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Enduring – and Evolving

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ON THE COVER

A fully modern and large capacity Crowley ATB makes way in the coastwise trades. The enduring ATB is apparently here to stay, it is evolving and at the same time, it is penetrating many different sectors.

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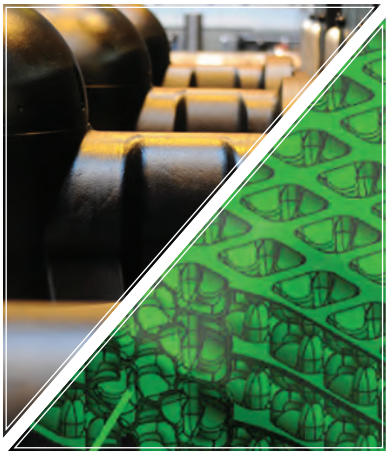

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At a time when many fear that the march to a cleaner environment had taken a step backwards, I actually see no evidence of that trend on the collective, North American waterfront. Whereas environmental progress up until now has been, to a certain extent, a function of regulatory pressure, the trend to green the maritime footprint today is increasingly a result of corporate social conscience. In other words, going 'green' is no longer done purely for compliance purposes. Some operators are finding that there are two kinds of green to be found along the way. To that end, Harvey Gulf and its LNG leadership immediately come to mind.

When it comes to looking for more evidence that the marine industry is indeed cleaning up its act, perhaps the first place to look would be under the hood of your workboat, where OEM's and designers are busy putting together fuel efficient, quieter – and yes – much cleaner propulsion solutions for myriad applications. I won't steal his thunder, but Bob Kunkel's assessment of hybrid propulsion and the state of the market is also a good place to start. That story begins on page 34.

Separately, the phrase 'articulated tug/barge systems' probably isn't something that rolls right off your tongue. Nevertheless, and in the space of just a few short decades, the now-familiar ATB concept has found its place in the domestic coastwise shipping game. In terms of numbers alone, the ATB fleet is now more than twice the size of the traditional Jones Act tanker fleet. That gap is expanding. As these vessels get bigger and faster, their utility in many other trades is also becoming more evident. And like other workboat sectors, ATB's are also getting cleaner. Take your choice – EGR, SCR or LNG – new ATB's are entering the markets with a cleaner signature.

Also within these pages, ATB specialist Bob Hill brings us up to speed on what's happening in his fascinating sector. At the same time, longtime ***MarineNews*** contributor Barry Parker looks at the business side of that equation; one which is growing rapidly. Although largely a liquid bulk sector today, the versatile ATB has a future in the container markets, shortsea shipping and other coastwise missions. And, as Bob Hill tells us, "anything that can be built as a ship, can be built as an ATB."

For the U.S. merchant fleet, one which is largely comprised of workboat class vessels, most of the low hanging fruit in terms of environmental improvement has already been picked. The final part of that journey will be more difficult, and it will likely be expensive. That said; we also don't need more rules (or a treaty) to get it done. Interim Port of Long Beach Chief Duane Kenagy recently said it best when he opined, "We believe that by working with industry, and as long as we don't specify the technologies or how to get there, we think industry will get closer to zero emissions." He said it, I believe it – and that settles it.

Joseph Keefe, Editor, keefe@marinelink.com

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Inland Vessels, Market & Conditions

Because 95 percent of commodities arriving in the U.S. Gulf do so in a barge, these vessels are very important, as is the infrastructure on the rivers upon which they travel. At a recent presentation given by Ken Eriksen and colleagues at Informa Economics, a broad look at inland towboats and the barges that they propel provided insight into current events, past results and what might come next. According to Informa, "the tank barge market is poised for a recovery, likely sometime in 2017," as the benefits from new streams of petrochemical and ethanol volumes are realized. Fleet utilization levels have experienced an uptick, and reportedly are nearing the 90% range for some operators. This will likely lead to improved pricing for tank barge operators later this year or in early 2018.

The tank barge fleet has increased slightly (+13). It is at record levels, and the buildup on was in response to crude oil. The construction of pipelines – as many as 30 additional trunklines being built or considered – has impacted waterborne movements. These lines take volume from both rail and barges. On the other hand, until that's fully built out, a possible increase in crude oil production may require that crude to be moved on barges to the refineries. For crude oil barges, location is everything. Where crude oil needs to be pushed to the river, they are doing well, but as pipeline capacity comes on line, others have way too much capacity. For heated barges, mainly carrying heavier crude oils, some of the demand for that has gone away. Conversely, smaller (10,000 barrel) barges, buoyed by the addition of substantial chemical plant capacity along the Mississippi waterway system, are thought by some to actually be inadequate for the market at present. That's a positive indicator.

The bigger story is the covered barge market. That's because rates weren't really that great, and the fleet increased by 790 barges (fueled by 863 newbuilds). The forecasts for increased commodity shipments drove this trend, and the good news is that volumes – especially grain – did increase. Nevertheless, the combination of almost perfect weather and the added capacity to the river system, combined with the addition of new barges kept rates at almost record lows.

For a long time, industry focused on trying to bring the covered fleets into equilibrium. They did that by reducing the number of barges in the fleet, but along the way, as many as 1,500 barges were converted into covered barges. Changing ethanol policy and a national grain surplus has resulted in increased exports. Last year was a record, but the reason for that was that Brazil had a drought. As the grain numbers start to drop, exports – compared to historical trends – still remain healthy. ***Wild Card:*** One thing that can and will help this market out is an increase in the volume of hydraulic fracturing sand being moved.

For open barges, 2016 saw a fleet decrease of 151 barges (267 retirements, and only 116 newbuilds). At one time coal was the number one commodity on the rivers; today it is down 30 to 40 percent over recent years. So far this year, coal numbers, supported by a rebound in exports in first quarter of this year (due in part to trouble in Australia), were up. Nevertheless, that can't and won't continue. Nationally, coal-fired powerplants can't just shut down, but they will be replaced by LNG. Domestically, this sector remains in a state of decline. This year, the good news is that if you put it on the river up north, it's a nice long haul all the way to the bottom for export. Whereas, in the Ohio River, these are shorter hauls. A lot of turns, but the ton miles are greater for the exports.

With coal and aggregates being carried, those barges get beat up. What that means is that the lifecycle of that barge is much shorter. Because of that reality, open barge markets will continue to see a healthy level of retirements. The Trump promise of building infrastructure – should it happen at all – will mean moving aggregates and this will eat up capacity as demand increases. Dry Barges as a whole are almost back to levels not seen since 2000. With only 340 total retirements and a younger fleet not expecting much more than that in the near future, challenges remain for operators. This makes it harder still to bring the market back into equilibrium.

The value of a covered barge asset went down last year. That number rises and falls not with the price of steel, but as a function of demand. Last year, rates were at near three-year lows. This year, good river conditions and robust cargo volumes are nevertheless being dragged down (rates) because so many barges have been built. The market typically assumes a certain level of capacity constraints, but when it didn't happen, we had too much capacity. Bottom Line: the covered barge market is a little overbuilt.

Finally, barges don't go anywhere without towboats. In 2015 – the latest data available, a sharp increase in the number of towboats available was seen. The collective horsepower of that fleet is also on the rise. The 1,800 - 3,700 HP fleet continues to expand, primarily because towboats in the 3,000 HP range are used in the liquid barge towing trades. In the bigger HP categories, a similar expansion of the fleet is not occurring. Good information simply doesn't exist to make comment about which boats and how many have been repowered. But, a look at engine OEM's participating in the towboat is a fascinating look at "who's who" in marine propulsion today. And the inland river system as a whole, by the numbers, is just as fascinating.

