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Marine News

Volume 31 • Number 8

AUGUST 2020

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MM one hundred

Why did MetalCraft Marine select the David Clark Digital Communication System?

Series 9100 Digital Communication System is installed on the new 10M Fast-Attack Interceptor demo boat from MetalCraft Marine.

Here's One Reason.

> My experience with David Clark was extremely positive. The [Series 9100] digital system has enhanced the demonstrations of our 10M Interceptor.
>
> *- Chris Toller, Project Manager, Patrol and Military Crafts, MetalCraft Marine US Inc.*

The **Series 9100 Digital Communication System** is designed to stand up to the harshest marine environments and most challenging missions. Ideal for crew members on board patrol and interdiction/interception craft, workboats, off-shore service vessels, fire/rescue boats tug and salvage boats, and more.

For more information visit **www.davidclark.com** or call **800-900-3434** to arrange a **system demonstration**.

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Glosten's HT-60 was developed with input from experienced towboat operators. From barge handling and general construction support to vessel and shipyard assist work, this versatile ASD tug can do it all.

At Glosten, we do **more than design**. We adapt to new technologies and the evolving needs of industry. Contact us to find out how the HT-60 can be outfitted for your operation.

info@glosten.com

Glosten

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CELEBRATING SAFETY

Working on the waterfront requires a commitment to safety. As a leading USL&H provider, we take that commitment seriously. That's why each year we celebrate our members with the strongest safety cultures in the business. Congratulations to our 2019 Safety Award winners.

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Marine News

(ISSN#1087-3864) (USPS#013-952)
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Subscriptions to ***Marine News*** (12 issues per year) for one year are available for $60.00; Two years (24 issues) for $95.00.
Send your check payable to:
MarineNews, 118 E. 25th St., New York, NY 10010

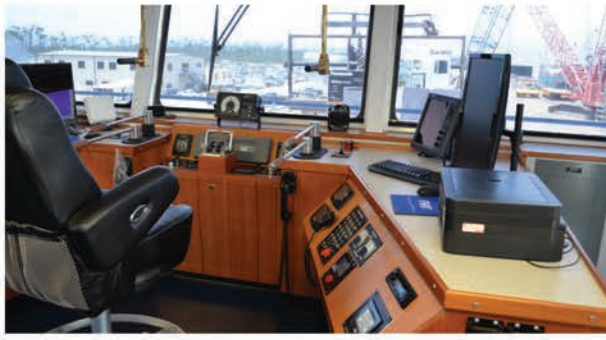
Member
BPA WORLDWIDE BRAND REPORT
Business Publications Audit of Circulation, Inc.

Marine News August 2020 Volume 31 Number 8

Sections

Features

Marine News (ISSN# 1087-3864) is published monthly (twelve issues) 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.



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EDITOR'S NOTE

As we enter into another August, I hope you've been able to find time for some of your favorite socially-distanced outdoor activities.

One summer activity that's become tradition here at new Wave Media is the publishing of *Marine News*' annual MN100 awards edition. Each year since 2014 the magazine's August issue has highlighted 100 of the leading companies serving the North American shallow draft market, from the most prolific shipyards and well-established vessel operators through the long and winding list of manufacturers and service providers vital to keeping them in business.

Over the years I've pitched in to varying degrees to help create past MN100 issues, but this year marks my first steering the 100 from the editor's seat. I'll admit that creating this issue has been a challenge. But what makes the undertaking worthwhile is evident in the final product, which shines a much-deserved spotlight on companies that typically receive very little recognition outside of this industry.

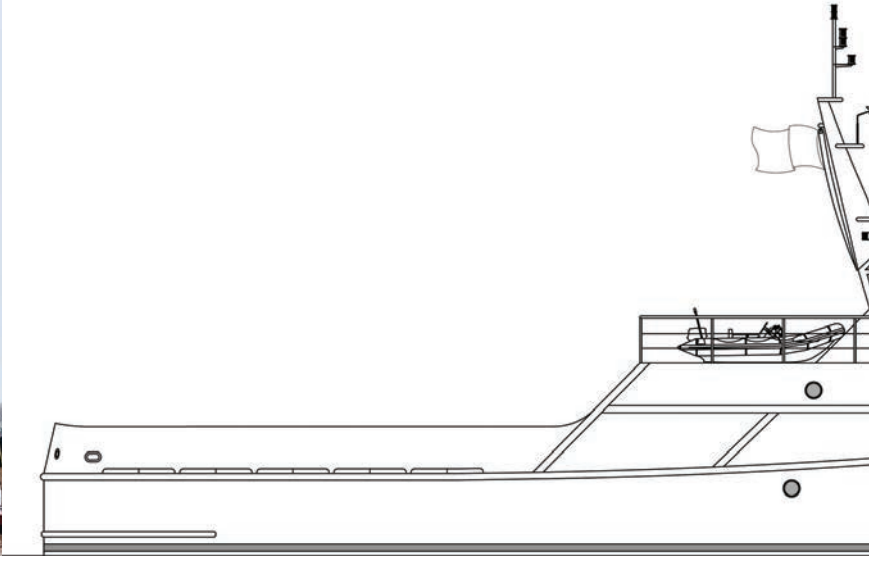
Many factors are taken into account as part of our selection process, but the first and most important requirement is that companies must to apply to be considered. My sincere thanks to all who did. Every year the list of MN100 applicants continues to grow larger and more impressive, which has made choosing this year's final 100 more difficult than ever.

It's an honor to present here 100 companies that, for one reason or another, stand out among the industry's best.

Eric Haun, Editor, haun@marinelink.com

Naval Architecture

Bristol Harbor Group, Inc.



Boksa Marine Design

Founded by naval architect and marine engineer, Nicholas Boksa, P.E., Boksa Marine Design, located in Lithia, Fla., incorporates hands-on experience working on board ships with expertise building in steel, aluminum and composite. Significant experience with industry icons in diverse markets is a bonus for clients expecting proven engineering and naval architecture solutions. Boksa designs are stout and crew friendly. The firm specializes in full-scale design and marine engineering and production services for the commercial marine and shallow draft industries, and it provides naval architecture and marine engineering for inland marine solutions and the world's largest ocean-going vessels in addition to rugged, maneuverable, stable workboats. BMD provides engineering support for shipyards and navigates vessel compliance and current regs for USCG, Subchapter T, Subchapter M and other societies. Since 2003, the company has completed 600 projects up to 740-feet for 55 clients, including shipyards, builders, clients, owners and operators. Among recent projects are ATB builds and refits, dry docking calculations for USCG vessels at various shipyards and a superyacht build in South Korea.

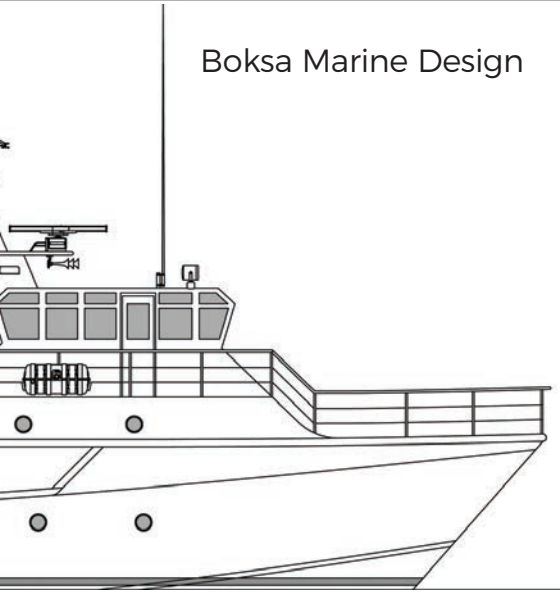
Bristol Harbor Group, Inc./The Shearer Group, Inc.

Sister companies Bristol Harbor Group, Inc. and The Shearer Group, Inc. are among the United States' top naval architecture and marine engineering firms.

A full-service naval architecture, marine engineering and consulting firm located on the harbor in Bristol, R.I., BHGI has been in business for more than 25 years and has produced numerous designs, to which hundreds of vessels have been built. The firm specializes in commercial vessel design and consulting and have experience with tugs, barges, ATBs, passenger vessels, workboats, dredges and floating dry docks.

This year, Houston-based TSGI is celebrating its 10-year anniversary. Ten years ago, Greg Beers, P.E. and Cory Wood, who are also the principal owners of BHGI, purchased the assets of Shearer & Associates, Inc. and formed the new corporate entity. TSGI has grown and continues to expand its expertise and experience in the inland marine sector. TSGI has led the industry with several significant z-drive towboat designs as well as LNG based

Naval Architecture



Boksa Marine Design

Donald L. Blount and Associates

projects. The company is currently participating in several innovative projects from LNG fueled vessel designs to new pressure barges.

DLBA Naval Architects

Donald L. Blount and Associates was founded in 1988 as a naval architecture firm specializing in the development of high-performance marine craft. Its founder, Donald L. Blount, has left a legacy of high-performance designs introduced to the maritime industry ahead of their time. Now a division of Gibbs & Cox, the firm focusses on in the design, construction management and testing of commercial, military, paramilitary and recreational vessels, with designs and innovations spread throughout the industry and around the world.

The company has recently unveiled a 120' service accommodation and transfer vessel concept intended to be used for delivering service technicians to offshore windfarms. Other noteworthy DLBA projects include supported the installation of a Manitowoc 4100W Ringer Crane on a barge W.F. Magann Capt. Bud and a propulsion refit on a 55' Haig Point passenger ferry.

Elliott Bay Design Group

Elliott Bay Design Group is a national leader in innovative vessel design and offers extensive engineering and production support for the marine industry. EBDG is a full-service, employee-owned naval architecture and marine engineering firm led by Brian King, who took over as president and chief engineer in August 2019. The Seattle-based team of naval architects, engineers, designers and analysts have expertise with designing, supporting and proving the feasibility of marine transportation for vessel owners, operators and shipyards. EBDG's design and engineering capabilities are complemented by extensive analytical services, hands-on experience in vessel operation, and thorough working knowledge of shipyard construction practices. EBDG's team of designers and engineers utilize the latest, state-of-the-art analysis tools such as finite element analysis (FEA) and computational fluid dynamics (CFD) to help customers resolve difficult problems. The group has also fully leveraged 3D scanning to support services like hull scanning, interior layout, and piping systems modifications.

The company is actively involved in multiple eco-friendly vessel designs and hybrid feasibility studies, and its de-

Naval Architecture

Elliott Bay Design Group

signs incorporate all forms of fuel-efficient hybrid power and alternative propulsion options. By providing owners, operators and shipyards across the country naval architecture, marine engineering and production support services that result in the design and construction of cleaner ships, EBDG aims to help make a greener maritime future a reality. For example, EBDG is involved in the conversion of the Jumbo Mark II ferries to hybrid technology for Washington State Ferries, and it was hired to design a new diesel-electric pax/vehicle ferry for Texas DOT. EBDG is also designing a 164' double-ended pax/vehicle ferry for Casco Bay Lines that will target energy optimization with a desire to run all-electric under most circumstances, as well as a 184' double-ended pax/vehicle ferry for Whatcom County that will operate as a diesel mechanical/battery hybrid.

Glosten

Glosten has provided engineering services for the marine industry for over 60 years, integrating advanced analysis with practical, experience-based design. The employee-owned, full-service consulting firm of naval architects, and marine, electrical, ocean and production engineers possesses a diverse range of capabilities spanning every sector of the marine industry. With offices in Seattle, Wash. and Providence, R.I., the firm's design experience includes research vessels, passenger/car ferries, tugs, barges, dredges and special purpose platforms. Consulting and design services include hull, structural, mechanical, and electrical systems design, as well as construction management. Glosten has developed specialized expertise in areas such as hydrodynamic analysis, climatology and risk analysis to serve vessel operators, marine civil engineers, and contractors performing challenging in-water projects. Glosten has a long history of solving engineering problems for complex and unique projects. While the firm is particularly adept at tackling projects with challenging design criteria or new technologies, it is skilled in a wide variety of marine related engineering disciplines. The team of 100 contains 43 professionally licensed engineers and includes personnel with seagoing experience and US Coast Guard operating licenses. Glosten is also the parent company to Noise Control Engineering, LLC, a Massachusetts-based acoustical

Naval Architecture

engineering consultancy specializing in noise and vibration measurement and control for marine, industrial, commercial and military applications.

Notably, Glosten recently designed an ice-strengthened variant of their HT-60 ASD (Z-drive) harbor tug for the Saint Lawrence Seaway Development Corporation (SLSDC) in Massena, N.Y. It is also working with fellow naval architecture firm Ray Hunt Design and the Canaveral Pilots Association on a pilot/demonstration project for the design, construction and operation of an electric pilot boat.

Incat Crowther

Australian-based Incat Crowther is one of the largest independent marine design business in the world, and continues to lead in the design of specialized marine craft, including passenger vessels and offshore support vessels.

Incat Crowther is a diversified marine design business with offices in Sydney, Australia; Lafayette, La.; and Eastleigh, U.K. The company has a 40-year history with nearly 600 vessels in service to its designs, including a rich his-

Richard Mueller
Northeast Technical Services Company, Inc. (NETSCo)

Mike Fitzpatrick
Robert Allan Ltd.

Naval Architecture


Incat Crowther

tory of firsts, having developed the wave piercing catamaran and pioneering the use of catamaran passenger vessels in the tourism and commuter sectors. More recently, Incat Crowther has been at the forefront of the use of catamaran hull forms in offshore vessels, as well as the continual evolution of monohull crew vessels with industry leading efficiency and performance. Its diverse product portfolio includes monohull, catamaran and trimaran hullforms serving a vast range of sectors, including commercial, recreational, military and passenger. Construction materials include composite, aluminum and steel construction, with the company possessing leading-edge engineering experience in all materials. Incat Crowther offers a full range of services, ranging from preliminary design and operational studies through to full functional design packages including 3D systems design. The company works with a world-class network of suppliers and shipyards which combine to deliver for projects with minimal technical risk.

NETSCo

Northeast Technical Services Company, Inc. (NETSCo) was formed in 1984 and today ranks among the most respected engineering firms in the U.S., providing a range of naval architecture and marine engineering services in support of vessel design, construction, conversion, modification, operation support and technical analysis.

NETSCo has worked extensively to reduce vessels' carbon footprints, having completed studies in the development of hybrid technology, along with designing vessels with low resistance and minimal power requirements to allow for increased fuel efficiency, as well as significant reductions in noise and vibration compared to traditional diesel plants. Additionally, NETSCo has handled ballast water management system engineering and retrofit projects that have included all the major treatment technologies. The NETSCo team uses advanced software to review vibration, stress, seismic and thermal loads, as well as impact and crash analyses. NETSCo's FEA services can be used to troubleshoot basic design concepts, optimize designs, validate vessel modifications or to ensure quality control for product replacement. Other core services at NETSCo include bulk material vessel design (both liquid and dry bulk), cargo integrity studies and structural analyses of cargo, including detailed FE modeling, for the largest capacity, self-unloading carriers built in the U.S.

Robert Allan Ltd.

Robert Allan Ltd. is Canada's most senior consulting naval architecture and marine engineering firm, first established in Vancouver, B.C. in 1930, with an international

Naval Architecture

reputation for innovative designs of a wide range of vessels for service in the marine transportation industry. In particular, it has earned a reputation as a leader in harbor and seagoing tugs, shallow draft towing vessels and fireboats for major world ports.

The firm's experience includes designs for hundreds of vessels of almost all types, from small coastal and inshore fishing boats to oceangoing vessels of various designs. With a legacy of almost nine decades of design experience, there are very few vessel types in its field of work which the firm has not already developed in some form and which exist in the Robert Allan Ltd. files at least as a basic reference. This legacy includes a large number of shallow draft designs for northern Canadian and South American Rivers. The scope of services offered ranges from concept studies through complete design documentation for contract bidding and classification society approval, to production working drawings and procurement support. Use of the latest CAD technologies expedites and improves the accuracy of every aspect of the ship design process.

The Robert Allan Ltd. team also undertakes projects for a broad range of marine consulting services, involving virtually every aspect of planning and developing either marine transportation systems, towing and ship-handling or escort operations, ship construction management and vessel maintenance and operations. It also offers support services throughout the entire vessel procurement process.

Shipbuilding & Repair

All American Marine

All American Marine got its start more than 30 years ago specializing in the construction of aluminum fishing vessels used from California to Alaska. But the Pacific Northwest boatbuilder adapted to changing markets in the '90s, and today it is a builder of custom-tailored aluminum high-speed passenger boats, hybrid vessels, dinner cruise boats, patrol and research vessels. In 2017, AAM relocated to a new state-of-the-art facility in Bellingham, Wash., where all of its vessels are built in a 57,000 sq. ft. production facility adjacent to Bellingham Bay. The production shop contains seven overhead bridge cranes, a brake press, shear, CNC router cutter and a laser-leveled construction platform.

AAM has exclusive North American building rights with one of the world's top naval architects and designers, Nic de Waal of Teknicraft Design, Ltd. in Auckland, New Zealand. The unique Teknicraft design incorporates the use of a cutting-edge hull shape and an optional hydrofoil system in catamarans to create lift and enhance vessel performance. Unique design characteristics ensure high-speed travel, ultra-low wake, industry-leading fuel efficiency, and all fully customizable depending on the application.

Notable green deliveries include hybrid-electric passenger vessels for Red and White Fleet and Kitsap Transit. It has also recently taken over the construction of the U.S.' first hydrogen-powered, electric drive ferry, on pace for delivery later this year.

Armstrong Marine USA

Since its founding in the Pacific Northwest over two decades ago, Armstrong Marine USA has specialized in the design and construction of commercial aluminum boats. The Port Angeles, Wash. boat builder is part of Bryton Marine Group, the largest builder of welded aluminum boats in North America. Armstrong operates independently within the group, benefiting from an experienced management team, skilled workforce and customized physical factory. While operating as separate business units, the brands are strengthened by sharing best practices and collaborating on strategic planning. Armstrong's combination of market focus, quality craftsmanship and designs partnered with Bryton Marine Group's strong purchasing power and effective management systems enable it to provide clients with superior vessels at great value.

The Armstrong Marine USA portfolio includes cata-

Shipbuilding & Repair

Armstrong Marine USA

Baltic Workboats

marans, monohulls and barges, all tried and tested in diverse industries. In particular, its extensive experience in designing and producing landing craft has positioned Armstrong Marine USA as a preferred builder for operators that work in remote areas or rely on repeated beaching. The builder also produces USCG Subchapter T passenger vessels and research/survey vessels suited for near coastal operations, plus rigid hull inflatable boats (RHIBs) designed by Naiad.

Baltic Workboats

Estonia-based Baltic Workboats is recognized among leading pilot boat manufacturers globally, thanks in part to a unique wave piercing hull-form that helps to provide a smooth ride. To date, it has notched more than 86 pilot vessel deliveries.

Beyond pilot boats, Baltic Workboats' portfolio covers aluminum and steel hull vessels up to 100 meters, including patrol, defense, oil spill response, SAR, research, tugs and ferries. Several recent deliveries have featured hybrid and electric propulsion systems, such as a 100-meter fully electric ferry for Sweden and three 30-meter hybrid ferries to the German waterways and shipping administration.

Baltic Workboats' 60,000 square foot shipyard facilities are located in the Baltic Sea on the island of Saaremaa in Estonia, where it has advanced its shipbuilding modernization program including substantial investments in facilities, equipment and skills for our expansion into the Americas. The builder's vessels are available for U.S. production through a partnership with Lyman Morse Boatbuilding, located in Thomaston, Maine.

Blount Boats

Warren, R.I. shipbuilder Blount Boats has constructed more than 372 shallow draft vessels during its 70-year history. It is now building Atlantic Wind Transfer's second crew transfer vessel for the U.S. offshore wind market and has recently been awarded a contract to build a

Shipbuilding & Repair

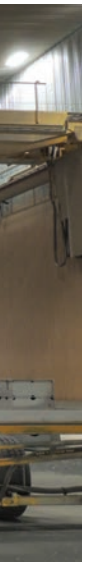
Julie Blount & Marcia Blount
Blount Boats

Keal Woodruff
Bludworth Marine

90-foot icebreaking buoy tender for the Maryland Department of Natural Resources.

Blount Boats, led by sisters Marcia Blount and Julie Blount, designs and builds aluminum and steel commercial vessels of all types. From its first boat built – a 77-ft. steel catamaran – to the hundreds of passenger vehicle ferries, fast commuter boats, dinner excursion boats, bunkering tankers, harbor tugs and commercial trawlers launched over the years, and through the variety of ferries, offshore wind support boats and icebreaking tugs being built today, Blount has progressively grown its capabilities and sought to squeeze the most out of its six-acre facility.

One of the most famous vessels built at the shipyard was a 130-ft., 600-passenger ferry boat built in 1952 that has carried more than 60 million passengers from Manhattan to the Statue of Liberty for the Circle Line. More recently, the construction and delivery of Atlantic Pioneer, the first U.S. flagged crew transfer vessel for the Block Island Wind Farm, is significant not only in being a 'first', but perhaps more importantly is signifies the boatyard's future as Marcia Blount, President of Blount Boats since 2007, said, when assessing opportunities. "This market has been off to a slow start but leases have been purchased and should develop into a robust market for a variety of vessels," she says. The next Chartwell-designed CTV for Atlantic Wind Transfers is slated to be delivered in November 2020.



