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Volume 32 • Number 7

Marine News

JULY 2021

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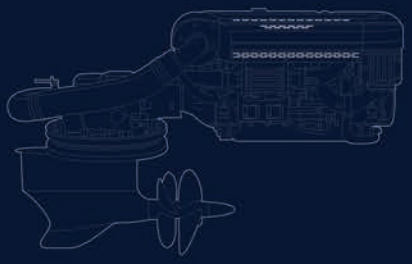

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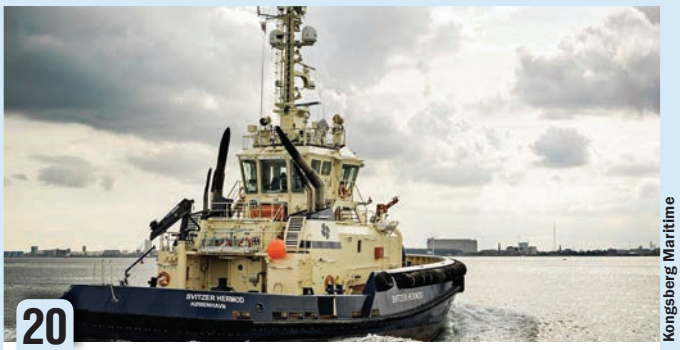

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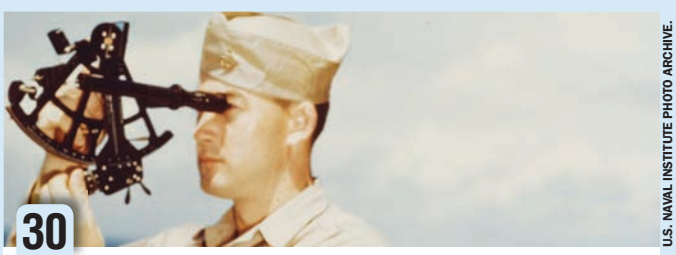

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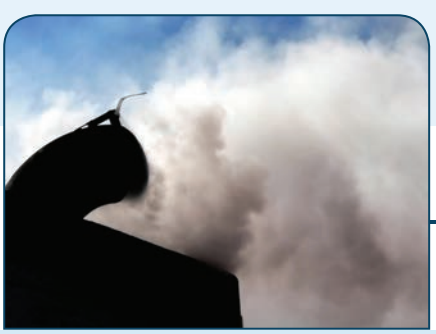

On the Cover

The maritime industry's emissions reduction journey is long and winding. (© Alan Smillie / Adobe Stock)

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Editor's Note

Eric Haun, Editor,
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Perpetually evolving regulatory mandates and emerging technologies continue to present new challenges for operators and owners of commercial vessels. Never before has the maritime industry faced more difficult decisions.

Some off the top questions confronting the industry today involve emissions reduction targets. In 2018, the International Maritime Organization laid out its initial emissions reduction strategy. The policy framework includes goals to cut shipping's annual greenhouse gas emissions by at least half by 2050, compared with their level in 2008, and work toward phasing out GHG emissions entirely as soon as possible in this century. The strategy envisages average CO2 emissions reductions of least 40% by 2030, with 70% reduction as the longer-term goal for 2050.

Certainly, these are lofty goals. Are they obtainable? It depends on who you ask. But either way, slashing emissions has been made a priority, and key market players have pounced on the task, presenting novel technologies, solutions and strategies designed to make waterborne commerce greener.

One person doing his part is Robert Kunkel, whose hybrid-electric cargo vessel Captain Ben Moore has been ferrying local produce between Long Island and Connecticut since 2019. Kunkel, an accomplished marine engineer and longtime friend of ***Marine News*** magazine, this month writes on maritime's long and winding path toward zero emissions. The journey will be anything but easy.

Marine News (ISSN# 1087-3864) is published monthly except for February, August and December by Maritime Activity Reports Inc. 118 E 25th St. New York, NY 10010-1062. Periodicals Postage Paid at New York, NY and additional mailing offices. POSTMASTER: Send all UAA to CFS. NON-POSTAL AND MILITARY FACILITIES send address corrections to Marine News 850 Montauk Hwy, #867 Bayport, NY 11705.

The publisher assumes no responsibility for any misprints or claims or actions taken by advertisers. The publisher reserves the right to refuse any advertising. Contents of the publication either in whole or part may not be produced without the express permission of the publisher.

Marine News

(ISSN#1087-3864) (USPS#013-952)
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Subscriptions to ***Marine News*** (9 printed issues) for one year are available for $50.00; Two years (18 printed issues) for $80.00.
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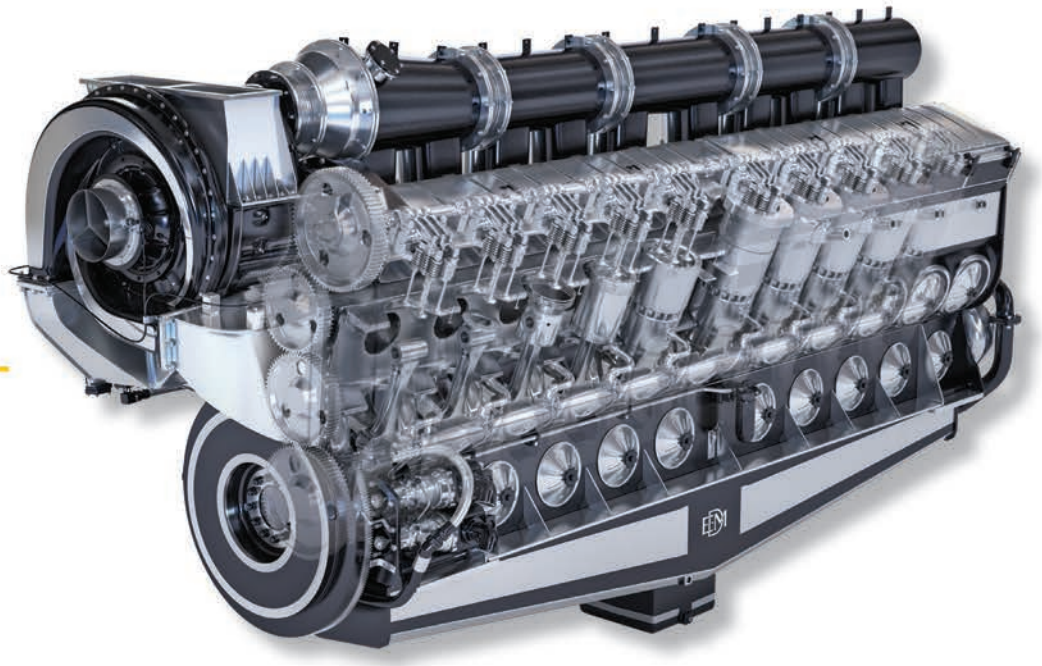

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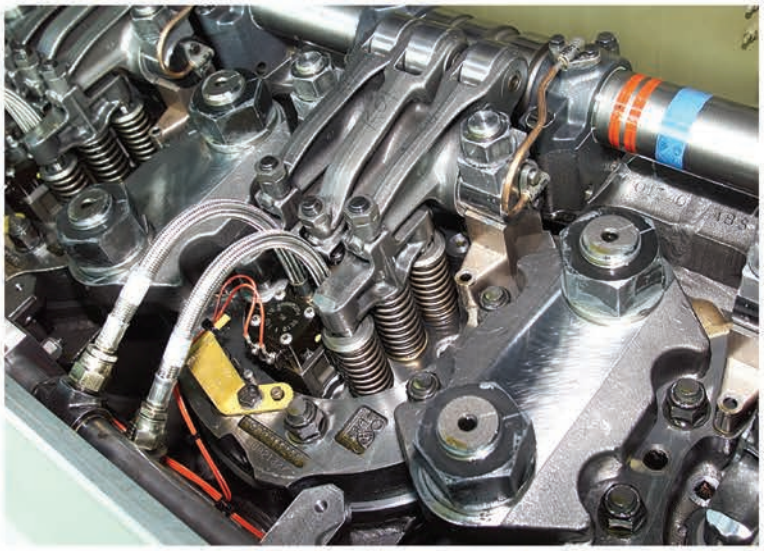

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By the Numbers

Marine Casualties

Each year the U.S. Coast guard publishes a report summarizing statistics and information regarding inspections and enforcement of regulations on U.S. flagged vessels. The handy account looks at deficiency and detention rates for each type of inspected domestic vessel, among other things, including casualty events.

A reportable marine casualty includes any marine casualty consisting of a grounding, allision or collision; loss of main propulsion; occurrence materially and adversely affecting the vessel's seaworthiness; a loss of life; an injury to a person which requires professional medical treatment; damage to property in excess of $75,000; or a discharge or release of a reportable quantity of a hazardous substance into the navigable waters. 46 CFR Subpart 4.05-1.

There were 1,644 reportable marine casualties reported in 2020 involving 1,956 inspected vessels, according to the U.S. Coast Guard's 2020 Flag State Control Annual Report. These totals were down from 2,095 casualties involving 2,561 vessels reported in 2019.

2020 Reportable Marine Casualties			
Vessel Type	**Active Vessels**	**Number of Vessels Involved in Marine Casualties**	**Percentage of Fleet Involved in Marine Casualties**
Barge	5,086	278	5.5%
Cargo	570	200	35.1%
Passenger	6,556	331	5.1%
Offshore	522	27	5.2%
Research	56	3	5.4%
Towing	6,608	1,117	16.9%

The table below lists the top three reportable marine casualty types for each vessel fleet and the percentage that each represents compared to the marine casualty total for that type. For example, 52.9% of all barge reportable marine casualties were defined as collision, allision or grounding.

Top Three Casualty Types					
Barge	**Cargo**	**Passenger**	**Offshore**	**Research**	**Towing**
Collision, Allision or Grounding 52.9%	Material Failure/ Malfunction 58.1%	Material Failure/ Malfunction 38.8%	Collision, Allision or Grounding 29.4%	Loss of Electrical Power 33.3%	Collision, Allision or Grounding 42.1%
Material Failure/ Malfunction 19.3%	Personal Casualty (Injury or Death) 14%	Personnel Casualty (Injury or Death) 24.7%	Personnel Casualty (Injury or Death) 29.4%	Material Failure/ Malfunction 33.3%	Material Failure/ Malfunction 21.6%
Personnel Casualty (Injury or Death) 8%	Loss/Reduction of Vessel Propulsion Steering 13.4%	Collision, Allision or Grounding 13.4%	Loss/Reduction of Vessel Propulsion/ Steering 23.5%	Personnel Casualty (Injury or Death) 33.3%	Loss/Reduction of Vessel Propulsion/ Steering 15.7%

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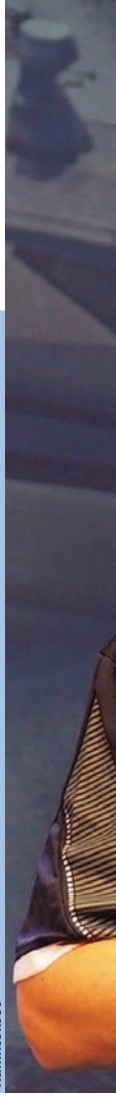
Ben Reed

Managing Director, HamiltonJet


HamiltonJet

Ben Reed is a mechanical engineer from the U.K. now leading New Zealand-based waterjet manufacturer HamiltonJet as managing director.

Raised in Shropshire, Reed graduated from Loughborough University of Technology in 1995 and later became a Chartered Engineer and Fellow of the Institute of Mechanical Engineering. He's worked for a U.K. gas utility company developing natural-gas-powered engines; Ford Motor Company as a Systems Analyst, and 17 years for Caterpillar UK in diesel engine and transmission development for off-highway machinery and military products, having held a variety of roles from Development Engineer through to Engineering Program Manager and Chief Engineer.

Eight years ago, Reed was approached by HamiltonJet in New Zealand to lead its new product development activities. So, Reed and his wife decided to move to New Zealand for the experience, bringing their four children with them. Within three years, Reed was appointed to lead the business, and the family has decided to stay in New Zealand long term.

