move, according to Stewart, are aimed at attracting even larger jobs, and to situate the company to grow for another 50 years.

"We've just recently had the opportunity to move into building two," and while it's empty right now, it is sized right for future growth. "We moved our hull and pipe shop into this building to plan for the next 50 years," said Stewart. "This houses our hull and pipe shop in one building and will allow us to do much bigger jobs. There are two 25-ton overhead cranes in the plate bay that travel out to the plate yard. Then in the main construction bay there are two overhead 50-ton construction cranes."

While heavy machinery is the muscle of any ship repair facility, skilled labor is the heart and soul, and like most in the business Stewart is in a perpetual search for employees who are willing and able to learn a trade.

"Also housed in our new hull and pipe shop is our new welding school," said Steward, "so all of our new hires, our employees, or students that want to come in and learn have a school to teach them how to weld and get them certified to our procedures."

Unique perhaps is Stewart's willingness to train welders without an agreement to be employed at the shipyard for a period of time.

Focus on People

While many companies talk the "people" talk, Stewart and Detyens walk-the-walk. Twelve years ago the company opened the Detyens Medical Center where employees and their families can come, for free, staffed with a primary care physician, a pharmacy and full service from pediatrics to geriatrics. Stewart sees it as investment to his most valued resource – skilled employees – healthy and committed to the shipyard. "We are always trying to attract and retain employees, and healthcare is a big part of this," said Stewart.

While Stewart aims to keep his employees happy, similarly he wants his yard to treat customers well, too, which was a reason the company stopped doing Navy work many years ago.

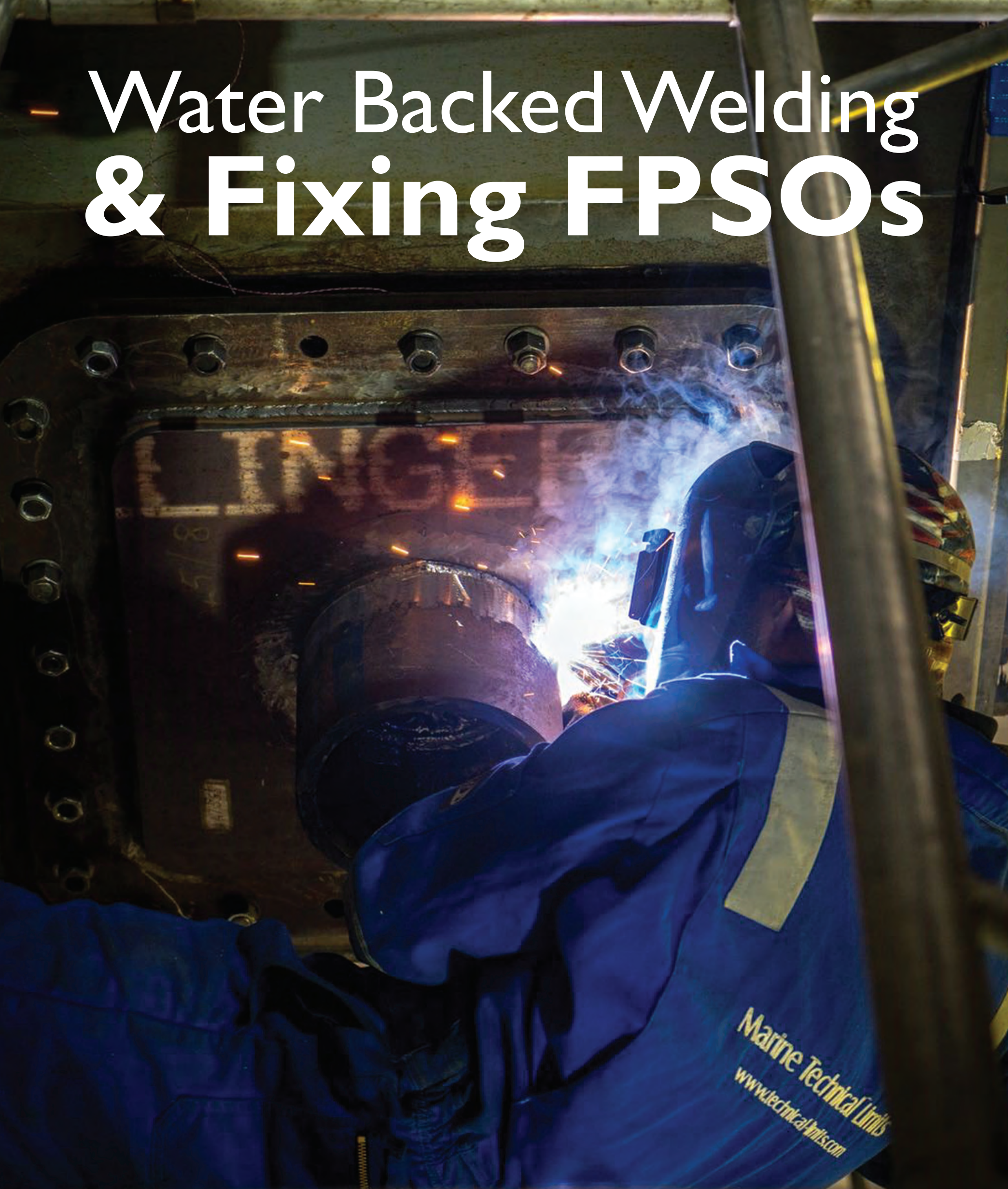
"Twenty years ago we were 90% navy work, and that's all we knew, then the Navy moved out of town," said Stewart. "When we reopened the Charleston Yard we still chased Navy work, but then we found that Navy work isn't all that much fun. The general mood is to fight."

So the management team set its course to be the best commercial ship repair yard that it could, with a balance of work that includes government vessels which Stewart notes are ABS classed and perform similarly to commercial ships. "Our job is create customers and friends," said Stewart.

"We don't want all of your money now, we want your business 10 years from now. Our clients want to come here because they know they're going to get a good job at a fair price and they're going to get out on time."

Like many in the business, Stewart is humble regarding his success, attributing it to three things: customers, employees and facilities. "You have to take care of all three, because if you don't take care of one, the other two don't matter."

Water Backed Welding & Fixing FPSOs



By Danielle Milne, Graduate Mechanical Engineer at Marine Technical Limits (MTL)

Although MTL has a robust oil and gas heritage, with formidable experience in the global energy marketplace, it also invests heavily in R&D and undertake rigorous testing and research from its base in Kintore, Aberdeenshire. MTL recognises the importance of progression and continual improvement for the benefit of the organisation and its staff. As a young engineer I've been afforded the opportunity to see new ways of working develop from the spark of a good idea through rigorous testing and finally to its successful deployment in the field. The freedom to explore fresh ideas is a compelling opportunity for any ambitious technician.

Innovation does not happen in isolation and MTL works closely with clients to quikly come up with bespoke solutions to unique problems.

FPSO Maintenance

FPSOs have played a key role in extreme offshore areas for many years, and an FPSO system is one of the most commercially viable concepts for remote or deep-water oilfield developments.

Harsh offshore environments, vessel motions and production demands can put FPSOs under stress. Ineffective inspection and maintenance regimes not only negatively impact the safety of the asset but can introduce onerous and unnecessary costs.

As an FPSO ages, an increasing number of defects can develop in the hull structure and problem areas found below the waterline can be particularly challenging to address. As dry docking may not always be a financially viable option for making repairs below the waterline, alternative methods are sought.

MTL identified that welding afloat with a water backing, or water backed welding, could be a solution. As it is not a commonly used or well-established welding process, there is limited Classification Society code guidance on whether it could be a viable option. But at MTL we empower our team to tackle these challenges, develop ground breaking concepts, appraise them through rigorous trials and testing, and ultimately deliver them to the market.

In light of this, we have recently undertaken extensive research and in-house welding trials to better understand water backed welding and its associated challenges.

Water backed welding creates more demanding conditions compared to conventional welding processes. At the same temperature, the water acts as a greater heat sink than air, which significantly increases the cooling rate of the weld. This rapid cooling results in a harder, more brittle weld that is not considered compliant with welding rules and standards. Therefore, it is not possible to achieve a suitable weld without altering the welding process or introducing pre-heat, a process which is against some Classification Society rules during water backed weld procedure qualification.

A thorough examination of the welding process and the specific alterations required was needed to render this technique feasible. Trials were undertaken using a bespoke welding test tank connected to an industrial water chiller unit, allowing the simulation of the conditions and flow rates found offshore. Water temperatures below 0°C were used to simulate the lowest temperature that could be encountered offshore during a repair. Throughout these trials, welding variables such as the welding process, position, technique, consumable and steel composition, as well as environmental conditions, were all examined to understand what impact they would have on weld quality.

By completing a full and thorough schedule of non-destructive and mechanical testing on each weld, MTL was able to obtain an understanding of the variables which affect the weld quality during water backed welding. MTL also identified the specific environmental control measures required to produce an acceptable water backed weld. By fine tuning the process and the introduction of specific controls for several variables, MTL was able to conduct successful welding trials which passed all non-destructive and mechanical testing requirements. MTL achieved this without the introduction of pre-heat and therefore avoiding additional challenges to the process. With the knowledge gained through MTL's extensive water backed welding trials, MTL also requalified some of its conventional weld procedures to align its welding consumables and processes, with all preparation and welding being undertaken in-house at its premises in Kintore, Aberdeenshire. The qualifications covered both full penetration butt welds and fillet welds in a range of positions, again without the use of pre-heat. These were witnessed and approved in accordance with an internationally recognized welding standard, and in compliance with several Classification Society rules. By completing the research and trials in-house, MTL was able to gain a wealth of specialist knowledge of water backed welding along with a clear understanding of a range of welding codes. In the pursuit of excellence and continual development, this allows MTL to ensure all of its procedures are tailored specifically to customer's project requirements as well as MTL's core business areas.

BWMS Business Starting to Boom

As more ballast water management systems (BWMS) gain U.S. Coast Guard approval, orders are predictably advancing at a brisk pace. Read up on some of the most significant business deals through October 2018, as well as some new entrants in the business.

After 14 long years, the technology side of the ballast water management systems story is coming to its natural conclusion, as shipowners globally step up to fit systems on newbuilds and retrofit existing ships. Called 'the most expensive ship refit program in history,' the real story remains to be told, as this business side of the equation will only manifest once these systems have been in full operations for five or more years, to discover which systems or technologies stand out as an effective treatment of ballast water, with seamless operation onboard commercial ships.

Tightening ballast water treatment regulations are driving shipowners down many paths to compliance. One thing they all have in common, though, is the need for efficient and reliable retrofitting of their BWMS. A long-established name in maritime, Goltens, is emerging as a market leader in BWMS retrofits. Goltens, with its global presence in shipyards, is unique in that it is not BWMS specific, allowing owners to deal with a single engineering and retrofit partner regardless of the system choice that fits their operational needs. As many owners who have taken the BWMS plunge can attest, regardless of technology, the single most important element to fitting these complex systems into an existing ship design is advanced preparation, which is central to the Goltens offering and experience.

Meanwhile, the choice of solutions grows daily, as Evac recently announced that its Evac Evolution ballast water management system now appears on USCG 'pending list.' Evac Evolution – based on a combination of filtration and UV technology and tested in 'real world' conditions and technically enhanced over a 10 year period – is designed and manufactured by Cathelco. "We are now within reach of gaining USCG Type Approval," said Mika Karjalainen, CTO, Evac Group. Finland's Evac acquired Cathelco earlier this year, and Cathelco was already well on the way to USCG Type Approval having completed all the stages of the land and sea-based testing programs. According to Karjalainen 'size matters' in the BWMS game, and he counts Evac's 160 million euros turnover in 2018, and offices in 14 countries across four continents as a sizable business chip. Evac Evolution is available with capacities from 34 cu. m./hr. to 1,500 cu. m./hr. in a single unit.

Meanwhile, several manufacturers are reporting business success from recent sales. Bio-UV group said that sales of the BIO-SEA ballast water treatment system have contributed to an increase in Q3 revenue for the French company, which reported a Q3 2018 revenue of €3.4m, an increase of 30% on the same period last year. "The expanding ballast water market is the main driver underpinning growth, and one that is expected to continue over coming months," said Benoît Gillmann, President and CEO, BIO-UV Group. "We are currently experiencing a ramp-up in order intake following our USCG certification and anticipate BIO-UV Group total revenue growth in 2018 of at least 15%, driven in particular by a sharp acceleration of the ballast water treatment market, which should secure growth of at least 60% over the full year." To date, BIO-UV Group has supplied its BIO-SEA Ballast Water Treatment System to more than 100 vessels worldwide, with more orders in progress. BIO-UV Group is one of only three manufacturers of UV-based BWTS to have obtained approvals from both the IMO and the USCG.

Powering the BIO-UV Group revenue jump has been a series of order such as the agreement to supply its fully type-approved BIO-SEA ballast water treatment system for retrofit installation to Louis Dreyfus Armateurs' 3,500 dwt

[1]

BWT Systems Goltens has undertaken retrofit projects for [4]
Alfa Laval – PureBallast
Auramarine – CrystalBallast
Bio UV – Bio-Sea
Desmi Ocean Guard – Rayclean
Ecochlor
Erma First – FIT
Headway Technology – OceanGuard
Hyde Marine – Hyde Guardian / Gold
Hyundai HI – HiBallast
JFE Engineering – BallastAce
Knutsen Technology – KBAL
MIURA – Miura BWMS
NuTech O3/NK Co – BlueBallast
Optimarin – OBS
Panasia – GloEn-Patrol
Samkun Century – ARA
Samsung HI – Purimar
SunRui – BalChlor
TeamTec (Oceansaver) – MkII
Techcross – Electro-Cleen
Trojan – Marinex
Wärtsilä – Aquarius UV

[1] BOS: A new name in ballast water management where one-size, one-price fits all.

[2] Evac Evolution ballast water management system appears on USCG 'pending list'.

[3] Goltens is seeking to become 'the' name in BWMS planning and refit, regardless of technology chosen.

[4] LDA's Ciudad de Cadiz will be retrofitted with the BIO-SEA UV BWTS

RoRO vessel Ciudad de Cadiz, LDA's sixth BIO-SEA installation which follows newbuild installations to the 83m service operation vessels (SOV) Wind of Change and Wind of Servitude. Turkey's CEMRE Shipyard is scheduled to deliver Wind of Change next year with the sistership following in 2021. Each ship will operate a skid-mounted BIO-SEA B01-0150 unit.

