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News

JULY 2016

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Insights

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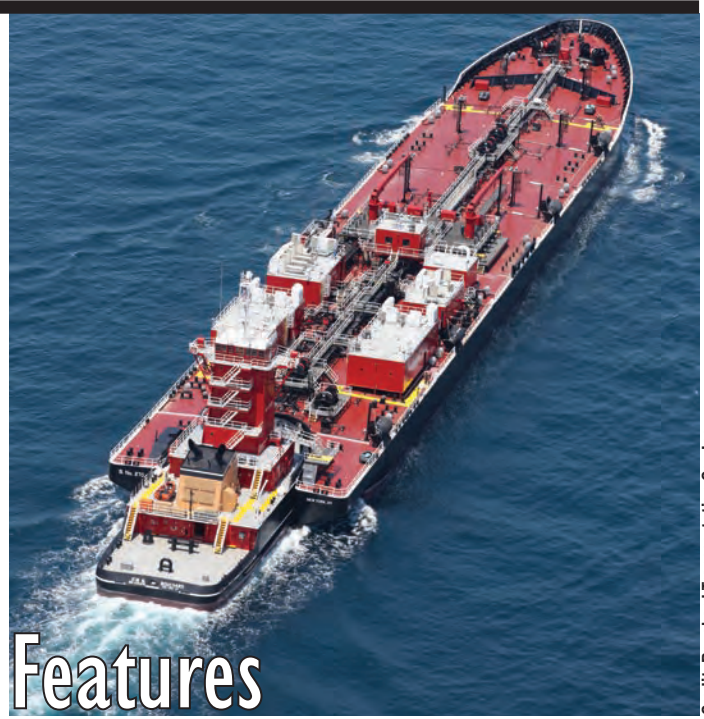


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ON THE COVER

Off the west Coast of Sweden, the former Finnish rescue boat Rescue PAF/PTA81 is propelled through the water by Volvo Penta's new D8/IPS15 engine configuration, under the steady hand of *MarineNews* Associate Publisher Greg Trauthwein. The story begins on page 30.

(Image Credit: Volvo Penta)





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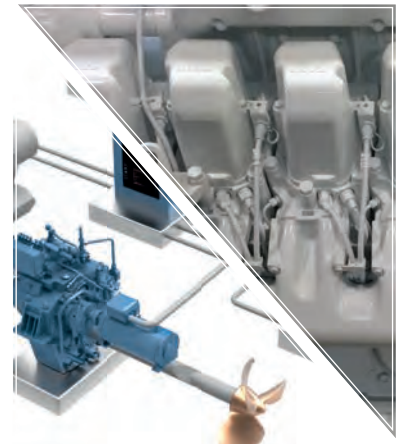
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Respective of the editorial focus of this edition of *MarineNews*, it is inadvisable to begin without acknowledging the arrival of the U.S. Coast Guard's long awaited, much anticipated and far reaching subchapter M towboat rules. The preliminary take on the advance text that the Coast Guard provided in mid-June is that the rule will be more forgiving than it otherwise might have been. The Coast Guard itself says it endeavored to soften the impact of the new regulations in its final version. If that's the case, one has to wonder whether the ultimate impact on safety will be similarly dulled.

Without getting into the weeds on what it all means, the Coast Guard asserts that subM will affect about 5,500 U.S. flag towing vessels engaged in pushing, pulling, or hauling alongside, and the 1,100 companies that own or operate them. Ultimately, they say, this translates into a net benefit of \$4.9 million for industry, not counting un-monetized benefits such as reducing the risk of accidents that have secondary consequences on waterways, highways, and railroads. That's interesting but encouraging math.

On the other hand, the apparent grandfathering of certain hulls and equipment and the ultimate delay to full compliance won't be good news to shipyards hoping to change their luck with increased business. The 798-page document that I viewed prior to deadlines for this edition was daunting. Interpreting what it all means will be equally difficult. Stay tuned.

On a brighter note, *MarineNews* Associate Publisher Greg Trauthwein arrived back from yet another incredibly difficult [?] assignment in Gothenburg, Sweden just in time to fill us in on some remarkable developments in the world of propulsion technology. Volvo Penta's newest equipment for the workboat world – as only Greg can attest to after having driven much of it – will no doubt very soon make a huge splash in your world. Before that, it debuts here, within this edition, starting on page 30.

Separately, we have learned over time that propulsion technology today involves so much more than just engines and/or the devices driven by them to move vessels through the water. That's because the need for combining speed, efficiencies, emissions control and fuel economy are changing the way naval architects design hull forms. Matching the propulsion arrangement to the hull in a fit-for-purpose manner isn't just a fad. For example, it is the way of the future for forward-thinking ATB operators – such as Bouchard – who hope, among other things, to maximize their bottom line. That story begins on page 24.

This month, it seems only fitting that I end with a few remarks on how we began this edition. Our usual **INSIGHTS** feature typically revolves around the Editorial Calendar, and this version is no different. In this case, I once again turned to my good friend and fellow Mass. Maritime alumnus Bob Kunkel, who speaks with authority on all things 'propulsion.' That he does so, primarily from an OEM agnostic position, makes his 'insights' that much more valuable. See if you don't agree.



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National Census of Ferry Operators

In late May, the U.S. Department of Transportation's Bureau of Transportation Statistics (BTS) finally released Highlights of the 2014 National Census of Ferry Operators (NCFO) – its first such survey since it last reported on the sector in 2010. As with all government numbers, the current version lags current totals by almost two years. Key findings indicate that 115.1 million passengers were carried on ferries in the United States and its territories in 2014. These passengers were transported by 128 ferry operators across the nation who reported providing service through 441 terminals on 741 unique route segments in 38 states and one U.S. territory, using a fleet of almost 500 active vessels. But, the numbers are only important in comparison to previous data, some of which shows definitive trends – some troubling, and still others that show we're headed in the right direction. To be fair, due to non-response from some ferry operators, these estimates are likely to underestimate the actual number of passenger and vehicle boardings.

Ferries in the U.S. carried just over 115 million passengers and over 30 million vehicles in 2013. The passenger totals show growth of 9 million passengers, or 8.5%. This is especially important within the guise of the previous survey figures, which had shown a decline from the next oldest survey. Shortsea shipping is indeed alive and well, and those 9 million passengers represent lots of cars and buses taken off the highways. But, it isn't all good news: fleet totals declined by 210 vessels, and although some of that is likely a function of larger vessels replacing multiple hulls, the statistic is troubling. Beyond this, the fleet is progressively getting markedly older and now stands at an average age of 28 years. *That's nominally good news for America's boat builders, but only if municipalities and other operators opt for modernization programs.* On the other hand, the fleet is now somewhat faster, getting passengers faster to more destinations (fleet segments nationwide more than doubled, giving riders more options than ever). It's also getting much cleaner; with new emissions regulations impacting engine and aftertreatment decisions (*see our feature on the new WETA ferries beginning on page 38 of this edition*). Finally, responders to the BTS survey declined by almost 40 percent, suggesting continued consolidation amongst the nation's ferry fleets or perhaps, incomplete data from entities that chose not to participate.

The Fixing America's Surface Transportation Act (FAST Act) (Public Law 114-94, section 1112) 2 set aside \$80 million for each fiscal year from 2016 to 2020 for the maintenance and improvement of the Nation's ferry system. It also required the Federal Highway Administration (FHWA) to use BTS' NCFO data as input for the formula for allocating Federal ferry funds. Hence, this

survey takes on heightened importance going forward.

The West region had the highest passenger and vehicle traffic volumes (45.8 million and 14.9 million, respectively) with the Midwest showing the fewest, with approximately 10.4 million passenger boardings. Operators indicated that just over half of their route fares were regulated by a public agency (53.7 percent – Appendix C). The majority of reporting operators' revenue came from ticket sales. Of these vessels, 42.8 percent were both privately owned and operated, while 39.4 percent were publicly both publicly owned and operated (table 5). Some of the vessels were reported to be publicly or privately owned but it was unknown how they were operated (2.0 percent and 7.0 percent respectively). A relatively small number were publicly owned and privately operated (4.4 percent), while fewer were privately owned and publicly operated (1.4 percent).

Nearly all of the vessels in the ferry fleet carry passengers (95.0 percent), while just under half (47.1 percent) carry vehicles, and less than a quarter carry freight (22.2 percent – Appendix C). The average passenger capacity of the passenger carrying fleet was 291 with a median capacity of 149 and maximum of 5,200 people. The average vehicle capacity of the vehicle carrying fleet was 51 with a median capacity of 30 and a maximum of 395 vehicles.

Almost all of the vessels in the fleet for which information was reported were self-propelled (94.6 percent) with just 5.4 percent using some other form of propulsion. Of those vessels that were self-propelled, the majority were propelled by diesel engines (94.4 percent), followed by gasoline engines (3.2 percent). The fleet also contained 3 vessels powered by electricity and 8 by some other unspecified fuel source.

The U.S. Ferry system consists of all of the ferry terminals and route segment being serviced in a given census year. Operators participating in the 2014 NCFO reported that there were 441 terminals in the U.S. ferry system in calendar year 2013. These terminals were spread fairly evenly across the regions with 29.3 percent of terminals in the West and 29.0 percent in the Northeast, followed by the South (26.1 percent) and the Midwest (13.2 percent) as is shown in table 7.

741 route segments served a combined total of 21,301 nautical miles with an average distance of almost 31 nautical miles per route segment. By far the greatest number of route miles served was in the West region (17,042 nautical miles), with the longest of these route segments being 595 miles long. The next greatest number of route miles served was in the Northeast (1,997 nautical miles), followed by the Midwest and the South (1,047 and 370 nautical miles, respectively) as seen in table 10.

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BY THE NUMBERS

U.S. Ferries: Through the Years ...

Year / Census Year	1999 / 2000	2005 / 2006	2007 / 2008	2016 / 2014
Ferry Operators Responding	224	230	213	128
Ferries in Service	N/A	N/A	669	476
Vessels Not in Service	N/A	N/A	40	23
Total Fleet Size	677	690	709	499
Ferry Terminals (U.S.)	546	541	496	441
Total Ferry Segments	452	382	349	741
Passengers Carried		108 million	106 million	115 million
Oldest Ferry	??	??	94 years	101 years
Average Age (years)	??	25	26	28
Average Ferry Speed	??	14.0	14.1	15.0

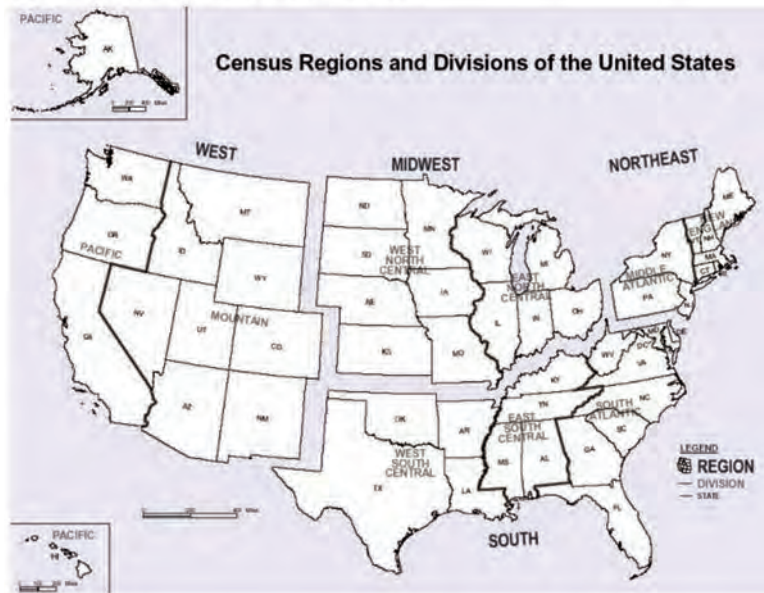
Passengers, Vehicles, Fleets & Terminals: by Census Region (2013)

Region	Passengers	Vehicles	Ferries, PCT Fleet	Top States (# Boats)	Terminals, PCT totals
Northeast	30,851,596	3,455,760	183 / 36.7	NY (45), MA (49)	128 / 29.0
Midwest	10,406,371	2,377,010	65 / 13.0	IL (21), MI (20)	58 / 13.2
South	26,441,653	9,121,240	122 / 24.4	NC (30), LA (21)	115 / 26.1
West	45,846,310	14,864,231	123 / 24.6	CA (53), WA (46)	129 / 29.3
U.S. territory	582,991	206,626	3 / 0.6	n/a	5 / 1.1
Non-U.S.	965,783	264,245	3 / 0.6	n/a	6 / 1.4
Totals	115,094,704	30,289,112	499 / 100	n/a	441 / 100

Today's Ferry Fleet ... at a glance ...

Parameter (sample size)	Count	Percent
Carry passengers (499)	474	95.0
Carry vehicles (499)	235	47.1
Carry freight (499)	111	22.2
Self-propelled (463)	438	94.6
Other propulsion (463)	25	5.4
Diesel (467)	441	94.4
Gas (467)	15	3.2
CNG (467)	0	0.0
Electric (467)	3	0.6
Other (467)	8	1.7

Appendix B – State Groupings by Census Region *



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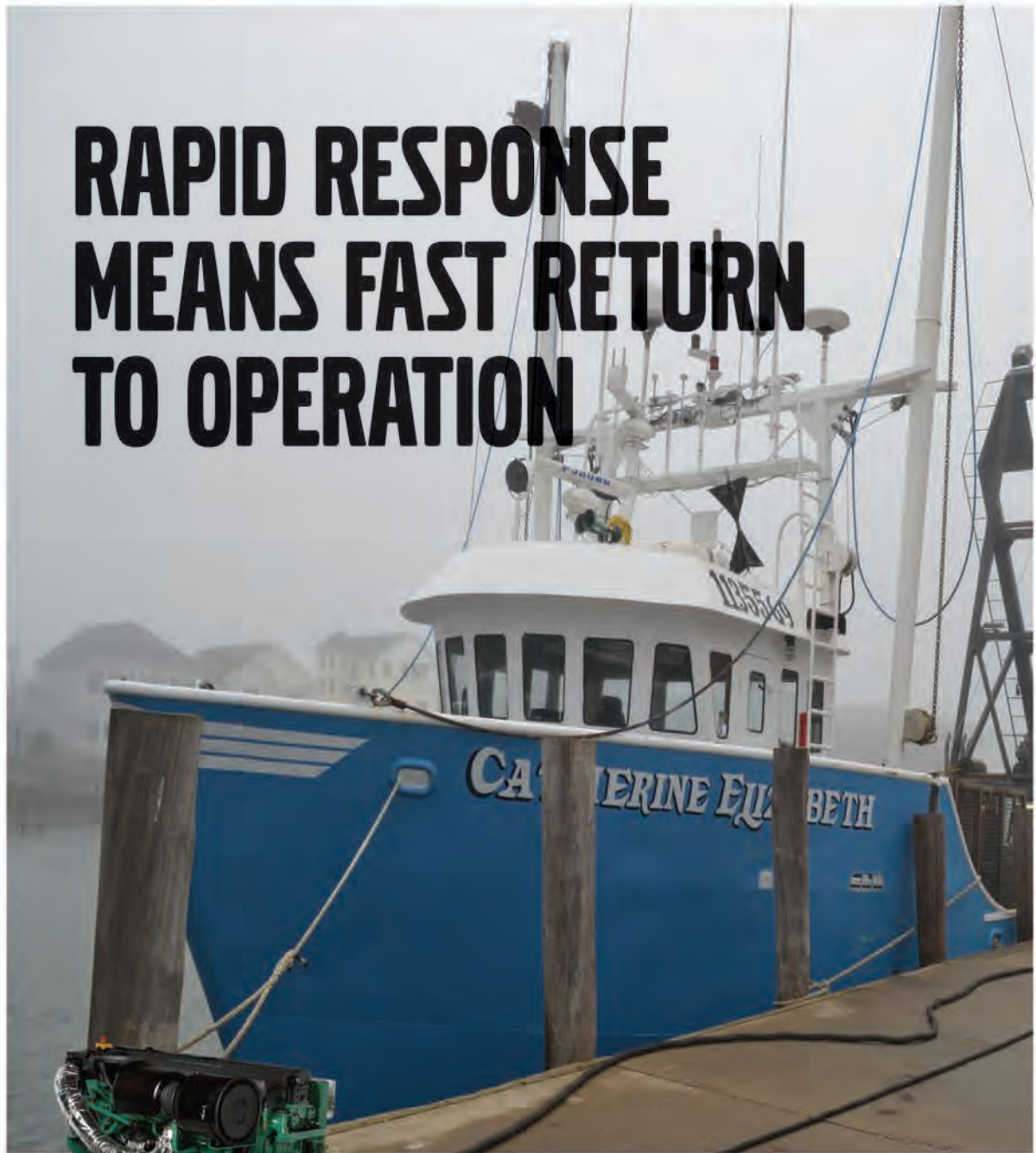
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When Jaime Sawyer, fleet manager of Truex Enterprises in Atlantic City, NJ, experienced a complete gear failure that destroyed the nine year old Volvo Penta D16 engine on his commercial clam boat, Catherine Elizabeth, he had to make a quick decision: rebuild or buy new.