Please introduce HamiltonJet, giving a brief overview of its main products, locations, client base and employees.

BR: HamiltonJet is the world's leading manufacturer by market share of waterjets and vessel control systems in the commercial and military space. Our smallest jet, the HJ212 is found in small craft, upwards of 5 meters long. It weighs 80 kilograms and would usually be found in single or twin driveline form with simple cable actuated controls. We then have another 17 different jet sizes, ending up with the HT1000, an 8,000-kilogram monster that would be found in pairs or quad configuration, in oil and gas or military applications up to 70 meters with electronically controlled hydraulic controls.

The company was founded in 1939 by Kiwi industrialist Sir William Hamilton, widely recognized as the grandfather of the modern waterjet. Today it employs 400 people in six countries: 350 people are in Christchurch, New Zealand where all design, development, manufacturing and business functions reside, plus three regional offices with around 50 total staff in Singapore, London and Seattle. These support 55 distributors across the globe with parts, sales and service support. Some 97% of products are exported, with customers all over the world.

How do you see waterjet technology advancing, and how is HamiltonJet preparing for the future?

BR: Over the last five years the company has really ramped up investment in products and technology development. This is foundational to our strategy and falls into several parts:

Waterjets: We are working on gradually replace our entire waterjet line-up with newer, more efficient, more robust models. Each new jet is coming in between 3% and 7% higher in propulsive efficiency than the model it replaces, delivering lower fuel consumption and higher speed. They also generate more thrust at lower speeds which is great for certain applications like wind-farm support. These new jet models are also easier to install and simpler to integrate.

Controls: We recently introduced a brand new electronic control system designed to the most rigorous class authority standards, called AVX. This, plus the soon to be released AVXexpress for smaller craft will replace both of our older control systems and offer a solid platform for future technology integration. Both systems offer multiple layers of redundancy, exceptional reliability and availability, and some truly innovative features. The best example is our GPS based control system called JETanchor which can automatically hold position and precisely maneuver a vessel with incredible accuracy.

Future Technologies: The marine industry faces three significant trends which are shaping our future products strategy:

• Autonomy – Operators are increasingly looking at forms of vessel remote control, autonomy and skipper-assistance to improve safety and productivity. Applications include military (e.g. unmanned minesweeping), survey and oil and gas vessels. We have been working for over 20 years in this area and have over 170 vessels equipped with some level of autonomy or remote control around the world. We continue to work with all the leading manufacturers of autonomous systems, but more recently signed an agreement with Sea Machines Robotics to develop a HamiltonJet pilot assistance tool that will be integrated at the helm and use an augmented reality vision system, fused with radar and AIS to allow autonomous route following with collision alert and avoidance. This will be available sometime in late 2022 and will be an option on all vessels with elec-

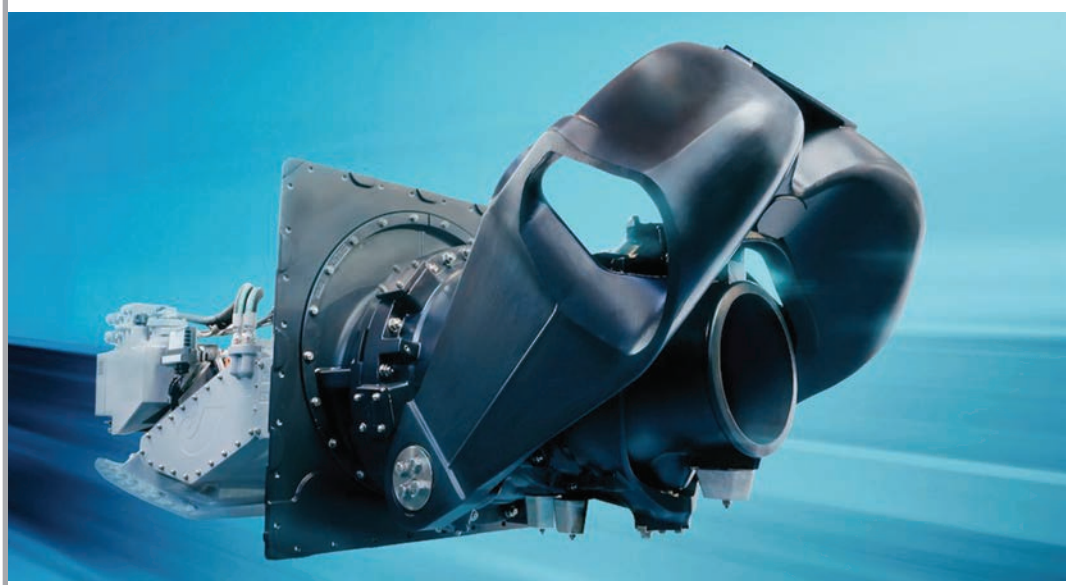
tronic controls.

• Electrification – The pressure is on around the globe to clean up the carbon footprint of the marine industry. It has been surprising to us just how quickly this trend has gone from being something of interest, to a strong buying driver with operators willing to pay a premium for the right technologies. Last year we launched our own electro-hybrid drive system called EHX. Essentially an integration of batteries, electric motors, Diesel engines and the system can also be used on an all-electric vessel. We were driven to do this after being involved with multiple projects where the detailed integration seemed to be left to the last minute. We wanted to grasp hold of the whole thing and deliver a fully integrated hybrid propulsion system that operated in a fully automatic mode, switching between power sources and optimizing the use of electrical energy. This product is now available to the market and the first installation we did was on our own vessel. We bought and converted a 15-meter foiling catamaran called Aria which is now capable of running 9 knots on electrical drive only, diesel only (or charging the batteries) up to 37 knots, and can boost performance with both together up to 42 knots. We deployed Aria up at the Americas Cup earlier this year as a showcase for what could be achieved with this technology. Feedback has been superb, in particular how quiet it is when loitering or slow-speed cruising on electric-only.

• Digitization – The modern vessel is an increasingly complex system-of-systems. The propulsion controls, navigation, alarms, hotel services, etc. are increasingly intelligent, connected systems. As the primary vessel controls, our system has the potential to be a central hub for information about the vessel. We are currently developing on a vessel monitoring, data logging and IoT system to complement our products that will allow operators to interrogate their journeys and activities in absolute detail from the ship or the shore. It even captures data on the movements of vessels around them through AIS. This will ultimately support productivity optimization, preventative maintenance, issue response and accident investigation.

Looking ahead, what are your top priorities for the remainder of this year?

BR: It is looking like a busy year. Sales wise, we have seen activity increase and we are now approaching pre-COVID levels. We also have a number of high-profile projects in the electric and hybrid drive space that will go to order. We have two new jet model releases (The HTX42 is imminent and the HJX27 at the end of 2021) and a 'lite' version of our control system called AVXexpress. Finally, we will continue our development work with Sea Machines on the pilot-assist system and a few other innovations. We are excited by the way all these releases will improve the operational effectiveness of our customers.



HamiltonJet

HamiltonJet recently launched the HTX42 waterjet

Why was the HTX42 waterjet introduced, and what are its key advantages? Which vessel types is it best suited for?

BR: The HTX42 is the fourth in our new range of jets, ultimately destined to replace the 18 models we have today. Each model is being developed to be more efficient, more reliable and easier to install/maintain than its predecessor. These jets are gaining traction in the governmental, military and patrol market where large, volume contracts have been won with each new model already. In addition, they are proving popular in commercial applications where their combination of class-leading hydrodynamic performance and robustness are critical buying criteria.

What portion of HamiltonJet's commercial/government business is in the U.S.? How do you see business in this market today, and where do you see greatest opportunities?

BR: The U.S. and Canada represent about 26% of our total business, with Asia Pacific being 45% and EMEA being 29%. The U.S. market for us used to be bigger when oil and gas was booming in the Gulf of Mexico, however it still remains our single largest country of sale and a hugely important market to us. The largest opportunities lie in the renewal and expansion of the ferry fleets on the east and west coasts, the current increasing momentum in offshore wind power, and of course a growing number of military and governmental projects.

We aren't at liberty to say much about our involvement in military projects, but a great example of our products would be the U.S. Navy MKIV Patrol Boat. This vessel has two of our HM651 waterjets in it, with 12 active in the U.S. fleet, plus several gifted overseas by the U.S. Foreign Military Sales (FMS) program. We work with militaries and coast guards around the world, with projects Europe, the Americas, Middle East and in Asia (where we have hundreds of vessels in service with the Japanese, South Korean and Taiwanese Coast Guards, as an example).

Of all the projects you've been involved in over the course of your career, which is your favorite and why?

BR: I think my favorite has been the creation of our Future Products team, and in particular the development of a whole new product line for us in the Hybrid and Electric vessel space (EHX). Fostering innovation in an established company is really hard, so we took the bold decision to separate some of our most talented engineers from their day jobs and give them a budget to innovate. We gave guidance as to the areas we thought needed our attention, but we did not get in the way of their work. We simply told them to make sure they focus on things that quickly can become products (not just blue-sky research) and get to demonstration as quickly as possible. The result was phenomenal. Within two years we have developed and launched a fully integrated, automatic hybrid-electric drive for commercial and military vessels, built a 15-meter demonstration vessel to prove it works, developed a new business partnership and future product with Sea Machines Robotics, and been granted a patent that could be significant in the offshore wind segment. I think this has put is in a leadership position in the key areas of vessel autonomy, digitization and electrification of marine systems.

Column

Autonomous Vessels

The Future of MASS is Drawing Closer After IMO Scoping

By Grady S. Hurley, Jones Walker LLP

An automated vessel is one where advanced decision support systems onboard the vessel, like the Global Positioning System (GPS) and auto pilot, undertake operational decisions independent of direct human control. A Maritime Autonomous Surface Ship (MASS) involves both automated systems and remote control operations. In August 2016, The Wall Street Journal published an article titled "Ship Operations Explore Autonomous Sailing." The article suggested that by 2030 there would be remotely controlled ships and that by 2035 there would be MASS on the high seas.

In 1974, the Safety of Lives at Sea Convention (SOLAS, Chapter II-1) addressed regulating automated unattended machines on ships and regulations adapted to technology. The SOLAS Convention is an international and flexible instrument that recognizes "exemptions" and "equivalents" for safe maritime operations more than the existing Convention on International Regulations for Preventing Collisions at Sea of 1972 (COLREGS). Autonomous ships, like MASS, now offer a greater regulatory challenge.

Since that August 2016 article, there has been a race between technology and the regulation of MASS to ensure safety on the high seas in accordance with the traditional Rules of the Road or COLREGS. In 2017, the International Maritime Organization (IMO), in cooperation with international bodies including the U.S. Department of Transportation, began a "scoping" exercise including to determine how the operation of autonomous vessels could interface with international treaties and agreements to provide uniformity and promote safety at sea. In May 2021, the IMO Maritime Safety Committee (MSC) completed its initial scoping exercise, which is a major step forward.

IMO

What is scoping?

In its simplest form, scoping is a review of existing laws and treaties to set a baseline for considering how navigation of autonomous vessels will impact them. Every time there has been an advance in technology, whether it's been a transition from sails to motors or from celestial navigation to GPS, its effects have been considered and accounted for.

From 2018 to 2020, the U.K. formed the Maritime Autonomy Regulation Lab (MARLab) to serve as a governmental point of contact to test MASS and also as a regulatory liaison. While supporting IMO efforts, the U.K. sought to facilitate the implementation of MASS trials as well as to support regulatory initiatives to improve autonomy.

In 2019, the U.S. Coast Guard sent out a request for information to seek input regarding the introduction and development of MASS subject to U.S. jurisdiction. The gathering of data was completed in October 2020. The U.S. Coast Guard has participated in the IMO scoping exercises.