In separate agreements, BIO-UV Group will also design, build and supply BIO-SEA units for retrofit installation to a Great Lakes tank barge operated by Canadian shipowner McAsphalt and for three newbuild barges under construction by Dutch shipbuilder Damen for delivery to Russian interests. For the three barges Damen is building for Rosneft, BIO-UV Group will supply three skid-mounted 250m3/h capacity BIO-SEA B02-0250 units. BIO-UV Group has partnered with Damen Green since 2014 and supplied a number of ballast water treatment systems to the Dutch shipbuilding group.

Optimarin recently won a contract to supply 36 systems to Ardmore Shipping, one of its largest orders to date. Ireland-based Ardmore Shipping will fit the three dozen units across 18 chemical and product tankers – two units in each vessel, with delivery starting in February 2019. The Optimarin Ballast Systems (OBS) – a UV-based system – was the first system in the market to achieve full USCG approval, and it will be fitted on a rolling basis across a selection of strategic partner shipyards with whom Ardmore has existing relationships.

"We have 10 vessels with alternative systems that were installed at newbuild shipyards and have encountered a series of operational problems," said Gerry Docherty, Director, Fleet Management, Ardmore. "These issues, which we believe are commonplace within the industry, impact heavily on system reliability. Ardmore's decision follows on the heels of the announcement that USCG will be using OBS on its next generation Offshore Patrol Cutters (OPC). Once completed, the Ardmore contract will take the number of Optimarin systems retrofitted beyond the 200 mark.

Ecochlor is another manufacturer that has been racking up some sizable orders, and according to John Morganti, VP Sales & Marketing, Ecochlor, part of the Ecochlor value proposition is the introduction of EcoCare, an offer from the company which essentially 'future proofs' the system in the event of changing regulation, and seeks to assure shipowners that the system will perform. "Shipowners are in a difficult position. I'm a former mariner, having sailed when I got out of Kings Point. I understand this is not a glamor sale, it's being driven by regulation," said Morganti. "Anything we can do to make installation, to make upkeep and maintenance easier … to make the operation and compliance easier … to ensure that the system is really going to work despite turbity, salinity, temperature," will be done, and is compliance guaranteed with EcoCare. EcoCare guarantees that the owner will never fail an invasive species test, a commitment with a finance backing of up to $1 million.

At the time of our interview in September, Ecochlor had a backlog of 150 systems and had recently announced 91 systems ordered from two owners in the bulker and tanker sectors.

New Entrants

As the market has matured and companies have fallen out, new players have emerged. One new name is Danish firm BAWAT, which claims to have devised a technology to help shipowners win the war – simply, cost effectively and reliably. BAWAT technology is unique, but it isn't 'new'. In fact it's been used simply, effectively and efficiently for more than 150 years. It's pasteurization or, in other words, heating the water. "There's a genius in simplicity," says CEO Kim Diederichsen, "and our system couldn't be more simple; it is effective, easy to operate, cheap to run and straightforward to maintain. Essentially it works by heating the ballast water to eliminate any potentially harmful organisms. The process is effective at temperatures as low as 64 degrees centigrade. That's it. No need for any chemicals, UV, filtering or post treatment holding time, and effective with just a one-pass solution.

The heat for the pasteurization process is obtained from a 'green' source, as it is scavenged, waste heat produced by the engine. Another key point of differentiation, as Diederichsen is keen to point out, "The fact that this is heat that would otherwise simply be vented to the air makes our solution, we believe, the most innovative, green and sustainable system on the market."

In a further development, the company has also developed a contingency, or portside, solution whereby vessels can simply 'plug in' and pass untreated ballast water through a containerized version of the BAWAT system. This can be used if operators have issues with their existing systems from different manufacturers or, in a bold step, if they choose not to install systems at all.

Another new name is BOS, which launched earlier this autumn at SMM in Hamburg with an innovative way of evaluating the problem, according to Dr. Jerry Ng, CEO, BOS Ballast Water Management Solution. "Most systems require treating the water, and treating the water consumes a lot of power, and the IMO has recently announced that it intends to cut greenhouse gas emissions 50% by 2050. There must be a better way."

The BOS way is a 'one size fits all, one price fits all' system. The first of its kind Bos Natural Ballast system uses a ballast water measuring and monitoring feedback methodology to ensure compliance to D2 standard without the increased GHG emission and enormous CAPEX/OPEX. BOS Natural Ballast has a small footprint and is easy to retrofit/install without the need for the ship to stop operation.

Adm. Davidson Earns SNA's "Old Salt" Award

By Yonca Poyraz-Dogan, Navy Office of Information Public Affairs

Adm. Philip S. Davidson, commander of U.S. Indo-Pacific Command (USINDOPACOM), became the Navy's newest "Old Salt" during an award presentation Oct. 22 at the Pentagon.

The "Old Salt" award is given to the active duty officer who has held the Surface Warfare Officer (SWO) qualification for the longest amount of time.

"It is a tremendous honor to receive this award. I have been fortunate to be part of this organization for more than 35 years, serving alongside a number of amazing men and women. This award honors them, those who have come before, and those still yet to serve," said Davidson who became the 20th recipient of the award, which is sponsored by the Surface Navy Association (SNA).

A 1982 graduate of the U.S. Naval Academy, Davidson is the 25th commander of USINDOPACOM, America's oldest and largest military combatant command located in Hawaii. As a surface warfare of-ficer, he has deployed across the globe in frigates, destroyers, cruisers and aircraft carriers.

Davidson received the award from Adm. Kurt W. Tidd, commander of the U.S. Southern Command.

Initiated in 1988, the "Old Salt" award is accompanied by a bronze statue depicting a naval officer on the pitching deck of a ship. The statue is cast from metal salvaged from historic U.S. naval ships, most notably the battleship USS Maine, which exploded and sank in Havana Harbor in 1898, precipitating the Spanish-American War.

Holding the award since 2015, Tidd said, "From its very earliest days, our Navy has been before all else a profession of Sailors -- that closely knit team of men and women who have made it their life's work to 'go down to the sea in ships.' It's been an honor and a privilege to play a small part in the history of this organization and to have held the title of 'Old Salt.' As I pass this distinction on to Admiral Da-vidson, I also pass along my very best wishes to him, our Navy's newest 'Old Salt'."

"Old Salts" have their names engraved on brass plates attached to the base of the "Old Salt" statue. The statue is then held in the custody of the current "Old Salt" during the recipient's active duty ten-ure. The "Old Salt" trophy may be kept in possession of the recipient or displayed by the command to which the Old Salt is assigned.

Adm. Phil Davidson, commander of U.S. Indo-Pacific Command, right, and Adm. Kurt W. Tidd, commander of U.S. Southern Command, pose with the Old Salt Award during a ceremony at the Pentagon. Davidson received the Old Salt award which is sponsored by the Surface Navy Association (SNA) and is given to the longest serving active-duty officer who is surface warfare officer (SWO) qualified. (U.S. Navy photo by Mass Communication Specialist 2nd Class Paul L. Archer/ Released)

The issuance of the Old Salt Award is a tribute to the Navy's customs and traditions which call the re-spected, experienced, knowledgeable and senior surface warfare officer with the designation as "old salt."

At the ceremony, Davidson and Tidd took a photo with Taylor Randall, the youngest SWO in the room, who received her service warfare qualification in 2016.

Upon Davidson's retirement, the statue will be passed on to the next officer, who will be determined by a search of records, a recommendation by director of surface warfare, and approval by the Board of the SNA, which is a professional organization composed of both military and civilian members dedicated to enhance awareness and support of the U.S. Navy and the surface forces.

The Surface Warfare director of the Department of the Navy determines which officers meet the award criteria which include being in continuous active duty and surface warfare qualification letters.

The award has been held by numerous distinguished leaders, such as, former Chairman of the Joint Chiefs of Staff Adm. Michael Mullen and former Commander of U.S. Fleet Forces Adm. John Harvey.

Former holders of the "Old Salt" award, include Adm. Lee Baggett, Jr.; Rear Adm. Lawrence Layman; Vice Adm. Albert J. Herberger; Vice Adm. Joseph S. Donnell III; Adm. David E. Jeremiah; Vice Adm. Da-vid M. Bennett; Vice Adm. Philip M. Quast; Rear Adm. George F. A. Wagner; Rear Adm. George A. Huchting; Rear Adm. Dennis R. Conley; Rear Adm. James B. Ferguson III; Vice Adm. James F. Amerault; Vice Adm. Rodney Rempt; Adm. Mike Mullen; Adm. John C. Harvey, Jr.; VADM John T. Blake; VADM Michael A. LeFever; and ADM Samuel J. Locklear III.

Hicks takes the Helm at LR Americas

Lloyd's Register (LR) announced that John Hicks is President of Americas Marine & Offshore. Hicks returns to the U.S. after two years of leading LR's Global Passenger Ship Center in Trieste, Italy as Global Passenger Ship Sector Manager and Italy's Marine Manager. Previously based in the U.S., he was Business Development Manager for the Americas as well as LR's Applied Technology Group (ATG).

Metal Shark Continues to Grow

Metal Shark is starting to build towboats, entering the market with a contract to build three 120 x 35-ft, river towboats for Florida Marine Transporters, Inc. of Mandeville, La. The towboats will be four-decked, welded-steel, USCG Subchapter "M"-compliant, designed by John W. Gilbert Associates, Inc. Each will be powered by twin Cat 3512C Tier 3 marine diesel engines rated at 1,911 hp each. Construction is underway at Metal Shark Alabama, with deliveries scheduled to start in 2019.

Metal Shark, best known for aluminum constrcution, enters the steel workboat market courtesy of its acquisition of the assets of Horizon Shipbuilding and its 35-acre Alabama shipyard. The company is recruiting in both Louisiana and Alabama, and several notable veterans of the commercial shipbuilding sector have joined Metal Shark, including:

- **Tim Scheib**, former Shipyard Commander of the Norfolk Naval Shipyard, and more recently, President and CEO of Brownsville Marine Products. He is President of Metal Shark, and directs the company's production operations.
- **Mike Hennessey**, former Brownsville Marine Products VP of Sales and Marketing, now serves as Metal Shark's Director of Commercial Sales – Inland Waterways.
- **Billy Smith III**, former founder, shareholder, and VP of Trinity Yachts, LLC., will serve as a Key Account Manager for Metal Shark.
- **Doug Barrow**, formerly General Manager of Great Lakes Towing Company and Great Lakes Shipyard, now serves as a VP at Metal Shark and directs operations at Metal Shark Alabama.
- **Travis Short**, formerly President and CEO of Horizon Shipbuilding, now serves as an Executive VP at Metal Shark Alabama.

Damen Maaskant Shipyards Stellendam Celebrates 70

On Saturday 13 October a party was held at Damen Maaskant Shipyards Stellendam (DMSS) to mark three key events; the 70th anniversary of the foundation of the yard, the departure of Managing Director **Frits van Dongen**, who has worked at Damen for the past 40 years, with 25 of those as managing director of DMSS, and the appointment of **Eric Moerkerk** in his place. Founded by Piet Maaskant and his two sons in 1948 as a repair yard in Bruinisse for the local fishing boats, the yard that is now DMSS has, despite a subsequent move to Stellendam, stayed true to its roots. It has developed a side specialization in maintaining winches, but it has also built 627 new vessels, many of which have been fishing boats.

This has been a cyclical market, but in the current decade the yard has benefited from demand from the offshore industry and, more recently, an upturn once again in the fishing industry.

Recent deliveries have included the completion of the first new beam trawler in the Dutch fleet in a decade, and two innovative, tightly designed fly shooter & twin rig vessels.

Cimolai: Giving Workboats a Heavy Lift

While lifting superyachts or workboats may sometimes appear seamless, it is not an easy job. Italy's Cimolai Technology is long-experienced with a broad project portfolio of delivering some of the largest boat hoists worldwide.

Cimolai Technology is an Italian company specialized in the design and manufacture of special lifting and handling equipment for the maritime industry, as well as for civil works and special applications. A family run company, Cimolai Technology is part of a group headed by a leader in the steel industry, Cimolai S.p.A., which was set up soon after the end of WWII by Armando Cimolai and his wife, Albina. They started in a small workshop producing steel gates and windows, and few years later, thanks also to the advent of their sons, the business expanded up to becoming an "empire of the steel construction industry", as a matter of fact the group today processes 150,000 metric tons of steel structures per year in 10 workshops, with 3,000 employees and a worldwide coverage of more than 58 countries. Cimolai S.p.A. has participated in a number of high-profile global projects, such as the set of lock gates of the Panama Canal, the Millennium Stadium in Cardiff, the Bayonne bridge in New Jersey, the Margaret Hunt Hill Bridge in Dallas, the Louis Armstrong Stadium and the WTC New Transportation hub in New York, to name a few.

With this background, Roberto Cimolai – Armando's youngest son – together with a team of skilled engineers established Cimolai Technology S.p.A. that has grown and become internationally renowned, a staff with high engineering skills leading Cimolai Technology to be a supplier of customized, special handling solutions for various fields of activities and applications.

Recently, Cimolai Technology has delivered to the shipyard S.T.P.-Servicios Técnicos Portuarios- in Palma de Mallorca, Spain, the model MBH 1000: a boat hoist that is 26-m long, 12.5-m wide and 25-m high and can lift up to 1000-metric tons boats: reportedly the biggest boat hoist in Europe for its size and lifting capacity. This equipment has been specifically studied and designed to adapt to the shipyard's needs with special technical features that give it more versatility and flexibility. It is equipped with two engines that comply with Stage IV/EPA Tier 4 Final standards, as Cimolai Technology's equipment meets specific anti-pollution requirements of each country where the company operates.

The delivery of the MBH 1000 is the result of a new need in the boat lifting sector, as demands for larger and greater capacity boat hoists are growing, not only in the yacht industry but also in shipbuilding and repair of working vessels, military and tugs. Cimolai Technology, in fact, has been awarded the supply of a mobile boat hoist with a lifting capacity of 1300 metric tons for Bayonne Dry Dock & Repair Corp., serving the busy New York/New Jersey market on the east coast of the United States. The equipment will be delivered in mid-2019 and will be the biggest boat hoist worldwide, while in early 2019 a 1,120-ton unit will be delivered to BSE Group Assets PTY LTD in Australia., making it the largest in that area.

Since 2011 when the company delivered in Qatar the MBH 1100, a boat hoist with a lifting capacity of 1100 metric tons which is currently the biggest worldwide, little by little it has ranked as a top supplier of large-size lifting equipment.

For the maritime industry, not only has Cimolai Technology specialized in the manufacturing of boat hoists, but also of handling systems for various purposes, such as gantry cranes on rails or on tyres, modular trolleys, ship-lift platforms and transfer systems.