Bludworth Marine LLC

An experienced shipyard with mobile repair teams that service the Gulf of Mexico from Corpus Christi to Lake Charles, Bludworth Marine, established in 1998, has continually expanded its physical plant locations and the appropriate service personnel to better service an expanding customer base of marine vessel owners. Its multiple marine repair locations in Galveston and Orange, Texas include a graving dock and two dry-docks up to 3,000 tons. Bludworth Marine services a full range of vessels from inland tugs and barges to oceangoing ships. Other services offered include shipyard and docking vessels to topside repairs on ships and ocean floating equipment. U.S. Gulf and worldwide services can be provided through traveling crews. Bludworth Marine also owns the Bludworth ATB flexible pushing system design and is the U.S. sales and service representative for the Japanese Taisei Engineering Articouple ATB systems.

C&C Marine and Repair

C&C Marine and Repair is a full-service shipyard specializing in steel new construction and barge repair services. The yard provides services for both the inland brown water and offshore industries. New construction services include boats, barges and dredges along with a whole host of other floating vessels. Its repair services include barge repair, barge modifications, piping repairs and modifications, ISE repairs, barge blasting and painting, and tank liners.

The Belle Chasse, La. shipyard is located along the Gulf Intracoastal Waterway, with proximity to both the Mississippi River and Gulf of Mexico. C&C Marine and Repair performs all new construction and some barge repair and conversion projects in one of its fully enclosed fabrication bays, totaling over 500,000 square feet. Its facilities allow for numerous barge repair and conversion projects of various sizes and complexities to be performed simultaneously. The shipyard's 83,000 square foot robotic blast and paint facility is the largest facility of its kind in the country, with space to accommodate barges up 320' x 80' inside the building.

Through the second quarter of 2020, C&C Marine and Repair has completed production of a 24,000 HP diesel-electric cutterhead suction dredge, a 6,600 HP (triple-z drive) towboat, the first two (in a series of 15) 2,600 HP towboat, three deck barges, a spud barge, and two 30,000 BBL tank barges. On the horizon for the second half of 2020 is the completion of a 4,000 HP towboat, two more 2,600 HP towboats, and the first in a series of three 6,000 HP towboats, along with numerous other projects that will be in various stages of production.

Colonna's Shipyard, Inc.

Celebrating its 145th year in business, Colonna's Shipyard in Norfolk, Va. is a family-owned, full-service vessel repair and service facility that serves everything from workboats to oceangoing ships. Colonna's strength is its diverse capabilities with extensive experience in commercial and government ship repair, machining and large steel fabrication.

While rooted in a rich history since 1875, today's Colonna's Shipyard is a company with diverse industrial capabilities. Colonna's Steel America Division is a custom steel fabrication shop and large-scale machining service provider with complex mechanical and electrical capabilities. Colonna's Down River Division is the rapid repair division of Colonna's, designed to mobilize outside the gate on a 24/7 basis for pier-side and underway emergencies, or preplanned voyage repairs.

The company continues to maintain its commitment to modernization, making the capital investments necessary for improvements in efficiency and productivity. Now encompassing more than 100 acres, Colonna's has three floating dry docks, one marine railway and a

Shipbuilding & Repair


Colonna's Shipyard


Conrad Shipyard

a 1,000mt Marine Travelift. The total covered building under roof at Colonna's is approximately 240,000 square feet, inclusive of 115,000 square feet of covered shipyard shop and storage space.

Conrad Shipyard

For more than 70 years, Conrad Shipyard has been a name to trust in shipbuilding. Operating five shipyards located along the Louisiana/Texas Gulf Coast, Conrad offers new construction, repair and conversion services. Founded by Parker Conrad in 1948, Conrad Shipyard has a reputation for on-time and on-budget delivery. Conrad employs an in-house engineering team; an experienced workforce firmly committed to safety, quality, craftsmanship, integrity and service; and, is led by a seasoned management team tightly focused on customer satisfaction. Each shipyard is equipped with computer-aided manufacturing technology, covered manufacturing buildings, and lifting capacity to handle demanding projects.

Conrad Shipyard designs, builds and overhauls tugboats, ferries, liftboats, barges, offshore supply vessels, LNG vessels and other steel and aluminum products. It also provides repair, conversion and new construction services at its five Gulf Coast shipyards strategically located in southern Louisiana and Texas. The company's extensive portfolio reflects a wide diversity of quality vessels delivered to commercial and government markets. The year 2019 displayed diversity in product lines as Conrad delivered 61 newbuilds, including 50 tank, deck, spud, crane and hopper barges; five LPG carriers; two tugs and one ATB tug; and, one dock and two large structures. In addition to new construction projects, Conrad completed a broad range of repairs, including hull repairs and painting; electrical, engine, piping and propeller repairs; and, maintenance and inspection on vessels spanning multiple markets.

Detyens Shipyards, Inc.

Detyens Shipyards, Inc., located in Charleston, S.C. is a one of the largest commercial shipyards on the U.S. East Coast, well positioned to service both blue and brown water fleets. Detyens provides emergency and scheduled maintenance and repair work for both domestic and international operators, including government and commercial vessels. The yard's location in the deepwater Port of Charleston offers deep draft repair berths, graving and floating dry docks along with all the services one would find at any modern ship repair facility. The Detyens Shipyards facility offers three graving docks and with a capacity of up to Panamax. In addition to the docks, the facility also offers modern, enclosed shops for all crafts; eight 56-ton gantry cranes (on a continuous rail system); four tower cranes; rail access and over 8,000 ft of deepwater pier space and a floating dry dock for smaller vessels.


Detyens Shipyards, Inc.


Eastern Shipbuilding

Of course, the facility is only part of the equation. Family owned and operated since its inception, the company has continually emphasized customer service, family values and safety in the workplace. Hard work, dedication and the goal to provide economical ship repair services is the benchmark behind the Detyens Shipyards creed, "Customer before company, employee before owner, family before self, and safety above all."

Eastern Shipbuilding

Eastern Shipbuilding has navigated its fair share of challenges over the last few years, quickly bouncing back from the damage caused by Hurricane Michael in 2018 and forging ahead through the coronavirus pandemic currently confronting all businesses globally. Today, the family-owned shipbuilder has a number of bright spots on its radar, having recently booked a large dredge contract and started construction on a second Offshore Patrol Cutter. Eastern is also adding staff, and in late 2020 it will open a third shipyard, in Port St Joe, Fla.

Eastern Shipbuilding currently operates two shipbuilding and repair yards located in Panama City, Fla. A portfolio of more than 350 vessels makes it one of the most diverse shipyards in the U.S. Eastern has built OSVs, MPSVs, offshore construction vessels, diesel electric vessels, dredges, ATBs, offshore tugs, Z-drive harbor tugs, inland towboats, RoRo passenger ferries, barges, fire boats, research vessels, fishing vessels, military craft and more.

The shipyard has recently delivered the 70th and final towboat in a series for Florida Marine Transporters, three tugs form McAllister Towing and another tug pair for E.N. Bisso & Son. Eastern won an order to build a new trailer suction hopper dredge for Weeks Marine in April, and it launched the second of three newbuilds for Staten Island Ferry in June. Also underway is the high-profile Offshore Patrol Cutter program for the U.S. Coast Guard, with the keel laid for OPC #1 Argus and steel cut for OPC #2 Chase.

Fincantieri Bay Shipbuilding

Tracing its history back to 1918, Fincantieri Bay Shipbuilding in Sturgeon Bay, Wis. is an industry leader in the construction, conversion and repair of commercial and government ships. In terms of new construction, the diversified FBS portfolio includes all types of vessels including articulated tug-barge units, dredges and dredging support equipment, self-unloading carriers, ferries and offshore support vessels. On the repair side, FBS is expert at managing critical deadlines in the repair and sustainment of bulk carriers and other ships of the Great Lakes fleet. While the split between newbuild and repair work varies from year to year, generally

Shipbuilding & Repair


Fincantieri Bay Shipbuilding

Gladding-Hearn Shipbuilding

30-40% of FBS' annual sales are repair driven.

Shipbuilding facilities at the 68-acre plant include a large graving dock, a U.S. Navy-certified drydock, and lifting capacity to meet the most demanding requirements. Erection buildings are climate-controlled and equipped with sophisticated computer-aided manufacturing equipment. Fincantieri's workforce has an average of more than 20 years of shipyard construction experience.

In 2020, FBS laid the keel for a bulk carrier for Interlake Steamship Company, the first new U.S. flag Great Lakes bulk carrier built in nearly four decades. Among other newbuild projects, FBS recently delivered the Washington Island ferry, Madonna, for the Washington Island fleet, and it is building a 5,400 cubic meter LNG barge for NorthStar Midstream for its East Coast route as well as a 740-foot self-unloading barge for VanEnkevort Tug & Barge, Inc.

Fincantieri Bay Shipbuilding is an operating unit of Fincantieri Marine Group (FMG), the United States division of global shipbuilding giant Fincantieri.

Gladding-Hearn Shipbuilding, Duclos Corporation

For almost 65 years, Gladding-Hearn Shipbuilding has built steel and aluminum commercial vessels operating in the U.S. and foreign countries. Located on seven acres along the deepwater Taunton River in Somerset, Mass., the family-owned and operated shipyard currently under the leadership of co-presidents Peter Duclos and John Duclos. Nearly all of the 431 vessels built by the shipyard are still operating today. Nearly 90% of Gladding-Hearn's business is from repeat customers.

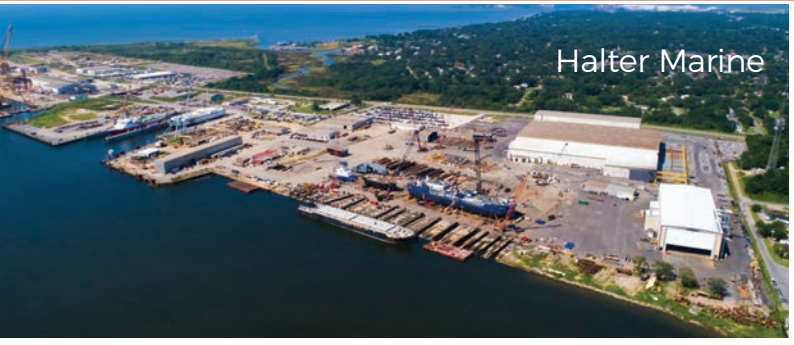
With in-house naval architecture and engineering capabilities and a cross-trained workforce, Gladding-Hearn is well-known for applying some of the most advanced shipbuilding techniques that rival many bigger yards, while still providing the personal customer service of a smaller yard.

The builder's primary products include pilot boats, high-speed passenger catamarans and mono-hull ferries, tugs, patrol and rescue boats, crew transfer vessels and research vessels. Since 1955, Gladding-Hearn has been synonymous with pilot boats, having built more launches (90) than any other shipyard. In 1978, the yard joined forces with designer C. Raymond Hunt to build the first launch with a deep-V hull, soon to become the industry standard. In 2014, the shipyard built the first pilot boat application of Volvo Penta's IPS drives in the United States. Having built over 200 tugs, barges and bridge tenders, the shipyard delivered America's first Z-drive tractor tug in 1977. An Incat Crowther licensee since 1987, Gladding-Hearn became the second shipyard in the country to build high-speed passenger catamarans and has built the majority of fast ferries on the East Coast and Great Lakes (43).

Halter Marine

Pascagoula, Miss. shipyard Halter Marine, a marine operations division of ST Engineering North America, designs, builds and repairs medium-sized oceangoing vessels such as patrol vessels, oil recovery vessels, ATB oil barges, ferries, logistics support vessels, LNG bunkering ATB units and survey vessels.

The shipyard is expanding upon more than 70 years of



experience and a strong track record in both the commercial and defense industry segments with several new and noteworthy projects underway. In 2019 it emerged as the victor in the race for one of the most coveted and long-awaited shipbuilding contracts in recent memory, a $746 million deal to build the U.S. Coast Guard's lead Polar Security Cutter – Americas first new heavy icebreaker in nearly half a century. Options for two additional PSCs could bring the total deal near the $2 billion mark. Construction on the first PSC is planned to begin in 2021 with delivery planned for 2024.

Among other notable projects, Halter Marine has built and launched the QLNG 4000 and its tug, the Q-Ocean Services, which together form an industry-first offshore liquefied natural gas bunker articulated tug and barge for owner Q-LNG and under long-term contract with Shell to deliver LNG fuel for various ports in Florida and the Caribbean. The barge is designed to carry 4,000 cubic meters of LNG, with dimensions of 324' x 64' x 32'.6". The 5,100 horsepower is 128' x 42' x 21'.

Lake Assault Boats

Lake Assault Boats, part of Fraser Industries, builds aluminum fireboats, patrol craft and various workboats, offering a wide range of custom hull designs and configurations suitable for use on inland lakes and rivers, and inter-coastal and offshore waters. Among several notable contracts in 2020, Lake Assault Boats has been chosen to supply up to 119 Force Protection-Medium (FP-M) patrol boats to the U.S. Navy. The five-year Indefinite Delivery Indefinite Quantity (IDIQ) contract carries a maximum value of $56 million, and the first deliveries will begin in November 2020.

In the past five years, the company has invested ap-

Shipbuilding & Repair


Lake Assault Boats


Metal Shark

proximately $10 million in new equipment, including a new high-definition cutting table, new dock facing, and upgrades to electrical infrastructure at its state-of-the-art manufacturing campus on the shores of Lake Superior. A new support center includes contemporary offices and working accommodations for customers, including the U.S. Coast Guard and the American Bureau of Shipping. Additional capital expenditures have been allocated for dock face upgrades and other facility improvements.

Master Marine, Inc.

Located in Bayou La Batre, Ala., on the U.S. Gulf Coast, at mile 117 of the Gulf Intracoastal Waterway, Master Marine's shipyard specializes in new ship builds, haul outs, conversions and repairs.

Since its inception in 1961, Master Marine, Inc. has gained extensive experience in various marine related projects for the gas and oil sector, inland transportation, passenger vessels and commercial fishing industries. More than 344 vessels have been constructed and delivered to companies, individuals and government agencies across the United States including the East, West and Gulf coasts, and all the way to Alaska. Master Marine has also delivered at far as the Northern coast of South America, and the West Coast of Africa. The shipyard has constructed large and small vessels with steel and aluminum including special projects and vessels for government agencies. Some of these vessels have included offshore utility vessels, tug boats, inland towboats, lugger tugs, barges working the Gulf of Mexico, and oil patches. The shipyard has worked with the Intracoastal Waterway and Inland River System along with fisheries related, shrimping, long lining and dragger vessels.

Master Marne is presently building a few different designs of USCG Sub M compliant tier 3 1600HP towboats, fleet boats and day boats for the inland towing industry. On the repair side, it has stayed busy with continued government contracts along with different commercial repair projects.

Metal Shark

Metal Shark has evolved to become one of the premier designers and builders of commercial, defense and law enforcement vessels in the United States. Everything about the company has grown over the years, from its manufacturing spaces and capabilities to the range, size and complexity of the vessels it builds. Metal Shark presently operates three facilities in Louisiana and Alabama, manufacturing vessels in aluminum, steel and fiberglass, with current capabilities supporting production for vessels up to 300 feet long.

"In spite of our growth and change over the years, we've managed to maintain the same engineering focus, and the same product-based, innovation-driven mentality that we've had since the very beginning," said Chris Allard, CEO. That engineering and problem-solving mindset has been key in helping the company to meet the requirements

of demanding military customers, having won several historically large government contracts.

In addition to military and patrol boats, Metal Shark builds a wide range of fire and rescue craft, pilot boats, passenger vessels, utility/workboats and, more recently, inland towboats. Metal Shark acquired the assets of Alabama-based Horizon Shipbuilding in 2018 and delivered its first towboat from the new shipyard earlier this year.

Metal Shark typically delivers more than 150 vessels each year to the U.S. Coast Guard, Navy, Air Force, Army, and the militaries of partner nations worldwide, as part of more than 200 vessels delivered annually on average. Allard says Metal Shark is on pace to deliver about the same number of vessels in 2020 as it did last year, but with a marked increase in value. "The average size and cost of our deliveries continues to trend higher as the boats grow in size and complexity," he said.

"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."

Metal Shark is also making strides into the world of autonomous vessels. In 2019 it partnered with Sea Machines to introduce a 29-foot autonomous vessel being offered through Metal Shark's new Sharktech autonomous division.

"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."

RIBCRAFT USA, LLC

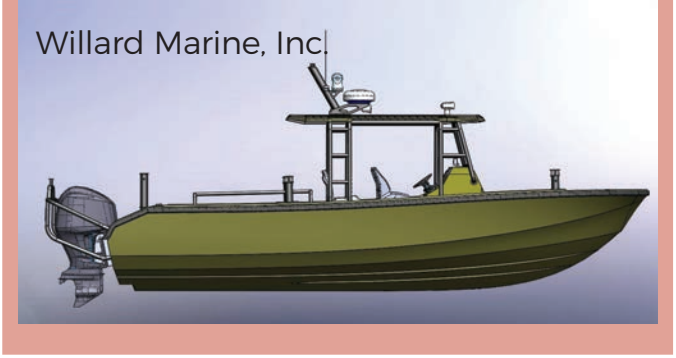
Built to order in the U.S., RIBCRAFT manufactures professional grade rigid inflatable boats (RIBs) from 15-41' for commercial and government markets, from military agencies and state and local governments to safety professionals, private industry and nonprofits. Every boat is built to industry recognized standards featuring RIBCRAFT's trademark deep V commercial grade fiberglass hull, full length lifting strakes, pronounced bow sheer, and a heavy duty multi-chambered tube. With more than 25 years' experience and thousands of deliveries worldwide, RIBCRAFT has developed a diversified client base and reputation as one of the most reliable and recognized brands in the RIB market.

RIBCRAFT has ongoing deliveries to first responders and safety professionals throughout the country including rescue RIBs, dive boats, and patrol and enforcement craft. Having recently completed a five-year contract providing the U.S. Navy with 7-meter RIBs, RIBCRAFT was awarded another five-year indefinite quantity contract worth up to $43 million to build up to 48 11-Meter Expeditionary Mine Counter Measure Boats for the U.S. Navy. Earlier this year it handed over two specialized 5.85 patrol boats to the Califor-

Shipbuilding & Repair


Silver Ships, Inc.


United States Marine Inc.


Willard Marine, Inc.

nia Department of Fish & Wildlife, who then awarded RIB-CRAFT a contract to supply and deliver shipboard RIBs.

Silver Ships, Inc.

Founded in 1985, Silver Ships is a family-owned premier builder of high-quality, cutting-edge aluminum workboats from 21 feet to 70 feet in length, used for fire rescue, law enforcement, military operations, marine surveying and other mission-specific applications. Its vessels are based on existing design types but are uniquely customized and outfitted for the needs of individual customers in the U.S. and overseas. On-site accredited naval architects and engineering staff design all boats within a three-dimensional modeling and hydrodynamic design software to ensure safety and operational usage in design, development, design evaluation and calculation throughout all stages of construction. From the initial design to the final send-off, every step of the boat building process is completed at Silver Ships' headquarters in Theodore, Ala. It also offers boat repairs and comprehensive refurbishment services for all makes and models of aluminum workboats.

Silver Ships was the first builder to manufacture RHIBs in the United States 30 years ago. Silver Ships' most popular and versatile vessel is the Ambar series, part of the RHIB family – its original "hybrid" air-and-foam collar provides excellent stability, making the vessels virtually unsinkable. Since 2001 when official record keeping began, Silver Ships has constructed approximately 1,100 boats with more than 100 currently in production and in queue this year.

United States Marine, Inc.

Headquartered in Gulfport, Miss., with a maintenance/repair facility in Chesapeake, Va., United States Marine Inc. is a fully integrated manufacturer of military, patrol and special warfare boats available in lengths from 21 feet to 90 feet. The company is capable of designing, building and testing all of its vessels in house. USMI has been delivering to U.S. Department of Defense and government/military customers from more than three decades with a track record that speaks for itself. "Quality is defined by the customer, and in the DoD world that is defined by a specification, scope of work and CDRLs [contract data requirements list]," says Barry Dreyfus Jr., CEO. "Our documented history of zero defects at the start and end of acceptance trials gives the government assurance we can deliver upon our obligations."

The shipbuilder, whose main Gulfport facility has a certified ISO 9001:2015 Quality Management System for the Design and Fabrication of Watercraft for Military

Applications, recently secured a $108 million, five-year, indefinite-delivery, indefinite-quantity contact to build Combatant Craft Assault vessels to support U.S. Special Operations Command missions globally. The CCA is also the fourth USMI-designed craft to be awarded the David Packard Excellence in Acquisition Award (including two from USSOCOM) over the last 25 years, Dreyfus says. The award recognizes organizations, groups and teams that have demonstrated exemplary innovation using best acquisition practices that achieve acquisition excellence in DoD.

In addition, USMMI's Naval Special Warfare Rigid Inflatable Boat, in production since 1998, continues to be a go-to craft for special forces around the world. The builder reports a significant backlog for the NSWRIB for the coming years.