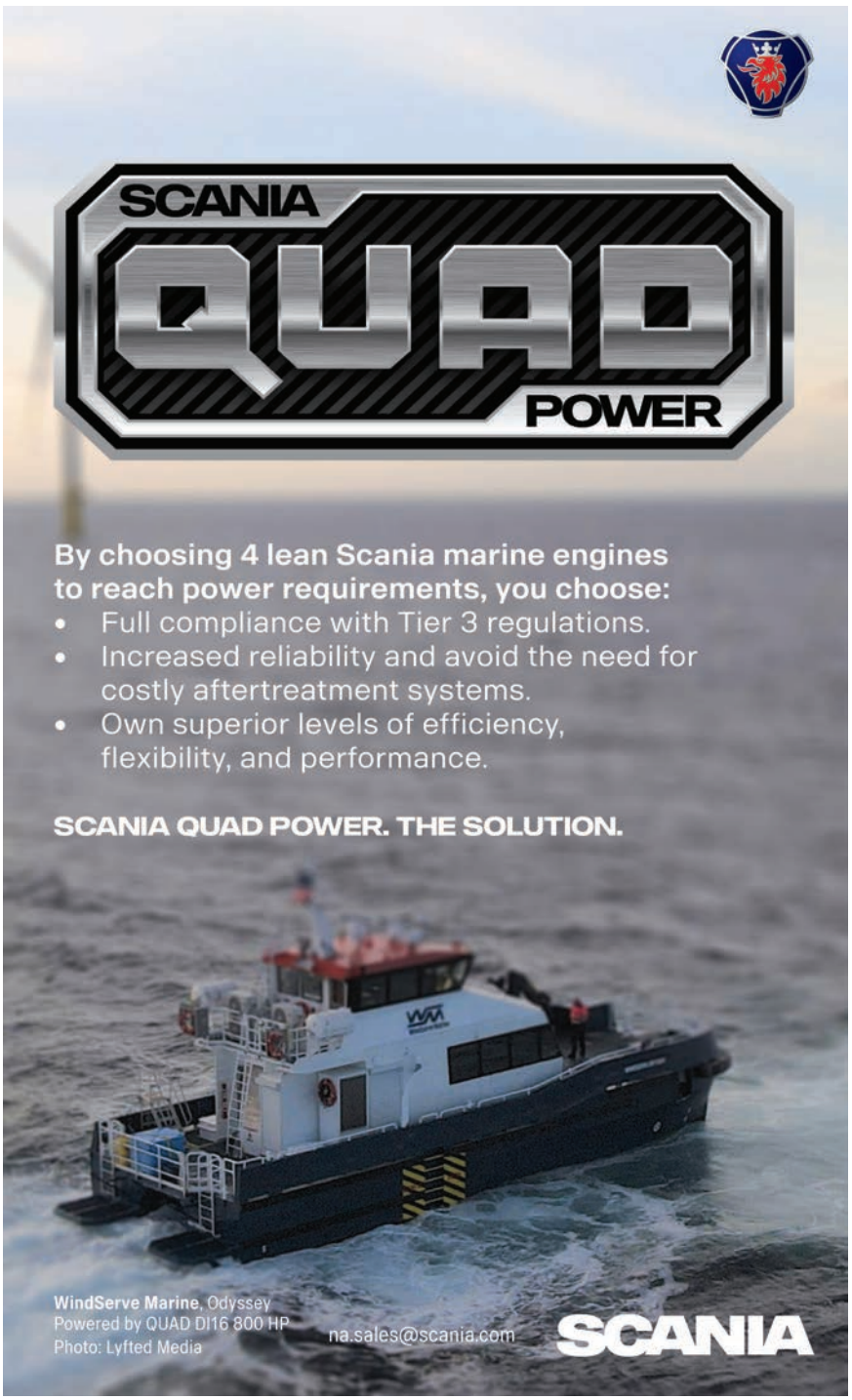
While the U.K., the U.S. and other nations were testing MASS and considering regulations, IMO's MSC agreed in 2017 to determine how safe, secure, and environmentally sound operators could be incorporated into existing international regulations and treaties. This scoping exercise or review included consideration of the human element,

safety, security, liability for damage, ports, pilotage, and emergency response. In June 2019, guidelines were established to first identify existing maritime safety and security regulations affecting MASS, and second, to identify conflicts and gaps in regulations with respect to MASS.

May 2021

During the MSC meeting in May 2021, this MASS working group discussed their results which will eventually lead to policy implementation. Initially, as with any new technology, there will be new definitions and even broader definitions. For instance, who is the vessel's master and who is the responsible person? Further, what current regulations apply or need to be clarified to address safety of life at sea? The MSC goals remain unchanged. The challenge was to make the proverbial "square peg" fit into a "round hole." Agreement on the goal now enables the MSC and the IMO central body to work toward a MASS code to account for automated and autonomous vessels and the meeting of standards that have already passed the test of time. The functional and operational requirements of MASS must meet and conform with the traditional safety goals that seafarers encounter to avoid collisions, allisions, and loss of life and property while navigating at sea and in close quarters. The MSC in May 2021 invited all participating parties to submit goal-oriented proposals which will ultimately lead to a convention and treaty to regulate MASS.

Presently, many sea trials have been undertaken for MASS, and many nations have automated and autonomous vessels in short service. It is now important for all nations to agree on a goal and a common set of Rules of the Road as testing and operations become more prevalent and create potential safety issues. Some may say the future of MASS is here, and regulation is close behind.



Column

Autonomous Vessels

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AI is Pivotal the Future of the Autonomous Shipping

By Yarden Gross, Cofounder and CEO of Orca AI

The shipping industry is responsible for around 90% of the world's trade distribution, carrying the likes of machinery, motors, food and vehicles around the globe. However, despite being around for nearly 5,000 years, the industry has been incredibly slow to innovate. All you have to do is look at how the automotive industry has gone from the original car through to self-driving vehicles in less than 200 years to fully appreciate how behind the curve the maritime world is.

There are many parts of the shipping industry that need to be reimagined to continue to keep up with the growing demand of delivery and technology is at the heart of this, factoring into nearly every element of the shipping process.

Health and safety on board ships is the highest priority for operators, customers and crews, and technology can play a big role in reducing the rising number of collisions. Some 90% of maritime collisions occur in congested waterways, as crews struggle to navigate vessels, but this number can be drastically reduced by introducing the right data artificial intelligence (AI) model.

AI technology provides captains and crews with additional support to deal with the complex scenarios crew face on a daily basis, including low visibility. The connected technology also ensures that data is shared in real time between crew that are on and off shore, allowing the captain to make more informed decisions and introduce new processes to make everyone's lives easier while keeping up with demand.

Introducing these new technologies allows the navigational officers on board to priorities their duties and save time on tasks, like simultaneously shifting between different sides of the ship, watching the navigational tools and calculating risks the crews face on a daily basis. It's an impossible task that requires an immense level of concentration through their duration at sea. The development models also help the captains and senior shipmates make better decisions based on the data gathered by the tech such as Orca AI. With AI developments, the level of responsibility and pressure on roles such as this will be aided greatly for the better.

Steps have already been taken to improve safety on ships, with the installation of motion sensors, but even this can be taken one step further by creating a complete hive network of sensors and readers to assist in measuring every part of the ship. This enables onboard crew to detect faults in hardware and software, harsh weather conditions, traffic updates and feed all the data back to shore where operators are able to update clients, tracking systems and even schedule future repairs or changes. The tech advancements offer crews more autonomy in their roles and get a good hand on sustainability by preventing errors and learning from previous mishaps.

In the future, AI technology will also enable stakehold-

ers and senior leaders in the shipping industry to look at the social and economic levels of struggling regions and create new channels, production lines and ports.

Shipping companies must assume a larger responsibility for workers within their networks and focus on those from areas and environments where protection of human rights is poor. The industry should look to become a safe space for crews to operate and navigate while protecting and respecting the people, natural resources and habits.

The basic understanding of establishing AI to alleviate risk and unnecessary stress on crews and operating staff will unlock the added business potential to explore new avenues of growth. The benefits for businesses looking at this will likely show customers to take more responsibility and an alternative approach to the social responsibility of shipping as a means of delivery and operational performance. Off the back of this, the door will open for unlikely partnerships that can boost mutual benefits, profits and create a wider society throughout the industry.

Sustainability is at the forefront of the global mind and the base of sustainability is human wellbeing. Introduction of new AI technologies will give businesses better outlooks on future operations with crew changes, emissions tracking and reduction of stress.

The industry is heading in a direction where crews and senior management will be able to make instant decisions backed by hard data and take health and safety into account at all points. Intelligent ships will allow faster operations, a happier workforce and a better understanding of where we need to take the industry. For the time being, AI needs to be welcomed into the industry as a means of growth and development instead of a replacement for people. We need to look to enhance the day-to-day of onboard operators which will in-hand benefit the lines, production, levels of risk and impact on environment.

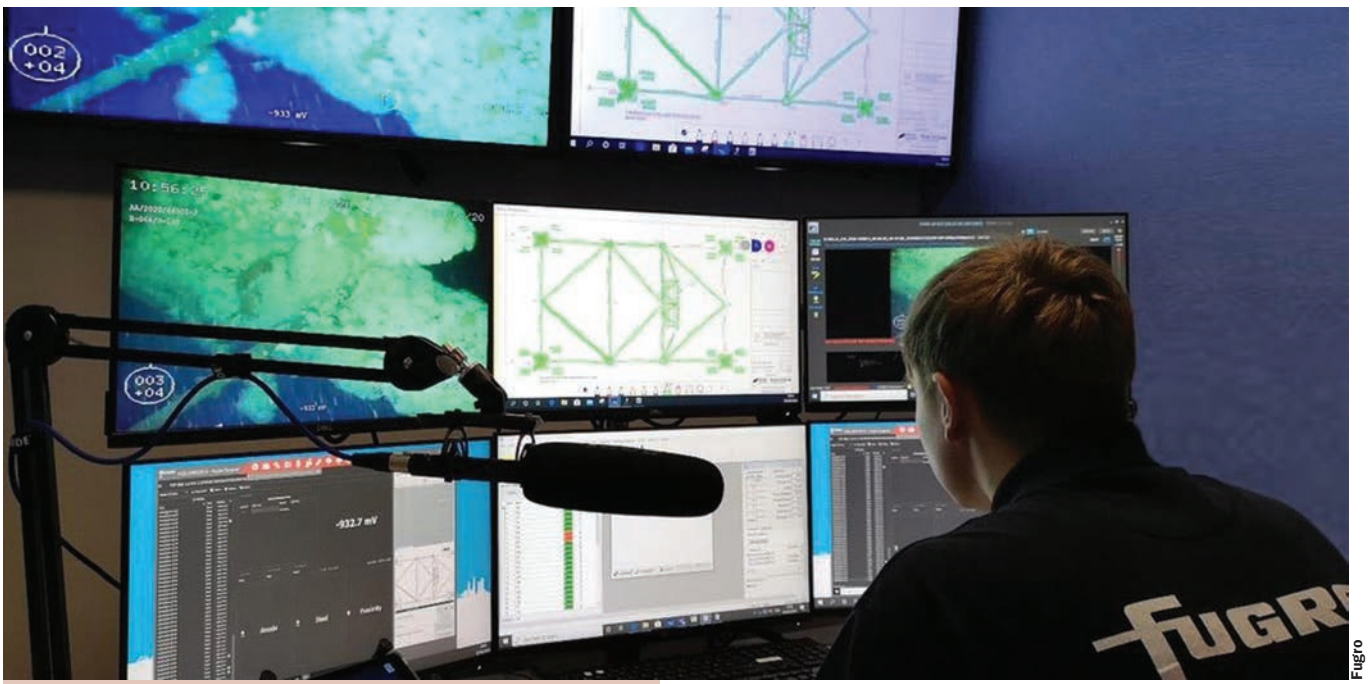
Kongsberg Maritime

MARINE AUTONOMY: *The Future is Being Revealed*

By Barry Parker

Automation, where routine tasks are handled by machines, has been talked about throughout maritime sectors for much of the 21st Century. Initially touted by suppliers of engine room and bridge management systems for its cost savings (with reduced manning levels), its value proposition was then infused with risk management (reduced human error) and remote operations, where vessels could be managed from a shoreside control room. In early 2017, Rolls Royce —an early proponent of unmanned operations—teamed with tug operator Svitzer on a remotely operated vessel, Svitzer Hermod in a well-publicized demonstration project in Copenhagen. This, and other earlier "proof of concept" exercises are now moving into true implementation phases.