Soon a new ambitious project will be completed in Italy: Palumbo Group, a renowned Italian shipyard, has commissioned Cimolai Technology to design and construct a ship-lift platform, capacity 3300 metric tons to launch and dry-dock ships. The project will engage a team of Cimolai Technology's engineers that will work to have the platform ready to be used by early 2019.

"The secret is offering our customers what they need, tailoring our equipment specifically to fulfill their requirements with the latest technologies and state-of-the-art solutions, with no limits, to be at the forefront of the industry. This is our mission." said CEO Roberto Cimolai.

Photo: Cimolai

New Antifouling Method for Workboats

Fouling has been a well-known problem in the maritime industry for a long time. The most popular way of preventing fouling continues to be the use biocide-based antifouling paints. When it comes into contact with seawater, the paint releases toxic biocides which prevent marine growth. However, with biocides under the microscope, a new way of thinking is required. An initial step was the worldwide prohibition of antifouling coatings containing tributyltin (TBT) in 2008. The new EU biocide regulation was adopted in 2013, will set new standards. According to this regulation all biocide-based products must be approved before entering the European market.

Only those products, whose substances have been authorized, will be approved. Experts assume, that, when finally becoming valid in 2019, the EU regulation will cause an increasing demand for alternative antifouling coatings. RENOLIT is a family-owned business, a manufacturer of high-quality plastic films. The company developed a new product solving the problem of toxic antifouling coatings: the film RENOLIT DOLPHIN S. Based on the principle of fouling release, this film offers an alternative option to conventional paints.

The biocide-free RENOLIT DOLPHIN S is IMO-certified and thereby complies with the IMO AFS International Convention on the Harmful Anti-Fouling Systems on Ship (2001).

One of the film´s unique features is the ability to turn the ship's hull into an amphiphilic surface. Studies have shown that there are certain types of barnacles which primarily adhere to hydrophobic surfaces and other types which adhere primarily to hydrophilic surfaces. Previous antifouling coatings based on silicone have only hydrophobic properties; Therefore, they would solely prevent the adhesion of the barnacles adhering on hydrophobic surfaces. The RENOLIT DOLPHIN S film combines these two properties and is thereby 'amphiphilic'. Due to these attributes, marine organisms cannot entirely adhere to the ship's hull and are simply washed off by the speed of the moving vessel (above 7 knots).

The Institute for Hygiene and Microbiology (formerly LimnoMar) is investigating the long-term effects of the films in direct comparison with other antifouling coatings since more than three years. In July 2015, a PVC plate was prepared with the RENOLIT DOLPHIN S and exposed in the Port of Norderney.

On the whole, 20 inspections have been carried out checking the films for any traces of barnacles, shells, algae or biofouling. The results are summed up in a so-called "Fouling Rating" (FR). On a scale from 1 to 100 (0 = full fouling; 100 = no fouling at all) the effectiveness of the film is rated.

The last inspection was conducted on 14 June 2018. After approximately 36 months by then, the RENOLIT DOLPHIN S shows only a small amount of barnacle seeds (1 percent) with a size of one millimeter. Apart from this, a slight biofilm (5 percent) is apparent. Overall, the film is rated with a FR of 98. A conventional silicon coating being tested in direct comparison, was rated with a FR of 96 after the same period of time. However, it shows barnacle fouling of barnacles (3 percent, size up to 6mm) as well as scratches (1 percent), barnacle imprint (2 percent) and flaking (1 percent) and a slight biofilm (5 percent).

Field Tests

In February 2016, the RENOLIT DOLPHIN S film was applied to the hull of the mooring boat Lütt Deern. In October 2017, it had to be taken out of the water for repair work. It provided the perfect opportunity to examine the special functionality of the film. At this year´s SMM, Benito di Racca, owner of the Lütt Deern and Managing Partner of H.S.H. Schleppgesellschaft mbH, shared his experiences with the film. 'We use the film since more than two years and we never had problems. When the boat was taken out of the water, there was hardly any deposit build-up on the hull. No fouling, no shells. For me, this means that the film works.' A further advantage of the film: A part of the film which was damaged in an accident in spring 2017 could easily be fixed with small film patches.

www.renolit-maritime.com

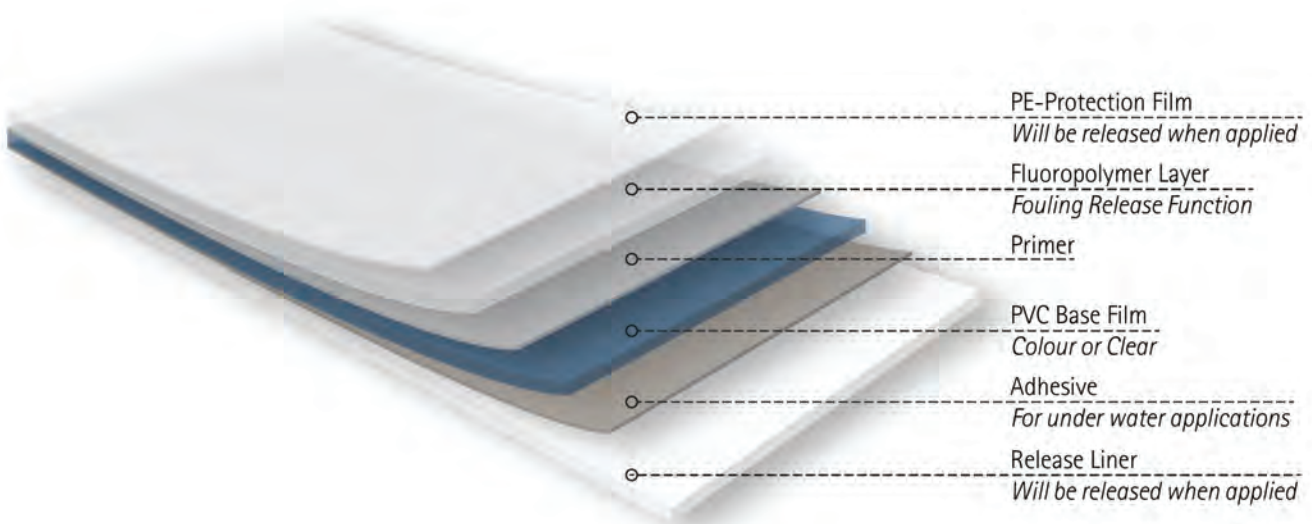


Photo: Copyright RENOLIT

Three Balearia Ferries to Convert to LNG

Spain's Baleària will convert three ferries from diesel to LNG dual fuel using Caterpillar and MaK solutions.

Incorporating the MaK DF engines will virtually eliminate the sulfur and particulate matter in the exhaust gases, while also cutting down NOx, resulting in even lower CO2 emissions. The three ferries to be converted are Abel Matutes, Bahama Mama, and Martin i Soler, each currently equipped with a pair of MaK 9 M 43 C main engines. After the conversion, the vessels will operate on two MaK 9 M 46 DF engines, which has a rated engine output of 8685kW. The MaK engines are used in a control pitch propeller application with a gearbox. The conversion will allow the engines to be powered by gas. Caterpillar will provide DF-Engine conversion kits and all the required engine modules including an ignition fuel oil module, engine ventilation modules, an exhaust gas ventilation module, GVU ventilation modules, and gas valve units with housing.

Included in its planning to expand and renew its fleet, Baleària will also replace the existing main engines on board their high-speed ferry 'Jaume III' with four new Caterpillar 16-cylinder C280 propulsion engines; each engine delivers 5650 kW at 1000 rpm. A similar repower was done back in 2017 on board the sister vessel 'Jaume II' resulting in a notable increase in efficiency and service, with the ship being able to reach high transit speed.

Photo: Caterpillar MaK

Cat Debuts New Thruster

Caterpillar Marine announced the new MTA v3, the company's latest generation azimuth thruster, which is available now. The MTA v3 lineup currently covers the entire Cat 3500 range with the MTA 524, 627 and 628 from a power range of 1500-2525kW. It provides the benefits of large savings in maintenance costs, lower maintenance and ser-vice risks, and simple FiFi installation.

Optional nozzle profiles are available depending on operation profile. In comparison to the MTA v2, the MTA v3 is 20% lighter in weight, has decreased oil volume by 27%, and has an increased power density of 25%. Additional improvements from previous MTA generations include a 3% bollard pull increase. The normal auxiliaries for azimuth thrusters such as hydraulic power pack, gravity tank, filters, cooler and clutch hydraulics have all been integrated onto the azimuth unit itself, resulting in reduced space consumption and installation time. With the introduction of the hybrid interface it enables switch ability between mechanically and electric power for the azimuth thrusters. Hence, users can achieve a higher average engine load by running only the necessary engines or generator sets dependent upon the operation mode. This creates the possibility for reduced fuel consumption. Reduced mainte-nance costs can also be achieved by running fewer hours on the main engines.

- **Standby and Low-Speed Transits** can be operated on full diesel-electric mode.
- **High-Speed Transit and Light Towing** mode can be operated on full power with the main engines powering thruster and electrical load from the gensets.
- **Full Power mode** provides the maximum performance available. The main engines and booster motors operate together to achieve full power, providing the maximum performance available. Full power operation also provides the best possible acceleration from the engine and gensets.
- **Fire Fighting mode** where FiFi pump is powered by the main engines while the azimuth thrusters are pow-ered by genset and electrical motors.

Photo: Caterpillar

North Sea Giant turns to The Switch

North Sea Giant, one of the world's largest and most advanced subsea construction vessels (OSV), installed a system based on a unique Electronic Bus Link (EBL) from Yaskawa Environmental Energy/The Switch, helping to enable the 18,151 GWT vessel to change between its diesel engines, running just one of its diesel engines during many operations, when necessary, rather than the standard three it used at all times in the past.

Yaskawa Environmental Energy/The Switch is a specialist in the development and supply of advanced drive train solutions. Since acquiring Wärtsilä Drives in November 2016 to help build its marine market share, it has gone on to secure many orders for its established permanent magnet (PM) shaft generators, DC-Hub technology and electric propulsion solutions. The North Sea Giant EBL order is the company's first for this breakthrough product.

"It works to connect the vessel's DC-Hubs and diesel engines and ensure efficient ongoing operations, even if a critical fault occurs," said Asbjørn Halsebakke, General Manager, Yaskawa Environmental Energy/The Switch Norway. "It does this by splitting the on-board grids in a matter of microseconds, isolating faults and protecting the complete operational system. This offers significant savings on maintenance costs. Also, by rapidly connecting and disconnecting energy sources from one another, including batteries and engines, they can be optimized for efficiency. This eliminates the need for the operator to run three different units during all operations, saving on long-term fuel costs and reducing emissions."

"This is the first vessel in the world approved to run a DP3 class dynamic positioning system with one engine and batteries – a global game changer," said Halsebakke. The Switch technology, supplied as part of a broader Wärtsilä solution, was installed in Haugesund, Norway, after a program of rigorous testing supervised by DNV GL.

Watch: Asbjørn Halsebakke, General Manager, Yaskawa Environmental Energy/The Switch Norway, discuss this innovative technology on "MR TV" at: https://www.marinelink.com/videos/video/modern-flexible-power-for-commercial-ships-100273.

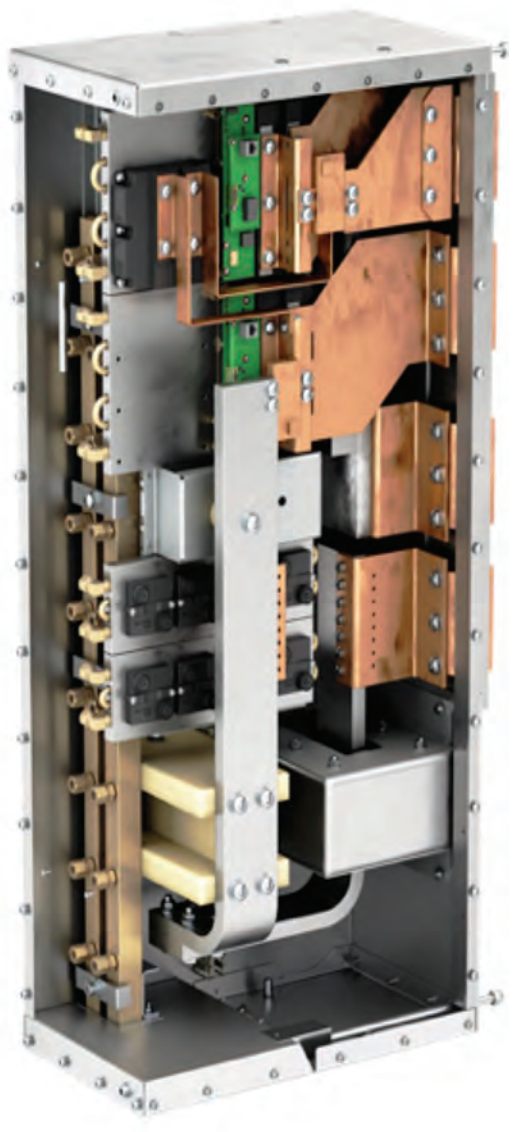


Photo: The Switch

Photo: Schottel

Schottel-propelled tugs for Med Marine

With the new tug "MED XXIX", which was recently put into service, Turkey-based Med Marine's new fleet of six Schottel-propelled vessels is now complete, a family of ASD-type tugs designed for harbor and terminal operations as well as for coastal towing.

The main propulsion for the RAmparts 2300-MM consists of a pair of Caterpillar CAT 3512C engines, each rated with 1,380 bkW at 1,600 rpm, and each driving a Schottel SRP 340 azimuthing stern drive unit with fixed-pitch propellers of 2,100 mm diameter enabling a free sailing speed of 12 knots. A diesel-driven fire-fighting (FiFi) pump for the tugs' FiFi E system is mounted on one of the main engines.

"As can be seen throughout the fleet, the Schottel Rudderpropellers have proven to be suitable for many applications, as they come in a robust design and offer easy handling for maneuvering," said Muhammet Gökhan Med Marine's Business Development Manager. The principal characteristics of the SRP derive from the combination of propulsion and azimuth steering. There is consequently no need for a rudder, and the engine power is optimally converted into thrust. The 360° rotation of the Rudderpropeller means that the full input power is available for maneuvering. RAmparts 2300-MM is an exclusive Robert Allan design for Med Marine. Each of the six vessels measures 23 x 10.9 m with a 4.4m draft.