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– Jamie Sawyer

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Robert Kunkel
 President,
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 Technologies, Inc.

LNG? Methanol as fuel? Hybrid systems? Tier 4? Reducing Noise? Cutting Emissions without crushing fuel economy? *MarineNews* readers have questions and Bob Kunkel has answers. Kunkel, President of Alternative Marine Technologies, previously served as the Federal Chairman of the Short Sea Shipping Cooperative Program under the Maritime Administration and Department of Transportation from 2003 until 2008. A past Vice President of the Connecticut Maritime Association, he is a contributing writer for *Maritime Professional* and *MarineNews*. A graduate of the Massachusetts Maritime Academy, Kunkel sailed as a licensed engineer and eventually continued his career in ship construction at NASSCO, San Diego, Hyundai Heavy Industries, S. Korea, Chengxi Shipyard and Dalian New Shipyard in China. He is a senior member of the Special Committee on Ship Operation with ABS and an elected member of the National Cargo Bureau. This month, as our featured INSIGHTS executive, he weighs in on propulsion technology, as perhaps no one else in industry can.

How much has the price plunge in oil impacted the emergence of cleaner propulsion choices – like, for starters – LNG?

There is no doubt that geopolitical conflicts and the impact they have on the price of oil affects energy technology. Alternative fuels or means of supplying power; whether that means solar, fuel cell or wind, rise in popular-



ity when crude prices exceed ~ \$80 per barrel and then fail to maintain that interest when the market falls below \$50 a barrel. Historically, the problem has not been the price of oil, but the price of the alternative infrastructure. Few will argue against the need to reduce our use of our natural resources and begin a long-term conservation process. That plan needs to follow emissions reductions, develop cleaner means of providing energy and reduce our dependency on oil. We have seen the shift occur in the automotive industry and honestly, it has been painless. Gasoline now lives alongside hybrid batteries and natural gas. We may even see Hydrogen enter mainstream automotive technology in the very near future. If they can live together in the car and truck market, then why not marine transportation?

Is there a crude oil price point where LNG again becomes more attractive in terms of propulsion costs for operators who want to switch?

Can we tell you that the price point is X? No. Why? Because the decision to burn natural gas and make that propulsion change reaches beyond fuel price economics. The company making the change has to believe in a long-term environmental compliance plan. In our experience, most of the customers we discuss the change with have a client base that demand that environmental compliance as part of their mission statement. Can we say that low sulfur diesel fuel at \$1,000 a metric ton made LNG look very attractive? Yes, we can. That said; many operators discontinued the gas discussions when low sulfur diesel and gas oil dropped below \$500 a metric ton. Make no mistake there are other companies that continued with their commitment to make the switch to natural gas regardless of price. I would like to think it is because they are working towards leaving a cleaner planet for our children and reaching beyond current economics. The lack of interest at this point is the fact that many of the operators received an education on LNG and cryogenics which in turn opened their eyes on how complicated the use of LNG as fuel can be. It is not for everyone, nor does it fit every propulsion application.

Big Data: it is being touted as the practice that will, when the data is properly analyzed, really help owners, designers and OEM's build and maintain less expensive and more efficient engines. But, has it yielded any fruit from that tree as yet? When will that happen?

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ucts. Because of that speed, we see owners being forced into more new construction and fleet replacement to keep up with their competitors. Unmanned vessels, alternative propulsion systems and any form of new innovation will require data analysis. We see that low hanging fruit every day. When Big Data demands real time emissions monitoring at the funnel and the direction an owner will have to take to report that data and to whom, that is when alternative fuels and more efficient engines will grow.

LNG engines – will they eventually need after treatment in order to reach Tier 4 compliance. If so, and if diesel engines can achieve tier 4 compliance with after treatment, is there any benefit to spending an extra 20 percent for the LNG engine, tankage and infrastructure?

This is not a simple question to answer as the gas engine type and the load application affects the actual gas combustion process. Many technical papers will tell you gas engines will not need after treatment to meet Tier 4 requirements. Otto Gas engines with their homogeneous combustion generally have low NOx emissions and high efficiency and can comply with IMO Tier III without exhaust after-treatment. That said; an Otto Gas Engine requires a certain gas fuel stability to protect against self-ignition or “knocking.” The methane number affects the knocking and the combustion must be carefully developed in order to keep un-burnt gas (“methane slip”) to a minimum. Spark-ignited and diesel-ignited gas engines show some differences especially when dealing with part load during maneuvering or in a generator application. LNG

propulsion of ships is currently seen as one of the most promising ways of complying with future IMO Tier III NOx emission limits already being implemented within the ECAs of Northern Europe. The gas engine applications have been dual fuel engines and with that engine type comes a different analysis of after treatment as liquid diesel fuel is injected with the gas. The dual gas engines have diffusion burning which ensure good capability of burning gases with low knocking stability or low methane number and at the same time producing low methane slip emissions. This engine type requires a high-pressure gas injection system and exhaust after treatment is needed to comply with IMO Tier III NOx emission limits. Although not part of the IMO emission limits, there is an increasing focus on Smoke and Particulate Matter emissions along the coasts and in our harbors. LNG propulsion is seen as capable of complying with new PM regulations, if and when they come into play. One of the most disturbing reports we came across in our development of gas propulsion with Coastal Connect was the fact that Particulate Matter emissions were being measured in infant deaths in and around our U.S ports. A combination of ship emissions and the truck congested associated with the port areas were the reason the medical industry took on the investigation. It is worth the 20% price premium and in the future, that may be considered priceless when it comes to our health and environmental protection.

Talk about GE's solution which reaches Tier 4 compliance without after treatment. How does it work and is the solution scaled small enough that workboats benefit?

With Tier 4 of the US Environmental Protection Agency (EPA) Clean Air Act now in force for diesel engines built after 1st January 2016, GE's 8-year investment in Exhaust Gas Recirculation or EGR technology is now delivering major benefits for the company in the U.S. build market. EGR reduces the NOx component at the combustion source and a closer look at the technology with GE will show how it selects certain cylinders when accomplishing this reduction. NOx emissions are inherently high in two-stroke propulsion engine sizes and slow rotational speeds – more time for NOx to form around the burning fuel spray and less heat transfer to surroundings. The GE engine is a high-speed engine at 900 and 1000 rpm, which helps to reduce the NOx formation. Low speed two stroke engines cannot make that claim. This GE development was announced in 2015 and AMTECH selected the technology for an ATB construction project we were handling up in Sturgeon Bay at Bay Shipbuilding. We had certain power



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requirements we were looking for and the 250MDC engines were available in 12 and 16 cylinder V configurations that met those power requirements while meeting emissions regulations. We tried to develop a competitive process with other engine selections for our customer but found that the GE engine was ultimately our only choice available without a total redesign of the tugboat. An 8-cylinder in-line model is on the product line and we understand a 6-cylinder in-line is already planned for future development. Yes: workboats can benefit. GE's latest engine meets both EPA Tier 4 and IMO Tier III emissions standards without the need for exhaust after-treatment by Selective Catalytic Reduction (SCR). NOx emissions have been reduced by 70 percent compared to EPA Tier 4 and IMO III emissions limits. We like the fact that SCR and the operating costs associated with that type of after treatment compliance is not required.

The use of so-called “Tier beater” engine combinations in workboats has become a popular tool for designers, operators and shipyards alike. For example, the use of two 800 HP engines – sometimes three – obviates the need for a higher tier rating in a new-build. Is there a ‘time stamp’ end to this practice – or can builders, designers and operators continue to “bust” the tier requirements indefinitely?

The practice will definitely continue simply because it is good design. Working efficiently means meeting regulations and filling a customer's needs and/or price range. That's what design is all about. There is a reason why the Tiered regulations were formatted in that matter and by limiting the size of an engine to fall into line with the requirements is efficient engineering. Is this application for everyone? No. That said; it is way to comply and should be utilized. Whether or not the regulations continue to allow this to occur is probably best answered in the “Big Data” question. Once real time monitoring takes effect, new regulations will be formulated based upon that data dump and you may see changes occur.

Hybrid energy: how does it work and why is it becoming more popular in wind farm and military applications?

Amtech was one of the first engineering firms to deliver a Hybrid Research vessel in the United States with Derektor Shipyard, BAE Hybrid and Corvus Energy. A second research vessel is under construction and we have also commenced design work for Harbor Harvest to deliver a short sea catamaran that will be used to move farm products between Connecticut and New York along Ma-

rine Highway 295 and down the Hudson River along Marine Highway 87. We are big believers in the technology. Many of our future power technologies such as fuel cell, solar and wind generation require suitable energy storage. The power sources can be both intermittent and at the same time capable of providing power at times when it is not needed. Large battery storage is the key to making those power sources competitive and efficient. We see new lithium technologies and battery chemical compositions filling that requirement. Scana line ferries have taken Hybrid propulsion to new levels by providing system exceeding 2 megawatts. From a Military aspect, the propulsion is silent and provides excellent stealth capability. The power response is much quicker than conventional combustion engines and you are not limited by the amount of fuel you carry on board if the charging system is designed correctly. Hybrid is our choice for future coastal propulsion designs.

Methanol is frequently mentioned as the real ‘white knight’ for clean marine propulsion, but yet the solution lags behind LNG in the big picture. What are the drawbacks and the advantages of this fuel and why haven't designers and operators moved in this direction more forcefully?

We are currently building six new 25,000 deadweight chemical carriers with International Paint's new cargo liner 9001. These vessels are being chartered to carry methanol and ethanol. Make no mistake: the movement of methanol is difficult and with that said; the amount of methanol now being traded as greatly increased. This will help with building a bunkering infrastructure for this fuel. The original “diesel” engine burned alcohol. A change to Methanol is not a stretch. It is a liquid and can be treated similar to normal petroleum carriage in a vessel's fuel tanks. We have attended two vessels currently being built in Hyundai Mipo Dockyard that have installed MAN B&W dual fuel methanol two stroke engines. The methanol use is limited by an on deck fuel tank as under deck storage regulations are still under discussion. The fuel use has been restricted to periods within the ECAs. You will see continued development as the bunkering infrastructure becomes available.

Noise: it is becoming the next ‘environmental battleground.’ Are engines getting quieter as they get clear? What's the best way to accomplish that?

Noise will be the next battle for owners and operators and war has already been declared. Under the revised SOLAS Regulation II-1/3-12, the IMO “Noise Level Code” has come into force as of 1 July 2014. This follows the

adoption of the Code in Resolution MSC.337(91) on 30 November 2012. Vessels with keels laid after January 1, 2015 must comply. The intention is to provide safer and healthy work places for crew. Specifically the code was developed to assist in clear communication and the recognizing of alarms while protecting seafarers hearing. Noise on board vessels, as well as ambient noise when in port, can have a significant impact on the quality of rest for seafarers. Whether seafarers get enough rest, specifically “sound” sleep is essential to avoiding fatigue related issues and ensuring a safe working environment. A Hybrid propulsion solution obviously exceeds the requirements. This was one reason the “*Spirit of the Sound*” was designed hybrid as the vessel’s Op Tempo included teaching sessions on deck and within the accommodations. Other engine manufacturers are also looking to increase their insulation capability and encapsulating their prime movers. The noise issue goes well beyond SOLAS requirements. Many refineries are being forced to limit their operating periods at night due to noise pollution complaints from surrounding neighbors. We have recently delivered three Medium Range Product tankers and six chemical tankers using a Marflex electric deepwell cargo pump system to reduce the noise during cargo operations. Our sister company, Southern Electric Pumping Systems, currently represents the Marflex Variable Frequency Drive pumps in the United States. Several noise reduction surveys have been completed on deck, in the crew’s quarters and underwater by Marflex with very positive results. There are discussions taking place to limit underwater noise from operating systems and propeller cavitation to protect sea life and right whales.



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Fix the Harbor Maintenance Trust Fund Now ... or in 2027

By Shane Skelton



Skelton

The Harbor Maintenance Trust Fund (HMTF) has been misused and underutilized for years, leaving U.S. ports and harbors in subpar conditions and disadvantaging the very shippers that pay to modernize and maintain them – to the tune of nearly \$2 billion per year. In May, the U.S. House of Representatives' (House) Committee on Transportation and Infrastructure (Committee) took a major step in the right direction by passing the Water Resources Development Act of 2016, which among other things, ensures that port and harbor infrastructure maintenance projects have access to the funding they need ... in 2027.

The HMTF is funded through an excise tax assessed at identified ports on the value of commercial cargo shipped (excluding exported product), or cruise tickets sold, at a rate of .125 percent. The revenues collected are intended solely for port and harbor maintenance and modernization activities, including dredging channels, maintaining jetties and breakwaters, and operating locks along the coasts and in the Great Lakes. There is one catch: none of the money can be spent without an annual appropriation from Congress.

In recent years, Congress has appropriated less than \$1 billion of the roughly \$2 billion collected each year, leaving the fund with more than \$10 billion in excess cash. The blame does not lie with Congress alone. The Obama Administration, which oversees the Army Corps of Engineers (the federal body that performs port and harbor projects), is tasked with sending Congress an annual assessment of port and harbor funding needs, but the administration has specifically asked Congress to spend less than \$1 billion per year in each of the President's annual budget requests since assuming office in 2009. The net result is leaving some U.S. ports and harbors in a state of disrepair, and others with insufficient depths to accommodate cargo ships used for global trade.

It is no surprise then that the American Society of Civil Engineers assigned U.S. ports and harbors a "C" grade in its most recent Infrastructure Report Card, and that the need for investment compounds with every passing day. Waterborne commerce already plays a major role in the U.S. economy, with approximately \$1.4 trillion worth of goods moving through U.S. ports each year, generating

\$41 billion of federal, state, and local revenue annually. A nearly complete Panama Canal expansion project could push these numbers even higher – if we are ready.

The "new" Panama Canal will accommodate significantly larger ships, accommodating vessels weighing as much as 14,000 TEUs – nearly triple the maximum weight 5,000 TEUs currently able to pass through the canal. Many U.S. harbors have not been sufficiently dredged to accommodate the larger ships commonly used in international trade, not to mention the mega-ships that will pass through the newly expanded canal. If the U.S. does not invest sufficiently to deepen these harbors – especially in the Atlantic and Gulf coasts, which do not possess the naturally occurring deep harbors found on the Pacific Coast – the U.S. economy will not reap the benefits offered by such large-scale improvements.

The obvious questions then are:

- *Why do Congress and the Obama Administration agree each year to spend less than half of the \$2 billion accrued annually, despite having a massive surplus?*
- *If the Committee acknowledges the need for a change, why are they waiting until 2027?*

These two questions share one answer: very complicated budget rules. At first blush, this seems absurd, but there are two very real obstacles to fully funding harbor maintenance projects. First, "discretionary" budget caps and secondly, statutes and rules governing "mandatory" federal spending.

By making this change effective in 2027, the Committee wisely sidestepped both politically thorny issues. The bill avoids discretionary budget caps by making the funds "available to the Secretary ... without further appropriation..." This has the effect of changing how the spending is classified from "discretionary" to "mandatory." Discretionary spending requires a specific appropriation from Congress each year, without which no funds can be spent from the relevant account. Conversely, mandatory spending is authorized to occur year after year on autopilot without Congressional approval unless and until Congress repeals such authority.