Increasingly, automation of vessels is also tied into reduction of emissions (with sustainability a goal that is now top of mind across the entire business), where optimization—a machine and data based concept—is used to manage, and reduce, fuel consumption. Kevin Humphreys, Americas president for marine and offshore at Lloyds Register's Houston office, told ***Marine News***, "Autonomy will make a contribution to reduced emissions by identifying what may appear to small gains



Fugro

Fugro remote operations center

Fugro

Fugro Blue Essence 12m uncrewed vessel

across multiple vessel systems and operating conditions. But when they are 'stacked together' they become a factor on each other; the value becomes increasingly noticeable and worthwhile."

This trend is evidenced by traditional equipment companies teaming up with data scientists and information providers. In mid-May 2021, Alfa Laval (which joined the highly influential Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping in January, 2021), described StormGeo, which it newly acquired, as "…a global leader in weather intelligence and advanced data science solutions." The Swedish technology purveyor added that, "The acquisition is part of Alfa Laval's strategy to support the marine industry's efforts to make operations more efficient." Swirling around in the background here is 2020's COVID-19 pandemic, with its issues of seafarer repatriations and then, as 2021 unfolded, vaccinations. Labor-saving technologies likely moved farther up on shipping company wish lists.

In early 2021, Svitzer announced a partnership with Kongsberg Marine (which had absorbed Rolls Royce's maritime business) on RECOTUG, a remote-controlled tug business that would build on its earlier efforts. In a prepared release, Kongsberg's manager for control applications, Carl Johansson, explained, "While the 2017 demon-

Foss ASD 90 class tractor tug

Foss Maritime

strator project proved the concept, the technology we have at our disposal today means that RECOTUG is no longer a simple demonstrator project. Its aim is to provide Svitzer with a commercially viable product that the company will be able to use in its operations worldwide."

From the Svitzer side, Thomas Bangslund, group head of innovation at Svitzer, added, "The original scope of the pilot was to assess if the remote control technology would allow us export situational awareness to an off-vessel location, and in a way that the captain was comfortable operating the vessel. This proved the case and now we are challenging ourselves to develop a tug that we can operate safely and efficiently from shore, down the line, potentially without a crew on board, so it's a completely different ballgame."

In the States, Foss Maritime will be installing an autonomous-command and -control system from Sea Machines Robotics, for use aboard its tugboat Rachael Allen, soon to be completed at the Nichols Brothers yard. The Z-Drive tug- with 90-ton bollard pull, will be used for tanker escorts and towing in California ports. According to Boston-based Sea Machines, its SM300 system includes "… transit autonomy, as well as remote access of the tugboat's onboard machinery, a feature that allows personnel to manage and support operations from anywhere on board the vessel or from shore," adding that, "Navigation obstacle detection and avoidance capabilities come standard…" The tug, the last of four to be delivered from Nichols Brothers, is powered by two MTU series 4000 main engines, meeting Tier 4 emission standards, coupled to US255 azimuth thrusters from Kongsberg.

Sea Machines is also making strides on the East Coast; it has demonstrated an autonomous delivery of cargo from Boston, where it is based, to Gloucester- farther up the

Massachusetts coast, and operated autonomous workboat prototype in Boston harbor. Another deployment in the works will see its SM300 on a hybrid-powered vessel handling palletized produce and food between Connecticut and the north shore of Long Island, N.Y.

As the pace of technological advancement quickens, a certain tension exists between technology and regulation. Shipping's regulator, the International Maritime Organization (IMO), in 2017 began a "scoping study" on how vessel automation might be regulated. Described the by IMO as a "first step" toward enabling regulation under a host of existing international treaties, the study, under the auspices of the IMO's Maritime Safety Committee (MSC) was completed in May, 2021 at its MSC 103 meeting.

The IMO, in its scoping study, looked at multiple layers of autonomy. In announcing the study's completion, it said, "Varying degrees of autonomy were considered: crewed ship with automated processes and decision support (Degree One); remotely controlled ship with seafarers on board (Degree Two); remotely controlled ship without seafarers on board (Degree Three); and fully autonomous ship (Degree Four)." An example of Degree One, well known in the offshore workboat realm, is dynamic positioning (DP), where seafarers can take control as needed. As IMO rules are developed, the Class Societies will play a vital role; in a submission to the just completed MSC 103, the International Association of Class Societies recommended that a new chapter of the Safety of Life at Sea convention (SOLAS) be devoted to autonomous vessels. Such a step—an alternative to the painstaking process of amending numerous international treaties—would provide a fast track for the regulators to keep up with the technologies.

The importance of the human element has not been lost in the journey to autonomy. Sea Machines asserted that, "Across all industries, autonomous technologies streamline manual, repetitive and tedious tasks, allowing personnel to focus on higher-level operations with reduced risk…" and stress that its SM300 "… allows personnel to manage and support operations from anywhere on board the vessel or from shore." Kongsberg Marine, in describing the RECOTUG, said, "While the new tug has been designed to include the customary facilities to accommodate a crew, once the Kongsberg systems have been fully tested, the tug

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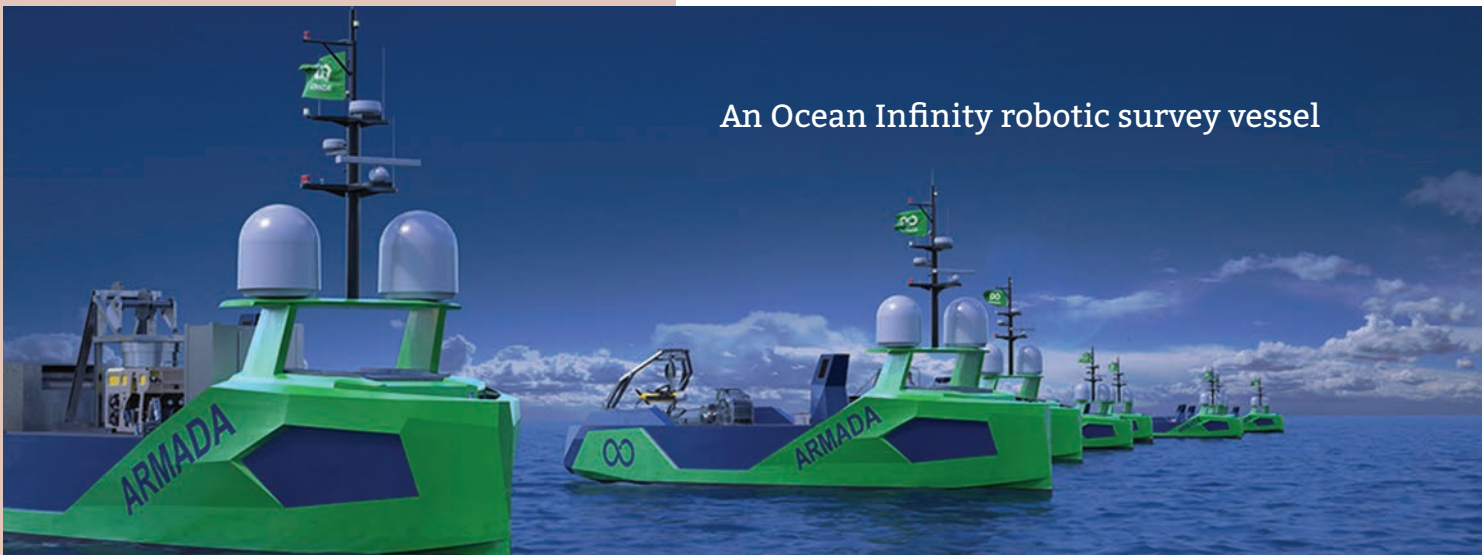
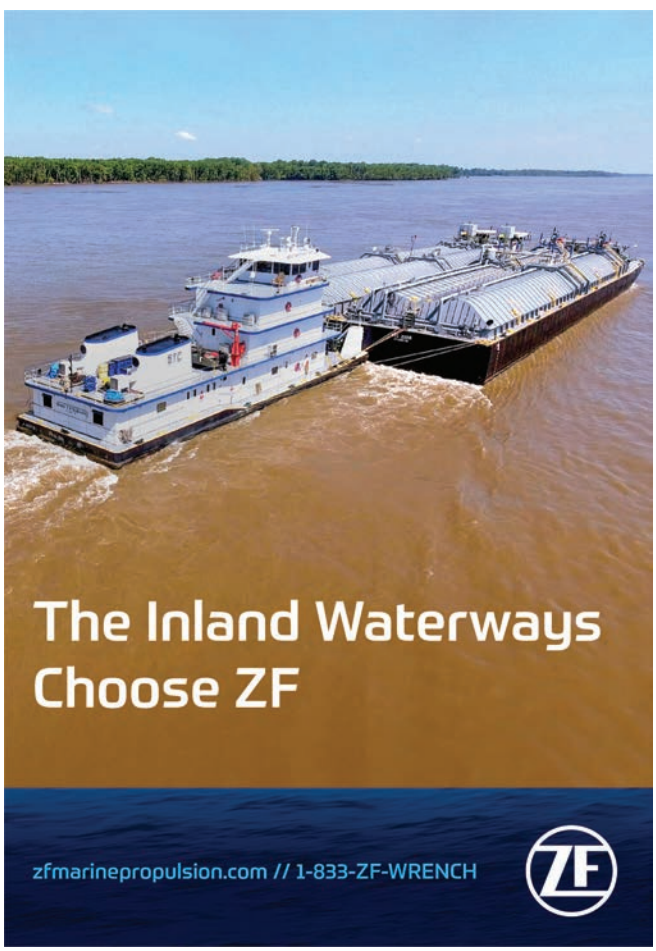


An Ocean Infinity robotic survey vessel

Ocean Infinity



has the operational potential to be deployed as a remotely controlled unmanned vessel."

The underwater sector has, by necessity, embraced autonomy, and technologies developed for underwater inspection and survey vessels are now being made available to the workboat and other surface vessels. Fugro, a leader in deepwater surveys, offers a suite of unmanned vehicles, including its unmanned Blue Essence 12-meter surface vessel which is suitable for "inspection, construction support, hydrographic and geophysical surveys." Fugro noted, "Blue Essence's modular design means that it can be used for a wide range of industry tasks within the energy sector and others". Ocean Infinity, a Texas-based marine robotics provider (known for its searches for the doomed MH370 airliner), which has been deploying Kongsberg Hugin autonomous underwater vehicles (AUV) in its unmanned deepsea survey and data collection work, is now developing a fleet of 15 hybrid (battery/ Volvo Penta diesel) powered unmanned surface vessels- dubbed Armada. The vessels, being built at Grovfjord Mek. Verksted (GMV) shipyard on Norway's west coast, will also be able to launch AUVs. Closer to home, offshore stalwart Edison Chouest, with its eye on the offshore wind sector (where sustainability is crucial in vessel choice), has extensive experience in AUV's and ROVs, with its C-Innovation subsidiary, based in the New Orleans area.

The classification societies' successes in developing sys-

tems for manned ships can be adapted for the unmanned surface segment. In early June DNV announced that Ocean Infinity would be deploying its ShipManager platform. DNV said, "The robotic ships in Ocean Infinity's Armada fleet use low-emission fleet technology and are equipped with state-of-the-art sensors and pioneering navigational solutions that allow information to be gathered from the shallowest and deepest waters, whether for exploration, mapping or searching for wreckage. The marine robots use hybrid technology, cutting CO2 emissions. An Armada robotic vessel emits up to 90% less CO2 than a conventional survey vessel." Ocean Infinity stresses its green bona fides, saying that "Armada will be the first ever carbon neutral ocean tech and data company." But Ocean Infinity also has its sights set on logistics and cargo delivery. At Armada's 2020 launching, Dan Hook, the firm's managing director, said, "We will be working with several partners as we introduce on-demand low emissions logistics services.

