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Volume 32 • Number 6

Marine News

JUNE 2021

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Combat & Patrol Craft

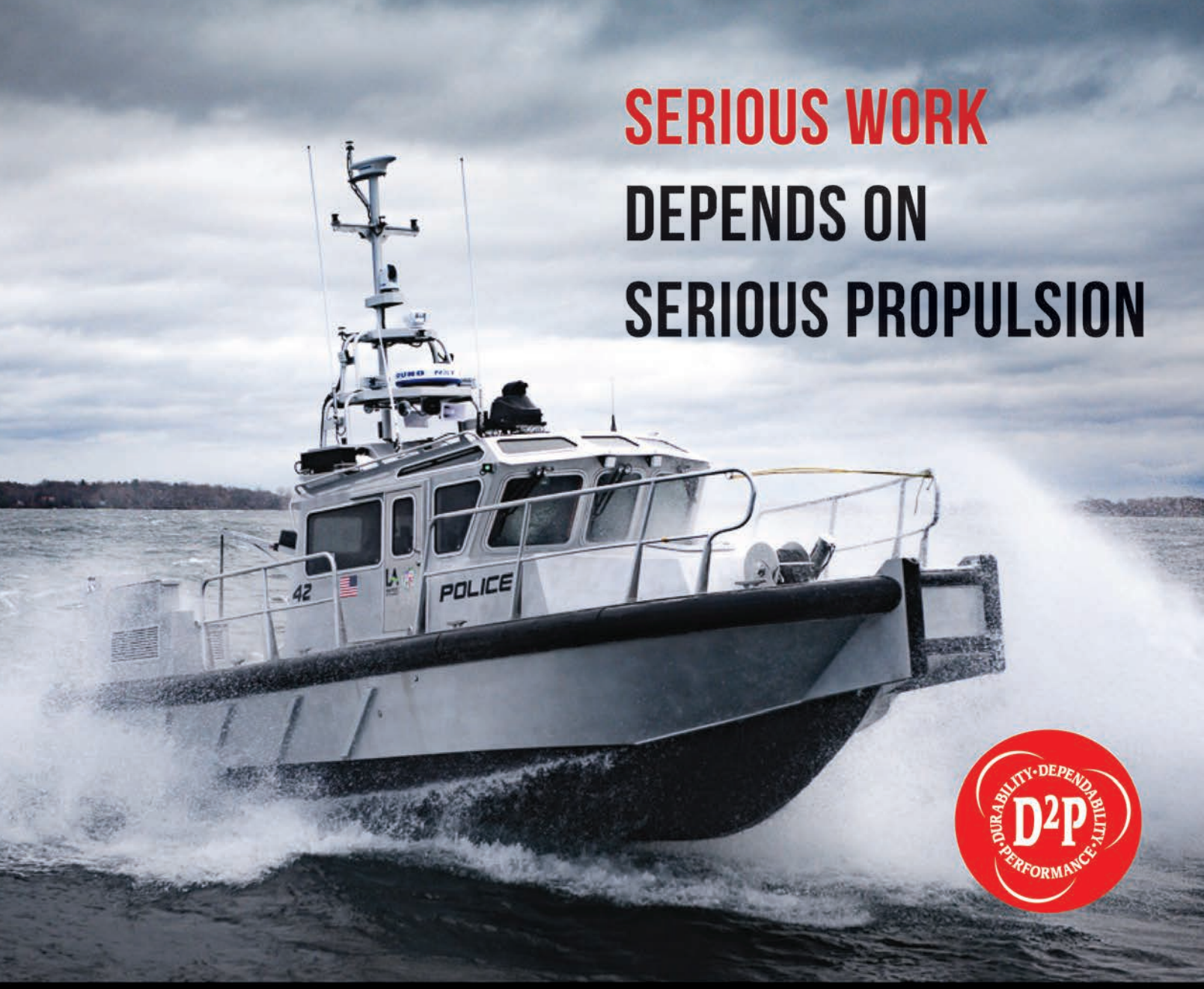
Inside the Navy's large fleet of small boats

Multimission Vessels
Ready for the job(s)

Chris Deegan
Gibbs & Cox's chief executive weighs in

Waterways Commerce Cutter
The new fleet is long overdue

Metal Shark
Moving fast ahead



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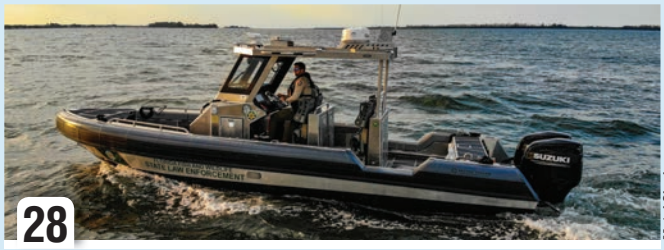
Tristan B. Lotz / U.S. Navy



Metal Shark

Thomas M. Blue / U.S. Coast Guard

On the Cover

The U.S. Navy's Mark VI class patrol boat is designed to patrol riverine and littoral waters around the globe. (Photo: Nelson Doromal Jr / U.S. Navy)

Editor's Note

Eric Haun, Editor,
haun@marinelink.com

There's been much talk over recent years surrounding the U.S. Navy's plans for assembling its 355-ship fleet, and for good reason as the U.S. continues to face evolving threats overseas.

But much less public attention has been given to what Edward Lundquist calls the Navy's "large fleet of small boats"—which numbers 3,200 and counting. Since 2010, PMS 325 within NAVSEA's PEO Ships has awarded 136 contracts with 23 different boatbuilders to deliver an average of about 120 boats a year, Lundquist writes in his feature starting on page 22. Today, PMS 325 has 14 active contracts with 12 builders for 902 boats worth $528 million combined, with plans for another eight procurements for 264 boats. It's a force to be reckoned with.

One of those helping to grow the fleet is Louisiana-based boatbuilder Metal Shark Boats, whose vessels are figuratively and literally pushing the pace of naval small boat operations (see story starting on page 32). Another very well-known name in U.S. Navy shipbuilding is the venerable naval architecture firm Gibbs & Cox, whose chief executive Chris Deegan weighs in for this month's Insights interview, starting on page 10. The company has a long and storied history in the sector, but its sights are fixed to the future.

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Florida: 215 NW 3rd St., Boynton Beach, FL 33435
tel: (561) 732-4368; fax: (561) 732-6984
New York: 118 E. 25th St., New York, NY 10010
tel: (212) 477-6700; fax: (212) 254-6271
www.marinelink.com

PUBLISHER
John C. O'Malley • *jomalley@marinelink.com*

Associate Publisher & Editorial Director
Greg Trauthwein • *trauthwein@marinelink.com*

Editor
Eric Haun • *haun@marinelink.com*
Tel: 212-477-6700

Contributing Writers
Tom Ewing • Barry Parker • Jeff Vogel

PRODUCTION
Production & Graphics Manager
Nicole Ventimiglia • *nicole@marinelink.com*

SALES
Vice President, Sales & Marketing
Rob Howard • *howard@marinelink.com*

Advertising Sales Managers
National Sales Manager
Terry Breese • ***breese@marinelink.com***
Tel: 561-732-1185 Fax: 561-732-8414

Lucia Annunziata • ***annunziata@marinelink.com***
Tel: 212-477-6700 **ext 6240** Fax: 212-254-6271
John Cagni • ***cagni@marinelink.com***
Tel: 631-472-2715 Fax: 561-732-8063
Frank Covella • ***covella@marinelink.com***
Tel: 561-732-1659 Fax: 561-732-8063
Mike Kozlowski • ***kozlowski@marinelink.com***
Tel: 561-733-2477 Fax: 561-732-9670

Managing Director, Intl. Sales
Paul Barrett • *ieaco@aol.com*
Tel: +44 1268 711560 Fax: +44 1268 711567

CORPORATE STAFF
Manager, Marketing
Mark O'Malley • *momalley@marinelink.com*

Accounting
Esther Rothenberger • *rothenberger@marinelink.com*
Tel: 212-477-6700 **ext 6810**

Manager, Info Tech Services
Vladimir Bibik

CIRCULATION
Kathleen Hickey • *k.hickey@marinelink.com*
Tel: 212-477-6700 **ext 6320**

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Jeanne Metayer
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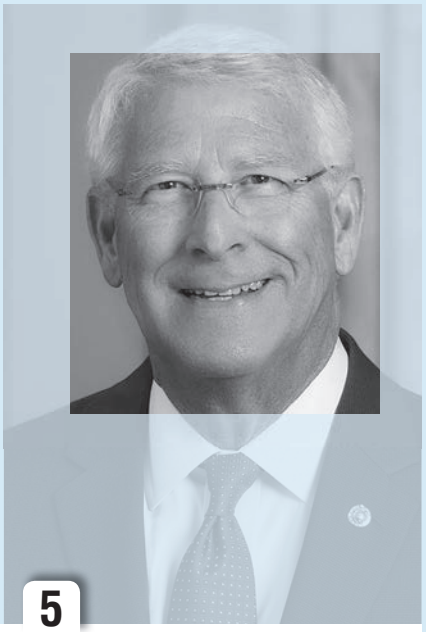
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1 Tom Ewing
is a freelance writer specializing in energy and environmental issues. He contributes regularly to this magazine.

2 Alan Haig-Brown
began his career as a commercial fisherman on the B.C. coast and later worked on coastal freighters. He writes about commercial marine subjects worldwide and has published several books, most dealing with commercial fishing history and issues.

3 Dr. Craig Hooper
is the CEO of the Themistocles Advisory Group, a consulting firm that specializes in maritime and national security strategy. Trained as an infectious disease expert, he has been a keen observer of navies and coast guards for over two decades.

4 Edward Lundquist
is a retired naval officer who writes on naval, maritime, defense and security issues. He is a frequent contributor to New Wave Media titles.

5 Roger F. Wicker
has represented Mississippi in the U.S. Senate since December 2007. He is the ranking member of the Senate Committee on Commerce, Science, and Transportation for the 117th Congress and the second-highest ranking Republican member of the Senate Armed Services Committee.

