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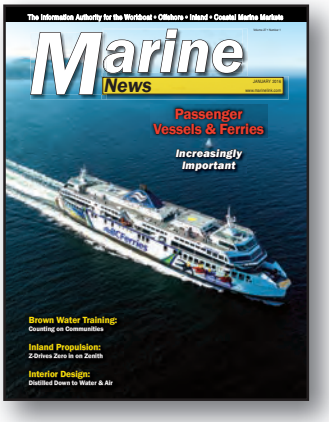
Features

ON THE COVER

A British Columbia Ferry is just one of hundreds of passenger vessels operating in North American waters; all of them critical parts of the intermodal equation and shortsea shipping solution. As it turns out, BC Ferries' safety culture is second to none. That story begins on page 24.

(Photo: courtesy BC Ferries)



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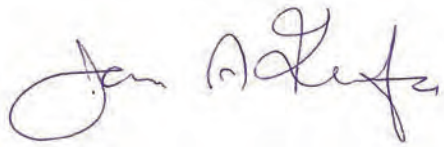
The New Year finds all of us taking 'last line' from the safety of a protected berth and proceeding full ahead on the next voyage (number *2016*). This trip begins with many unanswered questions and an equal number of uncertainties. In maritime nomenclature, this translates into a tramp voyage with limited contractual destinations and a bottom line that must be protected at all costs, in a year that promises more regulatory pressure on top of a choppy business climate. Nowhere is that more true than for domestic and North American ferry and passenger vessel operators.

Our annual Passenger Vessels and Ferries edition takes an in-depth look at one the most important brown water, workboat mission sets. Hence, if you open this periodical – *the number one audited subscription publication in this genre* – looking for the latest information on the ferry and passenger sectors, then you came to the right place. From training to regulatory issues, public and private concerns, all the way to commercial financial strategies, you'll find it here.

West Coast-based Sarah McCoy's take on the Washington State Ferries, for example, digs deep into the issues and challenges associated with running the nation's largest ferry system. That story starts on page 32. Also along the way, we reached across our northern borders for the Canadian, North American perspective, then across the pond to hear what's happening at Interferry and international ferry sector, and of course, we spent time with Dave Anderson, General Manager/Director of Operations of Fire Island Ferries, who also just happens to be the Passenger Vessel Association's (PVA) Chief Executive. That's because, and without all three perspectives, you simply can't get the full picture of what's hiding just over the horizon. And, there's plenty to think about.

At the same time, it is also true that sometimes, what you need already exists right in your own backyard. For example, educational and training opportunities for maritime professionals – especially for those toiling or looking to break into in the inland, brown water and coastal markets – are doing nothing but get better, and more prolific. On the Gulf Coast, for example, those opportunities are manifested in the expanding role and impressive facilities located in the heart of ports like Houston and New Orleans. A look at these affordable, proven community college programs therefore begins on page 28.

Finally, it is at times like this that I remember that there's a quote mounted on a plaque located just inside the front hall of the administration building at the Massachusetts Maritime Academy. It reads, *"You can have a Merchant Marine with first class men even if they sail second class ships, but second class men can't be trusted with the finest ships afloat."* The quote, attributed to the nation's first Marad Chief, Joseph P. Kennedy, reminds us that the future of the waterfront requires investment in the people who will someday be in charge of it all. That's a good place to begin our 2016 voyage, don't you think?



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The Market Drives Training & Employment Numbers

Yesterday's red hot maritime markets were fueled by a super-charged combination of domestic energy production, an increase in the number of hulls being turned out by the nation's shipyards, and robust salary structures. Those variables also drove an insatiable thirst for qualified licensed mariners, in particular. America's maritime academies are experiencing similar boom times, with record enrollments reflecting yesterday's euphoria, and – *something you won't necessarily see in the graph on page 10* – a marked increase in the number of students migrating ***back*** to the license track curricula. The most telling statistic, perhaps, is the 1,717 graduates who stepped out into the work place from the class of 2014. That number is up 431 students from just seven years ago, or a whopping 33 percent. It also represents a headcount leap of 246, or 17 percent, more than the seven year average. That's only half the story.

But, what do slowing employment numbers, stacked offshore supply vessels and sub-$40 oil mean for the graduates of these seven schools? At the Massachusetts Maritime Academy, today's enrolled four classes are not only larger than ever before, but both are also much more heavily weighted towards the license-track program. Almost 55 percent of these students are choosing the license track versus a seven year average of just 43 percent at the academy. Those numbers, although a far cry from the school's almost 100 percent license track numbers from the 1980s, reflect yesterday's demand for mariners everywhere. Most of these credentialed mariners will likely end up in the protected Jones Act trade, where the fleet has stabilized at its now anemic blue water numbers. A vibrant domestic, deep draft building program is still underway, but eventually, that cycle will also end. There are a limited number of ships to replace, after all.

Also not reflected in the table is Mass. Maritime's total regiment numbers for the coming school year – and the three that follow. With total enrollment topping out at 1,536 students, the numbers produce an average class size of 384, of which 210 graduates annually will potentially walk up a gangway just weeks after graduation. In fact, all of the seven schools recorded high water graduation marks within the last two years. For Mass. Maritime, 2016 promises to be its largest production of merchant officers ever – 223.

The positive trending brings with it another sea bag full of problems. The state maritime academies in particular are bursting at the seams, but also struggling to keep up with the unrelenting introduction of still more in the way of STCW training requirements that heap as much as an additional semester of requirements on the backs of cadets, all of which is being crammed into a traditional four-year academic calendar. Still, that's good value in today's spiraling education costs where a $100,000 MMA education immediately translates into a $70,000 job for 97 percent of its graduates. At MMA, as much as 25 percent of each graduating class is typically offered employment through the Military Sealift Command. *And the other schools?* They boast similar metrics. The license programs are becoming so popular that Mass. Maritime placed a "cap" to the number of students it can accommodate, and at least one other academy has already done the same. Good times indeed, for schools, some of which, that just 15 years ago were teetering on the brink of extinction as the U.S. merchant marine looked to be dying a slow and lingering death in an increasing global world.

All challenges aside, we asked Dean Lima for his assessment of the current situation and an estimate of how long the 'boom' time could last – at least at the academies themselves. For his part, Lima insists, "For the next half dozen years, the prospects look very good." He cited attrition from a graying workforce and the uncertainty represented by far more stringent U.S. Coast Guard medical standards that are now being applied at two year intervals, instead of the traditional five. The market changed, demanded products, and the academies delivered. And, looking at the price of Brent Crude oil, it seems like another change is coming. Can the market absorb as much as a 40 percent increase in licensed officers under market conditions that see scores of offshore supply vessels stacked in layup on the Gulf Coast? *Stay tuned for what comes next.*

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		CMA	Maine	Mass.	Michigan	SUNY	Texas	USMMA	All	PCT. Lic.
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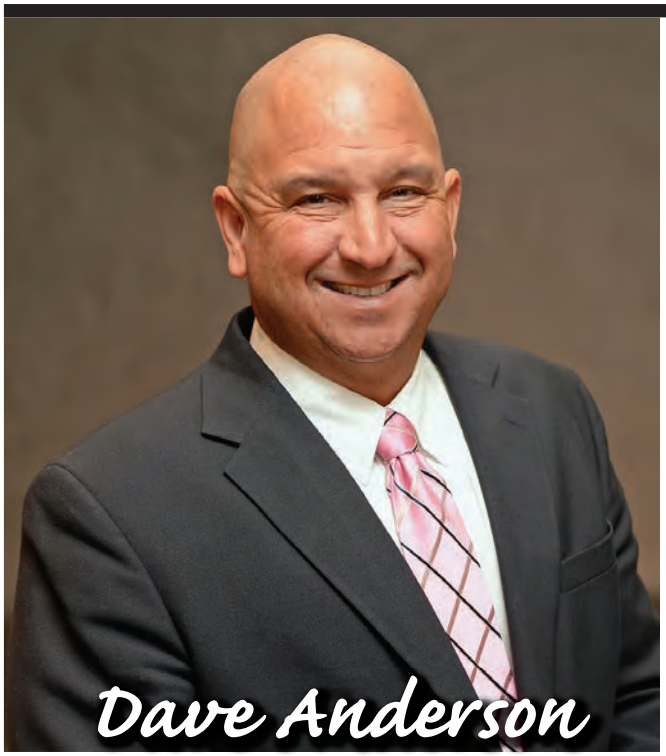
	Licensed	97	86	112	30	137	42	211	715	56
	Non-Lic.	34	83	102	0	131	221	0	571	
2009	Graduates	159	152	257	19	306	250	196	1339	
	Licensed	102	102	122	19	172	40	196	753	56
	Non-Lic.	57	50	135	0	134	210	0	586	
2010	Graduates	157	182	252	21	266	274	201	1353	
	Licensed	101	125	122	21	144	55	201	769	57
	Non-Lic.	56	57	130	0	122	219	0	584	
2011	Graduates	169	210	267	30	300	261	205	1442	
	Licensed	119	136	108	29	165	65	205	827	57
	Non-Lic.	50	74	159	1	135	196	0	615	
2012	Graduates	171	156	292	27	390	328	219	1583	
	Licensed	113	93	126	25	229	56	219	861	54
	Non-Lic.	58	63	166	2	161	272	0	722	
2013	Graduates	161	132	325	41	396	337	201	1593	
	Licensed	113	73	125	41	243	63	201	859	54
	Non-Lic.	48	59	200	0	153	274	0	734	
2014	Graduates	195	188	338	42	384	353	217	1717	
	Licensed	134	117	121	42	241	79	217	951	55
	Non-Lic.	61	71	217	0	143	274	0	766	
Totals	Graduates	1143	1189	1945	210	2310	2066	1436	10,299	
	Licensed	779	732	836	207	1331	400	1436	5,721	56
	Non-Lic.	364	457	1109	3	979	1666	0	4,578	
	PCT Lic.	68	62	43	99	58	19	100	56	
AVG	Graduates	163	170	278	30	330	295	205	1,471	
High #	Grads. (yr)	195 ('14)	210 ('11)	338 ('14)	42 ('14)	396 ('13)	353 ('14)	219 ('12)	951 ('14)	

(*) entries marked in RED show high water marks for those categories; total enrollment, average enrollment, numbers of licensed graduates, etc. CMA (California Maritime Academy). 2015 numbers not yet finalized. Source: Marad.



President, Passenger Vessel Association

Dave Anderson is the President of the Passenger Vessel Association (PVA). He also serves as General Manager/Director of Operations of Fire Island Ferries, Inc., Bay Shore, N.Y. on Long Island. The company has provided passenger service, freight service and water taxi service to Fire Island communities since 1948. The firm operates 23 subchapter T and K vessels ranging from six to 400 passengers. Anderson, an honors graduate from CW Post Long Island University where he earned his BA in Communication Arts in 1984, also holds a 100 ton Masters license which he earned in 1983. Dave is an industry leader and is recognized as such serving on the United States Coast Guard's Sector Long Island Sound Area Maritime Security Committee, Harbor Safety Committee, FSO and CSO Security Committee and the Committee for the Sector's Maritime Transportation System and Recovery Plan. He has been with Fire Island Ferries since 1984 and has been active in PVA since 1995. He currently is serving on the PVA Board of Directors as Vice-President and has served as Chairman of the Safety and Security Committee for PVA since 2005. Fire Island Ferries, Inc. has been an active member of NAPVO and PVA since its inception. As 2016 begins, Anderson finds himself leading PVA through an important time where looming regulatory issues, safety concerns and a challenging business climate have all come together for all manners of domestic ferries and passenger vessels. His take on what comes next, and more importantly, how PVA intends to navigate the coming year, is therefore especially important. Listen in this month as Dave Anderson weighs in on the state of the domestic passenger vessel industry.

What is the primary goal and function of PVA?

PVA aggressively advocates on behalf of owners and operators of U.S. passenger vessels to their lawmakers and regulators. While much of this work occurs at the Federal level, there are occasions when our organization is also involved in state and even local issues. PVA is also dedicated to safe and secure operations and remaining good stewards of the environment. To accomplish this, PVA provides its members with innovative tools and guidance to assist in compliance and training, and to address the evolving operational needs of passenger vessel operators. As an example, the PVA Green WATERS program was developed exclusively for members as a voluntary program aimed at reducing waste and operating in a cleaner, greener and more sustainable environment. PVA's ultimate goal is to help advance the U.S. passenger vessel industry by promoting a strong business operating environment for our members.

Give us some insight on the scope of the Passenger Vessel Association. How many companies and/or vessels does your association collectively represent?

PVA membership includes 530 companies around the country – including vessel operators, as well as suppliers and vendors for the industry. PVA members operate in nearly every port in the country and include small family businesses, large corporate organizations and a variety of public government passenger vessel operations. These operations involve a diverse variety of vessels including public and private car and passenger ferries, dinner cruise vessels, sightseeing and excursion vessels, amphibious vehicle (DUKW), whale watching and eco-tour vessels, sailing vessels and overnight cruise vessels. We are extremely proud of the fact that the U.S. passenger vessel industry safely carries over 200 million passengers annually.

PVA is developing a safety management system called Flagship. Tell us about it. Who is using it and what are some of its measurable benefits?

We are very excited about FLAGSHIP; a safety management system that has been designed by passenger vessel operators and is specifically tailored for passenger vessel operators to allow them to easily take their organizations to the next level in terms of safety management. We are fortunate that our industry has a stellar safety record. We have developed FLAGSHIP to advance safety even further and to ensure continuous improvement. FLAGSHIP is actually scalable to meet the needs of passenger vessel operators of all sizes and types. Importantly, the Coast Guard has been working with PVA on developing FLAGSHIP every step of the way, and we are hopeful that they will ultimately approve the program as an alternative to regulation. FLAGSHIP has undergone at least a year's worth of testing in the field by nine PVA member companies. Now that the FLAGSHIP framework is complete PVA will work to grow its user group community to include more operators.

Arguably, the most frustrating aspects of the Coast Guard's casualty investigation and reporting processes are its perceived inconsistent application, inappropriate restriction of operations and an outdated reporting form. Has there been any progress in the past 12 months on this front?

PVA and its members have long been frustrated with the marine casualty reporting process because of inconsistent reporting requirements from port-to-port. As a result, we have worked hard to advocate for significant changes in this program that would make it less onerous on industry. The recent release of the Navigation and Vessel Inspection Circular (NVIC) on marine casualty reporting was a significant step forward in improving this vexing situation. This new guidance provides several changes that directly address our concerns. For example the NVIC directs all immediate marine casualty reports to be made to a designated live person within the local Coast Guard. Additionally, the NVIC has further clarified terminology dealing with vessel groundings. It now includes two additional definitions: "bump and go" and "intended grounding or striking." The document makes clear that the mere "loss of propulsion, primary steering or any associated component or control system ..." does not, by itself, constitute a reportable marine casualty. However, there are still some areas where it doesn't go far enough. The $25,000 property damage threshold for a reportable marine casualty has not changed. This dollar value is far too low and has not been adjusted for inflation in decades. This cannot be increased to a realistic figure through a guidance document and requires a regulatory change. Additionally, the language describing momentary loss of propulsion, steering and control systems still remains confusing, particularly when it comes to interpretation and additional requirements placed on operators by local Coast Guard investigators. We will see how this NVIC is applied in the field as the true test of its effectiveness.

If you had to choose just one issue that is facing PVA members that you deem the most important to address in the coming year, then what would that be, and why?

Safe boating outreach and education is one of PVA's primary strategic initiatives going forward. Across the country, PVA members have become increasingly concerned about increased congestion on the waterways and frequent encounters with human-powered recreational craft, particularly those that are rentals. PVA vessel operators are encountering growing numbers of persons in craft such as stand-up paddleboards, kayaks and small electric boats who may not be aware of their responsibilities under the Navigation Rules of the Road. These dangerous encounters are becoming more and more common on many domestic waterways. To elevate this issue, PVA Board Members met with National Transportation Safety Board (NTSB) Chairman Chris Hart to voice concerns, and to emphasize PVA's commitment to safety. Since this meeting, the NTSB has begun planning for a Waterway Users Forum tentatively scheduled for the spring of 2016. PVA

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is also working with experts from the Coast Guard's Office of Boating Safety and Office of Waterways Management explore opportunities and ideas for strategic outreach and education to promote safe boating and communication on the water. PVA has spoken to the Boating Safety Advisory Committee, urging these industry experts to incorporate a discussion of this issue into its Boating Safety Grant Programs. As an organization, we are committed to safety and we stand ready to work with all waterway users to ensure a safe boating environment for all.

Security has to be an issue of enormous importance to the PVA and its membership. For example, you have worked to exempt vessels of less than 150 passengers from security plan and TWIC requirements. At the same time, what has been done to improve the security awareness footprint of this class of vessel?

PVA member operators are extremely secure. This attention to security actually predates 9/11 as maintaining the security of vessels for both passengers and crew has always been fundamental to safe vessel operations. Responding to the Maritime Transportation Security Act of 2002, PVA developed, in conjunction with the Coast Guard, an Alternate Security Program which offered members a far-reaching security program that could be implemented easily and effectively. This program is now being used by many PVA members and has saved them thousands of dollars in development costs. PVA continues to work to ensure that security regulations are reasonable and effective, and are based on Coast Guard risk assessments. To help maintain a strong security posture, PVA also offers a variety of training and informational tools for members that have been developed in conjunction with the Transportation Security Administration (TSA).

PVA works with Coast Guard to analyze incident data. What developments and positive steps have emanated from that effort?

Reinforcing PVA's commitment to safety and continuous improvement, we've partnered with the Coast Guard to review the industry's incident data. As a result of this analysis, we have identified that slips, trips and falls account for the majority of the reportable incidents on board domestic passenger vessels. Our desire is that this partnership with the Coast Guard will help us develop non-regulatory guidelines that PVA members can use to reduce slips, trips and falls aboard their vessels, and as a result, enhance safety for both passengers and crew. In recent months, we've also seen increased activity from Coast Guard enforcing the "interference with safe navigation of a vessel law" or more commonly known as "rail-jumper" or "wake jumper" amendment. This increased use of this statute came from PVA's urging at several quality partnership meetings. There have been several fines issued on the basis of this law and it has enhanced safety and the protection of our mariners.

Are there any other regulatory changes looming for the industry that give you and your collective membership particular concern? If so, which ones and in what ways do the new rules impact operations?

PVA is awaiting the issuance of the TWIC Reader final rule. We have gone on record opposing TWIC Readers for passenger vessel operators. We feel strongly that TWIC Readers will not enhance security and would only add unnecessary costs and administrative burdens on operators who are already extremely secure. The final rule is under review by the Department of Homeland Security (DHS) and then will move forward for evaluation by the Office of Management and Budget (OMB). So the release of this rule is still some time off.