Also in Norway, Yara International (active across agriculture and more recently, in developing ammonia fuels for shipping) took delivery in late 2020 of the battery powered Yara Birkeland from the Vard Brattvåg yard. The 3,200 dwt 120 TEU vessel has been tested for stability and is now docked at Horten (down the Fjord from Oslo) being further prepared for autonomous operation.

Autonomy in the maritime world is a gradual process implemented in phases, similar to that underway for automobiles. Sea Machines, outfitting the Foss tug, said, "While the Rachael Allen will be delivered with the SM300 and supporting hardware fully integrated into the vessel, the capability of the technology will be activated in stepped phases over the course of six to nine months to ensure full visibility and acceptance from all operational stakeholders."

The people on board are not going away so fast. As the pace of autonomy quickens, the human elements continue to be addressed. In early June, the U.K.'s Royal Navy, training specialist SeaBot XR and the U.K.'s National Oceanography Center signed a memorandum of understanding (MOU) to create the National Center for Operational Excellence in Marine Robotics, a training center that will be located in Southampton, U.K.

But as all the maritime sectors are now racing toward a greener future, the all-encompassing and role of automation, an ingredient in what is becoming a "virtuous circle", is now being revealed. LR's Humphries reiterated this, saying, "Digitization of autonomous vessels can enable transit optimization. Sailing routes, speeds and all destination port handling can be optimized in both financial and emission value terms to the shipowner/operator. Autonomy will also give understanding of vessel health, including predictive maintenance, that can support a marked reduction in emissions through its operational life."

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Moving Forward with Emissions

- Is it Tiers, Tears or Fears?

By Robert Kunkel

As International Maritime Organization (IMO) and U.S. Environmental Protection Agency (EPA) emissions requirements continue throughout the IMO Emission Control Areas (ECA), they are also forcing postponement of many new construction decisions as vessel owners and operators continue to tread cautiously along the path forward. The Marpol Annex VI program looked to correct emissions requirements while working with petroleum fuels. Technology developers continue best efforts to advance long-term solutions to reach the latest IMO zero emissions greenhouse gas (GHG) goals of 2050. Those GHG decisions and regulations are working to move away from oil and press forward with alternative sources of energy and fuels. Two paths that simply require a hybrid connection similar to the procedures the automotive industry has followed. The combination of those two paths will ease the decision process for owners and manufacturers. It is our opinion that the oil faucet will not be shut off as quickly as the IMO hopes. It is a simple statement based upon economics. And with those economics, watch as zero emissions achievements become a financial model using carbon credits rather than technical solutions to meet IMO 2050 goals.

The IMO emissions standards are commonly referred to as Tier I through III standards. The Tier I standards were defined in the 1997 version of Annex VI and they

are now ancient history in the discussion. The stricter Tier II/III standards were introduced by Annex VI amendments adopted in 2008—nearly 13 years ago. There's been 13 years to address sulfur, nitrogen oxide and particulate matter in the air by regulation, and another 30 years to meet the IMO goals of 50% reduction of GHG by 2050.

IMO Tier II represented an approximate 20% reduction in NOx from Tier I and was applied to engines greater than 130 kW. The standard took effect in 2011 for all areas that adopted IMO Tier I (keep track through this article of the time that has passed to meet some of the simplest of requirements along with the new projection for the reduction of GHG to meet "zero emissions").

Is the emissions goal post moving for most owners and manufacturers? You bet it is. A long-term goal has many moving parts.

The main changes to the original Marpol Annex VI have involved progressive reductions of SOx, NOx and particulate matter emissions globally. The introduction of ECAs was added worldwide to reduce those air pollutants to protect the coastal population areas. The latest tier (whether you are counting IMO or EPA designations) limits NOx emissions standard with enforcement from January 1, 2016 in ECAs as per the MEPC 66 meeting. Most do not understand that those requirements are only in the ECA. When returning to blue water, propulsion engines are not required to meet those NOx strict emissions standards. But to reduce GHG to zero and meet MEPC 77, engines will have to.

In many of the Far East yards the IMO 2016 requirements were circumvented by building keel blocks in inventory and having them certified as constructed prior to January of 2016. In turn offering them into new construction utilizing IMO Tier II propulsion engine standards as Tier III solutions were not available. We are in the new construction yards worldwide each day. Tier II engines and ships are being delivered well into 2021.

The regulatory loopholes were also applied within the domestic shipbuilding market. During the 2016 regulatory period there were no manufacturers developing IMO Tier III or EPA Tier 4 engines under 600Kw that could comply with the standards. In fact, larger propulsion engines utilized in the domestic workboat, tug and offshore operations only had EMD and General Electric to choose from to comply. That said, complying with propulsion did not relieve the domestic owners from meeting the requirements with generators and auxiliary engines. As a result, those newbuilds were restricted to only U.S. domestic operation. Operating in Canada or the Caribbean added a risk of losing that domestic "Tier" protection for those trading outside the zone. From a financial perspective or an investment opportunity, this created another hiccup in exit strategy should domestic markets fail.

Robert Kunkel

Owners have been forced to deal with the continuing regulation amendments when making decisions with assets that were financially modeled to trade anywhere between 20 and 40 years. The latest IMO revision to the EEDI calculation and EEXI amendments has also affected that decision process. In a recent construction supervision project in 2020 the owners delivered six chemical tankers that were a continuation of a design and delivery in 2016. Imagine their confusion when the 2016 vessels were determined to have a better energy rating than the 2020 builds because of changes to the EEDI and EEXI calculations.

How these calculations will drift into smaller tug and offshore markets is yet to be seen.

Under Tier regulations engines are tested using distillate diesel fuels, even though residual heavy fuels are usually used in real life operation. Under GHG "zero emissions" projections we are now looking at methanol, liquefied natural gas (LNG), hydrogen, liquefied petroleum gas (LPG) and ammonia, all of which have different energy densities that affect consumption, tank space and Kw /HP requirements. The range is significant with marine gasoil (MGO) at an energy density of 35.9 to hydrogen at 8.5. Beyond those performance issues look to the cradle to grave environmental impact when processing and developing those new fuels when you are attempting to reach environmental goals in your company.

In our marine applications we have worked toward a hybrid combination of battery technology and fossil fuel very similar to how the automotive industry has developed. It will be difficult to move directly into full "marine EV" in the near future, and though we are supporters of alternative fuels and electric propulsion we understand the infrastructure requirements and costs involved. It is hard to look beyond the energy density of distillate low sulfur MGO after all the work the engine manufacturers have completed to meet the Tier requirements. A hybrid application allows full "EV" battery operation within the ECA or around coastal populations with zero emissions and combustion engine operation when extending the battery

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range. Energy storage is important when working toward those alternative fuels or a complete movement away from internal combustion engines. That hybrid application is in operation along the New England coast with our company First Harvest Navigation (a documentary on the project is available on YouTube at **https://bit.ly/thelastlinedoc**).

The IMO goal of 50% reduction of GHG gases by 2050 requires all of these technical issues to be answered, built, tested and developed. Historically, regulation has never driven the marine markets. Private investment has been that leader and the investment path must have the ethics to take emissions reduction into the boardroom. Without that corporate drive you will see the application of carbon credits used to meet the 2050 goals.

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ELECTRONIC NAVIGATIONAL CHARTS:

An Update and Some Issues

By Tom Ewing

U.S. NAVAL INSTITUTE PHOTO ARCHIVE. Used with permission.

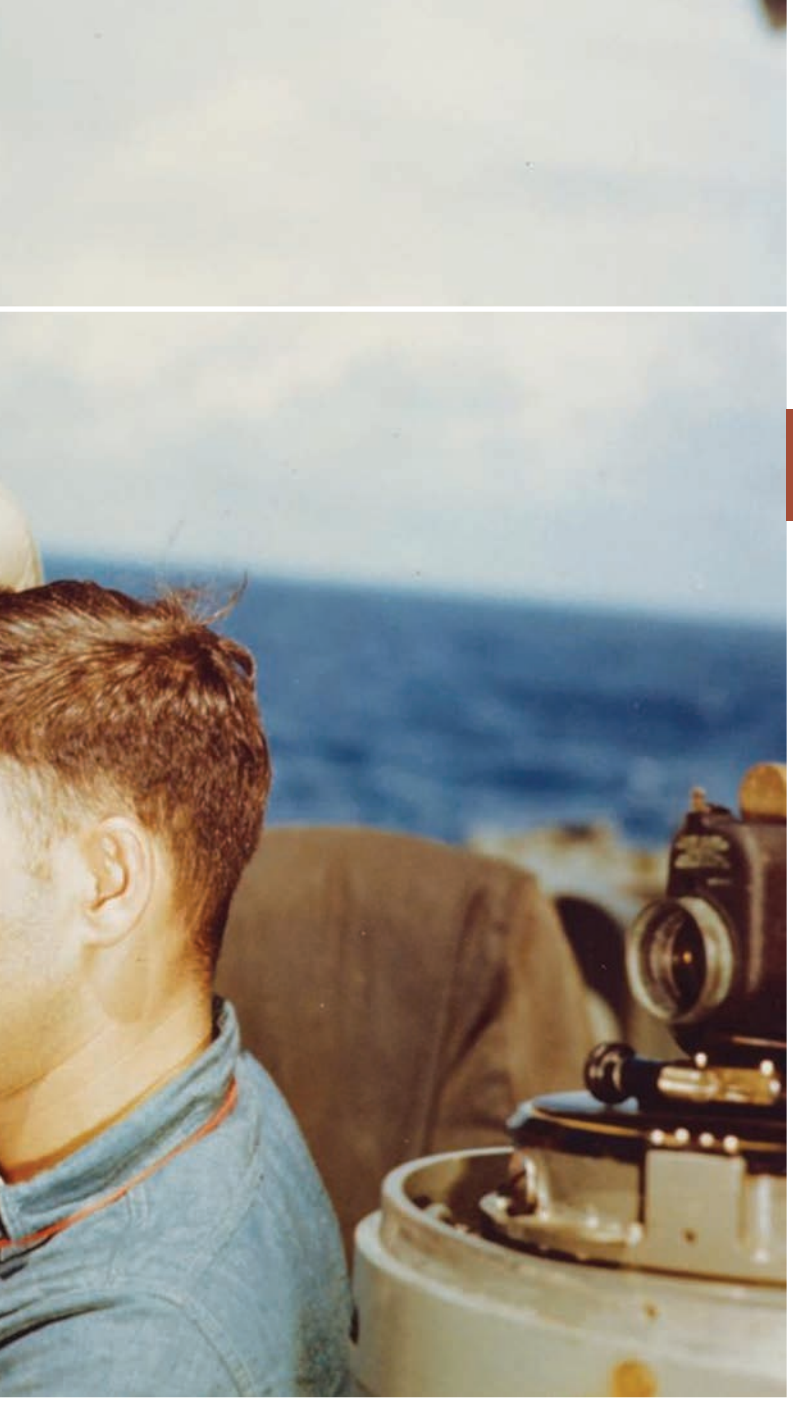
In November 2019, the Office of Coast Survey (OCS), part of the National Oceanic and Atmospheric Administration (NOAA), announced the start of a five-year program to "sunset" all raster and paper nautical charts.

NOAA has produced electronic navigational charts (ENCs) since 1993. In the 2019 notice, NOAA writes that "ENC sales increased 425% since 2008, while sales of paper charts are now half of 2008 levels."

For NOAA and mariners, a focus on electronic charts and publications promises many advantages. With a singular focus, NOAA can use its resources more efficiently. Mariners will get higher quality, more informative charts, eventually building to a library with over 9,000 ENCs.

And importantly, paper charts will still be available via a new NOAA web-based Custom Chart application. Users can define scale and paper size and selected positioning. Notes and other marginalia appear on separate PDF pages. The app is now available as Version 1 and, even better, development is ongoing and two-way: via NOAA's web page a user can comment on the app's good points and ideas for improvement.

The huge increases in demand for ENCs surely indicate support among users. That doesn't mean, though, that there are no questions with the sunsetting project. In a heavily regulated industry, one basic concern for mariners is, yes, NOAA makes the charts, but the U.S. Coast Guard



A quartermaster takes a sun sighting from the navigation bridge of the USS Alaska (CB-1) in 1945.