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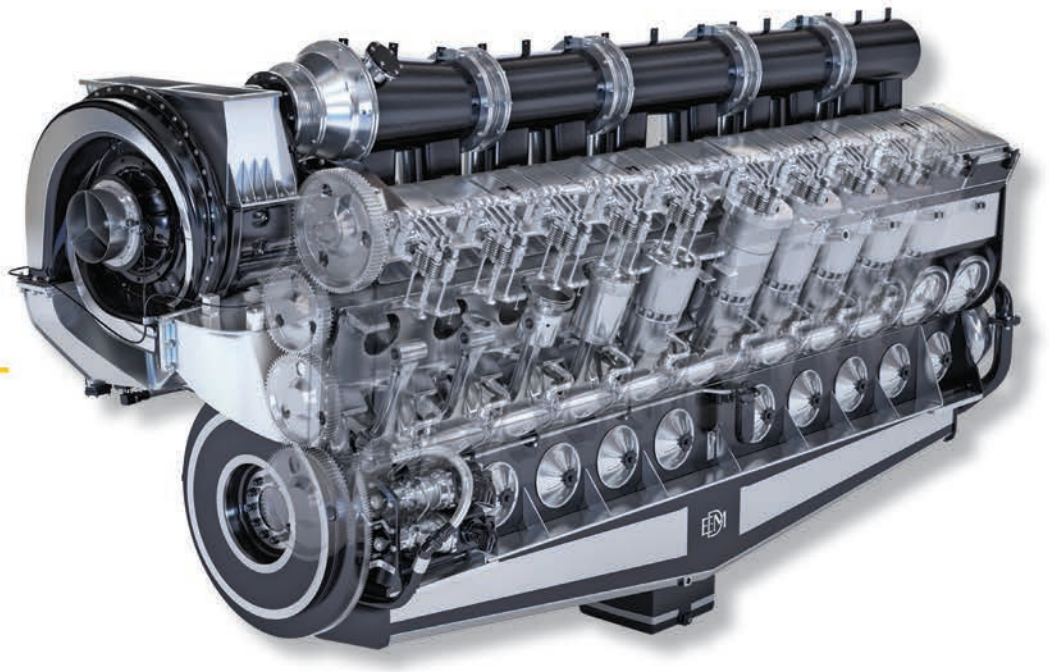

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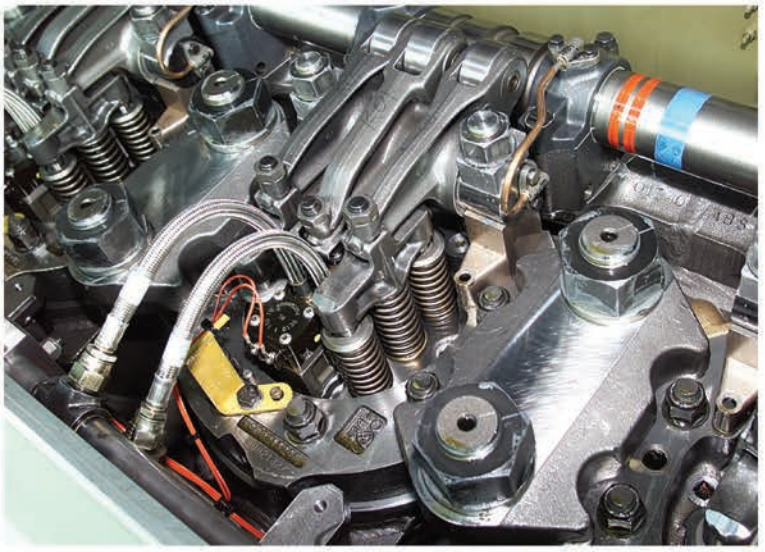

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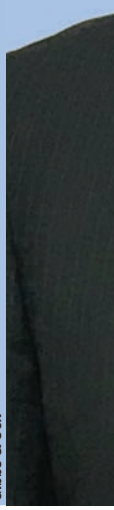

Gibbs & Cox

In 1985, Chris Deegan was hired out of Penn State as a nuclear submarine cost estimator by the Naval Sea Systems Command and retired nearly 28 years later as the Executive Director of PEO Integrated Warfare Systems, with the last 10 as a member of the Senior Executive Service. He's been with Gibbs & Cox since 2013, first as the Vice President of Engineering, and as President and Chief Executive since 2016.

Please give a "by the numbers" look at Gibbs & Cox today.

CD: Since our founding in 1929, Gibbs & Cox has designed approximately 300 vessels including 24 classes of naval combatants, and nearly 7,000 vessels have been delivered to G&C designs. We proudly support military and commercial clients in the U.S. and internationally with all phases of marine design, construction, and lifecycle management. Our recent merger with Leidos Maritime Solutions positions Gibbs & Cox with well over 1,000 employees serving the maritime market.

Which U.S. Navy shipbuilding projects Gibbs & Cox is involved in today?

CD: We have a long and storied history of designing vessels for the U.S. Navy and government. The staff at Gibbs & Cox are experts in all stages of vessel design and sustainment, ranging from concept evaluation to detailed design and production engineering, and life-cycle support. Our knowledge and processes, honed with over 90 years of customer alignment, ensure that G&C designs meet customer requirements while being cost-effective and producible.

G&C delivers value to the U.S. government on the fol-

lowing ship classes: Freedom Variant Littoral Combatant Ship (LCS) Design Agent for Lockheed Martin, FFG-62 Constellation Class Agent for Fincantieri Marinette Marine, Medium Unmanned Surface Vehicle (MUSV) for L3 Harris, Large Unmanned Surface Vehicle (LUSV) prime, LPD 17 Flight 2 Program Office (PMS 317), Naval Sea Systems Command, U.S. Coast Guard and DARPA. Internationally, we have interests in Australia, Canada, and several European and Asian countries.

Government shipbuilding projects—particularly naval projects—are some of the most challenging and complex. What do you see as some of today's top challenges, and what do you count as the keys for success?

CD: The loss of the U.S. ship- and boatbuilding industry to overseas providers has advanced foreign competitors' skills, and provided entry to foreign competitors into the U.S. market.

Our success is wholly derived from our people and our emphasis on quality control. "First Pass Success" is what we strive for, and we have the skills and reputation to recruit the best. New employees have called us a "destination" employer—a place where they always aspired to work. That is a heck of a compliment in a very tight labor market amid a highly competitive ship design market. Our backlog enables our engineers and designers to experience a great variety of experiences. Our retention rate is far above all industry measures (97% in 2020). For decades we have advanced new digital shipbuilding tools to better integrate the multiple aspects of ship design. Looking back to the 1980s, we are able to do the same amount of design work with 10% of the staff that we needed to support the Arleigh Burke design.

How do you balance the increasingly rapid evolution of technology found on navy ships with the fact that projects take many years to plan, contract, build and commission? How do you ensure the Navy is not commissioning ships with dated technology?

CD: It may take a decade to design and build the first ship of a class. The key to keeping up with technological innovations is to work closely with the customer on their design requirements, and ensure careful consideration is provided for installing pier-side upgrades upon delivery and modernization through its life cycle.

Two key areas of innovation are Combat Systems and Hull, Mechanical & Electrical Systems (HM&E).

Combat Systems are heavily computer hardware and software based. Computer hardware is commercial product based, where technology evolves rapidly. Threats that the combat system encounter also evolve and are becoming increasingly complex. This presents an opportunity to counter evolving threats with improved computational power offered by evolving commercial market space.

Hull, Mechanical & Electrical Systems are generally the technology associated with basic hull, mechanical and electrical systems and do not change rapidly. One exception to this is the electric power demand, which typically increases as new combat system elements are developed and installed.

To ensure ships are not delivered with dated technology, two things are required: (1) Adaptable and flexible ship infrastructure that can readily accommodate just-in-time delivery of computer hardware, and (2) Acquisition programs that routinely and periodically refresh commercial computer hardware intensive systems and the combat systems

software that runs them for in-service ships and provide the latest technology to ships as they are being delivered.

Looking specifically at the U.S. Navy, what are the key drivers for the "fleet of the future"?

CD: For the foreseeable future, Navy ship designs will continue to pursue reduced crewing, parts commonality, modular architectures, and earlier consideration for modernization.

In September, Gibbs & Cox was among several companies to win a design contract to develop a concept for the Navy's Large Unmanned Surface Vessels. Will you walk us through this project and describe Gibbs & Cox's approach to it?

CD: The U.S. Navy is on a path to acquire several different types of Unmanned Surface Vehicles (USVs) as part of an effort to shift to a more distributed fleet architecture. This gets effective sensors, weapons, and other nodes out in number, while reducing costs and helping to keep sailors out of harm's way.

The largest of the current USV acquisition programs is the Large Unmanned Surface Vessel (LUSV). The LUSV is envisioned by the Navy as an optionally manned warship, capable of fielding modular mission payloads that can consist of sensors, missiles, or other packages. It is expected to be up to 300 feet in length and weigh upwards of 2,000 tons.

Gibbs & Cox approached our LUSV concept design by initiating a thorough search of the military and commercial market to identify potential parent designs that fit the performance requirements of the LUSV while also emphasizing the critical USV enablers of reliability, survivability, and performance. We have an extensive library of ship characteristics feeding ship sizing tools that enable our team to rapidly identify platforms that are mission-matched to our client's needs. Through this process we were able to select a parent ship design that offered an excellent foundation of warfighting capability aligned to the speed, range, payload, and other required characteristics of the LUSV program.

The military pedigree of the parent design offers an inherently survivable design, necessary to protect the crew when the vessel is in a manned status. When in an unmanned status, reliability is absolutely critical to mission success. G&C utilized our extensive experience gained from other USV programs to drive mission duration and reliability into the LUSV design through equipment and system redesign. This was fostered by our unique market position where G&C can integrate best applications from both military and commercial designs to tailor our LUSV offering. The end result of our efforts will result not only in a formidable USV design for the Navy's consideration, but also a body of knowledge surveying the cost/capability trade space when finalizing the LUSV requirements for future acquisition phases.

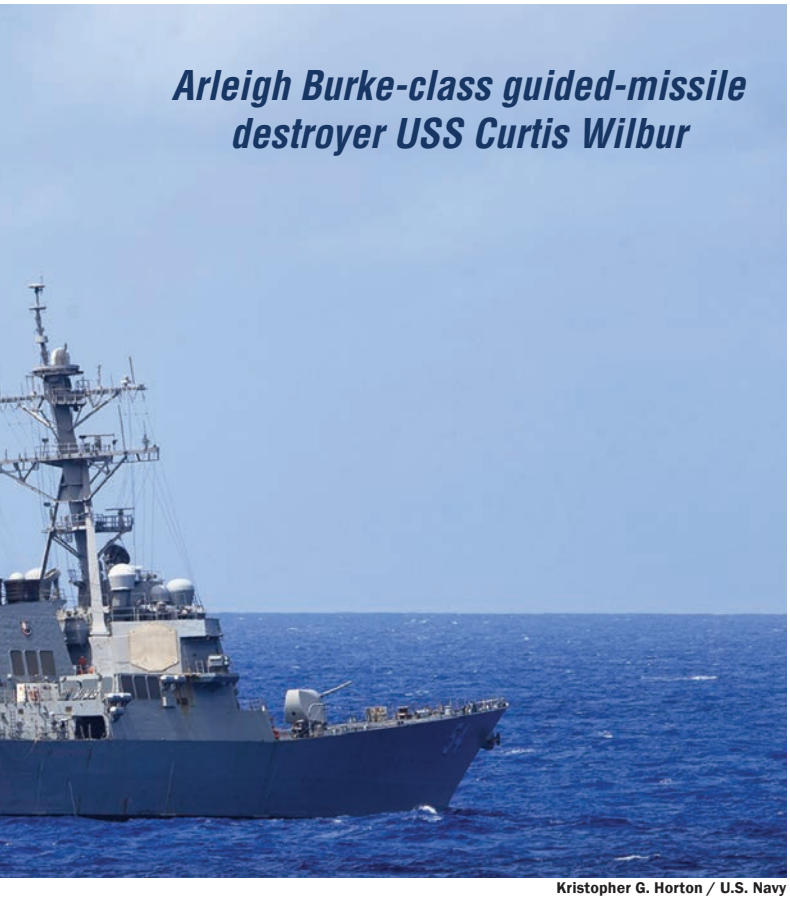
Looking at vessel autonomy technologies, what are your thoughts on the pace and evolution? Specifically, where are we at on the gestation curve?

CD: Looking at the autonomous car industry, there were lots of companies and pundits a decade ago that promised au-

tonomous cars by 2020. And in the last few years, all of those companies have moved their predicted delivery dates far to the right (often by decades) as they've discovered the challenges of bringing autonomous vehicles to a consumer market.

The good news is that autonomous ships aren't a consumer market. Many of the difficulties of driverless cars have to do with dealing with unpredictable people. Think about a four-way stop. There are rules about who goes when. How often do you see someone violate those rules? How often are you uncertain about whose turn it is next?