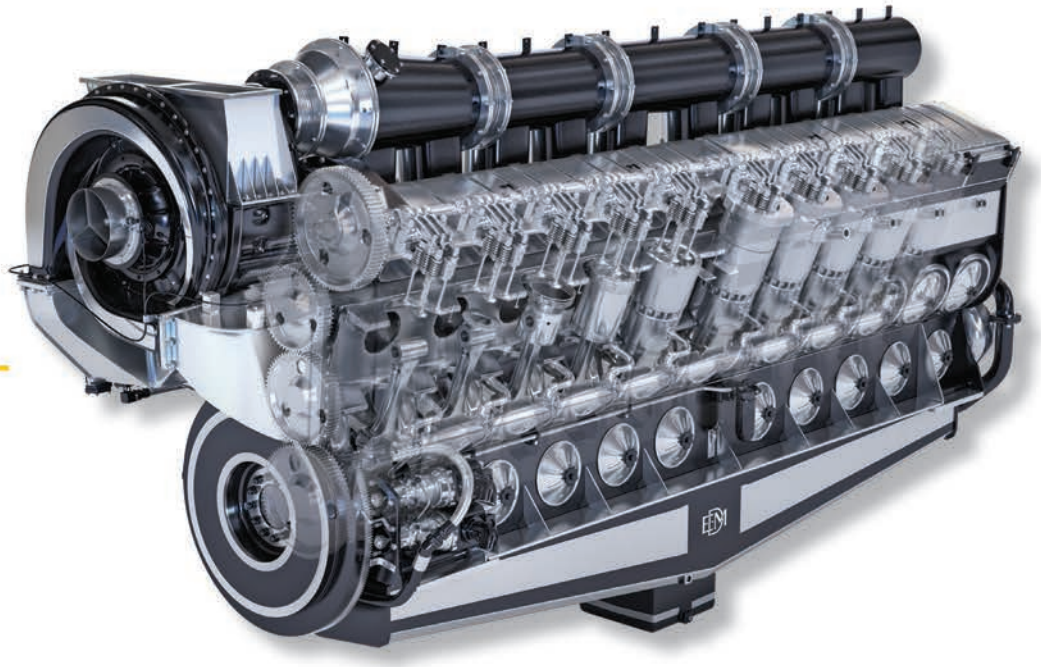
Willard Marine, Inc.

Willard Marine, Inc. has been in business since 1957 building military and commercial boats in Southern California. Over the years, WMI has transitioned from a recreational boat builder to exclusively build high-quality durable boats for military and commercial customers. It has been fulfilling U.S. Navy contracts for 7- and 11-meter RIBS since 1989. Looking beyond the U.S. Navy, WMI has a diversified customer base that includes several international allies and domestic first responders.

The Anaheim, Calif. boat builder is entering a new chapter, having recently been acquired by Future Mobility Solutions to join a family of boat builders including SeaLegs, Sillinger and Lancer. In collaboration with its sister companies, WMI has expanded its capabilities including autonomous and amphibious crafts for domestic and international markets.

Domestically, WMI has acquired the rights to builder the Crystaliner vessels, a model widely used by first responders in southern California which WMI has rebranded as the Surf Pro and Fire Pro. After this first step into the hardsided boat market, WMI is expanding its portfolio to include a hard-sided 27'-30' riverine assault boat. Introduced as the Assault Pro, this versatile craft is designed for close combat in shallow water or offshore interdiction.

Marine Systems, Inc.



The E 23 (IMO II-EPA T3) and E 23B (IMO III-EPA T4F) are available in 8, 12, 16 and 20 cylinder configurations with power ratings from (1675 hp) to (5500 hp).
*"Please consult MSI for specific application ratings"

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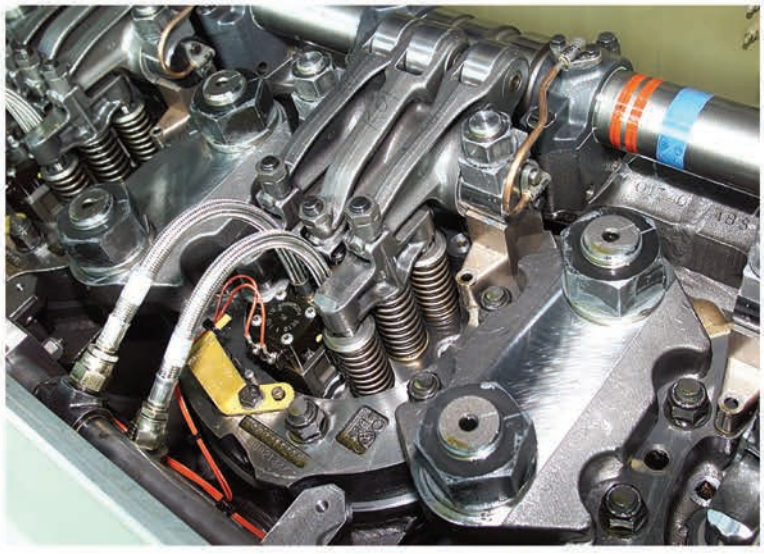

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Power & Propulsion

Caterpillar Marine

ABB

ABB is a technology leader that is driving the digital transformation of industries, operating in more than 100 countries with about 144,000 employees. The company has provided electric and hybrid systems on board vessels for more than 110 years. In fact, today, well over 1,300 ships employ ABB's electric system. In the shallow draft segment, ABB offers electrical, hybrid, propulsion and automation solutions for vessels such as towboats, dredges, tugs, marine construction and ferries.

In 2019, Niagara Falls tour operator Maid of the Mist decided to replace its fleet with two new ferries. It selected ABB Marine & Ports to provide zero-emission technology, making Maid of the Mist the very first fully electric ferry ever built in the U.S. Each of the vessels will be powered by a pair of battery packs with a total capacity of 316kWh, split evenly between two catamaran hulls. The ferries will charge between every trip while passengers disembark and board the vessels. Shoreside charging will only take seven minutes, allowing the batteries to power the electric propulsion motors capable of a total 400kW (563 HP) output.

Following the Maid of the Mist project, ABB was selected by American shipbuilding company Vigor Fab LLC as the hybrid-electric propulsion and energy storage system provider for the newest additions to the Washington State Ferry fleet, setting the largest U.S. ferry system on course for zero-emission operations. ABB is driving toward the next generation of ships, which it believes will be electric, digital and connected, as the industry moves toward new energy sources and autonomous ship operations. And this future is slowly becoming a reality in the United States.

BAE Systems

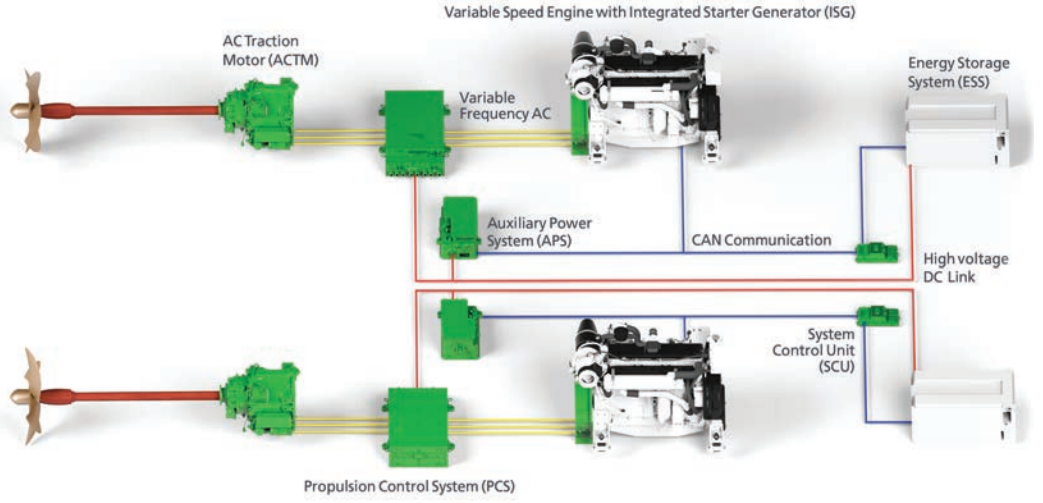
More than 20 years ago, BAE Systems set forth on a mission to help its customers get to zero emissions. Fast forward to today, and the firm ranks among leaders in low- and zero-emission solutions for vehicles, vessels and ports.

The need for electric vehicles is picking up speed. Transportation accounts for a quarter of the world's harmful air emissions, and that percentage is growing. This has cities around the world jumping into the fast lane to acquire electric vehicles for land, water and air applications. Even with the demand, in many cases it takes time to get them into service due to the infrastructure needs and technical challenges. As a pioneer in electric propulsion with over 20 years of experience and 12,000 systems in operation

Power & Propulsion


ABB

BAE Systems



around the globe, BAE Systems is helping to solve these problems and get to a zero emission future.

The company offers HybriGen power and propulsion products configured as fuel cell electric, battery electric and hybrid electric drive systems for ferries, wind farm support vessels, inland towing, harbor craft, research vessels and marine ports. BAE Systems manufactures and provides complete solutions that can include electric propulsion motors, power generating motors, power management hardware, top level controls, intuitive interface displays and energy storage systems. Hybrid and electric systems delivered and packaged by BAE Systems are fully integrated and are designed to utilize power in the most efficient way possible. The systems are automated and allow the driver or captain to focus completely on the safe operation of the vehicle or vessel. The intuitive systems and proprietary software provide CAN based control that allows power to be sourced from any of the applicable power sources such as lithium-ion batteries, hydrogen fuel cells, or diesel generators. The resulting efficiency of the system delivers on ROI while helping owners and operators get to zero emissions.

BAE Systems' electric drive vessels can be found across the nation, moving passengers on the West Coast in San Francisco and Seattle, and transporting cargo on the East Coast between New York and Connecticut.

Caterpillar Marine

Caterpillar Marine, with headquarters in Hamburg, Germany, groups all the marketing and service activities for Cat and MaK marine diesel, dual fuel and gas power systems within Caterpillar Inc. The organization provides power solutions in the medium- and high-speed segments with outputs from 93 to 16,800 kW in main propulsion and 10 to 16,100 ekW in marine generator sets. The Caterpillar line includes Cat and MaK marine engines, high performance propulsion engines, marine generator sets and auxiliary power, for tugs and container vessels to yachts and sport fishers. Caterpillar Marine works with 60 Cat dealers and 20 MaK & EMD dealers across more than 2,100 locations globally.

In 2019, Caterpillar Marine supplied Cat 3516E Tier 4 Final marine propulsion engines for Bisso Towboat Co. Inc.'s new tug, Andrew S. The Andrew S. marked Bisso's eighth tractor tug apart of its fleet. For the new tug, Bisso wanted an engine that provided increased bollard pull, lower emissions and met the Subchapter M regulation requirements. After visiting Cat-powered tugboats in both New York and San Francisco, Bisso decided to select the Cat Marine solution. The company was also impressed by the complete lack

Power & Propulsion


Cox Powertrain

of smoke generated by Cat Tier 4 Final engines.

Continual advancements in electronic engine technology mean Cat marine engines satisfy global emissions regulations and still deliver power and performance. Cat marine generator sets are built to provide dependable, efficient service under extreme conditions while delivering more power, greater efficiency and enhanced monitoring. The manufacturer offers more than 70 marine engine Tier 4 final products.

Cummins Inc.

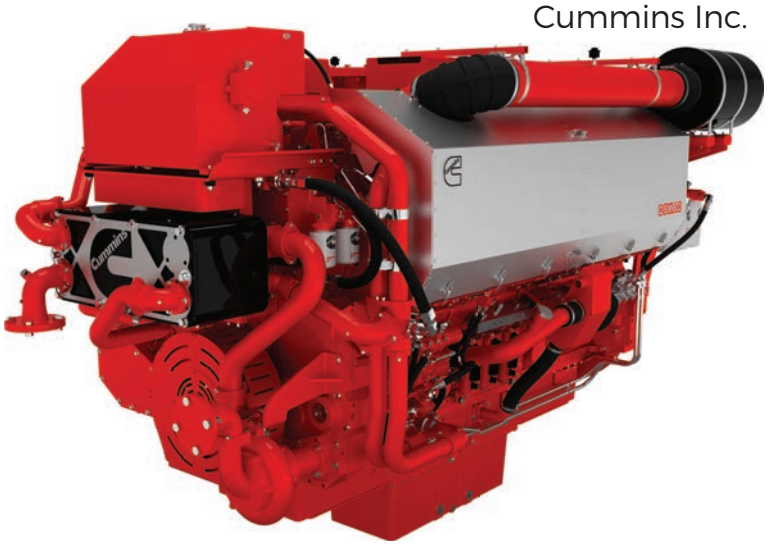
Headquartered in Columbus, Ind. since its founding in 1919, Cummins Inc. is a corporation of complementary business segments that design, manufacture, distribute and service a broad portfolio of power solutions backed by a support network that spans more than 190 countries. From its first marine diesel engine in 1919, Cummins has evolved to offer a complete line of variable speed propulsion, generator and auxiliary power solutions, from 4 to 3132 kW, designed specifically for commercial and government marine applications, from inland to offshore. The company's offerings range from diesel, natural gas, electric and hybrid powertrains and powertrain-related components including filtration, aftertreatment, turbochargers, fuel systems, controls systems, air handling systems, automated transmissions, electric power generation systems, batteries, electrified power systems, hydrogen generation and fuel cell products.

Eddie Brown, Cummins' Director of Business Development, Marine, says the company is seeing a solid level of interest and activity in the commercial marine space. "In the commercial transport sector, where they have operated throughout the pandemic, we are still seeing a need for new builds as well as repowers," he says. "Our engines are known for their durability and during this time, as always, we are working with customers to extend the life of their engines and manage operating costs."

Brown also sees opportunities on the horizon. "As Tier 4 implementation increases, we anticipate seeing more opportunities for our solutions in U.S. vessels," he says. "We are also seeing some movement around windfarms. While not as common in the U.S. yet, conversations have begun around how that industry could take shape. Cummins is working with operators to understand their needs and will look to leverage our extensive experience in the area of offshore support and services as we are sure there will be some parallels in this developing market."

Meanwhile, Cummins marine continues to innovate. Its IMO III line, which was announced last year, is fully released and the company is taking orders for its QSK60 and QSK38 Tier 4 solutions. To date, across all industrial markets, Cummins Tier 4 solutions have accumulated more than 10 million hours in the field. Also, there is a forthcoming genset package in the 99kW range that will pair well with Cummins' propulsion solutions that are used on inland waterways vessels. "We realize that power is just part of what our operators need to run a successful fleet, which is why we will be releasing a new connected vessel solution later this year," Brown said.

Cummins Inc.



Cox Powertrain

Cox Powertrain is a British design and engineering innovator of diesel engines developed for marine applications globally. Led by ex-Cosworth CEO, Tim Routsis, whose background lies in engine development in global automotive, aerospace and marine markets, the company's mission was to deliver a completely new concept in diesel engines that has the potential to revolutionize the marine market. With a strong pedigree in Formula 1 racing and premium automotive design, Cox's team of engineers has decades of experience in combustion engines and understands the many challenges customers face. Cox's first diesel outboard performance engine, the CXO300, delivers the same performance and packaging of a gasoline outboard but with the fuel efficiency and reliability of a diesel inboard.

Cox Powertrain commenced serial production of the CXO300 in Shoreham, U.K. at the end of May, with plans to reach full production of 38 outboard per week by August 2020. The engine recently achieved EPA Tier 3 approval, giving Cox Powertrain the green light to start shipping its production outboards to the U.S. Cox is supported by a worldwide distributor network made up of 35 distributors covering 100 countries.

Power & Propulsion

HS Marine Propulsion

HS Marine Propulsion provides propulsion engineering and propellers for vessels equipped with conventional shaft lines and controllable pitch systems. The firm has a full line of standard propeller designs as well as the capability to engineer and manufacture custom propellers in bronze, nickel-aluminum-brone and stainless steel up to 160" in diameter for any conventional shaft line vessel. In addition to its manufactured products, the company provides application sizing, CFD and FEA analysis.

For 45 years, Hung Shen has manufactured propellers for leading commercial and pleasure craft vessel builders. Distributed in the US by Rolls-Royce until 2010, Hung Shen has been a fixture in the American workboat market. In 2010 HS Marine Propulsion was formed to carry out the engineering, sales and marketing functions for Hung Shen in the U.S. to satisfy the growing demand for its engineered products and services. HS Marine Propulsion celebrates its 10th year in business in 2020.

Konrad Marine

Konrad Marine is a privately held entity, founded by husband and wife Ken and Kathy Konrad in 1991, that has engineered and manufactured high performance propulsion systems for nearly 30 years. In the beginning, as the demand for higher diesel horsepower applications became relevant, Konrad Marine launched the first stern drive within the 500 series line, the single propeller 520 drive. The Konrad 520 drive served well for commercial applications that seek more annual hour usage and longer maintenance intervals. These commercial fishing, military patrol boat and water taxi markets were very pleased. Fast forward to 2015 Konrad Marine has now developed the 600 and 600B series drives which can now handle even larger horsepower and offer dual propeller options. The 600 and 600B series units both offer two different dual propeller options. The 660/660B series units are geared towards vessels seeking higher speeds, such as patrol vessels. The 680/680B series units will be best suited for application pushing weights upwards of 18,500 lbs. and will utilize our largest propellers we have to offer. Konrad Ma-

Power & Propulsion

Konrad Marine

Marine Jet Power

rine continues to deliver stern drive technology to a variety of maritime markets throughout the world, who are seeking a commercially rated propulsion system.

The Konrad 600B stern drive series is the newest product line Konrad Marine has to offer. The standout model offered has been the Konrad 680B stern drives. The Konrad 680B utilizes the newly designed transom assembly that now has integrated trim and steering cylinders, making for fast and easy installation. This drive is capable of carrying weight capacities up to 8.4 metric tons (over 18,500 lbs.) per drive and operates with extreme efficiency in the 40-knot area (46 mph). These drives are commonly used in a variety of markets such as military, commercial fishing, medium duty, and recreational platforms.

Power & Propulsion

OmniThruster

Marine Jet Power

Engineered and built in Sweden, Marine Jet Power's stainless steel, mixed-flow and aluminum, axial-flow waterjets are used in many diverse applications, from fast military craft and passenger vessels to luxury yachts and workboats worldwide – with more than 100 million running hours strong.

The company recently launched its next generation of waterjet propulsion, the X Series, designed for high-speed applications including, military, passenger, recreational and commercial vessels. Built from duplex stainless steel, the unit is stronger, lighter, more efficient and more corrosion resistant, providing users with more power in a lighter unit that burns less fuel and extends range. It also features a redesigned cast aluminum reversing bucket and optimized steering nozzle.

Of note, MJP has been selected by Vigor as the propulsion provider for the U.S. Army's Maneuver Support Vessel (Light), MSV(L), project. The U.S. Army awarded the MSV(L) contract to Vigor in late 2017. The new generation of landing craft for the U.S. Army will feature triple drive MJP 750 DRB waterjets. In total, MJP will deliver 45 shipsets over the next 10 years. Selected for its superior shallow draft maneuvering capabilities, the 750 DRB waterjets are constructed from duplex stainless steel offering the latest advancements in MJP's proprietary mixed flow technology. Featuring an inboard hydraulic system and an integrated electronic control system, the selected propulsion package has been optimized to fit the needs of the U.S. Army.

OmniThruster Inc.

For over 40 years OmniThruster has been a developer of waterjet bow/stern thrusters and maneuvering systems for maneuverability and auxiliary propulsion, specializing in waterjet thrusters that operate efficiently in shallow draft conditions. Its HT Series in particular are capable of full power operation with only 3' of draft. The HT Series (200-600 HP) was developed to provide small vessels maneuvering and auxiliary propulsion capabilities. The unique design features a compact, conical chamber, which generates a helical flow pattern resulting in efficient energy conversion. This Heliconic approach effectively decreases submergence requirements for full power operation, appealing for shallow draft vessels. For larger vessels, the JT Series (700-2250 HP) is a scientifically designed and patented system for maneuvering and auxiliary propulsion. The JT utilizes a traditional mixed-flow impeller that draws water in through an intake, at the bottom of the hull, and then ejects it through the steering valve assembly.

OXE Marine AB

The OXE Diesel is designed and built for commercial users, with an emphasis on endurance, reliability, power and control. The patented technology of the commercial diesel outboard provides a robust drive unit that effectively transfers high torque diesel power from the engine to the propeller. Combined with a modular layout, easily accessible service points, closed coolant system, interchangeable gear ratios that allow the user to choose between high torque or high speed

and proven diesel technology from the automotive industry, the OXE Diesel is designed and built for commercial use.

OXE Marine AB commenced production of its new model, the OXE300, in May. After passing rigorous quality tests, the first units are now ready to be shipped to customers. The production of OXE300 will ramp up and move to new production facility in July. "The OXE Diesel is designed to be a vital part of marine operations that will help reduce cost and minimize the impact on the environment. The OXE300 is a statement of this commitment, a result of everything we have learned up to this point," says Per Wigren CTO, OXE Marine AB.