MOL Trials Intelligent Awareness Technology

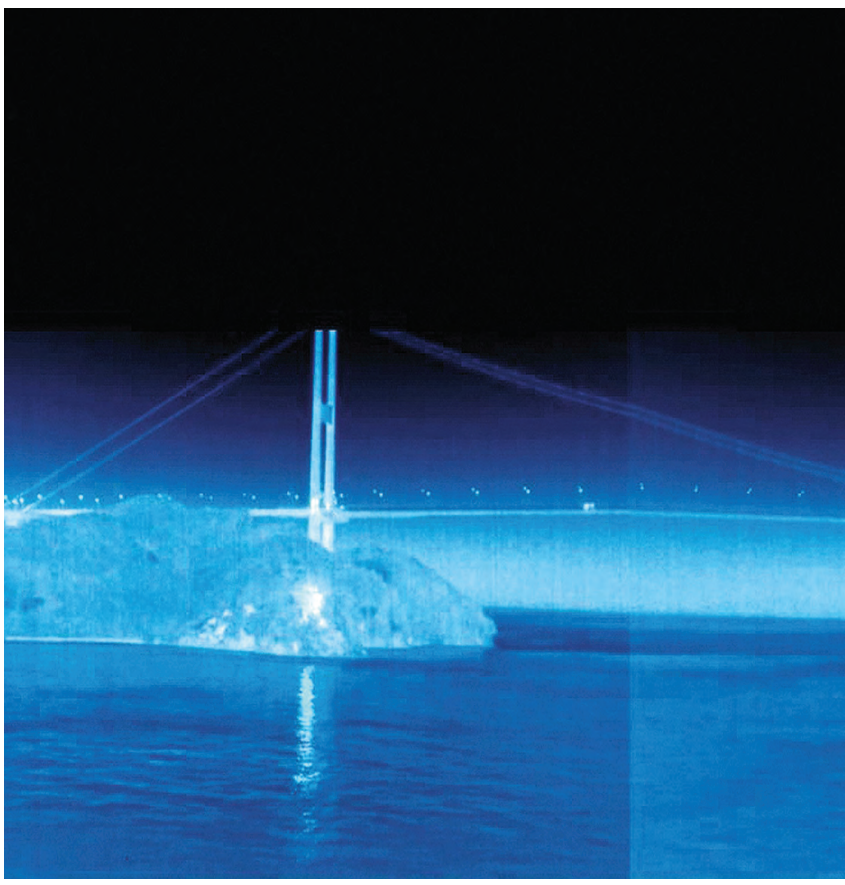
The capacity for Intelligent Awareness and machine learning technologies to significantly improve navigational safety has been verified by Rolls-Royce and Japan's Mitsui O.S.K. Lines, Ltd. (MOL), following the success of a pilot project aboard a 165m passenger ferry, Sunflower Gold. Results from sea trials on the vessel, which operates night-time sailings between Kobe and Oita, Japan, found that the navigating officers were able to visually detect objects that would otherwise have been cloaked by the blackness of night. The vessel navigates the Akashi Kaikyo, Bisan Seto and Kurushima Straits, some of the most challenging routes in the world. However, operations are more difficult during night-time crossings when these routes become heavily congested with fishing nets and small to mid-sized fishing vessels.

Rolls-Royce installed an array of Intelligent Awareness sensors, thermal imaging cameras and its revolutionary Light Detection and Ranging (LIDAR) system on the vessel in April 2018, following the 2017 signing of a joint development agreement with MOL.

The technology was fused together to give the vessel's bridge team day-time-like situational awareness of the surrounding area, providing enhanced decision-making capability and improving the safety of the vessel.

Data obtained from this and other Rolls-Royce Intelligent Awareness (IA) projects will now be fed into the company's machine learning algorithms to further develop the IA system, with the objective of putting a permanent installation aboard the Sunflower Gold later this year.

Watch: Yoshikazu Kawagoe, CTO, Mitsui O.S.K. Lines discusses marine tech trends on MR TV at: https://www.marinelink.com/videos/video/mol-invests-in-fleet-of-the-future-100271



Humphree Interceptors Seastreak Ferry

The latest Seastreak ferry features interceptors and Active Ride Control supplied by Humphree USA to help ensure a smooth ride. Seastreak Commodore is the biggest and fastest passenger ferry in the Seastreak fleet, a 150-ft. catamaran that can carry up to 600 passengers on daily commuter runs between Sandy Hook, NJ, and the East 35th Street terminal in New York City. On weekends, the boat makes offshore trips to Martha's Vineyard and Nantucket. The ferry was designed by Incat Crowther and built at the Gulf Craft shipyard in Franklin, La. The catamaran is powered by four MTU Tier 3 diesels with waterjet drives. The vessel has a top speed of 39 knots and normally cruises at 30+ knots.

For the large passenger catamaran Humphree designed a stabilization system consisting of eight HA750 interceptors, four on each hull. Each interceptor has retractable vertical blades, which deploy instantly to create lift that counteracts roll and pitch motions. The result is a steady, stable platform regardless of wind and wave conditions. The Humphree Active Ride Control also automatically optimizes the ferry's trim, list and heel angles, using inputs from GPS, gyro and accelerometers to measure 3D rates of turn and acceleration.

Photo: Seastreak/Humphree Interceptors

MacGregor Launches Breakbulk Optimizer

MacGregor, part of Cargotec, introduced a new breakbulk cargo stowage solution, the Breakbulk Optimizer, which enables operators to rapidly and optimally plan the stowage of many different cargoes. "The MacGregor Breakbulk Optimizer is the first automated, cloud-based application for the optimized stowage of breakbulk and general cargoes," said Magnus Sjöberg, Senior Vice President, Cargo Handling, MacGregor.

"It makes full use of MacGregor's expertise in cargo handling systems combined with Navis' expertise in loading computers and stowage planning know-how on container ships." Navis is also part of Cargotec.

The new application from MacGregor optimizes breakbulk vessel stowage plans by taking into consideration all influencing factors including what cargo is already on board, incoming cargoes, available cargo space, the actual capability of the cargo handling system, port rotations and vessel stability.

Currently, breakbulk stowage planning mostly relies on time-consuming, manual planning processes based on the capability and experience of an individual planner or team of planners.

No-shows of cargoes and last-minute changes can further add to the time it takes to complete an optimal stowage plan.

macgregor.com

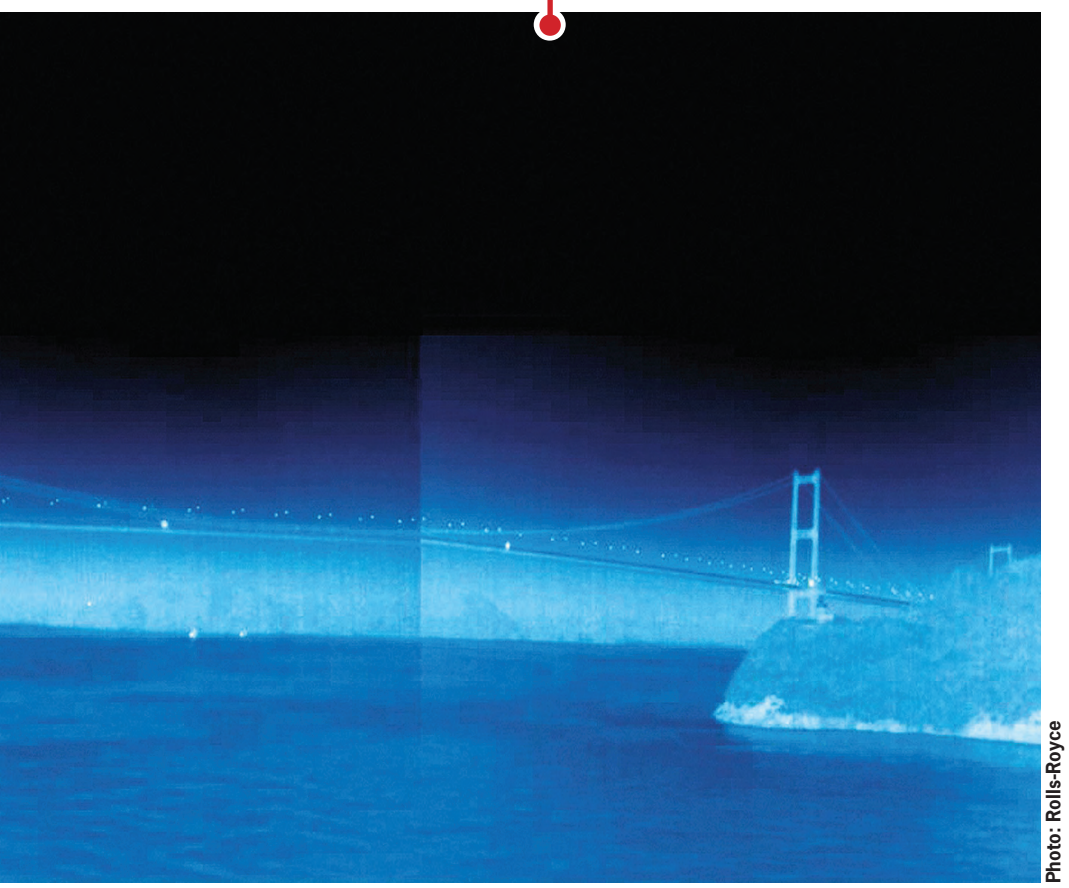
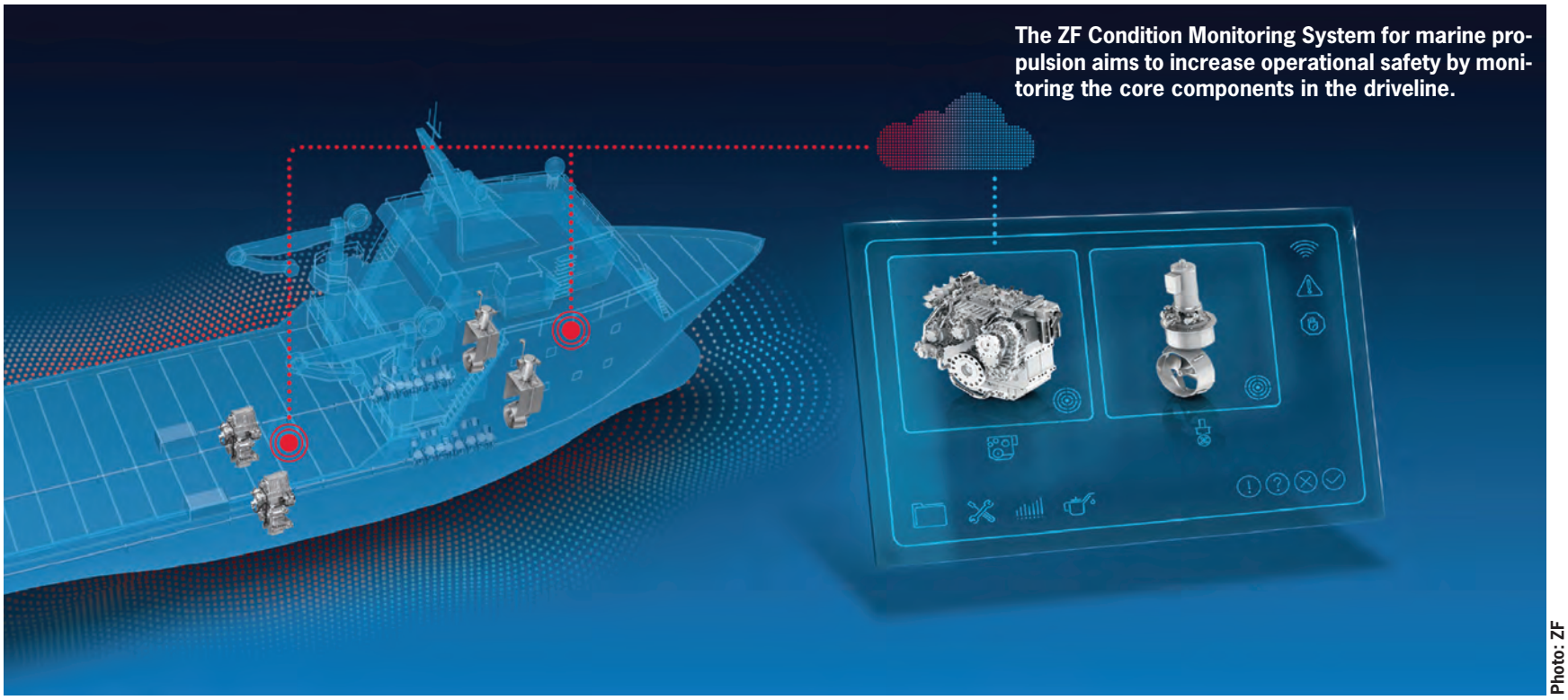


Photo: Rolls-Royce



The ZF Condition Monitoring System for marine propulsion aims to increase operational safety by monitoring the core components in the driveline.

Photo: ZF

ZF Condition Monitoring

Monitoring current data from the driveline as well as the status of core components makes it possible to avoid failures and plan maintenance work effectively. This is designed to shorten downtime, lowers operating costs and increases safety on board and at the port. In the standard version, CMS determines typical parameters such as oil level and pressure, as well as input shaft speed, clutch condition and oil temperature, both before and after the cooler. The expanded monitoring of the second level measures oscillation in the system and the state of the oil with regard to particle and water content. At the third level, CMS measures the actual transferred torque in the drive system using dynamic load monitoring (DLM), which makes it possible to detect changes in the performance of the components early on.

The condition monitoring system from ZF includes various sensors as well as an intelligent electronic evaluation unit. The OPENMATICS platform developed by ZF safely transfers the collected data and information to the ZF Cloud, where customers can access them. OPENMATICS allows for the integration of further data and systems to optimize the operation of ships and can therefore be expanded as needed.

CMS is a further step which ZF is taking toward a smart marine propulsion system. This intelligent system bundles all important data to optimize ship operation, save costs and provide critical information in emergency situations.

New Deere Engine Ships

John Deere Power Systems is shipping the new PowerTech 4045SFM85 marine engine to boat owners and builders. The manufacturer touts the PowerTech 4045SFM85's power-to-weight, torque and compact size, saying it is suited for planing and semi-displacement hulls. The PowerTech 4045SFM85 engine has two ratings:

- An M4 rating with 205 kW (275 hp) at 2600 rpm, and
- An M5 rating with 235 kW (315 hp) at 2800 rpm.

These ratings are ideal for light-duty commercial vessels, high-speed governmental applications and high-speed pleasure crafts. Both the M4 and M5 ratings are applicable to commercial and recreational applications.