We have similar rules for ships, and while sometimes there are violations of those rules, and sometimes it can be difficult in the moment to know "whose turn" it is, those incidents are far rarer than with cars. The training required of professional mariners and the international rules governing maritime activity led to a high level of predictability. Machines are good at following rules, so when the people around them are consistently following the rules, it is easier for the machines to be autonomous. So, as long as we're away from areas full of recreational boaters, ships do not have that very hard "people problem" that cars have.



Arleigh Burke-class guided-missile destroyer USS Curtis Wilbur

Kristopher G. Horton / U.S. Navy

One area that is more challenging for autonomy in ships is maintenance. The long periods of time that ships spend between ports dwarf those seen in other domains such as airplanes and cars. Ships generally require a lot of maintenance while underway, so in order for a ship to be completely autonomous, we will either have to design much more robust HM&E that can operate much longer without maintenance, or we have to design automated systems that can perform all of the traditional maintenance activities. At Gibbs and Cox, we are working on both of those approaches, but the solutions aren't here today, and they are both likely to increase the capital cost of ships.

But there are intermediate steps we can take today. We can design ships where autonomy systems and human crew work together. Navigation and collision avoidance in fair weather are largely solved problems, and we can apply those technologies today to reduce the number of crew required and/or to allow the crew to focus on other tasks. Artificial-intelligence systems can improve the performance of human crews in other ways—machinery monitoring for instance. While building robotic systems to perform all the maintenance on a ship is still in the future, today we have automation systems that monitor machinery for faults in order to alert the human crew. These systems can also advise the human crew of the best course of action to take. We can use collaborative human-machine teaming approaches like this today to improve the safety and productivity of shipboard operations.

Related to "gestation curve," Gartner, who might be considered one of the more knowledgeable prognosticators, said autonomous cars were "more than 10 years away" in 2010, "5-10 years away" in 2015 and "more than 10 years away" in 2020.

The real answer here isn't end-date driven; it's event driven. We've seen a lot of hype in the last couple years and industry activity beyond the first-generation disruptors and early adopters. The next step is to get real products in the water and begin to accumulate the data on what works well and what doesn't so that we can pave the way the second- and third-generation solutions that will lead to genuine transformation of the maritime industry.

What does your firm bring to the table in the area of automation and autonomy?

CD: Gibbs & Cox brings nearly a century of ship design experience, and familiarity with commercial and defense ship builders the world over, to the autonomy table. We've combined that with a new department dedicated to the design, development, test, and operational lifecycle support of unmanned systems. Our Autonomy department includes a number of industry specialists in robotics and other unmanned systems, as well as the industry partnerships they have developed over their own expansive careers. This department has racked up a formidable set of business captures, totaling a 200M$ portfolio that extends from concept development (DARPA SEATRAIN and NOMARS) through development and operations of a DOD program of record (Medium USV)—showcasing our systems engineering capability through the entire system development life cycle.

Gibbs & Cox is adept at preparing for and obtaining approval for American Bureau of Shipping (ABS) inspections for machinery control systems (MCS), including designing and programming/developing the hardware, instrumentation, and modular controllers required for orchestrating the operation of that machinery. We are commissioning a Controller Hardware in the Loop (CHIL) capability for the integration and test of various hardware, controllers, controller software and autonomy interfaces for future autonomous vessels. We offer solutions for the integration, evaluation, and test, including verification and validation, of multiple vendors for perception, avoidance and mission planning, classified data processing, and engineering operations control, all aligned to and supporting the Unmanned Maritime Autonomy Architecture (UMAA) development effort under the DOD.

Looking at the commercial maritime sector, what types of projects has Gibbs & Cox recently completed and/or is currently working on in?

CD: G&C supports a wide range of customers in the commercial sector, primarily from our offices in New Orleans and Chesapeake. Our client base ranges from commercial marine operators to recreational boat builders. Our recent projects include supporting Norfolk Dredging Company with regulatory body compliance of their new 200-foot-long clamshell dredge. On the other end of the spectrum, our team recently developed a new product model for Cruisers Yachts, a fiberglass boat builder in Oconto, Wis. In addition to platform designs, we have clients in the development of mechanical systems designs. One project we are particularly excited about participating in is the modernization of the towing tank carriage for Virginia Tech. Our team is working with university researchers to upgrade the carriage mechanical and control systems and achieve a significant increase in system capabilities to facilitate hydrodynamic research which could not previously be conducted.

What will Leidos' acquisition of Gibbs & Cox mean for the firm now and into the future?

CD: For Gibbs & Cox, the transaction strengthens our capabilities by adding the technology-driven core of Leidos. It enables the leveraging of a wide range of technologies, including AI/ML, signal processing, sensing and rapid prototyping.

This Gibbs & Cox acquisition accelerates Leidos' maritime strategy by providing placement, credentials, and capabilities to position for future U.S. Navy build plans. The renowned Gibbs & Cox brand, brings immediate credibility to Leidos maritime efforts and positions Leidos as a leading engineering design and autonomy provider for USV programs. For Leidos, this significantly up scales our naval architecture and engineering talent and prowess and adds production design engineers that can be leveraged across company.

The deal expands both companies deeper in the undersea domain through the combined marine engineering and platform integration capabilities.

The transaction will create a partnership between two companies driven by dedication to customer mission and will accelerate an expansion of products and services to current and future customers. Leidos intends to preserve and leverage Gibbs & Cox's strong brand and reputation in the market. The intent is to keep the Gibbs & Cox business intact (including subsidiaries and joint ventures) and consider opportunities for adding in complementary capabilities from across Leidos. Gibbs & Cox will operate as a wholly owned subsidiary of Leidos.

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Column

Waterways Commerce Cutter

It's Time for an Upgrade

Dr. Craig Hooper, CEO Themistocles Advisory Group

In the last week of April, with little fanfare, the U.S. Coast Guard released a much-anticipated opportunity to build up to 27 Waterways Commerce Cutters. After the detailed design and construction contract is awarded in Spring of 2022, a lucky shipbuilder will begin replacing the Coast Guard's eclectic fleet of 18 venerable river buoy tenders (WLR) and 13 inland construction tenders (WLIC).

The Coast Guard's inland waterways maintenance fleet has been ignored for far too long. It is about time America tended to the low-profile Coast Guard vessels that spend their days tending some 28,200 marine aids on America's 12,000 miles of inland waterways. With an average age of over 55 years, the riverine workboat fleet has sprawled into nine separate ship classes, ranging from the Coast Guard's oldest cutter, the 77 year old Inland Construction Tender and Coast Guard "Queen of the Fleet" USCGC Simlax (WLIC-315) to the two youngest members of the riverine fleet, the 30-year old River Buoy Tenders USCGC Kankakee (WLR-75500) and Greenbrier (WLR-75501).

The lack of interest is understandable. At best, buoy tenders are utilitarian craft, overshadowed by the Coast Guard's more dashing "white-hulled" cutters and patrol boats. Inland buoy and construction tenders, plying America's inland waterways, are even less exciting. They

USCGC Smilax is an inland construction tender commissioned in 1944. Smilax is the "Queen of the Fleet", as the oldest commissioned U.S. Coast Guard cutter.

U.S. Coast Guard

trundle about in quiet waters, setting buoys, clearing brush from navigation signals, removing wreckage, and handling various construction tasks. But the Coast Guard's often un-noticed contribution to waterways maintenance is enormously important in keeping America's maritime transportation system open, functional and trouble-free.

The new ships—an initial tranche of 16 river buoy tenders and 11 inland construction tenders—are expected to enter service sometime between 2025 and 2030, arriving at a fascinating period of economic and technical change on American waterways. Over the new tender's expected "minimum of 30 years" design service life, the Waterways Commerce Cutters are likely to preside over a waterfront renaissance, supporting a far more intensive national utilization of America's first real freeways than most expect.

There is a lot to do, and, frankly, the winning shipyard could immediately start making a case to grow the program of record. The Coast Guard's request may be undersized for the coming need. The Coast Guard, of course, has rightly focused on the $5.4 trillion dollars America's maritime transportation system provides the U.S. economy today. But the Service might have understated the tender's ultimate business case.

Such a suggestion may be contrary to popular opinion. Some maritime innovators consider old-school navigational aids obsolete, a dying maritime feature ripe for replacement by "virtual" buoys or other fancy electronic traffic control schemes. That's fine, but the old-fashioned "dumb" steel buoy isn't going away anytime soon, and, with more and more river traffic coming online, an active Coast Guard presence will still be required on the rivers. A refreshed and reinvigorated Waterways Commerce Cutter fleet can help get the Coast Guard where it needs to be as the inland waterways transform.

America's inland waterways are already changing. Riverine passenger traffic is increasing and inland waterway passenger volume may grow far faster than expected. Take Viking Cruise Lines. The company is known for rapid expansion into new markets—Viking entered the ocean cruise market in 2015 and, today, it expects to have 16 ships in service in the next few years. On the riverine side, over the past eight years, Viking has commissioned more than 60 river cruisers worldwide.

It will soon be America's turn. Viking's first river cruiser, the Viking Mississippi, is set to be a big ship, mustering 193 staterooms and a guest capacity of 386. And Viking is not alone. American Cruise Lines is in the midst of bringing a fleet of at least four modern river cruisers online, joining American Queen Steamboat Company's four majestic riverboats. If these big river cruisers take off, they will drive waterfront development, force operational changes on the waterways and, at a minimum, demand top-tier navigational aid support.

The wider shipbuilding community may not fully understand that the Coast Guard's new inland fleet will—almost by default—offer more utility than the legacy tenders. The aged and infirm fleet is already an under-appreciated provider of emergency response services—according to the Coast Guard Commandant, Admiral Karl L. Schultz, "inland cutters and Heartland Sectors responded to over 1,100 marine incidents in 2020," responding to "marine casualties, oil discharges, hazardous material releases and various security threats." As the modern platforms will be more reliable and capable, an array of emergency response duties will open to the Coast Guard's new inland waterway buoy and construction tenders.

That's good. America's rivers traverse some of the least-prepared cities and potentially highest-risk areas for accidents and other contingencies in the United States. If any one of the planned big new river cruise boats get into trouble, riverside first-responders will be hard-pressed to handle hundreds of passengers and crew. They'll need help. And then, as the acute danger passes, the Coast Guard will likely be called to manage or monitor what will be a complex multiagency recovery, investigation and salvage effort.

On the rivers, the potential for industrial accidents is always present, and, as riverside development and passenger traffic increases, timely river emergency response and command-and-control platforms will likely be in even greater demand than they are today.

The likely need is not just focused on conventional short-term emergency response, either. On the rivers, emergencies are often slow-evolving things, where disaster hangs in the balance for days or even weeks. In one example from 2016, a barge carrying 2,400 tons of anhydrous ammonia ran aground in the Quad Cities area, and authorities needed ten days to secure, refloat and transfer the dangerous cargo. River and coastal responders know that complex contingencies with dangerous cargoes can become tense, weeks-long affairs.

Column
Waterways Commerce Cutter

For that sort of work, the new inland cutters, which will be expected to provide up to 11 days of accommodations and habitability for around 17 to 19 crew members, might be perfect assets for situations where on-the-spot, command and control assets are needed for a period of time. To that end, cutter endurance is a highly rated evaluation factor, and a means to improve cutter endurance in a pinch might be an interesting differentiator for responding shipyards.