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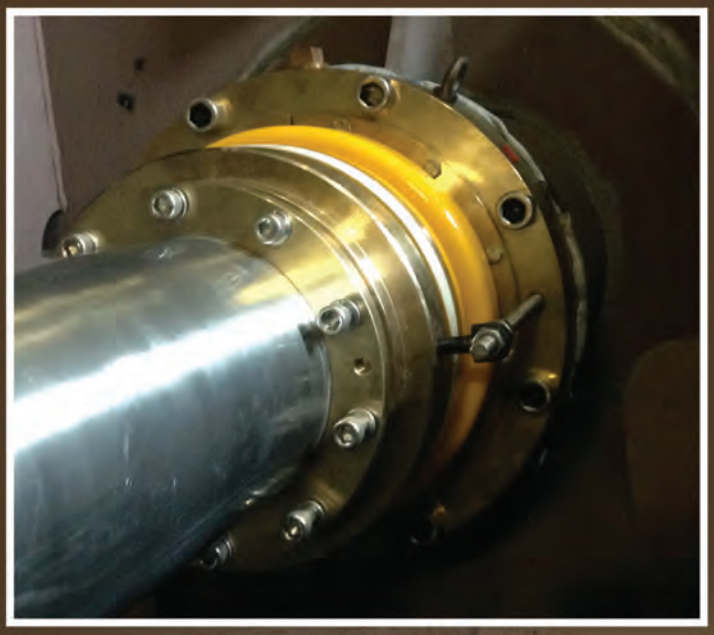

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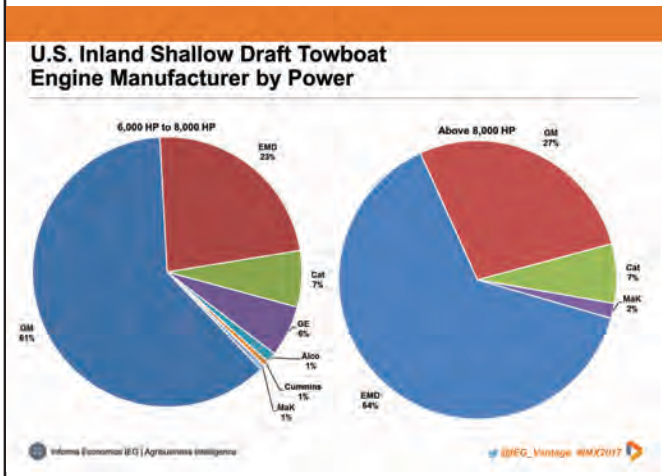
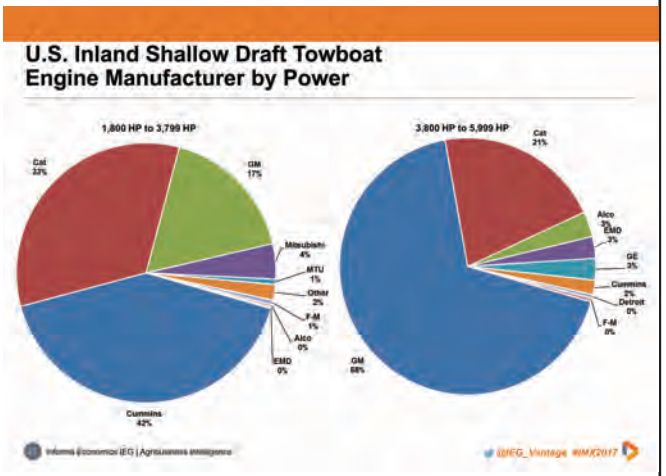
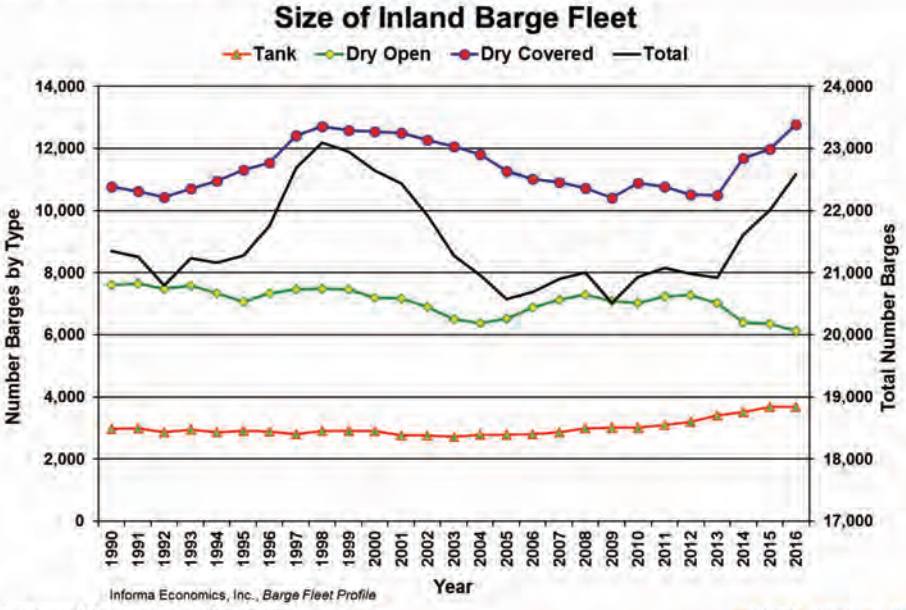




Fleet Expanded on Covered Developments



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President,

Ocean Tug & Barge Engineering Corp.

Robert (Bob) Hill of Ocean Tug & Barge Engineering Corp., of Milford, MA has specialized in the design of AT/B's for many years. Hill's name is, in most maritime circles – here and across the big pond – synonymous with the words "articulated tug/barge systems." As probably the world's most experienced designer of large articulated tug/barge (AT/B) systems, Hill's success comes, in part, from a willingness to innovate. Ocean Tug & Barge Engineering Corporation and Robert Hill are the co-inventors of the Intercon Connection System. Currently, the firm is involved in the design of AT/B gas carriers, container carriers, clean product and crude carriers, and their attending tugs. Beyond this, the firm created the FacetTug concept, and has building to its design, gas carrier barges, petroleum carrier barges, and 13 AT/B tugs from 4 to 8000 hp. In a nutshell, his firm has had a hand in over 70% of the operational AT/B's in service in America – including, 80% of those built or converted since 1994. In large part due to Bob Hill's efforts, the AT/B is now a familiar standard in the U.S. flag fleet for coastal, Jones Act and some inland applications. Listen in this month as Hill gives us an update on what's new in the world of AT/B's.

Some aspects of U.S. yards are doing well – ferries, for example. How active is the ATB buyer market?

If you measure it by how busy we are, then things are still fairly good. We had a number of vessels delivered in 2016, mostly AT/B tugs – but in 2017 we are having complete unit deliveries as well. In terms of new projects, we are just finishing up the Contract Design work on the SeaOne Maritime CGL (Compressed Gas Liquid) AT/B's that will be built at Samsung in Korea. There will be 12 of them. We are also starting a pair of new projects in July, but in the age of NDA's we cannot talk about either one just yet publically, but things are doing fairly well. As for upcoming deliveries, we have a 150,000 barrel Sub. O AT/B building at Senesco Marine for Reinauer, including both the tug and the barge. The large AT/B tug we designed along with Ship Architects, Inc, for Great Lakes Dredge & Dock for their new AT/B hopper dredge is nearing completion at Eastern Shipbuilding. And, the Savage Marine NH3 Carrier is nearing completion at Vigor/Nichols Bros. on the west coast.

The iconic ATB changed the marine transportation industry in many ways – in terms of economics, operating practices, etc. – especially for tanker operators. In what way did its advent eventually impact the overall marine transportation industry?

I started OT&BE Corp. in 1994 and have been constantly busy ever since, so given we and others have been so busy, there has been an impact on the maritime industry here in the United States for sure. I/we did not invent the AT/B. The credit for that has to go back to the early 1970's and to the Bludworth family and Edwin Fletcher, as well as Mr. Yamaguchi. The biggest change I believe occurred when it was proven that an AT/B can be every bit as reliable in delivering product as a ship can be. AT/B's are not weather-bound to the same extent towed barges, for decades, were. This came at exactly the right moment in the petroleum industry's transport chain, as "just in time" delivery began to replace constantly keeping terminals topped off – a time when a vessel being weather-bound was now a severe disruption factor in terminal operations. Now, we have AT/B's under design as gas carriers, container carriers, dredges – anything that can be built as a ship, can be built as an AT/B – but I find I do not have to "sell" the concept as we needed to do in the past.

What's the fastest ATB in service today? How important is speed in this sector?

We are increasingly seeing requests for higher speed units and have developed AT/B's that can make in excess of 14 knots just using fully articulating tugs and chined-hull barg-

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es, but we have also been at work creating units that can do 15 to 16 knots. To do that, you have to move away from traditional designs, but there are things about AT/B's that can go very wrong if in the hunt for speed you do not consider other factors. So rather than just design the fastest hulls we can, we take a "whole vessel" approach and look to create designs that are not only fast, but useable and operable. To that end our collaboration with Taisei Engineering in Tokyo, and its founder, Mr. T. Yamaguchi, has been instrumental in developing higher speed AT/B's. We have a joint patent now with Taisei on a connection system to make that more possible. Speed is particularly important with container AT/B's, and AT/B's moving high value cargoes over long distances. The Minyan Marine "Chemitainer" Concept design is a 15 knot unit that suffers no consequences in other areas for having that much speed, and it does so at a power level nearly identical to that of a similar sized ship.

What's the latest count of ATB's in service? What can we expect in the future in terms of newbuilds or growth?

There are many dozen AT/B's in service in the USA and hundreds worldwide. It is a perfect solution for coastwise and inter-island shipping. The future is definitely in the gas carrier and container markets, as well as in Ro/Ro and specialized markets. It is also able to penetrate worldwide tanker markets as American AT/B's show up more often in foreign ports and attract attention.

How many ATB's are in the newbuild (or order book) stage today? How many of those are you and your colleagues involved in?