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Interferry:
Aiming High in the Cause of Common Sense

Interferry CEO Len Roueche reviews the latest regulatory challenges impacting the ferry industry.

By Len Roueche


Roueche

With U.S. origins dating back more than 40 years, Interferry is the trade association and main voice for the global ferry sector – a crucial but often forgotten part of the wider shipping industry. Historically this has been particularly true with regard to regulatory issues at the International Maritime Organization (IMO), but in recent times the association has emerged as an increasingly influential platform within the corridors of power.

Most notably, Interferry obtained IMO consultative status in 2003 and built on those foundations in 2011 by establishing a regulatory office in Belgium's capital Brussels – which is not only at the heart of European Union affairs, but also within easy striking distance of IMO headquarters in London.

Over these past several years, the big issues for ferries have been the drastically reduced sulphur limits in Emission Control Areas, a battle we lost; and the Energy Efficiency Design Index, a battle we won. A 50 percent success rate isn't bad, but by learning from those experiences we are aiming ever higher both on current regulatory issues and those likely ahead in the coming years.

The current hot topic for ferries is the Ballast Water Management Convention (BWMC). It has been a decade since this was initially approved at the IMO – but that was only the start of a long journey, as each new shipping regulations convention has to be ratified by a specified number of member states representing a specified percentage of global tonnage before entering force. That is now about to happen.

From a global perspective, this is a good thing because the BWMC is designed to keep potentially harmful aquatic species from one part of the world from invading another part of the world, causing havoc to the local fauna. Does this have much to do with ferries? Probably not since ferries usually serve local markets within common environmental zones. But the Convention is not so simple. It does allow for exemptions, but requires a full environmental assessment of each port served by the route to prove that no harmful species could be transported between them. This is expensive, cumbersome and seemingly inappropriate for short ferry routes, so Interferry will be proposing a simpler and more streamlined process for ferry operation exemptions.

You might ask why we are trying to fix the ballast water problem at this late date. Firstly, Interferry was not IMO accredited when the Convention was first adopted so we had no input on the initial drafting. And once a Convention is adopted by the IMO, it cannot be amended until entering into force, which explains why our proposal is being finalized as the implementation date approaches.

Several other regulatory issues are approaching very quickly. The first is damage stability rules for Ro-Ro ferries. The issue has been highlighted in recent decades primarily as a result of two major incidents, the Herald of Free Enterprise in 1987 and the Estonia in 1994. Structural regulations were altered as part of the so-called Stockholm Agreement and subsequent revisions were made to SOLAS. Over the past 15 years a number of academic studies have been commissioned by the European Union to review and make recommendations on these rules. Very recently, the European Commission has put forward a proposal to the IMO that very much echoes the IMO's support for solutions based on more steel and technology. We appreciate that building the unsinkable ship is an attractive solution, but – much like our cousins in aviation – we would rather focus on how to prevent accidents in the first place.

In any case, the suggested additional structural rules will be expensive to implement and could seriously reduce the functional capability of the modern Ro-Ro ferry. Furthermore, energy efficiency would be reduced because new ships would have to be designed in a manner that requires more fuel to push them through the water. Saving lives certainly trumps environmental considerations, but in this case it is a very unfortunate trade-off because safety levels could surely have been much improved if operational aspects were also addressed. Interferry therefore advocates a balanced approach combining structural improvements with more emphasis on operational procedures.

Fire safety is another upcoming issue that once again has been prompted by accidents. The Norman Atlantic fire in

the Mediterranean in 2014 highlighted a growing concern about fires on vehicle decks. The accident investigation is still underway but will undoubtedly lead to discussions and proposals at IMO. Once again, Interferry will likely be pushing for a balanced approach where both structural and operational solutions are considered. Feedback from our members suggests that one of the stand-out issues is how to improve the speed and level of response to an onboard incident. To our mind, the 'more and better technology' approach must be matched by greater focus on the human decision-making process, which demands a fine balance between rational assessment and responding to each alarm as if a major fire was definitely underway.

Back on the environmental front, it has just been announced that the IMO's Marine Environment Protection Committee (MEPC) has agreed in principle to postpone implementation of MARPOL Annex IV requirements prohibiting passenger vessels from discharging sewage within the Baltic Sea special area. The requirements were due in force for new passenger ships from January 1, 2016 but a delay in arranging adequate port reception facilities has made this impossible. Subject to confirmation at the next MEPC meeting in April, the effective dates will now be June 1, 2019 for new ships and June 1, 2021 for existing vessels. Over several years, Interferry has engaged closely with Baltic marine environment body HELCOM to provide technical and operational input, but we still have concerns over compliance because the regulations place more of a mandatory burden on ferries than on the ports. As things stand now, when these new rules enter force it will be the ship's master who is not in compliance if a port cannot receive the sewage for whatever reason. The master will then file a non-conformity complaint to the port state and will eventually be cleared, but this could be an ever-repeated process as there are no apparent regulatory tools to force ports to actually provide the service.

Meanwhile, the European Union has introduced the strangely named Monitoring, Reporting and Verification (MRV) scheme for CO2 emissions from maritime transport. All ships calling at EU ports will have to monitor and report their CO2 emissions (technically – fuel consumption) as from January 1, 2018. The main concern for Interferry is how the requirement to relate the emissions to 'transport work' will be defined. It might be an easy matter for some ship types – ton-miles for bulk carriers, TEU-miles for container ships, passenger-miles for cruise ships – but ferries might be carrying passengers, automobiles, trucks, coaches, caravans, stacked containers, bicycles and even rail wagons. How do you objectively define that type of cargo mix in a single measure?

We have been chairing a correspondence group to recommend a ferry-specific metric. This is vital work because MRV is likely to be the first stage of a very profound development in shipping regulations. Once governments start measuring CO2 emissions, the next logical step is to start charging for it. Welcome to the climate change debate …

INTERFERRY
Representing the Ferry Industry World-Wide

From Canada, ***Len Roueche*** *joined Interferry as CEO in 2002 and since then has seen the association grow by more than 140 percent. Previously he was responsible for strategic planning at BC Ferries, where he spent 25 years. He has a B.A. from the University of Victoria and an M.A. from the University of British Columbia, both in economics.*

Ferries: An Economic Driving Force

By Serge A. Buy, CEO, Canadian Ferry Operators Association

Buy

While most people know that ferries are a method of transportation, few have a good understanding of the nature of the sector and its importance. In Canada, ferries transport more than 55 million passengers, over 19 million vehicles, billions of dollars' worth of goods and they employ close to 35,000 people. Beyond the numbers are the personal stories. Ferries are instrumental in helping:

- *children getting to schools,*
- *people going to hospitals,*
- *small businesses getting supplies,*
- *workers reaching their place of employment,*
- *tourists visiting remote regions*
- *and much more.*

For a good portion of Canadians, ferries are part of their way of life. Some are quite passionate about their ferries – something which shows when schedules, fares or routes are changed. But while this mode of transportation is as vital for some communities as other methods of transportation, the ferry sector does not, generally, receive the same amount of visibility. And that is an issue.

Planes, trains and automobiles. That's not just the title of a movie, it is also what immediately comes to mind when most people think about transportation infrastructure. And we often see that translated into practice when government priorities ignore ferries. A parliamentary committee reviewing Canada's transportation infrastructure recently managed to publish a report without mentioning ferries once. That raises red flags for our sector and for the millions of Canadians that rely on ferry transportation.

The Canadian federal government has announced that it will use infrastructure funding as a way to support economic growth. With this decision, tens of billions of dollars will be spent funding the building of bridges and highways, expanding airports, enhancing rail facilities and other projects. It is crucial to allow the ferry sector to also benefit from these infrastructure programs.

Some regions have very little ferry transportation, but others are entirely dependent on ferry services. While the reliance on ferries for the transportation of passengers, vehicles and goods may not always be evident in a capital city such as Ottawa (although there are a few ferries located in the immediate vicinity), it should not stop the decision makers from including ferries in their infrastructure programs.

Canada's recent federal election has resulted in a change of government. The new Prime Minister has been open to having provincial governments and municipalities decide on their priorities. This would allow provinces and regions to better define their needs based on their geographic landscape. We certainly support this and welcome Prime Minister Trudeau's leadership on this.

Ferries have been a method of transportation in North America for centuries. Indigenous communities have used boats to transport passengers and goods between communities and the same holds true for the French, English and Spanish colonists that came later. We have been able to maintain contact between communities separated by bodies of water, thanks to the efficiency of our ferry systems.

Whether it is travelling on the ocean to reach an island, crossing a river where no bridge exists, going across a lake or replacing an ice bridge by using a ferry system in the summer months, ferries are an environmentally friendly, efficient and economical transport mechanism. Governments should support this mode of transportation.

In the next few months, the ferry sector will make its case known. It will advocate for infrastructure funding programs that are inclusive of all modes of transportation. Stakeholders will need to be heard as well. This means that the suppliers benefiting from the billions of dollars spent by the ferry sector, the businesses that depend on the shipment of goods by ferries, daily commuters, tourism organizations that are located in regions served by ferries, and municipal governments, will all need to be vocal on these issues.

With a strong safety record, environmentally-friendly policies in place and flexibility to serve customers, ferries are the choice of millions of passengers on an annual basis. This will continue for the foreseeable future. Sound and inclusive government policies will be needed to serve the sector.

***Serge Buy** has served as the CEO of the Canadian Ferry Operators Association (CFOA) since 2012. CFOA is the national voice of the ferry industry in Canada, representing more than 85 percent of the ferry traffic (passenger and vehicle) in Canada. CFOA hosts an annual conference that brings together ferry operators, suppliers and other stakeholders to discuss issues relevant to our sector.*

Marine News 2016 EDITORIAL CALENDAR

JANUARY
Ad Close: Dec 14

Passenger Vessels & Ferries
MARKET: Training & Education
TECHNICAL: Thrusters & Inland Propulsion
PRODUCT: Interior Design, Outfitting & HVAC
REGIONAL FOCUS: U.S. West Coast

PVA Maritrends: January 22-26, Washington, DC

FEBRUARY
Ad Close: Jan 15

Dredging & Marine Construction
MARKET: U.S. Coast Guard
TECHNICAL: Naval Architecture
PRODUCT: Fire & Safety Equipment

ASNE Day: March 2-3 Arlington, VA
Inland Rivers, Ports & Terminals: Mar 1-3, St. Louis, MO

MARCH
Ad Close: Feb 15

Pushboats, Tugs & Assist Vessels
MARKET: Fleet Optimization & Navigation Software
TECHNICAL: Marine Coatings/Corrosion Control
PRODUCT: Water Treatment & Technology
REGIONAL FOCUS: U.S. East Coast

CMA Shipping 2016: March 21-23 Stamford, CT
Port Security Operations: March 17-19, Tampa, FL
NACE Corrosion: March 6-10, Vancouver

APRIL
Ad Close: Mar 14

Boatbuilding: Construction & Repair
MARKET: Marine Cranes & Deck Machinery
TECHNICAL: Communication Technology for Workboats
PRODUCT: Electronics & Navigation Equipment

Workboat Maintenance: April 12-14, New Orleans, LA

MAY
Ad Close: Apr 15

Inland Waterways
MARKET: Barge Building & Outfitting
TECHNICAL: OSV & Offshore Vessel Trends
PRODUCT: Cordage, Wire Ropes & Rigging
REGIONAL FOCUS: Inland Waterways

Inland Marine Expo: May 10-12, St. Louis, MO

JUNE
Ad Close: May 13

Combat & Patrol Craft Annual
MARKET: Shortsea Shipping Solutions
TECHNICAL: Lubricants, Fuels & Additives
PRODUCT: Oil Pollution Prevention & Response

SeaWork: June 14-16, Southampton, UK

JULY
Ad Close: Jun 13

Propulsion Technology
MARKET: ATB's
TECHNICAL: Safety & Fire Protection
PRODUCT: Shafts, Seals & Bearings

AUGUST
Ad Close: Jul 15

MN100 Market Leaders
APPLY AT: http://mn100.maritimemagazine.com

MARKET: Workboat Boatbuilding & Repair
TECHNICAL: Marine Operators
PRODUCT: Marine Diesel Engines & Gensets

SEPTEMBER
Ad Close: Aug 15

Offshore Annual
MARKET: Barge Loading & Offloading Equipment
Technical: Push Boats & Barges
Product: Winches, Ropes & Cranes

OCTOBER
Ad Close: Sep 13

Salvage & Spill Response
MARKET: Market: Special Purpose Workboats
TECHNICAL: Arctic / Cold Weather Operations
PRODUCT: CADCAM Software

SNAME: November 2-4, Providence, RI
Arctic Technology Conference: October 24-26, St. John's
Clean Gulf: November,New Orleans, LA

NOVEMBER
Ad Close:Oct 14

Workboat Annual
MARKET: Outfitting the Modern Workboat
TECHNICAL: Pumps, Pipes & Valves
PRODUCT: Deck Machinery/Cargo Equipment
REGIONAL FOCUS: Gulf Coast

Workboat Show: Nov 30 – Dec 2, New Orleans, LA

DECEMBER
Ad Close:Nov 14

Innovative Boats of 2016
MARKET: Fire, Patrol & Escort Craft
TECHNICAL: Emissions Control / Compliance
PRODUCT: Pumps, Pipes & Valves

*may be subject to change

Searching for a Better Way

Financing the Municipal, Tax-Exempt Workboat Sector.

By Richard J. Paine, Sr.

Paine

Poring over any of the many marine publications that seemingly arrive daily in your mailbox or inbox, you can get an idea of the depth and breadth of the current state of U.S. commercial marine vessel shipbuilding. Given the tumult in the oil market and the number of cancellations of vessels previously on order, it can safely be said that things certainly have looked better. Beyond this, the uncertainties of a domestic maritime industry that is so inextricably entwined with oil and gas makes predictions about what comes next, at best, difficult.

For some shipbuilders, the empty slots and shrinking order books have already spelled disaster for those with less than robust operations. With some exceptions, including a pair of coastal cruisers being built for Lindblad Tours, another batch of tugs for Vane Brothers and the Great Lakes Group and a few more Chesapeake Shipyard-built cruisers, a fair amount of the new boatbuilding business now seems to be centered in the tax exempt, municipal workboat market.

Selling and building boats for that market, success demands patience, persistence, perseverance and popularity. The shipbuilder must wait through the budget and appropriations process, has to survive while designing and producing a product that suits the market and proves attractive and necessary to the targeted end user. But, the tax exempt/municipal market, like the commercial marine market, comes with its own sets of rules, protocols, requests, notifications, publications, RFPs, RFQs and submittals. In some cases it may take years to complete the process of budgets, appropriations, specifications, meetings, bid evaluations, comments and negotiations and finally, award. There may be a better way. More on that later.

A Primer: Tax Exempt Entities

What or who is a tax exempt entity? Simply put, these are noncommercial, public sector enterprises that may be excused from one or more taxes imposed by regulatory or other governmental laws. More specifically, these can include:

- *all bodies corporate and politic and government agencies;*
- *cities, states, towns, municipalities and local governments;*
- *school districts, BOCES and boards of education*
- *fire and police departments*
- *water, sewer and electric authorities; sanitation/refuse districts;*
- *housing authorities;*
- *not-for-profit 501 (C)3 organizations financing through conduits or 66-20 corporations*
- *port authorities*
- *colleges, universities and hospitals*

In most cases, the vessels purchased, built and owned by these entities provide necessary services to a community that is not normally provided by a commercial entity. Nearly every port in the United States has one or more fireboats or patrol craft. From Bay Constables to research vessels, the universe of service boats is nearly unlimited. And, this fact presents an arguably golden opportunity to fill the many empty slots at our U.S. shipyards. Beyond this, the variety of workboat missions is endless.

Before we get to the better way, we should follow the vessel procurement process in a bit more detail.

In the lengthy procurement process, budgeting and appropriating funds plays the major part of putting a new hull in the water. Debt constraints aside (New York City's fireboats have run as much as $27 million per unit), a case

Municipal & Public Workboats at a Glance …

Police and Fire Boats	Patrol Boats	Landing Craft
Oil Skimmers	Research Vessels	Work Barges
Trash Skimmers	Ferries	Fish and Wildlife Vessels

must be made that the acquisition is necessary, sometimes to replace an aging asset or sometimes to expand a fleet due to increased demand or more sophisticated technology. NYC's newest fireboat, which only cost $4.7 million, the William M. Feehan, was named after FDNY's First Deputy Commissioner who perished in the World Trade Center on September 11, 2001. She was christened last November. In addition to pushing water out at 8,000 gallons per minute, she incorporates the newest technology in firefighter protection from chemical, biological, radiological and nuclear hazards. Needless to say, she was specified and built to meet the challenges of this century's threats which have evolved to demand ever more sophisticated solutions.

After the specification stage has been completed, vessel cost becomes the issue to be considered. As the end user submits a request to be included in the budgeting process, once approved, funding requires an appropriation be made for the funds. Funds are sourced either from internal or external resources and may entail complicated bond issues, construction loans, or increasing taxes to pay for the equipment. Increasing debt, increasing the budget or raising taxes to generate revenue is not the most effective way for a politician to win friends. Conversely, for the shipbuilder and end user it is just one more hurdle to be overcome.

As technology moves ahead, whether skimmer technology, counter terrorism, construction, energy or other public services, new vessels will always be, for those tax-exempt or municipalities that can afford them, a necessity. Certainly a big city like New York, Chicago or San Francisco has the resources to buy the newest, most advanced technology available. But what about those smaller communities whose tax base does not support the newest and best service vessels available?

A Better Way

The better way is for the tax-exempt or municipal user to lease rather than purchase the vessel. Leasing is a 'win-win' for the shipbuilder, the lessor and the lessee. Consider this: the shipbuilder sells and builds a service vessel that is purchased by a lessor who could be a bank, an insurance company and/or a pension fund which offsets the cost of the vessel by depreciating and renting/leasing it to the end user. The end user enjoys a highly reduced cost of ownership by paying monthly rent, which smoothes out any bumps in the budget or appropriations (easing the tax burden on the taxpayers) and has the ability to exit the lease when new vessel or systems technology arrives that improves the safety, performance or reliability of the current rental vessel. It keeps skilled workers employed and goods and services related to the design and building of the workboat.

In addition to stimulating the new boat building industry in these challenging times, the secondary market for the "last" generation of vessel technology may have found increased popularity in purchasing or leasing these used or off-lease vessels by the end users whose demand (and pocketbooks) do not require the sophistication of a boat like the William M. Feehan.