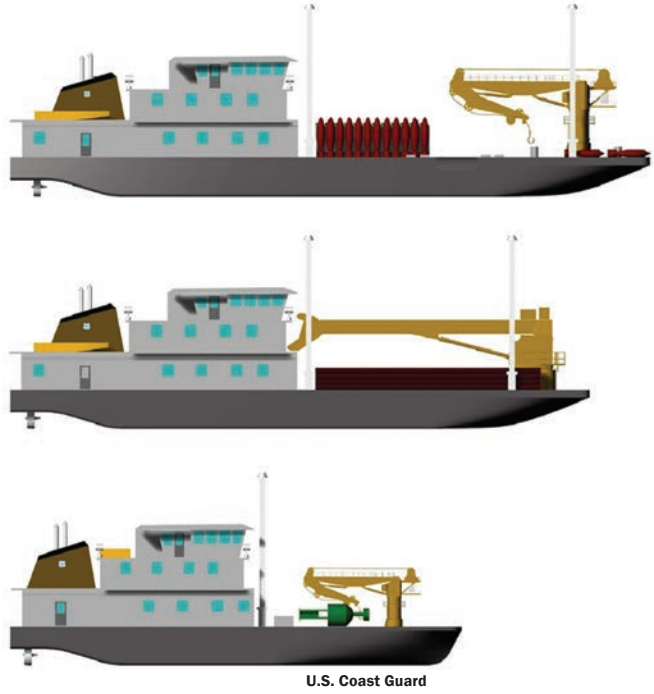
It might also be worthwhile for innovative shipyards to consider how the new tenders might support other State, Local and Department of Homeland Security components in an emergency, and, potentially, integrate with the Coast Guard's hazardous materials experts at the National Strike Team, commandos in the Maritime Security Response Team or other special Coast Guard assets. The Coast Guard already indicates the platforms should have strong multi-agency communications capabilities, and there are other features out there that a crafty builder could propose to gain an edge on the competition.

Floods, storms and natural disasters are all areas where a refreshed inland cutter fleet can shine. Category 4 Hurricane Laura forced the Coast Guard to repair or replace 80 navigation aids, but it also created toxic dangers as well. During the hurricane response, twenty of thirty-one spill response requests to the National Response Center were detailed to the USCG for action. Disasters can be seasonal or unique. Annual spring floods are a chronic challenge, and, on the other hand, government experts believe that the New Madrid fault, which stretches roughly from the river bottoms of Memphis, Tenn. to Paducah, Ky., has a 25 to 40% chance of generating a magnitude 6 or greater earthquake over the next fifty years.

All of these disasters require—or would require—substantial waterway navigation aid recovery work. But the cutters, already optimally positioned throughout the inland waterway system, will still need to get to where they are needed. It may well be why the Coast Guard has emphasized mobility, highlighting both speed and draft as important performance requirements.

Finally, the future inland tender fleet will be serving during a period of substantial technological change. As a decidedly "low-tech" platform, the Coast Guard is shying away from high-tech baubles and wants bidders to offer only robust, solid-state gear. But that does not mean shipbuilders should forgo thinking about the future.

The vast potential for unmanned platforms is already obvious, and, since buoys are, for the most part, unmanned platforms that simply lack engines, these tenders may have a real future in bringing unmanned craft to America's inland waterways. Some guesses as to how those platforms-of-the-future may integrate with the future waterways commerce cutter fleet may be an interesting way for the Coast Guard to keep the Waterways Commerce Cutter fleet relevant in the future, blending exciting new technologies with the tough, old-school task of keeping America's waterways open and American commerce going unvexed to the sea.



U.S. Coast Guard

*Coast Guard illustrations showing indicative (i.e., notional) designs for the **WLR** (top), **WLIC** (middle) and **WLI** (bottom).*

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Column

Naval Shipbuilding

Navy Infrastructure Needs a Boost from Congress

By Sen. Roger Wicker, (R.-Miss.)

America is home to some of the finest shipbuilders in the world.

This industry is becoming increasingly vital to our national security as we seek to build a larger Navy capable of confronting China. Unfortunately, our shipyards are aging and are too small to expand our fleet at the pace that is needed. As lawmakers consider what to include in an upcoming infrastructure bill, I am leading a bipartisan effort to provide a significant boost to infrastructure at our nation's shipyards.

My proposal, known as the SHIPYARD Act, would provide $25 billion to improve shipyards, including $21 billion for the Navy's four public yards and another $4 billion for private construction and repair yards like Ingalls Shipbuilding and VT Halter in Mississippi. I am encouraged by the growing bipartisan support for the SHIPYARD Act and hope it will be included as part of an infrastructure package.

Shipyards need bigger, more modern facilities

In 2017, Congress passed the SHIPS Act, legislation I authored making it the policy of the United States to build a 355-ship Navy as soon as practicable. This was an important step, but Congress now needs to clear away obstacles to reaching this goal. Our shipyards in their current state are struggling to service our existing fleet of 296 ships, let alone the massive fleet we need to compete with our adversaries.

The Navy owns and operates four shipyards, which are responsible for maintaining our aircraft carriers and submarines. All four of these facilities are more than 100 years old and in desperate need of upgrades. Aging equipment and a shortage of usable repair docks have caused long maintenance delays, resulting in fewer ships being ready for deployment. This slow process has kept us from build-

Huntington Ingalls Industries' Ingalls Shipbuilding division in Pascagoula, Miss.

Lance Davis / HII

ing our fleet in a timely manner and allowed China to begin challenging American supremacy at sea.

China's shipyards enable Beijing to project power

China has become our primary strategic rival and will likely remain so for the foreseeable future. Although our military enjoys technological advantages, China's Navy has eclipsed ours in terms of sheer size, surpassing 350 ships. China has achieved this massive naval force by dramatically expanding its shipbuilding and maintenance base, with more than 1,000 shipyards now supporting its sprawling fleet. The United States has significant ground to make up.

The Navy has been doing the best it can with the resources at its disposal. In 2018, the Navy released a 20-year plan for revitalizing its shipyards. But 20 years is far too long to meet our pressing security needs.

The SHIPYARD Act would help speed up the Navy's plan by funding it all at once, with appropriations that would not expire at the end of any fiscal year. This would give the Navy flexibility to ramp up operations on the most efficient timeline possible. The Navy would be able to put these funds toward projects at a range of facilities, including major shipyards and the many contractors and suppliers that help build U.S. Navy ships.

Shipyards are not our military's only infrastructure need, but they are the source of our nation's sea power and are playing an increasingly pivotal role in the global balance of power. As Congress considers what infrastructure priorities will best serve our communities and advance our national security, our nation's shipyards must be a priority.

The Navy's Big Fleet of Small Boats

Kaleb R. Staples / U.S. Navy

By Edward Lundquist

The Navy is known for its big ships. It has a lot of smaller boats and craft, too—3,200 of them.

The three primary stakeholders for these craft are the Surface Fleet, Commander Navy Installations Command and Navy Expeditionary Combat Command. Other stakeholders include Submarine Forces; Air Forces (which own the aircraft carriers); Naval Special Warfare; the Coast Guard; Naval Facilities Command and the Naval Warfare Centers.

Boats and craft are procured and managed by Naval Sea Systems Command (NAVSEA) Program Executive Office for Ships (PEO Ships), and specifically the Support Ships, Boats and Craft Program Office (PMS 325) within PEO Ships, which delivers integrated ship, boat and craft products and services to U.S. and international maritime forces around the world. While they also procure auxiliary and special mission ships, their focus is boats and combat craft.

Since 2010, PMS 325 has awarded 136 contracts with 23 different boat builders to deliver an average of about 120 boats a year. Today, PMS 325 has 14 active contracts with 12 boat builders with a total contract value of $528 million for 902 boats, and are actively planning another eight procurements for 264 boats.

According to a response from PMS 325, current and future acquisitions include self-propelled and towed seaborne targets and their related target augmentation systems (TAS), high-speed maneuverable surface targets (HSMSTs), ship-deployable surface targets (SDSTs) and fast attack craft targets (FACTs). Targets, training systems and simulations are managed with Naval Air Systems Command (NAVAIR).

A Naval Submarine Base New London harbor patrol boat participates in a small boat attack drill in support of Exercise Citadel Shield-Solid Curtain 2021 (CS-SC21).

Tristan B. Lotz / U.S. Navy

Sailors assigned to Commander, Task Force (CTF) 56 patrol aboard a Mark VI patrol boat in the Arabian Gulf in June 2020. CTF 56 is responsible for the planning and execution of expeditionary missions including coastal riverine operations in the U.S. 5th Fleet area of operations.

Maddelin Hamm/ U.S. Navy

Many of the Navy's boats are built to a standard design and can be adapted by different customers for their purposes. Navy standard boats are procured to support mission requirements for force protection; harbor security; patrol; port operations; special mission; search and rescue; VBSS (Visit Board, Search and Seizure) operations; MIO (maritime interdiction operations); escort and personnel transfer.

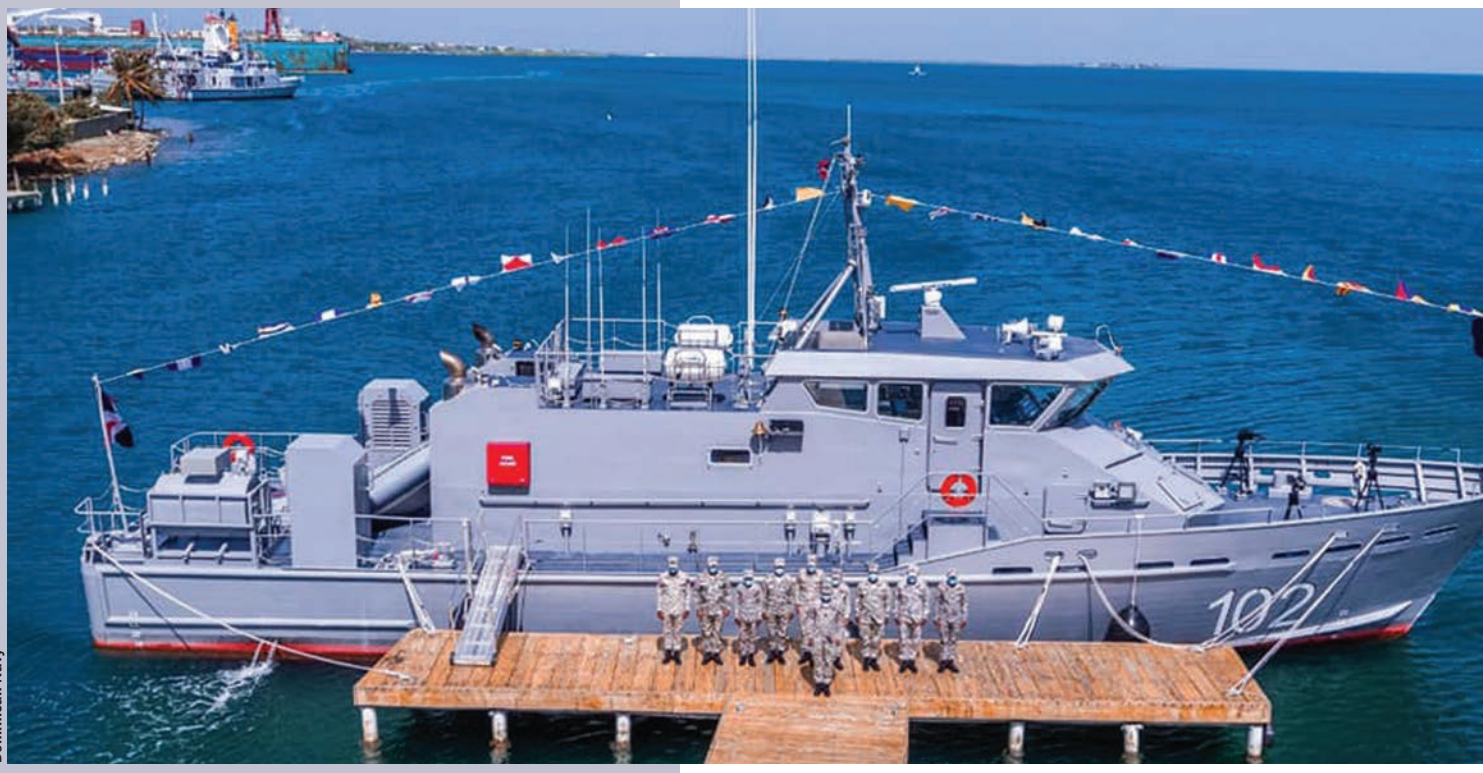
Current and future acquisitions include the Mark VI (MK VI) patrol boat; rigid inflatable boats (RIB); riverine command, assault and patrol boats; dive boat replacement; oil spill response (OSR) utility boats and rapid response skimmers; support craft; force protection boats; workboats and the new 40 PB 40-foot patrol boat.