OXE Marine AB

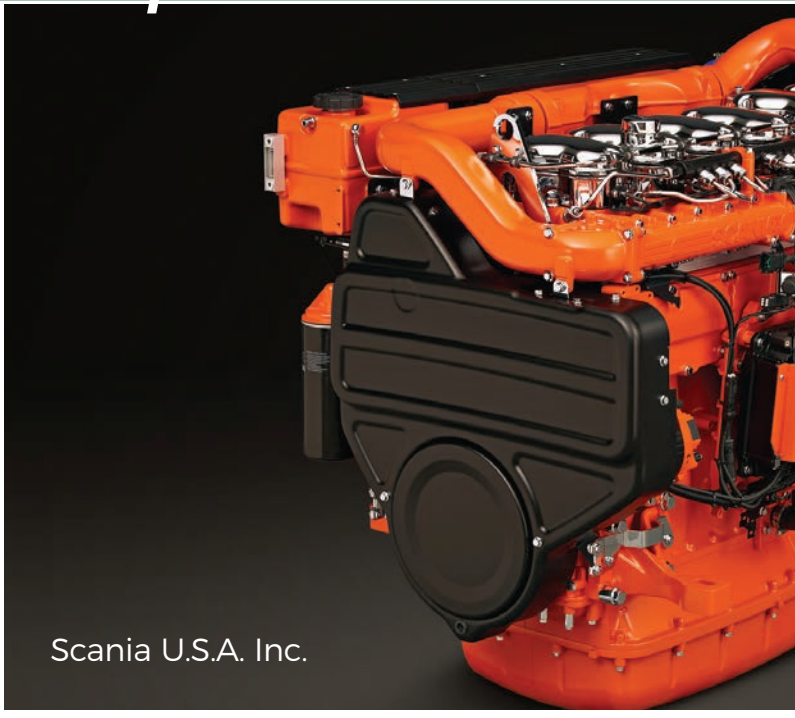
Scania USA Inc.

Scania U.S.A. Inc. is a subsidiary of Scania A.B., one of the world's leading manufacturers of marine and industrial engines as well as trucks and buses. Founded in 1891, Scania operates in more than 100 countries and employs some 51,000 people. The Scania marine platform is comprised of the powerful DI16 liter V8 and the robust DI13 liter inline engines. Scania also offers a robust, IMO Tier II, DI09 liter engine for continuous and intermittent applications.

Scania's products are suited for a range of commercial workboat and passenger vessel applications. In particular, the company has seen continued success serving vessels in salmon and lobster fisheries in the U.S. and Canada,

Power & Propulsion

SCHOTTEL Inc



Scania U.S.A. Inc.

recording dozens of recent deliveries for new vessels and repowers in these markets.

Scania is driving the shift toward a sustainable transport system, having developed an in-house hybrid and fully electric power systems concept designed to significantly reduce fuel consumption while lowering operational costs, noise and emissions. The system will offer potential CO2 emission reduction of up to 92%. Scania's first marine electrified power systems concept with a hybrid application is now ferrying commuters on behalf of Stockholm Transport. The hybrid electric system combines an e-machine with a combustion engine – either together or as stand-alone power sources.

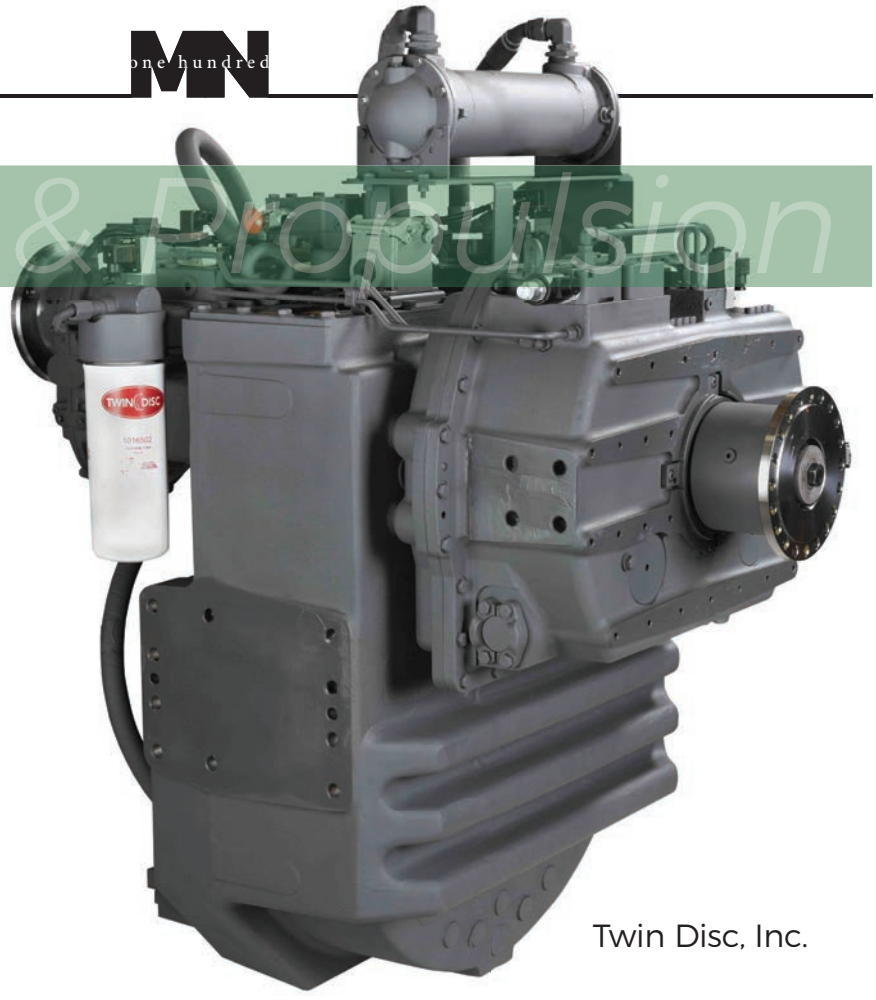
Scania is committed to achieving the Paris agreement goals of limiting global warming to 1.5°C above pre-industrial levels. Scania has pledged to cut CO2 emissions from its own operations by 50% by 2025, and reduce emissions from its products by 20% during the same period.

SCHOTTEL

SCHOTTEL Inc is a subsidiary of the global sales and service network from the German SCHOTTEL Group. Thanks to a decades-long presence in the U.S. and generous space and repair facilities in Houma, La., SCHOTTEL Inc is regarded as a propulsion expert for the U.S. and Canadian maritime markets, currently supporting more than 500 vessels in North America with parts and service.

The SCHOTTEL Group is one of the world's leading manufacturers of steerable propulsion systems for ships and offshore applications. Founded in 1921, the company has been developing and manufacturing azimuth propulsion and complete propulsion systems with power ratings of up to 30 MW for vessels of all sizes and types. The company has been developing and manufacturing azimuth propulsion and complete propulsion systems with power ratings of up to 30 MW for vessels of all sizes and types, for almost 70 years. Around 100 sales and service locations worldwide ensure customer proximity.

Among recent highlights for SCHOTTEL are deliveries for Crowley's new ATB Aveogan, working for Crowley Fuels LLC in Alaska; two hybrid ferries for BC Ferries in Victoria; McAllister Towing's newest tug Eileen McAllister built at Washburn & Doughty; and the tug Gemini for G&H Towing. Schottel has also secured recent contracts



Twin Disc, Inc.

to equip four tugs for the Royal Canadian Navy being built at Industries Ocean, Inc., as well as two new tugs for Seabulk Towing.

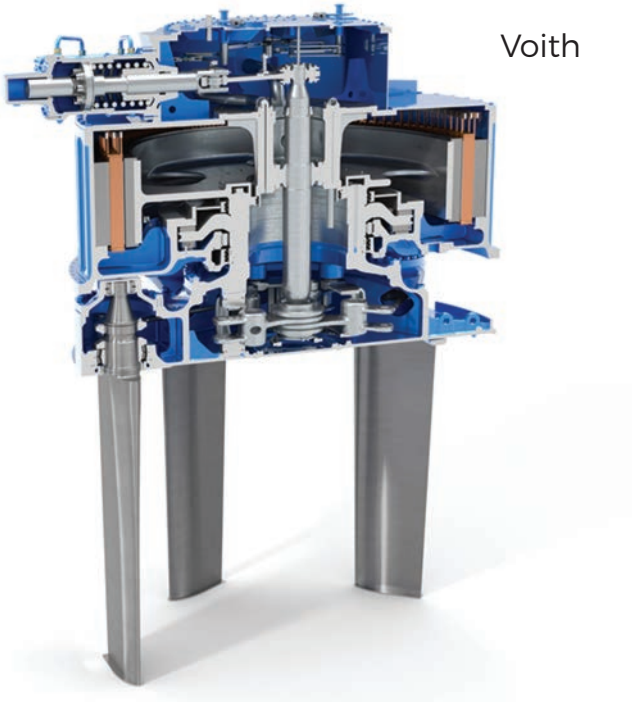
Twin Disc, Inc.

Twin Disc, Inc. designs, manufactures and sells marine and heavy-duty off-highway power transmission equipment. Products offered include marine transmissions, azimuth drives, surface drives, propellers and boat management systems, as well as power-shift transmissions, hydraulic torque converters, power take-offs, industrial clutches and control systems. The company sells its products to customers primarily in the pleasure craft, commercial and military marine markets, as well as in the energy and natural resources, government and industrial markets. The company's worldwide sales to both domestic and foreign customers are transacted through a direct sales force and a distributor network.

The trend toward hybrid marine propulsion systems continues to accelerate, particularly in Europe, as suppliers and operators see increasing benefits: reduced emissions for regulatory compliance, and fuel and maintenance savings for faster return on investment. Clearly, Twin Disc sees significant opportunity in this trend. Its acquisition of Veth Propulsion includes Veth's industry-leading technology and an industry-wide reputation for innovation and reliability. With expanded engineering capabilities, we're ready to meet growing demand for electric or electric and diesel-electric propulsion systems. Our flexible solutions include serial hybrid propulsion, or full electric, and parallel hybrid, toggling between electric and diesel power to turn the shaft. Projects are already in the works in North America, Europe, Asia and Australia, with more on the horizon—shaping our marine product line as well as the future.

Twin Disc hybrid propulsion systems combine electric motors and diesel engines, enabling switching between the two or using both for a power boost. Electric operation, practical at low power and speed, cuts fuel use and emissions. Hybrid uses include vessels with long waits between jobs (tugboats, pilot boats); those regularly operating at slow speeds (patrol boats, survey vessels); and those whose low full-power requirements let them rely on less costly diesel plus power boosts.

Power & Propulsion



Voith

Volvo Penta

Voith

With more than 90 years of experience, Voith provides propulsion systems tailored to a wide range of applications including ferries and passenger ships, offshore oil and gas, offshore wind, inland waterway vessels, tug boats and yachts, and others.

In June, Voith unveiled its innovative electric Voith Schneider Propeller (eVSP). With the eVSP, Voith is making an important step towards the electrification of the drive train in marine applications to facilitate more eco-friendly shipping. The integrated electric motor enables an even more environmentally friendly and resource-saving operation. The complete omission of gears reduces noise to a minimum and frees up critical space on the ship. In addition, the eVSP offers the same advantages as a conventional Voith Schneider Propeller which is the only propeller in the world that can significantly reduce the rolling motion of ships and thus significantly increase maneuverability, comfort and safety on board. Voith will deliver eight eVSPs to the Norwegian shipping company Østensjø, thus enabling resource-saving and energy-efficient operation of the four offshore wind supply vessels.

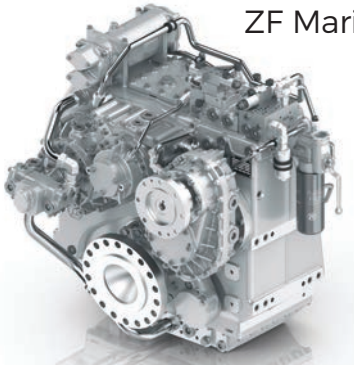
Volvo Penta

With a 100+ year tradition of innovation, engineering excellence and worldwide customer support, Volvo Penta offers a broad product line of engines that reduce fuel consumption, meet emission standards, extend service life and minimize downtime.

Volvo Penta, with approximately 3,500 dealers in over 130 countries, is a global manufacturer of engines and compete power systems for leisure marine, commercial marine and industrial applications. The engine range comprises diesel and gasoline engines with power outputs from 10 to 1,000 hp. Volvo Penta engines are type approved by major classification societies and comply with all applicable national and international emission regulations. Volvo Penta is part of the Volvo Group, one of the world's leading manufacturers of heavy trucks, buses and construction equipment. Volvo Penta of the Americas, based in Virginia, is responsible for North America, South America, Central America and the Caribbean.

Volvo Penta's extensive product line for the U.S. commercial and SOLAS marine market includes 3-16 liter Tier 3 diesel engines in inboard, sterndrive and IPS configurations, as well as gensets and auxiliary engines for fuel pumps and other applications. Key market segments for Volvo Penta globally include Coast Guard and patrol boats, pilot boats, short-sea and river transport, crew and supply vessels, research vessels, passenger ferries and sightseeing vessels, workboats, tugs and towboats, self-propelled and articulated barges, commercial fishing boats and wind farm vessels. Volvo Penta's marine diesel engines provide higher

Power & Propulsion



ZF Marine

torque out of the hole, superior performance at all rpm ranges and the lowest costs of ownership with better fuel efficiency, longer service life and less downtime on the job.

Significant projects undertaken or completed in the Americas during the past 12 months include Gladding Hearn-built pilot boats for Virginia Pilots and Maryland Pilots, a new ATB built by Greenbrier Gunderson for OSG, a fireboat built by Metal Craft and Orca Marine catamaran research vessel built by Armstrong Marine. Volvo Penta is also continuing to deliver sterndrives under an IDIQ contract for 46 US Coast Guard CBL RIBs.

In addition to newbuilds, Volvo Penta's retrofit business is strong, especially in the commercial fisheries of New England, Canada, the Gulf Coast and Central America. The company also strengthened its customer support with the appointment of a new Power Center in Mexico.

ZF Marine

ZF Marine is a well-known provider of marine propulsion components and complete systems for all types of commercial and fast craft. The company provides transmissions (reversing, non-reversing and hybrid), propellers, thrusters, steering systems and electronic control systems for a comprehensive range of applications with a power range from 10 to 12,000 kilowatts.

The ZF product range is continuously developed and adjusted to meet market requirements. Earlier this year ZF launched its first hybrid transmission that can be installed in the ship in both V (V drive) and A (down angle) positions. Thanks to the wide range of transmission ratios and space-saving design, the ZF 5200 A/V PTI is suited for many different types of marine vessels.

The company is also preparing for the next generation of marine propulsion systems with intelligent connectivity solutions that will further improve productivity and efficiency for different ship models. As part of this effort, ZF combines mechanics, electronics and digital technologies in order to shorten and prevent down time through predictive maintenance planning.

Credit: Equinor

From Oil to Offshore Wind, *Follow the Leaders*

By Barry Parker

At a time that "demand destruction" impacts have rippled throughout all parts of the energy business, offshore wind capacity continues to grow. In the U.S., as states mandate clean energy targets for the coming years, the sector will play a key role.

Ørsted

The Europeans have led the offshore wind charge, with the Danish project developer Ørsted bringing experience back to the early 1990s, long before "green energy" was on the radar. Headquartered in Denmark, its footprint extends across continents. Its financial profile shows its overall heft, with its Q1 2020 EBITDA (a measure of cash flow) at DK 6.8 billion (equivalent to slightly above US$1 billion), of which windfarms, both onshore and offshore, made up DK 6.5 billion. The consultants McKinsey, in an article on the company, wrote, "Ørsted invested aggressively in offshore wind and phased out coal. By 2019, it had become the world's largest producer of offshore-wind energy. The company also raised its renewable-generation share to 86%—hitting its [power generation from renewables] target 21 years ahead of schedule."

By early 2020, it controlled 6.8 gW of installed offshore wind capacity. This includes its project Hornsea One (in the North Sea, owned jointly with Copenhagen Infrastruc-

ture Partners), 1.2 gW. A follow-on project, Hornsea Two (1.4 gW) is expected to come online in mid-2022. Though these mega projects are in European waters, the U.S. figures prominently in this green energy behemoth's plans. Ørsted, in conjunction with U.S. partners, has stakes in a trio of pending east coast projects- South Fork (130MW), Revolution Wind (704MW), Sunrise Wind (880MW), and- in the mid-Atlantic, Ocean Wind (1.1 gW) and Skipjack (120MW). Most recently, Coastal Virginia Offshore Wind- a small demonstration project coming online later this year, sees Ørsted teaming up with Dominion Energy, in what is expected to be the precursor to a massive wind farm off the coast from Virginia Beach.

Equinor

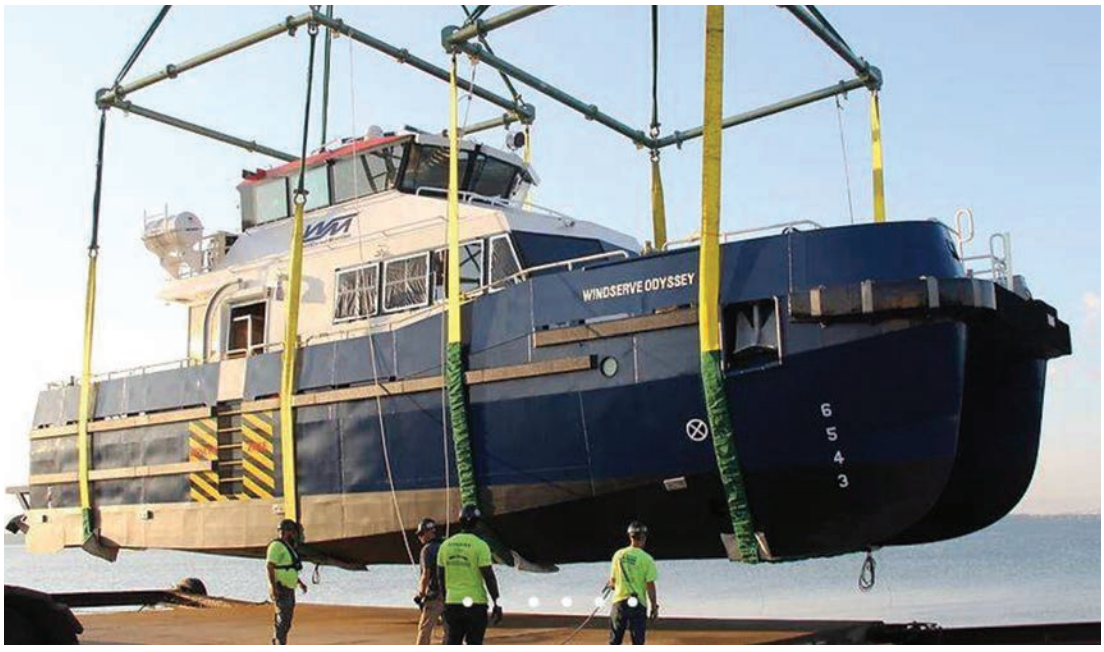
The European experience in offshore energy can be seen in the Norwegian headquartered Equinor (formerly Statoil), which has been morphing its dominance in North Sea fossil fuels into a leading presence in wind power. Its late 2018 name change reflected its transitioning from a leader in the oil and gas realm, into renewables. In late 2019, it won a contract to develop what is slated to be the world's largest windfarm, at 3.6 gW, in the Dogger Bank field east of the U.K. Its present portfolio includes Hywind Scotland, a 30 MW array of floating turbines (which will be become more prevalent as windfarms move to deeper water), mirroring oil's pivot from jack-ups to floaters.

Equinor's plans also see a movement across the Atlantic to the U.S. A major victory was achieved in 2019 when its bid to develop a windfarm in the New York Bight was accepted, setting the stage for the company's first windfarm outside of Europe. Its 816 MW Empire Wind project, anticipated to come online as soon as late 2024, fits into its "…ambition of building an offshore wind core area on the U.S. East Coast." The developer takes a view that extends well beyond turbines and the power grid; it also will be seeking to work closely with the onshore port infrastructure. It explains, "More broadly, Equinor is committed to developing the nation's first offshore wind supply chain to support the construction, installation and operation of offshore wind projects…Equinor will also invest over $60 million in port upgrades in New York that will support future offshore wind projects and further strengthen the state's position as the U.S. hub for offshore wind." In late July, the State of New York announced what it termed "The largest combined solicitations for renewable energy ever", which will include a substantial component for investing in port infrastructure.

Credit: Vard

Reinauer's WindServe Marine

An important theme among the companies described here is that of established businesses serving offshore oil, and transportation, transitioning into the newly emerging offshore wind segment. Reinauer Marine, a long-time provider of oil products transport along the U.S. East Coast, made a strategic acquisition of the Senesco shipyard, a builder of tugs and barges, in Rhode Island back in 2006. Fast forward a dozen years later, the Block Island Wind project (at 30 MW - the first functioning windfarm in U.S. waters, now in the Ørsted portfolio) is now online, and Rhode Island is well positioned to become a hub for numerous windfarms now gaining approvals and on paths to Final Investment Decisions. WindServe Marine was established by Reinauer to support the burgeoning projects. WindServe's shipyard facility in Quonset Point, on Narragansett Bay, played a role in the construction of Block Island Wind, where parts were transported out to the construction site. Activities included outfitting the feeder barge with dynamic positioning system and cable reel, fabricating and outfitting a jack-up vessel with blade transfer outriggers, and handling various quayside storage and lifting operations. With future projects along the East Coast in mind, WindServe Marine is building two crew transport vessels designed by BMT, one in North Carolina (to serve the offshore Virginia project) and another at Senesco, to transport personnel serving Revolution Wind and other New England projects. The latter crew boat, WindServe Odyssey, was undergoing sea trials in late July.



Credit: WindServe Marine

Vard

European expertise will be vital for the U.S. However, as activity ramps up on the U.S. Outer Continental Shelf, Jones Act compliant service vessels will be needed. Vard, through its engineering and naval architectural arm based in British Columbia (and a part of the Fincantieri Group) won Approval in Principle from the American Bureau of Shipping, in late 2019, for a service vessel that would be compatible with Jones Act requirements. In Vard's announcement, it noted that: "We already have experience supporting yards worldwide to construct our offshore vessel designs, so it is with great enthusiasm that we now start on this exciting journey with ABS in the U.S."

