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Volume 31 • Number 3

Marine News

MARCH 2020

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Ship Repair & Conversion

There's a new name on the U.S. West Coast

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The Great Lakes fleet remains fit for service

Emissions Compliance
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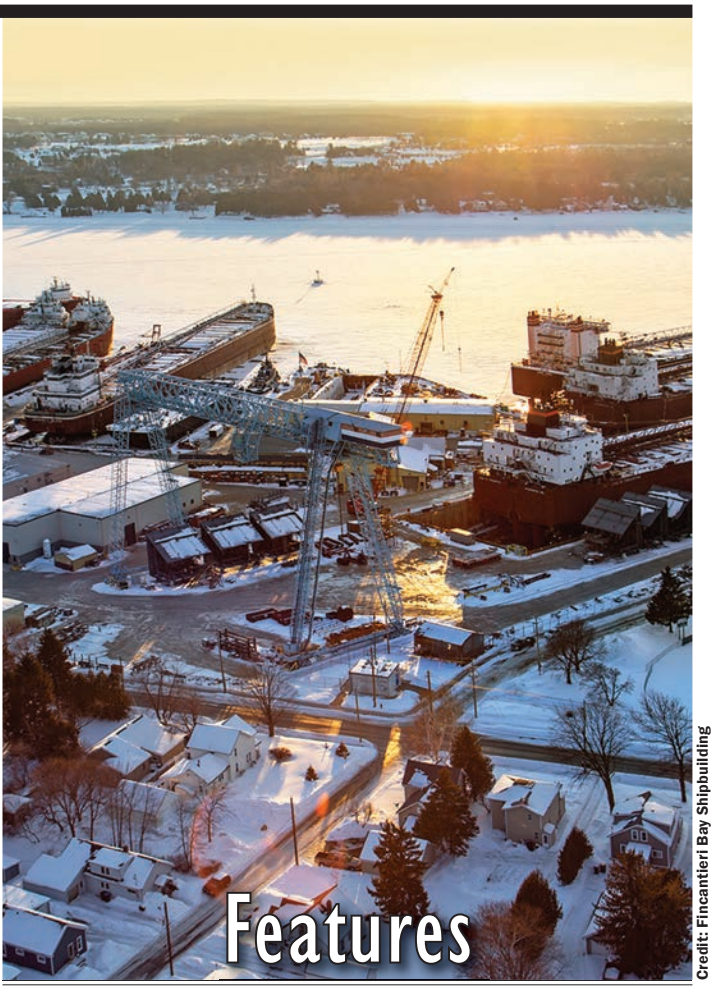

Credit: Fincantieri Bay Shipbuilding

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Everett Ship Repair is a new name in ship repair now up and running on the U.S. West Coast.

Image credit: Everett Ship Repair

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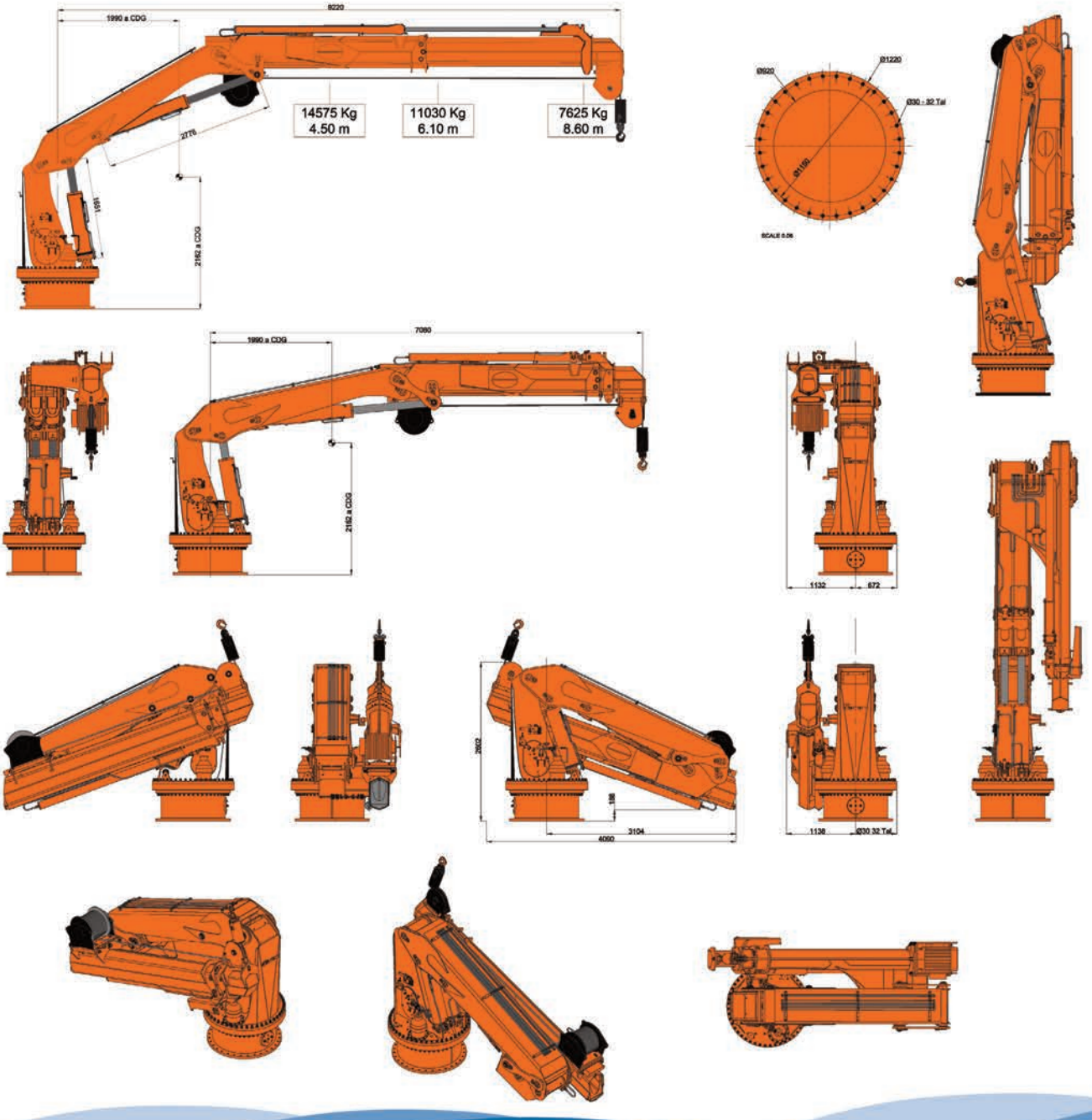

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EDITOR'S NOTE

Operating and working in the U.S. maritime industry has never been easy, and new challenges will always emerge to ensure it remains that way.

But a look around the industry can be encouraging. We continually see industry leaders tackling obstacles head on. Technical, regulatory, environmental, cultural, market, safety, etc.; the list is long. Yet, while challenges vary in form and level of difficulty, the response among leaders is typically the same. Let's buckle down and handle it.

The U.S. Coast Guard, of course, is "always ready" for a challenge. *Semper Paratus*, after all. In February I traveled to Charleston, S.C., where I heard Commandant Adm. Karl Schultz outline in his 2020 State of the Coast Guard Address a number of key challenges confronting the service today. Insufficient polar icebreaking capabilities, communications breakdowns in Alaska and elsewhere, IT systems on the brink of catastrophic failure, a $2 billion facility repairs backlog, government funding shortfalls and new and evolving security threats are just a few.

Nevertheless, the Coast Guard has triumphed despite its challenges, often by turning them into opportunities. In general, I'd say that the maritime industry has too.

Emissions and other environmental concerns are central among top challenges for today's marine operators. Robert Kunkel and Tom Ewing explore this topic in articles beginning on pages 30 and 34 respectively.

As anyone reading these pages knows all too well, ship repair and keeping vessels in good running order is often a difficult and costly job, particularly when the vessels are several decades old. This is the case with the venerable fleet of ships operating on the Great Lakes. Rick Eyerdam reports this month for *Marine News* on the regional repair work on the Great Lakes fleet, starting on page 40.

Finally, there's a new name in U.S. vessel repair: Everett Ship Repair, this month's cover subject. While the Everett name may be new, Gavin Higgins, the executive running the operation is a long-tenured industry veteran likely known to most of you. Everett is a subsidiary of Ice Cap Holdings, LCC and sister company to Nichols Brothers Boat Builders, and this month Higgins serves as our INSIGHTS interview, starting on page 14, sharing his thoughts on how the new venture aims to ensure its customers' vessels are fit for service.

Eric Haun, Editor, haun@marinelink.com

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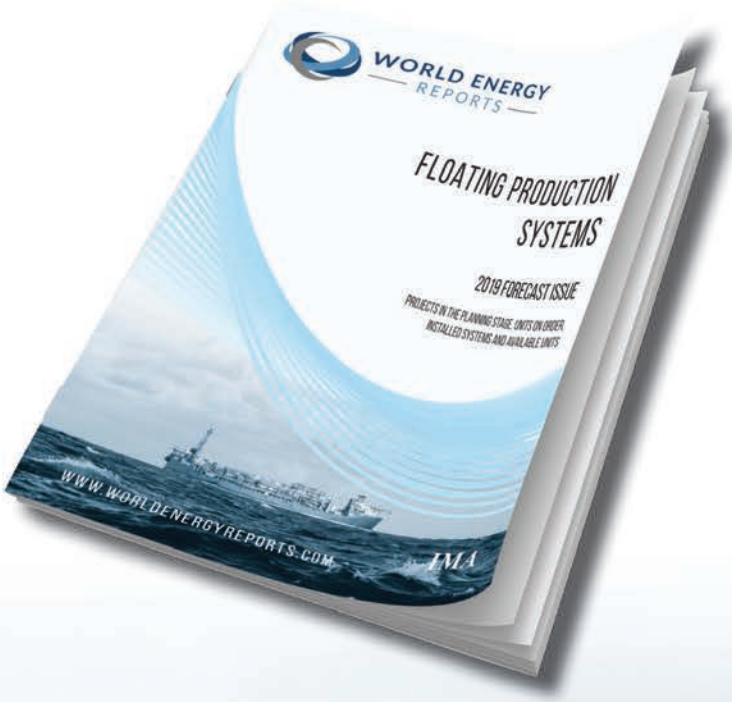

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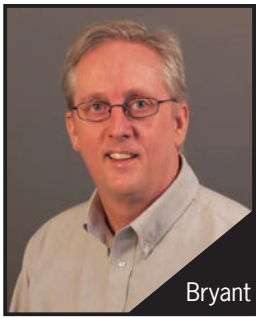
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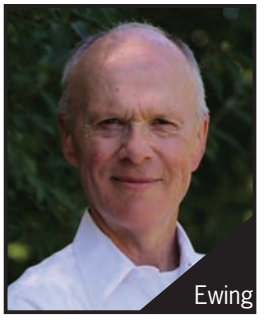
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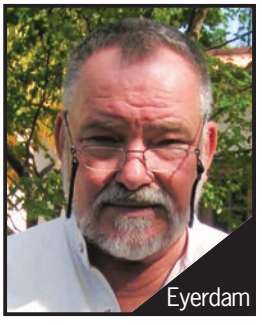
Tom Ewing is a freelance writer specializing in energy and environmental issues. He contributes regularly to this magazine.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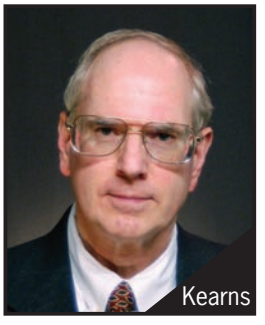
Kearns

Journalist and editor **Rick Eyerdam** was formerly Editor of Florida Shipper magazine. Additionally, he was Executive Director of the Miami River Marine Group and Captain of the Port of the Miami River. His articles have appeared in myriad shipping magazines and newspapers since 1970.


Koski


Kunkel

James A. Kearns has represented owners, operators, financial institutions and end users for more than 30 years in the purchase, construction and financing of vessels engaged in both foreign and U.S. coastwise trades.

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Robert Kunkel, President of Alternative Marine Technologies and First Harvest Navigation, is a frequent contributor to *Marine News*. He served as the Federal Chairman of the Short Sea Shipping Cooperative Program under the U.S, Maritime Administration from 2003-2008. He sailed with several U.S flag companies as a licensed engineer, was commissioned as a Navy Officer and continued his career in ship construction at various yards globally.

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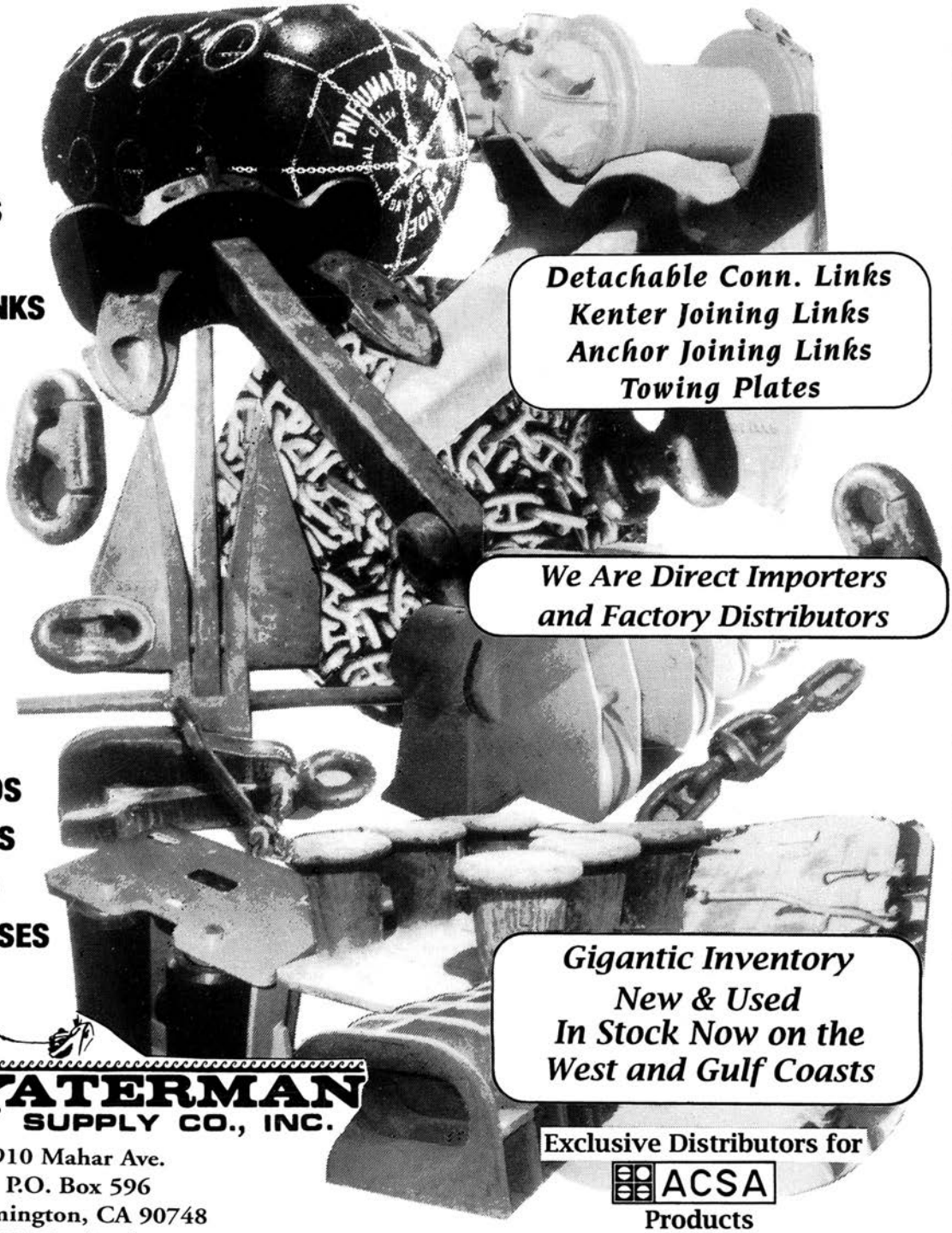

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USCG/AWO Annual Safety Report

The American Waterway Operators (AWO) and the U.S. Coast Guard (USCG) issued their annual safety report at the National Quality Steering Committee (NQSC) meeting in February 2020. Think of it as a safety report card for the domestic towing industry.

The NQSC uses three measures to track overall trends in safety and environmental protection. These useful indicators of towing industry trends include (a.) crew fatalities per 100,000 towing industry workers, (b.) gallons of oil spilled from tank barges per million gallons transported, and (c.) the number and severity of towing vessel casualties. Scouring towing industry data and measures for calendar years 1994 to 2018 the report also includes summary statistics on crewmember injuries, which the NQSC began tracking in 2006.