The bill also escapes statutory "pay as you go," or "Paygo" and "cut as you go," or "Cutgo" rules by delaying the provision until 2027. Under Paygo laws, Congress must increase revenues (read: raise taxes) or cut spending in a


sufficient amount to offset any new mandatory spending authorized by legislation. Paygo applies to the U.S. Senate (Senate) and the House. Similarly, Cutgo rules, which apply only to the House, require any new mandatory spending to be matched with an equal or greater amount of spending cuts. The primary difference being that in the House you cannot use new taxes to pay for new spending.

However, these budgetary rules focus only on new spending authorized in a bill occurring in the first year, the aggregate of the first five years, and the total of the first ten years. Fiscal years 2027 and beyond are not within the scope of spending considered when applying these laws and rules (with certain exceptions) to a bill that passes in 2016. In other words, the Committee sidestepped the House budget rules by delaying the provision until 2027, outside the ten-year scoring window. Additional rules may be triggered when the Congressional Budget Office produces its official cost estimate for the bill, but for now it looks like the Committee threaded the needle.


There are a finite number of opportunities for the federal government to improve infrastructure without spending a dime of taxpayer money. This is one of them. The Transportation and Infrastructure Committee should be applauded for its creativity and its leadership on this issue. Now the full House and Senate must follow suit and pass the Water Resources Development Act with this provision fully intact. Further, Congress should ensure all port and harbor funding needs are met until this provision kicks in (in 2027) by providing the Army Corps with sufficient funding to meet all project needs so long as the cost doesn't exceed HMTF receipts for the year.




Shane Skelton is the Executive Director of the Alliance for Innovation and Infrastructure. He can be reached at skelton@aii.org




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How Watertight is Your Company's Integrity?

A watertight boat is a beautiful thing. It keeps you afloat in heavy seas. Can you say the same for your company's integrity?

By Captain Katharine Sweeney



Sweeney

Vessels are built with specific hull openings. Hatches, or doors, and portholes, or windows, come equipped with gaskets and dogs to keep water out when these openings are secured. Usually there are several dogs because it would be unwise to rely on just one mechanism to keep an opening closed. On smaller vessels it is critical that these hatches and portholes be secured, with dogs closed, when the vessel is underway because allowing water to enter the vessel would threaten its buoyancy.

It's a very simple concept, yet how often do you see a boat leave the dock with its "doors" open? It is convenient of course, as someone will be going back through the hatch after handling the lines. Now in these hotter months hatches are often left open for ventilation as well. It may seem like a minor issue to leave a hatch open, but disastrous consequences may ensue. However unlikely taking on water may seem to be, there won't be time to shut the hatch, when it becomes evident it needs to be shut.

How well do you train your employees in this simple act of housekeeping? Do their actions reflect this training, thereby reflecting the integrity of the company as a whole? Failing to close the doors when the vessel leaves the dock is an indication of employees' actions on a day-to-day basis. Every day we all make choices about how to do things. It may be the simple way, the easy way, the quick way. But is it always the right way, and is it in line with our company's policies?

We may justify actions that are not in line with safety rules by telling ourselves that the likelihood of anything bad happening is negligible, but it doesn't mean it is okay to do it that way, even just one time. We all face the same types of decisions every day, whether it is using your cell phone while driving, not wearing a seat belt, or anything else that appears to save time, energy and hassle. Ensuring each employee makes these types of decisions correctly, with integrity, has a lot to do with clearly communicating your company's morals and values in a strong company safety and environmental protection policy.

MORE THAN REGULATIONS: GOOD PRACTICE

The International Safety Management (ISM) Code (and Subchapter M) requires each company to establish a safety

and environmental protection policy which describes how the objectives of the Code will be achieved. These objectives are to ensure safety at sea, prevent human injury or loss of life, and avoid damage to the environment, in particular to the marine environment and to property. The *ABS Guide for Marine Health, Safety, Quality, Environmental and Energy Management (2012)* stipulates that Top management must ensure "the policy is communicated, implemented, understood and maintained at all levels of the organization, both ship based and shore based."

The policy should be simple enough that each person within your organization can spit it out quickly, or at least paraphrase it, without too much prompting when asked by an internal or third party auditor. It can't be emphasized enough that you must expect employees to perform tasks safely every time. That means *keeping all the doors dogged shut every time the vessel leaves the dock*, as leaving the door open even once would not be safe, and is therefore against company policy. Knowing the policy, employees understand the overarching intention of the company, and what is expected of them as they go about every aspect of their job on a daily basis.

Much like having a business plan that defines the specific business objectives and goals and provides general parameters to guide the organization, a company's safety and environmental policy should force judgement and discipline into a business. A good safety and environmental policy should be fully integrated into the company and be a living document, one that is reviewed and updated regularly.

Integrity is defined as "the quality of being honest and having strong moral principles; moral uprightness," and "the state of being whole and undivided." Making sure your company's policy is well understood by all will ensure your company remains underway, and as importantly, making way.



Captain Katharine Sweeney is CEO of Compliance Maritime, provider of independent internal auditing of security, safety, quality and environmental management systems for vessel operators. Captain Sweeney is an experienced Master Mariner, safety expert and federally licensed pilot with over 25 years in the Maritime Industry. Contact her at ks@compliancemaritime.com



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Revised PREP Guidelines

Effective June 2016: What You Should Know

By Kate Kelley



Kelley

On April 11, 2016 the U.S. Coast Guard (USCG) released the revised 2016 National Preparedness for Response Exercise Program (PREP) Guidelines. The new guidelines will become effective on June 10, 2016. Established under the Oil Pollution Act of 1990, the PREP guidelines were developed to provide a mechanism for compliance with the vessel response plan (VRP) drill and exercise requirements. Use of the PREP Guidelines is voluntary, however, compliance with the PREP guidelines will satisfy these requirements.

The 2016 PREP Guidelines apply to all plan holders including tank and non-tank vessels that operate in the U.S. The USCG requires that, within a three-year cycle, all elements of the VRP, including the 15 core components, should be exercised in a drill, or series of drills, involving the vessel Owner/Operator, Qualified Individual (QI), Oil Spill Removal Organizations (OSRO) and Salvage and Marine Firefighting (SMFF) resource providers.

NEW REQUIREMENTS

Many existing requirements under the previous PREP Guidelines are either unchanged or have received only minor revisions. There are, however, several new requirements including: remote assessment consultation exercises, shore-

based salvage and marine firefighting table top exercises, and equipment deployment for SMFF providers. Existing requirements also include: QI notifications, emergency procedure drills, OSRO equipment deployment, and incident management team table top exercises (IMT TTX). A brief overview of the new requirements is shown to follow:

Remote Assessment and Consultation Exercise with SMFF:

The USCG requires an annual exercise for each vessel operating in U.S. waters. Under these new guidelines, the vessel master or designee should exercise VRP notification and activation procedures to communicate an emergency procedures scenario with the contracted SMFF resource provider identified in the plan, and establish a communication process to support the completion of the vessel's stability and structural integrity assessment.

Shore-Based Salvage and Shore-Based Marine Firefighting Table Top Exercises:

The USCG requires an annual exercise for plan holders and the respective management teams, as established in the plan. The USCG stated this requirement should exercise the team's organization, communication, and decision-making in managing a salvage and a marine firefighting response.

Response Equipment Deployment Exercise – SMFF Providers:

The USCG requires an annual exercise for plan holders, to be completed by the contracted SMFF service providers identified in the plan. The USCG stated these

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exercises should demonstrate the ability of personnel to deploy and operate response equipment, and ensure the equipment is in working order.

Plan Holder-Initiated Unannounced Exercise: The USCG requires plan holders to annually conduct either an emergency procedures exercise with an SMFF component, or the SMFF equipment deployment as an unannounced exercise. This is in addition to the current requirement to annually conduct either the emergency procedures, IMT TTX, or equipment deployment as an unannounced exercise. O'Brien's recommends that plan holders conduct two of their emergency procedures exercises as unannounced, including one oil spill scenario and one SMFF scenario, to satisfy this requirement.

Government-Initiated Unannounced Exercise (GIUE): While GIUEs are not new to PREP, the USCG recently renewed their emphasis on this program. According to the USCG, the current intent of a GIUE is to test an Average Most Probable Discharge (AMPD) scenario including response equipment deployment for tank vessel operators and facilities. These will be limited to a maximum of four per Captain of the Port Zone (COTP) per year. While the guidance on GIUE implantation originates from USCG Headquarters, each of the 42 COTP's maintain responsibility for implementing GIUEs in their respective zones. As a result, confusion remains regarding whether the USCG intends to focus GIUEs on tank vessels conducting cargo transfers at facilities or designated lightering areas.

O'BRIEN'S APPROACH

As the QI and vessel compliance consultants for a large number of domestic and international shipping companies, we are actively engaged in meetings with OSROs and SMFF providers to identify ways to minimize the impact

of the 2016 PREP Guidelines on our clients' operations. Additionally, we are working with our 24/7 Emergency Operations and Command Center staff to further streamline the exercise process and documentation procedures, and revise vessel response plans to align with and satisfy these new exercise requirements. We understand the added burden new requirements like this place on industry and are committed to identifying solutions with minimal cost and disruption to current operations. To this end, we remain in regular contact with the USCG Office of Marine Environmental Response, which oversees these guidelines, to communicate the impact the 2016 PREP Guidelines will have on industry before they come into force.

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Kate Kelley is the Vessel Services Compliance Manager for O'Brien's Response Management (ORM), a Witt O'Brien's company. Prior to joining ORM, Ms. Kelley worked for the Environmental Protection Agency (EPA) as a program lead for the development and implementation of the EPA's Vessel General Permit (VGP). Ms. Kelley holds an M.S. in Applied Economics from Johns Hopkins University, and a B.A. in Environmental Policy from the University of Michigan.



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Credit: Nautican



ATB Design Comes of Age

Bouchard's newest ATB units have been exceeding all performance expectations, and consistently deliver at maximum efficiencies. Close coordination between the design team and the propulsion OEM from the outset is a major reason why.

By Kathy A. Smith

The emerging trend of marrying the design of an articulated tug and barge (ATB) to a particular propulsion system to maximize efficiencies of that system has, of late, been taking hold in workboat markets. For example, one recent project involving a dynamic partnership between Bouchard Transportation Co., Inc, Guarino & Cox, LLC (GCL) naval architects, Nautican Research & Development Ltd., integrated propulsion unit manufacturers, and VT Halter Marine shipbuilders, aptly demonstrates the concept in practice. What the collaboration produced, is even more important.

Bouchard and ATB's: both top notch

New York-based Bouchard Transportation recently launched and put into service two ATBs that operate in the U.S. Gulf and East Coasts. The additions bring Bouchard's ATB tug fleet to 20, making it one of the largest and most experienced ATB operators under U.S. flag. The M/V *Kim*

M. Bouchard is paired with the B. No. 270 and was delivered in July of 2015. The M/V *Donna J. Bouchard* is paired with the B. No. 272 and was delivered in February of 2016.

Notably, the tugs are first in their class designed to be double-hulled for superior environmental protection, and both barges have cargo capacity of 255,000 barrels of petroleum products. Additionally, each tug and barge is equipped with the most up-to-date Hyde ballast water treatment system, which treats all ballast water upon taking ballast in, and discharging ballast out. "Come time, this will be an important regulated design factor for all Jones Act Tugs and Barges," says Jon Shaw, Bouchard's Maintenance and Repair Manager.

Both vessels are constructed with 20 cylinder EMD Tier 3 engines (producing 5000 HP each) that meet all EPA standards. The design decision behind the hull and bulbous bow was made to help increase speed and maneuverability, while also ensuring fuel-efficiency. Extensive model



The Donna/272 taken during the Christening Ceremony in New Orleans, LA in February, 2016.

Credit: Bouchard Transportation Co., Inc.

Kim M. Bouchard / B. No. 270

Credit: Guarino & Cox

tank testing with all simulated weather conditions was also an important part of the design phase to help ensure that the factors from weather or sea conditions would never affect the vessels' maneuverability, speed, and safety. In addition, the robust Intercontinental electrohydraulic 64-inch coupling system allows the tug to stay coupled with the barge during all types of weather conditions.

Initially, Bouchard hired GCL (based in Louisiana) to develop the bid package for both tugs and barges – the two companies have a long-standing relationship going back to the 1970s. GCL has been concentrating on ATB design for the past 15 years and is also known for their OSV designs as

well as yachts and standard tugs. The contract was awarded to VT Halter Marine who then subcontracted to GCL to do the detailed function design for the tug while they performed the detailed functional design for the barges in-house.

Design for Propulsion Efficiencies

GCL consulted Canadian-headquartered Nautican on their propulsion system before going ahead with the design phase. While Nautican is no stranger to ATB jobs, this was their first project with Bouchard. "We gave them (GCL) the propeller/nozzle performance curve so they could design the hull to fully take advantage of that," says Elizabeth Reynolds



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Credit: Bouchard Transportation Co., Inc.

“These are high end rudders that prove to produce the most efficient control for vessels of this capacity. Both ATB units have been exceeding all performance expectations, and consistently deliver at maximum efficiencies. Their design continues to prove to be a reliable and safe transporter for both our customers and their crew.”

– Jon Shaw, Bouchard’s Maintenance and Repair Manager

Boyd, Nautican’s President. “Our propeller and nozzle system is very effective at the high speeds that an ATB can achieve, and Guarino & Cox fully utilized that capacity when they did model tests to see what to change on the hull.”

GCL had oversight of the model test program that was carried out at Oceanic Consulting Corporation in St. John’s Newfoundland. “A scale model of the tug and barge were built – the hull form – including rudders, propellers, nozzles and shafts,” explains GCL’s Greg Cox. “It was towed through the water to measure resistance at various speeds in a controlled environment in a towing tank. The data could then be scaled up to predict the resistance and power required to go at any given speed for the actual vessel.” Prior to model testing, CFD analysis was also carried out on the ATB unit to try to optimize some of the hull form and the interface between tug and barge.

The model test confirmed the efficacy of the barge’s blended skeg stern developed by GCL. The aft body of the barge differs considerably from the conventional notched stern rake design used by many. It has a much deeper notch resulting in a very shallow angle of run for the vestigial rake providing a larger ‘shadow’ for the tug and cleaner flow of water to the tug’s propellers.

Hydrodynamically, the tug and barge unit then more

closely resemble a single ship-like unit with a significant reduction of resistance. The need for towing the barge is virtually non-existent, but if ever necessary, the tapered deep notch sides and the drag of the notch face will provide sufficient course stability to obviate the need for appended skegs further reducing resistance.

Below the waterline the bow of the tug is shaped to take advantage of the barge’s aft body characteristics with the minimum separation of the units required due to the tug’s motions relative to the barge. Cox states, “Fortunately, the Intercon system restrains movement of the tug to pitch about the coupler location without roll and heave. With the old wire connections the motions in rough seas would threaten to damage tug and barge, requiring the tug to leave the notch and tow with a hawser. If delayed too long, the act of disengaging could get dicey.”

Guarino adds, “The design of the barge’s bow has been developed to not only reduce resistance but also to minimize degradation of speed in rough weather. In lieu of the blunt barrel stems or scow type rakes these barges are more ship-shaped with finer waterlines and ‘U’ shape fore body sections. A bow has a relatively large bulb intended to improve seakeeping and add volume lost using the finer fore body sections.”

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Credit: Guarino & Cox

“A scale model of the tug and barge were built – the hull form – including rudders, propellers, nozzles and shafts. It was towed through the water to measure resistance at various speeds in a controlled environment in a towing tank. The data could then be scaled up to predict the resistance and power required to go at any given speed for the actual vessel.”

– Greg Cox of Guarino & Cox, LLC (GCL) naval architects

Nautican Efficiency: at any speed

The tugs are fitted with two 148-inch stainless steel wheels in Nautican’s triple flap on Kort nozzles for more efficient propulsion and more efficient maneuverability. “One of the reasons we like the Nautican nozzles is historically other systems were only good up to a speed of eight or nine knots,” says Guarino. “After that, they would start contributing to the resistance instead of helping. With the Nautican design nozzle, they’re effective at much higher speed.”