To put the engine through its paces to confirm performance, John Deere partnered with end-users to gather data from a bow picker, crabber, dive boat and recreational vessel. The 4045SFM85 engine ratings meet U.S. Environmental Protection Agency Marine Tier 3 and Recreational Craft Directive II emissions regulations, as well as International Maritime Organization Tier II standards for commercial and recreational applications. To date, this is the only known ABS-certified, 315 hp, 4-cylinder in-board diesel engine that will be type approved by the American Bureau of Shipping, DNV GL, Lloyd's Register and Bureau Veritas, according to the manufacturer.

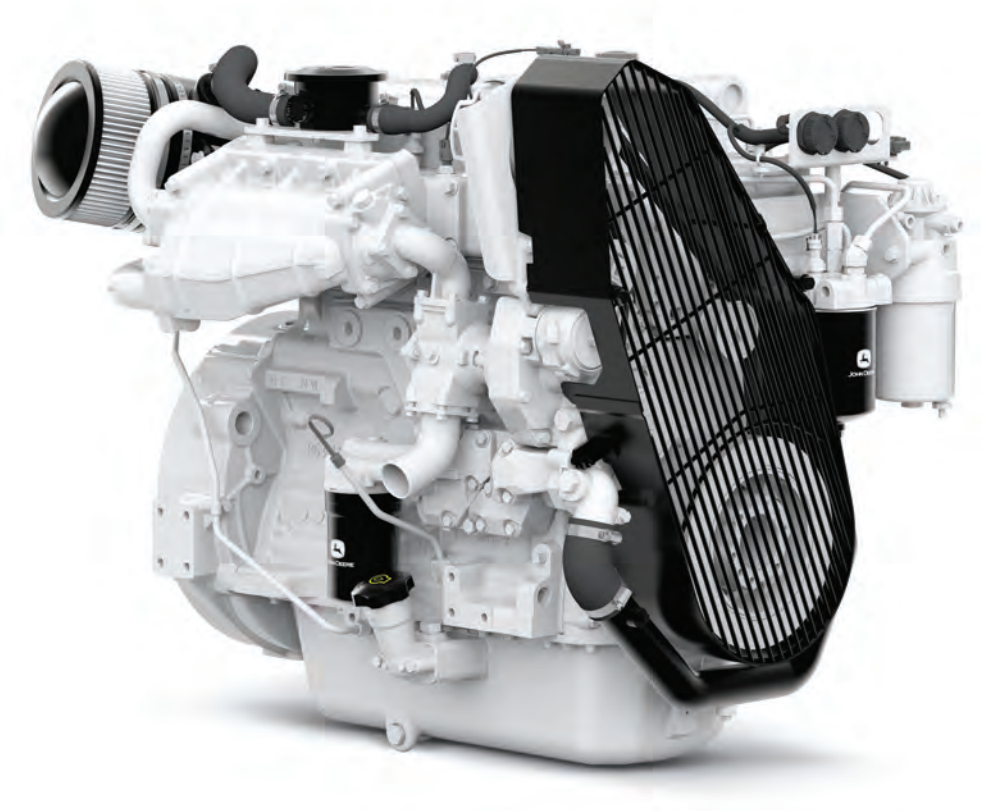


Photo: John Deere

Hybrid Propulsion for Super Yachts

RH Marine introduced pre-composed hybrid packages to convert conventional superyachts power systems to battery powered hybrid solutions. The three pre-engineered packages that can be installed onboard an existing yacht during a refit. The three packages vary in size and energy storage from 250 kWh up to 750 kWh. The hybrid solution also provides a reliable shore supply, solving the problem of blackouts in harbors and allowing complete silence on board during anchoring. RH Marine's Rhodium Energy Management System (EMS), using a self-learning artificial intelligence algorithm, automatically distributes the power demand over the available diesel generators and batteries. The system controls all energy sources to operate on their most optimal point, thus ensuring optimal operation given an (operational) goal.

Allweiler to Roll Out New Centrifugal Pumps

Allweiler GmbH offers a redesigned vertical centrifugal pump solution for ship engine rooms. "The new compact MA-S and MA-C series are vertically installed centrifugal pumps with axial inlets and radial outlets," said Christian Martin, Senior Director Product Management. "The S version was designed for simple and rapid assembly and disassembly of the insert unit with impeller. The C version offers the same reliability with a significantly shorter installa-tion height, so it's perfect for customers with severe space restrictions."

Both versions use a new and patented foot design and have a footprint that is up to 23 percent smaller than the predecessor model. In this shorter, lighter version, the suction flange was redesigned with integrated fixing holes for pedestal mounting on the ship's foundation.

Allweiler said this arrangement extends the pump's service life and reduces wear to the bearing and shaft seal by directing forces from the pipeline directly into the foundation. It also helps avoid damages at the impeller and cas-ing.

Photo: CIRCOR International

Kongsberg Condition Monitoring Solutions

Kongsberg recently debuted its new integrated Condition Monitoring solutions, solutions designed to enable personnel on board and ashore to optimize asset condition and equipment lifecycles by establishing and evaluating local maintenance plans and conducting fleet-wide comparisons and benchmarking.

Applicable to all vessel types in relation to diesel and dual fuel engines, generator sets, compressors, thrusters, pumps, fans, blowers and chillers, and gears and bearings, the new solutions leverage Kongsberg Maritime's experience in sensor technology, secure data handling and high-speed pro-cessing technology. The solutions measure and evaluate all integrated asset sensors during operation.

Eastern Shipbuilding Battles Back

In the wake of the devastation of Hurricane Michael, ESG begins the road back to the 'new normal.' There are two reasons why I wouldn't bet against them.

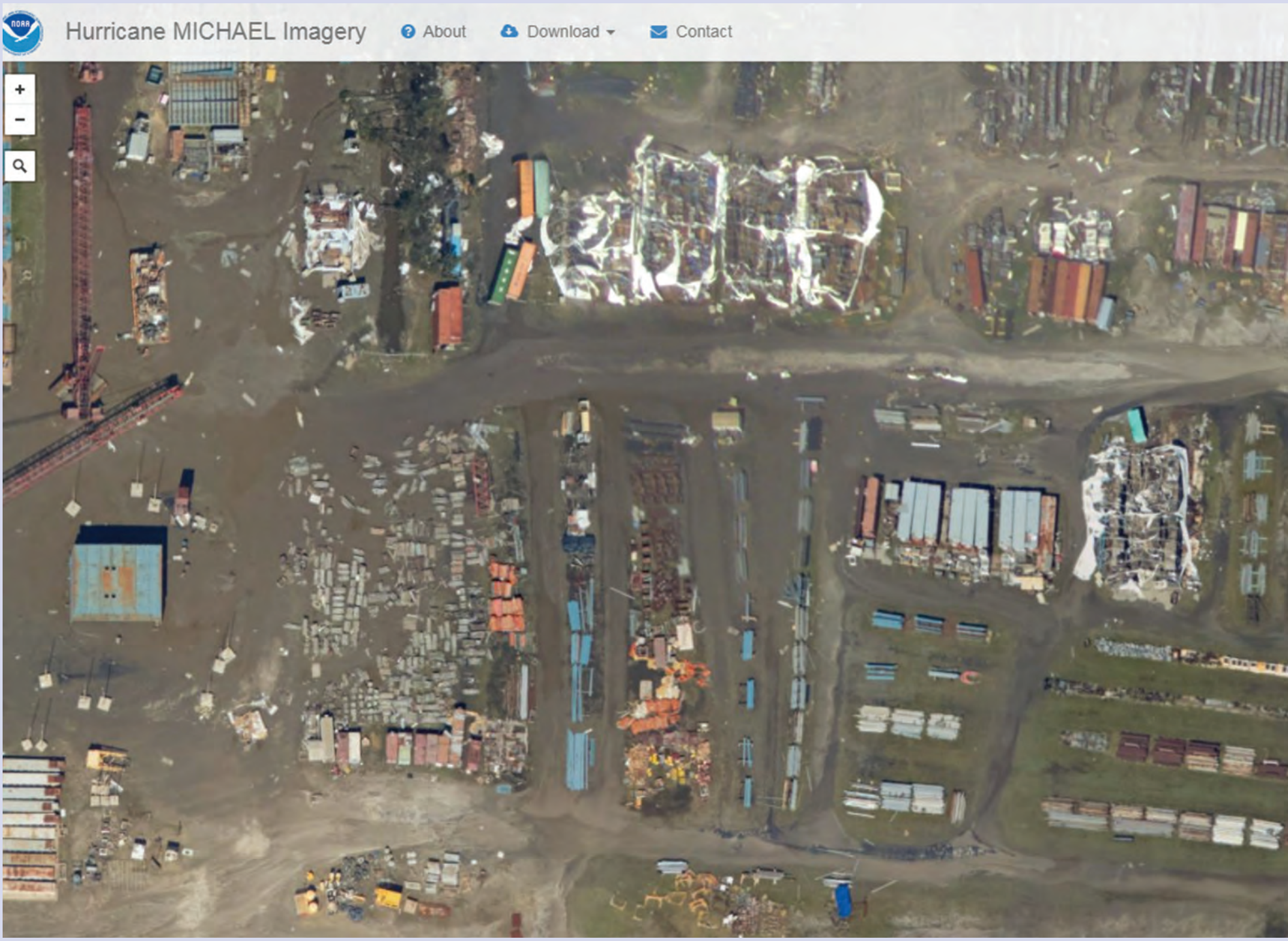
By Joseph Keefe

Florida Gulf Coast-based Eastern Shipbuilding Group has resumed operations at both of its two main shipbuilding facilities just two weeks after Hurricane Michael devastated Panama City Florida and the surrounding communities. Unquestionably the most powerful storm to ever make landfall in the Florida Panhandle, Hurricane Michael was the third most powerful hurricane to make landfall in the United States. Its impact on the Panhandle was profound and within the gates of Eastern Shipbuilding's two sprawling production facilities, the damage was unparalleled.

For its part, Eastern first took a 'family' approach to its recovery, stressing the basic needs of its employees first, and then embarking on the careful task of picking up the pieces. The second part – probably in no small thanks to their first effort – has yielded immediate fruit and today, ESG President Joey D'Isernia says that the majority of ESG's workforce has already returned to work, as well as all its U.S. Coast Guard OPC dedicated staff. In a prepared statement released on November 1, D'Isernia said, "Today, our staffing levels exceed 80% of our pre-Hurricane Michael levels and is rising daily." The firm reports working closely with its federal, state and commercial partners over the past two weeks to provide updates on the shipyard as well as on projects currently under construction. Power was restored to ESG's Nelson Facility on 10-21-18 and at ESG's Allanton Facility on 10-24-18 and production of vessels under contract is ramping back up.

Gulfport: Blueprint for Recovery?

As enormous as the Panhandle's rebuilding task ahead might seem, there



is real precedent for what might come next, how that gets done, and why it probably will. And, those who doubt that eventuality only need to look down the coastline to the port of Gulfport, Mississippi for guidance. That's because until Hurricane Katrina crushed the port and coastline with 125 mph winds and the force of a 25-foot storm surge in 2005, the Port of Gulfport, Mississippi was, in the words of MLPro contributor Rick Eyerdam, "a dynamic force, importing Chiquita bananas and Dole fruit from Central America and exporting wood products, and Tyson frozen chicken parts to Russia."

Arguably, the situation in both the port and the city of Gulfport – then with a population of about 72,000 – was just as bad, and in some respects worse than what recently occurred in the Florida Panhandle. In Gulfport, the bad luck that began with Katrina cascaded with the subsequent arrival of Hurricanes Gustav and Isaac and the BP oil spill in 2010.

The aftermath was simply staggering: the casino was leveled, the recreational and commercial ports were destroyed and most businesses near the coast were erased. The Port of Gulfport was in equally bad shape.

Approximately 430,000 square feet of waterfront warehouses and freezer facilities were completely destroyed by Hurricane Katrina. The one container gantry crane, the bulk vessel loader, banana conveyer system and support buildings were lost. The wharf area on the West Pier was severely damaged and unusable including approximately 2,100 linear feet of berthing area and 420,000 square feet of wharf deck. The task ahead to rebuild was daunting, and to many, it looked impossible.

Nevertheless, the port, one-by-one, retained tenants and attracted others as it rebuilt. These include Chiquita, Dole Food Company, Crowley Maritime, Chemours, McDermott International, Inc., Topship, LLC, and The University of Southern Mississippi. The Port also has one non-maritime tenant, the rebuilt Island View Casino Resort. The combination of local sweat equity, federal grants and assistance and the tenacity to come back even better were all driving forces in Gulfport.

Today, McDermott International is locating pipeline-finishing operations on the East Pier of the port. The new shipyard operated by Topship, a unit of Edison Chouest Offshore, builds service and supply vessels for the oil and gas industry. Gulfport is back, without a doubt, it is back better than ever. MLPro readers can find out how and why, by clicking HERE to read Rick Eyerdam's fine account of this port's success story, which first appeared in our September/October edition of Maritime Logistics Professional magazine.

Real Estate & ESG's Road Ahead

Having visited both of Eastern's shipbuilding facilities in the not-too-distant past, I have a unique perspective on what's likely to come next. For starters, one factor that will probably propel this recovery more quickly to its inevitable conclusion is the same reality that helped to make the firm's Florida business a success to begin with. And, that, in a word, is: real estate.

The highly successful Korean Shipbuilding model of series-build production depends on many things, but the lynchpin of what makes it really work arguably boils down to what boatbuilders refer to as "lay down" space. Fred Harris of NASSCO fame (and other yards) worshiped the template to the point where an entire conference table in his San Diego offices was dedicated to a step-by-step visual of how it was done. Harris, in his heyday, had few peers when it came to series-build efficiencies, even in the space constrained confines of NASSCO. Those basic concepts are no less valid today.

In a nutshell, "lay-down" space allows builders to more efficiently position the equipment, steel and tools necessary for assembly. Without it, the process becomes cumbersome and time is wasted on last minute positioning of the necessary materials during the manufacturing process. It can be a problem for U.S. yards, especially those situated in urban areas where sadly there just isn't any room to expand. In places like China, however, when space becomes an issue, they typically just bulldoze whatever was next door. And, there won't be an EIA to delay the process.

Circling back to ESG's sprawling two-yard complex, space is one thing that there's no shortage of. With real estate to spare – a good chunk of which hasn't yet been developed – Eastern's pre-storm efficiency stemmed in part from this reality. Indeed, and when they bid for the USCG's OPC, a key part of that quest involved the claim that they'd have no issue whatsoever in providing the necessary separation for the OPC from their many other commercial projects.

With regard to the recovery and rebuilding process, that same real estate will provide the necessary staging areas for the repairs and new buildings to come and allows the yard to continue operations as it recovers – something that's already underway. Of course, I can't claim to be The shipbuilding subject matter expert, but I know a well-run yard when I see it. At ESG, that standard is unlikely to change.