In 2018, there were four operational towing vessel crew fatalities. While 14 deaths were reported to the Coast Guard aboard freight carrying towing vessels in 2017, only four were related to towing operations. The others were due to preexisting medical conditions (six), one suicide and an intoxicated crew member falling overboard while the vessel was moored. Hence, as can be seen in Chart 1, the rate of fatalities aboard U.S. towboats continues to trend downward. Crew fatality rate is calculated using the "Mercer Model", developed with AWO-funded research. The denominator for this rate is derived from the number of towing vessels in operation, as reported by the U.S. Army Corps of Engineers (USACE). As with some government generated data, USACE numbers lag one calendar year behind USCG data. Therefore, the 2017 USACE data is used with the 2018 crew fatality number to project the 2018 crew fatality rate. Table 1 shows the fatality rates per 100,000 FTE calculated by the Bureau of Labor Statistics (BLS) for all workers from 2012 to 2017. Additionally, Table 1 shows the fatality rates for the

Chart 1 – Operational Crew Fatalities by Calendar Year (CY)

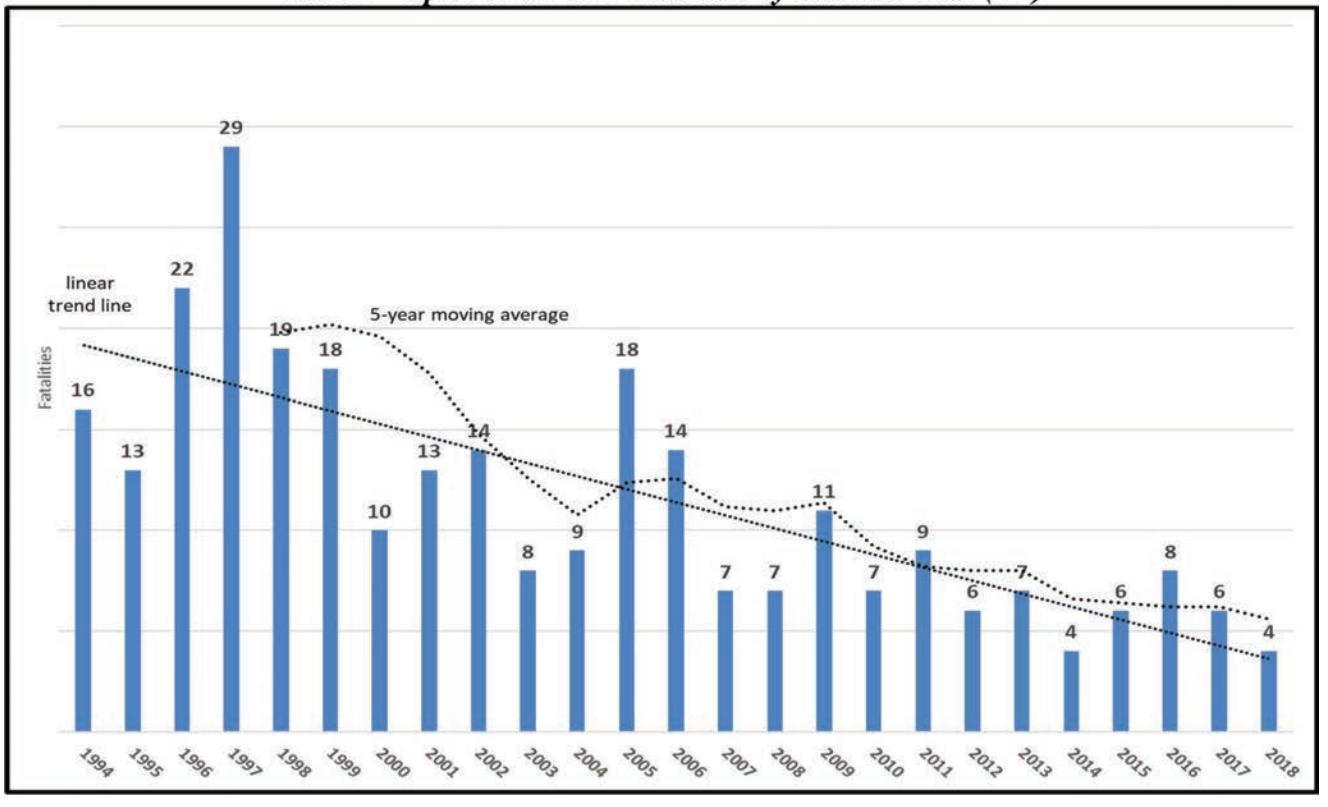

Table 1 – Comparison of Worker Fatality Rates	Worker Fatality Rates per 100,000 FTE					
	2012	2013	2014	2015	2016	2017
Bureau of Labor Statistic (BLS), All Fatal Work Injuries	3.4	3.3	3.4	3.4	3.6	3.5
BLS, Transportation Sector Fatal Work Injuries	14.6	14.4	15.4	14.7	15.4	15.1
Towing Industry, Crew Member Operational Fatal Work Injuries	6.7	7.8	4.4	6.7	8.6	6.2

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transportation sector and towing industry. For 2017, the towing industry fatality rate is 6.2, which is less than half the transportation sector but almost double the rate for all fatal work injuries. It's a dangerous world out there.

On the environmental front, the USCG reported 36,046 gallons of oil were spilled as a result of 55 tank barge pollution incidents in 2018. Chart 5 shows the total gallon quantity of oil spilled from tank barges for calendar years 1994 to 2018. The largest spill was the result of an allision between a barge and a moored vessel in Port Arthur, Texas. The resulting 26,020 gallons of ultra-low sulphur marine diesel discharge accounted for 72.2%of the total volume of oil spilled in 2018.The second largest oil spill in 2018 resulted from an allision between a barge and a concrete finger pier in the Lower Mississippi River, which caused a discharge of 9,450 gallons of biodiesel – or 26.2% of the total volume of oil spilled in 2018. While even one barrel spilled is one too many, two spills accounted for 98.4% of the total volume of oil spilled from tank barges in 2018. To say that the industry, over the past 20 years, has exponentially cleaned up its environmental signature would not give nearly enough credit to those firms providing service in this sector.

The projected oil spill rate for 2018 is approximately 0.48 gallons of oil spilled for every million gallons transported, or one gallon of oil spilled for every 2,083,222 gallons transported. The tank barge oil spill rate is calculated using USCG data, along with USACE data. The latest version of the publication available is for calendar year 2016; therefore, the 2017 (1.13) and 2018 rates are a projection based on 2016 data. In 2016, the USACE reported that approximately 74.8 billion gallons of oil was transported by barge on U.S. waterways. That amount represents 81% of all petroleum carried on domestic waterways. In 2016, the amount of oil transported by barge on domestic waterways decreased by 10.2 million short tons or 2.8 billion gallons, a 3.6% decrease from 2015. The overall spill rate decreased somewhat in 2018 as the oil spill rate continues to be relatively low considering the overall volumes transported, and that oil volumes transported by barge have increased greatly.

In terms of safety itself, a vessel incident is defined as a casualty involving a towing vessel or barge engaged in carrying freight. Incidents where only a crew member death, injury, or operational tank barge spill occurred, without a precipitating or associated towing vessel or barge incident, are not included in this measure since they are included in other sections of the report. Chart 7 shows the number of towing vessel incidents reported and classified by the AWO-USCG Severity Scale. The Severity Scale, was developed by the NQSC to assist in the classification of these incidents. Towing vessel incidents include ALL reportable marine casualties that involve a towing vessel or barge involved in freight movements. Tugs and barges involved in the construction, dredging, and industrial services are not included. Each incident is counted only once, regardless of the number of involved vessels or recorded events.

In 2018, there were 1,117 towing vessel incidents, of which 81.6% were classified as low severity incidents. Medium and high severity incidents represented 11.8% and 6.5%, respectively.

The top four categories of towing vessel medium and high severity incidents were allisions (36.6% of total), material failures or malfunctions (16.1%), groundings (10.2%), and loss/reduction of propulsion/steering (6.3%).

In 2005, the Coast Guard began documenting injury severity with each incident investigation. In 2018, there were 115 incidents onboard towing vessels or barges that resulted in injuries to 120 crewmembers (six incidents resulted in injuries to multiple crewmembers). Unfortunately, the total number of injuries as well as the number of injuries in at each level of severity rose from 2017. The 120 total number was the highest since the 133 injuries recorded in 2014. Table 3 provides a breakdown of the injuries by severity category, and Table 4 provides the number of critical, severe, and serious injury accidents by accident type for CY 2018.

The one critical injury in 2018 was the result of an unstable barge rolling over and crushing a mate who was on an adjacent barge. The five severe injuries in 2018 were the result of crewmembers being caught in rigging/lines (three incidents) or crewmembers being injured during crane operations (two incidents). There were 22 serious injuries in 2018 included nine falls and seven cases of being crushed between objects.

Table 3 – Number of Injuries by Severity Category, CY 2015-2018

Injury Severity	2014	2015	2016	2017	2018	Total
Critical	1	4	0	0	1	6 (1.1%)
Severe	11	2	5	2	5	25 (4.5%)
Serious	32	23	20	15	22	112 (20.3%)
Moderate	67	46	39	35	50	237 (43%)
Minor	22	34	36	37	42	171 (31%)
Total	**133**	**109**	**100**	**89**	**120**	**551**

Table 4 – Critical, Severe, Serious Injuries by Accident Type for CY 2018

Accident Type	# of Accidents
Contact Injury- Fall onto surface	9
Contact Injury- Crushed between objects	8
Contact Injury-Line handling/caught in lines	5
Contact Injury- Struck by moving object	3
Overexertion Injury- Strain or sprain	2
Contact Injury- Other	1
Total	**28**

Chart 5 - Gallons of Oil Spilled from Tank Barges per CY

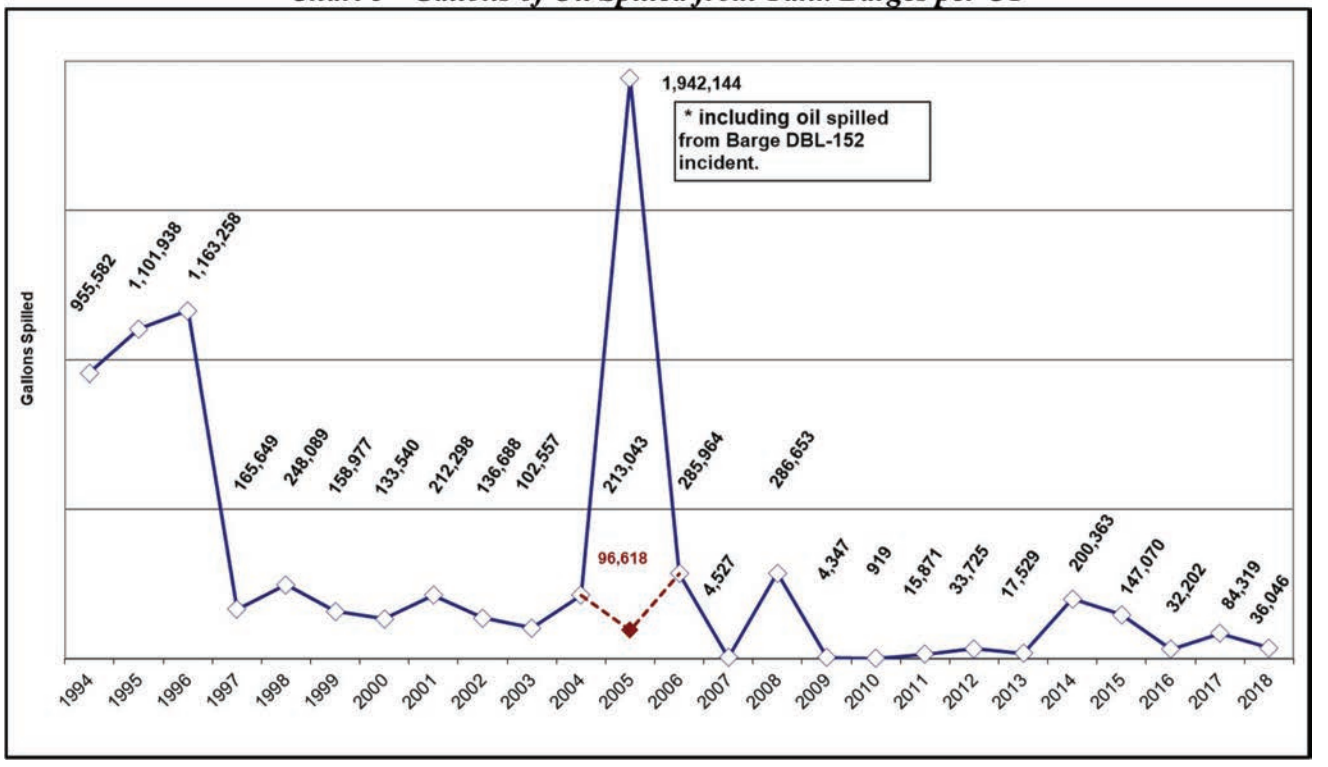
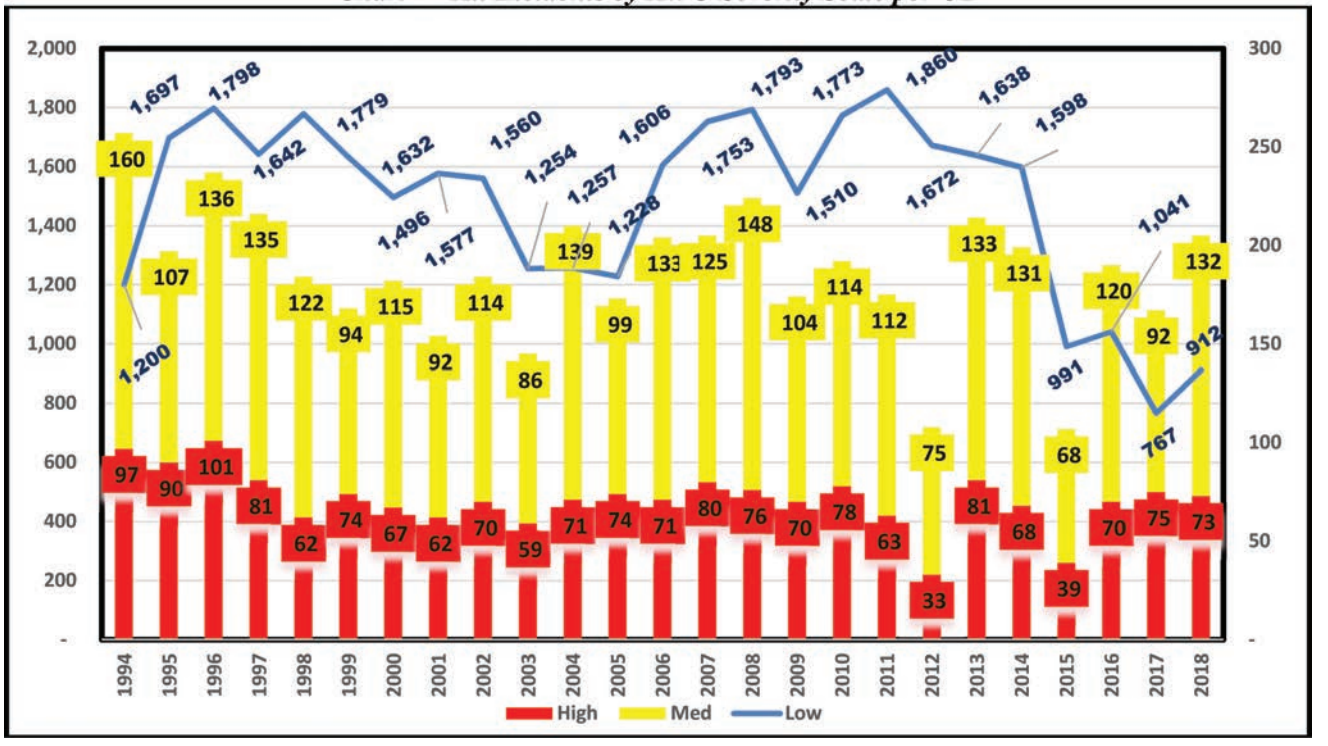


Chart 7 - All Incidents by AWO Severity Scale per CY



Read the AWO/USCG report:
https://www.americanwaterways.com/sites/default/files/2019-USCG-AWO-Annual-Safety-Report.pdf

Gavin Higgins

CEO,
Nichols Brothers Boat Builders and Everett Ship Repair

All photos: Everett Ship Repair

Everett Ship Repair (ESR) is a relatively new name in the U.S. ship repair business. Established in October 2019, the Pacific Northwest shipyard is owned by Ice Cap Holdings, LLC, which is also the parent company to another shipyard not too far away: Nichols Brothers Boat Builders (NBBB).

Both ESR and NBBB are headed up by CEO Gavin Higgins, who is responsible for the development of new business opportunities and cultivation of new business relationships, including working with industry groups, naval architecture firms, subcontractor and suppliers, to ensure the two shipyards establish and maintain prominent roles in their respective operations.

An experienced shipyard executive, Higgins worked as a General Manager of Shelbume Ship Repair with Irving Shipbuilding, Inc. before signing on at NBBB in 2012. Previously, he served as Vice President and COO for Derecktor Shipyards in its Bridgeport, Conn. facility and as Chief Engineer at its Mamaroneck, N.Y. facility.

Higgins has a degree in naval architect from Southampton College and an MBA from the University of Connecticut. A Fellow of the Royal Institute of Naval Architects (RINA) and a Member of the Society of Naval Architects and Marine Engineers (SNAME) in the United States. Higgins serves on The American Bureau of Shipping's (ABS) Committee on Small Vessels and is a member of the Shipbuilders Council of America (SCA).

In the coming pages, Higgins brings us up to speed on the new repair venture, discussing how the yard's strengths and capibilities will help Everett Ship Repair meet its goals.

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What type of business is Everett Ship Repair targeting – commercial, government, both? And what are your top goals as head of the new yard?

ESR customer base will be commercial operators, government agency and federal operations. The drydock capacity allows for a wide range of vessel size, and with support from the existing Nichols Brothers Boat Builders management and experienced personnel, the diverse customer portfolio is ideal.

We aim to build a world class ship repair facility that can support the needs of private, commercial and government clients.

What type of investment was required to acquire the site and then begin operations? Were major on-site modifications required?