During the sea trials carried out last June on the *Kim J. Bouchard* without the barge, the tug reached just over 17 knots, reports Wayne C. Wingate, Nautican’s Propulsion Technical Director, who was aboard at the time. He says several of the captains – a Halter captain and three captains from Bouchard – were impressed with how the tug steered and accomplished different maneuvers. “They found that the vessel was tracking easily, with less effort required to keep a straight line course.” As the team progressed throughout the day, they began doing turning circle and zig zag maneuvers.

“I had not been on a vessel of this type on a zig zag maneuver,” adds Wingate. “The buzz around the decks was that most of these guys had typically see rather harsh heel

conditions when zig zagging. Some people found a secure spot to hang on or went inside to prepare for a severe heel or rollover but everyone was shocked when that didn’t happen. There was an initial heel to about 17 degrees, then the vessel quickly steadied out at a lesser heel angle (approximately eight to 10 degrees). The actual radiuses and maneuverability was super tight but it was still easy to steer the boat.”

Pre-Swirl Stators reduce the rotational losses incurred by the propeller and further increase the performance of the nozzle system. By directing the flow to swirl in the opposite direction of propeller rotation, the energy that is normally lost in wake rotation is recovered. This increases thrust by an additional four to six percent.

“The stators are integrated into a hub which is the structural support for the shaft which replaces typical struts,” says Reynolds Boyd. “The stators have both structural and hydrodynamic benefits. And behind each propeller there is a set of three high-aspect ratio rudders that are very tall and skinny, which provide a tremendous turning force so the maneuverability of these things is remarkably different than a traditional arrangement. They’re also built into a head box, combining the nozzles and rudders, to make shipyard installation easy.”



“One of the reasons we like the Nautican nozzles is historically other systems were only good up to a speed of eight or nine knots. After that, they would start contributing to the resistance instead of helping. With the Nautican design nozzle, they’re effective at much higher speed.”

– Sal Guarino of Guarino & Cox, LLC (GCL) naval architects

Full Steam Ahead

The tugs meet SOLAS requirements and have a fuel capacity of 600 cubic meters which requires the hull to be double hulled. “Most have a fuel capacity of less than 600 cubic meters, but these particular tugs have a higher fuel capacity for a greater range,” says Cox. “They also have an ABS notation called ACCU, which makes for a higher level of automation and monitoring, with a central control room to monitor the engine room and machinery from.”

Typically when ATBs are going at full speed in open water, it’s relatively easy to have a rudder that does the job. “But when you’re coming in and out of a port, you’re using significantly lower speed and yet you need to do much more turning and handling and maneuvering than in ocean transit,” says Reynolds Boyd. “That’s where the triple rudders are really outstanding. According to our testing, they provide 70 percent of bollard in side force. These boats were a significant step for us in terms of actually getting the speed out of the system that it’s capable of getting. Both the hull and the propulsion system have to be designed for it. We’ve seen a tremendous surge in interest for our system on ATBs because those boats are performing so well.”

The ability to stay connected to the barge at all times continues to prove to be the safest, most reliable and efficient way for Bouchard to transport petroleum products. “These are high end rudders that prove to produce the most efficient control for vessels of this capacity,” says Bouchard’s Shaw. “Both ATB units have been exceeding all performance expectations, and consistently deliver at maximum efficiencies. Their design continues to prove to be a reliable and safe transporter for both our customers and their crew.”

It shouldn’t be a surprise that one of the nation’s biggest and most experienced operators of ATB’s, also has become one of the most efficient, and environmentally correct, as

well. But, any operator can put together this enviable team to create similar performing vessels. That said; Bouchard did it first.



Kathy A. Smith is a Victoria, BC-based maritime writer who has penned over 100 published trade articles.

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PROPULSION: TEST DRIVE



Credit: Volvo Penta

Volvo Penta

Debuts

New Diesel Engine and IPS

Volvo Penta's concerted push into the commercial marine market continues with the introduction of the D8 diesel engine and the new IPS15 propulsion system.

By Greg Trauthwein

The Rescue PAF/PTA81



Credit: Volvo Penta

Ever since the global financial meltdown of 2008 briefly crippled the world leisure boat market, Volvo Penta adopted a strategy to increase its commercial market share with its family of innovative propulsion systems and controls. Last month off the west coast of Sweden, *MarineNews* got up close and personal with the new D8 diesel and IPS15 pod, as well as the full range of command and control products courtesy of a day of test drives at Krossholmen, Volvo Penta’s Global Marine Testing Center.

In the middle of a financial storm such as the one that swept the globe in 2008/2009 it is not easy to see a ‘silver lining.’ However Stefan Carlsson, Volvo Penta’s Marine Diesel segment head said that the collapse in the marine leisure business in 2009 set the company in a new strategic direction, determined to maximize efficiencies while diversifying its business into the commercial sector.

“In 2009 we saw a dramatic drop in the marine leisure business, and as a result we took a loss. But it allowed us to restructure and reshape the company in a differ-

ent way,” said Carlsson. “This helped bring us back to profitability, and last year we saw the full effects of this strategy – focusing on marine commercial, focusing on the industrial business.”

Cracking into the rigorous commercial market is easier said than done, but backed by the Volvo name and with perseverance and a steady expansion of product and service, Volvo Penta now offers a compelling argument as a one-stop-shop for a variety of vessels workboat sectors, “able to supply everything from the prop to the helm” said Carlsson.

The D8 Diesel Engine

Well-engineered products with a solid support infrastructure are mandatory in the workboat sector, and last month Volvo Penta effectively broadened its product range to compete more efficiently. The company introduced the D8 engine – which will replace the D9 – built to U.S. Tier III and IMO II specification and available in 450, 510 and

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– Stefan Carlsson, Marine Diesel Segment Head



Credit: Greg Trauthwein

IPS Pod Range



Credit: Volvo Penta

550 hp models.

The 8-liter engine expands the offering between the D6 and D11 models, for applications that require low weight with high power suited for propeller, waterjet and Volvo Penta IPS applications. The new engine has been designed for use in planing craft, and commercial uses include fast patrols, coast guard and rescue launches, police and ambulance boats, water-taxis and high-speed passenger ferries, fishing boats, and offshore support vessels.

While the D8 is new to the marine market, it is a well-proven platform which has been manufactured since 2013 serving the truck, bus and off-road industrial market. Krossholmen is an ample testing ground for anything on the water, and Volvo Penta runs a diverse test boat fleet of more than three dozen boats, ranging in size to 70 feet in length, to get the job done.

The D8 is an in-line six-cylinder engine with a cylinder capacity of 7.7 liters, twin-entry turbo and sea-water cooled heat exchanger, a heat exchanger manufactured of

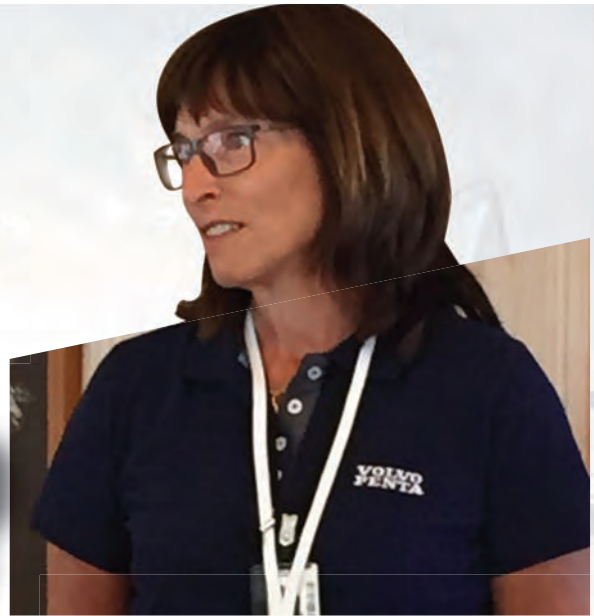
composite material to eliminate corrosion. The engine has a Denso common rail system working up to 2000 bars. The injection is electronically controlled, and pre-, main, and post-injection are essential aspects for the engine's power, torque, fuel efficiency, low noise and emission levels.

“The high power-to-weight ratio together with the new common rail injection system where the nozzle has been optimized, together with a piston bowl of re-entry type, will provide excellent fuel efficiency,” said Anna Pettersson, chief project manager for Volvo Penta's marine engines.

Volvo Penta has developed three power outputs for the D8 inboard range – of 450, 510 and 550 hp. The engines are designed to conform to the US EPA Tier 3 emissions standards, as well as IMO II and EU IWW. EPA certificates are expected in January 2017. Power ratings will be set at R3 (for 450hp), and R4 for both 510 and 550hp. The IPS system, engine, drive and propellers are expected to be approved by DNV-GL. The inboard engine will also require certificates, which will be applied for from various

“The high power-to-weight ratio together with the new common rail injection system where the nozzle has been optimized, together with a piston bowl of re-entry type, will provide excellent fuel efficiency.”

– Anna Pettersson, chief project manager for Volvo Penta’s marine engines



Credit: Greg Trauthwein

The new D8 and IPS15 package



Credit: Volvo Penta

Volvo Penta D8 Diesel Engine Highlights

- HP range: 450, 510, 550
- Cylinders: 6 inline
- Cylinder Capacity: 7.7 liter
- Cooling: Sea Water
- Fuel Injection: Common Rail, electronic control
- Emission Standards: U.S. Tier III; IMO Tier II
- RPM: 600 to 1600
- Available: January 2017
- Control System: EVC E3

classification societies, including DNV-GL, RINA, LR, China CSS, RS and the Indian Register of Shipping (IRS). The engine will be ready for delivery in June 2017.

Meet the IPS15

Volvo Penta’s Inboard Performance System (IPS) is the showcase of the company’s innovations in marine engi-

neering, and last month the IPS family added a fourth member, the IPS15, which has been developed and optimized to fit the D8 engines for the commercial market. Since its inception in 2005, Volvo Penta has continuously worked to develop its IPS pods to offer an integrated propulsion package with greater performance, fuel efficiency, maneuverability and comfort.

Helgoy Vind



Credit: Volvo Penta



Helm Station

“We were most definitely impressed with the intuitive, easy-to-use joystick control.”

“It is all about propulsion efficiency and productivity for the yards, designers and operators. This is a fantastic move for us and our customers,” said Jakob Ursby, strategy manager for Volvo Penta’s Marine Commercial sector.

The IPS design features forward-facing twin counter-rotating propellers which are mounted beneath the hull. As the propellers operate in undisturbed water, they cause less drag, which Volvo Penta claims improves performance and fuel consumption by up to 30% compared to traditional inboard engines. Features of the type approved IPS15 package include:

- *Improved materials for heavy-duty commercial use.*
- *Reduced ratio of weight and hydrodynamic resistance.*
- *Reduced ratio of hull insert size.*
- *Optimized backpressure with 6-inch exhaust system.*
- *A new propeller series (N) custom fit for the system.*
- *Improved maneuverability with increased steering angle at low speed.*

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Boat in Focus: Njord Offshore and the Volvo Penta IPS900 Quad

Njord Offshore's new crew transfer vessels are equipped with Volvo Penta's IPS900 Quad drives.

As it pushes further faster in to the commercial marine business, Stefan Carlsson, Volvo Penta's Marine Diesel segment head was quick to identify Offshore Wind Farm vessels as an area of particular growth, headlined by Njord Offshore's two new 26m, 24 passenger offshore crew vessels that are equipped with Volvo Penta's IPS900 Quad drives, for operation in the North Sea. After a year operating four new 26m crew transfer vessels (CTVs) fitted with Volvo Penta's IPS900 Quad drives, Njord has added another two new boats with the same propulsion system to its fleet. In total, the UK company now has 15 CTVs of 21m and 26m in its fleet. "We've been using Volvo Penta's IPS900 Quad system in our 26-meter CTVs for over a year now and all expectations have been fulfilled," said Tom Mehew, director at Njord Offshore. "We, and our customers, require speed, maneuverability and efficiency combined with high static bollard push. The joystick controls are intuitive, the control response times are fast and accurate which ultimately makes docking on a boat landing in rough weather easier and safer." The 26m CTV's were designed by BMT Nigel Gee and built by Singapore-based Strategic Marine. They have two Volvo Penta IPS900 drives in each hull. The precision handling and maneuverability provided by the system's joystick steering, high thrust propulsion and Dynamic Positioning System, help to ensure that a vessel can be held in a steady position against wind turbines, even in conditions of strong currents and high waves. With four IPS drive systems, the catamarans can operate at high speeds even when fully loaded, reaching 27-29 knots.



The New D8

Integrated Solutions

Central to Volvo Penta's commercial marine market push is the offer of a comprehensive, integrated solution. While the engines and IPS are central components, the entire package includes a family of intuitive and integrated controls, encompassing a joystick option, docking mode and dynamic positioning; it includes Humphree trim and stabilization products, as Volvo Penta recently took a majority stake (80%) in the iconic company; and it include the 'glass cockpit' solution, which ties together critical operational information in one neat, customizable package.

Installation of the IPS with 8-liter engines can be made for twin and triple configurations.

For triple installations, one pod can also be disengaged and the engine can be used in PTO mode – for example, in powering a water canon on fire rescue boats – while still keeping maneuverability on the other two.

The new package has three power settings: D8 IPS600;

D8 IPS650; and, D8 IPS700. The Tier 3, non-Type Approved version will be available starting January 1, 2017.

Test Run & Results

While at Volvo Penta's Global Marine Testing Krossholmen, *Marine-News* was afforded the opportunity to take the helm and test-drive four different styles of boat, each with different propulsion outfit and set up. While the official acceleration and boat test statistics presented were supplied by official Volvo Penta test drivers on different dates over the past few months, a spot testing of the data on each of the test runs June 10, 2016 in Sweden was in line with the data presented.

In overview, the performance of the machinery during the five hours of running these four boats through their paces was excellent. In its presentations prior to the test drives, Volvo Penta executives were naturally quick to extol the virtues and performance of the complete system, from the torque of the engine/IPS combination to the control afforded courtesy of the Humphree trim and stabilization products to the ease of control with Volvo Penta's advance control systems.

While it is not easy or practical to equally compare one feature versus another, we were most definitely impressed the intuitive, easy-to-use joystick control. The joystick delivered as promised, whether it was tested using the new D8/IPS15 set up (as tested on the former Finnish rescue boat Rescue PAF/PTA81) or tested using a more traditional twin-engine, shaft and propeller with electronic rudder and bowthruster (as tested on the Cranchi 48 Atlantique yacht).