(USCG) makes the rules. Is the Coast Guard on board with NOAA's e-chart initiative?

To a large extent, yes. In May 2020, the USCG issued a Navigation and Vessel Inspection Circular (NVIC, No. 01-16 (CH-2)) updating its "use of electronic charts and publications in lieu of paper charts, maps and publications."

The NVIC states that, because of technology advancements, "the Coast Guard now considers most electronic devices to be capable of meeting the 'ready reference' timeframe by which a ready-reference paper version on board a vessel would be available." The NVIC states further that "the Coast Guard sees no significant safety barriers preventing vessels from accessing voyage planning navigational information via the internet on an as-needed basis, versus keeping a publication or extract on board." The USCG writes of "encouraging the use of electronic voyage planning products."

Since 2019, the sunsetting process has made significant strides across a number of fronts. In April and May the Agency held two webinars to explain and update the e-chart process. Earlier, in February, it announced the end of work on its first paper chart, for Lake Tahoe, paper chart 18665. That means that starting in August, an electronic navigational chart will be the only NOAA nautical chart of the area. The notification about Lake Tahoe was included in the USCG's Local Notice to Mariners (LNM). Going forward, that's the venue that will be used for future end-of-paper announcements.

NOAA does not have a specific schedule or set of criteria for how it will progress with the sunset. Rather, changes will proceed when certain conditions develop. These include:

- **Availability of new, larger-scale, reschemed ENC coverage;**
- **New depth or shoreline data;**
- **Low chart sales; and,**
- **Some regional cancellations, especially if all or most of a particular chart's adjoining, similar-scale chart coverage is canceled.**

Again, to stay current on sunsetting, watch Local Notices. Plus, NOAA's website has a List of Latest Editions webpage tracking map and chart sunsets.

NOAA's transition plan was to incorporate stakeholder comments and concerns which would help guide the sunsetting process. What did people say to NOAA? That's hard to tell directly because NOAA did not make this a public docket.

"We wanted responders to be candid and forthright with their feedback and posting them publicly would discour-

age that," explained Julia Powell, Chief of the Navigation Services Division, Office of Coast Survey.

NOAA received more than 430 comments, Powell said. About 70% were from recreational boaters, 20% from professional mariners, and the remaining from other sources, such as maritime educational institutions and other government agencies. Over half of the comments supported the continuation of paper charts, especially as backup for e-charts. Powell added that there were "several comments" conveying "satisfaction with the use of NOAA ENCs and the advantages of focusing efforts on improving this digital chart product."

Regarding the many references to keeping paper charts, Powell emphasized that the e-chart move still makes paper charts accessible via the new NOAA Custom Chart app. Overall, the project is on schedule. "We fully expect to complete the process of canceling all traditional paper and raster nautical chart products by Jan 2025," Powell said.

With no access to public comments, it's hard to assess industry's top concerns and suggestions and whether that information is influencing implementation. As with all big projects, there are outstanding issues and unanswered questions. Maybe the biggest question: is the USCG a participant in the sunsetting project, or standing by as an observer? Yes, NVIC 01-16 is a critical document. But it wasn't issued as part of NOAA's sunsetting.

During NOAA's recent webinars, questions came up about NOAA and USCG teamwork. One participant asked, for example, about USCG-approved custom POD (print on demand) charts. NOAA's reply: "That is a good question for which we don't have an answer. We are looking into what it would take to make a carriage compliant, NOAA custom chart." Another person asked about petroleum transport and charting. NOAA's reply was a general reference to NVIC 01-16.

NOAA added that the Coast Guard is "presently working on preliminary steps that will result in new regulations related to the use of electronic navigational charts," likely ready in about a year. In response to a question about the Light List NOAA mentioned a NOAA-CG effort at "harmonization," underway now, pertaining to updated waterway references. NOAA's 2019 Sunsetting document tells that NOAA and the Coast Guard are "currently discussing if and what paper chart carriage the USCG may have in the future." Those discussions are ongoing.

After one question NOAA staff remarked that the webinar attendee list included several participants from the Coast Guard. Hopefully, NOAA's staff commented, "they will take note of (the) question."

With a new program, nobody expects all the answers at start up. But regulated businesses, facing inspection and enforcement, want to avoid policy zigs and zags and conflicting timelines. In fact, e-chart development seems active on a number of fronts – "harmonization," new carriage allowances – not just the sunsetting process. People expect interagency teamwork.

In 2020, the American Waterways Operators, sent comments to NOAA on sunsetting.

AWO suggested that NOAA "strategically sequence" the transition from paper to ENC products "for those (com-

panies) that need or choose to use them to meet US Coast Guard navigation carriage requirements."

Another suggestion was retaining the option to purchase traditional paper charts "until the Custom Chart application is fully tested, functional and operational."

A third major concern is more complicated. AWO notes that some of its members would prefer ENCs. However, AWO writes, "current Coast Guard policy regarding chart carriage requirements effectively prevents them from doing so. We would like to bring these issues to your attention and ask for NOAA's support to resolve them."

At issue is text within the CG's NVIC 01-16 directing that, "If any part of the vessel's intended voyage is seaward of the territorial sea baseline (as defined by 33 CFR 2.20), then the display system must be tested against and

Rose Point Navigation Systems

Rose Point Navigation Systems

Weeks Marine vessel with Rose Point ECS displayed on two Hatteland Technology Panel PCs.

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www.gladding-hearn.com

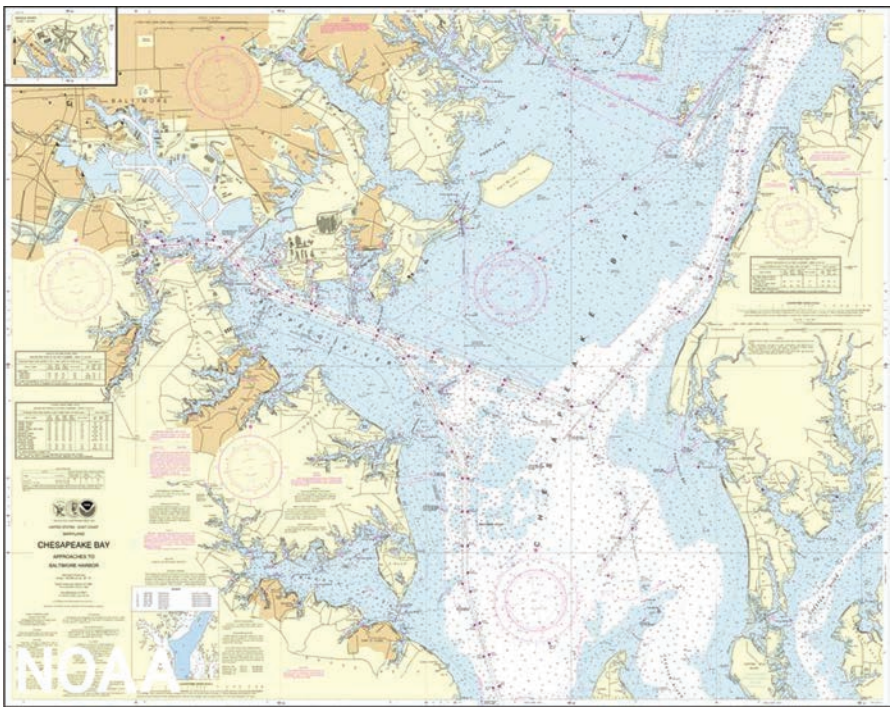
For almost 65 years, Gladding-Hearn Shipbuilding has built steel and aluminum pilot boats (95), Incat Crowther high-speed-passenger catamarans (43) and dozens of tug boats, patrol, rescue and fire boats and research vessels. The shipyard counts more than 425 vessels built as proof of its longevity and vessel reliability. Gladding-Hearn is best-known for some of the most advanced shipbuilding techniques that rival bigger yards, while still providing personal customer service of a smaller yard. As a result, nearly 90 percent of Gladding-Hearn's business is from repeat customers.

Contact: Peter Duclos, Co-President & Director of Business Development
508-676-8586, peterd@gladding-hearn.com

meet the International Electrotechnical Committee's Maritime Navigation and Radiocommunication Equipment and Systems Standard (IEC 60945) or be a Radio Technical Commission for Maritime Services Electronic Chart System."

As mariners know, a person could swim past the territorial sea baseline. Coastal vessels then, and this is also an issue in the Great Lakes, as required by NVIC 01-16, need computer equipment meeting the IEC standard, which is tough, and expensive, reportedly costing as much as $5,000 per unit. If a company owns 10 vessels, do the math. But that's not all. The

NOAA chart 06.09.21



NOAA

USCG requires a backup. The cost could double if a duplicate IEC-standard system is required, which, seems likely, if there are no paper charts that comply with Coast Guard regs.

In contrast, vessels staying inside the sea baseline can use any hardware to display ENCs, e.g., a laptop issued by the IT team purchased on Amazon or at Staples.

AWO writes that, "For members operating domestically in the coastal sector, ECDIS is the only ENC display system the Coast Guard will accept for vessels that transit outside the territorial sea baseline. Between equipment, installation and subscription costs, and the costs of specialized crew training, an ECDIS can cost up to tens of thousands of dollars."

Hardly an incentive to jump onto NOAA's sunsetting. AWO writes that it wants to work with the CG to find "practical options" and it asks NOAA's "assistance to resolve these issues."

In an update, Caitlyn Stewart, AWO's VP, Regulatory Affairs, said that NOAA and USCG staff have emphasized to AWO that the two agencies are coordinating their efforts regarding e-charts. With Lake Tahoe, for example, Stewart said the Coast Guard is reportedly working on "bridging guidance" for Lake Tahoe users subject to carriage requirements.

Additionally, the USCG advised AWO that the agency is working on new rules regarding ENCs and coastal operations.

Hopefully, these important discussions become public sooner, not later. Maybe NOAA and the Coast Guard can work separately, but mariners can't.

Silos bad. Teamwork good.

Tech File

X-Series Waterjets

All images: Marine Jet Power

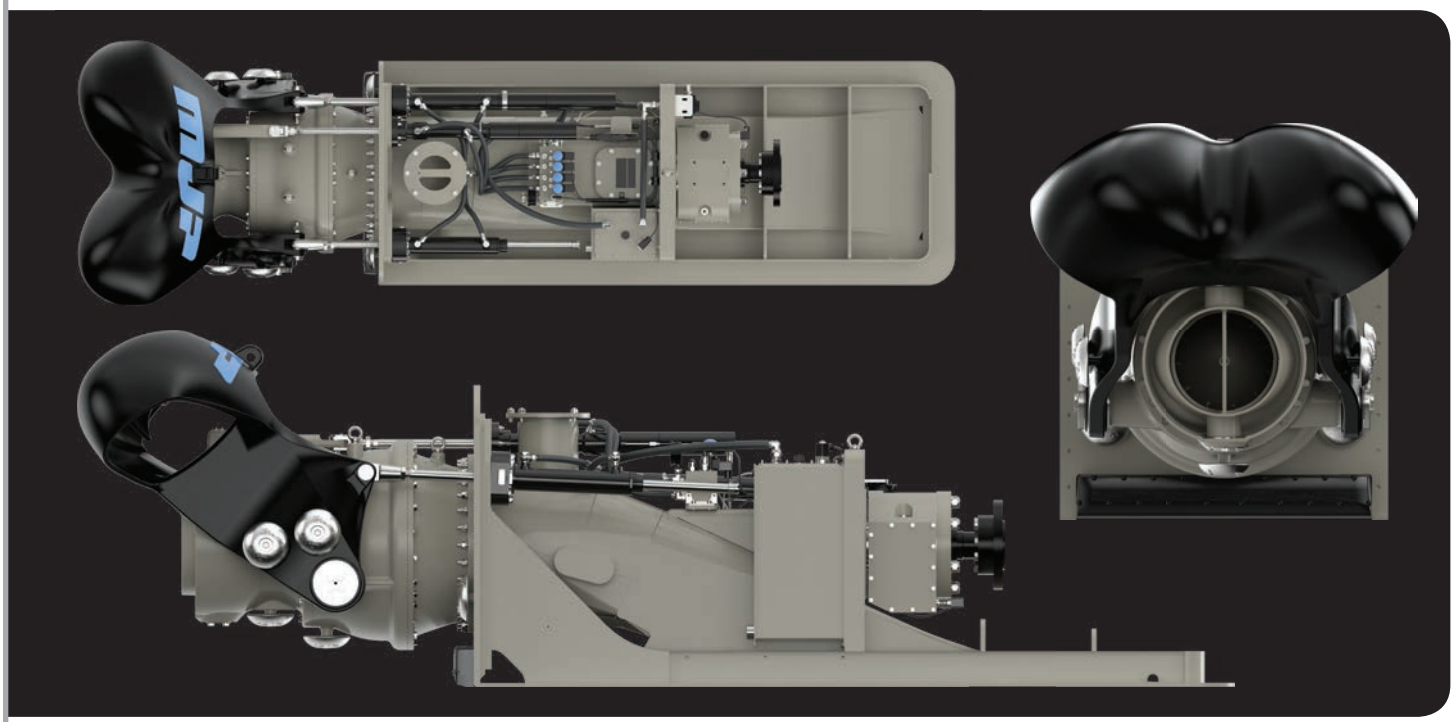
Launched in 2018 to cater to the propulsion demands of high-speed vessel applications, Marine Jet Power's (MJP) X-Series waterjets are engineered to deliver more power in a lighter unit that burns less fuel and extends range.