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SailSafe: A SEA Change for the Better

BC Ferries has improved its safety record, operational practices – and at the same time, its bottom line.

By Jeff Joyce and Murray Goldberg

In 2007, British Columbia Ferry Services Inc. (BC Ferries) initiated a union-management joint endeavor to create a world-class safety culture. This program, coined SailSafe, addressed a wide variety of safety-related aspects of BC Ferries' culture and operational practices. By almost any measure, SailSafe has been a tremendous successf. Although difficult to precisely correlate any one of the many facets of SailSafe to operational statistics, it is not coincidental that accidents have dropped by close to 60 percent, injuries and days lost due to injury have also dropped by the same amount and insurance claims costs have plummeted. A key customer service indicator, on-time performance of the fleet, has also significantly improved.

Key among the SailSafe initiatives was the creation of a new approach to familiarization training called the Standardized Education and Assessment (SEA) program. The SEA program is now in its seventh year of rollout and operation at BC Ferries. Over that time, many lessons have been learned – some the easy way, and others at some cost. This article sheds light on the SEA program and the lessons that have been learned through its implementation. It is meant to provide valuable guidance for any maritime organization either considering or embarking on safety improvements through best-practice training techniques.

SEA Training Program

The SEA program is an intensive blended (online and in-person) approach to job-, vessel- and route-specific training which replaces the previous job-shadowing approach to vessel and terminal familiarization for all 35 operational roles. It is supported by a web-based learning management system (LMS) specifically designed to support training in the maritime context. The SEA program is structured and sustainable, and produces consistent and reliable training outcomes – unlike job shadowing. Like other SailSafe initiatives, the SEA program involves all employees in its creation and sustainment.

Training the "SEA way" involves three core phases designed to ready an employee for performance within a position. It is then followed by a career progression phase which is comprised of two sub-phases focused on first addressing skill enhancement within the new position, and then preparing the employee for career advancement.

The three core phases are self-study, on board education (or "on-site" education for terminal operations) and clearance.

Phase 1 is self-study: In this phase, candidates learn online using the LMS, which provides a comprehensive set of job-specific learning resources. The materials include self-tests so the candidates can gauge their progress and readiness

Image above: British Columbia Ferry Services

to move on to the next module. The goal of this phase is to provide the candidates with the fleet-wide fundamentals for that particular position, bringing them all to a common level prior to embarking on the second phase. Phase 1 culminates in an online exam requiring a pass grade of 80 percent.

Phase 2 is onboard or on-site education: This phase takes place on the vessel or at the terminal with the support of a trained, supernumerary trainer. Depending on the position, between one and four candidates can be simultaneously trained by a single SEA trainer.

Phase 3 is the clearance phase: Here, the candidate is assessed for readiness to perform his or her duties. The clearance phase consists of four levels of measurement including practical demonstrations, verbal scenarios, an online clearance exam and a review with a senior operational supervisor (such as the watch master for a deckhand trainee). The candidate is required to pass all four components of the clearance phase in order to be cleared for duty. Once cleared, they continue their learning through the skill enhancement and career advancement phases.

Lessons Learned

Although SEA has proven to be superior in many ways to the traditional job shadowing approach to 'training' and clearing, change management had to be considered throughout all levels of the company. BC Ferries' strategy to address this challenge was focused on engagement and inclusion at all levels:

- *Executive support and engagement* – The president and CEO's support and understanding of the SEA principles and approach was fundamental. Additionally, the operational vice-presidents were asked to approve the design document for their individual departments. This program-specific document addressed the duration matrices for the training within the various training scenarios. The approved document also provided objective direction from the VP to the department; all layers below the VP were expected to support the program and its trainers.
- *Front-line inclusion and engagement* – The front-line employees were included in the entire process, from design through development, roll-out and sustainment. Those who had stepped up to participate in the design and development stages were the top trainer recruitment priority. Although perhaps obvious, it bears stating that the greater the understanding of the why and the how of any initiative, the greater the odds of early adopters acting as champions of the process to their colleagues. This is a key aspect of change management.
- *Curriculum development* was a joint effort between BC Ferries subject matter experts and a known and expert instructional design and project management contractor. This gave comfort to both management and operational employees. The return on the investment was dramatic. The approach taken by the project manager was consistently inquisitive and objective and fundamentally focused on ensuring that the front line employees ended up with what they needed.
- *Program prioritization strategy* – due to the higher volume of training need, greatest bang for the buck was achieved by beginning the SEA implementation starting at the lowest level (i.e. deckhand). An important additional unforeseen benefit was that over the duration of the project, we grew our expertise from the lowest level. The corollary of this bottom-up approach was that the understanding of SEA was not as broad nor as deep in the upper ranks, which meant SEA trainers occasionally had to develop their supervisors' understanding of the SEA trainer role and supervisory support requirements.

• *Sustainment of the program* – this necessitated strategic thinking and effective management that gave careful consideration to resource requirements, the SEA process, and objective performance measures.

Program Sustainment

Initially, the resources dedicated to the project consisted of two in management of design and development and one in LMS development (hosting and IT support). There was also one internal director-level person focusing about one-third of his time to ownership, leadership and part-time resourcing of the team. Completing the team was the cadre of operational employees who participated in working groups and on-site population of learning templates with site, vessel, and route-specific training information. As the program moved up the inaugural department (deck) and across the other three departments (terminals, engineering, catering), the number of part-time trainers grew. Additionally, as the number of programs increased, departmental dedicated expertise and leadership was required, so a SEA manager per department was hired from within our employee base.

It is important to note that while proper staffing is important, training can be improved using any level of staffing with the understanding that speed of progress will match the level of resources applied. There is no harm in the idea of beginning conservatively and with limited resources under the expectation that success has the potential to make additional resources available, if desired, at a later time.

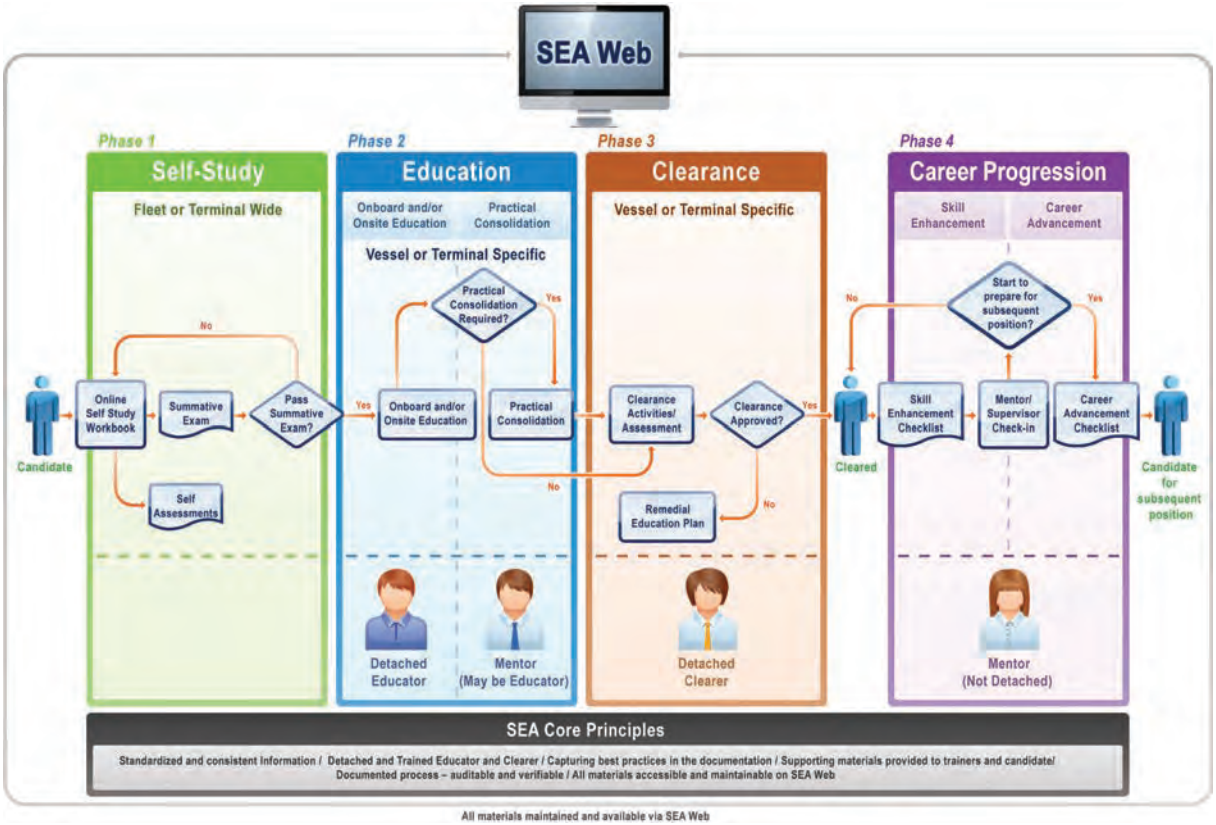
Documented processes were critical in order to ensure that the vision and fundamental tenets of SEA were sustained throughout the project. To develop the processes, key stakeholders were engaged from the employee base, crewing offices, employee relations and the SEA core team. A SEA training process map was created to show the workflows across the company to create awareness, ensure coherence and support sustainment.

Documented measures of performance were critical to sustainment: if you can't measure it, you can't manage it. The LMS needed to provide training metrics, ranging from exam performance at the individual question to roll-up reports on programs and ranks of employees.

Recommendations to Industry

Any company considering the transition to a standardized, LMS-enabled training program ignores the experience of early maritime adopters at its own peril. The experience of each company will differ, but there will be many similarities.

Regardless of the organization, a key recommendation is careful consideration of engagement and inclusion. These two levers will help ensure clarity on the impetus (why), the operational requirements (what), the resources, strategy, change management and executive support (how):



✓ **The 'Why'** – Why a company would forge a new path must be considered and articulated in compelling ways. Typically, these types of initiatives come from the front-line, so it is important to never lose that tone whilst honing the elevator speeches, the stakeholder/enabler engagement sessions and even the executive briefings.

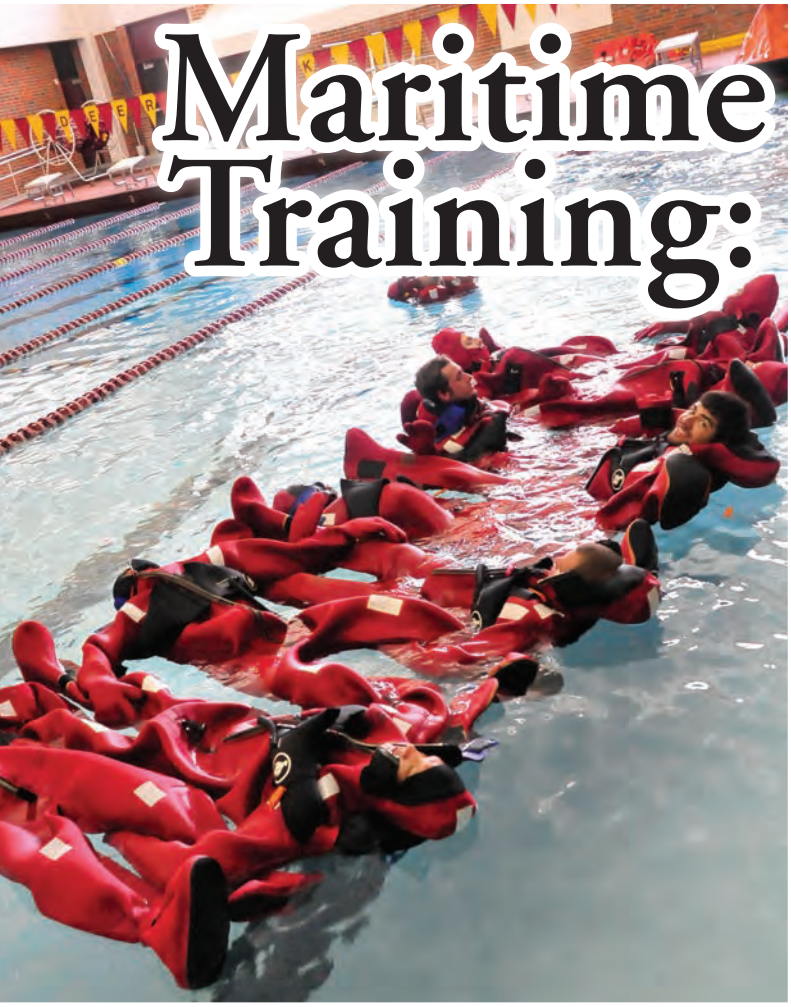
✓ **The 'What'** – What exactly is required? How best to determine the 'what' requires consideration of a range of items, from the regulatory requirements all the way through to the front-line employees' real training issues. Understanding their needs and addressing current training challenges and shortcomings are key elements of a successful implementation.

✓ **The 'How'** – How best to address these needs must be realistic. Having a training delivery plan that is not affordable is clearly poor planning and will lead to expedited failure. Iterative approaches are typically best when it comes to design and development. A conservative beginning with a small group in a pilot format will allow the project owner to gather key decision and planning-enabling data, ensuring long-term success. This underscores the point that it is not possible to have all the answers at the outset of the project; each implementation is a learning experience. But with some initial planning and a cautious and iterative approach to growth, rest assured that the answers will emerge over time and success will be achieved.

BC Ferries: a SEA Change for the Better

The SEA program at BC Ferries is alive and well as it shifts gears into sustainment. Many lessons have been learned that industry colleagues will hopefully be able to benefit from as they consider their own training strategy. The SEA process has provided much-improved structure, consistency and quality over traditional job-shadowing. The process has had significant positive impact on employee training as well as on employee soft-skills development. Employee buy-in is now very high. Critical thinking and objectivity, as well as collaborative planning and communication skills have all been honed through SEA.

__Jeff Joyce__ is BC Ferries' Director of Fleet Operations and has been the SEA Project Owner since its inception in 2008. __Murray Goldberg__ is CEO of Marine Learning Systems (www.MarineLS.com). An eLearning researcher and developer, his software has been used by 14 million people worldwide.



Maritime Training:

Keeping it Close to Home

On the U.S. Gulf Coast, two well-regarded maritime education providers are expanding to meet growing local demand, while satisfying local employers with quality graduates. The sense of 'community' that they project is both real, and intentional.

By Joseph Keefe

Less than 350 miles apart, the ports of Houston and New Orleans handle all manners of marine commerce and cargoes, employ tens of thousands on the waterfront and collectively service an increasingly large percentage of the nation's domestic and international marine traffic. As both ports deepen their channels and grow their facilities, the need for qualified mariners, dock workers and marine professionals has become more acute. In response, homegrown talent is emerging in both cities, trained locally and delivered directly to customers that need the help.

In both cities, that sense of community emanates, in part, from local community colleges, already providing a wide menu of marine training, but also expanding to meet new demands. Louisiana-based Delgado Community College is one such facility, having broken ground earlier this year on a new Delgado Maritime and Industrial Training Center. The $7 million state-funded project is expected to be completed by February 2016.

Separately, and located in close proximity to the Houston Ship Channel, the San Jacinto College Maritime Technology and Training Center is getting ready for this month's debut. Construction has been ongoing since last Fall. The facility will serve as the site for certificate and associate degree maritime training delivered through U.S. Coast Guard-required and approved course work.

Both expansion projects will augment already robust maritime programs at the schools and increase enrollment and training capabilities. That they operate under the umbrella of a local community college system gives both local ties, measurable commitments to the cities that they serve, and real value to the brown water and inland commerce that thrives just minutes from their doorsteps.

Delgado Community College

Over time, the Maritime, Fire, and Industrial Training Facility at Delgado Community College has earned a national and international reputation for providing quality maritime and industrial firefighting, radar, safety and U.S. Coast Guard-approved training. For more than two decades, Delgado's experienced instructors have helped provide training to licensed mariners and industry personnel in the maritime, oil and gas, and safety/homeland security fields.

"The new facility will bring growth. Numbers have steadily increased over the years, with even higher enrollments expected to coincide with the new building expansion. The new center will have additional classroom space and increased classroom size. This will afford us the opportunity to take in more students at once and to offer a wider variety of training at any given time. In anticipation of this, there are several new programs in development that will be offered in the new building, such as QMED and Engine Resource Management."

– Rick Schwab, Senior Director of the Maritime Program at Delgado

At Delgado, courses can also be tailored to meet the specific needs of an individual company and the school boasts U.S. Coast Guard-approved training including full mission bridge simulator courses.

The Delgado Training Facility has been a U.S. Coast Guard approved facility since 1978, and is currently certified by such organizations as the International Association of Drilling Contractors and American Red Cross. Training is conducted for more than 8,500 students per year, serving local, regional, national and international companies. More than 90 courses are offered in marine firefighting and radar, industrial safety and emergency preparedness, most of which lead to industry-based certification. Located on 3.3 acres used for classroom, field and simulation training, the fire field contains 10 props used for both marine and industrial firefighting scenarios.

Additional courses include Wheelhouse Proficiency Management and Wheelhouse Z-Drive courses, featuring Louisiana's first full mission bridge ship simulator and a second, interconnected bridge simulator to provide unlimited hands-on, realistic training scenarios.

Targeting the inland waterways, Delgado targets training leading to stacked and latticed credentials, from entry-level deckhand positions to top-

Delgado Curriculum at a Glance …

Basic and Advanced Firefighting	Industrial Firefighting	Steersman/ Apprentice Mate
STCW Basic Safety Training	Job Hazard Awareness	Western Rivers
Confined Space Entry and Attendant	Vessel Security Officer	ARPA
Confined Space Competent Person	Medical Care Provider	GMDSS
100 Ton Masters/200 Ton Mate	Comprehensive Radar	Radar Recertification

level captains. Eventually, 300 participants will have trained and obtained one or more industry credential. The program began in May 2014 and continues through 2016.

The soon-to-be-completed (March 2016) Maritime Center of Excellence will include a 23,000 square feet administration/education building and a 1,500 square foot saltwater pool with enclosure for expanded Water Survival, HUET, Able-Bodied Seaman and Lifeboatman training. The state-of-the-art building is intended to create a cutting-edge training facility to meet growing occupational needs of maritime, transportation and safety-related fields, as well as to provide a one-stop shop for licensing and certifications for inland waterways and offshore maritime clients. Delgado regularly reaches out into the local community, providing programs that articulate with secondary schools, four-year universities and industry apprenticeships.

According to Rick Schwab, Senior Director of the Maritime Program at Delgado, the new facility will bring growth. He explains, "Numbers have steadily increased over the years, with even higher enrollments expected to coincide with the new building expansion. The new center will have additional classroom space and increased classroom size. This will afford us the opportunity to take in more students at once and to offer a wider variety of training at any given time. In anticipation of this, there are several new programs in development that will be offered in the new building, such as QMED and Engine Resource Management."