Wester 45, PTA 95

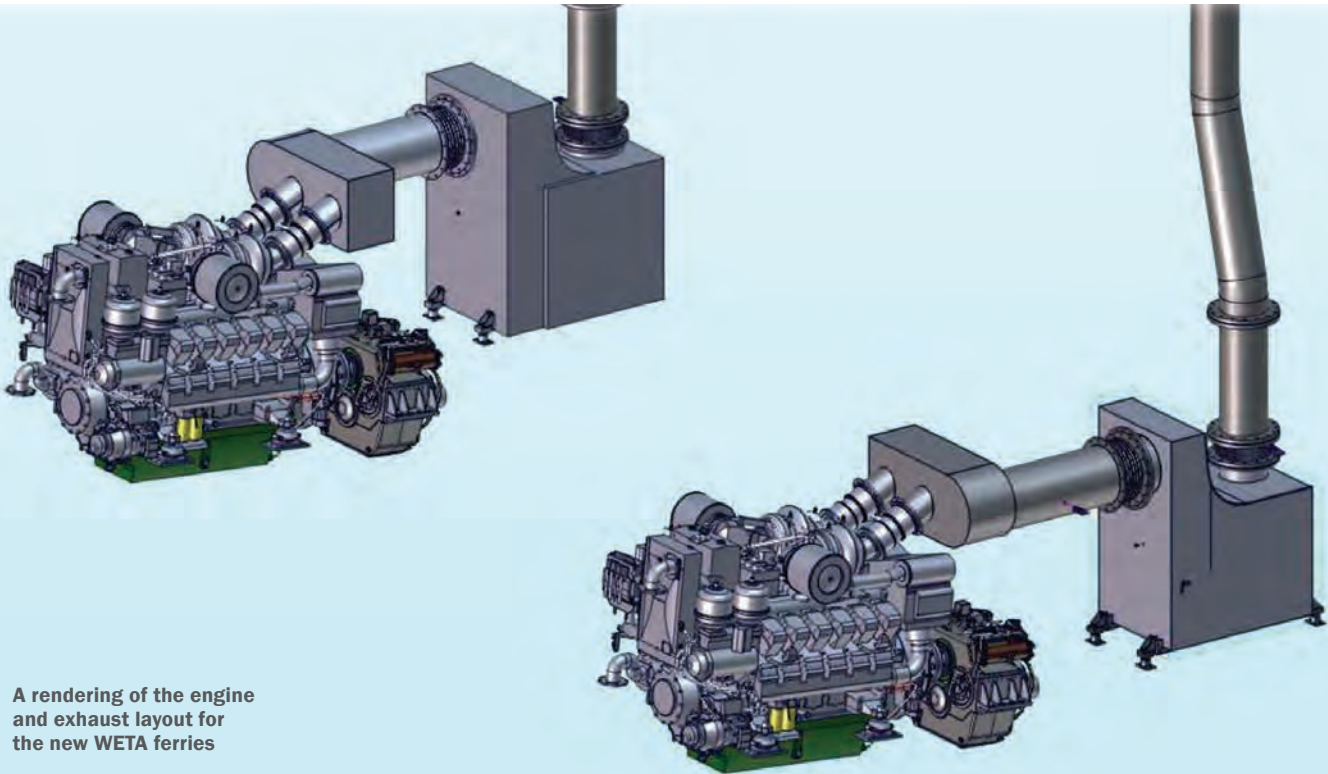


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Partnerships Produce Proactive Environmental Protection



A rendering of the engine and exhaust layout for the new WETA ferries

Credit: Vigor

A forward-thinking approach by environmentally conscious ferry operators produces green ferries that exceed local emission standards. A local consortium of longtime service providers comes together again for their mutual customer.

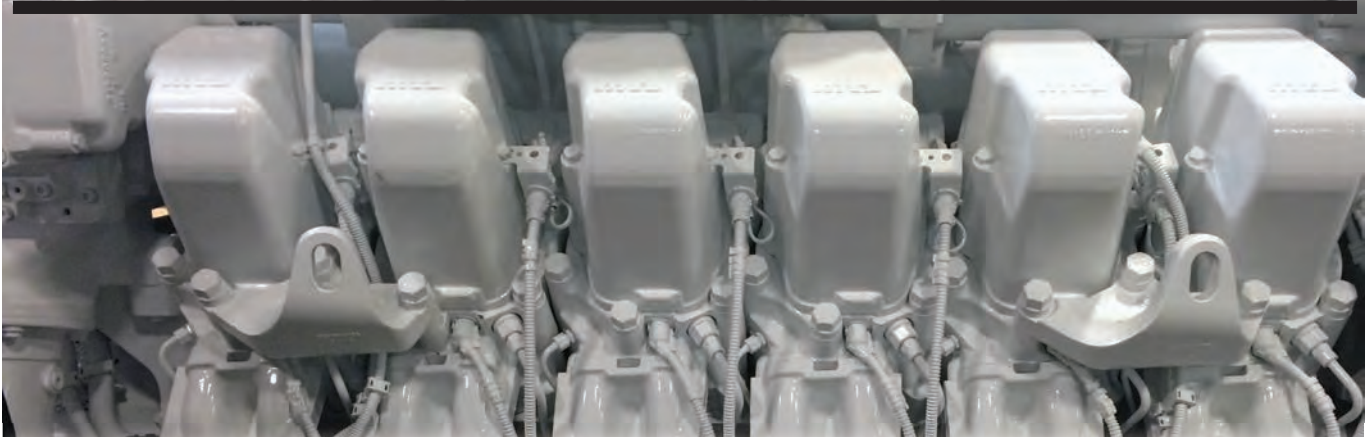
By Joseph Keefe

In April 2015, Kvichak Marine Industries, now a Vigor Company, was awarded a contract by the Water Emergency Transportation Authority (WETA), San Francisco, CA for the design and construction of two all-aluminum 400 passenger-only ferries. The deal wasn't Kvichak's first with WETA, and likely won't be its last. In fact, Kvichak has built four 118' environmentally friendly catamaran ferries for WETA which are currently in service in the San Francisco Bay area.

Jim Gow, Senior Project Manager with Vigor Kvichak,

told *MarineNews* in June, what sealed the deal was a great deal of comfort on the local level. "WETA does a pretty good job with their contracts and has a scoring process, based on price and technical quality and I think in this case, the team that we put together; Kvichak building the Incat design, Pacific Power Group providing the propulsion package and Nichols Brothers, as a partner in construction, was an attractive combination." Importantly, it also wasn't the first time this group had worked in unison during a newbuild contract.

PROPULSION: TECHNOLOGY



Vigor's Gow told *MarineNews*, "You go into the contract with a working theory – you know you can get the equipment, to produce the results, but the actual nuts and bolts design work comes later." Leveraging a close working relationship with PPG, Gow knew the project would come together successfully. He adds, "We've worked with PPG many times in the past – the key hulls being the four previous hulls for WETA. All had after treatment, all through Pacific Power. On those hulls, we did the custom integration of the after treatment in a very similar manner. The other notable program was the U.S. Coast Guard RB-M project. PPG was the engine resource for all those boats. This involved 180 boats." The new vessels will replace two of WETA's 12-vessel fleet that are approaching the end of their expected life.

Designed by Incat Crowther, the all-aluminum catamarans will feature MTU 12V4000 M64+ EPA Tier III engines rated 1950 BHP @ 1830 RPM coupled with ZF7600 reduction gears as the propulsion system. Kvichak again awarded Nichols Brothers Boat Builders the subcontract to provide the bolt-on superstructure for the project. An exhaust after treatment system will also be included – and that's where Pacific Power Group (PPG) comes in.

Trusted Partners, Proven OEM's

Pacific Power Group is a privately held, Vancouver, WA-based firm. They provide new and remanufactured engines, marine power, and power generation products. In this case, the complete propulsion system – and much more – was supplied by PPG. According to PPG Vice President Bill

Credit: Vigor

The Ferries at a Glance:

Length (overall): 135'	Draft (max): 6.75'	Engines: MTU 12V4000 M64+
Beam: 38'	Capacity: 400 passengers	Speed: 27 knots
Designer: Incat Crowther	Reduction Gears: ZF 7600	Operator: WETA

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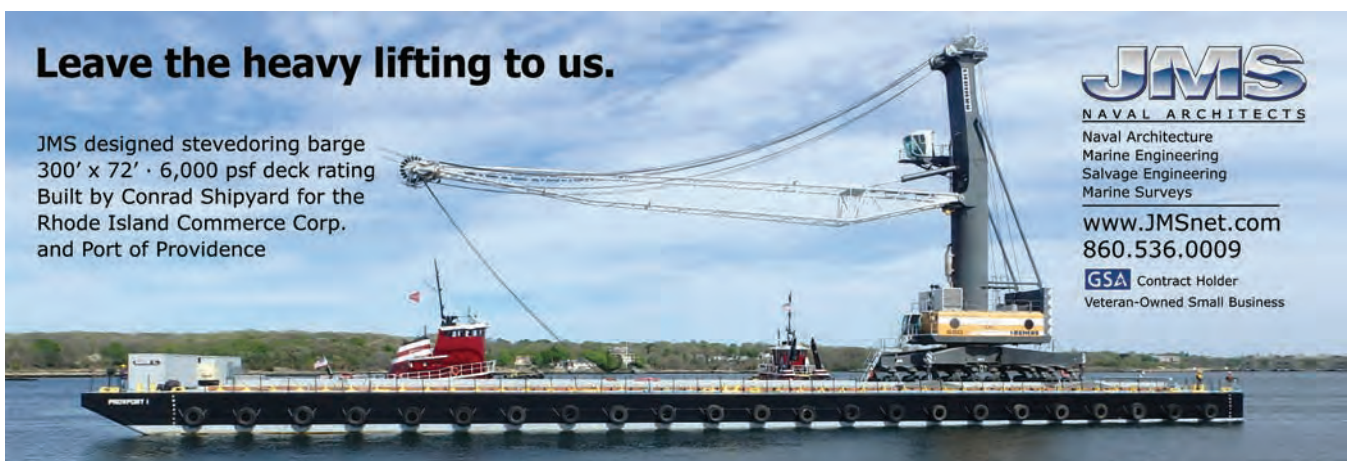
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“I don’t know if I’d call it preference, but certainly there is high acceptance with these engines. The RFP for the vessels was a performance based bid, and so the builder had to choose which engine provider they wanted to partner with. They also had to choose the path that they were going to comply with emission requirements of the vessel. In this instance, though, we actually provided a whole lot more than the engines and the after treatment equipment.”

– Bill Mossey, PPG Vice President



Mossey, the MTU Series 4000 engines provide clean-running operation that helps lower the ferries’ emissions output. “The Series 4000 engines also offer increased safety, lower fuel consumption and greater reliability for the commercial passenger vessels. Notably, the two new ferries will join nine others powered by PPG and MTU.” Utilizing Hug selective catalytic reduction (SCR) and diesel oxidation catalyst (DOC) technologies, the system will reduce an estimated 10 tons of NO_x, PM and CO emissions annually.

Mossey also says that the engine wasn’t pre-specified, but MTU dominates the passenger vessel fleet operating in San Francisco today, both with WETA and other major operators. “I don’t know if I’d call it preference, but certainly there is high acceptance with these engines. The RFP for the vessels was a performance based bid, and so the builder had to choose which engine provider they wanted to partner with. They also had to choose the path that they were

going to comply with emission requirements of the vessel. In this instance, though, we actually provided a whole lot more than the engines and the after treatment equipment.”

Design & Build

Gow lays out the process, saying, “The process of design and build is a design spiral. It starts with having a boat that will work – in this case; Incat Crowther. We take that hull to PPG and say, ‘how do we get a package that will work inside this hull?’ As the design matures, you determine how much real estate we have to work with and then figure out where the exhaust comes in, where it goes out. In the end, it is a lot of give and take. They need space to make their equipment work and we need to make it as small as possible. Once the geometry is nailed down, you start to work on the weight side of it. How small can we make components and save a bit of weight but also maintain the durability?”



PROPULSION: TECHNOLOGY

PPG's custom-engineered solution therefore focused on the operating conditions with the greatest emissions outputs with a high priority on vessel operational reliability and keeping weight and space claim to a minimum. That's because, unnecessary weight takes away from passenger carrying capacity, efficiencies and/or speed. And, explains Gow, "It is very much a custom solution. Certainly, we had a proven product line through Hug that Pac Power was proposing, but the actual boxes that are in the boat, the big physical pieces – aside from electronics – are all custom built to fit the geometry that we had to work with. Beyond that, the uptake that leaves engine room to eventually go to the stack impacts the look of the boat, passenger space and other issues."

PPG's Mossey says, "We watch what's going on in the market very closely with regard to exhaust after-treatment systems technology – what works and what doesn't, because it's a differentiator in our company. We're probably the only engine distributor who is working with the customer to provide a complete solution prior to the evolution of Tier 4. Now, that's going to become a standard part of tier 4 engine packages." Mossey adds, "We've achieved Tier 4-like performance, but it is not certified and there are many reasons it's not certified. That testing wasn't specified by the customer in the RFP."

Jim Gow explains the goals of the aftertreatment system from the builder's perspective, saying, "The vessel isn't certified to Tier 4, but that wasn't specified in the contract. The contract set goals based on Tier Three, so it was a percentage of improvement beyond Tier 3. The first engine was set up at Pacific Power where running emissions tests were done on that engine to prove the system before we moved

ahead with installing it on the boat. It was really impressive to stand there and see and feel all this heat coming out, but no exhaust or small amounts of it. That's not scientific, but it is an important observation."

Indeed, and back in April of 2015, third party independent emissions testing completed at PPG's Kent, Wash. location show that the system's emissions to be lower than any currently-operating passenger ferry in the

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– Jim Gow, Senior Project Manager with Vigor Kvichak



U.S. With MTU engines certified to EPA Tier 3 marine emission levels and adding exhaust after treatment, EPA Tier 4 Final level performance was achieved without the use of diesel particulate filters. The independent emissions tests were conducted and verified by Infowedge and The University of California at Riverside Center for Environmental Research and Technology.

Nut & Bolts

The Hug exhaust treatment system’s reactor housing is not asymmetrical. Its principal dimensions are 65” x 43” x 37” and was designed specifically for these vessels. PPG worked with the builder and Hug to optimize the

configuration of the equipment to best fit into the vessel and provide for service access not only for the SCR and DOC, but all the rest of the machinery, as well. Mossey adds, “Catamarans are relatively compact engine rooms, and exhaust trunks in Cats is particularly difficult, as well. We probably evolved through six or seven design ideas and concepts before arriving at the final design solution which was then manufactured for this vessel with mirror image housings manufactured for each hull.”

“Many manufacturers bring to market a set package and feel it’s the job of the builder to accommodate that equipment in a particular vessel. We took an approach that said we have certain constraints but also certain flexibilities and



we harmonized all of that together to find the best solution. We optimized the size of the unit to meet the emissions requirements of the client. This amounted to 82 pct reduction in NOx,” said Mossey.

SCR targets NOx emissions. DOC targets CO emissions and can have a benefit with PM reductions. All selective catalyst systems utilize either ammonia gas or urea. That sometimes gives operators concern – unwarranted concern in most cases, as it turns out. Because the ferries aren’t running long cruise distances, the operating pattern of the vessel combined with relatively low urea consumption means that there’s not a lot of requirement for storage on the vessel.

Mossey says, “The customer could replenish urea daily, if required. The vessel is configured for two 70 gallon tanks; one in each hull. At periods of low loads on the vessel – alongside as in the case of most ferries, you are producing low NOx emissions and typically not dosing at that point. And, when handled by the crew, it’s a fairly passive product, unlike diesel or other fuels.”

Producing Results with Proven Partners

The first of two vessels is expected to be delivered to WETA by Thanksgiving of 2016. With a host of well-known names involved – Hug, Vigor, WETA, Nichols Brothers, MTU, and of course, PPG – the project is coming together as planned. That’s not surprising, given the long history of collaboration between the client, the service providers and specific OEM’s. When it is all said and done, the air in San Francisco Bay will be a little cleaner, well ahead of schedule. Proactive planning was the key and PPG helped to pull it all together.



Credit: PPG



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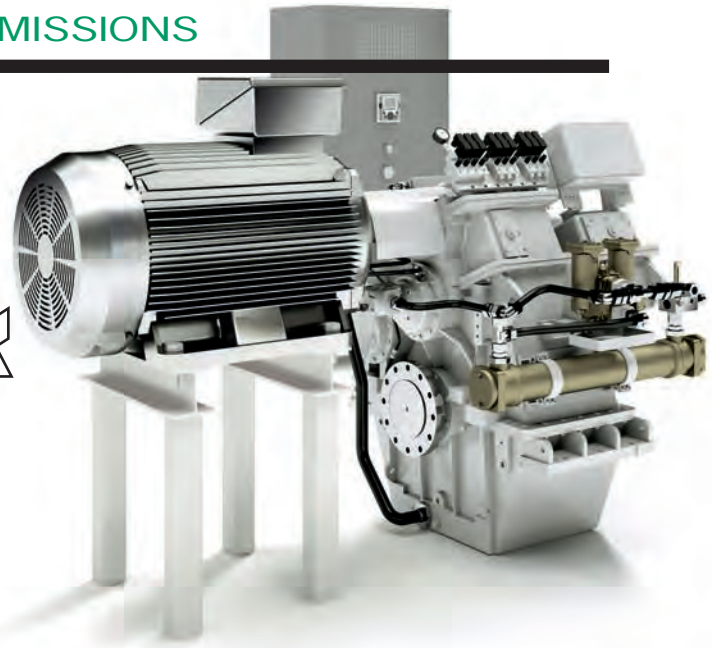
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Economics, Efficiency & Emissions

Drive Effective Choices



Louisiana-based Karl Senner widens its propulsion solutions toolkit with two options, both designed to provide economics, efficiencies and lower emissions.