"With the X Series we have taken our proven highly efficient mixed flow pump technology from our DRB and CSU Series, and adopted it into a fully integrated, quick to install waterjet which is mostly constructed from duplex stainless steel," said Jonas Tegström, CEO of Sweden-based MJP. "The DRB and CSU waterjets are highly customizable and very successful in various applications. But with the X-Series, we wanted to take the best performing pump on the market and provide our customers with a more 'off the shelf' and cost-effective waterjet that is much quicker to install."

First introduced in 280, 310 and 350 X sizes (611-1,000 kW), the X-Series has recently expanded to include the new 400, 450 and 500 X sizes (up to 2070 kW / 2775 bhp).

"The three new sizes in the X-Series range are suitable for vessels up to 40 meters, or 131 feet, in length," Tegström said. "Due to their duplex stainless steel construction and mixed-flow pump, the X-Series is not only highly efficient but highly durable. This equates to many benefits for a diverse range of marine applications including search and rescue vessels, fire boats and fast military craft globally."

Additionally, Tegström said the new larger X-Series models are particularly well suited for the emerging global offshore wind market, which will see a large number of new vessels built in the U.S. and overseas. "MJP has a long history of supplying propulsion for crew transfer vessels servicing windfarms across Europe," he said. "Our experience in this segment has influenced the design of the larger X Series models by creating a product that is easy to install, saving the shipyard time and money, and easy to maintain and operate, offering end-users a very low cost of ownership."



Jonas Tegström,
CEO, Marine Jet Power

According to the manufacturer, the 400, 450 and 500 X-Series models have been designed in compliance with full class approval with dual feedback sensors and a stainless-steel hydraulic tank. The jet models will be configured with MJP's JetMaster3 electronic control system, which under class rules come with a dual power supply, redundancy and back-up system. The fabricated intake has been developed for larger vessels, optimized through computational fluid dynamics (CFD) to offer both high-top speed and high thrust, MJP said.

MJP said other key X-Series features include a responsive nozzle with central fin, optimized reverse bucket, and a fully integrated hydraulic pump, resulting in a highly efficient waterjet that's easy to install, operate and maintain.

The new X-Series sizes are available now and the first 400X unit will be delivered to an undisclosed customer in Asia next quarter.

Tech
File

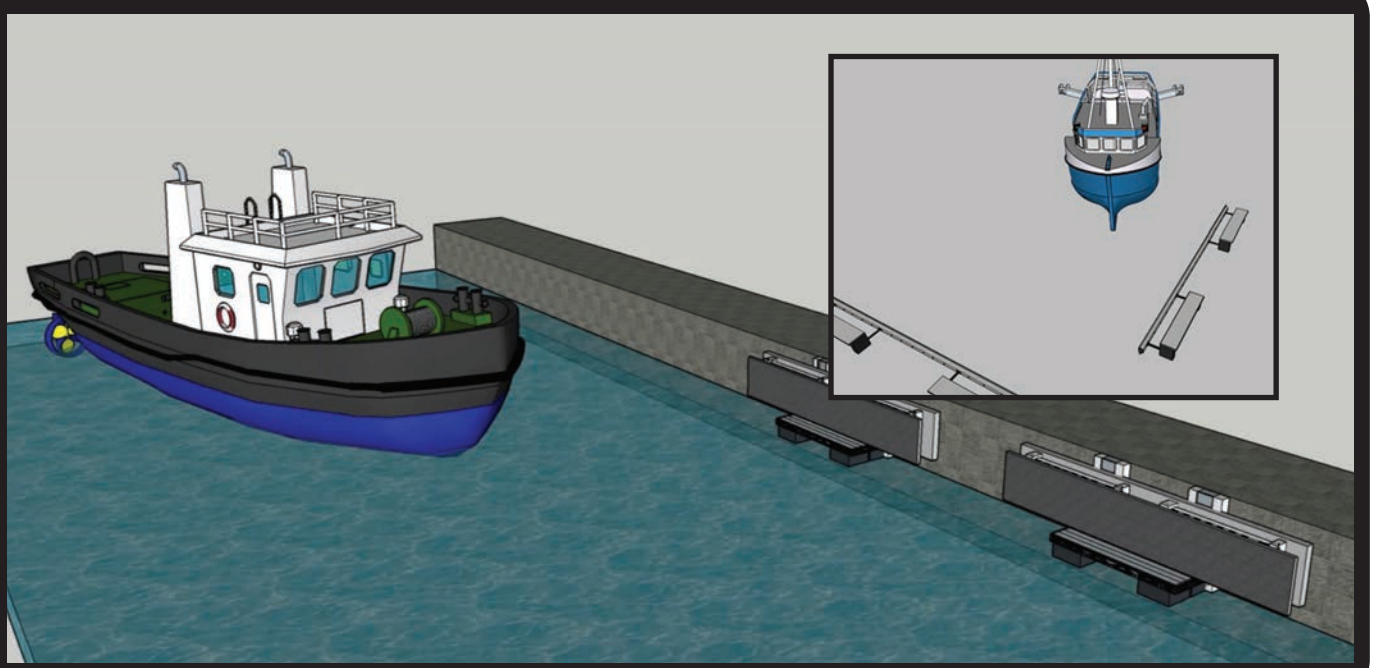
Dynamic Protective Barrier

Dynamic Protective Barrier (DPB) is an innovative safety device with a novel mechanism proposed to dissipate energy for short duration impact caused by the docking ship and/or vessels.

The main job of the device is to dampen and contain the vessel movements, thus eliminating the effect that passing ships, tides, wind and long-period waves have on moored vessels and the constant low velocity impact that occurs with the port infrastructure. This means using Dynamic Protective Barrier can eliminate the structural damage that occurs and can assist in improving safety and reducing operational costs of ports and marinas.

Additionally, the developer of Dynamic Protective Barrier claims the technology has advantages over conventional bollards such as reduced time for securing vessels and associated reduction in labor costs. This further increases the range of environmental conditions in which cargo can be transferred. It further enhances safety by keeping the vessels stagnant thus, simplifying day-to-day operations. The system speeds up the berthing process and minimizes workload and manual line handling thus improving overall efficiency.

The current state uses rubber fenders and they accumulate the kinetic energy resulting from the low impact of the mooring/docking vessels hence causing cracks in the quay walls, sometimes even damaging the vessels which has an economic impact. DPB aims to eradicate the constant repair of quay walls and vessels. It also aims to reduce time for securing vessels alongside and associated reduction in labor costs which is usually spent in the regular replacement of the fenders by effectively dampening the impact and thus dispersing the load using this innovative technology.



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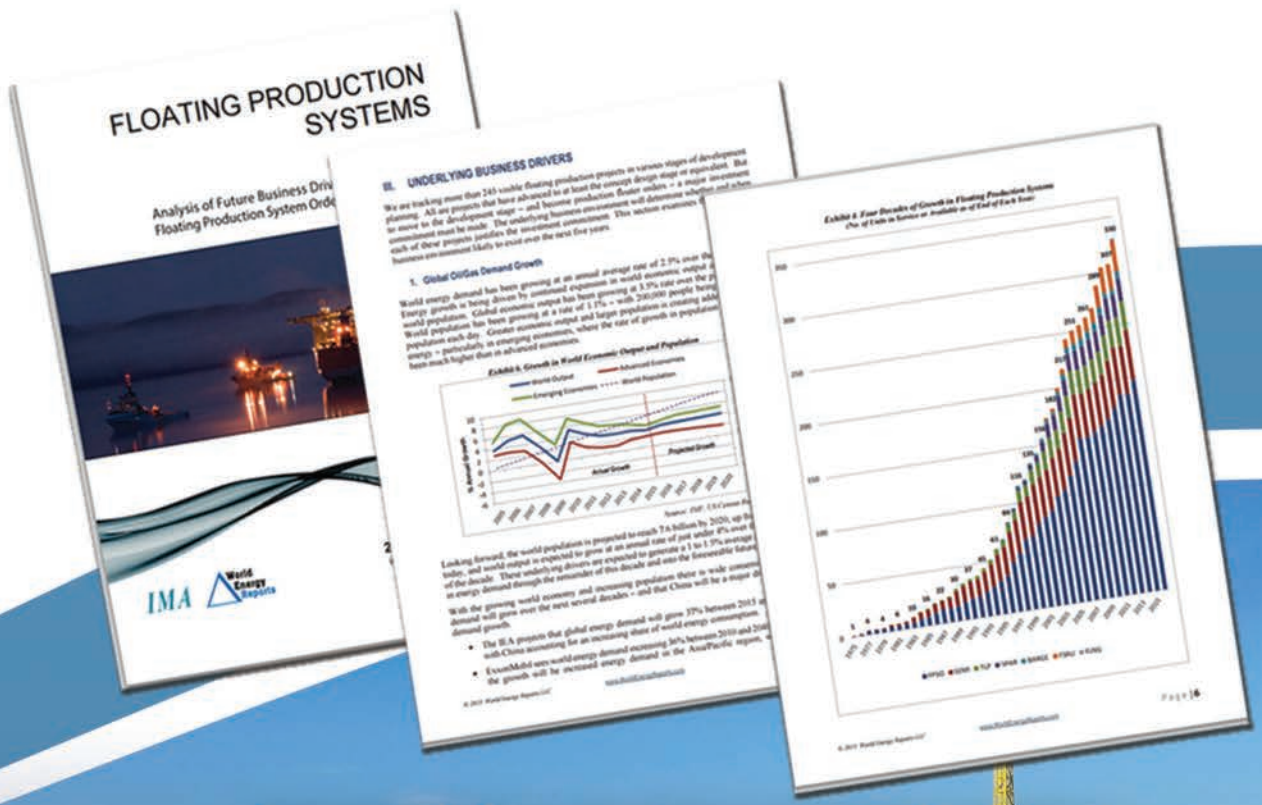

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USS Congress (FFG-63)

Fincantieri Marinette Marine

The Department of Defense announced that the Navy is exercising a $553.8 million option to have Fincantieri Marinette Marine build the second Constellation-class frigate, to be named USS Congress (FFG-63).

The shipyard is currently working with the Navy on the detailed design phase of building the first-in-class USS Constellation (FFG-62), a modern guided-missile frigate based partially on the Italian FREMM. Fabrication is planned to start at the end of this year, and the ship is expected to deliver to the Navy in 2026.

This contract is the first of nine potential options on future guided-missile frigates for the Wisconsin shipyard. Fincantieri Marinette Marine received the initial FFG(X) contract April 30, 2020, for the lead ship and options for nine additional ships valued at $5.5 billion.