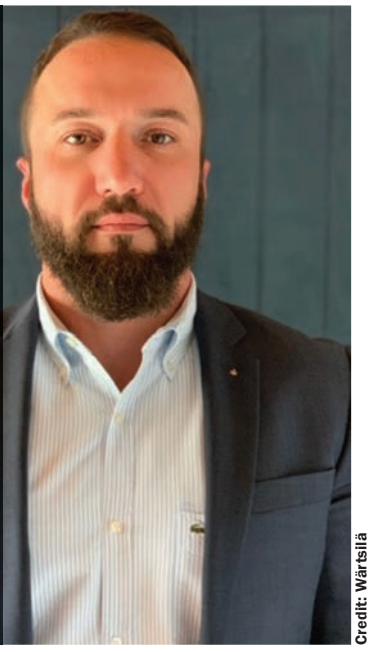
The vessel design is a bespoke version of Vard's 4 07 service operation vessel (SOV), with the standard design described as "a suitable vessel for small wind parks in harsher environment. Despite the cost effective size, the operability is close to that of most larger SOVs. This is because of the large centermounted gangway, good motion characteristics and DP capability." Vard's Offshore renewables team, based in Norway, explains that it is "offering vessel solutions for the entire offshore renewables value chain, including offshore wind, tidal and wave power. This includes wind farm support vessels with high focus on efficient logistics, crew and technician comfort, and high operability." Vard designed vessels include platform supply vessels, anchor handlers and subsea construction vessels. Its offshore service vessels include the Bravante series (built at Eastern Shipbuilding, in Florida) and its multipurpose vessels (built at the same yard) include a pair built for Harvey Marine. Its designs are also found in Hornbeck's OSV fleet.

Wärtsilä

This Helsinki-based solutions provider for the marine and energy segments has been at the forefront of recent developments in optimized vessel performance, and has been taking a long term view on developments in the burgeoning wind power sector. In April, 2020, Wärtsilä explained in a presentation, "The opportunities for SOV and large installation vessels fall into two categories: retrofitting and new builds. Much of the opportunity for conversions/retrofit projects is in the U.S. market, as strong growth continues there." When it comes to newbuilds, Wärtsilä has a design for SOVs, which it markets in conjunction with its packages which integrate the bridge, engine room and other increasingly complex systems.

As projects move into deeper waters, and heavier turbines become the norm, the nature of vessel demand is likely tilted towards newbuilds, with Wärtsilä saying, "In the U.S. offshore wind farm market, the operators are preparing for the possibility of building type-specific SOVs that can accommodate the usually land-based wind turbine technicians while conducting the maintenance of the offshore wind farms," says Blake Jackson, a U.S.-based sales manager for Wärtsilä Marine Business. In further enumerating the "must have" features of such craft, he said, "These ves-

"In the U.S. offshore wind farm market, the operators are preparing for the possibility of building type-specific SOVs that can accommodate the usually land-based wind turbine technicians while conducting the maintenance of the offshore wind farms."
– Blake Jackson, a U.S.-based sales manager for Wärtsilä Marine Business



Credit: Wärtsilä

sels have an elevated requirement for crew comfort, station keeping, and roll reduction," and talked about their need to be "highly integrated with self-compensating gangways interfaced into the dynamic positioning and alarm and monitoring systems for safe walk to workability."

Decisions to build long-lived assets require forward thinking on vessels' energy consumption unnecessary previously. Another Wärtsilä executive, Arthur Boogaard, general manager, Business Sales, Wärtsilä Marine Business, pointed to the development of hydrogen fuels, hybrid batteries and other fuel sources that might propel SOVs working offshore. He said, "We're already preparing customers for these fuels, and customers are responding by planning their vessels [for this] future accordingly."

Aqueos Corporation

Looking further down the coast, as development shifts into the mid-Atlantic states, a name less familiar to readers is worth mentioning. Aqueos Corporation, with an office in southern Louisiana where it is well known for subsea work in the oil and construction sectors, completed a diving contract for support of the Coastal Virginia Offshore Wind project. While this project (to be operational by late 2020) is starting small, with two Siemens turbines of 6 MW each, the participation of Aqueos provides a tangible example of offshore oil expertise transitioning to offshore wind. Indeed, in its announcement of its work offshore Virginia, a company executive explained, "We capitalized on our years of experience in the oilfields of the Gulf of Mexico."

Credit: Callan Marine

U.S. Dredgers Pile on New Business – and Equipment

By Eric Haun

The U.S. dredging industry is as strong today as it has been in years, with good market opportunities for dredging contractors from coast to coast driving booming business for dredge builders and equipment suppliers.

"The U.S. dredging market remains strong. Congress clearly recognizes the critical role that waterborne commerce plays in our economy and continues to support dredging projects of all types—routine maintenance and operations, deepening, and sediment reuse and shore protection projects—at increasing levels. That commitment is also recognized in the continued increases in year-over-year spending from the Harbor Maintenance Trust Fund for its intended purpose, dredging operations," said Harry Stewart, Chief Operating Officer of the San Rafael, Calif.-based **Dutra Group**. "We anticipate that the current port capital projects will produce an increase in routine O&M dredging for those waterways, and are also tracking inevitable upward trends in storm recovery operations, and shoreline protection related to climate change and sea level rise."

Stewart said Dutra's nationwide fleet of hopper dredges, clamshell derrick dredges and oceangoing split hull dump scows have been kept busy, performing dredging operations on the Atlantic, Gulf and Pacific coasts. Solid demand has led the company and other dredging contractors to bring new equipment into the U.S. fleet. "The current health of the dredging market is encouraging our industry to recapitalize assets at a once-in-a-generation pace," Stewart said.

The Dutra Group recently launched a new split bottom dump scow currently performing work in the Atlantic market, and it has also recently confirmed construction of another new 6000cy split lull bottom dump scow for delivering in 2021, Stewart said. "We constantly evaluate the market and demand for new dredge equipment, and as in the past, are quick to respond when the needs arise," he explained.

Another firm adding equipment is Galveston, Texas-

Credit: Dutra Group

based **Callan Marine**, who earlier this year took delivery of its newest and largest cutterhead suction dredge (CSD) General MacArthur, built by C&C Marine and Repair. "We saw a market that could use a large sophisticated dredge, so we designed the MacArthur, which is 100% diesel electric, 24,000 hp, and loaded with automation making her a difference-maker in the large dredge market, specifically for capital work, beach/marsh renourishment, and offshore borrow area situations."

The 32-inch dredge has been hard at work since entering service this Spring. In April, Callan was awarded a $97.9 million dredging contract from the U.S. Army Corps of Engineers (USACE) to complete the second phase of the four phase Corpus Christi Ship Channel Improvement Project. The project increases the channel depth from -47 feet Mean Lower Low Water (MLLW) to -54 feet MLLW, and widens the channel to 530 feet with an additional 400 feet of barge shelves.

General MacArthur is only several months old, and already Callan announced it has a new dredge under construction. The 28-inch CSD General Bradley, is currently being built by Hagler Systems at the Halimar Shipyard in Morgan City, La. It will be 341 feet long with a 6.6-foot draft. The diesel-electric driven General Bradley will be equipped with three ABC 12DZC engines that supply 9,260 horsepower combined. It will also feature advanced production automation and monitoring systems.

McGuire said the expansion of Callan's fleet is a direct response to increased opportunities and the direction of the dredging market. "The market is extremely busy and we are fortunate to have clients that are willing to make these investments to grow infrastructure," he said. "Callan Marine has a very healthy backlog at this time, and we feel there will be a great dredging market for years to come."

Callan's CSD orders are part of a wider market trend, according to trade group the Dredging Contractors of America, who said seven major CSDs have been added to the market since 2012.

In addition to Callan's General Bradley, another CSD has been ordered by **Mike Hooks, LLC**, of Westlake, La., who has signed a deal with Mobile, Ala. fabricator Mobile Pulley Works (MPW) to design and build a new 27-inch CSD.

Led by owners Kim Hooks McMahon and Ronnie Hooks, the fourth-generation family-owned company provides dredging, marine construction and environmental remediation services for government and private industry partners throughout the U.S. Gulf Coast. The company's fleet of hydraulic CSDs provides services that include navigable waterway maintenance dredging, wetland replenishment, beach restoration, harbor excavation and new construction.

In addition to the new dredge, Hooks and MPW are working closely on overhauling many of the key components and equipment on Hooks' existing fleet. This will include all-new, wear-resistant dredge pumps that provide an efficiency of up to 90%, rebuilding and replacing worn ladders as well as the drives to pumps and cutterheads. MPW has also been contracted to deliver ball joints, pontoons, and pipeline to provide additional support to Hooks' existing and future dredging operations.

Continuing the U.S. dredge fleet expansion, the Netherlands based **Royal IHC** has also recently been awarded a contract to design and build a Jones Act compliant dredger. The new dredge for the North Carolina State Ports Authority (NCSPA) will perform maintenance in the

main seaports of Wilmington and Morehead City in order to safeguard the depth of the ports. The water injection dredger will be built at a to-be-named partner shipyard in the U.S. for delivery in 2021.

"The construction, procurement of the main components, assembly and testing will be performed in the United States (following the Jones Act regulations) and is being managed by the local IHC operations team based in Houston," said Projects & Services Director Rafael Vorcaro. "We consider this project as an important step to develop the local team and prepare the organization for future projects in the United States".

The dredge will have a flow of 20,000 GPM, a dredging depth of 55 feet, a width jet beam of 27 feet and 770 total installed horsepower. It is designed to offer easy maintenance and a smooth operation, Royal IHC said, adding other key design factors include dredge depth, weight and cost. A modular approach helps to support the cost-effectiveness of the vessel and its maintenance, by allowing the easy removal and cleaning of the propulsion units, generator and jet water pump, the builder said.

"This is IHC's first U.S. flagged vessel," said Sales Director America Rafael Habib. "We are very proud to have achieved this important milestone for IHC, which is of key importance in continuing to develop the company's footprint in the U.S. dredging market."

U.S. dredging companies are also adding large trailer suction hopper dredges (TSHD). Two joined the U.S.-flag fleet in late 2017 and 2018 (specifically, Great Lakes Dredge & Dock Corporation's Ellis Island and Weeks Marine's Magdalen), and there are two more currently on order—one for each company—slated for delivery in 2023.

Cranford, N.J.-based **Weeks Marine** has ordered a new TSHD from Eastern Shipbuilding Group's Allanton shipyard in Panama City, Fla., to be handed over in the first quarter of 2023. The new dredge, RB Weeks, will be a sister ship to the Eastern-built twin screw 8,550-cubic-yard TSHD Magdalen, specifically designed for beach nourishment and capital dredging works and highly automated.

Within the last decade, Weeks Marine has spent hundreds of millions to strategically expand its fleet and equipment stores to both strengthen the company and rise to growing industry demand. Notably, in August 2019, the company placed into service a new 30-inch CSD JS Chatry, built at C&C Marine and Repair.

The other TSHD currently on order, a 6,500-cubic-yard-capacity dredge for **Great Lakes Dredge & Dock Corporation**, based in Oak Brook, Ill., is being built by Conrad Shipyard for scheduled delivery in the first quarter of 2023. The deal includes an option to build an additional dredge, the U.S.' largest dredging services provider said when the order was announced.

Credit: Royal IHC

Lasse Petterson, GLDD's CEO and President, said, "Great Lakes continues to strategically invest in its dredging fleet. This highly automated newbuild vessel will increase the capabilities of our hopper fleet in the coastal protection and maintenance markets as well addressing specific needs in the growing offshore wind market."

"This vessel reinforces our commitment to the U.S Army Corps of Engineers and faith in the future of the U.S. dredging market," he added.

The new dredge will be deployed for channel deepening, maintenance dredging, beach nourishment and coastal restoration projects with short to medium distance transport requirements. It will feature two 800-millimeter suction pipes and will be able to dredge at depths of up to 100 feet, with principal dimensions of approximately 346 feet in length, 69 feet in breadth and 23 feet in depth and total installed horsepower of 16,500.

The new dredge will complement Great Lakes' existing six-dredge hopper fleet, including the ATB tug Douglas B. Mackie and 15,000-cubic-yard-capacity barge Ellis Island, which was delivered in the fourth quarter of 2017.

Major investments demonstrate that America's dredgers are prepared to meet rising market demand, and with further work to be had, from coastal protection and wetland restoration projects to port deepening and channel maintenance services, it's expected that there's plenty more to come.

INLAND WATERWAYS OPERATORS

Credit: Kirby Corporation

Operators on America's inland waterways have been pressing on through challenging circumstances to help maintain the critical flow of U.S. commerce. Peter Stephaich, Chairman & CEO, ***Campbell Transportation Company****; Dave O'Loughlin, President & CEO,* ***Ingram Barge Company****; Christian O'Neil, President,* ***Kirby Marine Transportation Group****; David Konz, Risk Manager,* ***Tidewater Transportation and Terminals****; and Lee Nelson, President,* ***Upper River Services*** *weigh in on their respective companies and how they're navigating the current market landscape.*

By Eric Haun

Please provide a brief overview of your company and the markets it serves.

CO: Kirby Marine is the premier tank barge operator in the United States, transporting bulk liquid products throughout the Mississippi River System, on the Gulf Intracoastal Waterway, along all three U.S. Coasts, and in Alaska and Hawaii. We also operate several offshore dry cargo ATB's, offer project cargo services through Osprey Line, and now own a Houston shipyard, San Jac Marine.

DO: Ingram Marine Group has been a quality marine transporter on America's inland waterways since 1946, starting out as a small, family-owned business and growing into what we are today: the largest dry cargo carrier and one of the top chemical carriers on the river. Markets served encompass the entire inland river system, including major ports such as New Orleans, Houston, Memphis, St. Louis, Minneapolis/St. Paul, Chicago, Pittsburgh and Nashville.

LN: Established as Upper River Services in 1984, we are a river harbor operation located in St. Paul, Minn. We serve the Twin Cities market; we are the upper terminus for the Upper Mississippi River. Every boat that comes here drops their entire tow, typically picks up fuel and supplies, gets another tow and heads the other direction. We provide switching, fleeting barge cleaning and repair, fuel and supplies.

DK: Tidewater Transportation & Terminals has been safely transporting commodities in the Pacific Northwest since 1932 all the while providing the best possible service and quality customer care. Tidewater is the largest inland marine transportation company west of the Mississippi River and has evolved into a multi-commodity transportation and terminal company serving the diverse and evolving transportation needs of the Pacific Northwest. Headquartered in Vancouver, Wash., Tidewater's operating area spans 465 miles of the Columbia and Snake River systems, Canadian West Coast and Puget Sound region.

PS: Campbell has been around since the early 1900s based on the Upper Ohio. Our core market strength has

Credit: Tidewater Transportation & Terminals

been the Ohio River, mostly the Upper Ohio, but we've grown to become more active on the Lower Ohio, and actually we're running down to the Gulf now. Being up here in in the Upper Ohio, we've been mostly in coal the business and we've worked for the steel companies. And we have some covered barges that we operate in the grain trades. As we've expanded, we've gotten into towing liquid barges on the Ohio River; we run a third-party towing operation between Cairo and Pittsburgh. We've been moving more liquid barges, and we've been focusing more of our resources and capital expenditures in recent year on the liquid side. We also own and operate shipyards and a number of fleeting facilities.

Please give a "by the numbers' overview of your current fleet of vessels and barges as well as any additional assets on order.

DO: Ingram has a fleet of approximately 4,500 barges and 140 towboats to move dry and liquid commodities throughout 4,500 miles of America's waterways.

PS: Campbell offers diversified marine solutions in the liquid and dry cargo marine markets. CTC owns and manages over 1,100 dry and liquid barges, over 50 inland towboats in various horsepower ranges up to 6000 HP. Currently, 18 of these CTC owned towboats are SIRE approved vessels pushing liquid cargoes for multiple oil majors and chemical companies.

CO: As of the second quarter of 2020, we operated 324 inland towboats and 1,115 inland tank barges. In coastal, we operated 44 offshore vessels 47 barges, most of this fleet is articulated tug barge units. We also operate two offshore dry cargo ATB units. We have five new towboats on order from San Jac Marine that will deliver in 2021. We do not have any orders for new build barges. We recently took delivery of the 150-foot, 1,800-ton dry dock Rivers O that will expand San Jac Marine's capacity.

LN: We have seven harbor boats ranging from 800-2,000 horsepower, the last of which, Mendota, was delivered about a year ago from C&C Marine and Repair. Our barges are all work flats or crane flats.

DK: We have 14 active push tugs and more than 150 barges. By and large, the tugs are all twin screw river push tugs with horsepower ranging from 3,000-5,000 hp. We don't have anything on order at the moment, but that's not to say that we wouldn't build if the right opportunity came along.

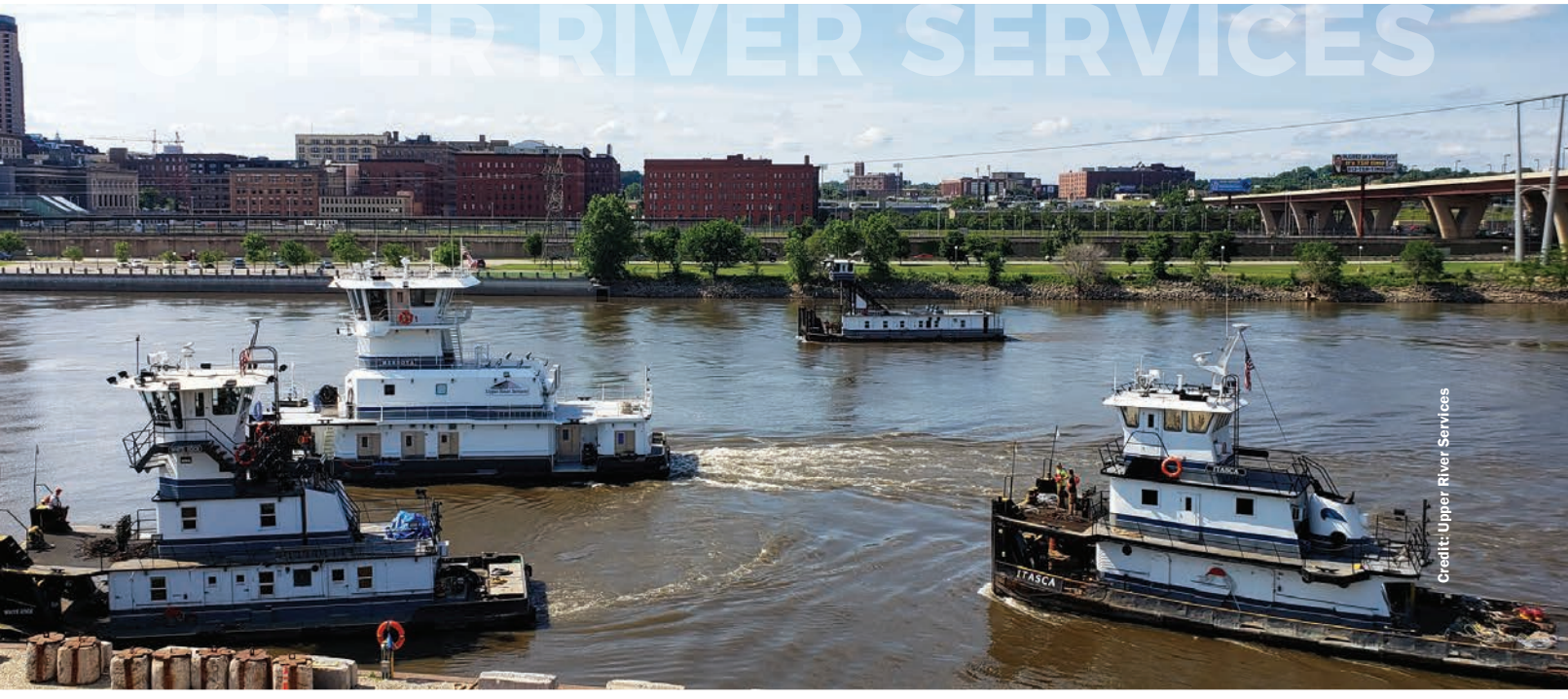
How has the coronavirus pandemic materially impacted your company to date, both from a business and operational standpoint?

LN: Certainly, COVID-19 has impacted the administrative side of the business. I've been the only one working in the office since March 17 as everyone else is working from home. But as far as the real work – the work on the water – that hasn't changed a great deal. We've had to change some protocols to encourage people to socially distance, and we've crewed our boats a bit differently where we're trying to keep the same people working together all the time. But the river keeps on rolling.

One of greatest impacts of this event has been trying to hire people. We're all looking for entry level position such as deckhands and barge cleaners. But with what's going on with unemployment and the amounts that are being paid for unemployment, it's nearly impossible to find people. It's a one-size-fits-all fix, but $600 a week here is not the same as $600 in New York or L.A. And then you have to look at what the state is offering. It's hard for me to say, 'I want you to go work out in the weather, no matter what it is, for 12 hours a day on steel decks, days, nights weekends. And I doubt that I'll be able to pay you as much as you're making on unemployment.'