Many of these boats are armed and carry ballistic protection for the crew, such as those operated by the Coastal Riverine Force (CRF), including the 52-foot Riverine Command Boat and 85-foot MK VI patrol boat, which serve as part of the Naval Expeditionary Combat Command's Coastal Riverine Forces (CRF was created in 2012 with the merger of the Riverine and Maritime Expeditionary Security Forces).

The CRF boats operate in seven ports continental United States and worldwide, from Djibouti to Bahrain to the Panama Canal. Typical escort missions run three to 12 hours from idle to bursts of 35 knots. The boats may be idle for hours, with short bursts of speed. The 34-foot boats have a range of about 200 nautical miles, and have a five-man crew, with 360-degree weapons coverage.

New patrol boats

The Navy had planned to buy a number of the MK VIs, calling it the "Next Generation Patrol Boat." However, due to a number of reasons, the program has been halted and the Navy is moving forward with the 43-foot 40 PB. Originally called the PB(X), the 40 PB is being built by Metal Shark of Jeanrette, La. Metal Shark's initial contract



Dominican Navy

was for 11 40 PBs, extending up to 50 with options. Today the company has delivery orders for 57 vessels.

The 40 PB is aimed at replacing approximately 100 to 160 of the Navy's 25-foot and 34-foot Coastal Riverine Force patrol boats over the next 15 years. The vessel's hull form and propulsion system are designed to achieve 40-knot sprint speeds.

The first of the 120 new 40 PB craft has been delivered to NECC and are being used to train NECC fleet instructors, leading to achieving initial operating capability (IOC) later this year. A total of 10 are to be delivered this year. They will operate at sea, in harbors, rivers, bays and across contested littorals to conduct maritime expeditionary security operations. The 40 PBs will replace the current aging 34' patrol boats, with expanded range and mission capabilities, as well as reduced total operating costs.

"The Navy made 'visual deterrence' a key factor in its selection process," said Josh Stickles, Metal Shark's executive vice president. "To achieve a more aggressive and threatening 'military' look, the 40 PB features a chiseled, angular profile with a unique faceted hull. The vessel bristles with

Betelgeuse (102) is based on Damen Shipyards' Stan Patrol 2606 design, tailored by Metal Shark to suit the requirements of the NCPV mission.

Metal Shark 85 Defiant Near Coastal Patrol Vessel NCPV US Navy Dominican Republic Damen Stan Patrol 2606 Military Patrol Boat

Metal Shark

armament, including six MK 16 weapons foundations plus a large forward foundation for stabilized, remote operated, optically guided MK 49 / MK 50 weapons systems."

Metal Shark is also the contractor for the ongoing construction of the 500-boat 29-foot Response Boat – Small (RB-S) contract for the U.S. Coast Guard, as well as the 26' High Speed Maneuverable Surface Target (HSMST) and 80-boat Force Protection Boat – Medium (FPB-M) contract for the U.S. Navy.

Foreign military sales

The Navy also helps 45 allied partners across all the combatant commands with boat and combatant craft procurements through Foreign Military Sales (FMS).

For example, Louisiana-based Metal Shark is building near coastal patrol vessels (NCPVs) for partner nations under FMS. The company is building up to thirteen 85-foot Defiant-class welded aluminum NCPVs for the Dominican Republic, El Salvador, Honduras, Costa Rica, Guatemala, and possible other U.S. partner nations, which will contribute to regional maritime security.

The U.S. Southern Command facilitated the donation through the Foreign Military Financing program of a NCPV to the Dominican Republic, which commissioned the boat last year. Named Betelgeuse, the Dominican Navy will employ their NCPV for maritime security and interdiction operations," operations, including counter drug trafficking and other transnational crimes, as well as. search and rescue, border patrol, police and customs duties.

"The donation of the coastal patrol vessel Betelgeuse is part of a broader effort to develop a shared capacity with the Dominican Navy to carry out maritime security and said U.S. Ambassador to the Dominican Republic Robin Bernstein.

Stickles said a second NCPV was recently delivered and is scheduled to be officially handed over to the El Salvador Navy next month. "Another NCPV is currently in-water at our Franklin, Louisiana shipyard and is undergoing final prep before it sails to Honduras. NCPV vessels four, five and six are also currently in production," Stickles said.

The 40 PB is aimed at replacing approximately 100 to 160 of the Navy's 25-foot and 34-foot Coastal Riverine Force patrol boats over the next 15 years. The vessel's hull form and propulsion system are designed to achieve 40-knot sprint speeds.

Metal Shark

Analyzing boat maintenance data isn't rocket science... *or is it?*

By Edward Lundquist

Navy Expeditionary Combat Command (NECC) operates hundreds of boats all the way from a 7-meter Rigid-Hulled Inflatable Boat (RHIB) to a 78-foot patrol boat, as well as construction equipment such as cranes, bulldozers, pumps, cranes, vehicles and chain saws and Explosive Ordinance Disposal (EOD) equipment.

Maintaining all of it comes under the watchful eye of Force Maintenance Director Dave Noel.

"I'm the guy that fixes the equipment we buy," Noel said. "Once it's fielded, it's our job to keep it operational, and do what it takes to support the warfighter."

For Noel, the measurable output is maintenance, but desired outcome is readiness. "We've established metrics, and can analyze and predict how effectively a system or piece of equipment performs."

Noel said NECC entered a relationship with a company that has developed technology through the Small Business Innovation Research (SBIR) program to help collect and sort data to provide that analysis.

That technology came to NECC in a rather indirect fashion.

"We've been working with an SBIR company, Frontier Technology Inc. (FTI), to develop a readiness assessment engine," Noel said.

"Dave Noel found out about our technology because he was looking for a tool to take in disparate data and analyze the best way to manage storage, maintenance, and repair of combat equipment," said FTI's Senior Vice President of Operations, Jeremy Andrews. "We were originally developing a real-time data management tool for missile telemetry for the Missile Defense Agency (MDA). It was required to take in disparate data, analyze it, and visualize the information. The Army picked up on it, and then the Navy at NSWC Corona. Dave Noel found out about it, because he was looking for a tool to take in disparate data and analyze the best way to manage storage, maintenance and repair of combat equipment. Our first task order with NECC was based on that original MDA SBIR."

Because of Noel's work, he was recently recognized with the Tibbetts Award from the Small Business Administration (SBA) for his success with and support of the SBIR and Small Business Technology Transfer (STTR) programs. The Tibbetts Awards are named after Roland Tibbetts, the founder of the SBIR Program.

The SBIR program invests in innovative technologies to support warfighters, and helps small companies grow.

As large amounts of NECC equipment were being returned from the Middle East, the Navy had to decide what to do with it. Using the capability developed from the SBIR, Frontier was then contracted by the Navy to conduct a business case analysis (BCA) to determine the best ways to maintain or store the gear.

Noel has used FTI's technology to best predict when maintenance is required rather than react when something breaks. Noel said that fixing things is important, but the most challenging part of his job is trying to prevent things from breaking. "Anytime we can make it better, that's my goal. I don't want to fail the warfighter."

Moving Fast Ahead

By Eric Haun

All images: Metal Shark

In any business, companies that achieve success must do at least one thing extraordinarily well. Shipbuilders like Metal Shark Boats are among companies that have taken their success to the next level by do a lot of things well. Government and commercial. Aluminum, steel and fiberglass. Serial and custom. Newbuild and repair. Sixteen to 300-plus feet. Patrol boats, pilot boats, fireboats, passenger ferries. Domestic and international. Metal Shark has thrived across the board.

A driving force is the problem-solving spirit and no-challenge-too-great mentality of Metal Shark CEO and co-owner Chris Allard. A naval architect and graduate of the Webb Institute, Allard brings to the business an engineering-centric approach that has fueled Metal Shark's growth, driving innovation and transforming the company from a small, regional builder to a globally recognized industry leader.

"When we first started, we were focused solely on trailerable boats, because that's what we understood best, and also, frankly, because we were limited in terms of vessel size because our first facility wasn't on the water. We were really only focused on the idea of serialized high-rate production, and not critical-path, long process builds," Allard said. "It has been a process of evolution to apply the positives of what we learned in smaller boats to larger and more complex builds. Goals evolve."

Metal Shark has grown to capture hundreds of millions in government and military contracts while expanding into the commercial sector and becoming one of America's largest suppliers of high-speed ferries. Now with three facilities and Louisiana and Alabama, Metal Shark builds vessels

in aluminum, steel and fiberglass, with the capability to construct vessels up to 300 feet long.

No job too big

Having already established itself among major players in the government and military boatbuilding space, in 2016, Metal Shark was one of two builders originally selected to build the new NYC Ferry fleet, operated by Hornblower (the other builder, Horizon Shipbuilding in Bayou la Batre, Ala., was acquired by Metal Shark in 2018.) Metal Shark delivered all six of its ferries on or ahead of schedule between April and June 2017, and through subsequent orders, it went on to deliver 22 ferries in total. The series' final ferry, Time Traveler, handed over in December 2020, wrapped up a newbuild scope with a vessel quantity and delivery pace many thought unobtainable. "It proved to the industry and clients that things that might not have been thought to be possible, are," Allard said.

"A key to the success of that project was the standard product. There were really two flavors of the vessel. Instead of building 20 different things, we were able to create a serialized batch, a run of boats that significantly reduced cost and time, and then in turn ramped up the ability to implement the service for the city. If anything, I think it's eye-opening for the industry, showing the things that can be done."

Allard said there's ample opportunity to apply the same approach in other parts of the industry, including large programs for government and military customers in the U.S. and overseas. "Given the unstable situation and security concerns in many parts of the world, and depending on geopolitical events in the next few years, we may see the need to do something that big and that quick in the military space."

If needed, Metal Shark is prepared to fill orders on short notice. Several years ago, it introduced its stock boat program, keeping an inventory of both completed and partially finished versions of its most popular models. "That is something that we continue to believe in, and we're pushing hard to reduce lead times and increase stocking efforts," Allard said. "And not just the small boats."