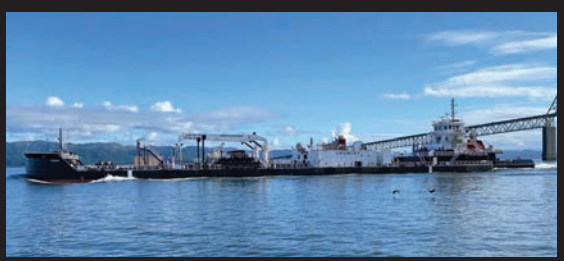
New River Cruise Ships

American Cruise Lines

U.S.-based river and coastal cruise operator American Cruise Lines has signed contracts with Chesapeake Shipbuilding of Salisbury, Md., to build two more modern riverboats in 2022. The 175-passenger newbuilds will be the fifth and sixth in American Cruise Lines revolutionary modern series, first introduced in 2018. Both vessels are yet to be named and will follow the 2021 debuts of American Jazz and American Melody on the Mississippi River.

American Cruise Lines has more than doubled in size since 2017. Including the two newbuilds announced, American's fleet has grown to 15 ships, including five small cruise ships, four classic paddlewheelers and six modern riverboats. In addition to the line's newest modern riverboats, American also plans to continue building new small cruise ships for their popular U.S. coastal itineraries.

Aurora/Qamun



Crowley

Crowley recently took delivery of its new 55,000-barrel, articulated tug-barge (ATB), the Aurora/Qamun. The 410-foot vessel is the second ATB in Crowley's fleet, after the Aveogan/Oliver Leavitt, to be dedicated to the Alaska market. The ATB is specially designed to add efficiency and range to transport clean petroleum products for Crowley Fuels, the company's Alaska-based business unit.

Master Boat Builders of Coden, Ala., constructed the tug, and the barge was built by Gunderson Marine LLC, a wholly-owned subsidiary of the Greenbrier Companies, Inc., in Portland, Ore.

Outfitted with EPA Tier IV engines for reduced emissions, the ATB has a range of 4,300 miles to access most locations in Alaska. The vessel also features Z-drive propulsion and 400-horsepower bow thrusters, allowing it to move smoothly in tight areas. The Aurora/Qamun meets Ice Class and Polar Code requirements, which include increased structural framing, shell plating, and extended zero-discharge endurance with shallow water capability.

Admiral Nimitz

Callan Marine

Texas-based dredging contractor Callan Marine released a tender package to build what it said will be the nation's largest capacity trailing suction hopper dredge, scheduled to enter service in 2023.

The new dredge, to be named the Admiral Nimitz, will have an overall length of 422 feet, a breadth of 92 feet and a hopper capacity of 16,000 cubic yards. The diesel-electric powered Nimitz will have a maximum draft of 28.8 feet, a maximum dredging depth of 100 feet in the short dredge pipe configuration and 130 feet in the long dredge pipe configuration. It will accommodate a crew of 28.

Rachael Allen

Foss Maritime

Foss Maritime's newest vessel is said to be the first U.S.-flag harbor tug to integrate autonomous systems in real-world commercial operations.

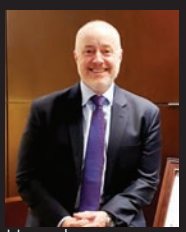
Launched in April and delivered in May 2021, the newly built 90-ton bollard pull Rachael Allen—the fourth in a series of ASD-90 Z-drive tractor tugs being built at Nichols Brothers Boat Builders, in Freeland, Wash.—features Sea Machines Robotics' SM300 autonomous-command and -control system. The system's capabilities include transit autonomy, as well as remote access of the tugboat's onboard machinery, a feature that allows personnel to manage and support operations from anywhere on board the vessel or from shore. Navigation obstacle detection and avoidance capabilities also come standard.

The 100-foot-long tug has been deployed in California, where it will provide tanker escort and ship assists. And while the Rachael Allen was delivered with the SM300 and supporting hardware fully integrated, the capability of the technology will be activated in stepped phases over the course of six to nine months to ensure full visibility and acceptance from all operational stakeholders.

People & Companies


Fagan


Vandroff


Humphreys


Brennan


Weithman

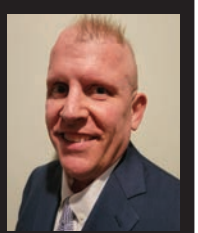

Jackson


Mitchell


Patton


Sutton


Bozzelle


Antoniak


Olmos


Hamel

Fagan Instated as Vice Commandant

Adm. Linda L. Fagan has taken over as vice commandant of the U.S. Coast Guard, relieving Adm. Charles W. Ray during a military change-of-command ceremony held Friday at U.S. Coast Guard Headquarters.

Fincantieri Marinette Marine Names Vandroff CEO

Fincantieri Marinette Marine and its board of directors announced that Mark Vandroff will be taking over as CEO effective July 7, replacing Jan Allman who has led the shipyard since 2014.

LR Taps Humphreys as Americas President

Lloyd's Register has appointed Kevin Humphreys as its new Marine and Offshore President for the Americas.

Maine Maritime Pres. to Retire

William J. Brennan, president of Maine Maritime Academy, announced he will retire after the upcoming school year, capping off 12 years of service to the institution.

Ports of Indiana Leadership Changes

Ports of Indiana has hired Ben Weithman as the new Ports of Indiana-Mount Vernon port director. Ports of Indiana has also hired Doug Mitchell as the information technology manager, and Erica Jackson has been promoted from controller to CFO.

Ørsted Names COO for North America

Offshore wind developer Ørsted has named Troy Patton as COO of its Offshore North American region.

HII Promotes Sutton

Huntington Ingalls Industries announced that Jason Sutton has been promoted to chief information officer for its Newport News Shipbuilding division.

Furuno USA Hires Bozzelle

Furuno USA has hired John Bozzelle as commercial business development manager, based in Jean Laffite, La.

Antoniak Joins Pemamek

Welding automation company Pemamek Oy and its North American subsidiary Pemamek LLC, have named Kevin R. Antoniak as Midwest regional sales manager.

Harvey Gulf Hires Olmos

Harvey Gulf International Marine has hired Steve Olmos as executive vice president for subsea installations at Harvey Gulf Subsea Solutions.

BHGI Hires Hamel

Naval architecture and marine engineering firm Bristol Harbor Group, Inc. (BHGI) has hired Jeb Hamel as a naval architect.

Products

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3 **Allsalt**

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5 **Helm**

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3. Kinetix

Allsalt Maritime launched four new Kinetix models of shock monitoring systems, each designed to provide easily assimilated guidance to operate safely within designated shock and vibration exposure limits, reducing the risk of damage to vessels or injury to occupants. The systems allows maritime agencies to monitor short- and long-term accelerations, investigate high-impact incidents and predict vessel maintenance intervals.

4. Jet Control System

Kongsberg Maritime unveiled two waterjet control systems based on its new JCS (Jet Control System) common technology platform. JCS Compact is a tailored, closed-loop control system solution designed to manage the steering, reversing bucket and optional interceptor functions on small- to medium-sized waterjets. It can be used with either one or two control stations and a single waterjet propulsion unit or, for full redundancy and operational safety in the event of unforeseen issues, a dual-waterjet configuration. JCS Extended applies the same seamless functionality but on a larger, more advanced scale. It can accommodate up to three control stations and four waterjet propulsion units, and allows for an optional GNSS antenna.

5. Harbor Automation Tools

Marine operations software developer Helm Operations and AIS services provider ShipTracks have launched a new set of integrated features for harbor docking companies designed to ensure that companies "never miss another job" in their ports. The integration links Helm CONNECT Jobs dispatch software and ShipTracks' AIS technology to streamline and automate the creation of towage orders directly from the AIS system. The result is greater operational awareness, reduced workloads for dispatchers, and increased revenue as operators identify and capture jobs that were previously lost to their competitors, the companies say.

Marine News 2021 Editorial Calendar

January 2021

Passenger Vessels

- Dredging
- Electric & Hybrid Vessels & Propulsion
- Health, Safety & Sanitization
- MaritimeEquipment.com Safety & Sanitization Resource Guide

Event Distribution:

PVA Maritrends:
Feb 6-9, Portland, OR

E-Magazine Edition: Offshore Wind Workboats

March 2021

Pushboats, Tugs & Barges

- Maritime Training & Education: Classroom, Simulation, Online
- Shipbuilding Report
- Coatings & Corrosion Control
- Spotlight: Q1 Inland Waterways Report
- MaritimeEquipment.com Coatings Resource Guide

Event Distribution:

AWO Spring Convention
Apr 13-15 Washington, DC
NACE Corrosion
Apr 18-21 Salt Lake City, UT

April 2021

Offshore Energy

- Water Treatment
- Marine Cranes
- Ship Autonomy / AI
- Marine Electronics: Communication & Controls
- MaritimeEquipment.com Water Treatment Resource Guide

Event Distribution:

CMA Shipping 2021
May 2021 - Stamford, CT

May 2021

Dredging

- Barges
- Material Handling Equipment
- Rope & Cordage
- Spotlight: Q2 Inland Waterways Report
- MaritimeEquipment.com Material Handling Resource Guide

Event Distribution:

Inland Marine Expo
June 2021 - St. Louis, MO
Seawork
June 15 - 17 - Southampton, UK

June 2021

Combat & Patrol Craft

- Multi-mission Workboats
- Patrol Craft Propulsion : Inboard, Outboard and Water Jets
- Marine Lighting
- Workboat Communications
- MaritimeEquipment.com Marine Lighting Resource Guide

July 2021

Propulsion Technology

- Autonomous Vessels
- Workboat Engines
- Fuels & Lubricants
- Workboat Conversion
- MaritimeEquipment.com Marine Propulsion Resource Guide

Event Distribution:

Clean Waterways
September 13-15 - Louisville, KY

E-Magazine Edition: Inland Waterways: Operations, Expansion & Dredging

September 2021

Shipbuilding & Repair

- Naval Architecture
- Shipyard Tools & Equipment
- HVAC and Ventilation
- Q3 Inland Waterways Report
- MaritimeEquipment.com Shipyard Resource Guide

Event Distribution:

SNAME Expo
October 2021 - Houston, TX

October 2021

MN100

- Offshore Wind
- Pipes, Pumps and Valves
- Maritime Training
- MaritimeEquipment.com Pipes, Pumps and Valves Resource Guide

Event Distribution:

SHIPPING Insight
October 2021 Stamford, CT, USA

November 2021

Great Workboats of 2021

- Tugs and Push Boats
- Power & Propulsion
- Deck Machinery
- Spotlight: Q4 Inland Waterways Report
- MaritimeEquipment.com Deck Machinery Resource Guide

Event Distribution:

Clean Gulf: December 2021
Workboat Show: December 2021

E-Magazine Edition: Patrol, Escort & Fast Craft Operations

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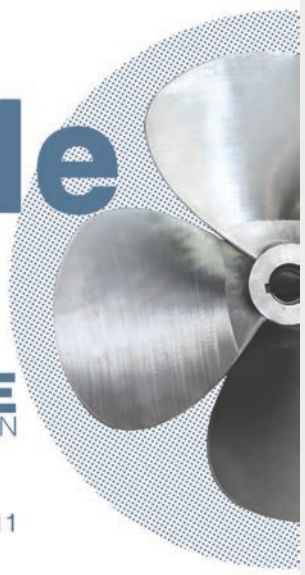

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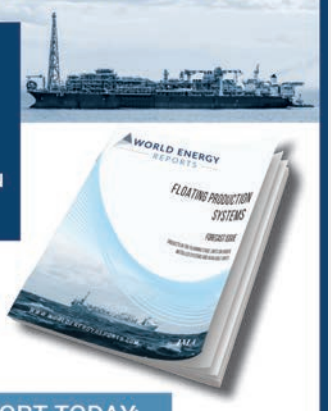

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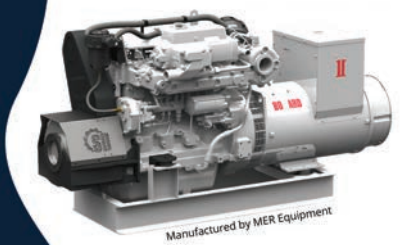

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