DK: We knew we had a duty to the nation to keep commerce flowing on the waterways. We were able to keep going, but it did come with major changes. Obviously, we weren't going to do it without keeping our mariners and other employees safe. Probably like a lot of other business, we had to stand up a COVID-19 response plan. We activated out internal incident management system, and we used an incident command system, or ICS. We had to put everything that came with that, from medical screening to daily wellness checks. And then plan what we were going to do if we had an outbreak on board or at one of our facilities. And then anyone that didn't have to be at the site – mostly in our admin group – we switched to teleworking. It was a big challenge, and I would say it's still a challenge because we can't get complacent when it comes to COVID-19. All the science shows it's still out there.

But I want to emphasize the resiliency of the maritime industry, including inland barging. It just demonstrates what we've been saying for so many years that this infrastructure is so essential to the nation. It was really tested during this, but the importance of our industry is playing



Credit: Upper River Services

out during these times.

CO: From a business perspective, we are managing well through the downturn staying focused on those things we can control: our operational performance, our customer service and our cost structure. Cost controls are not enjoyable but necessary and the team has embraced that as a challenge. Operationally I must give high praise for the Kirby team's ability to adapt to these unprecedented conditions. Crew changes are more complicated, it's a little more difficult to get "boots on steel." We have innovated quickly to do more remotely, communicate better. Our commercial team is staying engaged with the customer even though we can't spend as much time face to face. This business is tough on a normal operating day, with hurricanes, high water conditions, hazardous cargoes, big horsepower and big steel. I think our culture, which is deep and ingrained to attack these normal challenges every day, has paid off in a challenge like the pandemic. We don't flinch, we don't panic we just do what we do even though we accomplish it a little differently today. Our team embraced the challenges of COVID-19 and has worked tirelessly to make it feel like a non-event to our customers.

Put in perspective this black swan business interruption event compared to any other you have seen in your career. When the smoke clears, what will be the lesson learned, and what long-term effects do you expect to see?

PS: We've had other crisis situations where the river's been closed; we've had a lock outage. But it's been more acute but short term. A problem with the pandemic is that I don't know how long it is going to last for. It's been months since we were told it would be a few weeks and that we were going to flatten the curve and it would be done with. That hasn't happened. We're hunkering down for the long haul. Even high or low water events, lock outages, forces of nature issues, hurricanes do not last for this length of time, and usually there's a known timeline associated with them.

This thing is invisible and you can't physically fix it, you don't know how long it's going to last for and we don't know what the end game is.

CO: I have survived and witnessed multiple cycles and downturns over the years. In 2019 and early 2020 the industry seemed to have emerged from the prior protracted downturn which was principally due to industry reaction to crude volumes, initially moved on water and then found their way over time to pipeline. The industry suffered from those that had speculatively built in on the assumption those volumes would remain.

I was not in the business during the '80s which was a lengthy downturn, but I feel that might be the only comparable period. Other macro-economic reasons or recessions account for those cycles, this pandemic is different. It was not a slowdown it was a shut down. The speed of business interruption was shocking. If you look at historical downturns I think the biggest lesson learned for the industry is don't "get over your skis". Kirby takes a long term disciplined view of its business and its capital investments. Given we continue to see the disruption of COVID-19, at this point, the biggest lesson is patience, discipline and focus.

DK: I would put it up in the top two or three due to the pace at which it happened. The only thing I could compare it to for a Columbia-Snake River operator are instances when the lock chambers have gone down. The river system doesn't have redundant sets of locks, so when the locks go down, our highway is shut down. We have seen small outages over the years, and they obviously have a direct impact, but this one is right up there.

We did get a lot smarter, and I won't say we're experts on it, but now we have as good a plan as possible to manage it. Whether or not we're having a second

Credit: Ingram Barge Company

wave right now, or if the virus didn't fully get contained, we feel pretty good that we can build on what we learned before and still keep our operations going if there are situations like there was when the country is locked down. A lot it is still to-be-determined. We're living as we go along here, but collectively, from our perspective, it's not going to be a v-shaped recovery. It's going to be a slow tick back up.

LN: The real work on the water is going to stay largely the same. Administratively, we certainly have proven we can do a lot of work remotely. When it all comes down to it, we in the office are just support. We made the decided during our Zoom meetings that we should figure out what equipment we need to work remotely and keep it in stock so that when we get everybody back in the office we can revert back to remote working at a moment's notice. That's going to be a fairly significant change, and I think there will be fewer and smaller offices, quite frankly.

What is the most important issue that inland operators face today, and what is being done/should be done to address it?

CO: I think the most important issue today is the health of our workforce and maintaining business continuity in face of COVID. As an industry, we are on the frontline in this pandemic battle, we are keeping fuel supplied, keeping our customers supply chains uninterrupted. The industry and regulators have responded allowing us to make complicated crew changes across state lines. All Carriers are working together well to keep the waterways open, we compete hard, but are united in taking care of our mariners. I want to thank the Kirby crews for their focus and discipline as we respond to new travel challenges, cleaning protocols, customer requirements.

LN: In addition to workforce challenges, national investment in waterway infrastructure is one of our greatest issues. Our forefathers built a tremendous system. Over the course of the last few decades we have not a good job

Credit: Campbell Transportation Company

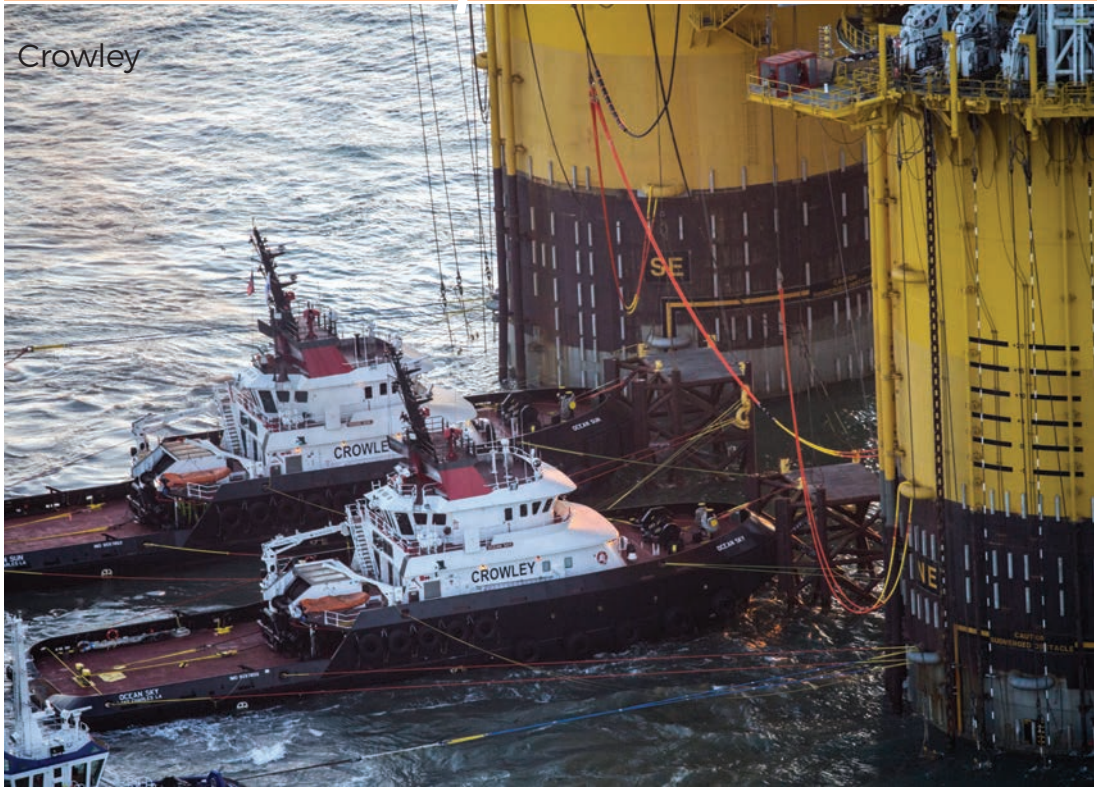
of reinvesting in that infrastructure, and we need to do a better. Hopefully in this current WRDA bill that's in Congress the cost share of Inland Waterway Trust Fund projects will be modified. I don't think it will be where I'd hoped it might be, but I think it will get modified and that will help. It's going to take a long time to invest in what we need to reinvest in. Keeping that fire lit is very important.

We're heading in the right direction, but we've always struggled to be recognized. We're kind of a silent giant. You go to most towns where the river goes through, most people don't realize the volume of commodities that float by on our inland waterways. And we often have the same problem getting recognition in D.C.

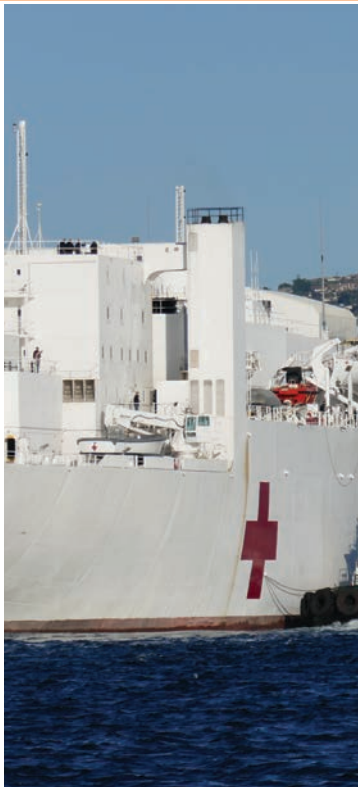
DO: Infrastructure needs and overall awareness of the benefits of barge transportation. Regarding infrastructure, lock and dam funding is needed at the full and efficient level for the Corps of Engineers to make the river system operate more efficiently. For awareness, people generally aren't as familiar as we'd like with the benefits of barge transportation in terms of better freight capacity, cost-efficiency, carbon footprint and safety as compared to rail and road transportation. Most people don't fully understand this value for themselves as well as for the U.S. economy.

DK: Preserving the Jones Act is the most important issue for us, now more than ever. COVID-19 has demonstrated how important it is. I think about some of the supply issues we've had with masks, and a big issue with those is that they are being made oversees and the supply chain was severely disrupted because of that. One argument against the Jones Act over the years has been to outsource your maritime expertise and let the word market compete, but this is a perfect example of why that's not a good idea. In times of crisis, the U.S. maritime industry has stayed resilient and reliable. Had it been outsourced to other countries that were locked down and couldn't send their people over, all of a sudden we wouldn't be able to move goods.

Operators



Crowley



Centerline Logistics

Centerline Logistics, formerly Harley Marine, has something to prove. "For us it is a redemption story more than anything," says Matt Godden, CEO. "There was so much about the company being at its death knell or final stages, and everyone looking at it and thinking, 'Oh, that thing's a mess.' It is quite the opposite. We have leased three new boats and are looking to add new boats to our growing markets."

Godden says the company is well positioned for the next chapter of its history and is moving forward with a strong name for a strong company. In choosing its new name, the company looked to select one that would honor its maritime history and experience. The center line of a marine vessel is a significant point of balance and one that represents strength for the broader hull of the vessel. Godden says the company has been renowned for its safety record and operational capabilities, and added that it intends to maintain this commitment.

Centerline is a marine transportation services provider operating on the U.S. West, East and Gulf Coasts, Mississippi River, and Alaska, active in the transportation and storage of petroleum products, ship assist, tanker escort, rescue towing, transportation of general cargos and offshore projects. It is also a full-service nationwide company that is a parent to seven marine services businesses and one bulk liquids terminal.

Crowley

Crowley is a U.S.-owned and -operated marine solutions, energy and logistics services company that provides services in domestic and international markets through four business units: Crowley Logistics, Crowley Shipping, Crowley Solutions and Crowley Fuels. The company was launched in 1892, by founder Thomas Crowley - the grandfather of current Chairman and CEO Thomas B. Crowley Jr. - and is now wholly and

Operators

Foss Maritime Company

privately owned by the Crowley family and Crowley employees. Today, Tom Crowley and his leadership team direct a company with more than $2 billion in annual revenues, approximately 5,300 employees and a fleet of about 200 vessels.

Crowley's offshore services team has the high-bollard towing capabilities and dynamic positioning power to transport oversized, complex and extraordinary cargoes anywhere in the world. Among recent highlights, TLP Olympus was escorted by Ocean Wind, Ocean Wave, Ocean Sun and Ocean Sky - from Ingleside, Texas, to her final location in more than 3,000 feet of water. Once Olympus had safely reached her offshore home, the tugs transitioned into the final positioning phase. Ocean Wind, Ocean Wave

Operators

Patrick Stant
McDonough Marine Service

and Ocean Sun, towed Lucius Spar from Corpus Christi, Texas, through the Ingleside Channel to some 300 miles offshore. Two Crowley Invader-class tugs, towing heavy-lift series barges 455-5 and 455-9, followed with 20,000 tons of dry ballast materials. Once in deep water, the tugs helped hold the platform for positioning. Ocean Wind and Ocean Wave pushed the Jack/St. Malo facility away from Corpus Christi and through the Port of Aransas, Texas. Once offshore, Ocean Wind and Ocean Sun towed the facility to its final location. In the positioning phase, all four tugs worked together to hold the Jack/St. Malo for positioning. Four Ocean Class tugboats, and five barges supported the tow-out of the Big Foot extended TLP. The vessels worked together to deliver the platform, tendons and other equipment from Spitzer Industries, in Houston, and Kiewit Offshore Services in Ingleside, Texas, to the floating production facility. Ocean Sun and barge, Julie B, transported a 3,747-ton platform jacket and piles to a drilling site 35 miles off the coast of Trinidad and Tobago from Offshore Fabrication Co. in La Brea, Trinidad.

Foss Maritime Company

Supported by project management and marine engineering group, Foss provides comprehensive marine transportation services, from global turnkey logistics/transportation services to inland movements and total project management. Foss transports cargos ranging from large-scale modules used for energy expansion all the way to single transformers along the entire Columbia/Snake River system.

Seattle-based Foss offers a complete range of maritime transportation and logistics services, from everyday harbor jobs to complex transportation challenges in remote parts of the world. In March, Foss tugs assisted the hospital ship USNS Mercy into the Port of Los Angeles to support COVID-19 response efforts. Foss' hundreds of tugs and barges provide harbor services and transportation operations in all major U.S. West Coast ports, including the Columbia and Snake River system. Internationally, Foss supports customers across the Pacific Rim, in Europe, South America and the Arctic. In addition to transportation and maritime logistics, Foss provides engineering and shipbuilding services. The company's mobile response repair service can send a team of maritime engineers to service vessels anywhere in North America within 24 hours. With two full-service shipyards and an expert marine engineering group, Foss helps throughout the life cycle of a project, including analyzing vessel and equipment requirements for a specific job, to designing a new build or vessel modification through to production and proper outfitting of the vessel.

In February Foss christened its new 90-ton tug Jamie Ann.

It is the first of four new ASD-90 tugs under construction at Nichols Brothers Boat Builders in Freeland, Wash., the newbuild will be followed by sister vessels Sarah Averick, Leisa Florence and Rachael Allen, all scheduled to be delivered this year for service within the Saltchuk Marine family of companies.

McDonough Marine Service

McDonough Marine Service is celebrating 75 years in business in 2020. As a complete marine transportation and logistics solutions provider, the company specializes in the charter of barges and tugs, and the coordination and management of cargo moves to support the successful execution of customers' projects.

With 15 barge fleets covering the Gulf of Mexico, the U.S. East Coast, the upper rivers of the U.S. Midwest and Mexico, McDonough claims to own the largest fleet of deck barges available for charter on the market today. The Metairie, La. based company strives to offer the flexibility customers need to secure the right barge for their marine transport and construction projects, with a fleet of inland and ocean barges include deck barges, spud and power spud barges, hopper barges and shale barges. And because every rented barge needs a tow, McDonough Marine Service has invested in inland push boats, high eye level tugs, and strong industry relationships in order to supply towing services. In addition, McDonough Marine's Project Cargo service is dedicated to the planning, coordination and management of marine cargo transport throughout the project lifecycle. Utilizing its extensive and diverse fleet of barges, availability and control of high-level boats, and specialized equipment, the project cargo team serves as a single source provider for resources and management of project cargo moves.

Vane Brothers

Headquartered in Baltimore, Md., Vane Brothers is a family-run company founded in 1898 and currently operating a fleet of 130 tugboats and barges on the U.S. East, West and Gulf coasts. Vane Brothers provides a wide range of maritime functions, including ship bunkering, launch services, and safety equipment inspection from multiple locations: New York, Philadelphia, Baltimore, Norfolk, Charleston, Savannah, Jacksonville, Tampa Bay, Puget Sound, Los Angeles/Long Beach, and San Francisco.

After taking delivery of new 4,200-hp articulated tug/barge (ATB) units in 2018 and 2019, Vane Brothers has added two new 3,000-hp push tugs: the Salisbury in 2019 and the Annapolis in early 2020, with two more push tugs currently under construction. The tugs were delivered by Chesapeake Shipbuilding Shipbuilders and Naval Architects of Salisbury, Md. They have a length of 94 feet, a width of 34 feet, a molded depth of 10.5 feet and a working draft of 8.5 feet. "These push boats ensure we have the most up-to-date fleet to continue providing the highest quality service in shallow waters and protected harbors," says Vane's President, C. Duff Hughes.

Matt Godden, CEO
Centerline Logistics

Comms, Controls & Electronics

Britmar Marine Ltd

Britmar designs, engineers and distributes over 300 commercial light fixtures, supported by technical staff with more than 80 years of combined commercial marine industry experience. The company got its start supplying the Canadian market before eventually moving into the U.S. and Latin America. Today, Britmar offers expertise and knowledge in navigation lights including advancements in LED, searchlights including signaling devices, interior lighting repair and retrofit, as well as the unique field of LED floodlights, exterior and interior lighting. Over the last several years, the firm has doubled its lighting range and expanded its engineering and development work. Through its own R&D work and involvement with new lighting technologies, Britmar is able to bring many solutions in the marine industry. The company also has access to a vast array of lighting spares, including European lamps, making it one of the most versatile marine lighting companies in North America. Britmar is also involved in custom made lighting for specific marine applications, and it provides information for approvals and class certificates for marine lighting.

David Clark Company

David Clark Company has more than four decades of experience providing critical crew communication system solutions. The company's marine business is expanding internationally in a variety of markets including foreign militaries, fisheries and offshore service/transport vessel sectors. Domestic system installations are also ongoing for the U.S. Coast Guard, U.S. Department of Homeland Security and U.S. Customs and Border Patrol interceptors.

David Clark Company is a leading manufacturer of headset communication system solutions for high-noise environments. The firm's noise-attenuating headset systems are used worldwide in a variety of critical communication applications by civil and government personnel in the marine, aerospace, aviation, fire/rescue and industrial markets. Over 300 employees are involved in product design, engineering, manufacturing, customer service and technical support at the company's 250,000 square-foot manufacturing facility in Worcester, Mass. An ISO9001 quality assurance system is designed to meet the most stringent testing standards to ensure product excellence. David Clark Company also

Anthony George,
CEO & Founder
FUELTRAX

maintains ongoing relationships with a variety of OEM customers, comprised of leading international workboat manufacturers. These strategic alliances help to enhance its products and systems to handle today's increasingly sophisticated mission protocols and marine communication applications.

David Clark Marine Intercom Systems are installed on all manner of workboats - at work on patrol boats and military craft, off-shore service vessels, fire/rescue boats, commercial fishing vessels and more. The company's Marine Intercom Systems provide crew members with clear communication over engine and wind noise, enhanced situational awareness and safety, and hearing protection while working on the water. All David Clark marine headsets and systems are designed to withstand the rigors of the harsh marine environment with marine-grade components that resist salt, spray, shock and vibration at sea. The Series 9100 Digital Intercom System - unmatched for scalability, versatility and simplicity of setup and operation - has become the communication system of choice for workboat and patrol boat crews. The system provides clear communication for an unlimited number of users, radios and other devices. Wireless headset technology can also be easily integrated, providing freedom of movement for crew members. The IP-based system can also accommodate several existing network ancillaries, resulting in a simple, cost-effective solution for all marine-based critical communications. David Clark Company Wireless Systems, based on the latest DECT technology, provide crew members with mobility to move about the craft, without being tethered to intercoms or equipment. Wireless units also offer seamless integration with wired Digital Intercom Systems, offering the ultimate in communication system setup, flexibility and ease of operation.

FUELTRAX

In today's operating environment, it would be an understatement to say that detailed insight into fuel consumption and efficiency are key to managing marine operations. But, beyond the operational headache of determining where and why you are consuming so much fuel and so quickly, regulatory compliance is a fundamental requirement of modern marine operators. And that's where FUELTRAX, a smart, self-contained fuel and data management solution comes in. FUELTRAX operates in real-time, standardizing the acquisition, securely transfers and tracks analysis of accurate vessel and fleet performance data. It operates with any vessel class, fuel type, engine model or geographic location. In simple terms, FUELTRAX manages fuel use, recording secure, reliable, real-time data. It improves asset value, in

Comms, Controls & Electronics

Furuno

gplink

part by taking the strain out of monitoring and reporting. The data captured and organized by FUELTRAX helps to ensure compliance with legal requirements for monitoring, reporting and verification (MRV) of CO2 emissions. It logs fuel consumption against time, distance and cargo.

Furuno

Furuno has been at the vanguard of marine technology since its inception in 1948, when the company commercialized the world's first fish finder. With service centers and authorized distributors worldwide, Furuno continues its role as a leader in marine electronics with the innovation of new technologies.