"We believe that the maritime market is somewhat behind in only offering clients build-to-suit options, and we want to be able to give our clients solutions that are as close as pre-constructed, buy-off-the-lot as possible. No design time, no lead time, no payment terms. Here's the boat, here's the bill, put it in service and do the job. And I think

Chris Allard,
CEO, Metal Shark

"Part of the unique challenge of being CEO is the importance of being willing to change your own mind. I find it fascinating how our elected leaders are criticized for 'flip-flopping' when they change positions. I think the willingness of a leader to change their mind, to analyze new data, to get smarter, to learn and to assess self-performance in real time is critical. We absolutely must get smarter every single day, and in doing so, we must not be so attached to our previous decisions that we are unwilling to make new ones. This can be very hard, as it often requires acknowledging you were wrong, which is something that never feels good, but it is essential to leadership."

Metal Shark has recently introduced the 45, 52, and 63 Fearless Super Interceptors, boasting top speeds of 70 knots.

"I am particularly proud of our growing success in the fireboat market, as we build higher quantities of larger and more complex vessels than ever before," Allard said. "These are challenging, technical, complex builds and our team has grown quite adept at tackling the challenges of each new build head-on."

the marine market is ripe, and needs to be led that way so that people that have a job to do, whether it's law enforcement or commercial, can go and buy the asset they need in days, weeks or months, not months, years or decades."

The leading edge

While the number of vessels Metal Shark is able to produce is impressive, the product is too, and growing more so as technologies and capabilities continue to evolve. Allard said that despite challenges brought on by the COVID-19 pandemic Metal Shark delivered about the same number of vessels in 2020 as it did the year prior, but with a marked increase in value—a trend that is expected to continue. "The average size and cost of our deliveries continues to trend higher as the boats grow in size and complexity," he said.

"It's the natural evolution of our company. Our technological capabilities and ability to deal with complex problems, and in turn projects, have grown. We've been able to participate and be successful in higher dollar projects that are more complicated."

This evolution, combined with the quality of the product, is also helping to drive Metal Shark's strong sales numbers abroad, Allard said. "It can be challenging to compete overseas, especially on price. Once you get overseas, there's no Jones Act. You've got potential competitors that are in lower-cost portions of the world, and dozens of different countries that are capable of building boats," he added. "What has made us successful overseas is our technology and our innovation. We're building a product that is a step above, and it's not easy to find comparables around the world. There aren't 70-knot interceptors anywhere else. So, we find our success is around countries that are looking for the highest quality product or the next generation product. The next step in maritime patrol technology, and boats that otherwise that isn't really available in the world scene."

Allard and Metal Shark have managed to stay on the leading edge of new boatbuilding developments. "This requires investment in technology, not only in the boats, but in the build process. Whether that's automation in the build process, or autonomy in the operation of the boats. I think that the incorporation of technology into the company, transcending just the boat is something that's really set us apart."

Autonomous vessels are quickly gaining acceptance across the maritime sector, but especially in government and military applications where the technological and safety advantages are most pronounced. In January, Metal Shark was selected by the U.S. Marine Corps to develop and implement the Long Range Unmanned Surface Vessel (LRUSV) System, continuing a long string of high-tech projects for the company's Sharktech autonomous vessels subsidiary launched in 2018. According to Allard, Metal Shark has designed, built and delivered more than 400 autonomous and remotely operated vessels to date, including boats for the U.S. Navy and U.S. Coast Guard.

"I am captivated by how the evolution of this technology will completely change the maritime sector. I think the impact on the maritime world will be seismic in scale, Allard said. "I am thrilled by the small role we've been able to play in the journey so far, and I am really excited about new projects in that space."

Multimission Vessels:

Interest Across All Sectors

By Tom Ewing

Damen

The development and construction of multimission vessels (MMVs) remains active across the maritime market.

The ability to perform multiple tasks when those different duties are needed is central to an MMV's value. Multimission capabilities mean that an expensive asset doesn't sit idle when it isn't being used for a singular purpose, such as firefighting. This is particularly important for public sector officials who have to weigh costs and benefits across a wide range of demands, from public parks to libraries to firefighting equipment.

"There is increasing demand for multimission vessels in many sectors due to cost-efficiency/efficiency drives," explained Ben Littler, communications advisor with Damen Shipyards. "One vessel," he pointed out, "can cover the job of many, allowing operators to offer a wider scope of services to clients. And, of course, it's very handy when it comes to resale if you can offer the vessel to a wider field of operators."

As examples, Littler refers to Damen's Multicat and Shoalbuster vessels as "Swiss army knives." These MMVs provide capabilities ranging from dredging assistance to offshore towing to anchor handling to marine construction. (It's worth noting that Damen has contracted for the first Multicats to be built in the US.)

"...And we use it as an aircraft carrier"

Bob Clark is contracts manager for MetalCraft Marine, which manufactures a range of MMV. Clark points out that a boat with a singular mission, say for firefighting or police work, may be used just 200 to 300 hours per year. With MMV capabilities, he noted, "productivity goes way up. You have a much better platform with much more gear for a relatively small increase in price."

These kinds of expanded benefits stand out in the varied roles for a new vessel—the Amwaal, placed in service in 2019—that MetalCraft built for the Prince Rupert Port Authority in northern British Columbia.

Captain Bernie Egan is the port's supervisor of marine operations. He described how the Amwaal's will be working.

The 60-foot vessel has firefighting capabilities. It can serve as a crew boat and is used for environmental response, safety and security patrols. It has a science research station used for water quality sampling and other environmental projects. And it has a new assignment: aircraft carrier.

"We launch drones from the deck," Egan said. The drones are used for port development projects and to monitor harbor activities. "A much easier effort from 200 feet in the air," Egan commented.

The Amwaal's original mission, as authorities considered a new port vessel, was as an escort vessel to assist LNG carriers transiting to and from a proposed liquefied natural gas (LNG) facility. That project never materialized but the port has become busier, nevertheless.

Egan said port officials determined a need for speed, all-weather performance, high visibility and firefighting. The final design is largely based on a pilot boat. "We needed versatility," Egan explained. "The boat had to be multipurpose."

Vessel crews are cross-trained for all missions, except for science-based water quality work, which is scheduled quarterly. Firefighting training was interrupted by COVID-19 because personnel could not travel between Canada and the U.S. As restrictions lift, that training will resume.

In looking back at the multimission project Egan highlighted, the value of working with a naval architect independent from the vessel's manufacturer, especially, he added, when it's a long-distance project. (MetalCraft's facility is in Kingston, Ontario, 3106 miles from Prince Rupert). Egan complimented the port's working relationship with MetalCraft. He added though that a consultant's eagle-eye spotted issues and decisions requiring a learned response. "We had regular meetings with our naval architect," Egan said, "and while expensive, he saved us costs in working on and resolving problems that he noticed."

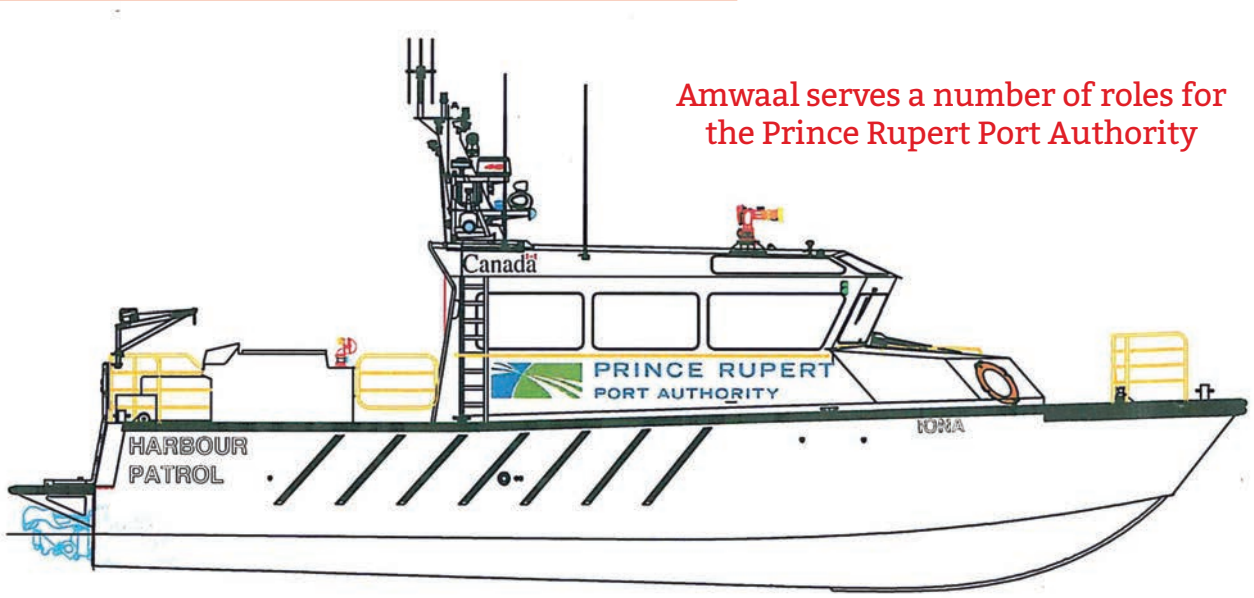
Larger vessels: a similar focus

Probably the most important MMV news this past year was MARAD's cutting-steel announcement at the end of 2020 for the first of five new National Security Multi-Mission Vessels (NSMV).

The NSMVs are primarily purposed for education and training, to be assigned to state maritime academies. However, undertaking additional roles was a priority.

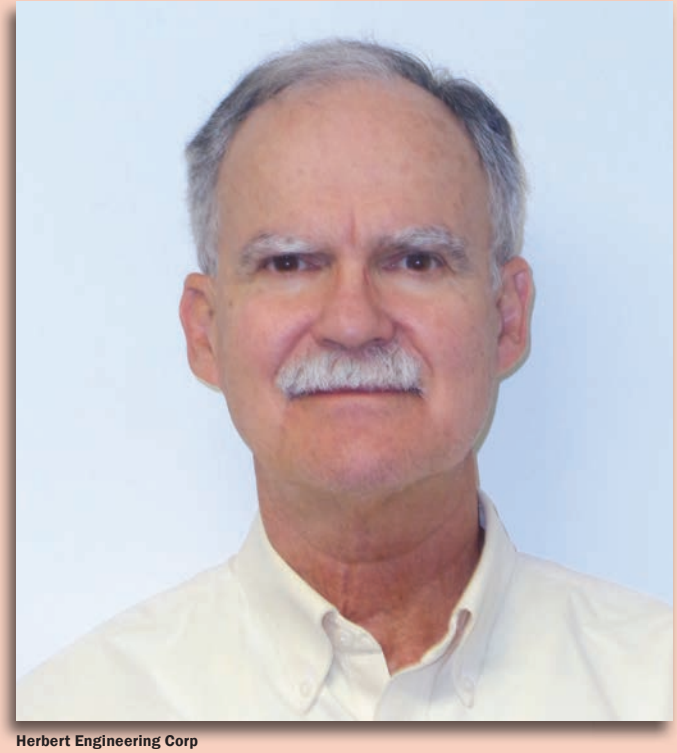
"Multimission capabilities start with the customer's demands," explained Eugene van Rynbach, Chairman, Herbert Engineering Corp (HEC), based in Annapolis, Md.

Van Rynbach was project manager for development of MARAD's NSMV), and the company continues to provide technical support for vessel construction.



Amwaal serves a number of roles for the Prince Rupert Port Authority

Prince Rupert Port Authority



Herbert Engineering Corp

Eugene van Rynbach,
Chairman, Herbert Engineering Corp

Van Rynbach explained that in the past, MARAD had pressed training vessels into service, to assist during emergencies, most notably during hurricanes and to provide humanitarian aid. (The training vessels are part of MARAD's National Defense Reserve fleet, on a custodial loan to the state maritime academies.)