By Joseph Keefe

In the increasingly competitive marine propulsion markets, workboat operators now have many choices from which to select an appropriate, long term solution for their propulsion needs. Paramount in that process is the need to meet regulatory requirements without breaking the bank. In response, propulsion distributor Karl Senner LLC offers two different electrical system arrangements; both of which will allow operators to remain tier compliant without the use of after-treatment.

Way back in 1967, Karl H. Senner sold the very first Reintjes Gearbox in the North America to Dickie Gonsoulin of LeBeouf Towing. Since that time, the inland waterways have always been a core focus of the Karl Senner business model. More recently, in 2015, Karl Senner collaborated with the Shearer Group and the Steerprop azimuth thruster group to develop a unique pushboat design that was both intended to accommodate the Steerprop solution and also maximize the utility of the thrusters / Z-drives. That's because installing thrusters for the sake of efficiency can be largely a wasted exercise unless all aspects of the vessel and associated equipment are taken into consideration. The latest developments look to leverage those advances with an even more efficient power signature. Together, they potentially represent the next step forward for workboat propulsion and power.

Two Choices

A Reintjes Hybrid System consists of an electric motor/generator, and diesel engine mechanically connected through a Reintjes Gearbox. The arrangement offers four

operating modes: PTI Mode, Booster Mode, PTO Mode, and direct diesel (where the hybrid system is simply shut off). Most suitable for conventional shafting arrangements on board 1,800 to 2,600hp vessels, the Reintjes Hybrid System offers flexibility and economy for today's operators, utilizing proven Reintjes technology. The most commonly built inland towboats fall within this horsepower range.

Alternatively, Karl Senner customers can also select a Diesel-electric System, designed by electrical systems integrator EPD. This is a full diesel-electric system where all electrical power is produced via onboard generators, and the main propulsion is driven by electric motors. Main propulsion can be configured through a Reintjes gearbox to maintain conventional shafting arrangements, or through Steerprop Azimuth Thrusters (Z-drive or L-drive – notably without an additional gearbox). According to Chris Senner, "The Reintjes Hybrid System (RHS) is best suited for a conventional driveline through a Reintjes Gearbox – up to a 630kW PTO/PTI/Booster input."

In practice, the Diesel-electric System is more scalable than the Reintjes Hybrid System, and can be configured on any size vessel. In fact, Karl Senner, LLC and EPD have over time delivered diesel-electric propulsion systems for more than 120 vessels in the offshore market. But, Chris Senner adds, "We offer both solutions, but can help the customer select which solution is best for their application. Both systems are viable options, but it depends on the customer's preference, level of comfort, performance requirements, operational requirements, budget and their application."

PROPULSION: EMISSIONS

Karl Senner explains, “Both are terrific options and both are backed by Karl Senner parts and service. The EPD option is a great fit on all Steer-prop and Reintjes projects that exceed 630kw. For smaller inland Diesel-electric z-drive tow boats we have a great system used on over 100 DP2 vessels utilizing simple and affordable AC and DC solutions. EPD’s John Norwood says it all comes down to what’s right for the individual customer. “What we offer is all tailored towards the customer’s requirements, operational profile, budget and marketing plan.” Either selection can be integrated with any engine manufacturer.

Reintjes Hybrid System Explained

The REINTJES Hybrid System offers many different operation modes. Easy switching between the electric motor/generator, using the main engine, the genset, or both by means of the hydraulically operated clutches, enables the vessel to optimally use its power and take full advantage of the gearbox and the entire power train. These operating modes include PTI mode (electric motor only), PTO mode (diesel engine for propulsion and shaft generator), Boost mode (electric motor and diesel engine in combination for higher speed and higher thrust) and the Diesel mode (diesel engine only). Each offers its own advantages, depending on operational needs at any one given time.

The PTI (Power Take In) mode provides maximum comfort at slow speed. With the diesel engine not operating, the electric motor of the REINTJES hybrid system drives the ship and enables normal cruising, maneuvering and reversing. The noise level and the energy consumption of the power train are reduced to a minimum and efficient operation is achieved with power coming from the genset or any other electric power

source onboard.

The Boost mode offers an additional operating mode in PTI operation. Using all the power of both the diesel engine and the electric motor in combination to drive the propeller to provide maximum propeller thrust and /or support the diesel engine in different load conditions.

In the PTO (Power Take Off) mode, the electric motor of the REINTJES hybrid system can be operated as a generator. It then feeds electric power into the ship’s grid and, hence, assists existing generator sets. Optionally, the remaining energy can be fed into batteries and used later.

Karl Senner sums up the advantages of the hybrid approach, saying simply, “Harbor Tugs are a great fit for the Hybrid applications due to their operating profile. Given the

high amount operating hours in low load demand, the Harbor Tug operator can switch to Hybrid mode and turn off the main engines when they are not needed. By keeping the main engines off throughout the majority of the vessel’s operating life, large cost savings can be realized by creating much longer overhaul intervals of the main engines.”

Karl Senner has sold and installed many gearboxes with PTO/PTI/Booster capability – mainly for offshore applications – but historically, a third party would supply the electrical system. It wasn’t until recently that Reintjes decided to make the packaging easier and integrate the full system from one source. For example, the most recent vessel to have a Reintjes Gearboxes that were PTO/PTI-ready was the M/V *Harvey Stone*.

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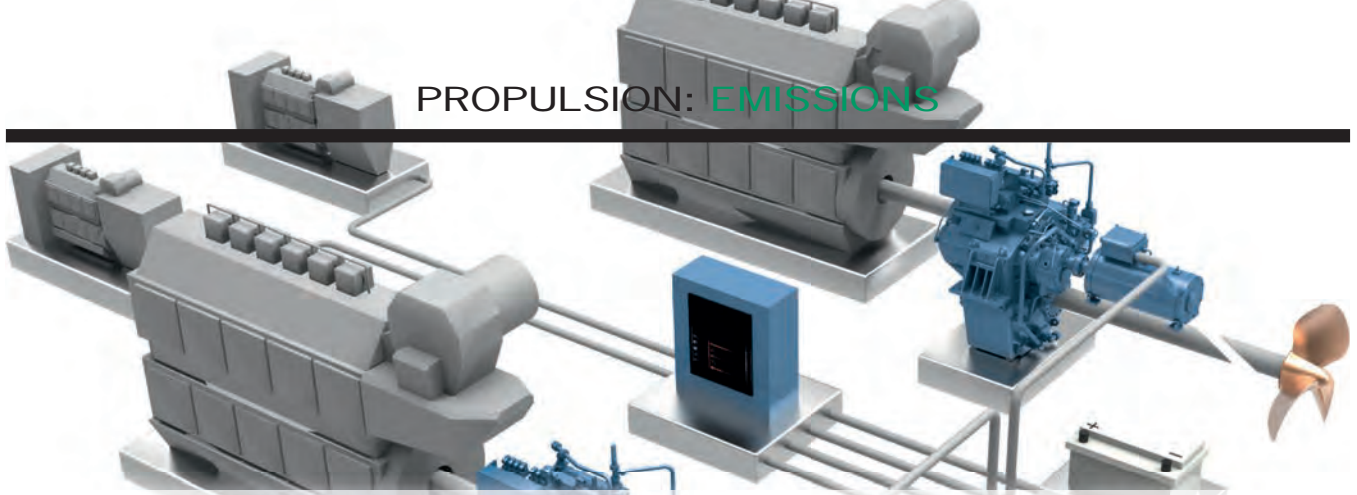
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Diesel-Electric System Defined

In the full diesel-electric system, offered in conjunction with EPD, all electrical power is produced via onboard engine generator sets, and the main propulsion is driven by electric motors. The main propulsion can be configured through a Reintjes gearbox to maintain conventional shafting arrangements, or through a Steerprop Azimuth Thrusters (Z-drive or L-drive). Which way a customer might choose to go depends entirely on the operator's requirements. Chris Senner explains, "For inland towboats it depends on the operating profile of the vessel and the operator's comfort with different types of propulsion. The Z-drive and L-drive vessel will always provide better maneuverability and control in currents and river bends. That's because shallow draft restrictions and impacts are often an area of concern on the inland waterways, which is why we are proposing rugged ice-class rated Z-drives suited for this environment."

One key advantage to the EPD Diesel-electric System is that it is more scalable than the Reintjes Hybrid System, and can be configured on any size vessel. In fact, the diesel-electric system can be configured on any vessel size for inland waterways, even if an application requires a higher horsepower demand than a hybrid system. In those cases, says Chris Senner, EPD can accommodate even larger electrical systems. Today, for example, diesel electric systems are being used on the largest cruise ships in the world, as well as offshore drillships and rigs. And, adds Karl Senner, "Diesel-Electric systems provide nearly endless possibilities of capability and options."

Although Karl Senner, LLC and EPD have for many years delivered diesel-electric propulsion systems to the offshore markets, the technology, even given its utility and success, has been slow to find acceptance in inland waterways. But, that's about to change forever. Today, with changing regulation on engine emissions, the inland market will soon be forced to adopt new technology in the form of tier 4 systems, hybrid systems, or diesel-electric systems. There simply has not been a real need to adopt this technology until now.

Tier Beaters = Good Design

Both systems boast fuel efficiencies and involve the use of smaller engines that can serve as tier beaters – good design all around. Chris Senner agrees, adding, "Both systems would provide the operator with additional operating modes to run the diesel engine and/or generators at more efficient load lines. If the owner chooses keep the main engines and/or generators below 800hp, both systems could allow the operator to remain tier compliant without the use of after treatment, and still deliver the needed power to main driveline – conventional or Z-drive."

EPD's Norwood told *MarineNews* in June, "Hybrid systems with electric motors for slow speed maneuvering and diesel engines for full power/speed are designed to save fuel/costs and reduce hours on main engines as they are not used at low power. These lower engine hours also save by extending the time between overhauls." That's because diesel electric systems are designed based on the operational profiles of the vessel so that engine generator sets can be shut off when the vessel operates at lower power levels and so that different engine generator sets can be shut down or used in combination as power is needed. Norwood adds, "This means that you only have just enough engine generator sets running to power the vessel operational mode at the time."

Karl Senner agrees, saying "The hybrid system, as it applies to inland tow vessels, has an immediate market for this power range which covers vessels that are on the edge of needing EPA tier 4 compliance such as vessels in the ditch, or for smaller fleeting boats that would benefit from the efficiency (fuel and maintenance savings) a hybrid system can offer on applications where the maximum fitted power of a vessel is only needed a portion of the time."

Propulsion subject matter expert Robert Kunkel is President of Alternative Marine Technologies. Speaking to *MarineNews* about the so-called practice of tier-beating designs, he said "The practice will definitely continue simply because it is good design. Working efficiently means meeting regulations and filling a customer's needs and/or price range." Today, there are two more viable options from which operators can choose to do just that.

A Sea Change in Waterjet Technology

Long time water jet propulsion equipment provider NAMJet introduces key advancements for this sector.

By Joseph Keefe



NAMJet's 10 meter demonstration boat underway at full speed

Back in 2011, when boat builder Birdon went looking for a propulsion system that they could utilize in the bid phases of a multi-boat contract with the U.S. Army, they landed on NAMJet propulsion systems and its TRAKTOR Jet line of high-thrust marine jets. Subsequent to that, and because their Army Bridge Erection boat (BEB) concept, powered by NAMJet, performed so well, Birdon went ahead and purchased the company. Since then, NAMJet has gone on to blaze its own trail for propulsion solutions over a wide range of workboats.

Denver-based NAMJet provides water jet technology designed for a wide variety of commercial, military, and workboat applications, fully customizable to meet the standards of the world's most demanding operators. Today NAMJet offers propulsion systems for engines in the 150–850-horsepower range, and stands ready to deliver the next generation of advanced marine propulsion with its newly developed RAPTORJet range with both electric and hydraulic options.

RAPTORJet & iNAV Unveiled

Last month, NAMJet introduced a new range of RAPTORJet water jets. These feature – *and NAMJet says it is the first time ever for this type of propulsion* – iNAV electric actuation which eliminates the need for hydraulic tanks, valves, oil, hoses, maintenance and potential oil leaks. In world where the EPA's VGP keeps vessel operators up at night, this feature alone will make potential customers sit up and take notice.

In a nutshell, iNAV is a comprehensive set of electronic controls spanning conventional throttle and joystick control, all the way through to glass helm operations. Beyond this, says NAMJet President Ian Ramsey, the iNAV system can provide remote updates and upgrades with predic-

tive maintenance and data logging capability. The firm's recently produced 10 meter demonstration workboat features two of the newly designed RAPTORJets, and made its debut last month at Seawork 2016. There, potential customers were able to witness firsthand the power, and improved thrust of the jets. The demonstration boat was built by sister company Birdon America and eventually will be based at a NAMJet facility in the UK and used for various exhibitions around Europe.

On that boat, the innovative RAPTORJet RJ431e propulsion system is matched with a Cummins' 6.7-litre QSB engine rated at 480hp and a ZF 301-1c transmission. Ramsey characterizes the new equipment as "a Sea Change in Water Jet Technology," adding, "The demo boat RAPTOR achieved 39 knots at altitude in fresh water. We expect it will do 42 knots at sea level and have a bollard pull of at least 4.2 tons, which is massive."

According to NAMJet, RAPTORJet is the first waterjet worldwide to provide the option of electric actuation, eliminating the need for hydraulic pumps, oil tanks, filters, plumbing, ongoing hydraulic maintenance and potential oil leaks. Raptorjet has been specifically designed to accommodate electric actuation, however a hydraulic option is also available. The introduction of the Intelligent Navigation & Control System (iNAV) is a fully integrated electronic control system, compatible with most navigational hardware and sensors. It can be configured as a basic system to control engine throttles, transmission, jet bucket and steering up to the iNAV-iN5 system providing joystick control, an intuitive user interface for navigation and full vessel control on a touch screen glass helm. The control features station keeping and dynamic positioning capability, as well as multi-vessel positioning control from a single vessel.



PROPULSION: WATERJETS

Our waterjets are of mass axial flow design, which relies on the volume of water passing through the intake. The impeller rotates at a very low speed between 700 – 1,150 rpms which is highly efficient in producing enormous thrust and little to no cavitation from idle up to 35 knots.

– NAMJet President Ian Ramsey

The main control box is located in the helm and handles all of the high level commands such as GPS headings and sonar. There is also a jet controller located near the waterjets which handles all the lower level commands for steering and bucket control. Notably, there are no bundles of cables running down the boat between the waterjets and the helm control panel. It is simply connected via an Ethernet Cat 5 cable so installation or refit for boat builders is much easier than running streams of cables.

NAMJet describes their waterjet design as a ‘smooth riding, instantaneous response with no chatter.’ Ramsey explains simply, “Hydraulic systems, whilst being very reliable if well maintained, do have a slight delay and slop in the command signals from the steering and bucket control system. Simply put; the electric actuation system is instantaneous which allows for smooth quiet ramping.” Beyond this, the RAPTORJet produces massive thrust at 700-110 RPM’s, whereas the competition needs 3,000 RPM’s to duplicate the same performance.

“Our waterjets are of mass axial flow design, which relies on the volume of water passing through the intake. The impeller rotates at a very low speed between 700 – 1,150 rpms which is highly efficient in producing enormous thrust and little to no cavitation from idle up to 35 knots,” said Ramsey. The feature potentially allows customers to use smaller engines, which might be incorporated into an EPA ‘tier buster’ propulsion scenario. Ramsey adds, “Generally, our waterjets operate a lot more efficiently and can produce significantly higher thrust than high speed jets, which allows for the use of small power plants (on some occasions).”

Value Added to Target Markets

NAMJet, like so many other marine operators and OEM providers, is also on board with the world of ‘big data.’ A Data Logging feature – essentially a black box feature which records numerous real time operating parameters – provides fundamental data including accident investigation and is also useful as a training tool. The system can also be fitted with a predictive maintenance capability which potentially increases ‘up time’ for vessels and can avoid equipment issues before they happen.