The NXT line of Solid-State Radars is among the more exciting evolutions in marine technology today. Furuno's decades of radar innovation have cumulated in a new lineup of radar products for ships of any size that are powerful, precise, and easy-to-use. No other manufacturer offers a Solid-State IMO Radar in both S-Band and X-Band configurations for SOLAS vessels, making the NXT series truly a class unto itself. Good target detection at all ranges combined with Furuno's superior signal processing techniques to deliver a radar presentation that is clean and uncluttered with minimal need for adjustment. With a single button press, the ACE (Automatic Clutter Elimination) function can activate, automatically adjusting filter and gain controls according to sea and weather conditions to provide the very best radar presentation. Furuno's Fast Target Tracking (FTT) acquires targets and immediately displays a speed and course vector, with the information becoming available in mere seconds. FTT gives navigators more time to assess the situation with accurate, reliable information, and make a decision to take action, avoiding incidents at a very early stage. NXT's new InstantAccess bar gives the operator immediate access to the tools they need to quickly and efficiently perform tasks. With a new, brushless motor and no magnetron to replace, the NXT Solid-State Radars require far less maintenance and over time, saving thousands of dollars and hours of downtime over the life of the radar.

GPLink

gplink provides remote monitoring, tracking and diagnostic solutions that enable owners and operators to remain connected to their fleets remotely. Engine performance, operator habits and fuel consumption are all tracked, and engine problems can be identified early for planned downtime. Information is electronically logged for seven years, making for easy compliance reporting. gplink provides remote monitoring, tracking and diagnostic solutions for high horsepower systems. gplink utilizes dual band technology with GSM communications, as well as the Iridium satellite system for location tracking, monitoring, and emergency notification systems. gplink uses both of these extensive networks to provide worldwide coverage, and ensure that connections are not only reliable but affordable too. gplink protects vessels by monitoring engines and onboard critical systems, including engine diagnostic codes, all while tracking the precise location of the vessel anywhere in the world. gplink is available for commercial vessels and fleets, as well as pleasure craft vessels. Passenger fessel fleets such as Boston Harbor Cruises, Bay State Cruises, NY Waterways, HyLine Cruises and Alcatraz


Kongsberg Maritime


Phoenix Lighting

Clipper work with gplink for remote monitoring, diagnostics and tracking.

Kongsberg Maritime

Kongsberg Maritime is a single supplier of diverse, integrated solutions with the power to optimize marine operations and reduce environmental impact. Its technology and services drive positive transformations and enable safe, efficient and sustainable management of more than 30,000 vessels in the seaborne transportation, energy, fishing, superyacht and naval sectors.

Kongsberg Maritime's development of sophisticated sensors, automation and control technology has improved safety at sea and operational efficiency for over 50 years. Always at the forefront of innovation, Kongsberg Maritime has taken the lead in the development of Maritime Autonomous Surface Ships (MASS) and is a major enabler of maritime digital transformation, with an extensive portfolio of information management and data-centric advisory systems. Kongsberg Maritime's established Full Picture product and service portfolio diversified further in 2019, through the acquisition of Rolls Royce Commercial Marine. The subsequent integration enables Kongsberg Maritime to offer integrated or standalone solutions for applications on any ship. Kongsberg Maritime is owned by KONGSBERG, an international, knowledge-based group delivering high technology systems and solutions to clients within the oil and gas industry, merchant marine, subsea, defense, aerospace and space.

Earlier this year, the ferry Bastø Fosen VI equipped with Kongsberg Maritime's advanced systems demonstrated fully automatic control from dock to dock while carrying passengers, cars and crew on board. The fully-integrated digital system on Bastø Fosen VI automatically performs all docking and crossing functions to a high and repeatable level of accuracy, a key step forward in the integration of autonomous technology into everyday shipping operations.

Phoenix Lighting

With the drastic increase in COVID-19 cases, the USNS Comfort was deployed to New York to provide relief for land-based hospitals. To properly accommodate this mission, the Navy required upgraded waterline security lighting. The USNS Comfort would benefit from an immediate up-

Comms, Controls & Electronics

Ventura Rigol
RHOTHETA

date to LED. The Navy looked to Phoenix Lighting, its longstanding lighting supplier in Milwaukee, Wis. Working closely with its distribution partner, Federal Resources, Phoenix was able to meet the Navy's needs. In a matter of four days, Phoenix Lighting customized, built and delivered ModCom 2 LED floodlights to give the USNS Comfort the updated safety, light quality and efficiency required for the current deployment.

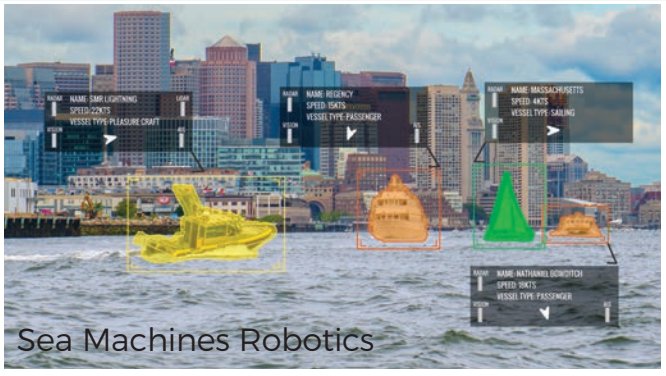
Phoenix, manufacturer of "the world's toughest lights", is a trusted authority for tugs, workboats, ferries, dredges, military service vessels, research vessels and barges that need reliable, sustainable lighting. It specializes in LED fixtures for machinery spaces, engine rooms and above deck areas which require well-lit and reliable illumination. The firm's expertise in the marine market continues to improve operations all over the world. Phoenix Lighting was chosen to illuminate the newest three vessels in the Staten Island Ferry fleet. Based on Phoenix's reputation in the marine market, Elliott Bay Design Group and Eastern Shipbuilding knew they could count on the U.S.-based manufacturer to deliver reliable LED lighting that will withstand the marine environment and help keep passengers safe. An LED package was chosen for the new vessels' overhead and floodlighting to meet stringent safety and security requirements and to ensure durable, marine-rated lighting.

Rose Point
Navigation Systems

RHOTHETA International, Inc.

Often used for navigation before the adoption of GPS, radio direction finders continue to function today as safety equipment for all types of vessels. RHOTHETA radio direction finders can display a line of bearing toward VHF/UHF radio signals including EPIRBs, PLBs and man overboard beacons.

RHOTHETA has leveraged more than 30 years of engineering experience to develop a comprehensive line of radio direction finding equipment for air traffic control, search and rescue, and vessel traffic services. The company has found a competitive edge in the industry thorough a keen dedication to customer service and an optimal price/performance ratio. A commitment to quality assurance is demonstrated through ISO 9001:2015 certification and an average turnaround time of 48 hours for repairs. More than 200 organizations depend on RHOTHETA products including the U.S. Coast Guard, Canadian Coast Guard, and German Air Navigation Services. In October 2019, the US Coast Guard selected the RHOTHETA RT-500-M radio direction finder for Sentinel-class Fast Response Cutter fleet, and in February 2020, the Canadian Coast Guard awarded a contract to Seacoast Marine Electronics, a RHOTHETA dealer based in Halifax, to replace existing radio direction finders installed across the CCG fleet including an installation on an offshore oceanographic science vessel.



Rose Point Navigation Systems

Rose Point Navigation Systems began when its founder, an avid boater, couldn't find charting software he could count on. So he set out using his vast programming experience to write his own. So many commercial captains starting using the recreational product Coastal Explorer, that the company began to develop and market Rose Point ECS, a navigational software built from the ground up for professional mariners and commercial fleet operators. It quickly became the dominant navigational software on the Mississippi River and beyond. Three years ago, the company launched Rose Point ECS Services to provide additional value to customers, and on July 1, 2020 the company began selling its Rose Point Fleet Services to provide even further service to fleets and port captains.

Sea Machines

Autonomous vessel technology developer Sea Machines Robotics has led the way in ushering in a new era of operational capability and safety for the marine industry. In addition to advancing the development of its intelligent vessel systems, the company has forged new partnerships with industry leaders, regulators and maritime academies; installed systems aboard active commercial vessels; gained approval from the USCG/ABS for its technology; and has served as a thought leader and expert speaker during events around the world. Most recently, it closed a new $15 million financing round with significant participation by America's largest military shipbuilder Huntington Ingalls Industries.

Headquartered in the global tech hub of Boston and operating globally, Sea Machines is a leader in pioneering autonomous control and advanced perception systems for the marine industries. Founded in 2015, the company builds autonomous vessel software and systems, which increases the safety, efficiency and performance of ships, workboats and commercial vessels.

Sea Machines develops autonomous control and advanced perception systems for commercial marine vessels. These include the SM200, a remote-helm control system for minimally manned or unmanned operations that's suited for tugboats, fireboats, target boats, utility craft and other workboats. The company's SM300 is an autonomous-command and remote-control technology for workboats and commercial vessels, ideal for survey vessels, patrol boats, tenders and other workboats. The SM360 is in development, to be released in late 2020. It's an artificial intelligence (AI)-powered situational awareness system for ships. Ideal for merchant and cruise ships, the system is currently undergoing trials aboard an A.P. Moller-Maersk container ship in Denmark.

Sea Machines has been involved in a number of innovative and noteworthy projects over the past 12 months. Here in the U.S., it has received ABS and U.S. Coast Guard approval to install its SM200 wireless helm system aboard a class of U.S.-flag tugboats that support articulated tug-barge (ATB) sets. Sea Machnies has also partnered with shipbuilder Metal Shark to introduce a new 29-foot autonomous vessel offered through Metal Shark's "Sharktech" autonomous division. It also demonstrated the world's first autonomous spill response vessel – a Vigor/Kvichak Marine Industries-built skimmer boat, owned by Marine Spill Response Corp. (MSRC) – as a part of a cooperative agreement with the U.S. Department of Transportation Maritime Administration (MARAD). Sea Machines has also collaborated with the Maine Maritime Academy to introduce autonomous vessel operations into the classroom, fleet and labs.

Oversees, Amsterdam-based Deep BV is upgrading one of its survey vessels with a SM300 autonomous control system to enable remote command of the vessel, including navigation and positioning, the control of onboard auxiliaries and sensors, and ship-to-shore data flow. The vessel will operate in multiple areas of the Wadden Sea while being commanded by personnel in the Amsterdam office.

Equipment


Allsalt Maritime


American VULKAN Corporation

Allsalt Maritime

Allsalt Maritime (formerly CDG Coast Dynamics Group) first introduced shock mitigated seating in 2007 to protect commercial and military boaters from injury in the line of duty. The design, manufacturing and R&D firm is the owner of the SHOXS shock mitigating seating and Kinetix impact monitoring systems product lines. SHOXS seats feature a patented impact mitigation design using marinized air shock technology to reduce physical impact on the passenger when traveling through rough waters. Kinetix is an advanced shock monitoring system that records impact exposure data on vessels, seats, and crew. A combination of hardware, software and consultancy services allow maritime agencies to use the data to monitor short- and long-term shock and vibration exposure, investigate high impact events, and predict vessel maintenance intervals.

American VULKAN Corporation

Established in 1971, American VULKAN Corporation (AVC) is a member of the multinational VULKAN Group. AVC is home to three divisions: VULKAN Couplings, VULKAN Drive Tech and VULKAN Lokring. Its offering to the maritime sector includes highly flexible couplings for marine propulsion, dredging and generators; resilient mounts for diesel engines or shock applications (navy); lightweight composite shaftlines for ferries, navy and waterjet drives; jawcouplings for industrial applications, such as (dredge) pumps, compressors and conveyor belts; and on board services including installation, commissioning and alignments.

Equipment

Appleton Marine, Inc.

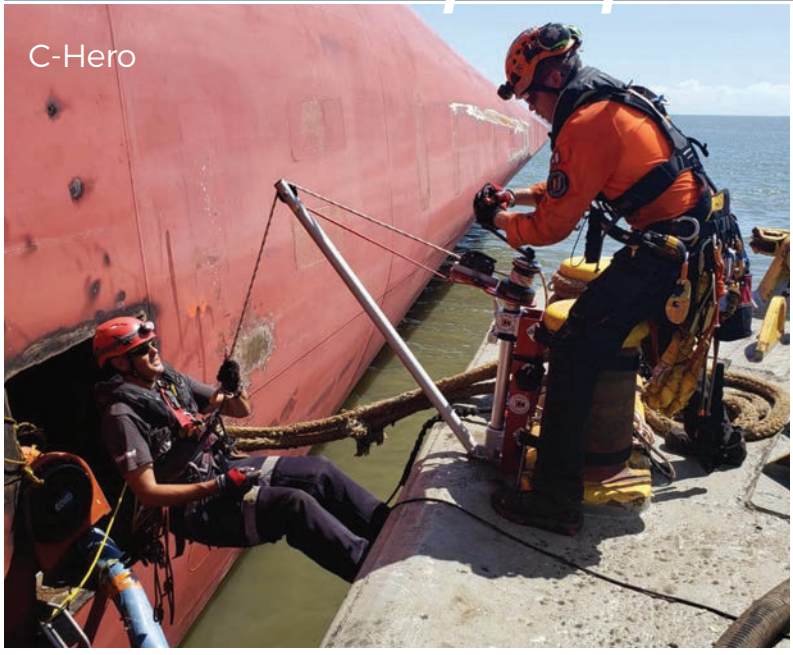
Appleton Marine, Inc.

Appleton Marine, Inc. designs and manufactures a wide range of custom marine offshore and shipboard products and specializes in integrating this equipment with ship systems. Not only does Appleton supply cranes, winches, windlasses, capstans, hose reels and other special systems, they are experts in combining the gear into a cost-effective turnkey solution. The employee-owned company has the flexibility to participate in multiple domestic and international market segments, having recently delivered offshore pedestal cranes for FPSOs to be located in the Gulf of Mexico and offshore South America; telescoping and folding boom cranes along with other deck equipment for the U.S. Coast Guard; knuckle-telescoping boom cranes for the U.S. Navy; capstans, winches and anchor windlasses for multiple dry dock projects; knuckle and telescoping boom cranes for the U.S. Army Corp of Engineers. In addition to multiple new-build contracts, Appleton Marine offers "Open-and-Inspect" and rebuild services for its own equipment. At present, the USCG has taken advantage of this service and is rebuilding multiple cranes and winches for various vessels.

Carver Pump

Since building its first pumps in 1938, Carver Pump has become recognized as one of the leading centrifugal pump companies, building to demanding engineering specifications and military standards. The third-generation family-owned company based in Muscatine, Iowa builds pumps for handling water, oil, chemicals and slurries for

Equipment


C-Hero



Ecochlor

both the public and private sectors. It offers a full industrial product line with horizontal, vertical, single, and multistage pumps, engineered to handle high flows, high pressures, extreme temperatures, aggressive materials and/or entrained solids. Carver Pumps has delivered its pumps to customers around the world, and it has been a supplier in every major U.S. Navy shipbuilding program for more than 60 years.

C-Hero, LLC

C-Hero innovates man overboard recovery products, designed by a tugboat captain, specifically for the tugboat industry. Its system allows for an underway one-person recovery of a helpless person from the water.

The company's president, Shane Smith, was born into the tugboat business and never left. He brings to the company 30 years' captain experience, a wealth of on deck knowledge, a passion for the water and saving lives and a desire to make a difference in MOB recovery.

The company started with the bitt mount rescue davit and has grown to offer a full product line for all vessels, including land-based rescues. The latest from C-Hero is its free eTraining, which helps crews be properly trained for MOB recovery and gives management in a company the ability to verify the MOB training is being completed. The certification is not complete until the person goes on deck and videos their drill with the equipment they just tested on.

Ecochlor, Inc.

Ecochlor, Inc. was founded in 2001 with the sole purpose of commercializing patents for a ballast water management system (BWMS) using a two-step process, filtration followed by a chlorine dioxide disinfectant treatment. The company installed its first commercial system in 2004 and has since installed 176 BWMSs with orders for an additional 164 vessels.

Ecochlor's treatment technology is unique. It uses chlorine dioxide (ClO2), generated by a simple process on board the vessel to treat the ballast water in a single pass during uptake. The system is simple to run with minimal crew involvement during operation and no TRO components. Treatment dosage and efficacy is not affected by salinity, temperature or turbidity that can cause uncertainty of the system's effectiveness when the crew is faced with varying water types. Since ClO2 degrades naturally to salt it does not require neutralization or retreatment before discharge.

Equipment

Humphree

Hyde Marine

Humphree

Humphree was founded in 2002 by a team of engineers that sought to leverage their expertise in high-speed marine propulsion – or more specifically, hydrodynamics, electronics and digital controls – to create vessel stabilization packages that would be easy to install and use. And thus, Humphree's interceptors were created.

The compact and robust transom-mounted units feature an adjustable blade that activates vertically into the water stream beneath the hull to create a lift force. "Deployment speeds are virtually instantaneous with none of the delays of traditional horizontal trim tabs," says Sean Berrie, CEO of Humphree's U.S. arm.

Today, Humphree's interceptors are offered in several different models and sizes for vessels from 8 to 150 meters in length, including monohull and multihull configurations, and can be found on thousands of vessels, from utilitarian pilot and patrol boats to ultra-luxurious superyachts. Most models can even be custom shaped to fit the hull exactly.

In addition to interceptors, Humphree's product lineup includes fins and computerized controls – all electric powered with no hydraulics and constructed of corrosion-free composites. "We have also recently expanded our line of course stability solutions to provide an integrated package specifically designed for waterjets, including electric rudders, fixed fins and interceptor steering," Berrie says.

Hyde Marine, Inc.

Through its Hyde GUARDIAN ballast water treatment systems (BWTS),

Equipment

Hyde Marine was one of the first suppliers of a safe, chemical-free UV BWTS, receiving IMO Type Approval in 2009. Hyde Marine was one of the first to receive AMS approval from the U.S. Coast Guard. Additionally, the company installed one of the first BWTS aboard a ship, which subsequently was the first BWTS in the USCG's Shipboard Technology Evaluation Program (STEP). Launched in 2020, the the IMO- and USCG-approved Hyde GUARDIAN US BWTS marks the next evolution, featuring a dose-based system design limitation and one of the smallest footprints in the market. The system offers the highest flow rates possible for each water quality and direct feedback to the operator about whether the system is functioning as it was tested. The Hyde GUARDIAN-US was recently type approved by the U.S. Coast Guard and the Kingdom of Norway under the new IMO MEPC.300(72) requirements allowing operation in all of the world's waters.

JonRie InterTech LLC

Manahawkin, N.J.-headquartered JonRie InterTech LLC is a leading full-service designer and fabricator of deck equipment for the marine industry, including the tugboat, barge, dredging, naval and offshore sectors. Its scope of equipment

JonRie InterTech

provided includes escort winches for escort tugs, towing winches, capstans, mooring winches and anchor winches, as well as hydraulic systems and controls. JonRie also provides in house designs for winch installations and vessel integration, plus design, survey, engineering and testing services.

Marine Travelift

When it comes to boat handling equipment, Marine Travelift is easily one of the industry's most recognizable names. Since the launch of its first mobile boat hoist and establishment in 1954, the company has continued to deliver an expanding line of solutions for boatyards and marinas, with more than 4,000 of its hoists presently in operation worldwide. Today, Marine Travelift offers extensive lines of mobile boat hoists offering capacities up to 1,500 tons, as well as marine forklifts and self-propelled transporters that are designed to safely transport a variety of vessels. The firm's complete boat hoist lineup includes its TG units, specifically designed for shorter, heavier units including tugboats. The self-propelled transporters are highly customizable and ideally work in tandem with the manufacturer's mobile boat hoists to maximize efficiencies at shipyards. Advanced remote diagnostics and other services are provided by an international network of dealers and factory service technicians.

Equipment

R.W. Fernstrum & Company

Menominee, Mich. based R.W. Fernstrum & Company is a fourth-generation family owned and operated business that has focused exclusively on providing custom engineered heat exchangers for more than 70 years. The small business in Michigan's Upper Peninsula has a global reach. In 2019, R.W. Fernstrum worked with customers across six continents in more than 30 countries. It works with a wide variety of customers on a wide variety of applications, from alternative energy on windmills and tidal power generators, to OSVs, PSVs and oil spill recovery vessels in the oil and gas industry. The company has equipped ferries from Staten Island to Washington State and works on dredges that clear the channels for other R.W. Fernstrum-equipped vessels such as ATBs, tugs and push boats to carry goods between ports domestically and around the world.

Undoubtedly, R.W. Fernstrum is widely recognized as the leader in its market segment. The company's customer base varies greatly across applications as well as regions across the globe. Recent highlights include LCU 1700 project with Swiftships; two tugs with Eastern; four tugs with Nichols Brothers Boat Builders; Florida Marine's David Goin from Steiner Shipyard; Osage Marine's Frank Mellor from Master Marine; McGinnis unnamed Ohio based towboat; 19 towboats and one dredge with C & C Marine & Repair; Canal Barge Company's H. Merritt 'Heavy' Lane Jr. from Conrad Shipyard; two fireboats for Hamburg with Damen; and tugs with Dry Docks World, to name a few.

Sean Fernstrum
R.W. Fernstrum & Company

Schoellhorn-Albrecht Machine Co. Inc.