In one order, SeaOne will build 12 units in Korea to our design and these are large units using 17,200 HP tugs, and there is another multiple-unit project we are starting in July. We have branched out from petroleum and bulk units to develop a specialization in gas carriers. The order book of AT/B's for us has in 2017, 15 barges and 18 tugs. In 2018, those will expand to another 9 barges and 7 tugs. We are also engaged in two conversion designs now from towed barges and tugs to AT/B's.

In terms of design changes, what is the most innovative thing that has hit your sector in the recent past? Why is it important?

The change to IMO Tier III and USEPA Tier 4 certificated/approved propulsion engines was perhaps the biggest anticipated change, but in reality we find it has not affected our design work appreciably. As an example, we are designing AT/B tugs right now with both SCR and EGR engines for propulsion. We had heard all of the warnings about massive SCR-related scrubbers and US engine manufacturers have given us compact tug-specific installations that give us no headaches of any kind space-wise, and American EGR engines offer a similarly compact installation, if the client does not want to carry DEF aboard their boat.

Container on barge – it is being widely discussed today. Are any in production at moment (fit for purpose) and/or in planning? What would you see as the maximum TEU capacity of a coastwise ATB and more importantly, does the concept have legs as a niche 'short sea' carrier, even with the Harbor Maintenance Tax in effect.

As noted above we have looked into and designed container carrier AT/B's. None are currently building, but that is not surprising given the flux in worldwide container shipping in general, and the post-Panamax maneuvering in that market. Minyan Marine continues to pursue their market and we have also worked with Argent Marine on LNG Container barges to transport of course containerized LNG. We find there are other firms looking at moving containerized LNG now but to really promote a number of newbuild AT/B's for container feeder service in general you need to compete with the railroads for domestic container moves, and recent experience shows that a higher speed newbuild AT/B will have trouble competing due to cost. You need a longer trade route and a large number of boxes to move, or a premium high value cargo to move. The United States has largely neglected the development of coastwise marine transportation infrastructure and that needs to change as well – but it will happen if all of the stars align.

Are you seeing a (more pronounced) move towards LNG as a fuel in this sector? Is the storage of the fuel an issue and is it possible to store the LNG on the barge itself? How would that connection work?

We were just contracted for our first sure-to-be-built gas-powered AT/B fleet. Yes, the storage of LNG on a tug is a severe problem if you want to go any distance. Storing it on a barge is possible but the U.S. Coast Guard is not fond of sending either LNG or gas over from the barge to the tug. There are two ways to look at it – transfer bulk fuel from barge to tug in port, or continuously provide a fuel stream of vaporized fuel from the barge to the tug. Of these, the bulk transfer would have the least regulatory issues, but it is not without its issues – most of which involve the location of the transfer in port. Given that the rail industry now runs LNG fuel tenders between gas-powered locomotives with a live supply line on each end, emulating their arrangement may help with the regulatory issues. We will need to solve it on the new boats.

Recently, an ATB on the Great Lakes was fitted with one of the new GE Tier IV engines that require no aftertreatment. Do you see this as a trend going forward or will the use of SCR aftertreatment probably be more prevalent?

There are benefits and negatives to both methodologies. Having now designed tugs with both GE V250 EGR engines and EMD 710 series urea SCR engines, I see no technical issues in way of either. We easily found space for large amounts of urea aboard but you have to plan for it. It becomes another consumable. It is easily stored, and does not require the same type of inefficient space usage inherent in say, a Type C Cylindrical LNG pressure tank.

The United States is not a signatory to the MLC (2006) Code which dictates, among other things, minimum living standards for crewmembers. But, ABS has habitability codes that some U.S. flag operators adhere to. How would you compare living conditions aboard a modern ATB and that of a typical coastwise product tanker?

I can only speak directly for the boats we design, but I know others design excellent boats in this regard too.... we make sure our boats are crew-friendly almost above all else. We design boats that people can live on and work on safely and with comfort equal to that of a tanker. The SeaOne tugs meets and in fact exceeds the ABS "HAB" criteria. People who go aboard modern AT/B tugs are amazed at how spacious they are. I recall working at Matton Shipyard many years ago and on those towing tugs, a large stateroom was 8 feet by 10 feet. Now that the boats are generally larger to carry enough fuel to make long voyages, and support tall towers, there is just more boat on which to build a decent hotel. Having said that – nothing is more important than the safety of the people who run the boats and live on them. A big part of safety is providing a comfortable environment to work in and to have good rest between watches.

You've been rethinking the iconic design of the offshore service provider with a unique AT/B arrangement. How far along are you with it, what advantages would it bring and are you planning DP capabilities, etc?

Our "Provider Class" AT/B PSV is, I believe, a great idea. I cannot take credit for it – it was brought to us by a fellow who worked for an OSV operator. He knows who he is – I keep trying to find him – if he reads this, please call me. He knows who he is. The big advantage of an AT/B PSV is the ability in places like the GOM, to build multiple barges and a smaller number of tugs to drop and swap barges – you build one tug and two barges doubling your earning part and halving your expense part and crew. We do have PROVIDER set up with DP capability. The slowdown in the GOM has hurt development of it as so much equipment is potentially idled - but we are talking to people about converting a few tied-up PSV's into barges. We'll see how that goes.

Subchapter M is here. It impacts the inland markets primarily. One of the most obvious non-issues and/or changes is that the U.S. Coast Guard did not address the watch system for smaller vessels. On ATB's, do your foresee any changes to manning or watch schedules, or is that aspect of the concept 'settled policy' and/or 'general practice?'

I am on a committee that is working within AWO with the USCG to update NVIC 2-81 – the NAVIC covering AT/B's. I cannot speak for the group as the work is underway but I believe I can safely say I do not see manning changes of any significance on the horizon coming out of that effort.

All of the marine industry is facing change and increased regulatory scrutiny and oversight. What's the biggest issue in this regard facing ATB operators and/or designers today?

When I came into the industry, the ABS Rules for building tugs were about 90 pages; now they are over 1,000, and it is worse for barges. None of the boats built to those rules have had huge design issues such that we needed over 1,000 pages of rules to "fix" them. Our biggest issue in my view is regulatory overload. The rules change constantly and even sometimes without any notice. Things approved initially are, at times, rejected after having been installed aboard a boat after initial approval. Things built one hundred times successfully have to be subjected to extensive analysis on boat number 101. For us, it is more of a problem more with Class Societies than with the USCG. We follow the rules as everyone does, but it has driven design cost ever-upward. No one would suggest going to back to the 1983 rules, but the reality is that many of the rules created are derived from rules for large ships and have no real applicability in small vessel design. Are the boats better for it? I am not sure they are. We routinely convert 40 year old tugs to AT/B service and they hold up well. The first Intercon AT/B tug was the "INTREPID" originally built by Main Iron Works in the late 1960's – we converted her to an Intercon boat in 1986 and she has worked continuously since. Most of the original boat was reused.

The Real Story Behind the Attack on SMFF Regulations

ASA Sets the Record Straight.

By Todd Schauer

Schauer

The U.S. salvage industry came under attack at a recent Congressional hearing on May 3rd by a special commercial interest that is promoting its own agenda. The American Salvage Association (ASA) intends to set the record straight. At the hearing, the attacking group made false allegations that the Salvage and Marine Firefighting (SMFF) resource providers are not willing or contractually obligated to respond and lack the resources to meet regulated response requirements. At the same hearing, this group also criticized the U.S. Coast Guard's oversight of the Vessel Response Plan (VRP) Program. The fact that this entity can provide none of the required 19 SMFF services themselves has not slowed their aggressive lobbying of Congress nor their promoting of a very dangerous precedent that would have dramatic cost implications for all vessel owners should it get traction.

The SMFF regulations were promulgated in December 2008 for tank ships and barges, and were extended to all commercial non-tank self-propelled vessels over 400 gross tons in October 2013. As such, the regulations apply to all but the smallest U.S. and foreign-flag vessels operating in U.S. waters. Estimates place the number of vessels subject to the SMFF regulations at over 24,000 vessels. The SMFF regulations have four principal components:

- *Define salvage and marine firefighting services and resources*
- *Establish planning timeframes for response*
- *Provide criteria for determination of resource adequacy*
- *Provide for pre-arranged contracts*

Critical to an understanding of these SMFF rules is that they are planning criteria, not performance standards. This is specifically stated in the SMFF regulations in 33 CFR 155.4010. Compliance with the regulations is based on assumptions that may not exist during an actual incident.

Vessel owners can rest assured that there will not be response delays due to contracting issues. All four national SMFF resource provider agreements in question meet the regulations by making the necessary statements of capability and commitment to respond within the required response times. The USCG clearly addressed this via the implementation of the SMFF regulations.