Delgado's Regina Radosta told ***MarineNews*** in December, "For inland and coastal credentialed personnel / students, I would say that quality sets us apart from the competition. From course development to information delivery, every step is taken with care and attention to detail. The final result reflects every staff member's most important questions: *What is the pertinent information the participant will need? What is the best way to impart this information so that the student will retain it and be able to utilize it in the workplace?*

San Jacinto College

In the considerable shadow cast by the San Jacinto Memorial, and overlooking the Houston Ship Channel, the San Jacinto College Maritime Technology and Training Center is in its final phase of construction. The facility will serve as the site for certificate and associate degree maritime training delivered through U.S. Coast Guard-required and approved course work. Maritime staff and faculty have already begun moving to the new Maritime Technology and Training Center based in La Porte, Texas.

The San Jacinto College Maritime Technology and Training Center showcases a training dock with lifeboats, davits and fast rescue craft, and a separate industry dock for crew changes. This also allows for vessel specific training for local maritime companies and serves as an aquatic training facility for sea survival and life raft training. 15 classrooms house engineering simulators to train maritime engineers for hydraulic, electric, pump control, motor control, heating and air conditioning, and refrigeration and a multipurpose space for industry conferences and corporate partner meetings has also been created.

The new facility includes three bridge simulators, all donated by the Houston Pilots. These ship control bridges are a part of a 3,748 square-foot simulation suite, complete with instructor stations, debrief classrooms and development stations. A full-mission engine room simulator is planned for the future and will interact and interconnect with the bridge simulators to allow vessel management exercises to accommodate deck and engineering officers and crew at the same time, in the same scenario.

The latest campus expansion, says San Jacinto's maritime instructor Captain Amy Arrowood, has been the maritime program's 10 percent annual growth which has outgrown the school's current facilities located on Highway 225. But the maritime aspect of the school straddles both sides of the education equation – both academic and professional training. Arrowood explains, "Our maritime program has two sides. We have some students that are getting their associates degree and then we have the professional mariners that come in for endorsements, upgrades and renewals for their licenses and Coast Guard training. Right now, there are 42 students in the credit program actually studying to get their associates degree in Maritime Transportation." And, says Arrowood, this particular degree in Maritime Transportation is geared towards those looking for positions on vessels.

Within the new facility, those programs will benefit from better sized and equipped classrooms, and some of most advanced and latest issue simulators on the market – a Kongsberg full mission bridge simulator, as well as an advanced Transas navigation lab. Here, radar and ECDIS will be taught leveraging the Transas equipment. Three bridge simulators, all capable of being interchanged as tugs, will be available to students. All of those simulators can interact with another within the same exercise.

Even limited to the previous, somewhat cramped spaces, San Jacinto issued a little over a thousand certificates in this past calendar year.

At San Jacinto College, the students in the associates programs are typically new to the industry. And, they serve the full gamut of demographics. Arrowood told ***MarineNews*** in December, "I'd say 85 percent know port, starboard, bow, stern, but that might be the extent of it. If they're not right out of high school, they're a year or two out. But we do have some with some prior sea time in some capacity – tanker men, or some military. We've got three students with prior military from the Navy and the Coast Guard.

Beyond this, San Jacinto's industry ties are deep, they are meaningful, and they help to shape the very curriculum that the school delivers daily. Arrowood adds, "We work really close with Higman Marine, Buffalo Marine and Harley. We're also really close with the Houston Pilots and G&H Towing. We have an advisory committee that works with us – we meet a couple times a year and they give us guidance and since they're either sending their mariners – their employees – for training, as well as looking at new talent already studying at the school." Those advisory meetings in turn produce course content that translates into real world skills, as well as more frequent offerings for courses and credentialing classes that are in high demand.

Unlike the maritime academies which focus largely on four-year bachelor degrees, augmented by a Marad-supplied training vessel, Arrowood says that San Jacinto depends on its industry partners for 'internships.' "It's not like a maritime academy; we don't have a training ship. So the students go out on commercial vessels for the summer, and then they come back, do the next fall and spring semester, then they go out and do another, their second internship. And then they would graduate in August of that second year."

Captain Arrowood is quick to point out that when the students do graduate, they leave with that associates degree, and 12 Coast Guard-approved course completion certificates. "But, they're not walking out of this program with a license, mostly due to the fact of not having enough sea time. They are typically graduating with about 120 days of sea time." But, in the same breath, she insists, "What's really cool about this program is that it's not cookie cutter like the academies, where everyone's either a third mate or a third assistant engineer." San Jacinto students therefore work towards a variety of goals, including 100- or 200- ton master's licenses, a tanker man position and some even want to work in the blue water industry – in which case, they'll work towards their AB ticket first.

Arrowood sums up the San Jacinto College philosophy nicely, saying, "The students are our clients. But, the ultimate goal is for them to get a job, so that's where it comes back to our advisory committee. That's how it works. We now have 17 members, but we're always looking for new support and new people to come in and help guide us in our program as it grows and expands."

Community College Curriculum for Community Customers

Not everyone who wants to find and train for a career on the waterfront has the time, wherewithal and connections to travel far and wide to get the training that they need. On the U.S. Gulf Coast, increasing numbers of prospective marine employees and students no longer have to make that arduous journey. Aptly serving the communities that support them, Louisiana-based Delgado Community College and Houston's San Jacinto College are both bringing expanded maritime training opportunities to the local waterfront. Leveraging recent, high-tech expansion projects, both schools can now promise that this won't ever change. At the end of the day, isn't that what community is all about?

Rough Waters for Washington State Ferries

Improved funding and management changes have the nation's largest ferry system on a course to better times. Challenges remain, but WSF tackles each one in turn.

By Sarah McCoy

Unlike the citizens of British Columbia, which pays a German shipyard to build its ferries, Washington state residents resolutely invest at home. By law, ferries are built locally and the results, overall, seem win-win. The state's Office of Financial Management estimates that every $75 million in ferry construction generates about $90 million for the state's economy. In-state shipbuilding provides the vessels that are at the center of the marine transportation system. On top of that, WSF employs 1,900 people.

So, while the shipbuilding end of the ferry system has been successful, the funding end has struggled. It has sometimes seemed as though taxpayers were at odds with themselves, on one hand expecting transportation but with the other hand cutting its funding. A 1999 tax repeal began years of persistent underfunding. Lean budgets have forced WSF into using decades-old boats and gave it uncertainty about buying new boats. Lack of funding meant delayed maintenance and tight staffing. And, the situation gave

Image above: The process of installing the superstructure built by Nichols Brothers Boat Builders onto the hull of the M/V Tokitae at Vigor's yard, March 2013.

Humpback whale breaching next to state ferry in San Juan Island.

shipyards little year-to-year certainty about new builds and set the stage for high-profile negative publicity.

Ferry Funding Fractured

Iconic green-and-white WSF ferries are the state's single biggest tourist attraction. They're also transportation for everyone from Bainbridge Island-to-Seattle commuters to long-haul truckers to personnel at the six naval installations around Puget Sound. As a "marine highway system," ferries connect the mainland to the Olympic Peninsula and to highly populated islands in Puget Sound. WSF's 24 ferries cover 10 routes and 20 terminals. WSF operations serve 60 percent of the state's population, about four million people. It should therefore come as no surprise that WSF is the largest ferry system in the United States.

Voters may not have had long-term effects on ferries on their minds in 1999 when they repealed the Motor Vehicle Excise Tax ("car tabs"), taxes reserved for transportation and ferry operations since 1937. Ferries lost 20 percent of operating costs and 75 percent of capital funding. Hence, in the choppy wake for that questionable voter edict, WSF quickly found itself raising tolls and fees. Given higher tolls and service cutbacks, ridership sank from its peak of 27 million trips in 1999 to 22.6 million trips in 2010.

In 2007, a second blow came in the form of the overnight removal of four 80-year-old Steel Electric Class ferries. When tests showed that the hulls were dangerously corroded, transportation secretary Lynn Peterson pulled them from service that day. The ferry system ran very lean for the five years it took to replace them.

In the rush to replace those very old ferries, WSF botched building decisions for the first new replacement. WSF decided to use a preexisting ferry design from the Island Home, which runs between Martha's Vineyard and Woods Hole, Mass. A 2013 state audit found that change orders caused the first replacement ferry, the Chetzemoka, to end up costing almost twice as much as the Island Home.

Nevertheless, the legislature funded new 144-car Olympic Class ferries built by Vigor in Seattle, with superstructure built by Nichols Brothers Boat Builders of Whidbey Island. The first, the Tokitae, was finished in 2014.

WSF Ferries Built Since 1991 … by the numbers

Class	Capacity (Pass. / Vehicles	Name	Built (*)
Jumbo Mark II	2,500 / 202	Tacoma	1997
Jumbo Mark II	2,500 / 202	Wenatchee	1998
Jumbo Mark II	2,500 / 202	Puyallup	1999
Kwa-di Tabil	750 / 64	Chetzemoka	2010
Kwa-di Tabil	750 / 64	Salish	2011
Kwa-di Tabil	750 / 64	Kennewick	2012
Olympic	1,500 / 144	Tokitae	2014
Olympic	1,500 / 144	Samish	2015
Olympic	1,500 / 144	Chimacum	2017 (*)

Source: WSF / (*) under construction

Washington State Governor Jay Inslee welding the initials of his grandchild "BRI" at the keel laying ceremony for the state's newest ferry, the Samish, at Vigor Industrial Seattle shipyard.

Ferry Follies

"Tokitae" means "nice day, pretty colors" in Coast Salish. Yet 2014 proved to be a summer of horrors for WSF's ferry chief. Staffing shortages sometimes cancelled sailings. In July, the Tacoma lost propulsion on the Bainbridge Island to Seattle run and had to be towed back to Bainbridge Island. Repairs cost $1.8 million. The 202-car Wenatchee was already out of service, making two of the state's three largest ferries unusable. In August, Seattle's KING-TV ran a story pointing out that the ferry system was attempting to sell never-used generators it had bought for $5.3 million in 2005 for the sum of $300,000. There are still no takers.

On August 15, in Bremerton, WSF allowed some 1,600 passengers onto a ferry bound for a preseason Seahawks game in Seattle. Ferry staff mistakenly thought they had allowed too many passengers and called in state troopers to have 500 debark. Only later did the ferry system staff realize they had been wrong on capacity. But the PR damage was done.

Ferry employees were understandably demoralized. The WSF ferry chief wanted to move on. Not finding a suitable replacement, Peterson called off the first search. At $145,000 a year, the job wasn't tempting to many from the private sector.

But then the stranded Tacoma and the mistaken passenger count in Bremerton tugged at Lynne Griffith's heartstrings. Griffith, a 36-year veteran of the transportation industry, said, "I saw they had serious operational issues. My goal was to come on board and stabilize the situation. That's what I do."

"Tom Wooten, Chairman of the Samish Indian Nation, and a tribal member present Assistant Director of Transportation for Ferries Lynne Griffith with a blanket at the dedication of the new ferry M/V Samish."

"I saw they had serious operational issues. My goal was to come on board and stabilize the situation. That's what I do."

– Ferry Chief Lynne Griffith

Righting the Ship

Griffith started getting familiar with her new territory by riding every ferry route and stopping at all the terminals and maintenance docks. Griffith and Peterson also spent several days completing the training for able-bodied seaman, to the surprise of ferry workers. Griffith flattened the management structure of the system; fired four high-level administrators and brought in members of her own team.

Meanwhile, on the legislative side of state government, House Transportation Chair Judy Clibborn was lobbying legislators to vote for a transportation budget that would pay for maintenance and new ferries. The 2015 legislative session, balanced between a Democratic House and a Republican Senate, went into not one but three extended sessions. By July of 2015, the parties at last agreed on a long-term transportation package that helped stabilize WSF funding, though there was still no dedicated tax revenue stream. The deal paid for a fourth Olympic class ferry; new terminals in downtown Seattle and Mukilteo, just north of Seattle, and some deferred maintenance. There is an RFP pending to convert up to six of the Issaquah Class ferries to LNG, but as yet, no funds.

The process of installing the superstructure built by Nichols Brothers Boat Builders onto the hull of the M/V Tokitae at Vigor's yard, March 2013.

Photo: NBBB

Today, it's not as if the ferry system's problems are over, but things are on the upswing. Vigor Industrial has completed two new 144-car ferries under budget in the past two years. Vigor will finish a third soon and undertake the fourth immediately. In the meantime, WSF hopes for better financial support. The oldest ferries in regular service were built in the late 1950s and the next oldest are the Super Class, built in the 1960s. WSF has continued to move passengers and cars and has come to the point where it manages to recoup 70 percent of its operational costs with tolls, a very high rate of fare box recovery.

"High-profile problems like the Tacoma's loss of power can be tough to talk about, but that's when a culture of accountability matters most …We took special care to listen to frontline engine crews as the team developed solutions to protect against issues like this in the future."

– WSF deputy and Chief of Staff, Elizabeth Kosa

Ridership is increasing. Ferries carried 23.6 million passengers in the past year and that number is expected to go higher in 2016. WSF reports there is growth in tourist trips and optional local travel and less in daily commuter traffic.

In addition, Griffith earns very positive reviews after more than a year on the job. Her orders from Peterson were to improve workforce coordination, invest in people, invest in maintenance and operations, update service disruption protocols, and work toward further capital investments. Griffith had a planned surgery and was not available to answer questions, but deputy and Chief of Staff, Elizabeth Kosa, filled in for her. She told ***MarineNews***, "All of these reforms are either complete or under way," said Kosa, adding "Morale has improved over the past year, but we're not interested only in the rosy picture."

The unused generators have not yet sold. So far in 2015, 17 crewmembers have been honored for saving 18 lives. A new San Juan Islands reservations system is working as hoped. Wait times, in the past stretching up to eight hours in the summer months, have been markedly reduced. "That's a thing of the past," says Kosa.

The new Olympic Class Tokitae and Samish had problems with cars bottoming as they drove onboard. They cost

Photo: WSF

The completed ferry M/V Samish

$308,000 to fix but, as Kosa points out, the vessels came in nearly $19 million under budget from Vigor. Separately, an official investigation of the football fan-packed Cathlamet uncovered a defective crowd counting clicker as the root cause, and WSF has said it won't happen again.

WSF's Board of Inquiry did an investigation and confirmed that the ferry Tacoma's failure was characteristic of the manufacturer's design, which led to modifications of electrical switchboard systems on the other Jumbo Mark II class vessels, Puyallup and Wenatchee. Kosa explains, "High-profile problems like the Tacoma's loss of power can be tough to talk about, but that's when a culture of accountability matters most …We took special care to listen to frontline engine crews as the team developed solutions to protect against issues like this in the future."

Looking Ahead

WSF has a maintenance backlog of $241 million and a biennial budget that only supports half of its preservation requirements. Construction of the newest ferry will help, but won't solve the problem of deferred maintenance.

The age of the vessels is still well over anything a private system would use. "All but seven [of 24] vessels are over 30 years old," said Kosa. "However, we've built five vessels since 2010. The sixth is under construction and the seventh is in the pipeline. Building new vessels continues to be a top priority." WSF would ideally have one relief vessel stationed in north Puget Sound, and one stationed in the south.

Despite running very lean, WSF has a 99.5 percent reliability rate. Beyond that, all vessels have been upgraded to meet EPA air quality standards. The first three Olympic Class vessels meet EPA Tier 3 standards and the fourth, the Chimacum, will meet Tier 4 standards.

Kosa said, "A few weeks ago, several members of the executive team were out riding a ferry in the northern Puget Sound during a nasty storm. The conditions were pretty rough—big swells, high wind, limited visibility. It was eye opening for our execs who don't come from a maritime background. They got to see what our crews deal with out on the water, the conditions, the competing demands, the pressure of keeping our passengers safe and secure. Experiences like these help us stay focused on what's really important when we make decisions back in the office."

Today's WSF has a steady hand at the helm and a weather eye on the horizon. What comes next for many aspects of the nation's largest ferry system isn't altogether clear, but at least one thing isn't shrouded in the fog: the Washington State Ferry system is moving eagerly, full speed ahead, toward the next challenge.

Image: Caterpillar

Image: Schottel

Driving the Inland Waterways

Propulsion evolves, improves and powers forward in the inland markets. And, Z-Drive propulsion is the future.

By Joseph Keefe

In a white paper released late in 2014 by The Shearer Group, Ed Shearer and Greg Beers outlined *The Next Generation* of inland vessels, what will drive design changes and the advantages of azimuthing stern drives – or 'Z-Drives,' for short. The authors point out that, until recently, towboats on all the inland waterways and Gulf Coast have traditionally been built using main engines connected to reduction gearboxes connected to long drive shafts passing through the towboat hull. In a nutshell, according The Shearer Group, the advantages of using z-Drives on inland towboats include decreased installation time, increased fuel efficiency, increased trip time efficiency, decreased maintenance downtime and higher customer satisfaction. In fact, savings in fuel and trip time from 10 to 30 percent have been shown to be possible – in theory and actual towboat operation.

In practice, the maritime industry tends to be conservative, slow to adopt new technologies and measured in their approach when they do. Until recently, the use of Z-Drive propulsion units on inland towboats has not been taken seriously due to concerns about initial cost, maintenance and durability. But, that hasn't stopped Z-Drive units from being used for many years on oceangoing and harbor tugs.

That's because the Oil Pollution Act of 1990 (OPA 90) created a need for ship assist boats with greater maneuverability and stronger pull/thrust than traditional design ship assist tugs. In practice, two Z-Drive tugs can take the

place of four conventional tugs during the typical ship docking operation.

According The Shearer Group, the original inland towboat to use z-Drives was the M/V Miss Nari. Originally built for Lake Tankers as a twin-screw conventional towboat in 1951, the boat was rebuilt with Niigata Z-Drives and diesel engines and put back into service in 1982. Seeing service on nearly every river on the inland waterways and even on the Gulf Intracoastal Waterway, the vessel reportedly suffered major failure since installation. According to its owner, the Miss Nari is a 3,000 horsepower towboat but has proven itself to be equivalent to a 5,000 horsepower conventional towboat. A strong endorsement, indeed.

Today, Z-Drive technology on the commercial waterways is hardly a novel concept, having firmly established itself as a viable propulsion solution, particularly where fuel economy and maneuverability are key considerations. That's because the mindset of traditional owners, long satisfied to continue operating long-tenured technology, is slowly changing. While Z-Drive technology is still the exception rather than the rule on the inland waterways, it continues to gain favor. Within this article, it's not hard to see why.