Road to Recovery

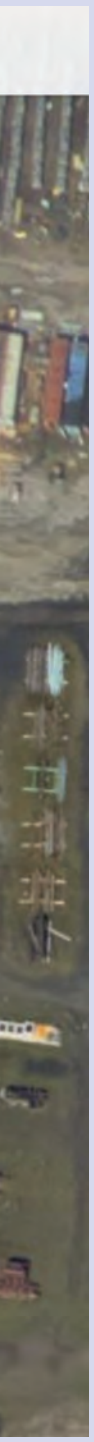
Meanwhile, the work continues on the Panhandle; in the yard, outside the gates rebuilding homes, lives and restoring local infrastructure. Through it all, ESG has importantly taken care of its most precious asset: the employees who make it all possible.

"We are grateful to our partners and the maritime business community as a whole for their support and confidence during the aftermath of this historic storm. Seeing our incredible employees get back to building ships last week was an inspiration," said D'Isernia. "While there is no doubt that the effects of Hurricane Michael will linger with our community for years to come, I can say without reservation that we are open for business and excited about delivering quality vessels to our loyal customers."

I'm confident that they will succeed. That's because, and while there are very few sure bets in life, this one is as close as it gets.

The Author

Joseph Keefe is a 1980 (Deck) graduate of the Massachusetts Maritime Academy and the editor of both Maritime Logistics Professional and MarineNews.



Florida Gulf Coast-based Eastern Shipbuilding Group has resumed operations at both of its two main shipbuilding facilities just two weeks after Hurricane Michael devastated Panama City Florida and the surrounding communities.

MISSION POSSIBLE

MultiMission Vessels have adaptable platforms

By Lisa Overing

Drug interdiction. Crew transport in hostile waters. Law enforcement. Rescue operations. Passenger vessels. Today's MultiMission Vessels (MMVs) are a diverse collection of workboats characterized by adaptable platforms, customized with standard accessories.

A larger budget for electronics and multiple, smart, navigational screens and MDTs challenge the interior configuration of already crowded MMVs, increasingly built with matching FEMA port security grant funds for joint venture operations.

More monohull patrol vessels monitor illegal fishing, while providing flexibility to lead disaster relief, rescue operations, or serve as a platform for research.

"There are workstations and you need a place to run ticket machines, these MDTs or Mobile Data Terminals," said Jeff Clark of WorkSkiff. "Patrol cars and fire trucks are combined into one, on the water, and work with limited space on the boat. The same hull is lengthened or shortened, reconfigured, moving the wheelhouse forward."

"We have a police package, with lights, sirens and underwater lights, and big fendering, said Clark. "Vessels are used for many purposes, to recover disabled fishing boats and perform rescue work, or as a dive boat for victims in distress, and law enforcement.

TULALIP Indian Fish and Game Agency has the WorkSkiff 24 x 8.5-foot MMV, an aluminum boat with an engine bracket and walls around the walk around pilot house built for Tulalip for fisheries management, law enforcement, search and rescue, and fire fighting.

"Accessories allow us to personify a boat in a specific way," said Clark. This is built from a commercial perspective, not a conversion, built to run hard 24/7 and last for 20 years."

WorkSkiff contracted with Boksa Marine Design to offer a series hulls outfitted to meet minimum responses, from oil spill response to police work. The deep vee or modified vee or flat bottom can be modified to be mission and budget sensitive.

The wheelhouse is far to stern, allowing space for deck equipment and personnel. State and law enforcement can use

24 Workskiff M Series multi-mission vessel with walk around pilot house for the Tulalip Indian Fish and Game Agency for fisheries management, law enforcement, search and rescue and fire fighting. Naval architecture and marine engineering by Boksa Marine Design.

Photo: Boksa Marine Design

Photo: Boksa Marine Design

BCSL Gulf Master 58 by North River Boats, for pilots association transporting crew in hostile waters near Venezuela. Naval architecture and marine engineering by Boksa Marine Design.

same hull as the Indians by reconfiguring and moving wheelhouse forward

Working decks accommodate a rescue craft as well as a rigid-hulled inflatable boat (RHIB), with davit.

"We provide a basic design and modify," said Nick Boksa. Boksa Marine Design has designed and engineered the WorkSkiff fleet and many military patrol boats, MMVs and army corp research vessels.

Characterized with a rugged, robust look and excellent seakeeping quality, Boksa said speed, flexibility and being reusable with minor tweaks is top of mind when designing MMVs.

"The boat can be used as a surgery vessel one mission, or as a harbor fire boat for another operator," said Boksa. "Our whale watch tour boat would also be a Navy force protection vessel.

It's the same platform with different purposes because there is different outfitting to meet the mission, from water monitors for fire fighting to machine gun mounts or different power systems on the same hull. Our BMD series for North River Boats are pilot boats that could be crew vessels, too. We consider the operating environment, fresh water lake, river to near shore and offshore."

Boksa tends to like aluminum, light, strong, flexible and doesn't require tooling for modification.

Keel up, custom designs to avoid hostile takeover.

"Our first big project with Nick Boksa wound up being a keel-up design," said Mike Blocher of North River Boats. "We've produced five, keel up designs together and developed a series of pilot and crew transfer boats for pilot associations, including a 52-foot crew transfer boat, Endeavour, and 58-foot Gulf Master."

Endeavour ran workers to Venezuela amid turmoil, cruising unsafe waters. Transferring crew around oil rigs for joint operations, the cabin was designed to transport workers and supplies. The cabin layout was designed with crew seating in mind, and also included working tables for computers and a first aid station for medical transport.

"From the exterior, you can't tell there is a fully enclosed operation enclosure." said Blocher. "You can't tell the glass is any different. It has a safety film applied to prevent breakage.They were worried about someone coming in and taking over the vessel during operation. The issue is to prevent takeover."

Some are designed with pressurized cabins for protection of personnel detecting of CBRNE, where air is pulled from outside and meter tested.

Air is filtered coming in with no outside contaminants.

There's a lot to consider incorporating that," said Blocher. "Thermal imaging multiple navigation displays, satellite overlays, engine data on the dash, dual 12-inch displays, takes up room."

Citing $6,000 - $8,000 as the previous threshold for electronics per vessel, today's electronics budget can easily exceed over $50,000.

"We must incorporate everything and see that it works," said Blocher. It is Increasingly difficult to get everything in these boats. Every single boat is a challenge, but we complete a full turnkey project incorporating everything to personal gear and life jackets."

Photos: Courtesy of the Author

WWII Era Fleet Tugs

Former U.S. Navy fleet tugs still sailing … 40 years later

By Capt. Edward Lundquist, U.S. Navy (Ret.)

The author recently had the opportunity to visit RCS Ta-Han (ATF 553) in Keelung Harbor. The ocean going fleet tug was commissioned in the U.S. Navy in 1944 as USS Tawakoni (ATF 114), and served in World War II, Korea and Vietnam. It was transferred to the Republic of China Navy in 1978. The author was the Tawakoni's executive officer at the transfer ceremony.

Mariners tend to be sentimental, almost to a fault. And we tend to have a special relationship with our first ship, with vivid memories and powerful lessons that stay with us throughout our lives. So it was with my first ship, an aging ocean-going tug that had fought in the Pacific during World War II, and helped landing ships get their cargo on the beach and rescue damaged destroyers, all while fighting off air attacks.

I had asked to be on a small ship so that I might visit remote and isolated places that larger ships didn't go, and gain ship handling experience. Rather than being an assistant division officer on a large ship, I reported aboard USS Tawakoni (ATF-114) as a department head in January 1977, and I was still an ensign when, as executive officer, I took part in the ceremony transferring Tawakoni to the Republic of China Navy on June 1, 1978.

As I had hoped, I had plenty of responsibility, got lots of time driving the ship, and visited big ports and tiny islands. The USN had several closely related classes of ocean going fleet tugs. They were their 205 feet (62 m) long, with a 38 foot (12 m) beam, and a fuel capacity of more than 90,000 gallons. The first three ships, Navajo, Seminole and Cherokee, were built prior to WWII. Later versions had a slightly different stack and diesel exhaust arrangement, but they all had a similar and distinctive shape. Altogether, more than 70 were built, and many had long service lives, as well as serving in other navies.

The Ta-Han was among several other ATFs and salvage and rescue ships (ARSs) that were transferred to the ROCN, and they still have most of them. Ta-Han was already 34 years old when it joined Taiwan's Navy. Now it is 74 years old!

Not much has changed in 40 years. The flying bridge is now fully enclosed. The original UQN-1 fathometer is still mounted in the pilot house.

The LN-66 radar has been replaced by the CP/UPS 60X radar, made in Taiwan by the National Chung-Shan Institute of Science and Technology, which is responsible for much of Taiwan's combat systems. The Sperry gyrocompass is also still in use.

The original 3-inch/50 cal. Slow-fire gun mount was removed in 1977. But the ROCN has installed a BAE Systems Bofors 40 mm gun on the gun deck, with an effective range of 2,800 yards against surface targets, and 4,000 yards against air targets. A pair of Oerlikon 20mm gun mounts—with a maximum range of 6,000 yards—are now installed on each bridge wing.

The ship's motor whaleboat (or whale dinghy, as they call it) is carried in davits on the port side. The 10-ton crane is the same. The 8,000 lb. Eells anchors, which are used for salvage operations, are carried in the gunwhales on each side. The Almon-Johnson Towing Machine is original equipment, too, and it still works.

U.S. Navy ATFs were diesel electric, with four main diesel engines powering a large electric motor. The motor had a separate diesel for excitation. Two additional ship service generators provided the electrical load throughout the ship. The engine room, where the four Caterpillar main engines can still be found, looked – and smelled – the same as it has for the past four decades. The electric motor was very responsive, and powered a single large 4-meter (13-foot) screw. Ta-Han routinely conducts damage con-

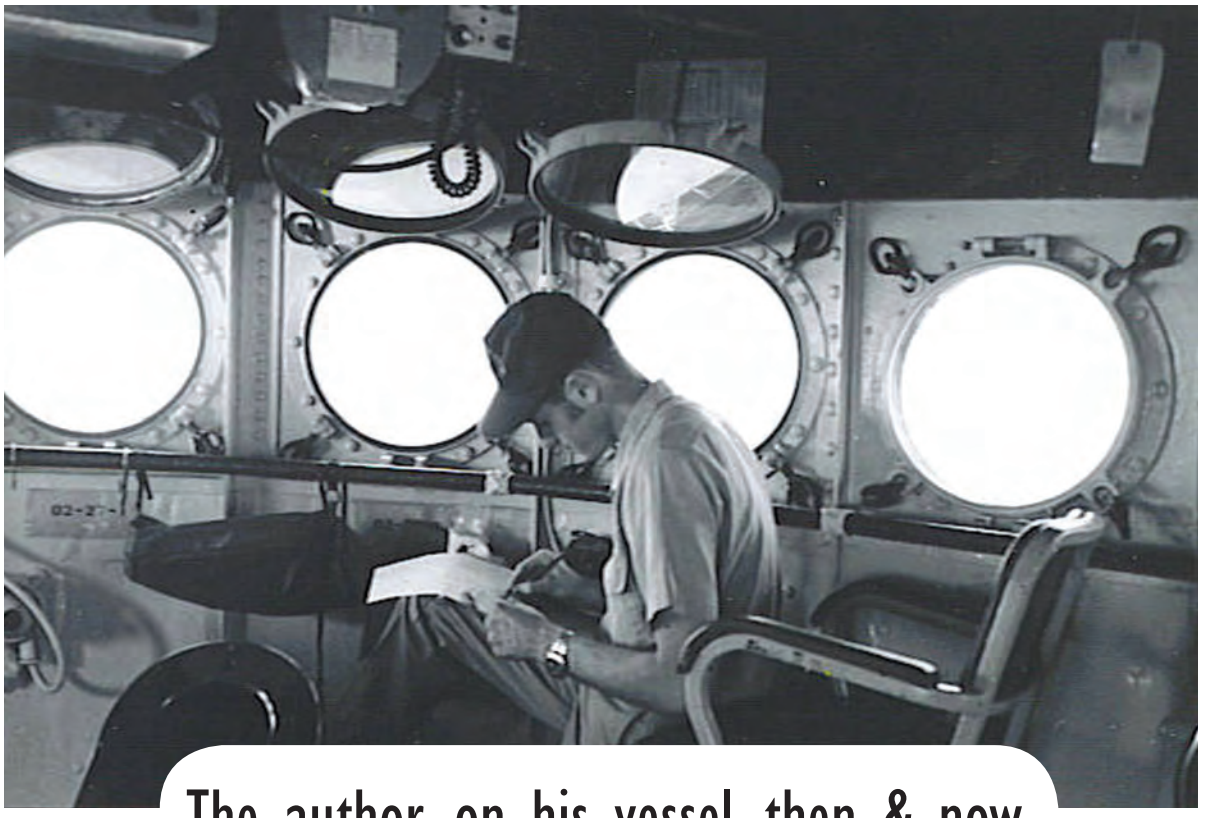
trol and man overboard drills, and conducts towing exercises with other ROCS ATFs to practice the seamanship skills required to assist a vessel in distress and tow her to safety. Ta-Han received an overhaul in 2016, to include a through bottom cleaning and hull-thickness measurements. She's ready to sail for years to come. That she looks so good today speaks to how well she was built, and how well the ROCN has taken care of her over the past 40 years.

Legacy of U.S. Navy tugs continues with new design

The USN had two closely related classes of ocean going fleet tugs. They were their 205 feet (62 m) long, with a 38 foot (12 m) beam, and a fuel capacity of more than 90,000 gallons. The first three ships, Navajo, Seminole and Cherokee, were built prior to WWII. Later versions had a slightly different stack and diesel exhaust arrangement, but they all had a similar and distinctive shape. Altogether, more than 70 were built, and many had long service lives, as well as serving in other navies.

Several classes of smaller tugs also served, including small auxiliary tugs (ATs) and wooden-hulled rescue tugs (ATRs). Most of the ATAs and ATRs carried only their hull number, and didn't have a name. At the beginning of the war the ocean-going tugs were designated as ATs. These included to new Navajo-class, but there were also many older ones – many built in the late 1800s – which were acquired from various sources of assorted dimensions. On May 15, the newer ATs were designated as fleet tugs (ATFs), and the other pre-war ocean-going tugs as ATOs, meaning "fleet tug, old." There were also ATAs built for Britain, designated as BATs.