The crux of the resource matter is that 24-hour dedicated availability of each supporting resource for every SMFF service was never intended by the SMFF regulations. Such a commitment to have the vast myriad of SMFF support resources specifically dedicated for the 19 SMFF services in all U.S. ports and for all U.S coastal and offshore areas would be absolutely cost prohibitive for the salvor and its clients. This was clearly not considered by the original economic analysis of the SMFF Tank Vessel Regulations

Unlike pollution cleanup contractors that have focused kits of specialized equipment (boom, spill boats, and skimmers, etc.), the diversity of the 19 salvage services demands a vast network of high value support resources in addition to specialized salvage equipment and these support resources routinely perform other marine related work and services to be commercially viable. (The Federal Register Dec 31, 2008, Pg 80645, VII Regulatory Analysis, contains a detailed discussion.)

SMFF providers rely heavily on the 'vessel of opportunity' and 'resource of opportunity' system that exists throughout the ports and waterways of the United States and throughout the industrial maritime infrastructure of the U.S. This includes thousands of tugs, workboats, supply and crew boats, hundreds of derrick barges, cargo barges and a nationwide network of other marine and industrial resources including heavy equipment, commercial logistics and transportation assets, industrial service providers, divers, welders, small boat operators, etc.

As stated by Coast Guard Rear Admiral Paul Thomas during his May 3rd testimony at the same Congressional hearing, the SMFF regulations do not require "dedicated resources" and the SMFF regulatory economic analyses were not based on this premise. Admiral Thomas went on to state that a system of dedicated resources would require a change in statute to support any regulatory change.

This system of national salvage resource providers, qualified subcontractors and other providers is fully capable

"… every vessel owner should take note of the actions of the small group aggressively lobbying Congress in an attempt to establish a monopoly market for themselves. By attempting to exclude existing fleets of tugs, supply boats, crew boats and other work boats from SMFF planning requirements, this group is promoting a precedent that will require an entirely new system of dedicated SMFF vessels and resources, at an overwhelming cost burden for vessel owners."

and, importantly, cost effective for the salvage industry, the ship operators and, ultimately, the consumer. It spreads the opportunity for response over a range of existing businesses, from small tugboat operators to large diving contractors, precluding the need for new investment in equipment that may sit idle and be employed only occasionally.

When the SMFF regulations came into effect, the salvage industry greatly expanded its existing equipment inventories, response staffing levels, and administrative support to ensure the regulatory timeframes are met for all 19 SMFF services. This expansion is concurrent with an even greater role internationally for American salvors. The U.S. SMFF providers through recent growth and continuous improvements in capability now represent a majority of the globally operating salvage providers; in essence, the strength of the US capability is growing and also being exported. This is also a substantial benefit to the US Navy's global salvage response capability which is directly supported by emergency response contracts with ASA members in a time of declining organic Navy salvage capability.

U.S. salvors will continue their proud and growing legacy of professional and effective salvage response throughout U.S. waters and in support of U.S. interests abroad. Salvors will continue to meet or exceed SMFF response standards and work closely with ship owners, regulators, and resource providers to grow and improve upon our substantial response capabilities. The ASA member salvors will continue the time-honored marine salvage tradition of "best endeavors" in responding anywhere, any time and for any incident to protect life and the environment, to keep our waterways open for commerce, and to save valuable ships and cargo.

In summary, every vessel owner should take note of the actions of the small group aggressively lobbying Congress in an attempt to establish a monopoly market for themselves. By attempting to exclude existing fleets of tugs, supply boats, crew boats and other work boats from SMFF planning requirements, this group is promoting a precedent that will require an entirely new system of dedicated SMFF vessels and resources, at an overwhelming cost burden for vessel owners. The ASA continues to counter this effort through dissemination of the facts and by building a coalition of relevant shipping organizations.

AMERICAN SALVAGE ASSOCIATION

Todd Schauer *is Director of Operations, Resolve Marine Group and President of the American Salvage Association. He graduated from the U.S. Coast Guard Academy with a degree in Naval Architecture. His experience in the Coast Guard included shipboard engineering, marine safety, advanced engineering and emergency response. He served for 5 years on the USCG Salvage Emergency Response Team (SERT) including acting as Team Leader.*

For Payroll Purposes, is Your Seaman Really a Seaman?

For operational purposes, it is critical to know what type of employees you have on your vessel. Failure to do so could be expensive.

By Larry DeMarcay

DeMarcay

As vessel operators, we pay close attention the provisions of the Jones Act and how they affect the operation, crewing and administration of our marine-based operations. A determination that your vessel-based crews are seamen under maritime law creates a different employment relationship when compared to employees designated as longshoremen or land-based employees.

For example, under maritime law, seamen are entitled to maintenance and cure in the event that they sustain an injury while in the service of the vessel. They are also able to recover general damages and lost wages if they can prove that either negligence, or an unseaworthy condition aboard the vessel, caused the injury.

On the other hand, a land-based employee, or a longshoreman, will receive compensation for these injuries under the applicable workers' compensation scheme, and the employer will be immune from any further liability for the incident.

For operational purposes, it is critical to know what type of employees you have on your vessel. Once you figure out the type of employees you have for operational purposes, you have to conduct another analysis to see what kind of employees you have for payroll purposes.

Apples-to-Oranges

A Jones Act seaman may not be considered a seaman for payroll purposes under the Fair Labor Standards Act ("FLSA"). As such, despite maritime law designating your crew member as a seaman, a court could determine that your seaman does not fall within the scope of the seaman exception to the FLSA and find you liable for penalties and wages related to the overtime rules included in the FLSA.

The FLSA requires employers to provide overtime pay to any employee who works more than forty hours per week unless an exemption applies. The law assumes that all employees are entitled to overtime and the employer bears the burden of proving that an exception to the overtime requirement is applicable. The FLSA provides an exemption to the overtime requirements for "any employee employed as a seaman." So, it would be reasonable to assume that any seamen working aboard your vessel, as determined by maritime law, would be exempt from the maximum hour requirements of the FLSA. But, the determination is not that clear.

The FLSA's definition of a seaman differs from that of maritime law. The Jones Act interprets the definition of seaman "broadly to maximize the scope of the remedial coverage;" the exemptions under the FLSA "have been drawn narrowly … to minimize the number of employees who lose the Act's protections." As such, the rules are not consistent and pose a serious trap for the unaware.

Under the FLSA, an employee is considered a seaman when two criteria are met: (1) An exempted seaman must be subject to the authority, direction and control of the vessel's master; and (2) the exempted seaman's service must be directed to assist the vessel as a means of transportation. Pursuant to the Department of Labor regulations, non-navigational work becomes "substantial" if it occupies more than 20% of the time worked by the employee during a work week. Courts look to the nature of the work that the employee performs and not the description of the position or the place where the job is performed. As such, the application of the seaman exception to the FLSA is determined on a fact intensive, case-by-case evaluation.

Case in Point

The Federal Fifth Circuit Court of Appeals recently considered a FLSA overtime case involving a vessel-based ROV operator, and its employee, a vessel-based ROV Operator. The employee filed suit against his employer for overtime wages and penalties alleging that he was not a seaman under the FLSA. The employer argued that the employee was a seaman as he was a permanent member of the vessel's crew and, as such, was exempt from paying overtime wages. The District Court found that he was a seaman covered by the exemption and dismissed the suit. However, the Court of Appeals reversed that ruling and reinstated the employee's suit finding that he was not an employee covered by the overtime exemption and that his employer could be found liable for paying overtime wages.

The Court found that the ROV Operator was not as-

signed to the vessel in a position with the primary task of assisting the vessel as a means of transportation. Essentially, the Court held that the employee's "primary purpose" must relate to the safe navigation of the ship for the seaman overtime exception to apply. Although, the Court found that some of the employee's work was nautical in nature, the dominant employment had nothing to do with the navigation of the vessel as it was limited to operating the ROV, a purely operational task aboard the vessel that had nothing to do with vessel operation.

Another example where the classification of crewmembers poses a significant overtime wage risk can be seen by looking at the position of a vessel-based tankerman. If the primary purpose of a tankerman is to get cargo on or off of the vessel, the court would find that he is not a seaman for FLSA purposes. However, if a vessel-based tankerman is responsible for the constant monitoring of barges to ensure the safe navigation the vessel, the court could find him to be a seaman exempted from the overtime rule. Assuming that both tankermen were permanently assigned to their respective vessels, the Jones Act would consider them both to be seamen. However, the FLSA would treat both employees differently, exempting the latter from the overtime rules while making overtime mandatory for the former.

The Waterfront's Changing (Employment) Landscape

As crewmember tasks have become more specialized over time, it is important to look at the operational nature of each position to determine whether the job entails spending a significant portion of its time performing tasks that involve the operation of the vessel as a means of transportation. In addition to looking at the tasks performed by the crew member, you should also evaluate the command and control structure to see if the position reports to the ship's master, or a non-navigational officer. Furthermore, if the position includes both navigational and non-navigational components, you could look at the position's job descriptions and the company's operations manuals to determine whether the company's documentation indicates that this is a navigational based position, or not.