Image: Eastern Shipyard

Changing Attitudes

According to Edward Schwarz, business development manager, ZF Marine Propulsion Systems Miramar, LLC, inland waterway towboat owners do not build vessels often, so a newbuild project is a major undertaking. He explains, "For many it might have been over 25 years since the last time they invested in building new vessels. The majority of growth for inland waterway operators has been through the acquisition of existing fleets, but as those opportunities dwindle, building new vessels will be the predominant growth activity. When deciding what type of vessels they want to build, operators have to ask themselves if they want to build for the future industry demands or build to traditional standards. Owners that want to prepare for the success of the next generation look at all the available technologies and then make decisions. This is what is truly driving changes in attitudes."

Roland Schwandt, General Sales Manager at SCHOTTEL, puts it a different way, saying, "Inland waterways offer a cost efficient and eco-friendly way of goods transportation through the country from and to coastal ports. And I would consider a rising of the inland waterways traffic volume in the years to come very probable. Of course, a higher traffic volume requires investments in traffic and transport safety. High maneuverability and short stopping distances on the vessels side will therefore get even


Image: Steerprop

"When the industry hits a 50 percent Z-Drive adoption rate for new build projects, owners competing with old technology will have a difficult time winning competitive contracts. Just as the industry saw with the harbor tug market, this is when the market will meet critical mass and Z-Drives will become the preferred propulsion system for the market."

– Edward Schwarz, business development manager, ZF Marine Propulsion Systems

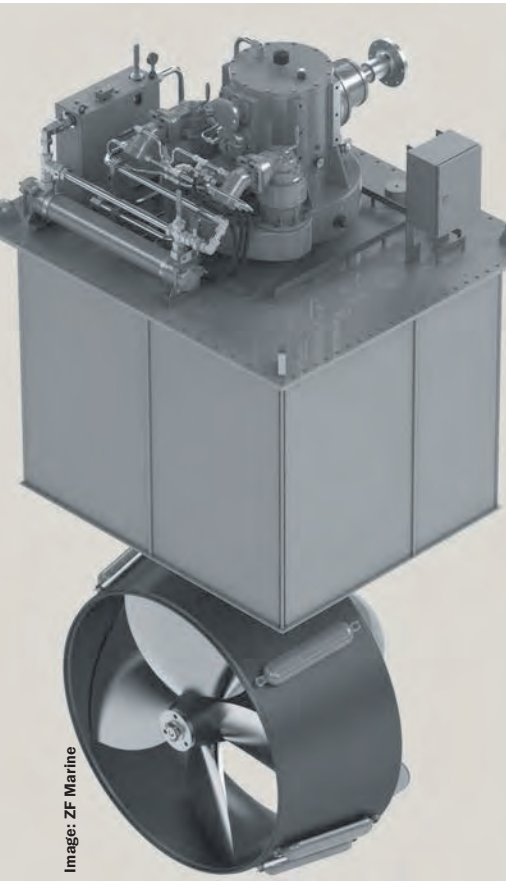


Image: ZF Marine

more important. Inland waterway vessels often operate at full load, following a tight schedule, and therefore need a robust thruster with easy maintenance or exchange possibilities. Towboat thrusters will have to answer these needs. Especially adequate for this task are Z-Drives, which can be found on the U.S. inland waterways since 2008, while they have been used in other countries already for a much longer time on inland waterways."

And Wärtsilä, for example, reports that owners who adopted the Z-Drive solution found operational efficiencies that allow them to install up to 20 percent less power with steerable thrusters versus traditional FPP props. In addition, there is considerable fuel savings, as rudders provide drag when they operate. Perhaps the most compelling argument is improvements in maneuverability, as there is no longer a need for complex rudder systems – steering and flanking rudders are no longer needed.

Separately, ZF's Schwarz insists that the major skepticism involved the lack of references of Z-Drive vessels for the inland applications. Despite the proven performance benefits, worries about the robustness of Z-Drives in river applications persisted. But he says, "ZF currently has dozens of pushboat vessels operating everyday from Minnesota to Texas and everywhere in between. In 2016, we project that ZF Z-Drives will have accumulated over one million operating hours, just in U.S. river applications alone."

Driving Change

There will always be a reason to keep the status quo, especially when it comes to the maritime industry and change. On the other hand, there are dozens of reasons to dip one's toes in the waters that will soon be dominated by Z-Drive technology. Here are just a few:

Efficiency: As reported in the Shearer Group white paper, Jeffboat Shipyard and Aquamaster did a joint study and model test of a triple screw towboat around (circa 1997). Shearer says, "The model towboat was tested using the traditional propulsion system and then tested using a Z-Drive propulsion system. Each propulsion system was tested with a tow and without a tow. Thrusting straight ahead was the same for both propulsion types; steering forces increased 50 percent to 70 percent using the Z-Drives; stopping forces increased 50 percent using the Z-Drives; and maneuverability increased 54 percent to 390 percent using the Z-Drives. These are significant increases in vessel efficiency since inland towboats do not go in straight lines for long distances. These types of efficiencies translate into less fuel used to make turns and bends, to enter locks, and to work around docks and fleets; to gain more miles per hour using the same amount or less fuel; and to decrease accidents due to greater stopping and handling ability."

Reinforcing those metrics, Schwarz points to ZF's operational experience and predicts it is just a matter of time before Z-Drives hit their stride in U.S. waters. He adds, "When the industry hits a 50 percent Z-Drive adoption rate for new build projects, owners competing with old technology will have a difficult time winning competitive contracts. Just as the industry saw with the harbor tug market, this is when the market will meet critical mass and Z-Drives will become the preferred propulsion system for

the market."

Kari Kyyrö, Naval Architect at Steerprop Ltd. is equally optimistic. "Azimuthing units offer significant benefits for river operations, where excellent maneuverability is usually a must. The market potential is good; however competition is also growing with makers developing products aimed specifically at the inland market. It will be interesting to watch if the U.S. operators will follow the European way and start building more diesel-electric push boats."

Mitch Jones photo courtesy of Sneed Shipbuilding

Pollution: OPA 90, and later, the EPA's so-called Vessel General Permit (VGP) both brought increased liability through a greatly expanded list of potential sources of leakage from vessels. In response, operators began to look for ways to eliminate any potential sources of oil leaks. Of course, a frequent cause of an oil leak from normal wear or damage was the stern tube shaft bearing or the strut shaft bearing, both of which are oil-lubricated bearings. Shearer and Beers tell us that "all conventional drive inland towboats have a shaft seal where the drive shaft goes through the hull. Over time as the seal wears, water leaks into the boat. On some seals, a small quantity of leakage is required to keep the seal lubricated. This causes water to accumulate over time in the boat's bilge where it mixes with oil and other liquids from mechanical sources. The boat operator then has to keep the bilge or other voids pumped out until the boat can be removed from service for drydocking to repair the seal. In addition to the loss of revenue, the cost of drydocking, and the cost of replacing the seal, the oily water mixture has to be disposed of properly." Z-Drive boats, on the other hand, produce no accumulation of oil or oily water mixtures in bilges or on the deck of the towboats.

Capital Investment and Maintenance: The old rule of thumb for the cost of new construction of a towboat with z-Drive units is to add as much as 25 to 50 percent to the cost of a traditional design. This comes from adding the cost of Z-Drive units to the total cost of a traditional towboat – but that doesn't tell the full story. This does not take into account the items that are eliminated from the construction cost of a traditional towboat. If a towboat is designed for Z-Drive units, there is no need for a main engine reduction gearbox, intermediate shaft, tail shaft, shaft couplings, shaft support bearings, stern tube, stern tube bearing and a raft of other related equipment. Hence, the cost of a new Z-Drive inland towboat will be approximately the same cost or at most 10 to 12 percent more than the cost of a new, conventional design inland towboat (depending on which manufacturer of Z-Drive units is used).

Brian Fariello, Wärtsilä's Business Sales Manager, Propulsion, Americas, couches the discussion in a different perspective, saying, "Downtime for any commercial vessel is critical. However many inland waterway companies are smaller and loss in time or revenue can be very damaging to their bottom line as well as reputation which could affect future contracts if they are viewed as having an unreliable fleet."

Fuel Savings: The Shearer Group's report goes into a great deal of detail on the real and potential fuel savings achieved by Z-Drive boats versus the fuel consumption for a conventional vessel. And, given the current state of oil prices, some of the financial assumptions (price per gallon of diesel) made by the report may now be (temporarily) dated, there can be no denying the long term financial impact that the switch to Z-Drives will have on the bottom line of any operator. Shearer's report went on to say, "Z-

"Z-Drive towboats have now operated long enough to gather comparative data for trip times and fuel used on the same trips with the same tows as conventional towboats … It appears the Z-Drive towboats do make quicker trip times by one to two days per trip and the fuel consumed per trip is typically reduced in excess of twenty percent. In fact, the average fuel savings for a Z-Drive towboat versus a conventional towboat is 28 percent for the data in question."

– The Shearer Group's white paper on the next generation of inland vessels

Drive towboats have now operated long enough to gather comparative data for trip times and fuel used on the same trips with the same tows as conventional towboats … It appears the Z-Drive towboats do make quicker trip times by one to two days per trip and the fuel consumed per trip is typically reduced in excess of twenty percent. In fact, the average fuel savings for a Z-Drive towboat versus a conventional towboat is 28 percent for the data in question."

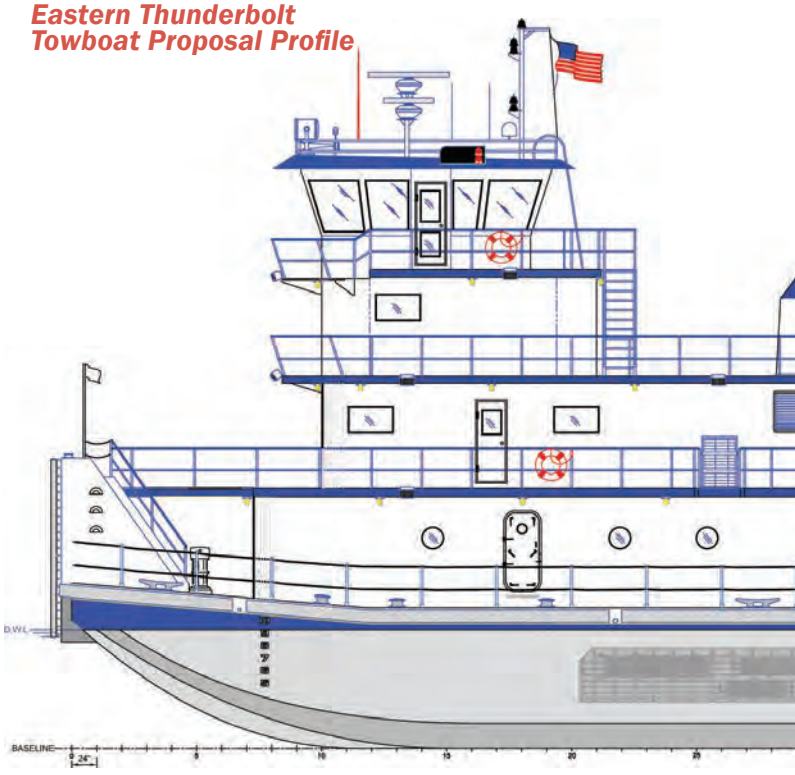
Early Adopters and Visionaries

In every industry, there are early adopters, leaders and quite simply, companies and managers who embrace new technology in a quicker fashion. If you are talking about LNG propulsion in U.S. waters, then that discussion would have to include Harvey Gulf's CEO, Shane Guidry. When it comes to Z-Drives, the inland industry has its own list of owners, operators and designers who find themselves out in front of the pack. We picked out just a few for the purposes of this article.

For example, and seeking a complete power and propulsion system designed specifically for tug operations, Seattle-based Harley Marine Services recently turned to Caterpillar – ordering four Cat 3516 marine propulsion engines and four Cat Propulsion Marine Thruster Azimuth-Tug (MTA-T) rated drives. These units will power two new Harley Marine harbor tug vessels currently under construction at Diversified Marine Incorporated, a shipyard in Portland, Ore. Each Harley Marine harbor tug will feature a pair of 3516 engines, each delivering 2,575 hp (1,920 kW) at 1,600 rpm and two MTA 524-T thrusters with a 95.5 inch (2,400mm) propeller diameter. The MTA 524-T is a new version of a proven design, specifically optimized for the operation profile of a tug. Cat Propulsion's complete package for tugs includes engines, high-speed shafting, clutches, and controls.

In South America, SCHOTTEL has taken on the Paraguay-Paraná River System, which extends over 2,500 km and is characterized by a winding river, creating alterations of the rivers' flow, dams, silting and pollution which have great impact on a vessel's propulsion system. The push boats of Hidrovias do Brasil, a South American logistics specialist; operate in this demanding environment with heavily laden barges over long distances at a high average speed. Eight new push boats in total will reinforce the fleet by pushing a 16 barge train of 285 meters length each. A powerful propulsion system is their constant companion: They have been equipped with 3 SCHOTTEL SRP 1215 (1,600 kW each) Rudderpropellers, driven by electric motors and designed to resist large and heavy floating debris.

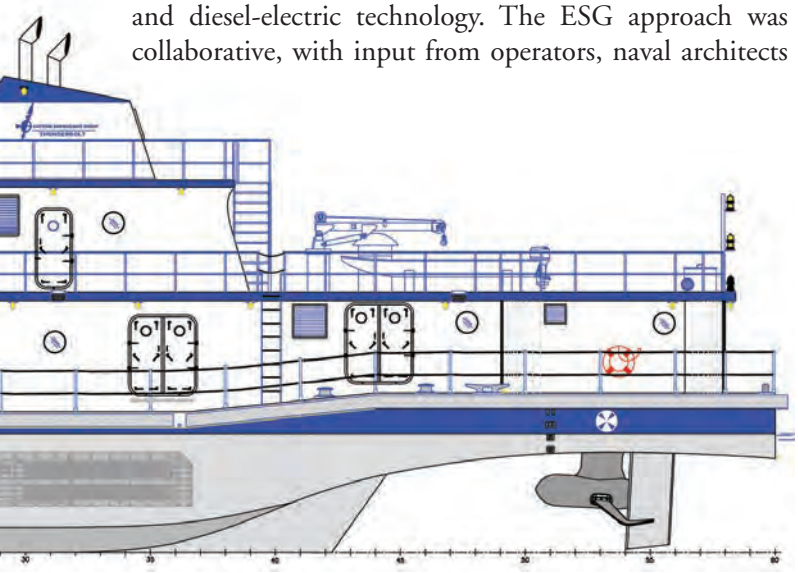
Eastern Thunderbolt Towboat Proposal Profile



Meanwhile, and back in the U.S. heartland, Marquette Transportation Co. last year took delivery of the fourth and fifth 2,000-hp Z-Drive towboat from Master Marine, Inc., Bayou La Batre, Ala. The St. Peter was designed by Frank Basile of Entech & Associates, Houma, La., for Marquette's Gulf-Inland division, based in Harahan, La. Master Marine is continuing to build Z-Drive towboats, with more underway for Marquette, said the yard's president Randy Orr. The steel-hulled St. Peter is powered by a pair of Thompson Power Systems Caterpillar C32 Tier 3 1,000-hp engines at 1,800 rpm connected to ZF Marine ZF AT 5111WM-FP Z-Drives with 1,650 mm (65-in.) four-bladed propellers in nozzles. The package gives the boat a running speed of 10 knots with a loaded draft of 8 ft.

Not to be outdone, Houma, La.-based Enterprise Mariner Services, LLC (EMS) added its eighth Z-Drive towboat, the fourth from Sneed Shipbuilding. The 87 x 34-ft. Sebastian D, with an 11.5-ft. molded depth, was built by Sneed Shipbuilding of Channelview, Texas. This boat is well-suited for working the Gulf Intracoastal Waterway where they routinely push two 30,000-barrel petroleum barges. Propulsion power is provided by a pair of 1,000-hp Cummins QSK38M Tier III diesel engines coupled to the ZF Marine AT 5111 WM-FP Z-Drives fitted with 66-in. diameter propellers mounted in Kort nozzles. With these drives, the boats draw only 8.5 ft. The QSK38M engines also give these very maneuverable Z-Drive boats plenty of power to safely handle the currents of the Mississippi River.

And in an interesting twist to the equation, Eastern Shipbuilding last year introduced its cutting edge 4,200 hp Thunderbolt inland towboat designed around twin azimuthing Verhaar Omega electric V-Pod propulsion and diesel-electric technology. The ESG approach was collaborative, with input from operators, naval architects (Gilbert Associates, Inc. (GAI)) and propulsion OEM's (Verhaar Omega: since 2012, 19 Omega V-pods have been installed and are in service in Europe on various types of vessels). In selecting the podded propulsion system for inclusion on the design, Eastern came upon Verhaar Omega after meeting with two inland owner/operators that currently have Z-Drive towboats, and others that didn't. Listening to each and noting their concerns, it was decided that the V-Pod was the best solution. Because the Thunderbolt will typically operate in shallow, sometimes turbid, debris filled water, ESG designed underwater protection in the form of a pipe guard protection system for each Omega V-Pod. These pipe guards protect the vessel from side bank impacts when turning in rivers and canals and stern impact protection when backing down. Currently, Omega has V-Pod units ranging from 445HP (330kW) to 2,011HP (1,500kW), but the thrust efficiencies underway and the maneuvering capabilities are far greater than conventional tail shaft, propeller and nozzle propulsion systems.



Finally, and pushing a complete design package in much the same way as Eastern Shipbuilding has moved forward with its Thunderbolt, Karl Senner has introduced a unique pushboat design intended to accommodate the Steerprop solution and also maximize the utility of the thrusters / z-drives. Karl Senner, the Shearer Group and Steerprop all look to leverage deep experience with the U.S. inland markets as well as proven success and experience with Steerprop in the offshore markets, starting back in 2001. According to Chris Senner, reliability is a key aspect of the Steerprop design. He adds, "We work closely with all parties during all stages of the design, build, and operation to ensure the best solution for the application. We aim to minimize downtime and maintenance for the life of the vessel."

Horses for Courses

All but a foregone conclusion, it is likely that Z-Drive propulsion will soon overtake conventional drive methods on the U.S inland rivers. With a little more front end outlay, operators purchasing z-drive packages will likely see that money and more return to the coffers in the form of improved efficiencies, better safety and a host of other metrics. We even found ourselves asking whether the (anticipated) advent of subchapter M towboat rules might even expedite the sea change. That depends on a lot of things, of course, but without a doubt, owners who make the move will soon boast more bang for their buck in the same sized river platform. And, isn't that what it's all about?