The U.S. Navy built a class of several ocean going tugs after the war. The Powhatan-class displace 1,387 tons and do not have organic diving or salvage equipment, but can embark them as needed. These tugs were delivered between 1978 and 1981 and operated by the Military Sealift Command. Four of them are still in service with MSC. A follow-on class of tugs is planned to replace the Powhatan-class, which will be designated T-ATS. Gulf Island Fabrication, Inc. subsidiary Gulf Island Shipyards, L.L.C., has been awarded a $63.5 million contract for the detailed design and construction of a Towing, Salvage and Rescue Ship (T-ATS) for the U.S. Navy with an option for seven additional vessels. If those options are exercised, the total value would nearly $523 million. The Houston, Texas-based company has three shipyards in Louisiana, and will build the T-ATS at its Houma yard. The Ta-Han is one of five ex-U.S. Navy ATFs, along with two ex-U.S. Navy ARSs, still serving in the Republic of China Navy.



The author, on his vessel, then & now.

Photos: Courtesy of the Author

Photo: Maersk/Kleven

Kleven Delivers Mærsk Mobiliser

Mærsk Mobiliser was delivered from Kleven yard recently, the fifth vessel in a series of six anchor handlers for Maersk Supply Service A/S. Built for deepwater operations, the Starfish series is of Salt 200 design and has an open deck space of more than 800 cu. m., with an additional covered deck space of 102 cu. m. The vessel is equipped with a 450-ton anchor handling winch housed in an enclosed garage to protect the crew and the equipment in harsh conditions. Mærsk Mobiliser has Ice 1A classification and is prepared for oil recovery. The bollard pull of the vessel is measured to 260 tons.

Mærsk Mobiliser was christened during a naming ceremony at Kleven yard with Trine Munch Agerskov as sponsor. It's first duty is with a major Canadian operator for drilling support and ice management duties. The last vessel in the series will be delivered from Kleven in the end of January 2019.

EBDG Design: Bunker Ship for Maxum

Maxum Petroleum has taken delivery of its newest tank ship, the Global Provider. The vessel was designed by Elliott Bay Design Group (EBDG) of Seattle, WA and built by Jesse Engineering of Tacoma, WA. The vessel is the first in its design and size for Maxum Petroleum and will be used to deliver fuel and lube oil to ship operators in the Pacific Northwest. The vessel can be used as floating storage during skimming and recovery. Additional onboard emergency safety and rescue equipment includes a Jason's Cradle man-overboard rescue system. EBDG's project scope included concept and contract design, vessel renderings, and regulatory support to obtain United States Coast Guard (USCG) approval and loadline certification from American Bureau of Shipping (ABS).

Photos: Island Tug & BArge

Island Tug and Barge Christens Tugboat

The Island Raider, the newest articulating tug in Island Tug and Barge's (ITB) fleet, was christened September 28, during an afternoon ceremony at ITB's headquarters in Burnaby, British Columbia. The Island Raider, along with its sister the Island Regent (delivery February, 2019), was designed by Robert Allan Limited naval architects and marine engineers of Vancouver, B.C. to be paired with ITB's double-hulled oil tank barge, the ITB Resolution, as an articulated tug and barge (ATB). Constructed on-site at ITB's Annacis Island facility along the Fraser River in British Columbia, the Island Raider was designed with considerable emphasis on crew comfort and endurance. By incorporating Sika vibration and sound dampening floors, and Norac wall and ceiling paneling, noise levels register at less than 59 decibels in the wheelhouse during vessel operation.

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Photo: Gondan

Gondan's Hybrid Icebreaker Tug

GONDAN Shipyard recently launched Vilja, a new hybrid-powered icebreaking escort tug designed by Robert Allan Ltd. for Port of Luleå, Sweden. Vilja is a RAL TundRA 3600-H class icebreaking design, customized for the for the Swedish port and designed to perform icebreaking of up to one meter of ice at a speed of up to 3 knots. In addition, it is designed to provide ice management, escort, ship-assist, coastal towing, fire-fighting and navigation aids service duties.

This 36-m tug with a hull structure that exceeds Finnish-Swedish ice class rules and has high environmental standards is classed by Lloyd's Register and is equipped with an innovative hybrid propulsion system that will include two diesel main engines, shaft generators/motors and batteries for energy storage. This configuration will provide operational flexibility that will produce significant fuel, emissions and maintenance savings.

With an expected bollard pull of about 100 tons in diesel-mechanical mode when including battery boost capacity, this tug reportedly will be the most powerful icebreaking escort tug of this size in the world with hybrid/electrical propulsion.

Blount Boats to Build Twin-Screw Tug

Blount Boats has signed a contract with the New York Power Authority (NYPA), the nation's largest state power organization, to construct an ice breaking, all-welded-steel, diesel-powered, double screw tugboat to operate in seasonal ice near the entrance to and within the upper Niagara River. This vessel will replace existing vessels in the NYPA fleet currently used for the installation, removal, and maintenance of the Lake Erie Ice Boom and various associated marine construction projects. The naval architectural and marine engineering firm, Bristol Harbor Group, Inc. developed the contract design and will provide technical oversight during the fabrication process on behalf of NYPA. The 56 foot long, 18.5 foot beam, shallow draft tug will be powered by two Caterpillar series C-9 engines, each 375HP@1800 RPM.

Photo: BMT

BMT: Water Taxi Designs

BMT introduced new vessel designs in response to a tender issued by Hong Kong's Transport Department. The new hybrid Eco Ferry and a smaller, nimble 14 passenger harbor craft have been designed for on-demand and ad-hoc trips, both of which could enable passengers to experience faster, smoother, and more fuel-efficient transits across Hong Kong's Victoria Harbor.

One example, the new hybrid Eco Ferry vessel design, is a low cost and sustainable 31m, 20-knot design, that has been proposed by BMT to serve traditional routes with typically higher passenger peak flows.

The second design is a small-scale but highly flexible craft, styled in a manner reflecting the city's Star Ferry that is geared toward commuter flexibility and tourist experience, as well as supporting increased connectivity and linkage around the harbor's edge.

Nitrogen Generation on Ships: PSA or Membrane Technology?

GENERON is the world's leading manufacturer of Nitrogen Generators, offering both PSA systems and Membrane systems. GENERON® Membrane systems make use of the superior performance of our proprietary GENERON® Membrane fibers, which are manufactured in California, USA. The GENERON® Membrane performance continues to lead the industry in terms of nitrogen flow capacity and air efficiency. Our GENERON® PSA systems are state-of-the-art with the highest air efficiency available, and can be operated in sequential configuration to allow for a minimum footprint and weight, while maintaining high nitrogen flow rates.

So which technology is the right choice for your marine application?

- **Simplicity of Equipment and Operation**

Both systems require similar air consumption, as well as air compressors and dryers. Both require pre-filtration, to improve quality operation. Membrane systems, however, do not require air receivers or post-filtration, and do not require the multiple valves typically found on a PSA system.

- **Utility Consumption**

The total power and cooling water consumption is comparable for both types of systems; at Nitrogen output purity of 95%.

- **Operating Purity**

Both technologies will produce Nitrogen ranging from 95% purity, up to 99.99% purity. However, when applications require up to 99.999% purities, PSA technology is used.

- **Installation Dimensions and Weight**

The GENERON® Membrane System occupies about 40-60% of the footprint required by a typical PSA system of the equal flow and pressure. The GENERON® patented membrane cabinet reduces weight up to 50-70% compared to a PSA system, saving valuable on-board capacity.

- **Lower Maintenance Cost**

With fewer moving parts and better accessibility, thanks to GENERON's new patented cabinet design, membrane systems are capable of serving at a reduced cost than their PSA counterpart.

Depending on the specific marine application, GENERON® Membrane systems can provide significant savings in space, energy usage, and maintenance when compared to a typical PSA system. Whatever your requirements may be, GENERON can provide a custom engineered solution for you!

Photo: Danfoss

New Hybrid Patrol Ship

Estonia border authorities launched a hybrid patrol vessel that features a hybrid electric propulsion from Danfoss Editron. The 45-m ship built by Baltic Workboats is equipped with Editron hybrid electric drivetrain systems, allowing efficient and quiet electric cruising and a swift, powerful reaction to emergencies. It is a wave-piercing design and will be used by the Estonian Police and Border Guard Service, mainly for use in combating pollution threats. It is the largest patrol vessel ever built by Baltic Workboats (Saaremaa, Estonia), and the first in the firm's emerging range of battery hybrid patrol ships.

The ship's Editron marine system is reportedly half the size of a conventional diesel-electric propulsion and power plant system, based on the Danfoss Permanent Magnet Machines to reduce fuel and running costs, reducing both payback period and CO2 emissions.

The control and monitoring software, and the control systems are all integrated into one single system made by Baltic Workboats.

The needs of the patrol boat made it an excellent project to build as a hybrid vessel. For example, the hybrid electric benefit of engine redundancy is important for the Estonian Coast Guard — in case of engine failure, the operator can switch to diesel-electric or batteries — while also providing improved fuel efficiency, and much lower noise levels in diesel-electric and fully-electric modes.

While the ship will also be used for patrolling, firefighting, and search and rescue missions in Estonian waters, its main role will be monitoring and responding to pollution threats, using state-of-the-art radar that can detect surface contamination, such as oil spills, from up to five miles away. It has a top speed of 27 knots, while the fully-integrated energy storage system allows electric cruising at typical working speeds of up to 10 knots.

New Catamaran "Unicat" in Argentina

In September 2018, a 17 x 5m catamaran completed its final tests in the Tigre Delta of the Tigre on the Parana River near Buenos Aires, Argentina prior to its delivery to her Chilean owners. The cat was designed by Eng. Emilio Noel and built by Astilleros Unidelta SA. which has a well-established reputation in a wide range of steel and aluminum workboats. The yard has a plant located in Buenos Aires with 10,000 cu. m. of open and 4,000 cu. m. of covered work space. The shipyard also has an engineering office located in the City of Buenos Aires.

The new catamaran has a capacity for 69 passengers and a three-member crew. The power for propulsion is provided by two Cummins QSB 6.7 engines, each delivering 350 HP (261 kW) at 2800 rpm. The two mains are coupled to two heavy-duty Konrad Sterndrives 680 B series. This arrangement allows the boat reach a speed of 22 knots with a range of 600 nautical miles. The auxiliary power for the vessel services is provided by a Cummins Onan MDKBJ generator of 6 KVA. Tankage onboard includes fuel tanks with capacity for 3000 liters as well as fresh water tanks with 300-liter capacity. The new catamaran, named Worsley, joins the tourism catamaran fleet owned by the Chilean company Hipsur SA, whose headquarters are in Natale port, Chile. The boat is built according to Lloyd's Register Class & Prefectura Naval Argentina standards.

Photo courtesy of Cummins Marine

ROSE POINT ECS

We are proud to announce that the New Rose Point ECS Version 4 is now available!

We've made hundreds of improvements throughout the program and added many new features, including new voyage planning and monitoring tools to help with your Subchapter M Navigation Assessments.

Rose Point ECS Services have also been updated with a brand new administrative portal that makes it easier than ever to verify your fleet's chart and navigation publication update status.

Together, Rose Point ECS and Services meet the requirements for paperless navigation outlined in the Coast Guard NVIC 01-16 for most inland vessels, and we now offer Hatteland Panel PC systems for vessels that have the additional hardware requirements.

Please visit www.rosepoint.com to find out why the New Rose Point ECS is Simply Better.

Photo: Cummins/Haig-Brown

Shallow-Draft Paraguay Towboat

Paraguay's Tsuneishi Shipyard, a subsidiary of the Japanese firm of the same name, recently delivered the powerful towboat Tebicuary 3 to her owners Navegación del Sur S.A. (Navesur) in June of 2018. The new vessel is a near sister-ship to the 2015-delivered Ceasar Primo for a different owner. The newer vessel will also work on the Paraguay-Paraná River system that provides marine access to large parts of central South America. "The Paraguay-Paraná Waterway is a regional agreement between Argentina, Bolivia, Brazil, Paraguay, and Uruguay with the aim of facilitating navigation and thus regional and international trade. Comprising the Paraguay, Paraná, and Uruguay rivers, at 3,442 km it is one of the longest natural waterways in the world, extending from Puerto Cáceres, Brazil to Nueva Palmira, Uruguay and Buenos Aires, Argentina. Its area of influence encompasses a direct surface area of 720,000 sq. km. and an indirect surface area of 3,500,000 sq. km.

At 6,400 hp, the Tebicuary 3 is more powerful than most of the towboats currently working on the river system. The power derives from four Cummins KTA50 engines, each developing 1600 hp at 1800 rpm. The boat is 43 x 18-m with an operating draft of only 1.83 meters allowing it to push barges into most areas of the inland waterway. In addition to the Cummins propulsion engines, the Tebicuary 3 is fitted with two Cummins Marine NTA855-powered 240 kVA / 50 hz (total power: 480 kVA) generator sets. There is also a Cummins 6B CS 93 kVa / 50 Hz emergency generator set. All the engines and gen sets have Japanese NK class certificates. With Cummins C Command electronic controls the engines will be able to maximize fuel efficiency and savings. All of this adds to the significant environmental savings by moving cargos from trucks to barges.