"Pursuant to the Department of Labor regulations, non-navigational work becomes 'substantial' if it occupies more than 20% of the time worked by the employee during a work week. Courts look to the nature of the work that the employee performs and not the description of the position or the place where the job is performed. As such, the application of the seaman exception to the FLSA is determined on a fact intensive, case-by-case evaluation."

Although some employees will fall into clear categories of navigational or non-navigational positions, some positions will be hybrids. For those positions, the company should tweak the operational requirements of each position to ensure that more than 80% of the employee's time is spent assisting the vessel in transportation to ensure the seaman's exemption under the FLSA applies. If you can't meet that requirement, it may be a good idea to modify your payroll system to pay any required overtime.

Although this issue has been around for some time, the Fifth Circuit's recent holding presents us with a good reminder of the need to evaluate the operational nature of the positions that we have on board our vessels. As an award of past-due overtime wages, penalties and attorneys' fees can be significant, it makes sense to take a close look at the nature of these positions before you are served with a lawsuit.

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The Evolving ATB Jones Act Business Model

Today's ATB play seemingly has legs for the long haul, as operators build and market needs fluctuate.

By Barry Parker

The refined product trades are always in flux. Similarly, the supply patterns for products (and for chemicals derived from oil refining) are subject to constant change. At the same time, the distribution of refined petroleum products sees great benefit from the efficiency of Articulated Tug Barges (ATBs), which have the flexibility to adjust to dynamic supply programs between refineries and myriad distribution facilities dotting the coastline. It wasn't always like that.

An ATB combines a normal barge with a bow resembling that of a ship, but having a deep indent at the stern to accommodate the bow of a tug. The fit is such that the resulting combination behaves almost like a single vessel at sea as well as while maneuvering. The Jones Act fleet today includes more than 60 larger tankers and nearly 160 ATBs. Replacing the traditional – and excruciatingly slow – oceangoing tug and tow arrangements of yesteryear, ATB's have produced economies both in terms of reducing manning costs and increased speed and reliability.

The ATB's attractiveness in terms of the traditional tug and tow model is obvious enough. The ability to operate with half the crew of a coastwise tanker, at similar speeds and leveraging a different set of regulatory rules is where the real utility of this unique vessel can be found. That's not to say that ATB's aren't safe and/or subject to a high degree of regulatory oversight. They are.

A Sea Change in Coastal Traffic

Since the mid 1990's, U.S. Jones Act trades have seen a sharp decline in cargoes moving aboard conventional tankers (as Alaska trades declined, and the fleet of older single hull vessels were phased out) and an increase in volume moving coastwise in barges. Beyond this, the advent of additional pipeline capacity killed the need for much of the marine tonnage which ordinarily would have handled that volume. The colonial Pipeline alone eliminates the need for almost 150 conventional coastwise product tankers. But, pipelines lack the flexibility of a marine vessel, which can be instantly diverted at the whim of the trader. Marine traffic is here to stay and ATB's will be part of that equation.

Indeed, U.S. Maritime Administration data – looking at barges of 10,000 DWT and greater, roughly 70,000

ATB Corpus Christi/ Petrochem Supplier

– 80,000 barrels capacity for refined products – shows a burst in volume during 2013 and 2014 (the last year for which complete data is available). Not coincidentally, and during a 20 year timeframe, the average carrying capacity of ATB's has increased, as have average lengths of haul. In 2014, the average voyage for the tank barges had grown to 522 miles, from just 387 miles in 1994.

Are ATB's competing – and succeeding in traditional blue water routes? The answer is yes. Larger ATBs are capable of runs previously undertaken by conventional product tankers such as trades from Texas ports into Florida and the Lower Mississippi River. There is no precise data on tonnage moving in ATBs – but the numbers are substantial and the market share is increasing. Data from the U.S. Department of Energy reveals that annual movements of refined products by tanker and barge between PADD 3 (the U.S. Gulf) and PADD 1, were 205.7 mbbl (2014), 205.6 mbbl (2015) and 212.4 mbbl (2016) – all around 25 or 26 million metric tons annually. Gasoline blending components accounted for nearly half of these flows, with finished gasoline, jet fuel, and distillate fuel oil accounting for much of the balance.

Image Credit: US Shipping Corp

U.S. Army Corps of Engineers data shows that coastwise receipts of petroleum products along the Atlantic Coast (equivalent to U.S. DOE's PADD 1) equated to 36.3 million metric tons in 2015 (the last year where data is available). This implies that intra-regional movements within PADD 1 were at least 10 million tons (not including moves within harbors which presumably would move in smaller barges into smaller local terminals).

PORT	Short tons x 1,000
Port Everglades	9,583
New Haven, CT	6,152
Boston, MA	3,928
Providence, RI	2,998
Fernandina Beach, FL	2,810
NY Lower Entrance	2,542
NY / NJ channels	1,839
Bridgeport, CT	1,173
Hudson River	1,031
Port Jefferson, NY	773

Source: 2015 annual receipts as per USACE.

The Players – an Expanding & Impressive Line-Up

Kirby Corporation, a titan of the inland markets, reinvigorated its entry into the coastwise markets in 2011 with its purchase of K-Sea Transportation (followed by its acquisition of Allied Towing the next year), providing it with a considerable ATB fleet. Much prior to that, Kirby signaled its long term intentions when it purchased Sabine Towing and Transportation in 1992. At the time, Sabine operated 38 tank barges, 24 harbor tugs and push boats and six aging coastal tankers. Importantly, approximately 65 percent of Sabine's revenues at that time were derived from coastal tanker operations. Over time, those tired, single hull tankers went away, to be replaced with gleaming, double hull barges – and, eventually, ATB's.

Recent ship tracking data revealed that Kirby Corporation's ATB combination Tina Pyne coupled with the 185,000 barrel barge 185-02 was hauling products across the Gulf of Mexico from Texas into Tampa, Fla. Its sister, Nancy Peterkin, has been trading on the West Coast, most recently on a run between Anacortes, Washington and San Francisco. ATB builder Nicholls Brothers, describing each of the ATB's, explains, "The ATB unit has the flexibility to reach and maneuver in ports that restrict larger vessels."

OSG Vision/OSG 350

Image Credit: Overseas Shipholding Group

Not surprisingly, Kirby also ordered two smaller ATBs, pairing 6,000 HP tugs with 155,000 barrel capacity barges. Meanwhile, the K-Sea fleet is a mainstay of Kirby's operations in the Northeastern seaboard trades. And, Kirby continues to invest in the ATB concept.

Crowley Maritime operates ATB's with cubic capacities that rival that of small tankers. A trio of large ATBs in the Crowley stable – the 750 series – with cargo carrying capacities of 330,000 barrels, were built in the US Gulf at VT Halter and the tugs at Dakota Creek Industries. These units trade side by side with similarly sized conventional "MR" product tankers. John Ara, Crowley's Vice President of Sales and Chartering, Petroleum and Chemical Transportation, told ***MarineNews***, "Because ATBs, with the exception of Crowley's 750 series, generally have smaller capacities than most tankers, these two types of vessels are utilized in different markets. Crowley's 750 series ATBs are the only ones that could potentially compete in the self-propelled tanker market, but they are currently on charter to dedicated trades."

Crowley also operates two other classes of ATB's – the 550 series (with barges of 155,000 barrel capacity) and the 650 series (with barges of 178,000 barrels capacity). Its equipment trades on all three U.S. coasts.

Reflecting the trend towards larger ATBs, privately held Bouchard Transportation is another Jones Act operator which has upsized. Recent tracks show these 250,000 ATB units trading between Texas and the Lower Mississippi River. Its smaller units trade actively along the East Coast.

Meanwhile, Vane Brothers, active in the fuel trades along the U.S East Coast, also operates a pair of 145,000 barrel ATBs. Vane, doubling down, also has three smaller ATBs under construction, according to its internal Pipeline publication.

Other important participants in the business include U.S. Shipping Corp., Overseas Shipholding Group (OSG), Reinauer Transportation and Moran Towing & Transportation. Privately held U.S. Shipping Corporation owns four modern ATB's that haul refined products and chemicals. The company's CEO, Al Bergeron, told ***MarineNews***, "We operate a chemical fleet of ATB's and one chemical tanker using COA's (Contracts of Affreightment) and spot market cargoes." He stressed the differences between his company's ATB parcel trades, as compared to those of competitors which might haul a full barge load

Kirby ATB construction budgets (source: regulatory filings)

Year	ASSET	ASSET
	6,000 hp tug / 155,000 bbl barge	**10,000 hp tug / 185,000 bbl barge**
2014	… $19,201,000 for down payments on the construction of two 155,000 barrel articulated tank barge and 6000 horsepower tugboat units	Based on current commitments, steel prices and projected delivery schedules, the Company's 2014 capital expenditures … will be approximately … $45,000,000 in progress payments on the construction of the 185,000 barrel coastal articulated tank barge and tugboat unit.
2015	… $33,030,000 for progress payments on the construction of two 155,000 barrel coastal articulated tank barge and 6000 horsepower tugboat units	For 2015, cash generated and borrowings under the Company's revolving credit facility were used for capital expenditures….including $74,442,000 for progress payments on the construction of two 185,000 barrel coastal articulated tank barge and 10000 horsepower tugboat units,
2016	$74,689,000 for progress payments on the construction of two 155,000 barrel coastal ATBs	For 2016, cash generated and borrowings under the Company's revolving credit facility were used for capital expenditures of …, including $14,884,000 in final costs for the construction of two 185,000 barrel coastal ATBs….

of gasoline or distillates. "Our vessels have highly trained crews," he said, adding, "The sophistication of vessels and experience of crews provide customers with high a high degree of flexibility for their cargo needs. The company's two main objectives are safety and customer satisfaction."