WATER & AIR

Workboats depend on reliable sources of both. To that end, the basic keys to crew comfort are both manifested in Dometic's newest equipment offerings.

By Joseph Keefe

As the New Year kicks off, marine equipment OEM Dometic has unveiled two new, completely upgraded offerings. The Sea Xchange CX Watermaker, a variable capacity system that can produce between 8,000-40,000 gallons per day (GPD) of potable water, is intended for a wide range of commercial applications, including on offshore platforms, floating production storage and offloading (FPSO) facilities, workboats and military vessels.

Separately, Dometic has also introduced the Dometic Titan Chiller, a 45-ton unit with revolutionary new titanium coaxial tube condenser. The chiller, custom designed by Dometic and built for a 50-meter project, represents a giant leap forward in improving the longevity of its chilled water system condenser coils. The coils in the new chiller are made of industrial-grade titanium, providing captains and crews with a unit that is virtually immune to erosion and corrosion.

The product announcements come at a time when workboat operators everywhere are looking to cut costs in an increasingly challenging business climate, while, at the same time, provide the best in possible accommodations, creature comforts and adherence to domestic and global habitation rules. Fortunately, the new equipment promises to satisfy all of these demands – and more.

Sea Xchange CX Watermaker

Dometic's newest equipment release, the variable capacity Sea Xchange CX, offers operators full mechanical and electrical redundancy, offsite monitoring capabilities and rugged steel plumbing and construction. Producing between 8,000 and 40,000 gallons per day of potable water, the high-capacity unit built for extreme offshore conditions, is unique for several reasons. First, it is a variable-capacity system, and can reduce output when demand is lower. And the system offers full mechanical and electrical backup to the automated features on the system, as well as remote, offsite monitoring capabilities included as a standard feature with every unit.

Taking Care of Business Means Taking Care of the Crew

Regulation 3.2 of the Maritime Labor Convention (MLC) 2006 provides that ships shall "carry on board and serve food and water of appropriate quality, nutritional value and quantity that adequately covers the requirements of the ship...,"however that rule does not specifically define what "water of appropriate quality" is. Likewise, while the ABS Guide for Crew Habitability on Ships addresses issues relating to ship accommodations, whole-body vibration, noise, indoor climate, and lighting, it does not specifically address the issue of on board water quality. Given that, Dometic has incorporated global World Health Organization standards to the potable water that its systems produce, so that the produced water is compliant with the regulations of all countries, including the United States.

The World Health Organization (WHO) standard for potable water – <500 ppm of total dissolved solids (TDS) – is easily matched by the Dometic system. For example, says Joe Pinto, Dometic's National Account Manager, "On one of our standard single-pass reverse osmosis systems, in standard seawater (35,000 TDS at 77 degrees F), when the prefilters and the membranes are fresh, you can expect the product water to be in the range of 125 TDS to 150 TDS. In a worst case scenario, our systems will produce potable water up to the WHO standard (500 TDS)."

In certain situations, there can be onboard requirements

for so-called 'technical water' (for boiler feed water, for example). In these cases, customers require technical water which has a much lower TDS level than standard potable water. This ultra-low level of TDS can be achieved through the implementation of a second pass of reverse osmosis processing in conjunction with engineered feed water pre-treatment and possibly post-treatment, depending on the customer's particular application. This second pass removes between 90 to 95% of the TDS from the watermaker's product water. Dometic's systems are specifically able to achieve this ultra-low level of TDS required of technical water if this is specified by the customer.

CX systems include the industry's 316SS passivated motor mount isolators, which properly support the high pressure pump during operation, thus minimizing system vibration. Properly placed vibration isolators minimize system vibration and result in noise reduction and increased crew comfort.

Utility and Economy in Challenging Waters

Dometic's commercial grade Watermaker is Skid mounted / unitized for easy install and maintenance. Readily lifted by a crane or other onboard equipment and placed without having to undergo extensive fabrication, plumbing and other connection costs, this capability makes the system attractive in the aftermarket, where often times systems are required to fit through door openings and other confined spaces. Pinto adds, "From a service perspective, maintenance can readily be performed on the system by one person because all integral parts of the watermaker are conveniently located within reach of the operator."

For the thrifty workboat operator, the CX watermaker can also reduce output when demand is lower. Beyond this, operators have the ability to program the system to make a certain number of gallons and shut off, or run for a certain period of time and shut off. The CX systems, fully automatic, also have mechanical redundancy. "This feature makes our reverse osmosis systems unique in the marketplace, since no other manufacturer of reverse osmosis systems offers this," adds Pinto.

Consistent with today's increasingly connected seagoing operations, the CX units come with remote, offsite monitoring capabilities. Joe Pinto explained, "We can monitor virtually all functions of the CX systems in that all system data is available. So, for example, we can look at a system fault history from the factory while a technician is physically in front of the unit to assist the technician in diagnosing a potential problem or other issue." The system can even be operated remotely in this manner, so the customer doesn't necessarily even need to have an onboard system operator.

Ben Haynes,
Dometic Director of OEM sales

Joe Pinto,
Dometic National Account Manager

Another place where customers can save money is through the use of Dometic's super-duplex, radial axial high pressure pump that is highly resistant to the effects of seawater. There is an 8,000 hour service interval on the pump, significantly longer than the service interval of the traditional piston pumps used by some of the other brands of watermakers.

A high-capacity unit, built for extreme offshore conditions, the Dometic CX notably utilizes a piping system comprised of 100 percent 316SS plumbing as opposed to plastic plumbing. Pinto explains why. "Our CX systems are plumbed completely with 316SS, unlike the other reverse osmosis systems offered in the marketplace (which use plastic plumbing on the low pressure side of their systems). The challenge with plastic plumbing is that when it is exposed to weather, the material typically fatigues over time, ultimately causing plumbing to leak and ultimately rupture." Beyond this, he insists, compared to overall system weight, the 316SS does not add a significant amount of weight.

That system is plumbed with Victaulic's "Vic-Press" plumbing system with 316 Stainless Steel Schedule 10 Pipe. Simply described, Vic-Press is a Press-to-connect piping solution offering hand-held, flame-free welding alternative installation of small-diameter stainless steel pipe in seconds. Rated for up to 2500 psi, Dometic's CX typically operates at less than 900 psi. And, the savings in the elimination of hotwork, permits and labor alone are enough to justify the use of a better product, says Pinto.

Dometic's 45-Ton Titan Chiller

If crystal clear water is a definite requirement of a fully MLC compliant vessel, then the other side of the equation arguably includes the right to work in a comfortable

environment. That wasn't always the case, and in many instances in the past, air conditioning was installed chiefly as a function of keeping the ever-growing list of electronic equipment that over time was being retrofitted onto the standard bridge layout. That's still important, of course, but a concerted effort to embark and keep the best possible mariner has led to an improvement in the way chillers are deployed, their capacities and greater attention given to aftermarket service.

To that end, Dometic's custom designed Titan Chiller is intended to satisfy those demands and a lot more. Central to the new design are the coils in the new chiller which are made of industrial-grade titanium, providing captains and crews with a unit that is virtually immune to erosion and corrosion.

"Until now, the problem has been that chiller condensers – made of a softer metal called cupronickel – simply couldn't stand up to the acid cleaning and high water velocity needed to keep the invasive marine life out of the chiller's plumbing," said Charlie A. Barefoot, Jr., Vice President of Engineering and Technical Support at Dometic. "This is why we built the Titan Chiller with a condenser made of industrial-grade titanium. It's a very strong material that does not erode the way cupronickel does."

Debris from invasive marine life has been increasing considerably in recent years, causing serious issues with yacht and superyacht chillers. Dometic studied this problem extensively and found that the common methods used to battle it, such as acid cleaning and higher water velocity, were detrimental to cupronickel tubing. Therefore, Dometic developed the Titan Chiller, which uses titanium tubes that can easily withstand these cleaning methods.

The robust Titan Chiller Titanium condenser comes with a limited 5-year warranty, and a maintenance schedule that promises low cost of ownership, in exchange for a minor increase in price.

And, as of January 2016, the Dometic Chiller only uses new titanium coaxial tube condensers as opposed to Copper-Nickel The Dometic approach costs 3 to 4 percent more, but also results in a weight savings of 8 to 10 percent, depending on the size of the system.

Ben Haynes, Dometic's Director of OEM sales, explains the rationale behind the change. "The real advantage is that the interior part of the tube – typically made of cupronickel – has sea water running through it. There are issues with that when people don't maintain them properly, which eventually results in pitting and erosion. If one tube gets plugged, for example, it increases flow through another coil which causes erosion. Growth inside is rampant – for example, operators are flushing the tubes out four or five times in a summer when it used to be once annually, and the acid flush is eating through the coils. So, the lesson here is that if you follow maintenance procedures for the old style coils to the letter, you'll probably be okay. But, most people don't. Eventually that leads to a condenser coil failure. And, operators can be confident that the new coils will last 5 to 10 years."

Like the watermaker, the new chiller comes with a flexible control system that can be changed, customized, and makes upgrades easier. And, it also will also allow external monitoring of the system from shoreside. A new feature, the new controls and monitoring fit nicely in an era of reduced manning, and MLC code enforcement. Beyond this, a shortage of qualified engineers can also impact operations and maintenance. Not to worry, says Haynes. "Remote monitoring can see and potentially prevent problems before they happen. The new controls can be bought in a basic format or, conversely, operators can get the Platinum option, which has a very user-friendly touch screen controller board."

The Dometic Chiller is built exclusively for harsh on board environments, built for purpose and also built-to-fit hard to access spaces – like the conditions found on some workboats, for example. And, the system is scalable – up and down – for a myriad of workboat applications.

With the coaxial setup, for example, the system can go all the way up to as much as 75 tons. Haynes adds, "There's really no limit to what we can provide. We do a lot of tugs; anywhere from 15 to 25 ton chillers." Current commercial maritime clients and customers who have bought previous versions of Dometic watermakers include Signet Maritime, Metal Shark, the U.S. Coast Guard, Harvey Gulf, Nichols Brothers, Metal Shark, and many more.

Ensuring Uninterrupted Air & Water

More than 750 dealers, plus 15 distributors in the U.S. alone ensure robust service and maintenance wherever and whenever needed. Internationally, more than double that number are strategically located around the globe. Six internal Dometic training schools annually keep all technicians up to speed on new developments and the improved equipment offerings. Haynes told MarineNews in December, "This is literally the largest dealer network in the marine industry. This network provides our customers with unparalleled service and support no matter where a vessel travels."

For workboat operators watching the bottom line and the welfare of their crews at the same time, water and A/C are probably two things they don't want to worry about. Now, they don't have to.

High Tech Training for Inland Applications

Transas, a global provider of high tech solutions and services for the maritime industry, has supplied the first simulation complex for inland navigation training in the Republic of Paraguay. The news is significant, especially as South America's bread basket countries and bulk material providers both ramp up their inland capabilities to better transport cargoes from the heartland to the coast for eventual export.

In years past, moving cargoes from 1,000 miles inland – on the mighty Amazon River, for example – to the big coastal ports for transshipment involved finding and buying an old, secondhand towboat being cast aside by a U.S. Mississippi River operator. Those days are gone forever, though, as South American countries look to more efficiently get their goods to market. Bigger, modern, built-for-purpose boats especially designed for south American waters, equipped with sophisticated controls, navigation and propulsion system are rapidly, one-by-one, modernizing the way South America conducts its shortsea and inland business. As that happens, training will be a bigger part of the equation.

To that end, a Transas navigational simulator Navi-Trainer Professional 5000 was installed at the Center for Maritime and River Shipowners (CAFyM) in Asuncion, Paraguay for training crews in tugs operations in the Parana-Paraguay Waterway. Transas provided these capabilities in accordance with Paraguayan market demands. The Republic of Paraguay has a special geographical position being located within the basin of the waterway, the most commercially important river system in South America. The country is surrounded by two large rivers, the Paraguay River and Parana River, where navigation is only possible by inland waters. This causes specific training needs, which are confidently met by the Transas simulation systems with inland navigation features.

The project was carried out in conjunction with VTG S.R.L., the Transas' local representative, which is covering commercial and technical needs of the Paraguayan market for all Transas products. The NTPRO version 5.35 installed at the CAFyM center is an ideal training solution due to its new capabilities for operation with different types of boats and barges in river waters. The simulator's configuration comprises four visual channels based on the Transas Seagull 6000 visualization software, conning module, ECDIS and ARPA/Radar. An additional maneuvering console is provided with the dedicated hardware to simulate maneuvering of conventional boats and push boats.

During the ceremony, Juan Carlos Muñoz Menha gave a presentation on capabilities of the new Transas simulator through various exercises, detailing possible applications, and highlighted the valuable contribution and support of Transas and VTG S. R. L. throughout the whole project.

Globally, Transas offers best-in-class navigation systems and integrated bridge solutions, recognized training and simulation solutions, well-known VTMS and coastal surveillance systems, fleet management systems, onboard and individual decision support systems for professional crew and pilots, as well as popular applications for leisure and the marine mass market. Transas operates more than 20 own regional offices and has a global network of partners serving Transas customers globally.

On the Web: **www.transas.com**

NATIONAL PARK SERVICE FERRY

Pensacola, Fla. and the Gulf Islands National Seashore are set to get a new passenger-only ferry service, complete with two new ferries. The Pensacola Bay ferry service scheduled to begin in March 2017 is the culmination of 45 years of discussion and planning to connect the National Seashore and Pensacola Beach to the mainland by boat. The ferries will operate in opposite directions on a triangular route, connecting downtown Pensacola to Pensacola Beach and Fort Pickens. The underlying funding to make the ferries a reality is coming from the Natural Resource Damage Assessment stemming from the Deepwater Horizon oil spill. Gulf Islands National Seashore Superintendent Dan Brown explains, "passengers will soon enjoy the 40 minute excursion across the Bay to reach Santa Rosa Island as a congestion–free alternative to a 17 mile automobile trip."

The contract for construction of the new vessels was awarded through a competitive bid process to All American Marine (AAM) of Bellingham, Wash., which, not coincidentally, specializes in aluminum catamarans. AAM's previous output includes catamarans built for Island Packers that operates the ferry concession from Ventura, Calif. to the Channel Islands National Park. The three 65' west coast Island Class catamarans provided design inspiration for the new Florida ferries. Additionally, Kenai Fjords Tours operates three AAM-built 83' Voyager Class catamarans for tours of the Kenai Fjords National Park in Seward, Alaska. The Park Service intends to release a concession opportunity for operation of the new vessels.

The National Park Service opted for two 150 passenger double deck aluminum catamaran boats to provide a comfortable and enjoyable excursion, which will average 12 knots over the 6.5 to 9 mile route. NPS rangers will provide onboard narrative of the area's rich history and natural resources. The National Seashore will engage fourth grade classes in the area to name the new boats. The winning classes will get to ride on the inaugural ferry trip as part of the National Park Service's Every Kid in a Park initiative.

The design for the identical catamarans was developed by AAM partner Teknicraft Design of Auckland, New Zealand. "The Park Service placed a very high emphasis on the passenger experience," AAM Vice President told ***MarineNews*** in December, adding, "We engineered the deck plans to offer comfortable seating for all 150 passengers as well as create plenty of personal storage for beach gear, coolers, camping equipment and bicycles." Beyond this, the main deck and each of the two heads are compliant with the latest proposed ADA accessibility construction guidelines for passenger vessels. AAM's design also includes designated family seating areas with room for strollers and the upper aft deck features a large open observation area. The vessels will be equipped with a multimedia audio-visual package for the park rangers to utilize for highlighting sights and information about the Seashore and Park. Space on the vessel's foredeck is also available for large groups to gather and receive further instruction from park rangers or group leaders.

Teknicraft's principal naval architect, Nic de Waal, utilized computational fluid dynamics (CFD) analysis and digital modeling to optimize the hull shape for performance. The propulsion system will be adequate to maintain the 12 knot service speed in conditions including headwinds up to 30 knots. Auxiliary power for each vessel will be provided by twin 40kW Northern Lights C40M.3 generators that are required to provide complete redundancy and support full load conditions on a single unit. The passenger cabin will be fully air conditioned via a multi-zone ductless system to ensure a comfortable passenger environment. The main deck cabin will also feature a snack bar kiosk complete with refrigerator, freezer and coffee maker.

AAM's current workload includes other catamaran projects, including a research vessel for the University of New Hampshire and a survey vessel for the U.S. Army Corps of Engineers in Philadelphia.

NPS Ferries at a Glance …

LOA: 72' 2"	Gen: 40kW Northern Light c40M.3	Nav. Electronics: Simrad E127	Designer: Teknicraft
Beam: 28'	Engines: Scania Di13 81M (2)	Engines: Scania Di13 81M (2)	Passengers: 150
Draft: 5.5'	Survey: USCG Subchapter T (LBS)	Gears: ZF Marine 500	Fuel Capacity: 1000 gal.
Builder: AAM	Passenger Seats Interior: 95	Seating: Freedman Citipro	Pass. Seats Exterior: 84

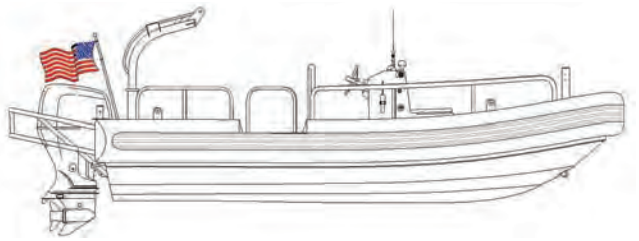
Tampa Bay Pilot Boat Powered by Volvo Penta IPS

Volvo Penta has supplied the integrated engine and drive systems for the new Chesapeake-class MKII launch delivered in November by Gladding-Hearn Shipbuilding to the Tampa Bay Pilots Association.

The new 52.7-ft. 28-knot pilot boat, designed by C. Raymond Hunt Associates, is powered by twin Volvo Penta D11 six-cylinder 503 hp diesel engines with IPS2 drives and Volvo Penta EVC electronic steering and control system. Each of the IPS pods has two counter-rotating forward-facing props that pull the boat through the water rather than pushing it. The EVC control system and three-axis joystick will increase the boat's overall maneuverability alongside a ship and when docking. The system complies with EPA Tier 3 emission standards. "We selected the Volvo Penta IPS2 for our next-generation Chesapeake-class boats to improve the performance and the arrangement of planing hulls like our pilot boats," said Peter Duclos, president of Gladding-Hearn. "IPS2 provides what pilots have been asking for – higher speeds, lower fuel consumption and more comfort." Last year, Volvo Penta and Gladding-Hearn teamed to produce the first commercial craft in North America to be powered by triple IPS drives and dynamic positioning for automatic hands-off station keeping. The 64-ft. Fort Ripley was delivered to Southeast Ocean Response Services in Charleston, S.C.