The site is owned and leased out by the Port of Everett. ESR occupies approximately three acres of laydown area, 20,000 square feet of fabrication shop area and occupies pier three directly neighboring the Port of Everett. ESR purchased the Faithful Servant, an existing drydock that serviced the Puget Sound area in Bellingham, Wash. Following the purchase ESR transferred the drydock to the new facility and began operations. The drydock is capable of hauling vessels up to 436 feet by 110 feet.

Please describe the research that went into buying the dry dock Faithful Servant, and why Everett ultimately decided to make the purchase.

We have been studying how to expand our service opportunities for a few years. The Faithful Servant has exceptional length and beam capabilities and large lift capacity. Mapping its capabilities to the market, we could see that this was an excellent opportunity to start the new venture.

The ESR website references "vast ship repair capabilities". Will you please define this?

ESR is capable of hauling vessels up to 436 feet by 110 feet with simplistic to complex work-scopes. ESR can schedule small maintenance work, extensive repair work, up to significant vessel conversions. The drydock also has capacity for double docking of smaller vessels to accommodate vessels out of season preparing for upcoming seasonal operations.

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What makes ESR different from other repair yards?

Principally it will be the size range that the dock can handle. ESR is one of only three facilities that can dock vessels with beams greater than 90 feet.

What are the advantages to having ESR and sister company NBBB in relatively close proximity?

NBBB is a full-service shipyard that has all the skills required to build vessels up to 350 feet in length. The ability to share that resource to support work and utilize the apprenticeship program to support future growth if the yard is a giant asset.

With Everett now in existence, will NBBB's repair, maintenance and conversion work shift to the new site and free up NBBB to focus on new construction exclusively?

Nichols Brothers will continue business as usual. NBBB has a great barge/ferry/tug repair customer pool who they will continue to serve. NBBB repair is limited to size constraints of vessels up to 275 feet in length with a draft maximum of 18 feet and vessel weight of 2,500 ST. This is only a constraint when hauling vessels into the yard, due to the unique hauling method.

ESR's repair capacity is much greater than Nichols', ac-

commodating vessels up to 436 feet by 110 feet by 32 feet. NBBB has a "sweet spot" repair size, if you will. Both facilities can accommodate vessels of all complexities; however, size does matter.

Please give a brief rundown of the jobs performed at Everett to date. Were any of the scopes particularly challenging or unique?

The first docking was a double docking of a tugboat and fishing vessel. Both were in dock for owner-required maintenance. Second, a large oil barge came in for significant steel work. And lastly, a second large barge has come in for substantial repairs, maintenance and preservation. ESR targeted work-scopes that matched the capabilities as the facility ramped up operation. This allowed us to grow as a company while minimizing risk and offering our customers a positive first experience.

What does your current backlog entail? How far out are you booked?

ESR is booked now through the summer with work coming in rapidly.

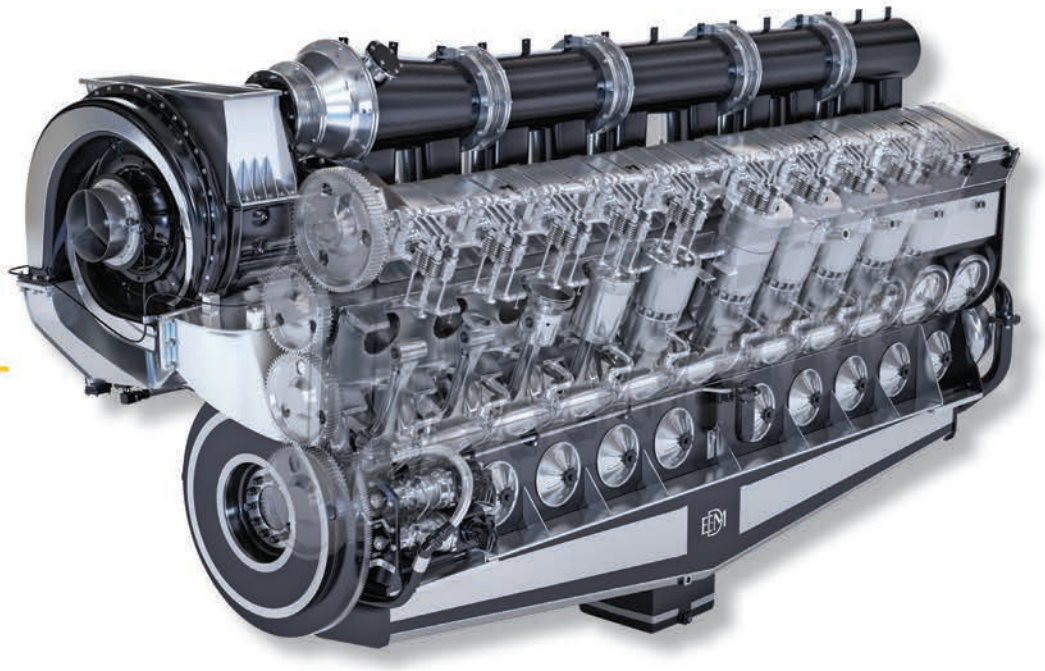
Please describe the trade services that Everett and Nichols Bothers provide.

ESR and NBBB perform in-field service work. We have great relationships with our customers, and are very familiar with their vessels. Anytime a customer needs us we offer services.

How many employees work for ESR currently? Has it been a challenge to attract talent? Are there plans for expansion?

ESR has a complete management team, production crew and production support personnel consisting of about 45 individuals. As operation develops ESR anticipates a crew of 80, plus or minus. ESR currently is recruiting for talent and interested candidates should apply only through the ESR website.

Marine Systems, Inc.



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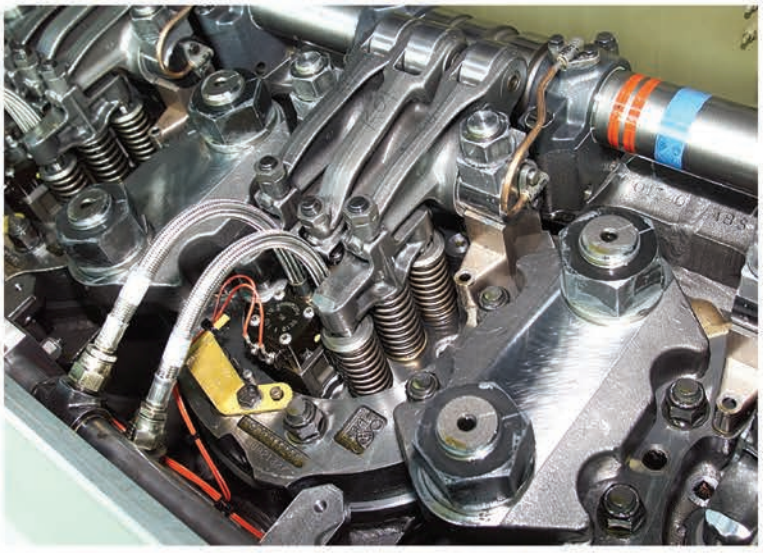

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The National Freight Strategic Plan and the Inland Waterways

By James Kearns


Kearns

The Fixing America's Surface Transportation (FAST) Act was enacted in December 2015. The FAST Act required the U.S. Department of Transportation (DOT) to develop a National Freight Strategic Plan to address multimodal freight transportation. In the Federal Register of December 27, 2019, DOT requested information from the public, including industry trade groups, to aid development of the National Freight Strategic Plan.

This article summarizes certain of the comments that were submitted by Inland Rivers, Ports and Terminals, Inc. (IRPT) in response to DOT's request. IRPT is a nonprofit trade association with nearly 300 members nationwide that advocates for our nation's inland waterways and the industries and companies that serve and utilize our inland rivers, ports and terminals. I am the Secretary-Treasurer of IRPT and I assisted the association's Executive Director, Aimee Andres, in the preparation of these comments.

We hear frequently about the 24,000 commercially navigable miles of inland and intracoastal waterways that move domestic and international cargo in America's maritime transportation system. But what transforms those thousands of miles of waterways into a freight transportation system are the ports and terminals that are on them. Inland and small coastal ports and private terminals are critically important for domestic uses and export of agriculture, mining, chemical, energy and other commodities.

The National Freight Strategic Plan relies on a second strategic planning tool that the FAST Act requires DOT to develop, namely, the National Multimodal Freight Network. At present, DOT has developed only the interim


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version of this network according to the specific components that the FAST Act requires to be used for the interim version. The only public ports of the U.S. that the FAST Act allows to be included in the interim version are those that have total annual foreign and domestic trade of at least 2,000,000 short tons, as identified by the Waterborne Commerce Statistics Center (WCSC) of the Army Corps of Engineers, using the data for the latest year for which such data is available. The interim version of the National Multimodal Freight Network that was announced in the Federal Register on June 6, 2016 listed only 113 U.S. ports as satisfying the 2 million short tons threshold.

In contrast, the WCSC itself lists no less than 150 ports as "Principal Ports of the United States" on its website, many of which have annual foreign and domestic trade less than 2 million short tons. The website of the U.S. Maritime Administration (MarAd) goes further:

> Ports are a vital part of a nation's maritime transportation system. The United States has more than 300 – operated by states, counties, municipalities and private corporations. Many of our ports, including the waterways and facilities connecting them, are complicated elements that integrate water, rail, road and even airborne transportation modes.

In contrast to the list of specific components that are prescribed for inclusion in the interim version, the FAST Act directs DOT to develop the final version of the National Multimodal Freight Network by considering a dozen factors of much broader scope, and then only after soliciting input from a wide spectrum of stakeholders through a public process that includes notice and an opportunity to comment on a draft system. These factors include, for example, the origins and destinations of freight movement within, to and from the United States; the volume, value, tonnage and strategic importance of freight; access to major areas for manufacturing, agriculture or natural resources; and intermodal links and intersections that promote connectivity (49 U.S.C. section 70103(c)). These factors would result in the inclusion in the final version of the National Multimodal Freight Network of many more public inland and coastal ports than those that meet the threshold of 2 million tons in annual trade.

By several measures, therefore, if DOT were to use only the 113 ports currently designated in the interim version of the National Multimodal Freight Network to inform its development of a national freight strategy, the maritime sector of that strategy would suffer from a significantly inaccurate and understated representation of many of the public inland ports and smaller coastal ports.

The National Freight Strategic Plan could also help the inland waterways make a greater contribution to our nation's freight transportation system by providing for expanded funding opportunities for inland and smaller coastal ports and private terminals, and by remedying the imbalance that they face even within the limited funding opportunities that exist.

Historically, federal assistance to the inland river ports and terminals has been provided through MarAd. In the Further Consolidated Appropriations Act of 2020 (Appropriations Act) signed on December 20, 2019, MarAd's budget was funded at over $1 billion, but with less than $10 million directed to inland ports through the Marine Highways Program. A significant further limitation from the perspective of inland and small coastal ports is that this amount does not generally extend to dry or liquid bulk commodities.

The Port Infrastructure Development Program included in the Appropriations Act makes $225 million available to fund projects for coastal seaports, inland river ports and Great Lakes ports, but reserves $200 million of this total amount, or nearly 90%, for coastal seaports and Great Lakes ports, in effect limiting the funding available for inland river ports to $25 million. Note that this $25 million is not reserved for inland river ports, so the inland river ports must still compete with the coastal seaports and the Great Lakes ports for the relatively small portion of the Program's funds for which the inland river ports are even eligible to apply.

It is true that there are provisions of the Port Infrastructure Development Program that are helpful to inland river ports and smaller coastal ports are: first, the minimum grant size is $1 million; second, for grant awards of less than $10 million, DOT is to give priority to ports that handled less than 10 million short tons in 2017, as identified by the Army Corps of Engineers; and third, for grant awards of less than $10 million, DOT may increase the federal share of project costs above 80%.

The fact remains, however, that the inland and small coastal ports and terminals will not be on a level playing field in terms of federal funding opportunities until there is specific dedicated funding for them by way of either a reserved percentage of existing program funding (INFRA, TIGER, BUILD, etc.) or a standalone discretionary grant program dedicated to the many inland private and public facilities that serve the nation's freight transportation needs


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on the inland waterways. For far too long, appropriation bills such as INFRA and BUILD programs and authorizing legislation like the FAST Act and WRDA have underfunded inland facilities. Infrastructure projects sought by inland facilities are far less costly than the minimum required for those programs, but the composite result provided by potentially funding these projects could be exponentially beneficial to the nation's transportation network.

IRPT has undertaken a legislative initiative of proposing to Congress an Inland Port and Terminal Grant Program to level the competitive playing field. This program would be similar to MarAd's small shipyard grant program, in that the program would be administered by MarAd, would adhere to 60-day submission and 120-day award distribution requirements, and would include both private and public facilities. The program would differ from the small shipyard grant program in that funds could be used to construct buildings, physical facilities, purchase equipment, etc.; and funds could be used for fixed landside infrastructure projects, such as docks, wharves, piers and road and rail improvements. The program would also differ from the Marine Highways program, in that the program would extend to both private and public entities, would be available for fixed landside infrastructure projects such as those mentioned above, and would extend to liquid and dry bulk cargoes.

Most of the discretionary grant programs for federal funding assistance currently require a public sponsor, yet many of the facilities moving the nation's freight are not located within a public port or they are located in rural areas in which the local public entities have very limited staff and resources. In such situations it is often difficult for a private terminal to secure a public sponsor in order to be eligible for federal funding assistance, since securing a public sponsor often means that the sponsor must spend time and resources to administer the grant, perform audits and carry out other tasks.

Private terminals on the inland waterways create jobs, relieve landside traffic congestion, reduce landside fuel consumption and emissions and avoid wear and tear on roads, bridges and rails no less than their public port counterparts. It is therefore, a benefit to the general public in terms of job creation, safety, environment and cost savings to allow private terminal facilities to be eligible for federal funding assistance.

The inland and smaller coastal ports and private terminals are proud of the role that they play in our nation's freight transportation system. They ask that this role be appropriately recognized as the nation plans its freight transportation strategy for the years ahead.

Credit: Eric Haun

The State of the Coast Guard

By Eric Haun

U.S. Coast Guard Commandant Adm. Karl Schultz outlined his vision for the service in February during the State of the Coast Guard Address in Charleston, S.C., highlighting the organization's top initiatives, accomplishments over the past year, and challenges facing the service today and on the road ahead.

The 26th Commandant stressed the importance of America's marine transportation system and highlighted Coast Guard's role in safeguarding maritime commerce among the service's many crucial contributions to U.S. security. "Our interconnected global economy relies on efficient ports and waterways. Over 90% of the world's goods move by sea. We are clearly a maritime nation, and our marine transportation system generates over 30 million jobs and $5.4 trillion annually in economic activity."

"Today we face unparalleled growth in vessel traffic and complexity within the marine transportation system, from liquefied natural gas exports, to offshore wind farms, to increasingly sophisticated vessels. These factors and a host of others all contribute to an unprecedented demand for Coast Guard services," Adm. Karl Schultz said.

"Nationwide, the Coast Guard has an enduring responsibility to safeguard the marine transportation system and bolster maritime competitiveness, infrastructure improvement, economic prosperity and national security."

"Our people are working around the clock on waterways across the country to keep our maritime industry safe and efficient, ensuring American shelves remain stocked and our vast needs for energy met."

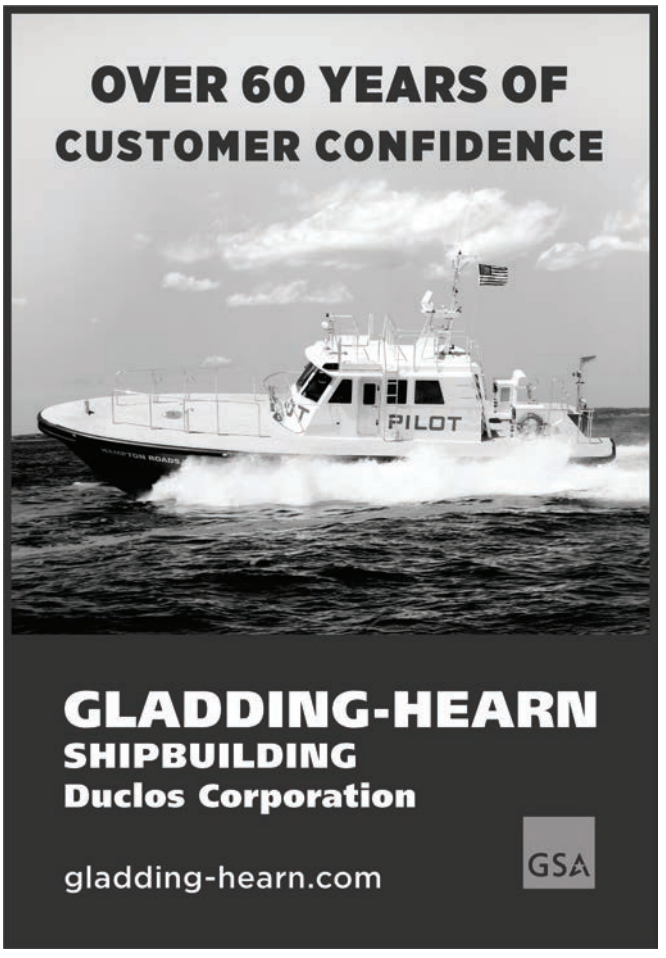
The Commandant said ongoing vessel acquisition programs, including the Polar Security Cutter and Offshore Patrol Cutter, will help the Coast Guard to best perform these duties.

"Today we face unparalleled growth in vessel traffic and complexity within the marine transportation system, from liquefied natural gas exports, to offshore wind farms, to increasingly sophisticated vessels. These factors and a host of others all contribute to an unprecedented demand for Coast Guard services."

– Adm. Karl Schultz.