Bay Shipbuilding, which is completing its second unit for Kirby in July 2017, is particularly active and experienced in the production of ATB's. The yard's VP/General Manager, Todd Thayse, told ***MarineNews*** in June, "Fincantieri Bay Shipbuilding (FBS) is well suited to build ATBs as the shipyard has been the premier builder in the last 20 years, with a total of 32 units delivered to date." He adds, "This familiarity with the rules and regulations, plus the learning curve, virtually minimizes/eliminates the usual risks associated with new construction projects."

OSG is back in business after a complete re-organization. After jettisoning its international flag tanker business, the "new" OSG is now a pure Jones Act operator. Its fleet of 10 ATB's include older units that came to OSG with its 2006 acquisition of Maritrans , which had a legacy coastwise barging business centered around hubs in Tampa and Philadelphia. Two modern ATBs built with generous 342,000 barrel barges are mainly deployed in lightering operations in Delaware Bay. Eight other ATB's (some with barges originally single hulled but retrofitted to comply with OPA 90's double hull requirements) round out its ATB business model.

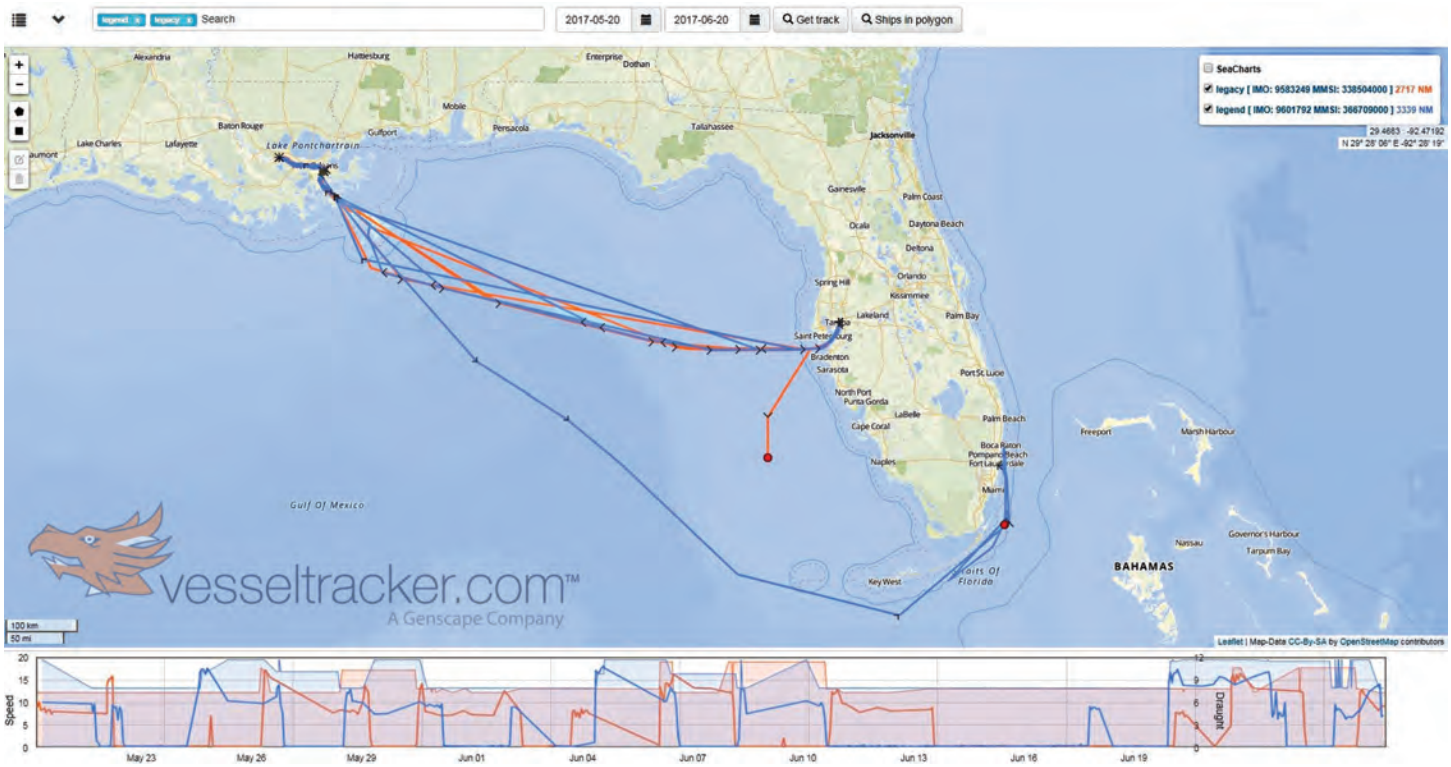
Reinauer, which owns the Senesco Shipyard in Rhode Island, participates in the movements along the East coast within PADD 1. Its fleet includes more than a dozen ATBs. Moran Towing participates in similar trades from the US Gulf into Florida. Its vessels have been tracked taking gasoline from Pascagoula to Port Everglades, Florida – not coincidentally the leading coastwise destination for refined products moves.

A new entrant to the ATB club is Harley Marine. Its tonnage is new, and the fleet is growing. Two additional ATB units are slated for delivery in 2017. This operator trades in clean products on the East and West Coasts.

The Business Model: Today & Tomorrow

Charter and asset markets for tankers have swooned in recent years, following the huge run-up in wet markets during 2014. OSG, in regulatory filings, said, "… Impairment charges aggregating $104.4 million on seven of the Company's eight rebuilt Jones Act ATBs were recorded during 2016." Its two lightering units earn high per diems, all booked on a spot basis. Hires for its fleet of smaller and older ATBs are lower – especially those that moved into (less favorable) spot trades in 2016.

Cargo flows and distribution patterns will continue to evolve over time and the flexibility of ATBs will be pivotal as the needs of the market also change. Participants in the trade are keeping a weather eye on developments which include the burgeoning infrastructure linking the Permian Basin with refineries on the Gulf Coast, which could lead to additional coastal product moves. A potential reversal of a Buckeye Partners pipeline in central Pennsylvania could set



the stage for more coastwise shipments of product from Philadelphia-area refineries (presently moving inland). Changes are also coming to the marine fuels markets in 2020, when refiners will likely be producing increased quantities of low sulfur fuel, and transporting them to bunkering ports.

But, what about the ATB itself? A talk with the universally recognized authority on ATB design, Bob Hill of Ocean Tug & Barge, reveals a few important points. First, any fears that the traditional (reduced) manning protocols on these vessels might change has been put to rest, especially since the Coast Guard largely ignored that aspect of the regulatory picture within their recently released subchapter M towboat rules. That financial advantage isn't going to go away.

Secondly, Hill reports that customers are consistently asking for a faster boat, something that would close any remaining gap between blue water coastwise performance and that which the ATB is capable of providing. When and if that improvement can become reality – and Hill himself says the effort involves more than just adding some zip to the engines – the ATB business model that has, for the last twenty years become a big part of the coastwise landscape, will only improve with it. And if, as Crowley's Ara says, the 750's are the only ATB's that can today logically compete in the blue water sandbox, then that's likely about to change as the overall ATB fleet becomes progressively larger and eventually, faster.

Barry Parker, bdp1 Consulting Ltd provides strategic and tactical support, including analytics and communications, to businesses across the maritime spectrum. The company can be found online at www.conconnect.com

The **Strong** and Silent **Type**

Mapping and shaping the growth of marine hybrid means many things to different stakeholders. The journey leads us all to the same place.

By Robert Kunkel

Derecktor Shipyard General Manager Micah Tucker and Project Manager Joe Goodspeed shaping the Keel for the first Harbor Harvest Hybrid.