NOAA Orders Research RHIB from Willard

Willard Marine was awarded a contract by the National Oceanic Atmospheric Administration (NOAA) to produce a 20'8" rigid hull inflatable boat for the Pacific Island Fisheries Science Center (PIFSC) to facilitate their fisheries and marine mammal research in the Pacific region. A slightly modified version of the SEA FORCE 730, a military-grade, aluminum, rigid hull inflatable boat (RHIB), designed with a deep-V hull for maximum stability in the roughest sea conditions, will be built. The 20'8" research RHIB designed for NOAA is constructed in accordance with ABYC standards and Subchapter S requirements, and is fitted with both lift fittings and a lift sling that are designed for hoisting 6,700-pounds of weight with a 6:1



weight ratio safety factor. Twin Honda 115 hp outboard engines will propel the vessel throughout the Pacific Ocean and islands. The collar will be closed-cell foam with a polyurethane sheathing that covers the foam. Additionally, Willard Marine will provide a complete davit for deploying and recovering scientific equipment.

Front Street Shipyard Partners with Norwegian Ferry Builder

Front Street Shipyard in Belfast, Maine, is partnering with Brødrene Aa in Hyen, Norway, to market, sell and build carbon fiber ferries throughout the United States under the new company name Arcadia Alliance. Arcadia Alliance is marketing its ferries to state and federal agencies seeking to replace aging, inefficient passenger vessels. Brødrene Aa currently designs and builds carbon-fiber passenger vessels in its 86,000-square foot Norwegian facility situated along a fjord. The company has built 50 carbon ferries to date. Unlike U.S. ferries built of aluminum or fiberglass, Brødrene Aa's carbon fiber ferries are lightweight and consume less fuel, releasing fewer emissions into the air. Front Street Shipyard hopes to be able to begin construction on the first fast ferry in 2016.

New Class of Fast Support Vessel for Seacor

The Alya McCall, the first vessel in a fleet of new class of Incat Crowther designed monohull Fast Support Vessels (FSV) for SEACOR Marine, has been delivered. This is the first vessel in the SEACOR Express Plus class and features striking lines not ordinarily found in traditional monohull FSV designs. Gulf Craft in Franklin, La., constructed the vessel. The vessel features seating capacity for 100 and has an impressive top speed of 38 knots. Performance is enabled by a quintet of Cummins QSK 60, EPA Tier 3 compliant diesel engines, each producing 2680 bhp. The engines are coupled to Twin Disc MGX 61500 SC reverse reduction gearboxes that drive Hamilton HT-810 water jets. A cardan shafting system by Driveline Service of Portland connects the gearboxes to the waterjets. Superior station-keeping capability is provided through the combination of three Thrustmaster 30TT200 electric-mechanical tunnel thrusters in working in conjunction with the azimuth-like waterjets, all of which are controlled by a Kongsberg DP-2 dynamic positioning system. The vessel is certified by the USCG under the provisions of 46 CFR Subchapter T and by ABS as a High-Speed Craft with DP-2 and Firefighting Capability notations.

The Monohull FSV at a Glance …

Length Overall: 206' / 62.8m	Draft: 9' 3" / 2.8m	Crew: 16
Length Waterline: 194' / 58.9m	Depth: 15' / 4.6m	Speed (Max): 38 knots
Beam Overall: 32' / 9.8m	Fuel Oil: 83,500 gallons	Bow Thrusters: 3 x Thrustmaster
Construction: Aluminum	Passengers: 100	Fire Fighting Capable

Introducing the Moore 250B

Moore Boat has introduced an all new aluminum 25' outboard, The Moore 25 OB. Designed in house and with the assistance of CDI - Band Lavis Division, the new boat is the builder's first application of its proven, patented Moore Boat hull design propelled by an outboard. Like the entire Moore Boat product line, the Moore 25 OB excels in the shallows yet proves more than capable in various sea-states. The Moore 25 OB has been designed with a parallelogram hydraulic engine lift that is capable of raising the single 300 HP outboard a full two feet. This unique ability allows for optimized shallow draft operation while underway, maximized full economy and performance benefits. Another large advantage of the engine lift and hull combination is observed while the vessel is off plane and maneuvering in the shallows. The lift allows the boat's prop to be raised and protected above the boat's delta ski bottom plate thus allowing the operator appropriate maneuverability in the shallows. Many rescues required in non dredged back bay areas that have been thought non-navigable are now accessible to responders. The vessel has a trailer friendly length of 25', a beam of 8'6" and capable of a top speed approaching 50 miles per hour with the ability to get up on plane quickly.

Nichols Brothers to Build 236' Expedition Vessels

Nichols Brothers Boat Builders (Nichols Boats), located in Freeland, Wash., recently signed an agreement with Lindblad Expeditions Holdings, Inc. to build two new 100 guest ships. The first vessel is scheduled for delivery in the second quarter of 2017, and the second vessel will be completed in the second quarter of 2018. These new vessels will provide the Lindblad Expeditions' guests with comfortable accommodations, flexible dining options and advanced technical equipment for presentations and discussions. The new vessels will also have storage for a fleet of sea kayaks, paddle boards and specially designed landing craft, all of which are geared to get guests out and into the wild, remote places being explored. Outside decks provide open space for guests to view their natural surroundings, as well as space for social gatherings and group activities.


McGee


Blackburn


Parrott


Cox


Noone


Monroe

Chesapeake Hires New Director of Design and Engineering

Chesapeake Shipbuilding announced that **Steven McGee**, P.E. has joined the firm as Director of Design and Engineering at Chesapeake Shipbuilding. With more than 20 years of engineering and maritime experience, McGee will oversee all aspects of vessel design. McGee holds a bachelor's degree in naval architecture and marine engineering and a master's of science in naval architecture and marine engineering as well as aerospace engineering.

Bollinger Promotes Blackburn

Bollinger Shipyards announced the promotion of **Brent Blackburn** to Director of Engineering. Blackburn has over 16 years of experience in the U.S. shipbuilding and maritime industry. He joined Bollinger in 2004 and rose steadily through the engineering and technical design departments.

Foss Maritime Welcomes New COO

John Parrott joins the Foss executive team as Chief Operating Officer (COO). Parrott comes to Foss from sister company, TOTE Maritime Alaska, where he has served as President for 16 years. After 10 years sailing aboard a wide range of vessels in trade routes around the world, Parrott began at TOTE Maritime in 1992 as the Chief Mate of the SS Northern Lights. Parrott has a BS degree in Marine Transportation from the U.S. Merchant Marine Academy.

Cox Named VP at BMT

BMT Designers & Planners has named **Rick Cox** Vice President of Business Development. Rick brings senior-level experience, knowledge and contacts. He has managed multi-million-dollar programs for military, civilian and commercial customers, and has advised U.S. Government representatives operating in locations throughout the world.

Noone is President of TOTE Maritime Alaska

TOTE Maritime Alaska announced that **Michael Noone** assumed the role of President on January 1, 2016. Noone joined TOTE Maritime Alaska as Chief Operating Officer in August 2013, bringing 28 years of experience in the shipping and logistics field. Noone received his bachelor's degree from Wagner College and is a past Steering Committee Member at the Retail Industry Leaders Association (RILA).

Monroe Receives Coast Guard Commandant Award

Capt. Jeffrey Monroe of the MacDonnell Group has been awarded the Meritorious Public Service Award and Medal by the Commandant of the U.S. Coast Guard. Capt. Monroe was presented the award at his final meeting as Chairman of the Secretary of Homeland Security's National Maritime Security Advisory Committee this month. Monroe was cited for "notable services that have assisted greatly in furthering the aims and functions of the U.S. Coast Guard." Monroe is a senior port and maritime consultant and provides seminars in professional development for senior port executives.

Mathey Dearman Names Account Manager

Mathey Dearman has announced the addition of **Mike Brace** as Key Account Manager. Mike brings over 20 years of sales and operational experience, with strong relationship building skills necessary for successful customer service and ensuring client satisfaction and growth. Formerly with Miller Electric, he is an AWS Certified Welding Inspector, and an AWS Certified Welding Sales Representative.

Jones Joins Metro Group Maritime

Formerly with Safmarine, a unit of Maersk Line, **Christopher Jones** has joined Metro Group Maritime. Jones has spent the last decade working in the steamship industry. He brings industry-specific knowledge from his last three positions held during the last 10 years: Accounts Receivables Specialist, Account Manager and Customer Relations Specialist. Metro Group Maritime is a commercial receivable management, debt recovery and consulting company focused on the maritime industry.

New Faces in the Crowd at Furuno


Closson


Disher


Ortiz


Terry


Shield


Christopher


Linzey

Furuno has announced several changes to their Sales Department, including the addition of two Commercial Sales Representatives and promotion of several long-time employees, as well as welcoming new Service personnel into the Furuno family. **Jon Closson** has been named Fisheries and Specialty Products Sales Representative. Previously Furuno's Southwest Regional Manager, **Bart Disher** is taking up the mantle of Commercial Sales Representative for the Gulf Region and West Coast. **Reynard "Rey" Ortiz** has joined the Furuno family as their new Southwest Regional Sales Associate. Rey is a recent graduate of the maritime business program at the Massachusetts Maritime Academy.

Furuno also announced that **Alan Terry** will be taking over as their new Northwest Sales Associate. Alan has decades of experience in the U.S. Coast Guard on both active duty and the reserves. Previously one of Furuno's Deep Sea Field Technicians, **Jeff Shield** is Furuno's newest Commercial Sales Representative for the Eastern United States. **Brandon Christopher** joins the firm as a Field Service Technican. Finally, **Drew Linzey** has recently expanded his territory to include the Mid-Atlantic dealers. Drew joined the Furuno team in 2008.


Brace


Jones


Credit: Susanne Hakuba

Rodgers


Stirpe

Paddy Rodgers Named 2016 CMA Commodore

Paddy Rodgers, CEO of Euronav NV has been named as the Connecticut Maritime Association (CMA) Commodore for the year 2016. The 2016 Commodore Award will be presented on March 23, 2016 at the Gala Dinner marking the conclusion of the annual Connecticut Maritime Association conference and trade exposition. The award is given each year to a person in the international maritime industry who has contributed to the growth and development of the industry. Rodgers has been Chief Executive Officer of Euronav since 2000 serves and has served on the Board of Directors of Euronav since June 2003 and has been a member of the Executive Committee since 2004.

WAGO Appoints Regional Sales Manager

WAGO has announced the appointment of **Joe Stirpe** as Regional Sales Manager for Upstate New York. Stirpe comes to WAGO with a diverse background of success in technical sales and business development with a focus on control and electrical products and applications. Over the last several decades, he has held leadership position in business development and management at Siemens, Invensys Eurotherm and KJ Electric Corp.

Pitcher Joins Videotel as Sales Director

Videotel has appointed **Joe Pitcher** as its sales director to lead business development efforts and liaise with Videotel's global network of agents and sales offices. Previously, Pitcher was head of sales at V.Group Marine Services.

SSI USA Names Holder to Sales Team

SSI announced that CAD/CAM specialist **Robert Holder** as part of its sales force in the U.S. market. Robert has utilized CAD software for over twenty years and for the last decade has sold and consulted with companies on implementations of 3D CAD/Analysis, data management and ERP integration.

Rodda Paint Announces Leadership Team

President & Chief Operating Officer at Rodda Paint Co, **Bill Boone**, announced a strategic succession plan for the future growth of the company. Bill takes on a new role as Director of Strategic Accounts and has named **David Wolf**, presently Vice President Industrial Sales as the new President and Chief Operating Officer for the company. Wolf brings 24 years of experience to Rodda, the last 21 years with the Carboline Company headquartered in St. Louis, Mo., where he most recently served as Director of Marketing, Vice President Sales, and Vice President of Global Sales and Marketing.

FUGRO Welcomes Linck as Senior Consultant

Joseph P. Linck, Jr. has joined Fugro as a Senior Consultant to represent


Pitcher


Holder


Boone


Wolf


Linck

business development efforts in South Texas and in particular the Rio Grande Valley and the Corpus Christi areas. Joe has over 30 years of professional experience and is a past port director of the Port of Brownsville. A graduate of the University of the Americas in Mexico, he also completed postgraduate studies at the Wharton Business School of the University of Pennsylvania.

Chiarello, Cox and McKenna Win AOTOS Honors

The United Seamen's Service (USS) this year honored **Anthony Chiarello**, President and CEO of TOTE Inc.; **Matthew J. Cox**, President and CEO of Matson; and **James C. McKenna**, President and CEO of Pacific Maritime Association with the 2015 Admiral of the Ocean Sea (AOTOS) Award. At this gala, the recipients shared the evening with a group of American seafarers who were recognized by the USS for specific acts of bravery at sea. At the close of the evening, USS presented a special remembrance in honor of the 28 American crewmembers of the El Faro and five Polish nationals who perished at sea on October 1, 2015 during Hurricane Joaquin.

Crowley Awards Scholarships to Great Lakes & USMMA Cadets

Crowley Maritime Corporation recently awarded Thomas B. Crowley, Sr. Memorial Scholarships to cadets at the U.S. Merchant Marine Academy and the Great Lakes Maritime


AOTOS Award


Toohey


Watts

Academy. **Michael Atwell**, a senior at GLMA, is in the deck officer program and working to earn an unlimited third mate's license with first class pilotage. Kings Point cadet **William Murray** is a first class midshipman studying logistics. **Peter Tolles**, also from Kings Point, is a first class midshipman at King's Point majoring in logistics and intermodal transportation. USMMA First classman **Robert Tirrito** is studying systems engineering with a minor in oceanography. In 1994, Crowley Chairman and CEO, Tom Crowley Jr., established the Thomas B. Crowley Sr. Memorial Scholarship Program, in honor of his father, and has also donated more than $2 million to support myriad educational programs.

Nicholls College of Business Maritime Management Program Grows

The College of Business Administration at Nicholls State University began offering students the option of maritime management as a degree concentration in the fall of 2013. In addition, a minor in Maritime Administration was approved this December. The program started with 24 students and had grown to almost 90 students this fall. The goal of the maritime management concentration is to prepare the student for a career in general management in the maritime industry, with particular focus on the oil and gas sector, as well as periphery businesses. The program, fully funded by local and regional businesses, includes courses such as Introduction to Maritime Management, Admiralty Law, Marine Accident Prevention, Economics of Shipping and an internship with a maritime-related firm.

Crowley Selects Eagle LNG as Marine Fuel Provider

Crowley Puerto Rico Services, Inc. has selected Eagle LNG Partners (Eagle LNG) as the liquefied natural gas (LNG)-supplier for the company's new LNG-powered, Commitment Class ships, which will be delivered in 2017 for use in the U.S. mainland to Puerto Rico trade. To support Crowley's LNG needs, Eagle LNG will build a natural gas liquefaction plant (LNG plant) offering a capacity of 200,000 gallons per day (87,000 gallons per day initially) in Jacksonville. The state-of-the-art facility is slated to be operational by early 2017.

FY '16 Omnibus Appropriations Yield Record Funding for USACE

The Waterways Council (WCI) last month applauded the work of negotiators to reach a final agreement last night for an FY 2016 Omnibus Appropriations bill that funds the Corps of Engineers' Civil Works program under the Energy & Water Development Appropriations bill. FY '16 funding for the Corps' Civil Works mission is $5.99 billion, a 27 percent increase above the President's budget request of $4.732 billion. The Corps will decide where the funding will be allocated. WCI President/CEO **Mike Toohey** said, "Some things are worth the wait and this is certainly true for the FY '16 Omnibus Appropriations agreement that provides record-level funding for the Corps' Civil Works mission. The $1.3 billion above the Administration's request for the Corps' overall funding will help to modernize our nation's waterways infrastructure, facilitate exports, create jobs, make more efficient the transportation supply chain and increase American competitiveness in world markets."

Gulf and Hendry Marine Consolidate Operations

Gulf Marine Repair Corporation is consolidating operations with Hendry Corporation, its affiliated company and fellow shipyard. By combining the activities of these two shipyards, Gulf Marine will operate more efficiently and be better positioned for additional growth. **Rick Watts**, the newly appointed President of Gulf Marine, explained, "The intent of this consolidation is to create a focus, flexibility and competitiveness that will meet both the needs of existing customers and the emerging markets."

November U.S.-Flag Laker Cargo Plunges

U.S.-flag Great Lakes freighters (lakers) carried 7.9 million tons of cargo in November, a decrease of 15 percent compared to both a year ago and the month's long-term average. Year-to-date U.S.-flag cargos total 79.8 million tons, a decrease of 1 percent compared to the

Great Lakes Carrier

Crowley

same point in 2014, and a drop of 3 percent compared to the long-term average for the January-November timeframe. Iron ore cargos have decreased 8 percent compared to a year ago. Coal shipments are up 4 percent. Limestone loadings have increased 8 percent. Lake Carriers' Association represents 15 American companies that operate 56 U.S.-flag vessels on the Great Lakes.

Gibbs & Cox Acquires Donald L. Blount & Associates

Gibbs & Cox, Inc. announced the acquisition of Donald L. Blount and Associates, Inc. (DLBA), a Chesapeake, Va.-based naval architecture and marine engineering firm, specializing in the technical development of high-performance marine craft consulting services related to the design, evaluation, testing and construction management of motor yachts, custom sport fishing boats, production boats, commercial, military and paramilitary vessels.

Crowley Opens VA Government Services Office

To better serve government agencies such as the Military Sealift Command (MSC) and the U.S. Maritime Administration (MARAD), Crowley Maritime Corp. has opened a government services office in downtown Norfolk, Va. Additionally, this new location will be used to better service the Norfolk Naval Base and several of Crowley managed ships located there, including three ROCON ships, five BOBO class ships and seven T-AGOS/T-AGM ships.