"The Coast Guard operates our nation's only icebreaker fleet countering malign influence as our nation's most persistent surface military presence at the Polar regions. We do this with just two cutters: one heavy and one medium icebreaker. This is a woefully unacceptable level of presence in an area where we must be a leading force. Presence equals influence, and we must up our game with respect to high latitude presence.

"The good news is that both the Administration and Congress have duly recognized the burden our Polar Star sailors bear to meet the Nation's call. That's why I'm grateful for their recent support to fully fund our new Polar Security Cutter, the first modern heavy icebreaker to be built in the United States in half a century. Additionally, the President requested $555 million in Fiscal Year 2021 to fully fund our critically needed second Polar Security Cutter, and there's an acquisitions and funding strategy to build a third.



"And today we're developing operational requirements for medium icebreakers. A fleet of at least three Polar Security Cutters, and three medium icebreakers will ensure American sovereignty and presence in the Polar Regions for decades to come."

But it is the new Offshore Patrol Cutters that "will become the backbone of [the Coast Guard's] modernized fleet," Adm. Schultz said. "The first in its class, Cutter Argus, is already under construction and will be delivered in 2022. The Offshore Patrol Cutter program is set to deliver 25 hulls and that fleet will ultimately comprise almost 70% of our offshore presence."

Several Offshore Patrol Cutters, as well as five National Security Cutters, will be homeported in Charleston, "a future Coast Guard operational center of gravity".

Adm. Schultz shared plans to restore hurricane-damaged facilities in South Carolina and expand the Coast Guard's footprint in the Charleston area. "Over the next five years, the Coast Guard will work to consolidate our campus along one waterfront. This gives Charleston the potential to grow into the largest concentration of assets and people in the Coast Guard."

"Charleston is a first stop to nationwide investment in our service, our facilities and our people," said Adm. Schultz, who also pointed out the need to address the Coast Guard's nearly $2 billion shore infrastructure backlog.

"Every mission begins and ends at a Coast Guard facility," Adm. Schultz said. "Unfortunately, due to years of flat-line budgets forcing tradeoffs, the facilities that our men and women deploy from and return to are crumbling around them."

Similarly, the Coast Guard's information technology infrastructure is also in need of a major update, the Commandant said: "Years of investment tradeoffs have brought our information technology to the brink of catastrophic failure. Just this past summer over 95 vital systems went offline for several days due to a single server malfunction, impacting our ability to save U.S. citizens, thwart criminals, defend our nation, and yes, even to simply check our email. Our people will never fail our country, but our technology is failing our people."

Adm. Schultz rolled out a "Tech Revolution" roadmap designed to update the Coast Guard's 1990s-era hardware, software and analytics. He also described the need to strengthen service innovation initiatives and accelerate the implementation of the best ideas service-wide to field commanders. These include the marine inspector mobility application INSPECT, partnering with Global Fish Watch to

The U.S. Coast Guard helps safeguard maritime commerce.

Credit: Eric Haun

combat illegal fishing, linking to the DoD's Defense Innovation Unit in Silicon Valley, and the establishment of the Blue Technology Center of Expertise at the University of California San Diego.

Other technology improvement efforts highlighted included the Coast Guard's Cyber Strategy, improving cutter connectivity and modernizing the Coast Guard Auxiliary's information technology capabilities.

Adm. Schultz also stressed a need for the Coast Guard to better manage its talent, outlining several personnel initiatives to recruit and maintain a highly-skilled workforce. "Talent management is both our most pressing challenge and our greatest opportunity," Schultz said. "That is why I believe wholesale investment will enable our talented people to carry out their missions across the maritime domain today and tomorrow."

The USCG plans to build 25 new Offshore Patrol Cutters, the first of which is currently being built by Eastern Shipbuilding in Panama City, Fla.

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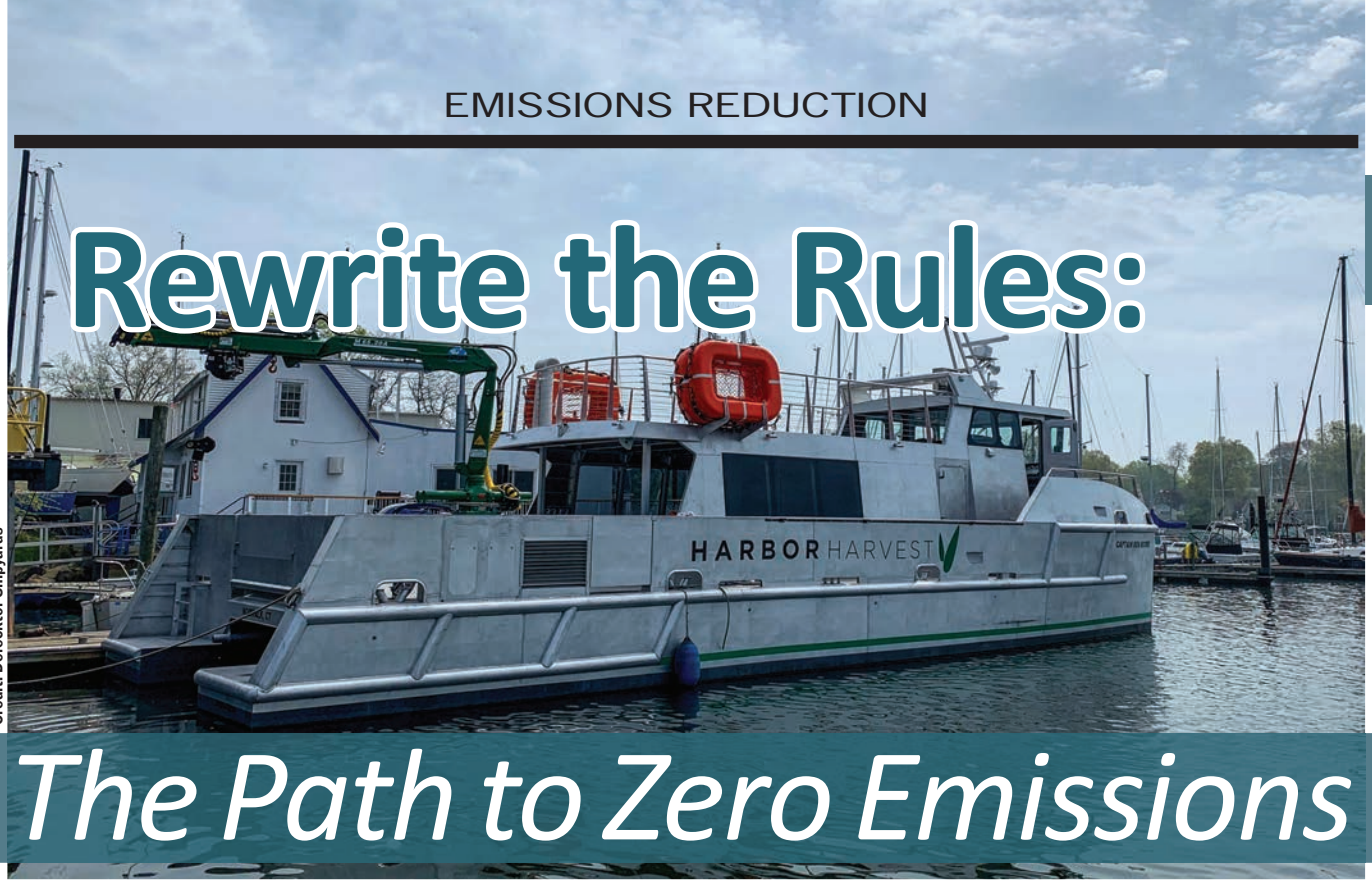

Credit: Derecktor Shipyards

Rewrite the Rules: The Path to Zero Emissions

By Robert Kunkel

With social media updates and conference agendas addressing the subjects of climate change, emissions reductions and alternative fuels, it's a wonder we are not climbing the Himalayans in search of the Jedi Master that will provide us with the magic potion. Yoda's blessing with a calming breath, "You have chosen wisely."

Government emissions intervention started with a move to reduce energy and fuel consumption measured in greenhouse gas (GHG), at a time when the world and our politicians spoke about global warming. Chapter 4 of MARPOL Annex VI circa 2011 introduced two mandatory standards with the objective of reducing GHG using improved ship design and operations. The Energy Efficiency Design Index (EEDI) and the Ship Energy Efficiency Management Plan (SEEMP). Most owners and builders when reviewing the six-foot-long EEDI formula wondered if the International Maritime Organization (IMO) understood we practice fuel efficiency each operating day as it affects our bottom line. Few rarely speak of the regulation these days, and many flag states "waived" the new ship requirement until 2019 with shipbuilders manipulated the formula as a beginning of "ECO" sales.

As research continued and carbon dioxide (CO2) reduction was debated, the world turned to sulfur (SOx) and particulate matter (PM) to address the new tag "climate change" in the established Emission Control Areas (ECA) zones. Monitoring and enforcement of the new limits fell to government agencies as sulfur was slowly being removed from our fuel sources. As a result of current 2020 IMO requirements, sulfur content is now .1% in the ECAS and .5% worldwide.

Again, not to beat a dead horse about the industry's bottom line, owners got pummeled with the costs of cleaning fuel tanks, facing a decision to scrub or not to scrub or absorb the cost of experimenting with ultra-low sulfur fuels. Within months operators invested nearly $100,000 in their two-stroke engines, watched a rise in lube oil prices exceeded 7% due to lack of lubricity in the new fuels and suffered quality issues with sediment, plastics and chemicals added or blended into very-low-sulfur fuel oil (VLSFO).

Has the use of VLSFO solve the climate change issue? Not according to the International Council of Clean Transportation and a measurement of "black carbon". This emission category appeared with blended aromatics of the new fuels. According to their research, black carbon remains in the atmosphere for only weeks as a short-lived pollutant and traps heat. An estimate of nearly 3,200 times more heat than CO2 measure over a 20-year period. The effects are devastating in permafrost areas and as a result VLSFO may be restricted or banned in future Artic shipping. Another continued attempt to extend the use of heavy fuels in our propulsion systems despite continued

First-of-its-kind cargo vessel Captain Ben Moore delivers local produce and food across Long Island Sound. Built by Derecktor Shipyards, the aluminum catamaran is powered by two Cummins QSB 6.7 diesels, and lithium batteries connected to a pair of BAE Systems HybriDrive electric motors.

technical research needed.

We can continue the decades of discussion with the introduction of the "Tier" concept, with IMO and U.S. Environmental Protection Agency (EPA) giving us Tier I, II and III and IV. The goal being reduction of nitrogen oxide (NOx) in new buildings after January of 2016 and the move toward selective catalytic conversion (SCR) or exhaust gas recirculation (EGR) to meet the NOx reduction goals. In our opinion the NOx reduction is now the most important change in the historical path of petroleum-based fuels. Reducing NOx levels opened the door to alternative fuels – liquefied natural gas (LNG), propane, methanol and ammonia continuing the development of the internal combustion engine (ICE). Many of these fuels are far beyond the testing stage and in full operation despite the fact no one has determined this is the final solution or if a bunkering infrastructure is available worldwide. As the stricter requirements were put into place, we again remind everyone that not one small engine manufacturer worldwide was capable of meeting the NOx goals under 600 kilowatts (kW).

This may be a quick recap of "emissions reductions" and we should take into account that decades have passed as government intervention slowly propels petroleum-based fuel oils forward. The quest for "zero emissions" can be a simple repeated Jedi mantra: "Go electric", and that decision needs to be made now as government regulatory dates of 2030 and 2050 may be too late for our industry to be actively involved in the zero emissions solution.

We would be proud to say the electric decision is based upon environmental stewardship, sustainability goals and an effort to save the planet. Our Hybrid and EV projects with Harbor Harvest, First Harvest Navigation, Amtech, BAE Hybrid, ABB and Tucker Yacht Designs have proven we chose the correct path. Beyond our climate change concerns we see it more as economic survival of the marine industry as a mode of transportation. Maritime needs a new definition of emissions reduction and pollution prevention beyond fuel. We need only to look at the automobile and trucking industry as an example of their accelerated efforts to embrace electric vehicles.

Many in our industry have suffered through the extended collapse of the offshore sector. The market for oilfield services in the U.S. Gulf has been historically cyclical, and the current down cycle has extended well beyond those historical trends with near disastrous economic results. There are many who are looking at offshore wind energy to replace major oil needs and create a new maintenance and service sector utilizing the skills and experience offshore oil provided. Certainly, the technical requirements of the wind market will require new construction, new designs and new services in the U.S. workboat sector. If we are to invest hundreds of millions of dollars to create clean alternative energy offshore, we would suggest the marine service and construction sector be built with hybrid and electric vessels. If not, servicing offshore wind

Credit: ABB

wind energy with current fuel oil emissions would not only be strangely ironic but an oxymoron "clearly misunderstood".

Let's also look at highway congestion and public transportation when we discuss emissions reduction. Has government supported the use of hybrid or electric marine vessels while acknowledging these problems exist? They have not. New York City recently built and employed 26 new ferries, a successful operation supporting a reported 50,000 passengers a day. Not one city or state program or for that matter one vessel was built with electric or hybrid technology to reduce emissions.

Harbor Harvest and First Harvest Navigation built and delivered into operation the first U.S.-built hybrid cargo vessel with private funding. They have waited over four years for the promise and award of a Marine Highway grant from the Maritime Administration (MARAD) and the Connecticut Port Authority to support the growth of the infrastructure and follow on vessels tor the program. To date no funding has been provided. Private investors answered the call, delivering the first emissions-free vessel into operation on the Long Island Sound.

ABB Marine & Ports recently delivered testimony in the U.S. House of Representatives Committee on Transportation and Infrastructure about the future of marine technologies. This year, the first all-electric vessels ever built in the U.S. – the Niagara Falls tour operator Maid of the Mist tour boats – will start operation, powered by ABB's zero-emissions technology. Tucker Yacht Designs, one of our network partners, handled design integration and construction supervision of a very successful operation. This project too was supported by private funds and an owner with a drive to answer the climate change call.

Harbor Harvest's Captain Ben Moore

Credit: Harbor Harvest

Niagara Falls tour operator Maid of the Mist ordered a pair of passenger vessels that will sail on pure electric power, enabled by ABB's technology. Each of the vessels will be powered by a pair of battery packs with a total capacity of 316 kWh, split evenly between two catamaran hulls.

There are other leaders worldwide. Bangkok, Thailand as part of its "Smart City" project is building 42 electric ferries to restructure the city transportation hub with private industry funding. Hurtigruten delivering the first hybrid cruise vessels in Norway and the Brim Explorer built by a simple whale-watching family touring the Norwegian Artic on battery power. Ultimately it will not be government regulations or programs solving climate change problems. It will be the private sector, and industry leaders that understand the problem needs to be solved now – not 30 years down the line.

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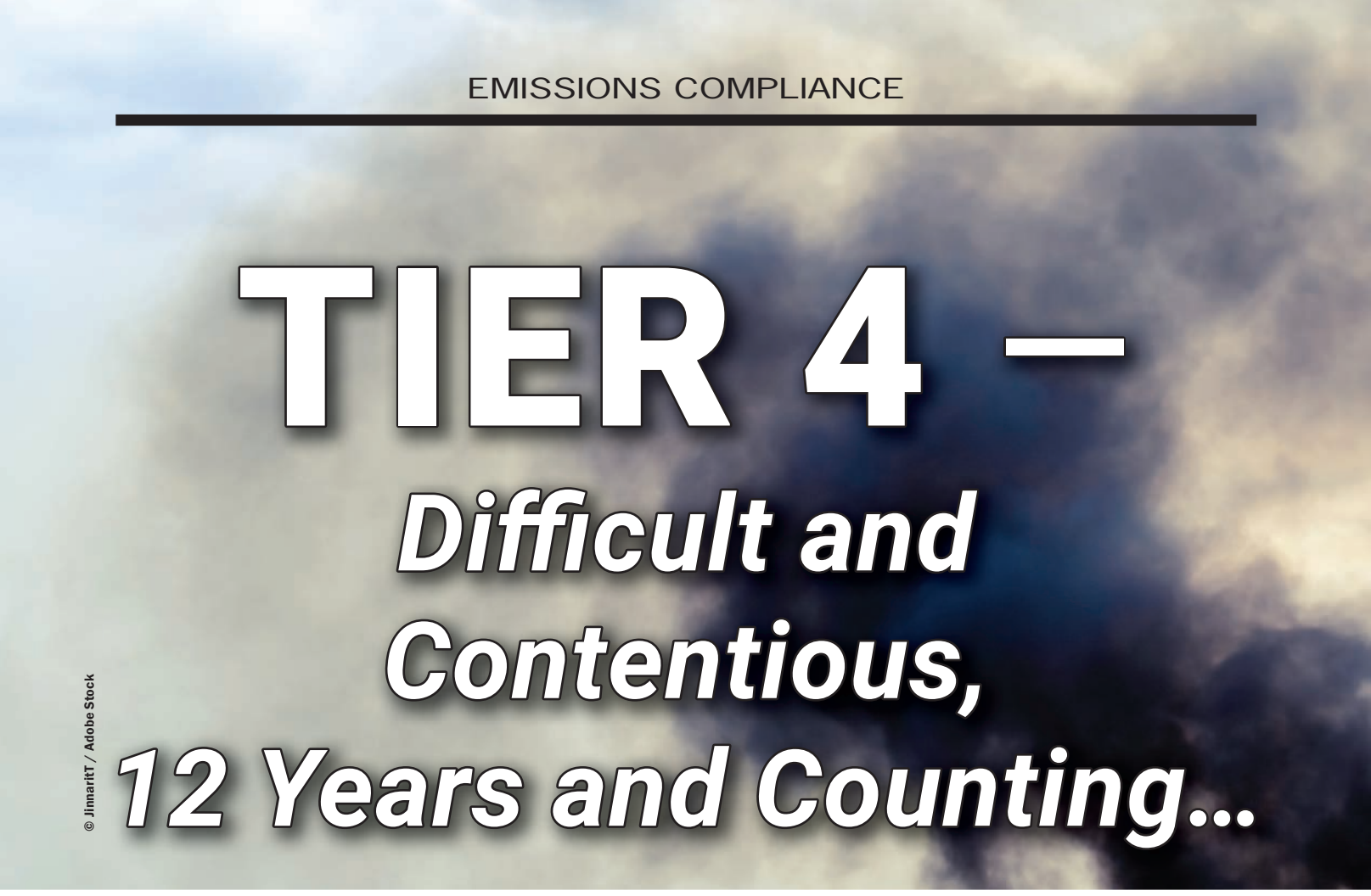

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TIER 4 – Difficult and Contentious, 12 Years and Counting...