As offshore wind power develops offshore and finally gets its sea legs here in the U.S., NAMJet’s newest entry to the

workboat propulsion market is positioned to compete. Ian Ramsey explains, “NAMJet’s higher thrust capability and little-to-zero cavitation provides wind farm crew transfer vessels with a much higher transfer limit window which means the CTV’s can stay engaged longer with the wind farm towers in greater sea state conditions,” adding, “There is a growing trend with windfarm operators that the need for greater speeds and larger power plants to drive larger jets is not necessarily the best possible solution for these type of operations. Our studies have proven that by going to a quad waterjet solution has many advantages over larger twin waterjet operations. Quad waterjets provides full redundancy and given NAMJet’s higher thrust capability, it is possible through the use of the iNAV control system, to power cycle the jets to maximize fuel economy and reduce wear and tear whilst connected to a wind farm tower.”

Track Record: Looking Back, Thrusting Forward

No stranger to the competitive bid process, Birdon’s successful route to build U.S. Army BEB’s went through 600 hours of extensive testing at Aberdeen. In November of 2013, it was announced that Birdon America – the American subsidiary of Birdon Australia – had in fact won the competition and was being awarded the contract. Those boats included two Traktor Jet 381’s – NAMJet’s smallest jet, commercial off-the-shelf units. In the end, the Army decided that NAMJet was the only propulsion system that could satisfy both speed and thrust requirements for this type of project.

The very nature of the work required of the new generation BEB also involves toiling in riverine, sometimes highly turbid and muddy, debris choked waters. That means that the propulsion systems for these shallow draft craft must not only be durable, they’ve got to be able sustain prolonged service in unfriendly waters. According to NAMJet, that’s exactly why they were chosen.

NAMJet’s Ramsey told *MarineNews* in June, “The industry has seen very little innovation and change in recent years [beyond electronic control systems for throttle, helm and joystick controls]. We see the introduction of electric actuation and the capability for autonomous vessel control as the beginning of a profound transformation in technology that will deliver improved thrust and performance; a more cost effective and value for money proposition for vessel owners.”

BRUNSWICK'S ALL NEW 1100 IMPACT D-COLLAR

At a trade event held in Baltimore, MD, Brunswick unveiled its most exciting hull to date. First on board to test drive the new vessel was *Marine-News* Editor Joe Keefe. An exhilarating 35 minute cruise revealed all of the exciting features the new vessel had to offer – whether barreling ahead at 63 KT in open waters or smartly backing down at the berth with the help of Brunswick's JPO joy stick controls. Taken from the new wide body 11 meter RHIB design, the boat has an all-new top skin with two options: the full tube IMPACT, and the D Collar style (as equipped at the show).

Turning on a dime at more than 60 KT, the vessel represents a major breakthrough for municipal and military customers, both in terms of maneuverability and new features that promise to dramatically improve boat handling and navigation for small patrol craft. Brunswick will position the craft to sell into the municipal law enforcement and military, littoral patrol markets. Already, the firm reports one confirmed sale to an unnamed South American entity and negotiations for a multi-boat contract underway. Brunswick will be demonstrating the vessel in the near future, in multiple East Coast locations, over the course of the next few months.

The primary difference in previous Brunswick boats – beyond the width of the boat – involves a one piece stringer grid system. The molded Fiberglass grid is more uniform, saves money and time in terms of boatbuilding and more importantly, allows for easier configuration of a customized boat. A foam fill finishes the cleaner, Class A finish below decks.

The IMPACT D-Collar features a hybrid/foam filled collar mounted to a solid fiberglass gunnel. Instead of a fully circular tube, the D-Collar allows for more space on deck and added maneuverability/versatility for crew. The D-Collar provides the best characteristics of standard fi-



berglass hulls with the benefits of the RHIB. Military users tend to prefer the Tube design because they are not typically boarding in a law enforcement mode. The tube design is lighter by about 400 pounds, affording more payload and provides slightly more speed. Additionally, the D Collar can also be designed to employ ballistic protection.

As configured, the boat seats four with Shoxs 6300 seats, but the boat is extremely customizable – no matter which style you choose (D Collar/Tube). According to Brunswick Director of Sales Jeremy Davis, “It’s a huge open platform that we can adjust and equip to most any mission. We can go to a cabin configuration for a crew up to six or down to a crew of two. We can do inboard diesels, Jets, I/O’s and for outboards, we can add duals, triples or quads. The boat can be used for troop transport – up to 14 or 16 individuals.”

Perhaps the most intriguing new feature involves the JPO system – joy stick piloting – which has eliminated the need for a bow thruster and changed the dynamics of small boat handling forever. Emanating from Brunswick’s high end recreational markets, they are one of the first builders to introduce this in a commercial application.

The 1100 IMPACT D Collar at a glance ...

LOA: 31' 4"	Transom Height: 30"	Max HP: 1050 hp	Raymarine IP200 Marine Camera
Beam: 11' 6"	Dead Rise: 21°	Eng. Weight: 2400 lbs	Custom Aluminum T-Top and Console
Draft: 21"	Weight: 7400 lbs	Mercury JPO w/DP System	SHOXS, Shock Mitigating Seating Package
Capacity: 18	Fuel Capacity: 450 gal	Raymarine Electronics	Triple 350 HP Mercury Verados

Stevedoring Barge for the Port of Providence, RI



JMS Naval Architects engineered and designed a crane barge that will be used for stevedoring operations at ProvPort, the municipal port of the City of Providence, RI. The

barge will carry and operate the facility's 440 ton Liebherr LHM 550 mobile harbor cranes. The 300-foot long x 72-foot wide rake/box barge has a deck rating of over 6,000 pounds per square foot. The crane barge design allows for the easy loading and unloading of cargo from ships to the dock or from ship to ship. The barge is ABS classed A1 with notation "Deck Barge", uninspected and unmanned. The barge was delivered to ProvPort in May and christened on 6 June 2016. Funded, in part, by a \$10.5 million Transportation Investments Generating Economic Recovery (TIGER) grant in 2010, the crane barge, along with two high performance cranes that were delivered in 2013, have transformed the port into a modern marine cargo center.

SAFE Boats International (SBI), a manufacturer of high performance aluminum boats located in Bremerton, Washington unveiled a new model, the Multi-Mission Interceptor (MMI), at the Multi-Agency Craft Conference (MACC) on June 8, 2016. Designed around SAFE Boats proven, commercially available Interceptor family, the 35-foot MMI has a maximum speed of 55+ knots and is capable of high speed open-ocean transits, extreme velocity maneuvers and superior cornering performance. A unique integrated SHOX TRAXS mounting system allows the operator to rapidly configure the aft deck to accommodate a variety of mission-specific payloads. This is an incredibly safe platform with outstanding performance, sea keeping

SAFE Boats Multi-Mission Interceptor (MMI)



and multi-mission capabilities. The MMI also carries the latest in innovation from SAFE Boats' supply partners, including Mercury, FLIR, Raymarine, Boatmaster, David Clark, Soft Deck, HyperSpike and Weldon.

Second Foss Arctic Class Ocean Tug Christened



The second of three state-of-the-art Arctic Class tugs, the Denise Foss, was christened June 1, 2016 at the Foss Waterway Seaport in Tacoma, Wash. Built at the Foss Rainier, OR. Shipyard, the Denise is designed to operate in the extreme conditions of the far north, and will enter service this summer. The Denise Foss is ice class D0,

meaning the hulls are designed specifically for polar waters and are reinforced to maneuver in ice. The first of the three Arctic tugs, the Michele Foss made its debut in 2015. Like the Michele, the Denise complies with the requirements in the ABS Guide for Building and Classing Vessels Intended to Operate in Polar Waters, including ABS A1 standards, SOLAS and Green Passport. She includes a Caterpillar C280-8 main engine, which complies with the highest federal environmental standards; a Nautican propulsion system; and Reintjes reduction gears. Markey Machinery supplied the tow winch. The tug has a bollard pull of 221,000 pounds. The vessel incorporates several environmentally focused designs and structural and technological upgrades, including the elimination of ballast tanks and holding tanks for black and gray water to permit operations in no-discharge zones.

Marquette Z-drive Towboat from Master Marine



In May, Marquette Transportation Co. took delivery of a new 2,000-hp Z-drive towboat from Master Marine of Bayou La Batre, Alabama. The 78'x 34'x11' St. Bartholomew was designed by Entech Designs, La. for Marquette's river division. Master Marine is continuing to build "Z-DRIVE" towboats, with more underway for Marquette with an increased crew capacity of 8 in 5 staterooms with 3 ½ bathrooms. The steel-hulled St. Bartholomew 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") 4-bladed propellers in nozzles. The package gives the boat a running speed of 10 knots with a loaded draft of 8'. For ship's service power the towboat is outfitted with a pair of Kennedy Engine John Deere 4045AFM85 Tier 3 generator drive engines each driving an 80-kW Marathon Mariner generators. Cooling for all engines and z drives was provided by Eastpark Radiator Duraweld coolers. Doors and windows were provided by Dales Welding & Fabrication, LLC. Rubber bumper systems were provided by Schuyler Companies. The electronics was supplied by New World Electronics and Rio Marine supplied the alarms and monitoring systems. To secure barge tows, there's a pair of Patterson 40-ton deck winches supplied by Donovan Marine.

ESG delivers ZYANA K to Bay-Houston Towing

Eastern Shipbuilding Group has delivered the Escort Tug ZYANA K for Bay-Houston Towing on May 5th, 2016. This series of Robert Allan, LTD. (RAL) designed Z-Tech 2400 Class Terminal & Escort Tugs is currently under construction at Eastern's Nelson Street facility. The ZYANA K is the second in a series of four (4) Z-Tech Class Terminal & Escort Tugs being constructed for Bay-Houston Towing Co. Robert Allan, LTD (RAL) of Vancouver, B.C. provided the Z-Tech 2400 Class Terminal & Escort Tugs design and engineering. G&H Towing's fleet currently consists of eight "Z-Tech" tugs in operation. This "Z-Tech" incorporates the latest technology for escort service and ship assist.



The ZYANA K Z-Tech 2400 at a glance ...

LOA: 80'	Main Propulsion: (2) Schottel SRP 1215FP Z-Drives	Total HP: 5,150 HP @ 1,600 RPM
Beam: 38'	Generators: (2) John Deere 4045AFM85 Tier 3, 99kW	Main Engines: (2) Caterpillar 3516C Tier 3
Depth: 15'	Hawser Winch: Markey Fairleader 50HP Electric	Flag: USA

Vane Bros. Continues Fleet Expansion



Vane Brothers has added two vessels to its fleet: the 4,200-horsepower tugboat Hudson and 55,000-barrel barge Double Skin 601. The Hudson is the second of eight vessels in Vane's Elizabeth Anne Class of 4,200-horsepower tugboats contracted through St. Johns Ship Building in Palatka, Fla. The Double Skin 601 is the

first in a new series of 55,000-barrel barges and will be followed later this year by the Double Skin 602. Both barges are products of the Conrad Deepwater South Shipyard in Amelia, La. Designed by Frank Basile, P.E., of Entech Designs, LLC, Vane Brothers' Elizabeth Anne Class tugboats are a close cousin of the company's Basile-designed Pataasco Class tugboats, 15 of which were produced between 2004 and 2009. The Double Skin 601 is configured and outfitted in a nearly identical fashion to the most recent 55,000-barrel Vane Brothers barges that were delivered in 2015 by the Indiana-based Jeffboat Shipyard. The Double Skin 601 is equipped with an 8.6MM BTU thermal fluid heating system, vapor control system and cargo tanks coated with International Interline 994 Epoxy Novolac.

PEOPLE & COMPANY NEWS



Jelenić



Michel



Champagne



Long



Peabody



Kent

Jelenić Joins PMSA

Thomas A. Jelenić has joined the Pacific Merchant Shipping Association (PMSA) as Vice President. Jelenić brings two decades of maritime industry experience to his new role, including more than 14 years in environmental and planning positions at the Port of Long Beach and senior management roles in private consulting and logistics development.

U.S. Coast Guard Receives Second Four-Star Admiral

Charles D. Michel, vice commandant of the Coast Guard, was promoted to the rank of admiral in June. Following passage of the Coast Guard Authorization Act of 2015, the president nominated Michel for promotion to the rank of admiral to align the leadership structure of the Coast Guard to that of the other armed services. As second in command, Michel directly oversees Coast Guard's senior operational and mission support commanders, as well as Headquarters staff, and serves as service chief in absence of the Commandant. He graduated from the U. S. Coast Guard Academy in 1985. In 1992, he graduated summa cum laude from the University of Miami School of Law.

Intellian names Champagne Director of Americas Sales

Intellian Technologies has appointed Ken Champagne as its new Senior Director, Americas Sales. Champagne has more than 25 years of experience

in delivering electronic technologies to the Energy sector, with a career path that includes offshore specialists Datacom, Stratos, CapRock, RigNet and Tampnet.

SEACOR Names Long EVP, CLO and Corporate Secretary

SEACOR Holdings announced that William C. (Bill) Long has been appointed the Company's Executive Vice President, Chief Legal Officer, and Corporate Secretary effective immediately. Long joins SEACOR with over 20 years of business and legal experience with publicly-traded companies. Prior to joining the Company, Mr. Long served as Senior Vice President, General Counsel and Secretary of GulfMark Offshore, Inc. He holds a Juris Doctorate degree, a Masters of Business Administration, and a Bachelor of Business Administration from the University of Houston. He is a member of the State Bar of Texas.

Mott MacDonald Names Peabody as Director, Federal Programs

Mott MacDonald appointed Major General John Peabody as Senior Vice President and Director of Federal Programs. Peabody, who retired from the US Army Corps of Engineers in 2015, commanded three different corps divisions. As Deputy Commanding General for civil and emergency operations, he was responsible 23,000 military and civilian professionals, 693 dams, 4,254 recreation

areas, 926 harbors, over 12,000 miles of commercial inland waterways, and approximately 14,000 miles of levees.

Pettit Expands Sales Teams

Pettit Marine Paint announced the addition of two new regional representatives. Mike Kent is a new technical sales representative for the territory of Texas, Louisiana and the Caribbean Islands and Travis Johnson will be working part-time representing Pettit products in southwest Florida. Kent, who joined the Pettit Team in January, 2016, has 28 years of experience in the marine coatings market. Johnson brings nearly 40 years of industry sales and management experience to Pettit. Johnson spent 10 years with Interlux/Awlgrip, after 28 years with Interlux.

Liebherr USA Promotes Cabiedes-Uranga

Liebherr USA announced the promotion of Ana Cabiedes-Uranga to the position of General Manager, Marketing. Ana has over ten years of combined marketing and management experience at Liebherr with expertise in implementing integrated marketing communication strategies. She has also served on a variety of committees for major industry associations and trade events and holds a Bachelor of Science in Business Administration with a major in Marketing from the Monterrey Institute of Technology and Higher Education (ITESM).

PEOPLE & COMPANY NEWS



Johnson



Cabiedes-Uranga



White



Lian



Harvey

White Joins INTTRA as CFO

INTTRA announced that **Jeff White** has joined the company as Chief Financial Officer and Head of Strategy. White has over 20 years of experience, including serving as CFO of bio-fuels and chemicals start-up Virent, Inc. Prior to that, he was the CEO of Renew Energy. Mr. White also has deep experience in the telecom industry, where he was President and later CFO of RCN Corporation after serving as CFO of New Zealand Telecom.

BIRNS adds Manufacturing Engineer to Team

BIRNS announced the hire of **Xin Lian** as Manufacturing Engineer. Lian will be responsible for writing detailed work instructions, operation procedures, and job travelers for all BIRNS production operations. Prior to joining the team at BIRNS, Lian served as Manufacturing Quality Engineer for Quan Yun Company, and Quality Control Project Manager for Fei Cui Yuan. She holds both Masters of Science and Bachelors of Science degrees in Engineering Management.