PRODUCTS

AlphaEye Allows Real-time Audio Visual Support

Alphatron Marine's robustly designed AlphaEye is a next generation service communication tool offering the capability to have an extra set of eyes "onboard." With the AlphaEye, the crew onboard can call through a dedicated (satellite from 128kb, 3G or 4G) communication link directly with the expert in the Alphatron Marine office and obtain error analysis and problem solving in a matter of minutes.

www.alphatronmarine.com

Join Schedule 80 Carbon Steel Pipe Without Hotwork

Victaulic's roll sets for VE416FSD roll grooving tools permit roll grooving of 2- to 6" Schedule 80 carbon steel pipe. This enables Schedule 80 pipe used for corrosive services to be grooved and joined with Victaulic couplings, eliminating hotwork. The tool simplifies and speeds up pipe-end preparation in shipboard applications. Roll sets are available for standard-wall pipe, light-wall steel pipe and stainless steel pipe.

www.victaulic.com

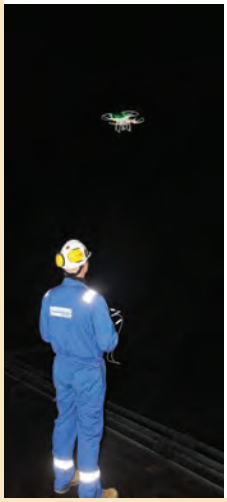
BlueTide releases app to manage wireless networks

BlueTide Communications' Access Management Portal (AMP), BlueTide's second proprietary iOS app allows for control of wireless networks directly from an iPad device. AMP is like a fuel gauge for bandwidth, delivering a real-time snapshot of how bandwidth is used and by whom. AMP enables customers to block and reauthorize devices instantly. This feature disables wireless access to non-critical devices until business operations are completed.

www.bluetidecomm.com

Drones Allow Surveys Without Scaffolds

DNV GL has completed several tests using drones to support hull surveys of vessels. Using drones to visually check the condition of remote structural components has the potential to significantly reduce survey times and staging costs, while at the same time improving safety for the surveyors. The tests used a camera-equipped drone to visually evaluate structural components through video streamed to a tablet.



www.dnvgl.com/maritime

Commercial Vessel Medical Kits – Coastal & Offshore

OceanMedix introduced its new product line of Commercial Vessel Medical Kits. Designed to meet the demanding needs of the commercial marine market, these kits are available in three sizes, in both "coastal" and "offshore" configurations, to accommodate the number of POB, duration of trip and the distance away from professional medical care. OceanMedix - The Source for Medical, Emergency & Safety Equipment - Since 2006.

www.oceanmedix.com

Sherwin Williams Heat-Flex Protects, Insulates

Enhancing safety and minimizing 'corrosion under insulation' risks means turning to an insulative acrylic coating from Sherwin-Williams Protective & Marine Coatings. Heat-Flex 3500 is designed for personnel protection and mitigating CUI. Enabling hot piping and ductwork to stay cool to the touch, preventing burns and protecting personnel, it can be applied to hot surfaces up to 350° F, reducing downtime, keeping systems online during coating applications.

http://protective.sherwin.com

Network Sensors Enhance Marine Integration

A redesigned lineup of easy-to-install, intelligent sensors designed to monitor an array of vital engine and boating functions is now available. Compatible with NMEA 2000 networks, the products include the Simrad Fluid Level Sensor, Fuel Data Manager, and Fuel Flow, Pressure, Paddlewheel Speed and Temperature Sensors and feed data to Simrad NSS evo2 and NSO evo2 displays for effective management of onboard fuel levels.

www.simrad-yachting.com

Pettit Launches Antifouling Line

Pettit Marine Paint has released a superyacht antifouling system, the Pettit XL line. Consisting of the top-selling antifouling products in Pettit's line, the paints will be marketed as Pettit XL and sold specifically to the large boat market. With over 150 years of experience, Pettit's offering of Pettit XL paints have been designed to provide exceptional protection for the workboat market.

www.pettitpaint.com

WheelHouse Technologies Launches 'WheelHouse Underway'

WheelHouse Technologies' WheelHouse Underway, a tablet application for iOS, Android, and Windows devices, expands functionality of WheelHouse, which provides vessel documentation, maintenance recommendations, and spare parts guidelines in a cloud-based application. WheelHouse Underway provides offline access, allowing a convenient way to view equipment information, documents, enabling users to view and complete maintenance tasks when an internet connection is unavailable.

www.wheelhousetech.com

Helm's Maintenance and Compliance Solution

In line with the Subchapter M waterways rules which are due to come into effect in 2016, Helm Operations' latest Maintenance and Compliance solution, Helm CONNECT, will serve as an ideal platform. Helm CONNECT's new Maintenance Dashboard functionality as well as the new Compliance feature gives shore based personnel oversight to their entire fleet's maintenance on one screen.

www.helmoperations.com

SIMRAD's 9 & 16" Commercial RADAR

The Simrad R2009 and R3016 Radar control units are paired with Simrad's radar antenna solutions. Both systems utilize an intuitive control interface with the latest generation of digital tuning to allow for optimal situational awareness in the most adverse conditions. Outstanding target resolutions are achieved using beam sharpening technology when paired with the Simrad Broadband 3G/4G Radomes or Halo Pulse Compression arrays.

www.navico.com/commercial

Tarka Portable survey system MOSS

Tarka Systems' MOSS system for a wide range of marine surveys provides clear functionality and the ability of reading a wide range of sensor inputs. The MOSS model is a handheld unit that provides the readout and storage of connected sensors. The sensor value is gathered, displayed and stored on a USB drive. Average values can be calculated and displayed during the measurements.

www.tarka-systems.nl

No Performance Drawback with EPA VGP-Compliant Grease

When the EPA came out with the Vessel General Permit (VGP), most vessel operators felt their only option was EP 2 grease or nothing at all. PANOLIN customers have always had options. PANOLIN's full line of EPA VGP-compliant greases include BIOGREASE EP 2, MARGREASE EP 2, BIOGREASE EP 2 and MARGREASE EP 0 – a grease solution for every application. PANOLIN has been proven in real-world applications.

www.panolinamerica.com

Petrofunnels for Barge Petroleum Sampling

For petroleum cargo samplers, the PetroFunnels solution reduces risk, provides immediate results and keeps the deck clean. The Speed Funnel is a unique tool that reduces spills that may occur during the sampling process of the cargo. The product significantly reduces or eliminates spillage of test samples which in turn reduces environmental contamination and increases the field personnel's daily production as well as lab results.

www.petrofunnels.com

Alternative Green Power from Torqeedo

On the Colorado River, a new raft powered by Torqeedo's Deep Blue electric propulsion system is in keeping with its environmentally friendly philosophy. The Deep Blue system is a fully integrated system in which components are designed to match seamlessly. Deep Blue is available in 40 or 80 hp, inboard or outboard versions. The outboard is offered in remote throttle and tiller steering models.

www.torqeedo.com

Parker Bestobell's Compact Marine Valve

Parker Bestobell Marine's compact version of its innovative Float Isolation Valve (FLIV) was developed for smaller diameter floats specified by shipyards for secondary level monitoring systems on LNG carriers. The patented FLIV is installed on top of the cargo tanks and isolates the gauge and float from the cargo tank. These valves prevent boil-off gas from the cargo tanks, which could be extremely dangerous.

www.bestobellvalves.com

Variable Frequency Drive Saves Energy

Invertek Drives' energy saving Variable Frequency Drives (VFDs) used in bow thrusters, winches, cranes, pumps and compressors, significantly reduce energy consumption by matching the speed of the motor with requirements of the application. Invertek's range of Optidrive VFDs, including DNV approved products, cut energy consumption of electric motors used on marine vessels by as much as 60 percent. Owners then meet CO2 reduction targets while reducing costs.

www.invertekdrives.com

Safe, Reliable DC Fans & Blowers

Delta "T" Systems' range of high-performance 12V and 24V DC blowers and fans is designed from the ground up specifically for use in a marine environment and built for years of maintenance-free service. The foundation of a Delta "T" System fan or blower is its ignition-protected and marinised motor. The Fan Control System features efficient, automatic dual-speed operation with fire system shutdown capabilities.

www.deltatsystems.com

VIKING Rafts for Safety – and Compliance

Upgraded Coast Guard regulations for survival craft now dictate that vessels sailing in coastal waters must swap out the life floats and rigid buoyant apparatus which allow partial immersion. Vessels must ensure evacuation systems in the form of Inflatable Buoyancy Apparatus (IBA) or other approved liferafts are used. Viking's 25-person IBA is a self-inflating raft that complies with the new requirements.

www.VIKING-life.com

Henriksen's SOLAS Boat Lifting Hook

H Henriksen has received SOLAS certification for a new off-load single-point boat lifting hook capable of holding up to 22.5 tons. The quick release hook has been developed for use with heavy workboats while a smaller hook has received SOLAS certification for 8-ton, making it ideal for the deployment of emergency rescue boats and heavy duty rigid inflatable boats.

www.hhenriksen.com

Bending Tool Reduces Cycle Times, Waste

Previously, three process steps were required in the manufacture of bent pipe: cutting, the bending process itself and final cutting. In response, Schwarze-Robitec developed a cutting device integrated into the bending tool, making it possible to bend and cut pipe components of commercially available lengths in a single. The benefit is a reduction of material waste of up to 90 percent and reduced production time.

www.schwarze-robitec.com/cutting

Harken Industrial's LokHead Winch

Harken Industrial's LokHead winch significantly changes the way loads are lifted and rescues carried out. Its lightweight, portable design and use of unlimited length fiber rope allows more flexibility, space savings and is easier to use in confined spaces. Compact, portable and weighing just 4.2 kg (9.3 lbs), the LokHead winch can be used anywhere a load needs to be safely lifted and lowered.

www.harkenIndustrial.com

Miko's Underwater Drill & Fixing System

A new electric underwater drill and fastening system that can penetrate and join two metal plates up to 22mm thick in one action has been developed by Miko Marine. The battery powered Miko Fix drill can be operated by divers at depths to 50 meters. It is mounted in a specially designed stand that is clamped to the work piece by high-power permanent magnets.

www.mikomarine.com

SpillFix Industrial Organic Absorbent

SpillFix, a 100 percent recycled organic material, instantly absorbs hazardous liquid spills on contact including oils, fuels and chemicals, enabling faster, cleaner and safer clean up with minimal downtime. Compared to clay-based absorbents, SpillFix users need 80 percent less product, in less than half the time. SpillFix can reused to clean up more than one spill due to its superior absorbency, further adding to savings.

www.spillfix.com

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Minimum Qualifications:
- Master/Mate 200 GRT Near Coastal
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Minimum Qualifications:
- 3 years experience on tugs at least 2000HP
- DDE 4000HP, STCW w/security endorsement
- Passport, TWIC

Assistant Engineer
Minimum Qualifications:
- Degree from Maritime Academy or DDE 4000HP
- STCW w/security endorsement, TWIC, Passport

Barge Tankerman
Minimum Qualifications:
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- STCW w/security endorsement, Passport, TWIC

AB Deckhand
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- 2 or more years of tug experience, STCW w/security endorsement, TWIC, Passport

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Marine Electronics Field Service Engineer

Salary: $ $20-$45 per Hour, Full Time, Company Employee

Category: Engineer / Naval Architect

Job Location: 90 Myrtle Street Cranford, NJ, 07016 USA
Contact:
Partner-Marine Engineering
Email: mick@flagshipmgt.com
Work Phone : 954-577-5100
101 N. Riverside Drive, Sutie 210 Pompano Beach, FL, 33062 United States
Skills:
• Integrated Bridge Navigation System Maintenance
• Voyage Data Recorder
• Radar
• GMDSS
• Radio
• Marine Electronics repair and maintenance

Description:
• Marine Electronics Field Service
• Navigation and Integrated Bridge Systems
• Technical Education
• FCC License with Radar Endorsement a plus
• 1+ years experience with marine electronics service
• Willing to travel extensively
• TWIC Card Preferred
• Ability to read and interpret system documents
• Experience with Mackay or Radio Holland Equipment Repair is especially valued
• Associates Degree in Electronics or Electrical Engineering preferred
• B.S. Degree in Electronics or Computer Science highly valued
• Experience with marine industry, willingness to travel across US East Coast and Caribbean Region
Excellent Field Service Opportunity - base, overtime, per diem, car allowance, expenses covered. Great benefits.

Project Engineer

Curtin Maritime
Full Time
Category: Project Engineering / Project Management
Job Location: 1500 Pier C Street, Berth 57 Long Beach, CA, 90813 United States
Contact:
Email: curtinjobs@curtinmaritime.com
1500 Pier C Street, Berth 57 Long Beach, CA, 90813 United States
Position Overview:
Curtin Maritime is seeking a highly motivated, detail oriented professional to fulfill the Project Engineer role. The Project Engineer will report to the Chief Operating Officer (COO) and work closely with the Project Manager in supporting the new project proposal and bid process, as well as post award submittal and plan preparation throughout the projects life cycle.

Job Responsibilities and Duties include, but are not limited to the following:
• Provide support in reviewing, researching, writing and submitting project bids and proposals
• Review plans and other technical documents
• Assist in the development of cost estimates or tentative schedules
• Conduct new project research
• Assist with materials research, purchasing and project support needs
• Review, check and compile information and verify data for accuracy, completeness and compliance according to project specifications
• Assist with project mobilization
• Conduct client communications and updates on an as requested and needed basis
• Clerical Skills to maintain accurate records, reports, orders, etc.

Skills Required:
• Able to read, speak, write, and understand English in person and over the telephone
• Excellent interpersonal, verbal and written communication skills are essential in this collaborative work environment
• Ability to work independently, as well as follow directions and perform tasks
• Capable of working efficiently in an environment of constant change
• Possess time management and scheduling skills
• Strong attention to detail
• Ability to read/understand bid documents and specifications
• Proficient Computer Skills: Microsoft Word, Excel, PowerPoint, and PDF editing programs

Physical Requirements:
• Work is performed while standing, sitting and/or walking
• Must be physically fit enough to board barges and tugs at sea and in port
• Comfortable on construction sites
• Able to bend, squat, crawl, climb, and reach
• Able to lift, carry, push or pull weights up to 50 pounds
• Able to communicate effectively using

speech, vision and hearing

Certification Requirements:
• Valid Driver's License
• TWIC card (or ability to obtain one)
• USCG Merchant Mariners Credential (or ability to obtain one)
• Able to pass a government background check and US Coast Guard physical and drug test

Education and Experience
• Minimum Requirement:
High School Diploma
• Associates or Bachelor's Degree Preferred
• 3-5 Years in Commercial Construction or Marine Construction Industry
• Proposal preparation experience for government contracts preferred
• Maritime and Dredging experience preferred

First Assistant Engineer Mixed Work Schedule (W), WM-9932-27 (304)
Military Sealift Command
Salary: $ $72,267 , Part Time , Mid Career
Category: Engineer / Naval Architect

Description:
Announcement #: 16-304-01EXOCIWS INTERMITTENT WORK SCHEDULE
Title, Series, Grade (Code) First Assistant Engineer (W), WM-9932-27 (304)
Base Salary: $72,267 Per annum
Type of Appointment: Excepted Service
Opening Date: October 1, 2015
Closing Date Open continuously with periodic cut-offs
Location: Military Sealift Command (MSC) Vessels Worldwide
Who May Apply: Open to all qualified United States citizens who are not currently employed with Military Sealift Command (MSC) as civil service mariner (CIVMAR) employees. Relocation expenses are not authorized for this position.
Duties: The First Assistant Engineer is responsible for the proper operation, maintenance, and preservation of all engine department machinery and equipment. Responsible for the economical use of consumable supplies, stores, and spare parts; the cleanliness and proper condition of all spaces under the jurisdiction of the engine department; and the conduct and efficient performance of engine department personnel. Must be competent and skilled in the use of condition monitoring equipment, including basic interpretation and analysis of the raw test results. Must have a thorough understanding, be well versed and be a proponent in the proper use of MSC's ABS approved preventive maintenance and machine history program (SAMM) and special programs (e.g. lube oil analysis, fuel oil analysis, condition monitoring including VMS Megger, implementation and administration of MSC lockout/tag out program, water treatment, electrical safety, heat stress, sewage handling, refrigerant handling, and gas free engineering). Incumbent is required to be proficient in the performance of shipboard engineering, fire, and collision drills. Carries out instructions safely and efficiently, and takes the initiative to perform emergency duties without specific orders or instructions. Everything in this Position Description is considered to be an essential function of this position.

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NEW PRODUCTS

Marine Marketplace

NEW PRODUCTS

PROFESSIONALS

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25	All American Marine	www.allamericanmarine.com	(360) 647-7602
23	Breaux Brothers	www.breauxboats.com	(337) 229-4232
29	Diesel America West, Inc.	www.dawest.com	(360) 378-4182
C2	DMW MARINE GROUP, LLC	www.dmwmarinegroup.com	(610) 827-2032
27	Gladding Hearn	www.gladding-hearn.com	(508) 676-8596
27	Glosten	www.glosten.com	(206) 624-7850
13	Great American Insurance	www.gaic.com	(212) 510-0135
13	John Deere Power Systems	JohnDeere.com/marine	Visit us online
11	Kidde Fire Systems	www.kiddefiresystems.com	(508) 881-2000
1	KVH	www.kvh.com	(401) 847-3327
7	Louisiana Cat	www.LouisianaCat.com	(985) 536-1121
53	Mariner's House	www.marinershouse.org	(617) 227-3979
55	McDonough Marine Services	www.mcdonoughmarine.com	(504) 780-8100
11	NEWARK Community Economic Development Corp.	http://www.ci.newark.nj.us/portauthority	Please visit our website
C4	R.W. Fernstrum & Company	www.fernstrum.com	(906) 863-5553
19	Tampa Yacht Manufacturing, LLC	www.tampa-yacht.com	(727) 954-3435
3	Tidewater Marine	www.tdw.com	(504) 568-1010
5	Vigor Industrial	www.vigorindustrial.com	(855) 844-6799
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Analysis of Future Business Drivers and Forecast of Floating Production System Orders between 2016/2020

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INCLUDES OVER 110 CHARTS, GRAPHS AND EXHIBITS

This report presents our five year forecast of floating production system orders. First we present an overview of the industry and our assessment of the underlying market situation likely to prevail over the 2016/20 forecast period. Then we provide our forecast of orders for eight types of production systems under three market scenarios. The final four sections of the report contain details for floating production systems in the planning stage, on order, in operation and available for

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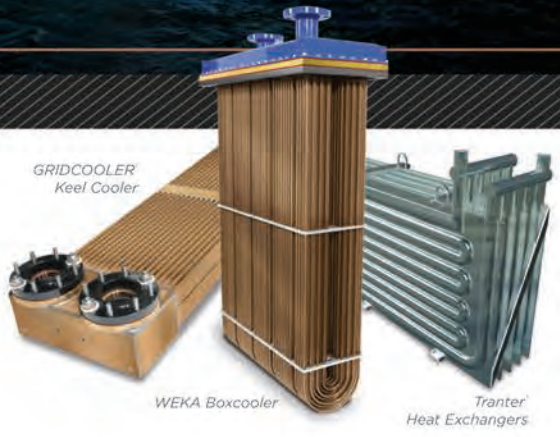

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