By Tom Ewing

When it comes to complying with EPA's Tier 4 emissions regulations, there's no shortage of creativity emerging from America's maritime engineering firms. Companies such as Hug Engineering are offering flexible, customized aftertreatment-based control systems that can assemble almost in modular like fashion. Other companies, such as ABB Group, offer battery-hybrid power sources to complement combustion power and avoid threshold diesel emissions. Engine manufacturers, such as Cummins, are working with aftertreatment suppliers to ensure operational harmony between power plant and pollution controls. Scania AB is demonstrating new successes by approaching power from a systems standpoint, taking a close look at a vessel's actual power demands and how and when that power needs to be delivered.

As vessel owners know, this is not easy stuff – in any way. Tier 4 systems are complex and expensive, to purchase and operate. They are big, frequently requiring customized, specific analyses for placement within a vessel; a challenge and difficulty that EPA refers to as "packaging," literally working to fit the hardware and related components inside a hull. Tier 4 demands are rigorous: emissions from 25 Tier 4 engines are supposed to be equivalent to just one Tier 1 engine. The vessel, its engine and the aftertreatment need to function as a single system for optimal performance, reliability, cost and emissions reduction.

From discussions with experts in the Tier 4 field, some of the Tier 4 installation technical challenges are being met. Progress is slow but new vessels, at least, are being designed to incorporate Tier 4 engines and the aftertreatment systems which, of course, require as much room as the engines to which each unit must be linked. (See diagram.)

Importantly, though, these advances must spread out across a very fractured landscape. Progress with one vessel or application doesn't mean success elsewhere. Each different class of vessel requires a different approach and analysis to Tier 4 implementation, lobster boats are not the same as ferries which are not the same as pilot boats. It's not an exaggeration to write that every vessel – not just every vessel class – demands its own analysis.

SYSTEM LAYOUT EXAMPLE

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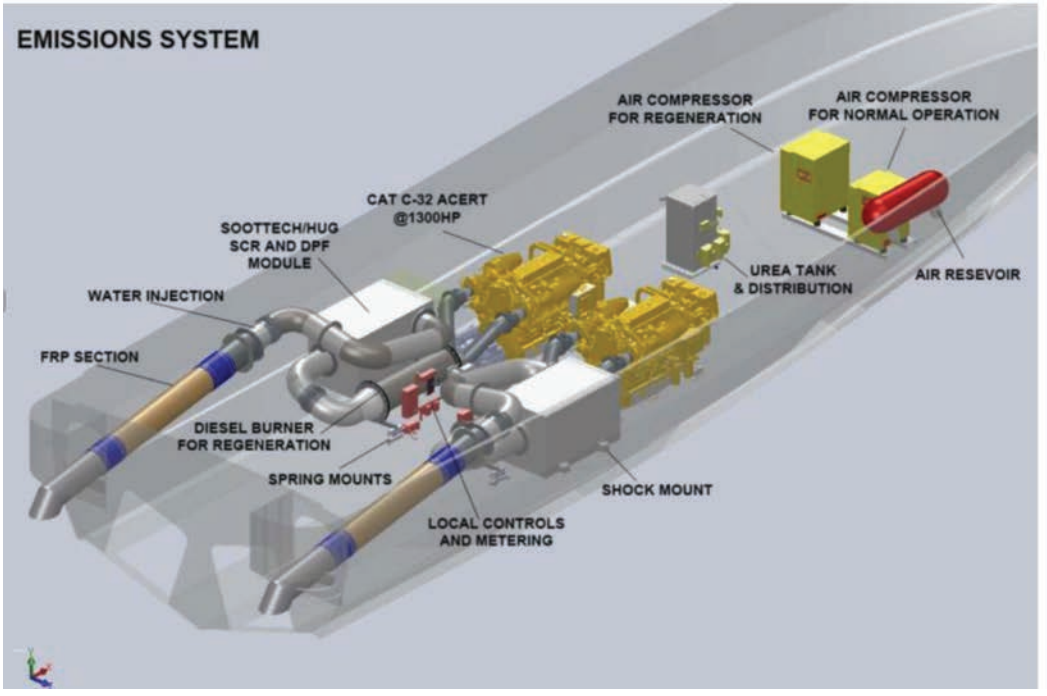

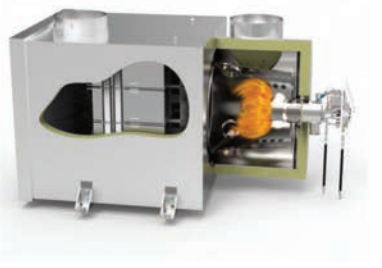

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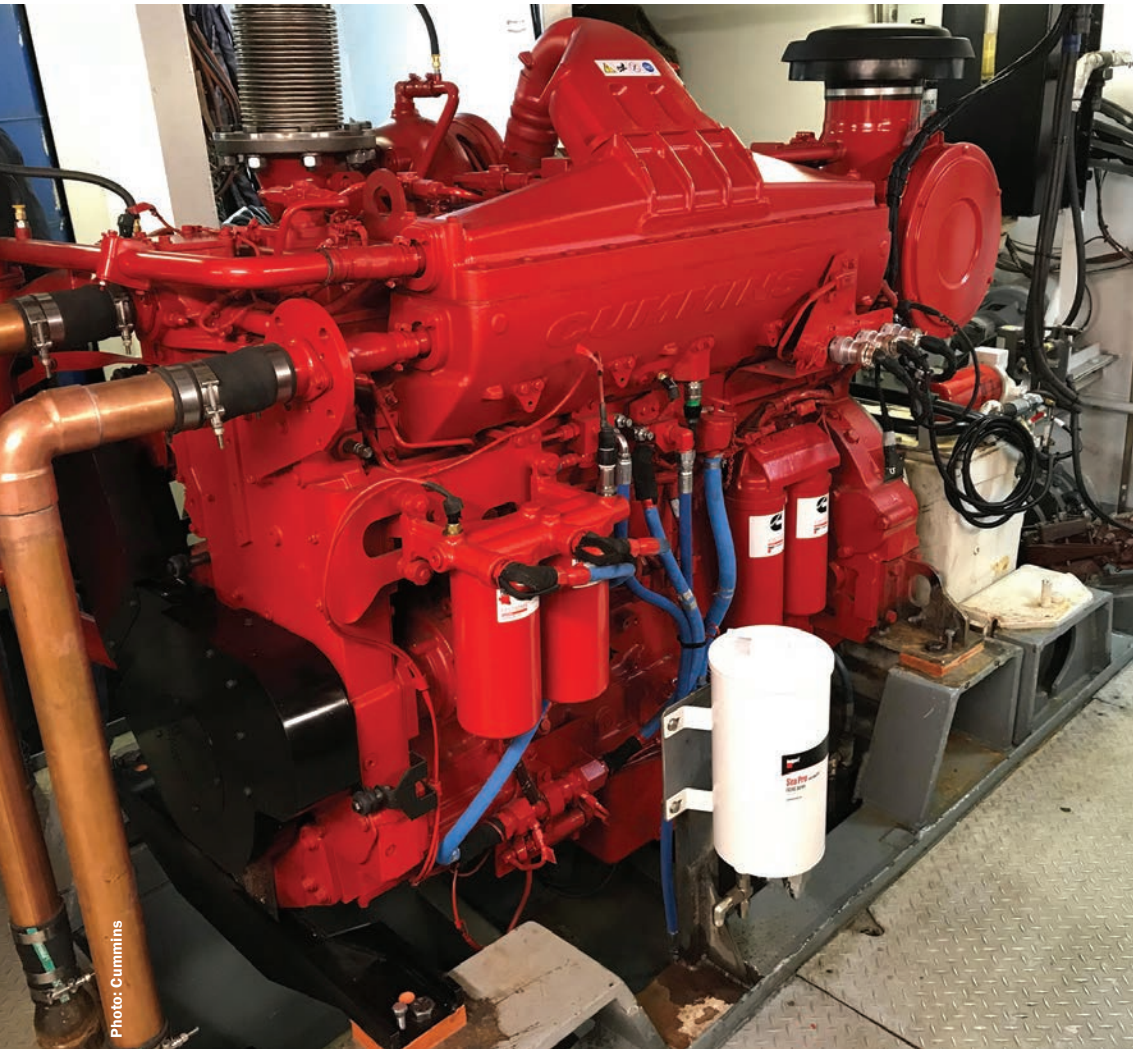

Boyer Towing recently repowered its 1997-built tug Gretchen H three new Cummins QSK19 Tier 3 compliant engines rated for 750 HP each at 1,800 RPM.

Tier 4, of course, doesn't apply just to new vessels. A vessel owner seeking to repower an older vessel confronts the same long list of questions and trade-offs. He or she may decide it's easier just to avoid the whole set of issues and instead of buying one Tier 4 engine at 800 HP (the 800 HP Tier 4 threshold, also 600 kW) he or she may purchase two smaller engines instead. And increasingly, hybrid applications, using electric and diesel power generation are drawing operators' attention. Hybrid systems double-up, when needed, to deliver maximum power under load, and maximum load is usually just a fraction of a vessel's operating time.

To make matters more complicated, the Tier 4 market and business milieu remains shaky. Tier 4 decisions sit within an unsettled regulatory environment – even though EPA's regs were finalized in 2008 and Tier 4 phase in was supposed to have concluded by 2017. This uncertainty impacts decisions across the board – at shipyards, among engine manufacturers and vessel owners.

Last September, EPA proposed to delay Tier 4 implementation for certain types of vessels – high powered vessels such as lobster boats. In response, comments came in from across the industry imploring EPA to expand the scope of that delay – to include a broader range of vessels, from workboats to tour boats. EPA's public comment period ended in October. However, behind the scenes, EPA has maintained an active and pointed discussion with industry reps, asking for their perspective on the charges and countercharges within the Tier 4 debate. The many issues with Tier 4 compliance remain hotly contentious.


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EPA was counting on vessel design changes and technological advancements to be market ready by 2017. EPA allowed that development time to resolve the "packaging" issues (EPA's term) that stymied a quicker phase-in in 2008; EPA knew that application and installation of Tier 4 aftertreatment was still some years off. Ten years later, though, the "packaging" problems remained. "(EPA's) decade-old assumption of how the market would respond has proven to be incorrect," is the way Robert J. Lawler, Jr., President of the Passenger Vessel Association summed up the Tier 4 state of affairs in comments to EPA.

EPA is targeting summer 2020 to issue a final action on its proposal to delay.

Hug Engineering's approach to Tier 4 compliance illustrates how engineers are seeking maximum flexibility regarding materials and space. This kind of advance is important for vessel owners seeking to repower. You may not have been able to fit a Tier 4 system in your vessel five years

Alberto Alcalá, Scania, U.S. Marine Sales Manager

Dana Brewster, Hug's Regional Sales Manager, Mobile Applications

ago. Today, that same space might work for installing an aftertreatment system to your existing engine.

HUG Engineering offers a retrofit aftertreatment selective catalytic reduction (SCR) to reduce NOx emissions to Tier 4 standards. A diesel particulate filter (DPF) can be added to the SCR system to also reduce particulate matter (PM). HUG's Nauticlean and Clean4Marine systems are adaptable with various engines; in fact, HUG has certifications for IMO III today and additional engines currently in the certification process. HUG partners with some of the marine diesel engine OEM's on a global scale. Another Tier 4 path to explore is a "Best Available Technology" (BAT) option. When a Tier 4 engine is unavailable for repower applications, air quality agencies in some cases may consider the BAT.

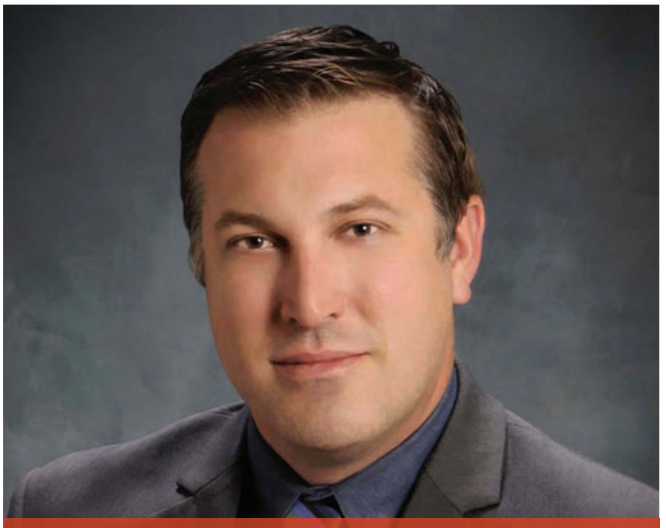
Dana Brewster is Hug's Regional Sales Manager, Mobile Applications (Marine/Rail). He said that HUG's engineers take what he calls a "Lego approach" to aftertreatment installation, i.e., to fit it into just about whatever space is available. Brewster said that Tier 4 control schemes can, increasingly, be installed in various configurations. If there is more vertical space available, the hardware gets stacked. In a narrow but more lengthy space, the system will stretch out. But if you need an engine in excess of 800 HP, the odds are better now that Tier 4 can work. Again, though, there are no across the board answers with Tier 4.

Eddie Brown, Segment Leader, Commercial Marine at Cummins Engines, said his team is "working closely with naval architects and customers on power solutions that meet Tier 4 emission levels and enable vessels to complete their missions." Brown said that "overall, the impact of cleaner emissions systems on vessels does vary." Some vessels can accommodate new aftertreatment systems without significant vessel redesign. However, in higher speed and/or weight-sensitive applications, Brown said "there may be a need to redesign or reconfigure the boats and their engine rooms." Cummins works closely with customers on these kinds of projects.

Brown said that alternative power solutions are on the horizon, from diesel-electric hybrids to hydrogen fuel cells. "Customers want to optimize their vessels with the best power packages to meet regulatory rules and still provide the most efficient engine performance."

Hybridization is a big focus for ABB and its marine generator products. ABB's low voltage (LV) standard marine generators are designed for fully electric vessels and for marine diesel gen-sets in main, auxiliary or emergency power generation. They cover the power range 14-2,600 kVA in frame sizes 180-450 with typical voltages of 380-480 V. This equipment is well-tested in marine applications, currently working in over 1,300 ships.

Dave Lee , ABB's Senior Account Manager, New Build, describes a hybrid evaluation as part of a "different thought pattern" regarding vessel power. He notes that in a workboat, for example, full engine power is rarely used. ABB installs smaller generators to complement the diesel engine. "We offer an optimal power range and battery and fuel cell



David Lee, ABB, Senior Account Manager, New Build

technology," Lee said. This approach can avoid the need for a second diesel engine. It utilizes horsepower most effectively, depending on the task at hand.

The notion of strategic power is an important one for Scania, which is not offering engines over 800 HP. That high-power market is too limited. As designers evaluate future power demands, Alberto Alcalá, U.S. marine sales manager for Scania, predicts additional progress on vessels themselves: shaped for speed and energy efficiency.

He too expects increasing hybridization, writing that "hybridization can fill in the gap between tier 3 and the need for a larger engine with the complexities of tier 4." In 2012, Scania outfitted the Hornblower Hybrid in San Francisco with a Tier 2 / electric mix. That ship was recently upgraded to a Tier 3 / electric mix in order to meet California's tougher air quality goals.

Alcalá placed hybridization at the top of the list regarding future disruptive technologies. Scania works with ABB (and others) on projects that demonstrate how a mix of electric-diesel generation can replace larger engine sets.

Scania engineers have demonstrated that three smaller engines can replace 3-4 engines in a traditional 2,000 HP tug, at tier 3 levels. New gensets can provide up to 2,400 HP in what was once a 2,000 HP vessel. The vessels use power as needed – idling or shutting down in low-load situations, using dramatically less fuel, then drawing maximum power only when needed, again, usually a relatively small portion of a vessel's operating hours.

Stay tuned for EPA's decision this summer.

Hot Enough to Boil Water...

When EPA proposed a delay (last September) in marine diesel emission standards, heat was a main focus area – engine heat and heat from the Selective Catalytic Reduction (SCR) exhaust treatment systems, part of the Tier 4 process.

Lobster boats were highlighted by EPA. Lobster boats need specific compartments for live lobsters. But the "packaging" required for larger engines (above 600 kW) placed the engines – and heat – too close to the lobsters. Then, add SCR heat and the outcome was not good – the lobsters were getting cooked, or close to it.

This example may be a bit singular, but the issue of heat dispersal is a critical safety issue. R.W. Fernstrum & Company has been designing and building heat dispersal systems for 70 years.

We asked Fernstrum: what are your customers asking about regarding repowering and Tier 3 vs Tier 4 options?