As planning progressed, van Rynbach said MARAD officials kept in mind that training ships were called on for other roles. "It was likely," van Rynbach noted, "that new vessels would similarly be needed, and decisions were made to design-in expanded capabilities," to have vessels built to respond to emergency assignments and with the capabilities to perform centrally, not marginally.

The older training vessels are converted merchant ships, hardly built for multiple roles.

As planned, the new NSMV's multimission capabilities, beyond teaching and training, will be extensive. These ships will have roll-on/roll-off and container storage capacity for the emergency response missions. Each will have hospital facilities, a helicopter pad, and the ability to accommodate up to 1,000 people in port.

MMVs in commerce

Van Rynbach said that among large commercial vessels, a multipurpose design is more common in international

Prince Rupert Port Authority

maritime trade than in the U.S. On international sea trade routes, particularly in Europe, shippers use what van Rynbach described as modern versions of older style cargo vessels: ships with five holds, separate cranes and removeable decks. The ships are versatile and can carry, as a customer might need, break-bulk cargo, project cargo, containers, grain or aggregates.

Similar ships are not used in U.S. mainland trade, van Rynbach explained, because of Jones Act constraints and the economics of using rail and trucks to move freight between U.S. ports. However, containerships with added roll-on/roll-off capability are used between the U.S. mainland and offshore states and territories.

Multiple functions: Central to the Coast Guard

Beyond MARAD, multimission vessels are central within the military, particularly the U.S. Coast Guard.

Consider the USCG's Sentinel-class fast response cutters. These vessels are built for multiple missions, including port, waterways and coastal security, fishery patrols, search and rescue and national defense.

More recently, in April, the Coast Guard announced plans for a Waterways Commerce Cutter Acquisition Program. This new vessel construction would replace the cur-

MARAD

The new NSMV training ships will better meet the maritime academies' training needs while also providing the U.S. with ships that can support disaster response and other critical national needs.

rent inland tender fleet. The primary mission is continuing the USCG's aids to navigation (ATON) services in six U.S. regions, e.g., inland waterways, Great Lakes and Alaska.

This is critical work. According to the USCG, the Marine Transportation System (MTS) accounts for more than $5.4 trillion annually in U.S. economic activity. Inland ports and waterways are basic MTS components; how well they function, or not, is integral at individual locations and across the system. The CG's MTS operations include setting, relocating and recovering buoys in navigable river channels as water levels change, constructing and repairing safety related structures, and specific abilities required to reach and operate in shallow or otherwise restricted waters.

The CG's current inland tender fleet includes 35 cutters and 27 barges. Average vessel age exceeds 54 years, vessels are working long past their 30-year design service life.

For the new commerce cutters, a multimission perspective is central. The CG's preferred alternative is for three classes of vessels. Design would maximize "commonality between the three classes to reduce sustainment costs, training needs and other associated requirements," the CG writes in its program announcement.

All three variants will be monohull ships, meaning self-propelled cutters instead of tug and barge configurations. The river buoy tender and inland construction tender variants will be acquired on one contract; these variants are expected to be common except for hull length, working deck layouts, and deck equipment, including the crane.

Again, ATON is the primary mission but the cutters will be capable of side and stern towing, or to be towed. They will have capabilities for search and rescue, ports, waterways and coastal security and marine environmental protection, and have the ability "to quickly and effectively respond to emergencies such as environmental incidents and severe weather events."

Because of their varied capabilities, built in and included from the start, these ships will be able to work 24-7. Downtime with MMVs? Maybe, but not because they can't do what needs to be done.

Tech
File

A Mini-Tractor for the US Navy

By Alan Haig-Brown

Moduteh Marine, of Tacoma, Wash., has gained recognition on meeting the stringent conditions of military contracts. In 2020 they completed a contract to build a fleet of five small tugs. These carry the military designation Work Boat Docking.

"The mission of the CNIC Work Boat Docking (WB Docking) is to provide waterborne support at U.S. Navy Installations," said Modutech's Brian Swindahl. "The boats are required to have the ability to safely assist vessels including submarines for mooring and dry-docking, open and close security barriers, as well as to tow/push floating port operations support equipment. The boats must include propulsion equipment that is optimized for bollard pull, be highly maneuverable, and include sufficient deck fittings and winches to tow astern, alongside, or push."

In effect, the Navy wanted a Swiss Army knife that would fit in a mooring pocket. Modutech built a series of five boats that do just that. The rectangular shaped 25-by 14-foot hulls have an 8-foot draft. The relatively deep draft results from the requirement that these little boats be highly maneuverable. To meet that requirement, they are fitted with s single Schottel SRP 150 azimuthing drive. The drive has a 41.3-inch propeller in a nozzle. The forward-mounted drive is protected by a heavy pipe guard. A pair of fins, with approximately the same depth as the single drive, enhance the maneuverability while providing tracking stability.

The powerful heart of these remarkable craft is a single Cummins QSM11 engine, producing 450 horsepower at 2,100 rpm. This big power gives the little tug a speed over 7.5 knots and a bollard-pull in excess of 10,000 pounds. This power allows the tug to operate in both push and towing methods as required.

The steel hull carries an aluminum pilot house with heating and air conditioning. The wheelhouse can be removed for repair or transportation. Similarly, a pair of push knees mounted forward are removable. Arching from the top of the push knees, over the house, and down to the aft deck, a cage allows the boat to pass easily under mooring lines. Normal operation will be with a two-person crew, although there is room for an additional five passengers.

The five Cummins-powered Yard Tugs were deployed to naval yards in 2020.

Alan Haig-Brown

Tech
File

SOLID

Commercial vessel operators are increasingly leveraging high-tech sensors and the data they provide to achieve greater efficiency and better their bottom line. A condition-based monitoring system offered by Fincantieri Marine Systems N.A. (FMSNA) is engineered to contribute toward both objectives.

"FMSNA decided to develop and launch the SOLID because we wanted to help customers save money by avoiding unnecessary maintenance and repair costs," said Simone Scafetti, technical director and business development manager at FMSNA. "A lot of preventative maintenance can be postponed or just eliminated."

FMSNA

Combining a monitor, data logger, powerful analysis software and radio (LTE & SAT) in one compact unit, the SOLID system offers an integrated approach to data collection, communication, projections and analysis. Essentially, sensors measure the status of an operational piece of ship equipment over time, and the data collected can be used to establish trends, predict failure and calculate remaining life of the asset.

"Customers can use the SOLID to continuously monitor their equipment and automatically analyze the performance data to determine maintenance requirements," Scafetti said. "It can save customers money through prevention of equipment damage/repair, elimination of unnecessary maintenance and reduction of downtime."

SOLID interfaces with common digital communication protocols, allowing for connection with all existing vessel equipment, from the main engines, power generators and gear boxes, to HVAC systems, rudders and bilge pumps, and every mechanical system in between. It accepts numerous analog signals that are configurable to match most ship's sensors.

Sold as a standalone device or as part of a services package, SOLID has been installed on several European ships and is being integrated on board a number of U.S. military vessels and U.S.-based cruise ships.

"SOLID can be treated as an investment. Customers can expect a ROI of approximately three times the expense of one SOLID," according to Scafetti. "The SOLID system allows FMSNA to support our vast global presence by providing us access to equipment performance data. The data can be used to execute service agreements to monitor equipment performance and optimize maintenance activities."

Marine 1

Moose Boats

Moose Boats has delivered a new fireboat to the Rochester, N.Y. Fire Department. The M2-38, dubbed Marine 1, is the first Moose in the Great Lakes, and it was selected after a thorough review of all options as the best platform to patrol and respond to the area. With a roof monitor, a cockpit monitor, a 5" large diameter hose Storz discharge, and the ability to pump over 1,500 gallons per minute, this boat will offer greatly increased capabilities to the city and its surrounding communities.

Susquehanna

Gladding-Hearn Shipbuilding

The Association of Maryland Pilots has taken delivery of its fourth Chesapeake class launch from Gladding-Hearn Shipbuilding, Duclos Corporation.

With a deep-V hull designed by Ray Hunt Design, the new all-aluminum launch measures 52.6 feet long, with a 16.8-foot beam and a 4.8-foot draft. Powered by twin Volvo Penta D16, EPA Tier 3-certified diesel engines, each producing 641 bhp at 1,800 rpm, the vessel's top speed is over 26 knots. The engines turn five-blade Bruntons NiBrAl propellers via ZF500-1-A gear boxes. A Humphree interceptor trim control system, with its Automatic Trim Optimization, is installed at the transom. The launch is equipped with a 12kW Northern Lights genset and 100% LED lighting.

USCGC Glen Harris

Bollinger Shipyards

Louisiana shipbuilder Bollinger Shipyards has delivered the USCGC Glen Harris to the U.S. Coast Guard in Key West, Fla. The vessel is the 167th Bollinger has delivered to the U.S. Coast Guard over a 35-year period and the 44th Fast Response Cutter (FRC) delivered under the current program.

The USCGC Glen Harris is the third of six FRCs to be home-ported in Manama, Bahrain, which will replace the aging 110-foot Island Class Patrol Boats, built by Bollinger Shipyards 30 years ago, supporting the Patrol Forces Southwest Asia, the U.S. Coast Guard's largest overseas presence outside the United States.

Spirit of Matushka

All American Marine

Bellingham, Wash. shipbuilder All American Marine (AAM) has delivered a new 150-passenger hydrofoil-assisted aluminum catamaran for Major Marine Tours. The 87- by 32-foot vessel, Spirit of Matushka, is certified USCG Subchapter T and will operate out of Seward, Alaska and will carry passengers on tours visiting Kenai Fjords National Park.

The semi-displacement catamaran hull for this vessel was developed by Nic de Waal of Teknicraft Design in Auckland, New Zealand. The design integrates the signature Teknicraft symmetrical and asymmetrical combined hull shape, bow wave piercer, and innovative hydrofoil system. The propulsion package includes four Hamilton Jet HM422 waterjets, powered by four Scania DI16 082 engines, rated at 788 bhp at 2,100 rpm.

New Water Taxi for QXMC

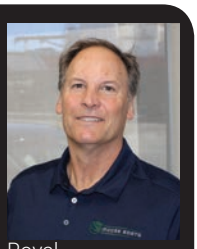
Brix Marine

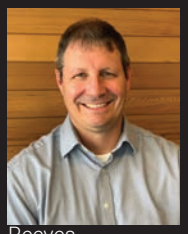
Boatbuilder Brix Marine (formerly Armstrong Marine USA) is currently constructing the 32- by 12-foot catamaran for the Qathen Xwegus Management Corporation (QXMC), the business arm of the Klahoose First Nation, located on Cortes Island, B.C, Canada. The corporation, whose activities include industries such as forestry, aquaculture, tourism and retail, will operate the 12-passenger vessel as a water taxi. Completion is slated for Fall 2021.

Power and propulsion are twin Volvo Penta D4 270hp engines with Aquamatic DPI outdrives. The 3212-CTC model vessel's full walk around configuration, combined with two side boarding doors port and starboard, allows for safe passenger access from stem to stern. Heated cabin, exterior-accessed head, and 12 individual passenger seats ensure comfort.

People & Companies


Galoni


Royal


Reeves


Complita


Federer

Sabine Pilots


S&B


US Watercraft


Fairlead

Galoni Takes the Helm at Thordon Bearings

Anna Galoni has been appointed chief executive officer of bearing and seal specialist Thordon Bearings Inc., a Thomson-Gordon Group company.