Schoellhorn-Albrecht has enjoyed a long history in Saint Louis supporting the inland river industry. In 1887 the Schoellhorn-Albrecht building was located in historic Laclede's Landing on the west bank of the Mississippi River. The company began by providing steamboat engines and deck equipment for river boats built in Alaska and used on the Yukon River during the gold rush. Today Schoellhorn-Albrecht is located in Saint Louis County, Mo. supporting the entire marine industry worldwide. With over 120 years of experience, Schoellhorn-Albrecht is a market leader in engineering, designing and manufacturing of marine deck equipment, dock equipment and vessel access systems. In addition to its standard product line, the company also specializes in designing and manufacturing castings, fabrications, and specialized machinery to meet any customer's needs. It has designed and built capstans, winches, mooring winches, anchor windlasses, tugger winches, hawser reels, anchors, bitts, chocks, cleats, mooring rings, hatches, kevels, roller chocks, roller fairleads, smit brackets, bollards, dock cleats, panama chocks, accommodation ladders, and gangways. Specialty products include (and are not limited to) bow stems, strut assemblies, bow chocks, hawsepipes, rudder trunks, and other supported hardware.

Victaulic

Since 1919, Victaulic's solutions and drawing services have increased construction productivity and reduced risk;

Equipment

Todd Nelson
W&O Supply

Victaulic

helping to ensure projects are completed safely, on time and within budget. In the early 1920s Victaulic gathered its sea legs and began to demonstrate value in rigorous maritime applications. The small product footprint and light weight design allowed their couplings to be employed in tight shipboard spaces and areas of the ship where a weld arc or fumes could be deemed risky or impossible. Today, Victaulic products are certified by the U.S. Coast Guard, global regulatory agencies, and classification societies for many shipboard applications.

W&O Supply

For over four decades, W&O Supply has been a top source for pipe, valves and fittings to the maritime and offshore industries. Through the years, W&O broadened its offerings to include value added engineered solutions including pumps, actuation expertise and assembly, consultancy, and project-management services. W&O operates its global branch network from Jacksonville, Fla., plus 17 locations in the U.S., Canada, Europe and Asia with more than $65 million in stock items to provide mission-critical products and services around the clock from strategically located service centers globally.

Steady growth over the years has led W&O to expand its products and territories and is now one of the world's largest suppliers of actuation, engineered solutions, pipe, valves, and fittings to the marine and upstream oil and gas industries. The company serves all segments of the maritime industry, including commercial shipping, the U.S. Navy, Military Sealift Command, MARAD, U.S. Coast Guard, cruise lines, barge owners, upstream oil and natural-gas rigs, and shipyards that build and repair vessels of all sizes. W&O was selected as the major supplier of valves on board the new USCG Offshore Patrol Cutters being built by Eastern Shipbuilding.

Services & Distributors

360 Coverage Pros

360 Coverage Pros is administered by Gallagher Affinity, a global insurance brokerage, risk management and consulting services firm. Founded in 1927, Arthur J. Gallagher is the third-largest insurance broker in the world and has operations in 33 countries and offers client service capabilities in more than 150 countries around the world through a network of correspondent brokers and consultants. The Marine License Insurance Program is underwritten by Berkley Offshore Underwriting Managers, a member company of Berkley, whose member insurance companies are rated A+ (Superior), Financial Size Category XV by A.M. Best Company.

With the new Marine License Insurance Program from 360 Coverage Pros, professional mariners can put affordable, comprehensive, "A+" rated professional liability coverage in place within minutes, allowing them to focus on what matters most-their career. 360 Coverage Pros Marine License Insurance was developed by mariners who understand the daily risks associated with the maritime industry, with coverage starting as low as $25.83 per month. Preferred rates and custom programs for companies, associations, fleets, unions and other groups can be tailored to meet any organization's needs.

ABS

ABS is one of the world's biggest classification societies, with thousands of employees worldwide driven by a mission to promote the security of life and property and preserve the natural environment. A founding member of IACS, the organization serves both the global marine and offshore sectors. ABS offers technical support during the design, construction and operation of commercial marine assets, providing the tools and services that can extend their operational lifecycles.

The strong global safety record of the ABS-classed fleet illustrates the group's commitment to protecting people; as an organization, ABS leads by example, consistently setting industry benchmarks for class safety. In 2019, ABS' global workforce achieved the unprecedented record of three consecutive years without a work-related long-term injury.

Globally, ABS continues to develop the innovative products and services that safely address the key challenges associated with digitization and connectivity, cyber-security, performance optimization, reducing operating costs and environmental compliance.

Those global resources are regularly brought to bear in the U.S. shallow-water sector, where compliance and certification requirements were complicated this year by the COVID-19 pandemic.

In the U.S. Coast Guard's (USCG) Subchapter M initiative, the U.S. brown-water fleet is in the midst of implementing the most comprehensive safety and environmental legislation in its history. ABS has been contracted to verify the Sub-M compliance of more than 2,200 vessels since the start of that important regulatory rollout.

When the social-distancing requirements of the coronavirus pandemic restricted in-person audits, ABS responded by offering remote audits, which it is USCG-approved to conduct. ABS helped clients to apply for deadline extensions, as needed, and began offering remote support for companies' internal audits.

Most U.S. domestic brown-water operators have never been regulated, so ABS offered training to help with Sub M planning and operations, and the development of the safety-management systems that are mandatory under the new regulation for operators who chose the TSMS option.

Services & Distributors

Advanced Mechanical Enterprises

Karl Senner, LLC

ABS also offered remote surveys to clear vessel repairs, such as those for damage that may restrict operations under CG-835s. These surveys help clients by verifying the repairs have been made in accordance with requirements; provision of the associated reports to the USCG allows the vessels to resume operations as quickly as possible.

Keeping people safe – and assets operating – during the COVID-19 pandemic poses unprecedented challenges for operators, both overseas and in the U.S. In response, ABS in April published Response Measures to COVID-19 for the Marine and Offshore Industries, a guidance document designed to help asset-owners prevent and respond to outbreaks of the virus. The best-practice guidance was subsequently published, with permission, on the American Waterways Operators' website to help its members respond to the safety challenges associated with the spread of COVID-19.

Two other relatively new ABS services that have been well received by operators in the U.S. shallow water sector are asset management and cyber security. Helping owners to maximize resources, the ABS 'Condition Manager' tool provides a digital dashboard that offers a remote way to track the integrity of a vessel's hull and machinery, including inspections, repairs and spare-parts management.

The ABS CyberSafety program provides asset owners, shipyards, designers, vendors and ship managers with the tools and knowledge to help them understand and manage the risks associated with cyber-security, software quality and data integrity as they navigate the digital age.

Advanced Mechanical Enterprises

AME is a mechanical reliability services company specializing in predictive and preventative maintenance for machinery assets on land and sea. Under the direction of maritime engineer Rich Merhige, AME has been commissioned worldwide to consult on some of the most complex vibration and alignment projects for various applications, including those on workboats and motor yachts, pumping stations, power plants and manufacturing facilities. Condition monitoring and precision alignment cutting edge technology, methods and procedures form the backbone of the asset management support AME provides. With vibration analysis, diesel engine condition monitoring, shaft torque and power measurements, ultrasonic and infrared technologies, the company can pinpoint exactly what issues machinery is experiencing, or what components need to be addressed to prevent unforeseen downtime and outages. Once data is analyzed, AME has the know-how, equipment, resources and expertise to correct it. Whether laser, strain gage, optical or feeler gage – AME will get your alignment straight. When one-size-fits-all isn't an option, AME's two fully equipped machine shops can fabricate, balance, machine, weld and line bore customized solutions. The firm's

hydraulics department can also handle service and repair, including stabilizers, steering systems, thrusters and more.

The American Equity Underwriters, Inc.

The American Equity Underwriters, Inc. is the program administrator of the American Longshore Mutual Association Ltd., a group self-insurance fund authorized by the U.S. Department of Labor to provide USL&H coverage for the liabilities of its members under the United States Longshore & Harbor Workers' Compensation Act. AEU works with insurance brokers to provide USL&H coverage to employers who are members of ALMA, including shipbuilders, ship repairers, marine terminal operators, stevedores, marine contractors and other waterfront businesses. With a history rooted in maritime, AEU is keenly aware of the challenges faced by waterfront employers and has carefully built services and teams around loss control, underwriting and claims handling to directly address the challenges and intense regulation these employers face. Our members can rest assured their unique exposures are being managed by experts in longshore.

Michael L. Lapeyrouse
The American Equity Underwriters, Inc.

Karl Senner, LLC

Karl Senner, LLC is a family business established by Karl H. Senner in 1972. It is now owned and operated by his son and grandsons entering the third generation. In 1967 Karl sold the very first Reintjes gearbox in North America, quickly making a strong name by selling reliable products and providing dependable support for his customers. In 1999 the company was approached by azimuth manufactured that shares a very similar design philosophy to that of Reintjes, and shortly thereafter Karl Senner, LLC became the exclusive sales and service representative for Steerprop in United States, Mexico and the Bahamas. As the azimuth market grew, Karl Senner, LLC was chosen to supply Steerprop thrusters onboard over 155 diesel-electric vessels side-by-side to EPD Electrical Systems. This collaborative partnership poised Karl Senner, LLC to become the North American representative for Marine in 2015. Today, Karl's son Ralph and his sons Karl and Christopher still operate under their fathers' philosophy remaining dedicated to the product, customer support, parts availability and even in-house training. Family is everything at Karl Senner, LLC, from the founding family itself, to people they employ and their families, the family of vendors and the family of customers formed by principles of Karl himself. Karl Senner, LLC looks for long-term partnerships for generations to come. It is forward thinking yet rooted in tradition. Karl Senner, LLC is the exclusive sales and service representative for Reintjes Marine Transmissions, Steerprop Azimuth Thrusters, and EPD Marine Electrical Systems throughout North America.

The company has reported tremendous growth and development over the past few years, highlighted by progress increasing its customer base with multiple new customers converting to Karl Senner products. Simultaneously, the firm has improved the overall efficiency and responsiveness of its already highly regarded service department. Karl Senner, LLC has seen the primary demand for gearboxes and Z-drives from several market sectors including inland towboats, ferries, fishing vessels, harbor tugs and govern-

Services & Distributors


Massachusetts Maritime Academy

Resolve Marine

ment vessels. The common horsepower range extends from about 800 to 3,500 horsepower per shaft line, arrangements in single, twin, triple, and quad screw arrangements. Industry-proven diesel electric and hybrid systems are seeing high increase in interest and demand in new market segments. Karl Senner, LLC has become the leading Z-drive supplier for high horsepower (6,000hp+) inland towboats, delivering Steerprop Z-drives for all nine existing vessels in North America to date.

Massachusetts Maritime Academy

Massachusetts Maritime Academy is a fully accredited, four-year, co-educational state university offering Bachelor and Master of Science degrees that are highly regarded in the worldwide maritime industry and beyond. Located at the mouth of the scenic Cape Cod Canal, MMA prepares women and men for careers on land and at sea. Through Sea Terms and Cooperative Education Programs, undergraduates log invaluable career experience during their four-year pursuit of a Bachelor's Degree, often while traveling to foreign countries. Upon graduation, cadets are qualified to lead as licensed maritime professionals, skilled business managers, ship safety officers, commissioned military officers, and more. The U.S. Department of Transportation's Maritime Administration (MARAD) recognizes the Academy as one of six state maritime colleges approved to prepare graduates for federal license examination as third mate, ocean vessels, unlimited tonnage or third assistant engineer, steam or motor, unlimited horsepower.

Eying future prospects in the growing U.S. offshore wind industry, MMA has launched the first-in-the-nation offshore wind crew transfer training facility. Focusing on basic safety training for the offshore wind industry courses comprising five modules: first aid, manual handling, fire awareness, working at heights and sea survival. Training takes place on campus at the indoor climbing and Crew Transfer Training Facility.

Maritime Professional Training

Maritime Professional Training is a full service private maritime school that has been training mariners since 1983. Its Fort Lauderdale, Fla. based campuses host over 45,000 square feet of classrooms, deck and engineering training labs, the Ship's Store, and student service facilities. In addition to the MPT main campus, training programs also take place at the MPT SMART Simulation Center, Marine Tech Shipboard Firefighting Site, the Sea Survival Training Facility, and on board the MPT fleet of training vessels.

MPT offers all levels of certification, license and document study programs. Many of these offer in-school testing and are USCG-approved and recognized by many foreign administrations. MPT's training programs are designed to meet and exceed IMO standards and are STCW Compliant.

Services & Distributors

Over the years MPT has trained thousands of commercial mariners, yachting professionals and enthusiasts, with a client list that includes commercial shipping companies, marine corporations, the military, vessel management firms, superyacht personnel and thousands of other individuals.

MOPS Marine License Insurance

MOPS Marine License Insurance has been protecting the USCG licenses, livelihoods and professional reputations of mariners across America since 1935. MOPS provides its policyholders with defense of their USCG-issued licenses following a covered marine casualty. For one annual premium payment, MOPS policyholders are assigned an experienced maritime attorney who represents them from the first report of casualty through any and all administrative proceedings and, if necessary, appeals. Providing unlimited license defense and optional income protection, civil legal defense and professional liability coverage, MOPS has been in the corner of professional mariners for more than 85 years.

Resolve Maritime Academy

Resolve Marine provides global salvage, emergency response, training and compliance solutions as well as naval architecture, marine engineering and marine services. The company translates real-world experience into intense, live-action fire, safety, and damage control training at its "as real as it gets" Maritime Academy in Fort Lauderdale, Fla.

Initially developed to train in-house OPA90 SMFF response teams, the Resolve Maritime Academy has grown into a nationally recognized educational facility training thousands of students from all over the world. From OPA90's inception in the 1990s, Resolve has been at forefront of marine firefighting and is considered to be a leading emergency response provider with the most advance fire/safety training facility in North America. The Academy specializes in shipboard firefighting, maritime firefighting for land-based teams, safety and damage control training. Academy courses are USCG/MCA and STCW approved certification programs fulfilling requirements for license upgrades, renewals, and revalidations.

At the core of the Academy's training is the T/V Grey Manatee fire trainer which is a 140-foot shipboard firefighting simulator located inside Port Everglades that utilizes live fire, search and rescue training scenarios giving students the experience of real smoke, intense heat, full-gear practice using real-world tactics. Academy courses include firefighting aboard maritime vessels, organizing and training fire response teams, proper handling and use of onboard fire suppression equipment/systems, and crisis management/damage control. Combing in-classroom learning and live-action training, students are taught by instructors who are professionals in the emergency response industry with access to Resolve Marine global response operations.

Sewart

Founded in 1969 by Allie W. Adams Jr., Sewart has grown into one of world's leading distributors of Twin Disc, Hamilton Jet, and Veth Propulsion products along the U.S. Gulf Coast for the marine industry. The firm has been celebrating its 50-year anniversary throughout 2019 and into 2020, and as part of the milestone anniversary, the organization has been rebranded from Sewart Supply to Sewart.

Sewart operates two Louisiana offices located in Morgan City and Harvey, and its Texas-based operations are headquartered in Friendswood, Texas. Sewart claims to be the world's largest stocking distributor of parts and assemblies for commercial and recreational marine applications, industrial applications and oil and gas applications. The company sold more than 400 marine gear units in 2019, and says it's on track to exceed that in 2020.

"Strategically partnering with the manufacturers that we have has allowed us to be flexible and move into nontraditional markets for Sewart. Even though our products are being used in more applications than ever before we are still focused on delivering quality products with outstanding service," says Allie Adams IV.

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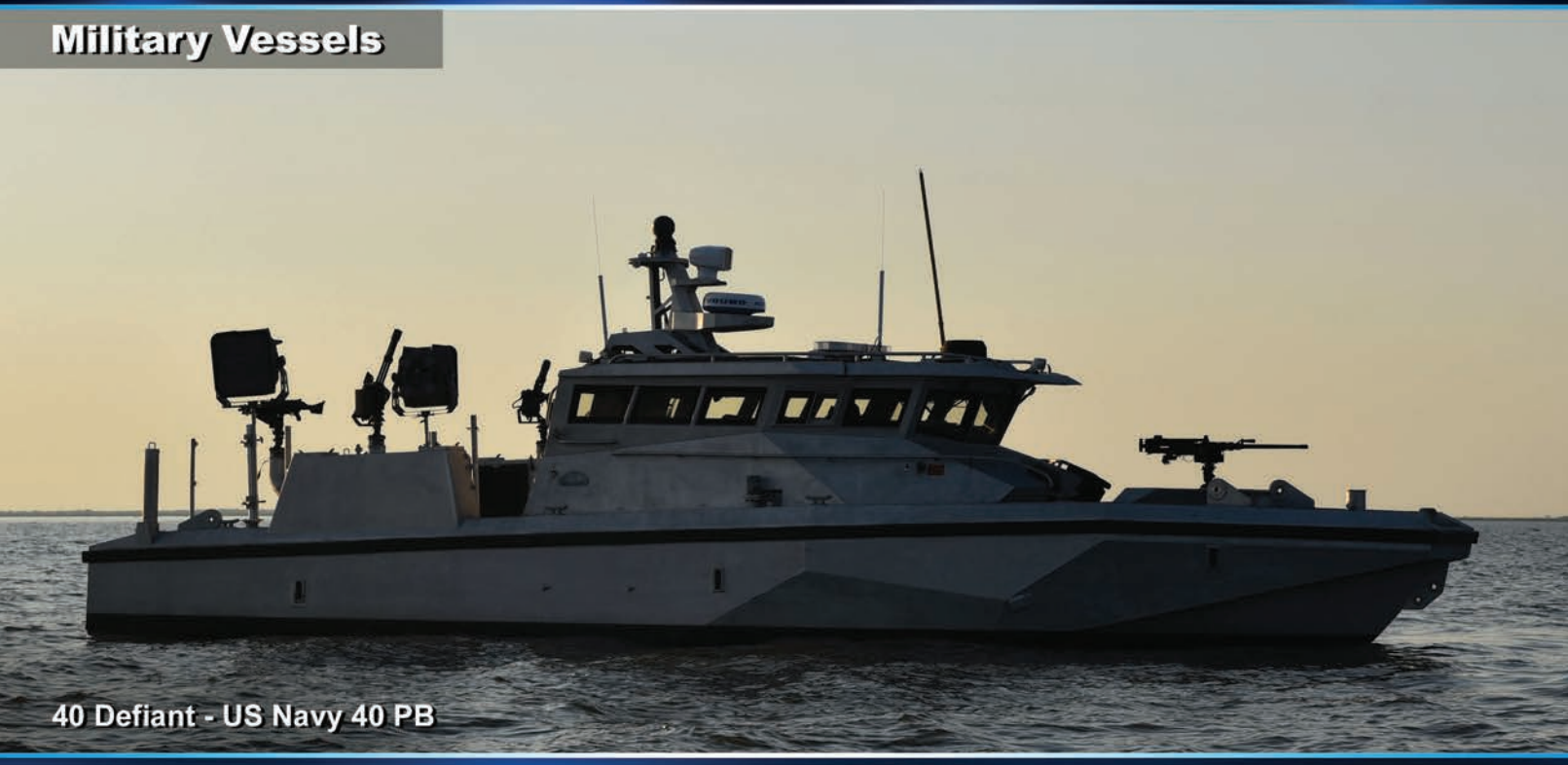
METAL SHARK

METALSHARKBOATS.COM

Military Vessels



40 Defiant - US Navy 40 PB

Designed for the Future. Delivered Today.

Fireboats

70 Defiant - Canaveral Fire Rescue

Pilot Boats

55 Defiant - Pascagoula Bar Pilots

Operators across a wide range of markets are discovering the many benefits of Metal Shark. Our advanced, modern designs offer crew-friendly features and globally-proven hull forms. Meanwhile, our military-honed serialized construction methods and stock boats program assure high-quality builds with significantly reduced lead times.
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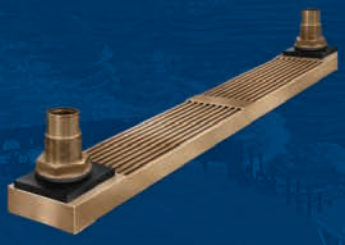
We take the heat, so you don't have to.

Cool. Because you need it.
We deliver cool based on your reality. So no matter where you operate, hot days and heavy loads will never slow you down.

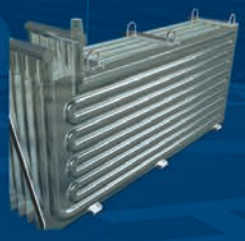


GRIDCOOLER® Keel Cooler

- **One Piece Head Design** maintains greater structural integrity.
- **Higher Silver Content Braze Joints** resist fatigue and maintain the strength of surrounding material.
- **Better Penetration at Braze Joints** places more braze material with less heat, making joints stronger.
- **2-Year Warranty on Copper Nickel GRIDCOOLER Keel Coolers:** Industry-leading design, craftsmanship and materials create industry-leading products.
- **70 Years of Experience with Fully Assembled Packaged Keel Coolers**: Our focus is and always has been heat exchangers.

WEKA Boxcooler®

- **Over 20 Years of Experience with Copper Nickel Boxcoolers** offering longer product life cycle than standard coated tube units.
- **Manufactured in the USA and The Netherlands:** provides the greatest product availability.
- **Weka Guard and Protector** eliminate the need for bulky and costly copper sacrificial anodes.



Tranter® Heat Exchangers

- **Tranter Heat Exchangers** product offerings make Fernstrum your single source for multiple stage cooling systems.
- **Tranter Superchanger** plate and frame heat exchanger provides a range of options in pattern, size and material for a wide variety of applications.
- **Tranter Platecoil** provides an efficient and cost effective alternative to traditional pipe coil heating for bulk cargo, ballast and other applications.

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R.W. Fernstrum & Company

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