Seafarers' House Honors Guy Harvey

Guy Harvey is this year's recipient of the Seafarers' House International Golden Compass Award. The award is given each year to those who have achieved distinction in the maritime world, those whose vocation or avocation has been the sea, or those who have ministered to or otherwise

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PEOPLE & COMPANY NEWS



Scholten



Guidry



Montgomery



Richards



Angiolino



Martin

assisted seafarers. Harvey has been a champion of the seas since an early age. The Guy Harvey Ocean Foundation is well-known for its research in the marine biology field and the message of stewardship and conservation of the oceans.

Scholten Joins ABYC as Technical VP

The American Boat & Yacht Council (ABYC) announced that **Craig Scholten** has joined the association as technical vice president. With 33 years of experience in the boating industry, Scholten will further support ABYC's mission of being the essential source of technical information in the international marine industry. Scholten joins ABYC from Rec Boat Holdings, LLC, where he most recently served as production engineering/product compliance manager.

AEU's Guidry Appointed to SCA Health & Safety Committee

American Equity Underwriters Senior Loss Control Manager **Terry Guidry** has been appointed to the Shipbuilder's Council of America's (SCA) Health and Safety Executive Committee. Committee members provide feedback on comments for new regulations, safety seminar topics and speakers, and support SCA Health and Safety legislative initiatives. Guidry has extensive experience in the shipbuilding and ship repair industry and familiarity with OSHA.

New EVP Takes the Helm at NCBFAA

Megan Montgomery, Esq., has been named Executive Vice President of the National Customs Brokers & Forwarders Association of America, Inc. (NCBFAA). Ms. Montgomery replaces Barbara Reilly, CAE, who held the position for 18 years before resigning effective June 7. Currently the Principal Consultant for Washington, DC-based MWM Consultants, Montgomery manages conferences, events and operational activities for multiple clients. In addition, she brings with her extensive industry experience that she acquired during five years of service as the Director of Government Affairs at the American Association of Exporters and Importers (AAEI) in Washington, DC.

GT USA's Richards Honored as Maritime Person of the Year

Peter Richards, CEO of GT USA, the U.S. division of global port operator GulfTainer, has received the Maritime Person of the Year Award from the Propeller Club of Port Canaveral. The honor from the Propeller Club of Port Canaveral recognizes a person's contributions to the maritime industry and local community. With more than 12 years of seagoing experience and 28 years of expertise in the operation and management of port facilities and container terminals, Richards has played a key role in building the global presence of GulfTainer, the largest privately owned, independent port operator in the world.

Angiolino Joins Integro's Marine Practice

Integro Insurance Brokers announced that **Thomas Angiolino** has joined the firm's Marine practice in New York City as a Principal. Angiolino brings more than 35 years of insurance industry experience to Integro, with primary focus on marine and energy placements, including hull & machinery, protection & indemnity, charterers, liability coverage, terminal operators, pollution and yachts, among others. At Integro, Angiolino will be responsible for producing and servicing Marine industry related clients.

New AAA Chair Aims to Add Value

Keith Martin, the new chairman of the Association of Average Adjusters, has made clear his determination to help the Association broaden its contribution to the international marine and offshore energy market. Martin was confirmed as chairman for 2016-17 at the Association's annual meeting in May. For the past year, Martin has been vice-chairman of the Association. In the latest stage of a career which has included average adjusting and energy loss adjusting, Martin is the UK energy claims advocacy leader for the Marsh broking group.

Carrix CEO Stubkjær to Receive 2016 Connie Award

Knud Stubkjær, CEO of Carrix Inc., will receive the 2016 Connie Award presented by the Containerization & Intermodal Institute in Long Beach,

PEOPLE & COMPANY NEWS

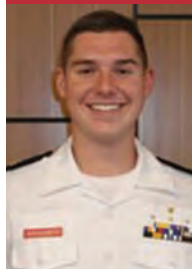
Thomas B. Crowley Sr. Scholarship recipients:



Stubkjær



Arrieta



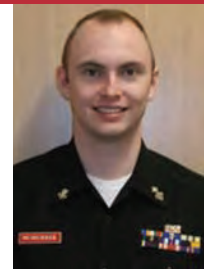
Goldsmith



Mentuck



Murphy



McMurrer

CA, on September 20. Connie recipients are recognized with the award for significant contributions to containerization and world trade and transportation industry and are acknowledged for a pioneering spirit in their careers and at the companies where they worked, as well as for their positive influence on the individuals up and coming in their field. Stubkjær joined Carrix in 2012, bringing to the company more than 35 years of expertise in the transportation, terminal operations and logistics industry. He started his career as a trainee with the A.P. Møller-Maersk Group in 1977.

GAC appoints Regional Commercial Director

GAC North America named Carlos Arrieta as Regional Commercial Director – Oil and Gas, responsible for developing its network of agents and general cargo throughout the region. Arrieta brings with him more than 40 years of industry experience to his new role. Prior to his latest appointment, he was Commercial Director, Oil & Gas for GAC North America – Logistics, after joining the Group in 2010 when it launched its oil & gas and logistics activities in the U.S.

Four Mass. Maritime Cadets Awarded Crowley Scholarships

Crowley Maritime Corp.'s Thomas B. Crowley Sr. Memorial Scholarships have helped to further educational opportunities for four students of www.marinelink.com



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the Massachusetts Maritime Academy (MMA). The four recipients, **Patrick Goldsmith**, **Jack McMurrer**, **Paige Mentuck** and **Christina Murphy**, were chosen based on their excellent grades, demonstrated financial need and plans to pursue a career in the maritime industry. Goldsmith is majoring in marine engineering and minoring in international maritime business. He recently completed his commercial shipping experience aboard the Crowley-managed container ship National Glory. McMurrer is pursuing a dual major in marine transportation and international maritime business. He spent the winter semester aboard the Crowley-managed tanker Evergreen State. Mentuck is majoring in marine transportation. Murphy is majoring in marine transportation and will soon spend her summer-at-sea semester aboard the Crowley-managed container ship Yorktown Express. Since 1984, Crowley has provided more than \$3 million dollars in scholarship funding for more than 1,000 students.

SUNY Maritime Graduates Receive Chancellor's Award

Two of SUNY Maritime's spring graduates received the State University of New York Chancellor's Award. **Jawad Azam**, who studied electrical engineering, and **La'Quey Smith**, marine

transportation, were among 248 students from the 64 SUNY campuses to be recognized. Azam took time away from SUNY Maritime to enlist in the Air Force reserves, and upon his return, balanced being a full-time student with military service. Smith spent three years working as a custom broker for an import/export company before enrolling at SUNY Maritime. In addition to her studies, she rose through the ranks to become the regimental commander of cadets her senior year.

Allgood to lead GPA board

The Board of Directors of the Georgia Ports Authority has elected **James L. Allgood** as chairman. Allgood, who served as vice chairman for two years, will assume his new responsibilities July 1. Currently featuring more ship-to-shore cranes than any other U.S. terminal, at 22, Savannah's Garden City Terminal will add four cranes this year. Another set of four will arrive in the late spring of 2018, bringing the total number to 30 cranes.

IMS Announces New Tankering & Plant Service Company

Inland Marine Service (IMS) has launched a new tankering and plant service division called Inland Marine Tankering, LLC (IMT). **Dave Hammond**, President of IMS, made the announcement. "Two years ago, IMS

began diversifying into other marine related business segments. In addition to vessel management, planned maintenance, compliance management, harbor services and liquid operations, we now have tankering services to offer our current and future customers," said Hammond. At the same time, IMS has partnered with **Shawn Hantz** of Third Coast Tankering, LLC to form the new company. IMT services include loading/unloading liquid tank barges and in-plant services for refineries and third party facilities.

DMS Completes Jeppesen Marine Division Acquisition

Digital Marine Solutions (DMS) announced that it had completed acquisition of the assets of the Marine Division of Jeppesen. Jeppesen Marine and C-MAP portfolio will continue to operate as a separate entity under the C-MAP brand name. "The completion of this deal is good news for C-MAP, our customers, our staff and the marine industry," said C-MAP CEO **Egil Aarstad**. **Leif Ottosson**, DMS chairman, added, "We believe that C-MAP is very well positioned to take a leadership position in the dynamic and developing market for digital content and services. We are very excited about future C-MAP partnerships and growth opportunities across both the recreational and commercial marine market."

Rail and Trolley System for Commercial Marine

The Harken TR31 continuous rail and trolley system allows crewmembers, fully-harnessed and securely tethered to the trolley, to move freely with fall restraint security during dangerous duties. Both rail and trolley are fabricated of marine-grade 6061-T6 aluminum, proven to withstand the harshest environments on the planet. An optional brake trolley with manual screwpin keeps the tether trolley immobile when not in use.

www.harken.com



Cat Marine Hybrid Thruster Delivers More Power, Uses Less Fuel

Caterpillar's hybrid thruster concept offers dramatic cost savings for off-shore operators. The new propulsion set-up outperforms diesel mechanical systems in all partial load conditions, offering improved fuel economy and substantial through-life savings. For vessels spending a high amount of time in standby or DP service, the annual fuel savings can be as high as 35% - calculated across the entire operating profile of the vessel.

www.cat.com/marine

Survitec Group's Crewsaver Workvest Lifejacket Range

Survitec Group's Crewsaver single chamber Workvest range is ideal for workboats. Bladder design is integral to Crewsaver lifejackets and all Crewsaver lifejackets come with a unique chin support, keeping crew comfortable and well supported should they fall overboard. Designed to remain robust and reliable when used constantly, they offer the option of a wipe clean cover for the harshest of conditions.

www.crewsaver.com



Centek Check Valves Prevent Backflow To Engines, Gensets

The Check Valve from Centek Industries helps prevent water from flowing back into engines and gensets. Especially useful on boats and yachts that navigate in a following sea, the Check Valve is Lloyd's Register Type approved. Manufactured from flame-retardant and heat resistant resin, it is available in a wide range of standard sizes for both gas and diesel engine applications.

www.centekindustries.com



Trelleborg' Fire Protection & Thermal Insulation Materials

Trelleborg's newest offerings include Vikotherm, made from non-syntactic silicone and can be cured at room temperature without exposure to air, making it resistant to cracking and shrinking. Vikotherm R2 offers improved elasticity, as well as enhanced process and manufacturing flexibility. Using Trelleborg's Mobile Production Unit (MPU), the system can be applied on site, anywhere around the world.

www.trelleborg.com/offshore

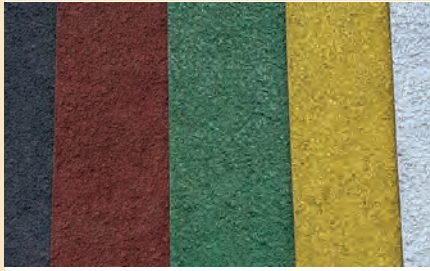
Schottel's VarioDuct High-Performance Nozzle

The new Schottel VarioDuct SDV45 high-performance nozzle is now available in the Rudderpropeller range. Given the same propulsive power, it has a greater bollard pull than the thrust of previous nozzles and, at the same time, offers considerably greater efficiency in the medium and high speed range. The system, consisting of a Rudderpropeller and the new nozzle, contributes significantly to fuel savings.

www.schottel.de



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www.silvanonskidsolutions.com

Superlok Self-Measuring Gauge

Superlok's tube fitting with a self-measuring gauge installed on each fitting and compression end valve eliminates over and under tightening, which can lead to replacement expenses and worker safety concerns. Improperly tightened fittings account for most connection failures. This patent virtually eliminates human error and provides a safer working environment. The technology works for all of Superlok's tube end valves and fittings.

www.superloknorthamerica.com



Electronic Controller for MCD Adds Versatility

Marine Control Drives (MCD) from Twin Disc split power from the main engine to another system. The EC085 electronic controller adds more versatility and precision handling to workboats. The EC085 is ideal for any boat that requires a variable power divide with gradual, controlled propeller speed change and instant response, such as tugs, OSVs, icebreakers, dredgers and fire-fighting vessels.

www.twindisc.com



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www.torqeedo.com

Blue Ridge Forge's Barge Lid Lifters

Barge Cover Lifters were engineered by Blue Ridge Forge in 2012, since gaining widespread approval at forty Barge Terminals throughout the United States. The patent pending, easily transportable lifter arms fold and lock for easy travel from one location to another. The arms unfold to a four point spread for use on Barge Covers. Each lifter is certified for a Lift Capacity on 4000 lbs.

bluridgeforge@yahoo.com



PPG's Sigmashield MTC System for Dry Bulk Holds

PPG's protective and marine coatings business has unveiled a new protective system for dry bulk carrier cargo holds. The PPG Sigmashield MTC system is built on a unique coating technology that comprises a prime undercoat and topcoat. The system features a unique chemistry that maximizes technical performance and offers a commercially sound solution for spot and full repairs as well as for application at newbuild.

www.ppg.com



Microsite for NITROMEM Marine Membrane Nitrogen Generators online

NOXERIOR's new microsite for its NITROMEM

Marine Membrane Nitrogen Generators has been launched. Both operators and shipyards are now able to obtain direct information about this unique and reliable solution for shipboard nitrogen generation by only one click. NITROMEM Marine Membrane Nitrogen Generators are used by LNG or dual-fueled vessels as well as smaller IMO II and IMO III chemical and gas tankers.

www.nitromem.com

Krill Systems Fuel Measurement and Monitoring System

Krill Systems' Vessel Fuel Measurement and Monitoring Systems (VFMMS) supplies fuel measurement data collection and transmission, in real time, in addition to bunker measurement, management and reporting. Coriolis flow-meters are used to provide the highest accuracy measurement of fuel consumption, made possible by Krill's very flexible design format. Meters can measure the fuel consumption of: Main Engines, Generators and Bunkers.

www.krillsystems.com



Klüber Lubrication Introduces VGP-Compliant Grease

Klüber Lubrication's Klüberbio BM 32-142 is an environmentally acceptable lubricating grease for rolling and plain bearings in cranes, fairleads, winches and rudder systems. Klüberbio BM 32-142 contains special additives that reduce wear, protect against corrosion and enable smooth operation even at extremely low temperatures. Klüberbio BM 32-142 complies with the requirements of EALs as defined by the EPA's Vessel General Permit (VGP).

www.klubersolutions.com



JonRie's new Container Master Series of Winches

JonRie Marine Winches' Container Master Series of Winches are designed with increased braking capability and rope capacity to deal with larger containerships and increased loading due to the sail area of today's containerships. The winch system features JonRie's New Gen-X Controls with its new Hall Effect foot pedal & joystick operation to provide proportional control of the line haul and line out modes.

www.marinewinch.com

New Boat Features Mercury Optimax diesel Outboards

Norsafe's Marathon 900 RIB is fitted with two newly developed Mercury outboard engines that run on diesel fuel. The Mercury OptiMax Diesel Outboard, developed for the US Armed Forces, is a 3.0 liter V6 engine that produces 175 propshaft horsepower. The outboard engine is comprised of 95% components of a 225hp gasoline engine, is low-compression, and utilizes an advanced fuel injection concept.

www.mercurymarine.com



Viega's Tees for the MegaPress System

Viega has introduced eight reducing tee configurations for Viega MegaPress and MegaPressG systems for joining schedule 5 to schedule 40 black iron pipe in sizes 1/2" to 2". The Viega MegaPress system is ideal for hydronic heat, chilled water, compressed air, fire sprinkler systems, low pressure steam and vacuum lines. Viega MegaPress is flameless, safer than traditional systems and eliminates the need for hotwork.

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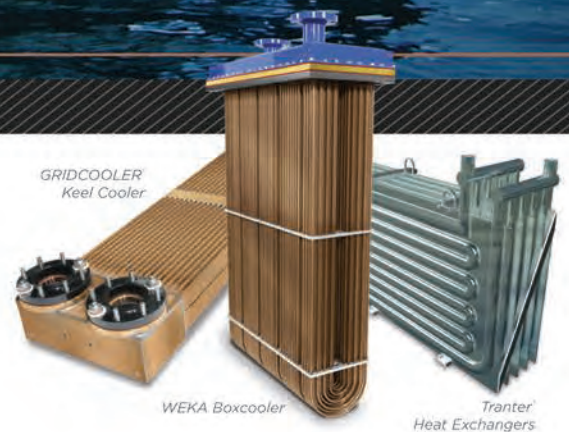


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