Vessel owners could, for example, install three Tier 3 engines instead of two Tier 4 engines, thereby avoiding SCR systems altogether. Plus, this saves space, a critical concern within overall vessel design and performance – whether for speed or cargo.

"Our company's goal is to reconfigure existing technology in even more efficient ways," explained spokesperson Rachel Fernstrum. "Our systems allow us to reject more heat in a given area of the vessel."

Ferstrum added that this approach retains a familiar technology, avoiding a new, and complex, SCR learning curve.

"We can retrofit keel coolers in a vessel to replace an existing cooling system that may not be working as expected," Fernstrum said. In addition, the company can also "leverage" an existing cooling system, as long as it is a closed-circuit system. This "leveraging" can reduce the additional cooling requirements associated with certain applications. Sometimes, with a repower, the keel coolers from an original installation may be able to be used as part of the new cooling system.

The point is: if you're facing these difficult decisions, check all options.

Winter Work on the Great Lakes

By Rick Eyerdam

Credit: Fincantieri Bay Shipbuilding

Along the 1,600-mile, ice gray arch of the St Lawrence Seaway, the 2020 Great Lakes commercial shipping season will lurch back to life on March 25 when the Soo Locks at Sault Ste. Marie, Mich. reopen.

The ceremonial opening signals a passage with passable ice and the 114th Great Lakes season for its fleet of 45 venerable lakers. Most of these huge self-loading freight haulers are at least 50 years old, rust free, and fit; American steel sailing on a freshwater sea.

To handle Great Lakes cargo, a special type of vessel has evolved: the North American "laker", the largest being more than 1,000 feet long, capable of carrying up to 70,000 tons of iron ore or 1,700,00 bushels of grain in one trip.[Interlake Steamship Company's Paul R. Tregurtha, christened in 1981, is the largest laker sailing the Great Lakes.]

Thanks to a career spent primarily in freshwater, the average life expectancy of a Laker is 40-50 years, compared to about half that for saltwater vessels. Downtime during winter lay-up allows ample opportunity for maintenance, another key factor in a laker's long lifespan, according to Eric Peace, director of operations and communications for the Lake Carrier Association (LCA).

The majority of lakers are self-unloaders, able to discharge cargo without dockside equipment. Many such vessels that once carried only ore pellets, stone or coal have been modified to carry grain, salt or even fertilizer. Others carry cement and petroleum products.

Lakers' self-unloading capability is unique, and the equipment requires maintenance to ensure the vessels can continue to unload up to 75,000 tons of cargo in less than 12 hours, one of the reasons why U.S.-flag Lakers are the most efficient mode of dry-bulk cargo transportation in the world, Peace said.

Ohio-headquartered Interlake Steamship Company has a fleet of nine self-unloading vessels, ranging in carrying capacity from 24,000 to 68,000 gross tons, with a total trip capacity of 390,360 gross tons. Interlake Steamship Company carries approximately 20 million tons of cargo annually. In 2016, the company completed a 10-year, $100 million fleet modernization program.

Winter work

Peace is making an educated guess, but he figures more than $97 million in maintenance and modernization work was done on U.S.-flag Lakers for the 2019-2020 winter season at multiple Great Lakes shipyards.

The biggest part of it is winter work, which includes, steel renewal, installation of advanced electronic navigation systems, and replacement of safety equipment such as lifeboats.

More than one-thousand engineers, welders, pipe-fitters, mechanics and electricians have worked tirelessly on the ships to ensure they are ready to sail as soon as the Soo Locks open on March 25, according to Peace.

Major shipyards are located in Duluth, Superior and Sturgeon Bay, Wis. as well as Erie, Penn., with other work being done in Toledo and Ashtabula, Ohio; Ludington, Mich.; Detroit and Milwaukee.

Virtually all the great lakes lakers that fly Canadian flags winter in Ontario and Hamilton.

Todd Thayse, Vice President and General Manager of Fincantieri Bay Shipbuilding, said the shipyard this year is servicing the Edgar B. Speer (1,004 feet), James R. Barker (1,004 feet), Mesabi Miner (1,004 feet), American Integrity (1,000 feet), Roger Blough (858 feet), John G. Munson (768 feet), American Mariner (730 feet), H. Lee White (704 feet), Joseph L. Block (728 feet), Thunder Bay (740 feet) and Wilfred Sykes (628 feet).

In 2018-2019, Fincntieri serviced the Paul R. Tregurtha (1,013 feet) the largest ship on the Great Lakes, James R. Barker (1,004 feet), Burns Harbor (1,000 feet), Roger Blough (858 feet), John G. Munson (768 feet), Cason J Callaway (767 feet), Joseph L. Block (728 feet), Wilfred Sykes (628 feet), American Courage (636 feet), Barge Huron Spirit (328 feet), the Madeline Island Ferry LaPointe and several tugs, Thayse said.

"We provide full-service maintenance and repair – everything from engine overhauls to mechanical and electrical repairs; hull and propulsion repairs; surveying and inspection needs; repowerings, retrofits and conversion services and more.

"We do 60 to 70% of our repair work during the winter months. But there is a flow all year long, as our repair business has steadily grown. Ship repair in total is about 30 to 40% of our business.

"We service vessels that require conveyor system and boom belt work. We also blast and paint cargo holds and ship's hull structure. We do any emergency repairs needed; not just during winter but year-round. Our floating drydock and 1,154 foot graving dock help us accommodate many of the largest Great Lakes vessels in operation."

When asked about trends for new services and equipment, Julie Koch, Manager of Contract Services at Fincantieri Bay Shipbuilding , said the yard has completed five exhaust gas scrubber installations, including three for

1,000-foot freighters.

American flag vessels have been ordered to operate since January 1, 2015, in compliance within the North American Emissions Control Area (essentially all U.S. and Canadian fresh and saltwater coasts). The sulfur content of vessel fuel must be no more than 0.1% by weight, a substantial reduction from the 1% allowed in 2010. So, this is a pressing need.

"We can install closed-loop, open-loop and hybrid systems. We transform ships to make them scrubber-ready by providing extensive structural, piping and electrical modifications and can minimize downtime by accomplishing this during the winter layup," Koch said.

"FBS has also completed 14 engine repowerings which are more energy and emission efficient, ranging from 1,000-foot vessels to passenger ferries and tugs. Both of these services have been trends over the last several years," Koch said. "For the last 10 years, we've also provided electrical retrofits of original deck winches to new, user-friendly operations."

"Installing waste heat boilers has been a common part of conversions we've done. We have also gained experience in installing and operating various ballast water treatment systems," Koch said.

First new ship in 35 years

Fincantieri Marine Group, Fincantieri Bay Shipbuilding and The Interlake Steamship Company hosted a ceremonial first-cut-of-steel event last August for construction on the first U.S.-flagged Great Lakes bulk carrier built in more than 35 years, due by 2021.

"The first cut of steel is a major milestone that signifies we, along with Fincantieri Bay Shipbuilding, are ready to begin production on this historic project," says Interlake President Mark W. Barker. "We are extremely proud to build our company's first ship since 1981 on these freshwater shores. It's a true Great Lakes success story."

100-year-old tugs

Such long and unwieldy lakers on the often-narrow pathways of the Great Lakes waterways demand a fleet of skilled tugs.

Marine News spoke to Kirsten Buccigrossi, Director, Marketing & Communications for The Great Lakes Towing Company and Great Lakes Shipyard. Great Lakes Towing's fleet of tugs is the largest on the Great Lakes.

"Many of our tugs are around a hundred years old," she said with remarkable calm. "We change out the engines at about every 40 years. The last one was back in the '70s."

"It is pretty wild," Buccigrossi said. "But operating in fresh water, we have no issue with salt corrosion on the steel. And they are all good U.S. steel."

She said federal regulations finally made it cheaper to build new tugs and retire the 100-year-olds. "We are building about one new tug a year at our Great Lakes Shipyard."

Last winter, the company's shipyard worked the American Steamship Company's 635-foot Sam Laud, but hosted no lakers this year, Buccigrossi said.

"For winter work on lakers, typical service/maintenance includes routine inspections, steel reinforcement, etc. In addition, we provide a wide variety of services on other vessels that are not lakers (i.e., research vessels, ferries, fireboats, tugs, barges, etc). These services include five-year regulatory inspections, repowering, coatings, electrical installation, everything. And we operate a new 770-ton Marine Travelift, the largest in the Great Lakes, she said

"With the implementation of Subchapter M, we have seen a few tugboats in looking for some additional work to be compliant with the new regulations.

"Appropriation of federal funding over the last couple of years has increased the work items on government vessels, such as research vessels, USCG cutters and barges, USACE (Corps of Engineers) tugs and barges, all of which can be handled by the Marine Travelift," Buccigrossi said.

Credit: Fincantieri Bay Shipbuilding

USCG RV ARCTICUS in for winter work

Credit: Great Lakes Group

Credit: Fincantieri Bay Shipbuilding

Lubrication Selection Fundamentals

By Ben Bryant

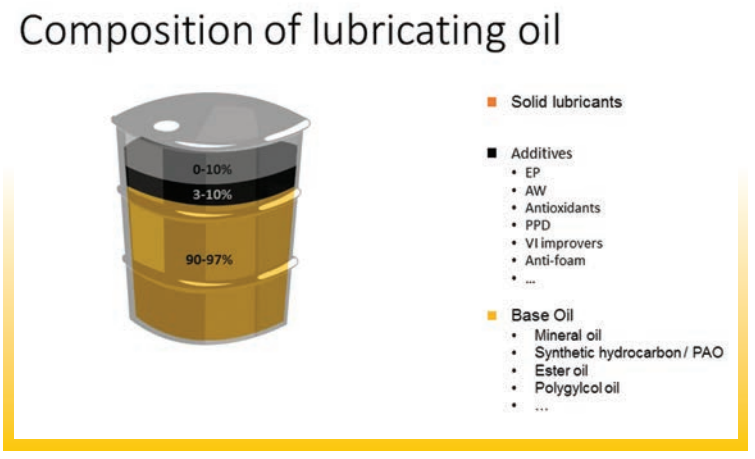
As an operator of vessels, you understand that lubricants play an important role in helping you achieve your operational objectives. Yet, finding the right one can be overwhelming since there's an almost unlimited number of different lubricant formulations. An understanding of lubrication chemistry, performance expectations and operational objectives will help you select a lubricant that will improve operations and lower your overall costs.

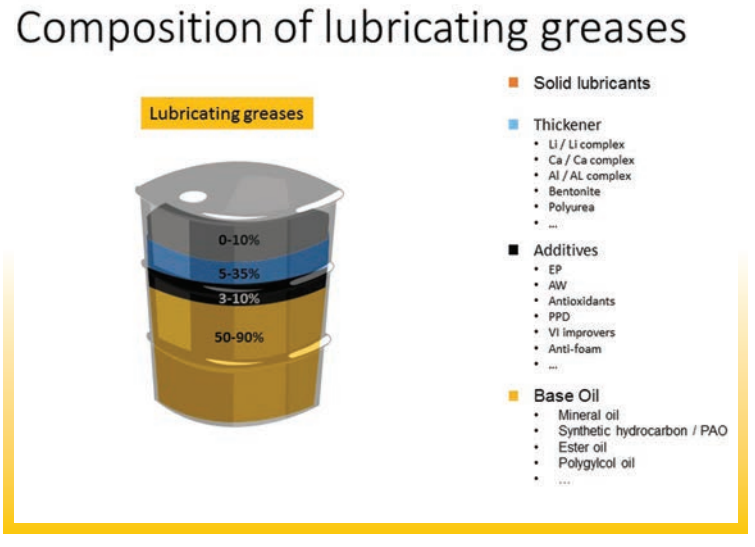
LUBRICATION BENEFITS

The basic function of a lubricant is to reduce friction by separating interacting surfaces. In operation, a lubricating oil or lubricating grease is applied to the surface and monitored for effectiveness. Possible lubrication benefits include:

- *Create surface separation*
- *Reduce friction between components*
- *Minimize or prevent wear*
- *Increase efficiency*
- *Reduce energy consumption*
- *Extend service life of the equipment*
- *Improve reliability*
- *Noise reduction*
- *Cut maintenance and repair costs*
- *Improve machine safety*
- *Prevent rust and corrosion*
- *Cleanse equipment of fouling/contaminants*
- *Prevent or remove deposits, sludge, varnish*
- *Remove heat from system*
- *Perform work (e.g., hydraulic fluids)*

In addition, you might have external considerations, like meeting environmental certifications that leads you toward a specific formulation. However, even in these circumstances, the lubricant selected significantly impacts the overall operation.





COMPOSITION OF LUBRICATING OILS AND GREASES

A lubricating oil consists of a base oil, additives and – in some cases – solid lubricants. A lubricating grease is created by adding thickener to the oil.

Options for base oils include mineral oil, synthetic hydrocarbons (PAO), esters, polyglycols (PAG), silicon and perfluorinated polyethers (PFPE) – each with advantages and disadvantages. The correct base oil will depend on your operational objectives. If your overall goal is the lowest purchase price, then mineral-oil based lubricants are the standard. However, as you look to lubricants to help improve your operations or meet environmental standards, the performance characteristics of each of the other base oil types should be considered. A sample of performance characteristics for four base oil types is in the table below.

Additives either improve the chemical and physical characteristics of the oil or they protect mechanical elements within the contact zone. Examples of lubricant additives that improve oil performance are antioxidants that extend the life of the oil, pour-point depressants to impart better low-temperature flow, viscosity improvers to reduce the variation in viscosity over changing temperatures and detergents to minimize sludge and varnish. Additives that work in the contact zone include phosphorous-based anti-wear additives that form a protective layer on top of metal surfaces, sulphur-based extreme pressure additives that prevent spot welding under high loads and corrosion inhibitors to reduce rust.

It's important to achieve proper additive balance because different combinations either work synergistically (work together) or antagonistically (work in opposition). Additives are also fighting for space on the metal surface. For example, too high a concentration of corrosion inhibitors may reduce the ability of an extreme pressure additive from doing its job. Solid additives such as graphite and molybdenum disulfide (Moly) can improve performance in highly loaded gears. These additives maintain surface separation even when the lubricant has been displaced under pressure. Solid additives are beneficial in some applications, but a well-balanced lubricant with EP additives is more often selected. Thickeners for greases can be divided into two categories: soaps and non-soaps. Soap thickeners include lithium, calcium, barium, aluminum and sodium soaps. Descriptors such as "simple," "stearate" and "complex" added to the name of the soap refer to the complexity of the grease structure created during the production process. Complex greases usually perform better than simple greases but tend to cost more

Comparison of base oils

Properties	Mineral oil	PAO	Polyglycol oil	Ester oil
Viscosity-temperature behavior	o	+	++	+
Ageing resistance	o	+	++	+
Low-temperature characteristics	---	++	+	+
Wear protection	o	+	++	+
Friction coefficient	o	+	++	++
Neutrality towards sealing materials and paints	++	o / ++	o / +	o / +
Hydrolysis	n.a.	n.a.	n.a.	- / ---

++ = very good + = good o = satisfactory --- = poor

due to their increased production time. Non-soap thickeners include bentonites, polyureas and plastics.

The thickener's role is to thicken the oil, control the oil's release and seal the friction point from contamination. However, each type of thickener also imparts performance characteristics onto the grease. Below is a comparison of lithium simple soap and calcium complex soap. Notice that the complex calcium soap has better performance characteristics regardless of the additives or base oil used.

The NLGI scale of a grease refers to the amount of thickener added to the base oil. A "soft grease" has less thickener than a "stiff" grease. Soft greases are often used in automatic lubrication systems while stiffer greases can be found where the grease requires vertical adhesion.

TRIBOLOGY AND THE "TRIBO SYSTEM"

Tribology – the study of friction, lubrication and wear – has become the basis for selecting the correct lubricant in today's demanding environment. Before the proper lubricant can be selected for a specific application, the tribological system must be identified to its fullest extent. Analyzing the type of motion, speed of the components, operating temperatures, loads and the application's operating environment will lead to proper selection of the lubricant.

Types of motion that create friction are defined as rolling, sliding, combined rolling/sliding and boring. The choice of base oil and additives will determine how well the lubricant protects against each type of friction. As an example, PAG base oils have better performance in areas of

Comparison of Soaps – example

Lithium simple soap vs. calcium complex soap

	Lithium Simple Soap	Calcium Complex Soap
Temperature range	-10 to100°C	-25 to 150°C
Drop point	>160°C	>190°C
Mechanical stability	+	+
Lubricity	+	+
Corrosion protection	+	++
Water resistance	-	++
Resistance – acid / alkaline	-	++
Load carry Capacity	+	++

Conclusion:

- Different thickener types have different characteristics
- Select the most suitable thickener type for your application

sliding friction than mineral oils or PAOs.

The speed of the mechanical element will impact the viscosity of the base oil chosen as well as the NLGI grade of a grease. The faster the speed, the lower the viscosity and/or NLGI that should be selected.

The choice of lubricant will be affected by the operating temperature. The base oil chosen can improve performance at high temperatures, low temperatures and changing temperatures. Additives can improve the oxidative performance of the base oil. The thickener system may have a big impact on the performance.

Load will determine the viscosity and whether anti-wear or extreme pressure additives are required.

Finally, operating environments including ambient temperature, moisture, contaminates, exposure to vapors or chemicals and whether the element is operating under pressure (deep sea) or in a vacuum (gyro stabilizers) must be considered.

CONCLUSION

Understanding that the choice of lubricant chemistry and formulations can have a substantial impact on the performance of your vessel operation is the first step toward an optimal lubrication program. A lubrication engineer can assess the tribological conditions of each application and make recommendations that balance the price of the lubricant with the return on investment derived from reduced lubrication usage, lower labor costs, extended lubrication intervals, safety and asset life extension.