If you follow the advancements in automotive design, the term or tag "Hybrid" has come to define the alternative energy movement on our roads and highways. HEV autos have moved past Ford and GM in Detroit and into the hands of contemporary entrepreneurs and inventors the likes of Tesla's Evan Musk or Dr. Victor Wouk. BMW, Ferrari, Bentley and Rolls Royce have all followed the paths of these geniuses and have developed or are developing electric hybrid propulsion systems. A quick "Google" will report over four million hybrid automobiles running silently along our highways. More will follow despite bureaucratic debates about climate change or the Paris Accord.

Hybrid is a path towards clean and alternative energy and no one can argue any longer whether that path should be taken or not. Alternative power sources reduce emissions, save fuel, and maintenance costs and creates new jobs and opportunities for our next generation. Make no mistake: we are seeing a generational shift to alternative energy and shipping needs to climb on board.

Going Green: for the right reasons

That said; there are more important factors that the Hybrid automotive application defines than merely being "Green." It is moving an industry historically propelled by combustion engines into a new era of emissions compliance and noise reduction and it is not the result of regulation. The simple fact is that shipping needs to follow

that lead. Our industry needs to take part in this rebirth and we don't need governments or bureaucrats to advise us how it should be done. The auto industry has shown us the private citizen base has accepted and supported the movement and it is time to get that profit center offshore and into the U.S. marine industry.

Why embrace Hybrid? Quite simply, hybrid requires battery storage to be successful and energy storage is the key to alternative energy. The advancement in battery technology has been staggering and it will continue not only to increase reliability and capacity but also reduce size, weight and most importantly cost. Look to advancements not only with Tesla but also with, Plan B of Norway, Corvus Energy of Vancouver, British Columbia and Spear Power Systems of Missouri. These lithium battery energy companies are leading the U.S. and International maritime charge.

Moving Ahead Quietly

Spear Power Systems has collected a decade of experience designing and manufacturing safe and reliable lithium-ion battery systems for defense, marine, oil and gas. Spear's Trident marine ESS system is giving integrators the ability to utilize the optimal lithium-ion chemistry for their applications while leveraging a standard BMS control interface.

Designed and built specifically for the maritime industry, the Orca ESS product line from Corvus Energy represents a new solution for maritime ESS solutions. Corvus combined its industry research and development capabilities to build the largest global installed base of ESS solutions – one of industry's safest, most reliable, and cost-effective maritime ESS product line.

Separately, Plan B Energy Storage of Norway announced their latest innovations with the release of the Harpoon battery product line. Harpoon Power 65 is an evolution of the existing PBES product line incorporating new technology advances. Harpoon Power 65 now provides more than 15,000 cycles at 80% depth of discharge with reduced cost per kWh and with an impressive 35% decrease in weight, volume of the battery and overall system cost.

The development of Hybrid propulsion systems does not stop at storage and battery. The most significant task

> *Quite simply, hybrid requires battery storage to be successful and energy storage is the key to alternative energy. The advancement in battery technology has been staggering and it will continue not only to increase reliability and capacity but also reduce size, weight and most importantly cost.*

of producing a successful hybrid project is the application software and hardware controlling charge and discharge and how that software is translated into a complete "Marinized" operating platform. On our projects we selected the BAE Systems "Hybrigen" electric power and propulsion system utilizing Cummins variable speed diesel Gensets. BAE Hybrid has taken the lead with system applications with two U.S. projects on the water and a third on the way.

From our point of view as builders and integrators, the most important issue when analyzing new technologies is trend. We look for trending data and successful installations that show extended operating histories. When we were first introduced to Dave Adamaniak and his team at BAE in Rochester, NY, the question of historical success with their technology was easily answered with over 4,000 systems installed in city buses around the world. All we needed to do was "Marinize" it.

Today, we are following Norway's lead with this technology. Ampere was the first all electric groundbreaking ferry project for Noried, in collaboration with Siemens in 2014. The vessel operates on a 5.7 kilometer crossing between the villages of Lavik and Oppedal, making 34 trips a day with two 450kw electric motors. The ingenious part of the project was the charging system that incorporated battery storage at each terminal due to a challenging shore side hydroelectric grid. The project claimed a reduction of one million liters of diesel fuel, 2,680 tons of carbon dioxide and 37 tons of nitrogen oxide each year.

The glass ceiling of Hybrid size and power was also shattered by Swiss battery manufacturer LeClanche. Working with the Danish shipbuilder Soby Shipyard LTD, they collectively installed 4.2 Megawatts of power in what is claimed as the world's largest electric ferry, scheduled for delivery in June. Corvus has also installed storage on this large a platform.

CUNY 1 Siemens and Furuno navigation suite

Closer to Home

U.S. centric projects have targeted the smaller research vessel, harbor Tug and passenger ferry markets. The first of our Hybrid vessels was delivered to the Norwalk Maritime Aquarium as a 65' catamaran research vessel carrying 65 students each trip into Long Island Sound in 2015. The second vessel, using a similar research design for the City University of New York and again built at Derecktor Shipyard in New York, completed trials and was commissioned this month.

More recently, our project with Harbor Harvest and Harbor Connect of Norwalk, CT moves Hybrid into new markets of moving cargoes of agriculture and artisan food products along Long Island Sound between New York and Connecticut ports. This hybrid will be the third generation project completed by the BAE, Derecktor and the Amtech team. Moreover, the project has been submitted to the Federal Department of Transportation's Maritime Administration Marine Highway program and we expect our official project designation within the coming weeks.

Separately, the new Connecticut State Port Authority is the project's public sponsor and it has been widely supported by Congressman Jim Himes and State Senator Bob Duff. Connecticut area merchants, local farms on both sides of the Sound and the shellfish community are all eagerly waiting the project's arrival. The first catamaran, incorporating many of the upgrades and modifications made available to the CUNY 1 hybrid will be available spring of 2018. The keel was laid at Derecktor Shipyard this month.

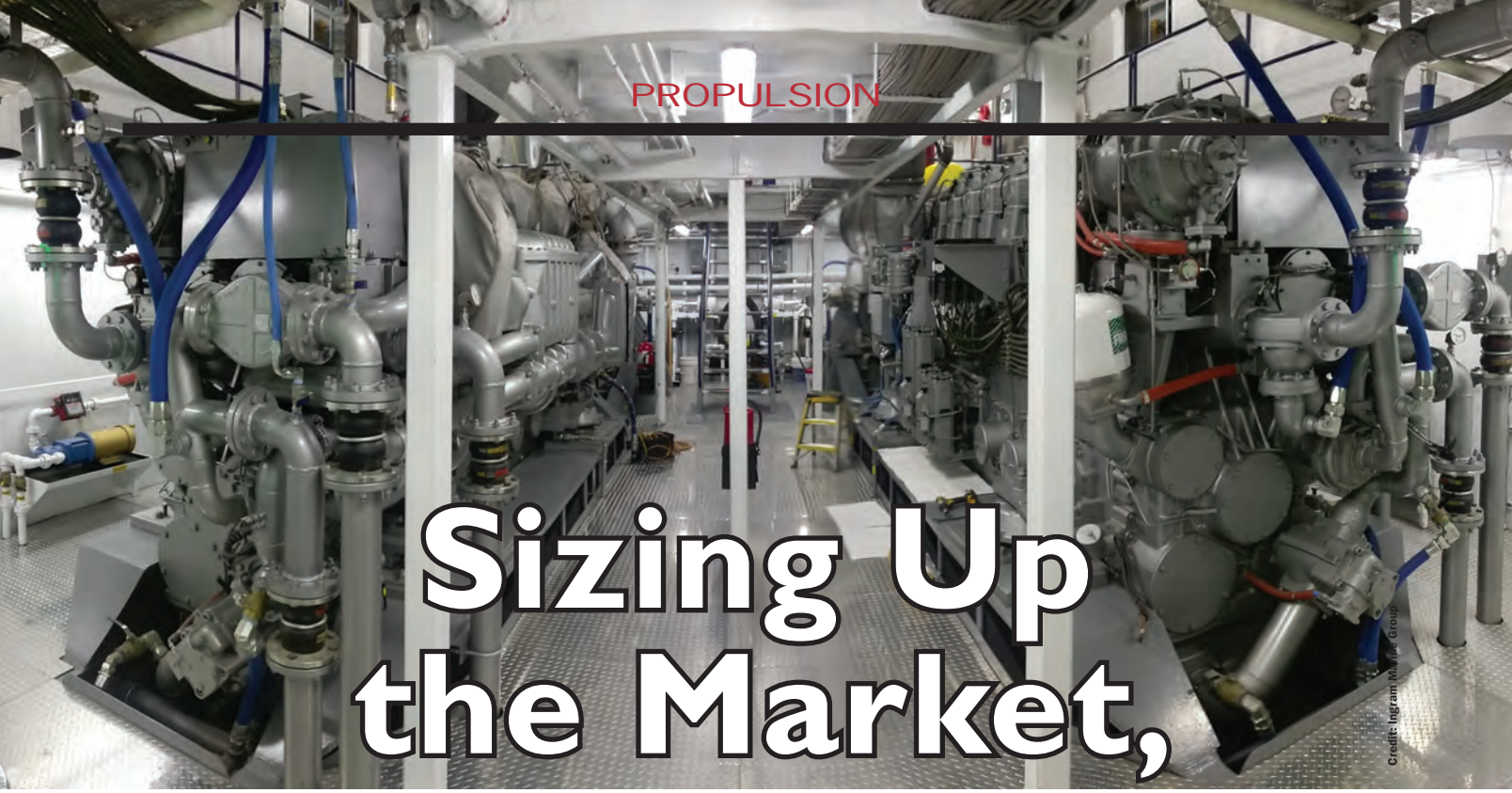
This Harbor Harvest Hybrid Catamaran will carry 12,000 pounds of pallet cargo, much of which is refrigerated on board. The vessel will be berthed at the Copps Island Oyster facility in East Norwalk and recognize the Port of Norwalk, Connecticut as one of the nation's first environmentally sustainable secondary ports. The growth potential of the Marine Highway project is enormous. Follow on vessels serving the mid Hudson valley along the Hudson River and coastal areas reaching into Rhode Island and Maine are under consideration. No less then five trade routes within Long Island Sound have been identified to continue the series.