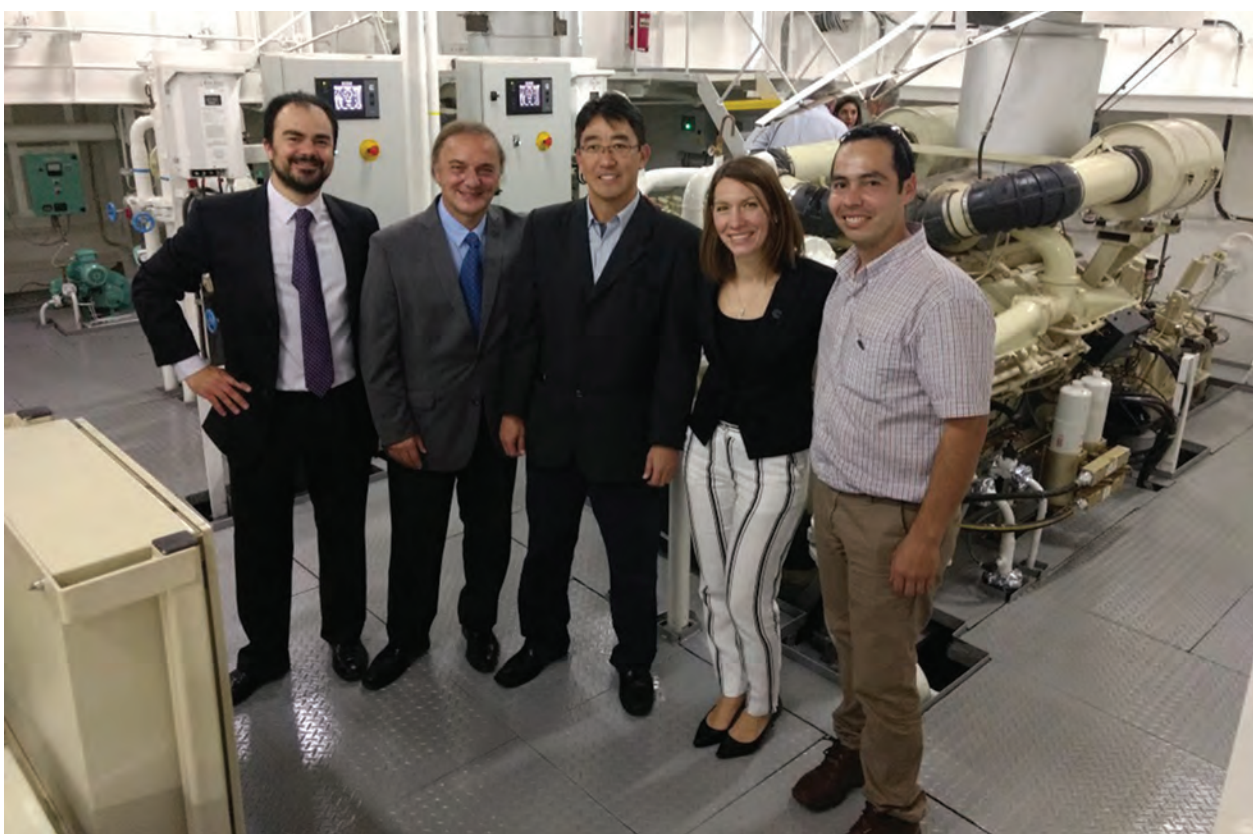

Photo: Cummins/Haig-Brown

Above:
The red carpet was literally out for visitors to come onboard at the commissioning ceremony for the Tebicuary 3.

Right:
Gathered in the Tebicuary 3 engine room are (l to r) -Victor Vacelar, Application Analyst at Cummins, Armando Tavarozzi, HHP Sales Leader at Cummins, Marcial Yoshizaki, Commercial Manager at Tsuneishi, Claudia Kowalczuk, Marketing & Communication Leader at Cummins, Modesto Benitez, Mechanical Technician at Cummins.

RIBS & Patrol Craft

Boatbuilders continue to look to the lucrative RIBS and patrol boats sector for new orders: a number of deliveries of newly designed vessels have taken place over the past year and there are further orders in the pipeline for next year, 2020 and beyond.

Edited By Tom Mulligan

Royal Canadian Navy chooses MRRBs from Rosborough Boats

The Royal Canadian Navy has selected Rosborough Boats' new Rough Water Combatant as the multi-role rescue boat (MRRB) for its Harry DeWolf Class Arctic and Offshore Patrol Vessels (AOPVs). The Rough Water RHIBs will serve as the ship's platform for the RCN's Enhanced Naval Boarding Party (ENBP), as well as a search-and-rescue (SAR) platform, dive tender, personnel transfer vessel and general workboat. Twelve of the Rough Water 8.50 MRRBs are currently in production, with the first three vessels delivered after passing the RCN's testing and evaluation procedure. The Open Combatant and Wheelhouse Coast Watch series are Rosborough 's new D-Collar configurations, available from 7.9 to 10.5 meters in length, and allow for a greater diversity of layouts and capabilities on the Rough Water hull form. Other recent deliveries include three of Rosborough's flagship Rough Water 9.11s for the Canadian Coast Guard's new Arctic SAR program. These full Wheelhouse RHIBs will provide inshore SAR in remote areas of Canada's Arctic coastine.

Rough Water RHIBs and D-Collar vessels are presently in service with several Canadian federal, provincial and municipal agencies and US state and municipal agencies; as well as in the private sector in Canada and the UK.

Rosborough Boats was established in Canada in 1955 and builds semi-customized vessels from six to more than ten meters in length, specializing in particular in creating boats for naval boarding party, policing/patrolling, SAR, conservation and protection, dive operations, water ambulance, oil platform assistance, survival training and general workboat applications.

www.rosboroughboats.com

A specialized RIBCRAFT 7.8 was recently delivered by RIBCRAFT USA for tow operations and use in commercial dive applications. (Photo: © RIBCRAFT USA, LLC)

Rosborough Boats' Rough Water Combatant: Chosen by the Royal Canadian Navy for patrol and search-and-rescue work. (Photo: Rosborough Boats)

RIB for tow and commercial diving operations from RIBCRAFT USA

RIBCRAFT USA recently delivered a specialized RIBCRAFT 7.8 to be used for tow operations and commercial dive applications on the Gulf Coast. Originally designed for tactical operations and patrol, the RIBCRAFT 7.8, with its long steep bow sheer and deep V hull, is designed to offers the best possible rough-water performance and safety. This purpose-built 25-foot RIB features an all-aluminum T-Top, antenna arch with dive ladder and life ring bracket, reinforced fore and aft tow posts, and a complete electronics package with dual Garmin GPS displays, radar, and VHF. Powered by twin 150 hp Yamaha outboards, this boat will reach speeds in excess of 55 mph, fulfilling its mission as a fast-response boat. The RIBCRAFT 7.8 provides a stable, dry ride, even in the roughest offshore conditions. With highly a durable construction and stable and reliable performance, the RIBCRAFT 7.8 is a typical RIBCRAFT RIB providing a high-performance platform for military agencies, commercial diving, tour operators, and for private industry uses.

www.ribcraftusa.com

Bullfrog Boats debuts Bullfrog 22 patrol boat

Bullfrog Boats newest launch is its 22 foot x 8 foot 6 inches Bullfrog 22. Powered by a 250hp Honda engine and equipped with a 20-inch pitch stainless steel propeller, the boat can achieve speeds of more than 50 mph. With the patented Bullfrog flotation collar and a 24 degree aluminum hull, this patrol/rescue/workboat vessel can achieve a very soft and dry rough ride and is available as a basic package or with a number of optional extras added.

Bullfrog Boats also has on offer its Bullfrog 17 boat. With the simple addition of a tow post for oil boom deployment, the vessel, powered by a 90 hp Honda engine and with a lift harness in place, has become the standard workboat for Harvey Marine and its fleet of ATBs. In addition, three Bullfrog 17s are working for the US Army Core in the Marshal Islands and Foss Maritime employs six of these vessels.

www.bullfrogboats.com

Gladding-Hearn: New pilot boat deliveries

Starting with Brandywine, built for the Pilots of the Bay and River Delaware in 1957, Gladding-Hearn Shipbuilding has built more than 80 pilot boats operating in the US and the Caribbean. These include almost 20 of the company's Chesapeake Class vessels, including its latest launch, the Chesapeake Class Mark II. The shipyard's association with designers C.Raymond Hunt Associates led to the introduction of the first deep-V pilot boat hull, cutting commuting times by half and permitting safe boarding a higher speeds. Gladding-Hearn's all-aluminum pilot boats, which range from 40-foot launches to 75-foot station vessels, are characterized, the company said, by

Designed by C. Raymond Hunt Associates, Gladding-Hearn's 53.6'x17.10' Chesapeake-Class patrol boat has a top speed of 26 knots. The company delivered one of its new Mark II vessels to Virgina Pilot Association in May of this year. (Photo: Gladding-Hearn Shipbuilding)

a soft, dry ride, steady tracking, maneuverability, rugged construction, low upkeep and reliability.

In October this year, the Southwest Alaska Pilots Association took delivery of a new pilot boat from the company. With an overall length of 75.7 ft., a beam of 20.5 ft. and draft of 3.11 ft., the all-aluminum Galveston Class pilot boat features the Ray Hunt-designed Deep V hull. The boat is powered by twin Cummins QSK38-M1, EPA Tier 3 diesel engines, each delivering 1,400 hp at 1,800 rpm and connected to twin ZF-5000 gearboxes. The launch is propelled by a pair of Hamilton HM651 water jets and reaches a top speed of 29 knots. In addition, a Humphree interceptor system with active ride control and automatic trim optimization is installed at the transom and electricity is supplied from two Northern lights 30 kW generators.

The wheelhouse, flush-mounted to the deck amidships, features forward-leaning front windows, is outfitted with six Norsap shock-mitigating seats and has a small galley located behind the helm station. An eight-camera LCD CCTV system is installed in the wheelhouse, with four cameras mounted in the engine room, two cameras in the jet room and two on the aft deck. The forecastle includes two staterooms, head, shower, dressing area and hanging lockers. Interior sound levels at full power are under 74 dBA. A multi-zone hydronic system provides heating and air conditioning to the wheelhouse and forecastle.

Outside of the wheelhouse, the roof, main deck, and all of the handrails are heated by a hydronic deck heating system. The vessel is provided with a hand-held remote for use at port and starboard hydraulic rescue davits.

Earlier, in May of this year, Gladding-Hearn delivered one of its new Chesapeake Class MKII launches to Virgina Pilot Association, while in July the com-

The 22-ft., 250 hp Honda engine-powered Bullfrog 22, equipped with a 20-inch pitch SS propeller, will top out at over 50 mph. With the patented Bullfrog flotation collar and a 24-degree aluminum hull, rough-water riding with this boat is surprisingly soft and dry. (Photo: Bullfrog Boats)

Protecting the Dutch Caribbean Islands: The DCCG has ordered 12 new 38 Defiant model patrol boats from Metal Shark Boats. (Photo: Metal Shark Boats)

pany delivered a 52-foot St. John's Class launch to Delta Launch Services, the operating company for the Associated Branch pilots on the SW Pass of the Mississippi. New orders yet to be fulfilled include one from Lake Charles Pilots for its fourth Gladding-Hearn launch, with delivery schedules for 2019 and an order from Seaway Pilots Inc based in Cape Vincent, New York for a Chesapeake Class boat, with delivery scheduled for early 2020.

www.gladding-hearn.com

Dutch Caribbean Coast Guard orders new patrol vessels from Metal Shark

Four new high-speed patrol boats manufactured by Louisiana, USA-based shipbuilder Metal Shark for the Dutch Caribbean Coast Guard (DCCG) have been commissioned on the island of Curacao. The new vessels are the first to be delivered to the DCCG under a 12-boat order announced last year.

Designed in-house by Metal Shark and built at the company's Jeanerette, Louisiana production facility, the welded aluminum, enclosed-pilothouse, the 38 Defiant model monohull patrol boats are the result of a multi-year effort by the DCCG to procure a replacement for its fleet of open-cockpit RIBs. The new vessels will serve as the DCCG's main interceptors, patrolling the territorial waters of Aruba, Bonaire, Curacao, St. Eustatius, St. Maarten, and Saba.

Powered by twin Cummins Marine QSB6.7 diesel engines coupled with Konrad 680B counter-rotating dual-prop stern drives, the 38 Defiant reaches top speeds in excess of 45 knots.

A fully-enclosed pilothouse shields the crew from the elements, while Metal Shark's 'Pillarless Glass' pilothouse arrangement is designed to ensure unimpeded visibility, day or night, while specially engineered composite armor panels provide ballistic crew protection from unfriendly fire. Shockwave Corbin shock-mitigating seating has been provided for a crew of six, and anti-fatigue floor covering has been employed in the pilothouse and the belowdecks crew spaces. A urethane-sheathed, closed-cell foam Wing collar provides durable and resilient fendering. For extended patrols at sea, accommodations include an enclosed head compartment, galley, and v-berth.

Additional Metal Shark vessels for patroling the islands of Aruba and St. Maarten are currently in production, with deliveries slated for later this year.

www.metalsharkboats.com

Norsafe confirms repeat order for Munin S1200 Open patrol boat

Norsafe has confirmed that an undisclosed repeat customer has signed an additional order for one of the company's Munin S1200 Open patrol boats With its triple Mercruiser inboard engine installation, this vessel delivers a top speed of more than 60 knots and is suited for safe, long-distance crossings through its double-stepped hull design, high freeboard and low center of gravity. It also acts as a highly suitable open platform for carrying specialized equipment needed for private expeditions.

The new delivery will feature a full-height windscreen with defroster outlets and windscreen wipers. In addition, a side wall canopy solution will make it possible to close off the cockpit during winter or in adverse weather conditions. Fitted with heat outlets, the boat can comfortably be used in the harsh climatic conditions found in Norwegian waters. The flush aft deck with cargo rails can carry racks and mounting hardware for bikes, kajaks and other equipment and the forward console cabin will be decked out with a sleepover solution for extended expeditions.

www.norsafe.com

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Box C-3 Castine, ME, 04420 USA
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Third Assistant Engineer
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Salary: $ 56,700 , Full Time
Category: Engineer / Naval Architect
Job Location: Pleasant Street Castine, ME, 04420 USA
Employment Specialist
Email: HR@mma.edu
Work Phone : 207-326-0254
Box C-3 Castine, ME, 04420 USA
Description:
The 3 Engineer acts as Engineer Officer of the Watch, assists in the oversight of shipboard maintenance, and provides Cadet training during the annual training cruise. As a junior officer in the Engine Department, reports to the Chief Engineer. A Bachelor's degree preferred, and at a minimum must possess all USCG Certificates and Licenses, and all STCW endorsements required of a 3 Assistant Engineer/ OICEW. Must possess a valid US passport.

Shipyard Director of Operations
Blount Boats
Salary: $ TBD , Full Time , General / Operations Manager
Category: Superintendent / Foreman
Job Location: P.O. BOX 368 Warren, RI, 02885 USA
Contact HRM
Email: julie@blountboats.com
P.O. BOX 368 Warren, RI, 02885 USA
Job Description Blount Boats is seeking an experienced Shipyard Director of Operations who will plan, coordinate, manage and evaluate work required to construct, repair or modify vessels that produces on time deliveries and meets profit targets.

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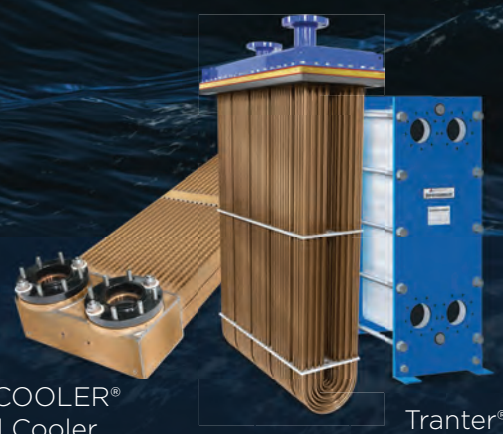

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