New VP of Sales for Moose Boats

California-based aluminum boatbuilder Moose Boats announced it has hired Ken Royal as vice president of sales.

EBDG Promotes Reeves, Complita

Naval architecture firm Elliott Bay Design Group has promoted John Reeves, PE, PMP to Principal in Charge and Michael Complita, PE, PMP to Vice President of Strategic Expansion.

Federer Joins AAM

Terry Federer recently joined Bellingham, Wash. boatbuilder All American Marine as business development manager.

Leidos Acquires Gibbs & Cox

Defense, engineering and IT conglomerate Leidos completed its $380 million cash acquisition of marine engineering and naval architecture firm Gibbs & Cox. The deal, announced in February, will see Gibbs & Cox operate as a wholly-owned subsidiary combined with Leidos' maritime systems division.

S&B Acquires Technology Associates, Inc.

Houston-based engineering company S&B Infrastructure, Ltd. announced it has acquired naval architecture and marine engineering firm Technology Associates, Inc. TAI will continue its operations as TAI Engineers, LLC.

MARAD Announced Training Centers of Excellence

The U.S. Department of Transportation's Maritime Administration announced the designation of 27 Centers of Excellence for Domestic Maritime Workforce Training and Education. The designation recognizes community colleges and training institutions that prepare students for careers in our nation's maritime industry.

US Watercraft Licensed to Build SeaArk Designs

US Watercraft has entered into an exclusive licensing agreement with SeaArk Marine to utilize the complete portfolio of its commercial firefighting, military, survey and workboats.

Fairlead Licenses Rafnar's ÖK Hull for US Builds

Portsmouth, Va.-based Fairlead said it signed an exclusive agreement with the Icelandic company Rafnar to build its patented ÖK Hull in the U.S. for both manned and unmanned applications.

Sabine Pilots Opens New HQ

The Sabine Pilots Association opened its new headquarters located in Port Arthur, Texas. The new structure is designed and built to enable the Sabine Pilots to handle the growth and challenges of expanding shipping demands on their waterway.

Products
Lighting

McDermott Light & Signal

McDermott Light & Signal

Solving unique lighting challenges is a specialty of McDermott Light & Signal, according to Vernon McDermott Sr., president of the Ridgewood, N.Y.-based company. "It's why I come to work every day," he said.

Not long ago, McDermott was presented with a new challenge when it was asked to develop an easy-to-use and cost-efficient solution for U.S. Coast Guard rules that require vessels not under command to exhibit two all-round red lights in a vertical line and vessels restricted in their ability to maneuver to exhibit three all-round lights—red, then white, the red—in a vertical line.

So, the company went to the drawing board and created a portable LED signal light kit that can be easily arranged in either configuration for mounting when required, then disassembled and stored for convenience when not in use.

The solution is especially relevant for vessels engaged in towing or dredging operations that restrict maneuverability, McDermott said. "Operators that don't comply with the rules can be hit with a big fine. This solution is something I think a lot of people will want to know about."

Phoenix Lighting

Phoenix Lighting

Milwaukee.-based manufacturer Phoenix Lighting has recently launched the SturdiSignal Series, LED navigation lights that are ABS approved and UL 1104 certified. The modular design allows for field repairability, without needing tools or an electrician which reduces costly service calls.

The navigation lights are available with self-monitoring capabilities to notify a vessel if output falls below COLREGs regulations and an alarm panel option for new builds.

Phoenix said its navigation lights are installed on the Raymond Butler and multiple push boats for leading operators.

Phoenix also manufactures and maintains inventory of American-made deck and flanking floodlights, built to withstand harsh marine environments.

SONARAY

Sonaray

SONARAY LED Lighting offers a wide variety of marine-grade flood lights for commercial marine and fishing applications. With a wide variety of beam angles and color temperatures available, the company says its solutions are engineered to take on challenges that others won't.

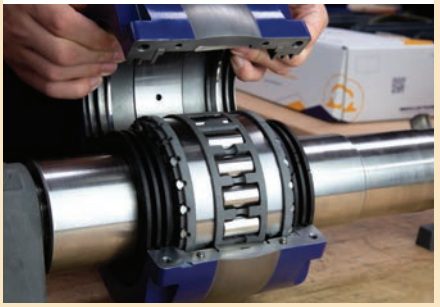
According to Verona, Va.-headquartered SONARAY, its LED floodlights are tough, dependable and meet the challenges of marine craft in commercial fishing and other extreme and challenging applications in open water. Shown here is the SONARAY 1000-watt LED flood lighting in action on a new lobster boat running out of Maine.

Products

1 **Wilson & Hayes**
Marine Furniture

2 **In-Mar Solutions**

3 **Bowman**



4 **NovAtel**

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2. In-Mar Solutions: Alu Pilot Chairs & Deck Rails

In-Mar Solutions offers a complete line of Alu Design & Services Marine Pilot Chairs and Deck Rails. There is a standard line in addition to the option for custom designs to suit specific needs. Sleek, modern design and maximum utility and comfort are emphasized.
www.inmarsolutions.com

3. Advanced Split Roller Bearing

Bowman International launched a split roller bearing with substantially higher radial and axial load capacities. Suited for applications such as propulsion shafts and electric motors, the new Bowman Advanced Split Roller Bearing offers up to 75% higher radial load capacity and up to a 1000% increase in axial load capacity in both directions, the manufacturer said. "For the first time, shipbuilders and vessel maintenance engineers can specify a split roller bearing that does not rely on race lips alone to accommodate axial force in high-load applications," said Ian Breeze, Technical Director for Bowman.

4. GAJT-410MS

NovAtel, part of technology company Hexagon, has unveiled a new GPS Anti-Jam Technology (GAJT) device amid heightened interference and jamming in marine environments worldwide. The low size, weight and power (SWaP) GAJT-410MS is designed to protect civil and military operations from interference and jamming, with jammer direction-finding capabilities for enhanced situation awareness in the marine environment.

5. AgilePlans Regional

KVH Industries, Inc.'s AgilePlans Regional solution designed for fishing vessels, workboats and smaller commercial vessels now features data speeds as fast as 6 Mbps down/2 Mbps up and worldwide coverage providing vessels that typically work in regional waters with greater geographic flexibility. AgilePlans Regional is a Connectivity as a Service (CaaS) subscription-based model that includes a choice of hardware (TracPhone V30, KVH's newest and easiest-to-install ultra-compact system or the 37 cm TracPhone V3-HTS antenna with expanded network management), unlimited email and texting, installation in as many as 4,000 ports and locations, cybersecurity protection, KVH OneCare maintenance and no commitment, all for one monthly fee.

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

Marine Marketplace

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NEW PRODUCTS

PROFESSIONALS

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35	Dascom Americas	www.dascom.com	(540) 904-0391
5	David Clark Company	www.davidclark.com	(508) 751-5888
21	Environmental Marine, Inc.	www.envmar.com	(606) 561-4697
C2	Konrad Marine	www.konradmarine.com	(715) 386-4203
7	Lake Assault Boats	www.lakeassault.com	(715) 395-2255
8,9	Marine Systems, Inc	www.marinesystemsinc.com	(985) 223-7100
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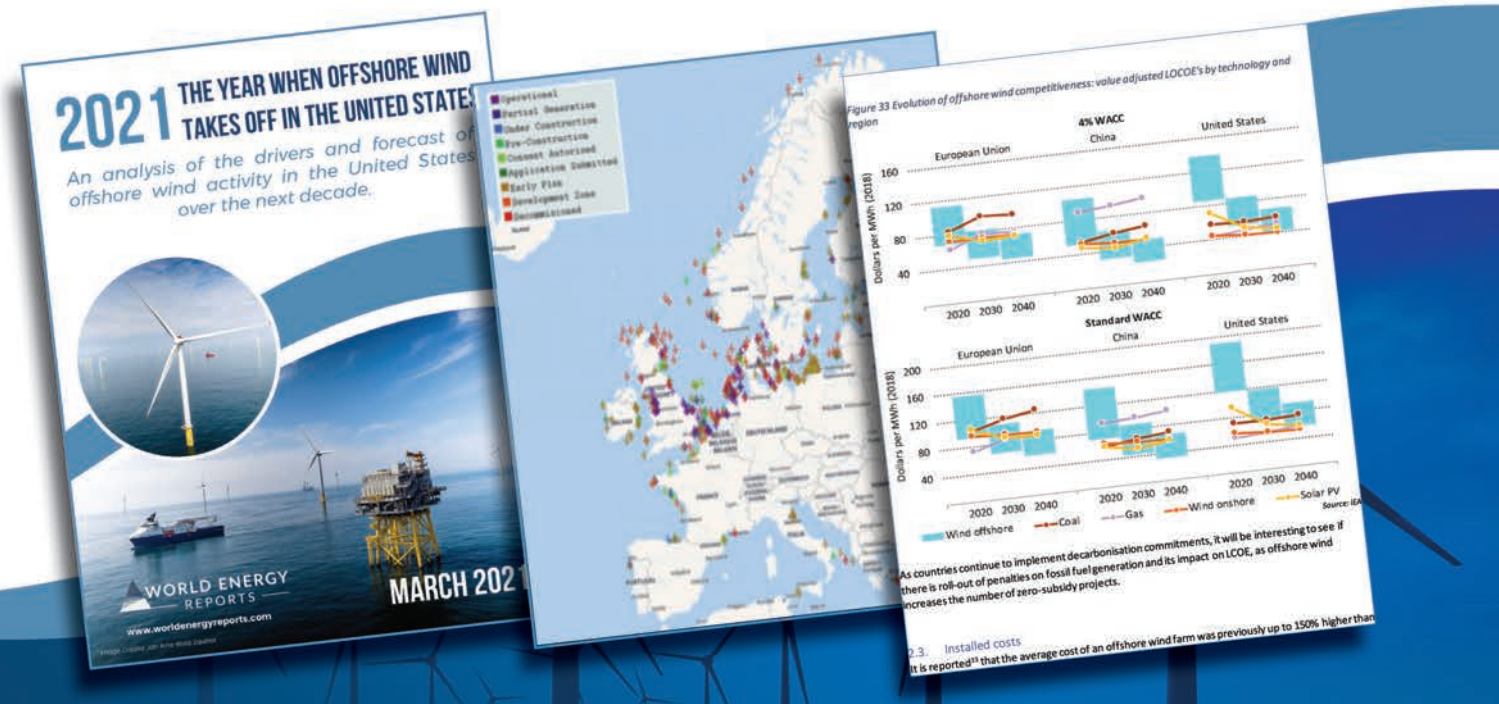
WORLD ENERGY REPORTS

2021 THE YEAR WHEN OFFSHORE WIND TAKES OFF IN THE UNITED STATES

OFFSHORE WIND MARKET INTELLIGENCE PACAKGE

This new report brings you all the market drivers that will make 2021 the year to launch the US offshore wind industry and why it is destined to become a global top three market by the end of the decade.

The report, quarterly updates and accompanying datasets, prepared by professionals with wide experience in the offshore energy business, will be a useful reference source to companies at all levels of the offshore wind supply chain.



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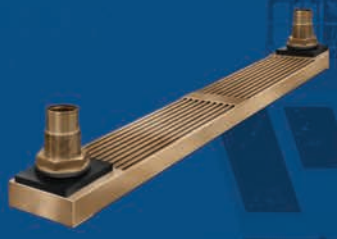

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