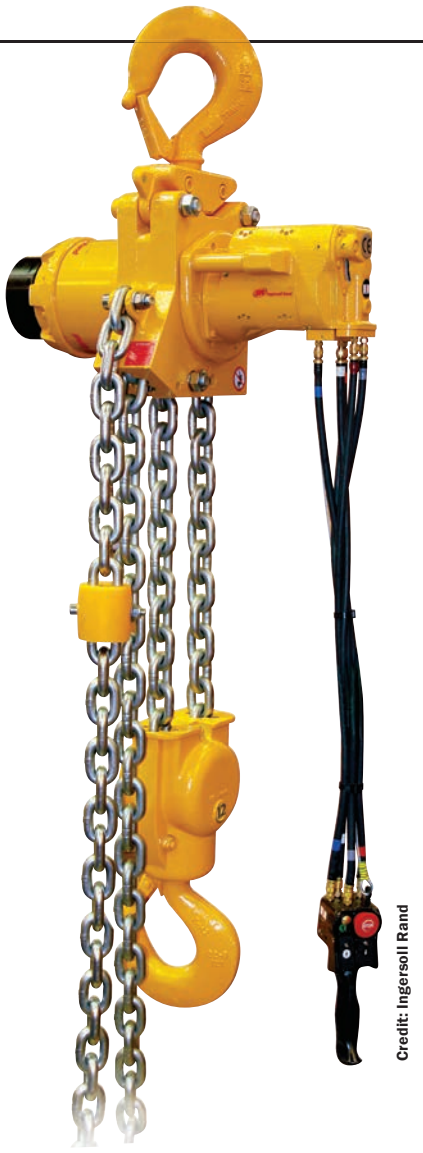
Chemical-physical characteristics

NLGI-classes (DIN 51 818)

NLGI grade	Worked penetration in tenth of millimeter	Consistency	Application
000	445 to 475	Highly fluid to fluid	centralised lubrication systems gearbox lubrication
00	400 to 430	Fluid	
0	355 to 385	Semi-fluid	
1	310 to 340	Very soft	sliding bearings rolling bearings water pumps
2	265 to 295	Soft	
3	220 to 250	Relatively consistent	
4	175 to 205	Consistent	sealing greases block greases
5	130 to 160	Very consistent	
6	85 to 115	Hard	

Shipyard Maintenance: *Which hoist is best?*

By Mark A. Koski, CEM, CDSM; Commercial Leader, Material Handling, Ingersoll Rand North America



Credit: Ingersoll Rand

Shipyards are rugged, corrosive environments with aging infrastructure. Hoists can sit inoperable for months or years, wasting space and assets because the hoist doesn't have the correct capacity needed for the applications.

To save resources, shipyards interchange the use of non-subsea and subsea hoists, causing problems like premature maintenance requirements and dangerously degraded equipment from seawater and improper use. Non-subsea hoists create a maintenance nightmare for shipyards when saltwater enters the gearbox during use. When a hoist not designed for subsea use it submerged in water, it needs to be completely disassembled and every component cleaned and greased to prevent motor corrosion.

To reduce capital investment, shipyards can utilize versatile, modular hoists that mitigate downtime and ensure the utmost safety of maintenance crews in the field. There are many factors to consider when selecting a hoist for shipyard maintenance applications.

Simple safety considerations

Shipyards are one of the most dangerous industrial workplaces, and safety is the most important consideration to protect crews from injury. Maintenance managers can look for features that increase safety while the hoist is in use and that prevents the hoist from damage.

A limit switch shuts off the air supply on a hoist to prevent a load from damaging the hoist if it comes into contact with the body of the hoist. This occurs if the operator doesn't stop the block before it engages with the mid-section of the hoist. Some hoists have air limit switches integrated into the main body of the hoist for better durability. Their design has no external equipment that can degrade over time or equipment that can catch and tangle a chain while in use. Hoists with integrated limit switches can even pull loads horizontally.

A limit switch on the bottom of the hoist, in conjunction with a chain stop, prevents the operator from accidentally running the chain out of the hoist. This would cause the load to fall, which could cause serious injury or death.

The European Directive requires that every hoist with a capacity of 1-ton or greater have overload protection to prevent the hoist from picking up a load greater than 125% of the hoist's capacity threshold. The overload protection automatically engages the hoist's brake to stop the load from moving. The hoist includes an emergency stop function. When an operator presses the emergency stop button, a valve prevents compressed air from entering the motor and the brake engages automatically.

An operator can easily add an overload protection system to an Ingersoll Rand® LC2A Lift Chain® Hoist. Simply add a bolt-on a CE-approved1 overload motor end plate, without removing the hoist from the perch. Shipyards can use the overload adjustment to "de-rate" the hoist, or lessen the total capacity, for applications requiring less load to increase the hoist's range of available capacities.

Explosion and spark-resistant components

Shipyards in Europe follow the ATEX (Atmosphères Explosibles) Directive 2014/34/EU, the European Regulatory Framework for the manufacture, installation and use of equipment in explosive atmospheres. It defines the essential health and safety requirements for equipment and protective systems.

Shipyards in North America follow the National Electrical Code (NEC) explosion-proof requirements, which standardizes electrical safety practices for equipment. Shipyards should refer to the NEC standards to determine the class and division requirements before adding hoisting equipment to a shipyard.

Hoists that are used for applications like maintenance inside a ship engine room must be explosion-proof and spark-resistant. Hoists with air motors are ideal for hazardous environments because the motor does not require electricity that could create sparks while in operation. Manufacturers commonly install copper-plated or solid bronze parts for additional spark resistance in explosive environments.

Manage assets with versatile and modular hoists

Most ships are repaired in dry dock, so having a hoist that is lightweight and versatile prevents the need to configure multiple hoists for one application.

Shipyards can prevent growing a collection of inoperable hoists due to capacity mismatches by investing in versatile hoists. Maintenance operators can rig a hoist with varying lengths of chain or add bottom blocks to double or even quadruple the capacity of a hoist. For example, the Ingersoll Rand LC2A Lift Chain Air Hoist is modular, so shipyards can increase the load capacity of one hoist. Adding additional lengths of chain and bottom blocks increases the hoist's capacity up to four times.

Compact hoists with greater capacity are ideal for applications like positioning rudders, propellers or drive shafts for installation. During installation the operator welds a pad eye to the ship's hull and hooks the hoist to the pad eye. This application requires operators to work in tight spaces and compact equipment provides maintenance teams more room to work.

Mitigate downtime with low-maintenance hoists

Ships require frequent maintenance, and a ship in dry dock for maintenance isn't transporting payloads to generate income. Hoists with modular features decrease the amount of time required to perform maintenance because technicians can easily access the interior components of the hoist. Moreover, one hoist motor is compatible with hoists of many capacities so a simple motor swap can have the hoist back in service is minutes.

Hoists with an air gear motor require less maintenance than vane type air motors because there is no friction between the rotors and the motor housing. The motor is highly durable in rugged environments and is less sensitive to damage from long periods without use. Air gear motors have fewer internal parts and require less maintenance from use or contaminated air particulates.

An exhaust filter silencer is an important component for an air hoist because it prevents dirty compressed air particulates and aerosols from exiting the hoist and contaminating the workspace and it silences the compressed air as it travels through the hoist. Some silencers can be manually screwed onto a hoist, without requiring the operator to use tools to install the part. Operators install the filter while the hoist is mounted on the perch, mitigating the need to completely disassemble the hoist to service the filter.

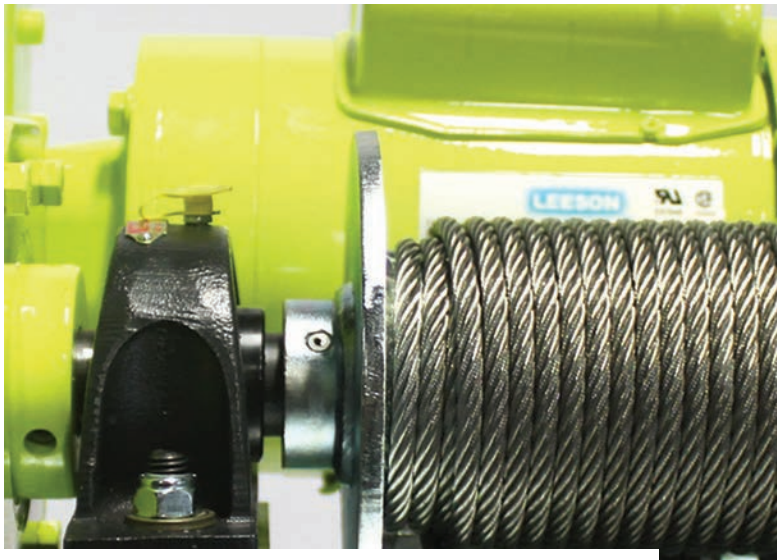
Air-gear motors are ideal for shipyards

A hoist with an air gear motor is ideal for dirty shipyards because it can intake and process large amounts of compressed air contaminants such as oil, rust and mineral scale. Air gear motors have fewer parts than vane and other types of motors, which makes the frequent maintenance common in corrosive environments easier and quicker.

Air gear motors can operate at lower pressure than standard vane and other types of hoists. The shipyard compressor room is typically located furthest from the dry docks where ships are serviced. Compressed air must travel across the shipyard to reach the point of use, and air pressure decreases the more it has to travel.

Hoists with an air gear motor are ideal for applications like engine room maintenance that require shipyards to replace the engine or boiler room equipment. Operators pull the machinery horizontally through the side wall of the ship with a hoist placed on its side to work as a pulley. Air gear motors don't require an oil bath to operate so the hoist can be placed on its side without spilling oil from within the hoist.

Shipyards are rugged, corrosive environments that require versatile hoists for optimal efficiency and productivity. Hoists with air gear motors are best-suited for shipyard environments due to their modularity and versatility.



Reliable Lifts

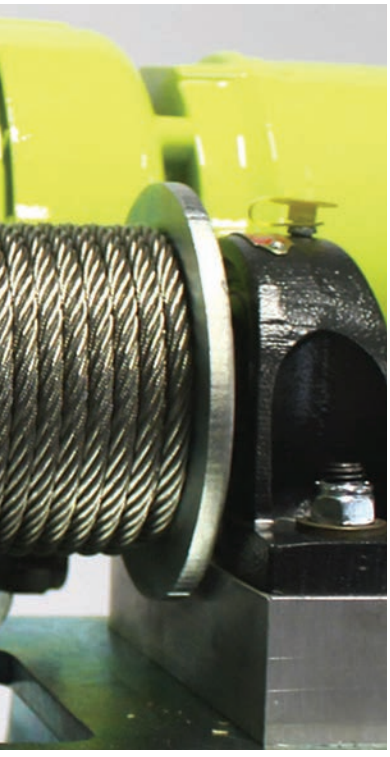
Patterson Manufacturing's new davit cranes are designed from the ground up for improved safety, ease of use, durability and reliability. What more could you ask?

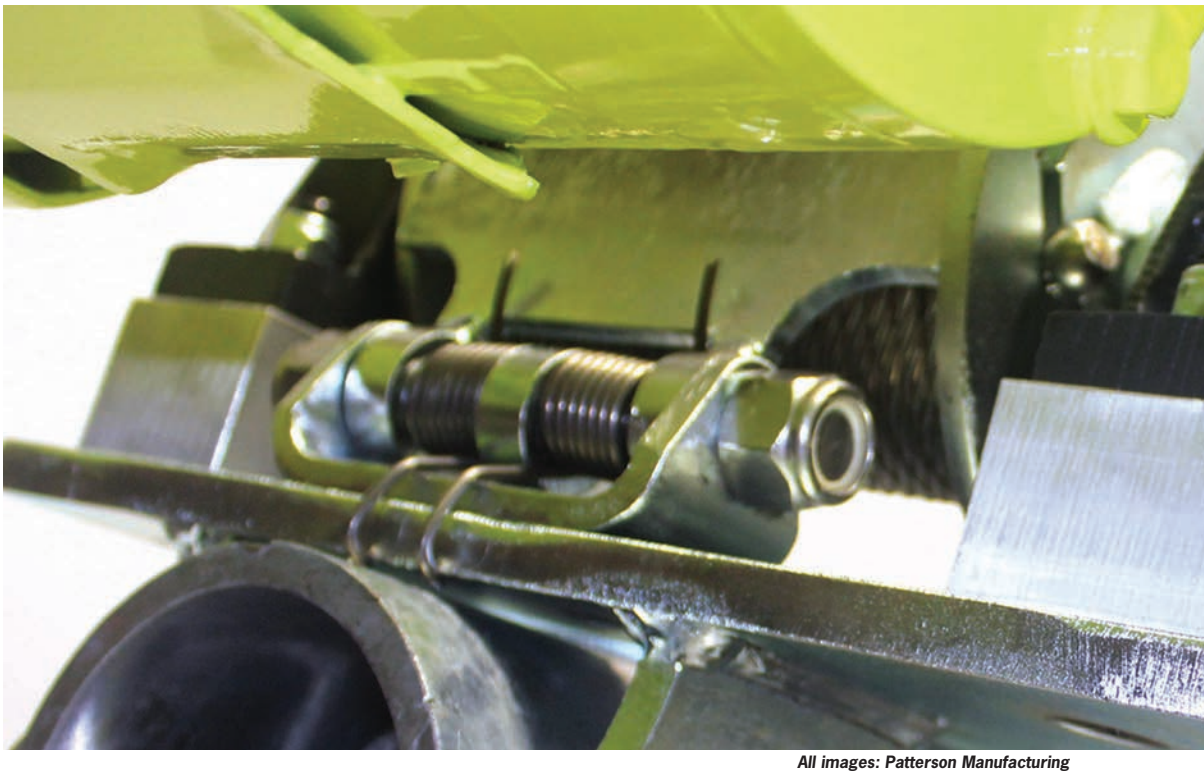
By Eric Haun

Patterson Manufacturing has supplied equipment into the marine market for more than 160 years, consistently expanding its lines of winches, rigging and fittings to meet evolving demands along the way, and even engineering custom products when the job requires. Now the Pittsburgh-based manufacturer is adding a new line of davit cranes to the mix.

The new cranes, available in 0.5-ton and 1-ton capacities, are both an answer to customer requests and a natural addition to Patterson's existing catalog, said Taylor Grapes, President, Patterson Manufacturing. "Patterson had regularly received requests for products in various lifting applications for a long time. Having made many custom lifting products in the past, we felt that it was a natural extension to our product line," Grapes explained. "From both a functionality standpoint and the high volume of marine applications, we knew our expertise was a match for the market's need."

Grapes said the new davit are hot-dipped galvanized/saltwater ready with no plastic sheaves or pulleys, de-





All images: Patterson Manufacturing

signed from the ground up for improved safety, ease of use, durability and reliability. "Because we are not relying on legacy designs or iterations, we were able to incorporate the highest quality components and finishes, which will benefit the customers in a variety of ways," he said. "A fully galvanized body means there is no concern of scratched paint or flaking powder coats, which can lead to corrosion and eventually failure. Steel sheaves, as opposed to plastic, offer significantly longer life and extended duty cycles between replacement."

"The simple design, durability and overall quality lead to minimal maintenance and downtime, which reduces cost and increases efficiency making operations faster and easier. The mobility of these units, also allows customers to service multiple locations with a single crane, which minimizes upfront investment and makes the Patterson Davit Crane an easy choice for operators and purchasing agents alike."

"Patterson has consistently expanded our line to offer a wider variety of high-quality options for deck equipment. With the addition of the Davit Line, our customers now have one more spot on their deck where they can be sure that the equipment that they purchased will be rugged and reliable for years to come," Grapes said.

These claims are backed up by thorough digital and physical testing. "Using ANSYS for digital finite element analysis, we can see where problems may surface due to focused stress–in a part or assembly–before we ever physically build something," Grapes said. "Once a prototype has been made, we perform thousands of loaded cycle tests at various loads and positions, and other conditions depending on the product. Lastly, all products are tested to yield and to failure, either in-house on a hydraulic test bed, or by a certified third party."

"Patterson is very cautious in our go-to-market strategy," Grapes added. "We go to great lengths to bring a concept to fruition and maturity internally, as opposed to using customers as guinea pigs."

The U.S.-built davit cranes are due to officially hit the market in March, and Grapes says Patterson is already in talks with multiple customers (marine or otherwise) who plan to place orders once the first production runs are completed.

"While our core market is marine, and more specifically inland marine, this product line has broad use in a plethora of industries including wastewater management, general construction and more," Grapes said. "It is a great fit in any application where you need a stationary or portable solution for repeat lifts."

Partners Developing Electric Launch for Canaveral Pilots

Credit: Glosten

Glosten said it is 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.

Marking a first for a pilot boat in the U.S., the vessel will feature a battery-electric propulsion system with an emergency 'get home' diesel engine.

During the feasibility-level engineering, the team established that a Ray Hunt hull form outfitted with a Glosten-designed battery propulsion system will achieve the speed and operating range required to support normal pilotage operations in Port Canaveral. Fla. Once in service, the electric launch will serve as one of two primary boats for supporting pilotage operations in the port.

Morgan Fanberg, President of Glosten, said, "Ray Hunt brings a wealth of knowledge on planing hulls and pilot vessels, specifically. Combining that with our own experience in electric propulsion systems, we hope to provide an excellent working solution for Canaveral Pilots."

Glosten said specific design details remain confidential at this stage, but the minimum performance criteria established by Port Canaveral included a cruising speed of 18 knots and an operating range (on battery propulsion only) of 24 nautical miles.

While hybrid and all-electric propulsion solutions have been in use for years for a number of vessel types such as ferries, tugs and offshore supply vessels (OSV), certain design challenges have slowed the technology's inroads in the pilot boat realm.

In 2018 Canada's Robert Allan Ltd. introduced an all-electric pilot boat design for short run applications of 5 nautical miles or less. And in 2019 the Port Authority of London took delivery of the world's first hybrid pilot boat (developed by French naval architects Pantocarene and adapted by U.K. builder Goodchild Marine), but there are currently no pilot boats operating in the U.S. with hybrid or fully electric propulsion systems.

"The technology isn't necessarily new. The challenge is managing total weight in relation to the hull form and the required operating profile," said Winn Willard, President of Ray Hunt. "Because we are seeing a growing interest in such vessels, it made sense to partner with Glosten to work through those technical challenges."

With feasibility-level engineering now complete, the Glosten-led team will now work to develop a draft program for the pilot/demonstration project to be used for Federal and/or State grant funding solicitations. At the current stage, a potential builder has not been not named.

Brendan McMillin, Co-chairman of Canaveral Pilots, said "[The project] presents an opportunity not only to reduce some of our maintenance and operating costs, but to demonstrate that electric propulsion can be adopted by marine pilot associations on a broader scale."

NOAA to Order New Research Ships in 2020

Credit: NOAA

The U.S.' National Oceanic and Atmospheric Administration (NOAA) said it expects to award contracts for the construction of two new oceanographic ships by the end of the year.

Once in service, the new large oceangoing, multimission research vessels will support missions ranging from general oceanographic research and exploration to marine life, climate and ocean ecosystem studies, NOAA said.

A NOAA spokesperson told Marine News that Dakota Creek Industries, Thoma-Sea Marine Constructors and VT Halter Marine are currently conducting design work and that each is in the running to be awarded build contracts later this year.

Target launch dates will be determined after the shipbuilding contracts are awarded, NOAA said.

The two newbuilds will be named after long-serving NOAA vessels Oceanographer (active from 1966 to 1996) and sister ship Discoverer (active from 1967 to 1996).

The new Oceanographer will be homeported in Honolulu, while the homeport for Discoverer remains to be determined.

New Boat for Texas Parks and Wildlife

All American Marine, Inc. (AAM) launched an aluminum catamaran built to patrol Texas state and federal waters for the law enforcement division of Texas Parks and Wildlife.

The 80- by 27-foot (OAL) Captain Murchison features twin CAT C18 ACERT D Engines, with Hamilton Jet HM 521 waterjets and is built to USCG Subchapter T standards. It is also the first vessel in North America to feature Hamilton Jet's innovative Advanced Vessel Control (AVX) system. The new AVX features include both a station keeping and a JETanchor positioning system. Additional vessel features include a DJI Mavic Drone integrated to the helm displays, as well as a FLIR M400 XR High resolution Thermal Imaging video with tracking to assist with patrol duties in the Gulf of Mexico.

The state-of-the-art hydrofoil assisted vessel, from Teknicraft Design, will combine innovative design features critical to modern maritime law enforcement.

One innovative feature is the inclusion of Teknicraft 's Rapid rigid hull inflatable boat (RHIB) launching system integrated into the stern of the vessel to increase safety and reduce the time and manpower required to deploy the RHIB. It will allow for deployment and retrieval in under 1 minute. The RHIB is a 20-foot Willard with a 170 HP Volvo Diesel Engine, and also features Hamilton Jet Propulsion.

Credit: All American Marine

ACL to Launch Riverboat Pair in 2021


Credit: American Cruise Lines

American Cruise Lines plans to launch two additional modern riverboats for the 2021 season. Construction is already underway on the new riverboats and will ramp up as American Jazz, the Line's third modern riverboat, is readied for its 2020 debut in New Orleans.

The two riverboats coming next year will be sister ships to the American Harmony and American Jazz, but will feature new design elements to be unveiled later this year.

All three new ships are being built at Chesapeake Shipbuilding in Salisbury, Md. an affiliate of American Cruise Lines.

American's series of modern riverboats ushered in a new era of river cruising in the U.S. The line introduced the country's first modern riverboat in 2018, with the debut of the series flagship, American Song. The second modern riverboat, American Harmony, was introduced in 2019 and the third, American Jazz, begins cruising the Mississippi in 2020. American Cruise Lines has introduced five new ships since 2017, including new coastal ships, and will have 14 ships cruising in 2021.

All-electric Harbor Clean-up Boat

The Waste Cleaner 66 – billed as the world's most powerful all-electric boat designed for cleaning up pollution in inland waterways and harbors – was unveiled at the end of 2019. The unique vessel is powered by a Torqeedo 25kW Deep Blue motor with a 40 kWh Deep Blue battery, which provides up to eight hours of endurance at a cleaning speed of two knots.

The 20-foot aluminum boat, built at EFINOR's shipyard in Paimpol, uses patented technology to retrieve up to 1,100 pounds of solid waste and 263 gallons of liquid waste, including hydrocarbons like oil or fuel spills. The patented clean-up system automatically separates water and hydrocarbons to eliminate emulsification.

The boat is designed for operation in inland waterways, harbors and coastal waters, including jetties and tight corners where access is difficult. The versatile platform can conduct suction at halt or when moving, either forward or in reverse. It can be trailered for road transport and has a single point of lifting for easy launching and recovery.


Credit: Torqeedo

OBITUARY

George Raymond Duclos
(1933-2020)

George Raymond Duclos, age 86, died on February 15, 2020. Born in 1933 in Fall River, Mass., George spent most of his life in Westport, Mass., spending summers on the Watuppa Pond and moving to the Pond permanently in the 1960s. George is survived by his wife and life-long partner in adventure, Pauline D. (Duperre) Duclos, and his four children, 10 grandchildren and two great-grandchildren.

At 22 years old, George joined Gladding-Hearn Shipbuilding in Somerset, Mass. With the support of his partners and his family, George grew the business to become recognized worldwide as a premier builder of small commercial vessels including high-speed catamaran ferries, pilot and patrol boats, tugboats and research vessels. The company had built nearly 400 vessels upon his retirement in 2011. If asked, he would say his greatest joy and satisfaction came from working with his family and all the talented people at the shipyard.

WCI

Calhoun Toohey

Stephens

Fitzgerald

New Leadership at WCI

Waterways Council, Inc. (WCI) Senior Vice President Deb Calhoun has taken over as Interim President/CEO, effective February 18, 2020, following the retirement of President/CEO Michael J. Toohey, who led WCI since 2011. An executive search firm will select a permanent President/CEO.

Stephens Elected PVA President

Colleen Stephens, President of Stan Stephens Glacier & Wildlife Cruises will be President of the Passenger Vessel Association (PVA) for 2020. Also elected to terms as PVA Officers for 2020 were Vice President Bob Bijur, Island Queen Cruises (Miami) and Secretary-Treasurer Jim Swindler, Golden Gate Bridge, Highway and Transportation District (Larkspur, Calif.). Ben Bernstein, BB Riverboats (Newport, Kent.) was elected to PVA's Board of Directors.

Kirby Buys Savage Inland Marine Fleet

Kirby Corporation signed a definitive agreement to acquire Savage Inland Marine's towboat and tank barge fleet for approximately $278 million in cash and the assumption of leases. Kirby will acquire Savage's inland fleet consisting of 46 towboats and 90 tank barges with approximately 2.5 million barrels of capacity, and will also take over Savage's ship bunkering business and barge fleeting services along the Gulf Coast. Savage's offshore marine business and certain shoreside services including dock operations, management and logistics remain unaffected by the deal.

Fitzgerald to Rejoin Crowley as COO

Ray Fitzgerald will rejoin Crowley Maritime Corp. as chief operating officer effective March 1. Fitzgerald began his career with Crowley in 1987and spent 13 years with the company – many of them in a vice-presidential commercial role within the liner services group. He then joined the Wallenius Wilhelmsen organization and over the past 20 years served in a variety of senior leadership roles.

Rand Acquires ASC

Rand Logistics announced it has


Hamilton


STEHMO


Lindström


McAfee

entered into a stock purchase agreement to acquire rival Great Lakes shipping company American Steamship Company (ASC) from GATX Corporation for $260 million, create the largest and most diverse fleet on the Great Lakes.

Hamilton Joins Ingram's Board

James L. Hamilton, an investment banker specializing in global transportation, has been elected as a director of privately-held Ingram Industries Inc. Hamilton has served as the Global Head of Transportation for JP Morgan during the past decade.

STEHMO Expanding

Ship maintenance and repair company ST Engineering Halter Marine and Offshore, Inc., will invest $10 million to expand at its Pascagoula, Miss. site, adding 100 jobs in the process. The expansion will enable the company to perform new commercial repair work for larger ships and oil platforms that require greater size and lifting capacity. STEHMO is adding dock space and water depth adjacent to its Bayou Casotte site. The company also is investing in machinery, equipment and building upgrades. STEHMO plans to fill the new jobs by the end of 2021, increasing employment at the facility to 186.

Hempel Taps Lindström as COO

Katarina Lindström will join Hempel as Executive Vice President & Chief Operating Officer from August 1, 2020 as the coatings manufacturer aims to double in size over the next five years.

McAfee Leads Resolve Alaska

Resolve Alaska, the northwest operating arm of the Resolve Marine Group, has appointed A.W. McAfee as its new Managing Director.

Madely Joins Ecochlor

Michael "Mick" Madely has joined ballast water treatment systems manufacturer Ecochlor in the newly created position of Vice President of Global Service. He will initially work out of the Ecochlor Connecticut USA office with a global remit for this role.

KPI Bridge Oil Acquires OceanConnect Marine

KPI Bridge Oil has agreed to acquire OceanConnect Marine, creating one of the largest independent marine fuels service and solutions providers in the world.

The two companies will merge to form a new brand and entity, KPI OceanConnect, with a team of 170-strong operating across 15 locations globally, led by KPI Bridge Oil's current CEO Søren Høll.

OMSA Honors Alario

The Offshore Marine Service Association (OMSA) announced the institution of the Robert J. Alario Distinguished Achievement Award, named after former OMSA Chairman and President Robert "Bob" Alario, who received the inaugural award in a ceremony organized by OMSA in New Orleans.

Madely

Høll

Robert J. Alario Distinguished Achievement Award

Duthu

Alario served OMSA as President for 16 years between 1988 and 2004, and also served a six-year term as Chairman of the OMSA Board of Directors. He is currently the Managing Member of marine management consulting firm Alario & Associates, L.L.C. The Robert J. Alario Distinguished Achievement Award is an annual awards program designed to recognize individuals who, through their lifetime of deeds and accomplishments, are indisputable champions of the U.S. maritime industry.

Duthu Joins NSRP

The National Shipbuilding Research Program (NSRP) and its Executive Control Board (ECB) kicked off the New Year by holding a Strategic Investment Plan and Technology Investment Plan Workshop to develop the guiding documents for the upcoming 2020 R&D solicitations. In addition, Mike Duthu, VP of Business Development at Ingalls Shipbuilding was selected to the ECB to replace the long-serving Rick Spaulding (now with HII-NNS). Mike Duthu was also elected to the position of Treasurer for the ECB.

In-Mar Solutions: Alu Pilot Chairs & Deck Rails

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

www.inmarsolutions.com

Victaulic

The 2" Victaulic Style 107N QuickVic Rigid Coupling is now approved by Bureau Veritas for Class II and Class III applications on board. These services include water seal/scrubber effluent, seawater, freshwater, deck drains (internal), water tanks/dry spaces, and several others. This coupling allows for faster installations, eliminates the need for a fire watch and time in drydock.

MegaPressG

Suited for installation and retrofit projects, Viega's MegaPressG is engineered to withstand harsh environments, including heat, oil and chemical exposure, and can make connections in 16 seconds or less. Configurations include elbows, couplings, no-stop couplings, reducers, tees, reducing tees, adapters, reducing adapters, unions, caps and flanges, in sizes from from ½" to 4".

Rubber lined butterfly valves

W&O Supply's rubber lined butterfly valves are available in many variations: Wafer, Lug, Mono, Double Flanged Types with a flange connection of 5K, 10K, 16K, 20K, PN6, PN10, PN16. Seats can be chosen from the following options: NBR/BUNA, EPDM, FKM, PTFE or Silicone. Disc material of Alu Bronze, SS316 & Super Duplex. Sizes on stock vary from DN32 to DN1200. Larger sizes or alterations can be specially ordered and customized to your specific needs.

End-Suction Centrifugal Pump

Carver Pump's horizontal end-suction pump is engineered to handle water, oils and chemicals in marine, process and general industrial applications. Hydraulic performance extends to 2,500 GPM and is covered by 28 sizes. Available as either a frame-mounted (GHF) or close-coupled (GHC) unit, the GH is based on the same product platform as the manufacturer's vertical pumps and shares many of the same parts.

'Big Berty'

Australian Pump introduced Bertolini's new CAX Series heavy duty triplex pumps, offering pressures up to 750 bar and flows up to 25 liters a minute at 1,000 rpm. The pump head is stainless steel (316), providing strength to maximize chemical resistance in high-pressure applications. Solid pistons with tungsten carbide coating are standard, designed to reduce wear and to prolong both high- and low-pressure seal life. The high-pressure seals are made of PTFE and energized component.

Mag Drive MICROPUMP

The MICROPUMP range of magnet drive gear pumps has recently been extended to include new options which provide exceptional pumping performance for high system pressure applications. The GLH Series compact, magnetically driven external gear pumps are designed for fluids handling applications with system pressures up to 103 Bar (1500 psi) and maximum differential pressures to 8.5 Bar. They can deliver flows from 2 lit/min up to 22.0 lit/min (at 2850 rpm) on liquids with a maximum viscosity range up to 2500 cp, at temperatures up to 121ºC.

ZF 5200 A/V PTI Hybrid Transmission

With the ZF 5200 A/V PTI, ZF Marine is expanding its portfolio with the brand's 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 (main drive: 2.588 to 4.250; power take-in: 2.5888 to 13.813) and modular space-saving design, the ZF 5200 A/V PTI is suited for many different types of marine vessels. The marine transmission can transmit primary drive outputs of up to 3,500 HP.

EcoLine Greases

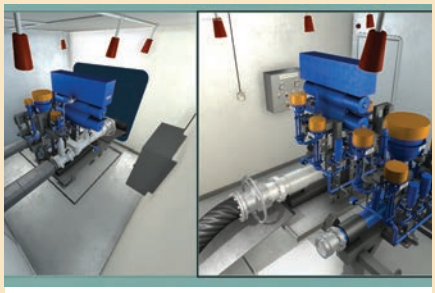
Cortec's selection of biobased EcoLine greases ranging from NLGI grades 0 to 3 make it easy to start the move toward greater environmentally responsible maintenance. While many EcoLine names designate specific uses, the greases can typically be used across applications wherever a biobased version of a particular grade is desired. Many are biodegradable, low toxicity, and non-bioaccumulative as required to be an environmentally acceptable lubricant (EAL) under the EPA's VGP regulation for vessels operating in North American waters.

Roxtec extends high density cable sealing solution range

Cable and pipe transit provider Roxtec added two new versions to its range of Roxtec HD (High Density) cable transit devices for use in terminal boxes, cabinets and enclosures. Developed for high cable density applications with high demands for environmental protection, Roxtec HD transits help securing sites and saving time during design, installation and upgrades.

Life-Calk

Marine-grade sealant Life-Calk from BoatLIFE is formulated specifically for use on watercraft. A U.S.-made long-lasting, permanently-flexible polysulfide compound, it can be used above or below the waterline and is capable of bonding to fiberglass, wood, metal, glass and itself. It is resistant to teak oil, gasoline and diesel fuel. Life-Calk is tack-free in one to three days, curing to a sandable firm, waterproof, non-shrinking seal that can be top-coated with various paints.



LNG Systems Simulator

Wärtsilä's new LNG Bunkering & Supply System simulator aims to improve the level of training, and thereby safety, for operators of LNG systems. It covers all operations related to the use of LNG fuel, from bunkering to gas fuel supply and engine operations, as well as troubleshooting. It provides realistic representation of the user interface for remote and local operating posts, as well as animated 3D visualization to facilitate situational awareness training.

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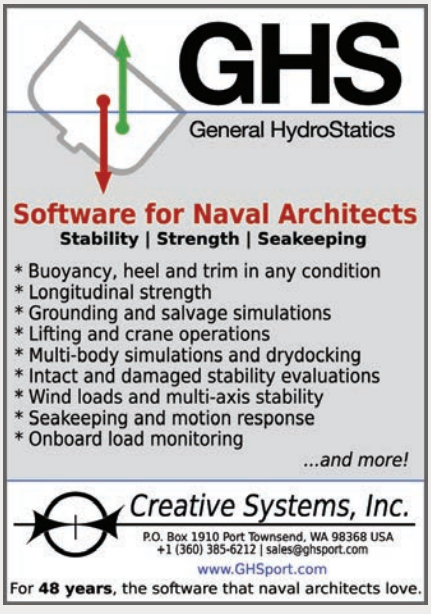

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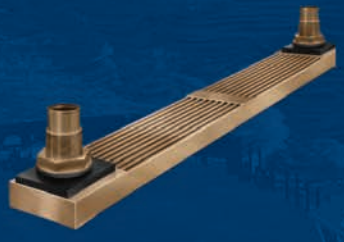
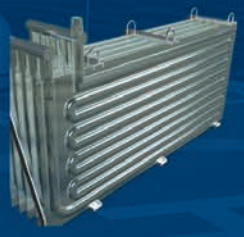


GRIDCOOLER® Keel Cooler

- **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.

FERNSTRUM®
R.W. Fernstrum & Company

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