Hand-in-Hand: Marine Highways, Hybrid, and Shoreside Infrastructure

The growth potential of hybrid and shortsea shipping –hand-in-hand – raises another subject that should also be vigorously debated within the U.S. Maritime industry; namely, the loss of our working waterfront. Harbor Connect moved towards the Hybrid Catamaran design to gentrify coastal cargo movements, develop new markets for our local farmers and work towards an environmentally sustainable transportation system; a system that can rise above the "not in my backyard" noise. To develop these projects we need to support our working waterfronts.

We have seen a Bridgeport, Connecticut shipyard – a developed shipyard site we actively pursued with the city to continue building Hybrids – fall to real estate development that includes restaurants and apartment complexes. We are now investigating the reconstruction of the Manrissa/NRG real estate to develop gentrified working waterfront properties that continue the New England tradition of commercial fishing, shipbuilding and repair. Offshore wind, Solar and hybrid alternative energy will require the working waterfront to not only exist, but also to grow. And support these local industries. Amtech and Harbor Harvest both intend to be part of that growth.

Robert Kunkel, President of Alternative Marine Technologies, previously served as the Federal Chairman of the Short Sea Shipping Cooperative Program under the Maritime Administration and the USDOT from 2003 until 2008. A past Vice President of the Connecticut Maritime Association, he is a contributing writer for MarineNews. A graduate of the Massachusetts Maritime Academy, Kunkel sailed as a licensed engineer and continued his career in ship construction at NASSCO and Hyundai Heavy Industries, among others. He is a senior member of the Special Committee on Ship Operation with ABS and an elected member of the NCB.



Sizing Up the Market, Scaling Solutions to Size

GE Dips its Toes in Inland Waters with its compact and easy to install Tier IV EGR Solution

By Joseph Keefe

In October of 2014, news of Oceaneering's purchase of GE Transportation's newest marine engine offering was making waves. These engines – ones which meet EPA Tier 4i and IMO Tier III Emissions standards – without the need for a Selective Catalytic Reduction system (SCR) exhaust gas after-treatment, had workboat operators everywhere looking at new possibilities. Before that, Harvey Gulf International Marine also entered into a contract to construct a new Multipurpose Field Support Vessel (MPFSV) at Eastern Shipbuilding, this one also powered by GE's Tier 4 compliant, EGR main engines. That's important because Harvey Gulf, the recognized North American leader in rolling out LNG and dual fuel propulsion vessels, in this case, selected a pure diesel engine.

Fast Forward

Two years later, more compact versions of the environmentally advanced engines have been introduced to the inland and workboat sectors. Until recently, the repower or rebuild quandary was largely a question of whether to go with diesel and SCR, dual fuel and/or pure gas engines. As mid-year 2017 approaches, vessel operators in virtually every category have a new choice to consider when it comes to newbuild or repower decisions. The GE Marine 12V250 Marine diesel engines reduced NOx emissions by 70 percent when compared to EPA Tier 2 or IMO Tier II. Common rail fuel injection provides better fuel atomization through a high-pressure fuel rail feeding solenoid valves instead of individual high-pressure fuel pumps feeding in-

dividual injector units. This injection method also allows for better control of injection timing over the entire operating range. Exhaust Gas Recirculation lowers NOx emissions by cooling, mixing, and recirculating a portion of the exhaust gas with incoming air to reduce stack emissions. This method is self-contained within the engine.

Beyond this, GE Marine's self-described 'breakthrough' engine technology not only eliminates the need for SCR, but all of the extra costs associated with that extraneous equipment. Now, that option also comes in both 6L and 8L versions.

Operators tempted by the LNG route still must decide whether the present infrastructure – and that which is promised – will materialize and if so, will be adequate to their requirements. For others, the answer, until just recently, was quite clear: eventually you'd need SCR. And in the case of both LNG and SCR assisted diesel arrangements, operators were looking at large infrastructure installs and the potential loss of deadweight and/or capacity. Not anymore, says GE.

GE Engines are offered for direct mechanical propulsion or as gensets for diesel-electric propulsion.

GE's Newest Marine Engines – up close and personal

In a late May, ***MarineNews*** and Hatton Marine's Thor Hatton and Matt Zeitz toured the GE Marine Engine production facility located in Grove city, PA. Employing 500, GE produces three Tier 4 compliant, EGR solution marine engines here. Seattle-based Hatton Marine, an engine distribution shop providing both service and installation work, partners with many OEM's, none more important at this time than GE Marine. Firm believers in the GE EGR solution, they've gotten in on the ground

"Many of our customers operate in remote areas of Alaska for extended periods of time, or tow back and forth to Hawaii. Logistically, supplying DEF to vessels in these areas could be difficult. Certain components of the SCR system will require maintenance or replacement ahead of a typical engine overhaul cycle – pump, dosing injector, the catalyst itself."

–Thor Hatton, Hatton Marine

floor with GE, and are now actively planning and taking orders for the simple Tier 4 solution.

For Thor Hatton, sales will never be Hatton Marine's main focus. That said; and with so many different lines to choose from, Hatton Marine will always sell the customer what they want and what is best for their application. For example, Hatton represents Brunvoll-Volda Propulsion, allowing Hatton to offer a complete, turn-key propulsion package along with the GE engine, whether conventional, diesel-electric or in a number of different configuration options. Following every engine from cradle to grave, Hatton provides, 24/7/365, worldwide, the following services:

- *Sale of an engine;*
- *Installation and commissioning;*
- *Fabrication of engine room exhaust & piping;*
- *Gear & drive line sale and installation*
- *Generator sale and installation*
- *Service support over the life of all those products*

The GE Tier 4 solution has gained considerable traction in the past three years, and sales of the 6L and 8L versions – those suited to smaller workboats – are eclipsing the sales of the larger engines. This is hardly GE's first rodeo with

OPERATOR	VESSEL TYPE	SHIPYARD	ASSIGNMENT	6L250MDC	8L250MDC	12V250MDC
HARVEY GULF	MPFSV		NEW			2
INGRAM	TUG		REPOWER		2	
INGRAM	TUG		REPOWER		2	
INGRAM	TUG		REPOWER		2	
OCEANEERING	MSSCV	BAE	NEW			5
REINAUER	TUG	SENESCO	NEW			2
REINAUER	TUG	SENESCO	NEW			2
REINAUER	TUG		NEW	2		
REINAUER	TUG		NEW	2		
YOUNG BROS	TUG	CONRAD	NEW		2	
YOUNG BROS	LINE HAUL TUG	CONRAD	NEW		2	
YOUNG BROS	LINE HAUL TUG	CONRAD	NEW		2	
YOUNG BROS	LINE HAUL TUG	CONRAD	NEW		2	
HARLEY MARINE	ATB	CONRAD	NEW	2		
HARLEY MARINE	ATB	CONRAD	NEW	2		
PAA	ATB	FINCANTIERI	NEW			2
AMA	TUG	FINCANTIERI	NEW			2
OTHER	ASD ESCORT TUG		NEW			2
TOTAL				8	14	17

Source: Hatton Marine

Tier 4. With more than 850 Tier-4 compliant locomotive engines already in service, GE's marine sector offerings are based on a proven, time-tested concept. Hatton told ***MarineNews*** in May, "The 250 series marine engine is based on the GE Evolution or 'EVO' locomotive engine which was originally a 12 cylinder V engine. A few years ago GE developed an inline 6 and inline 8 engine based on the same 250mm bore engine platform. Typically this has been used in tugs, ATB's, fishing vessels."

The most immediate impact of Tier 4 regulations to the maritime industry is with new construction vessels, but that hasn't stopped Ingram from plans to repower at least three of their workboats with the GE tier 4 solution.

Credit: Hatton Marine

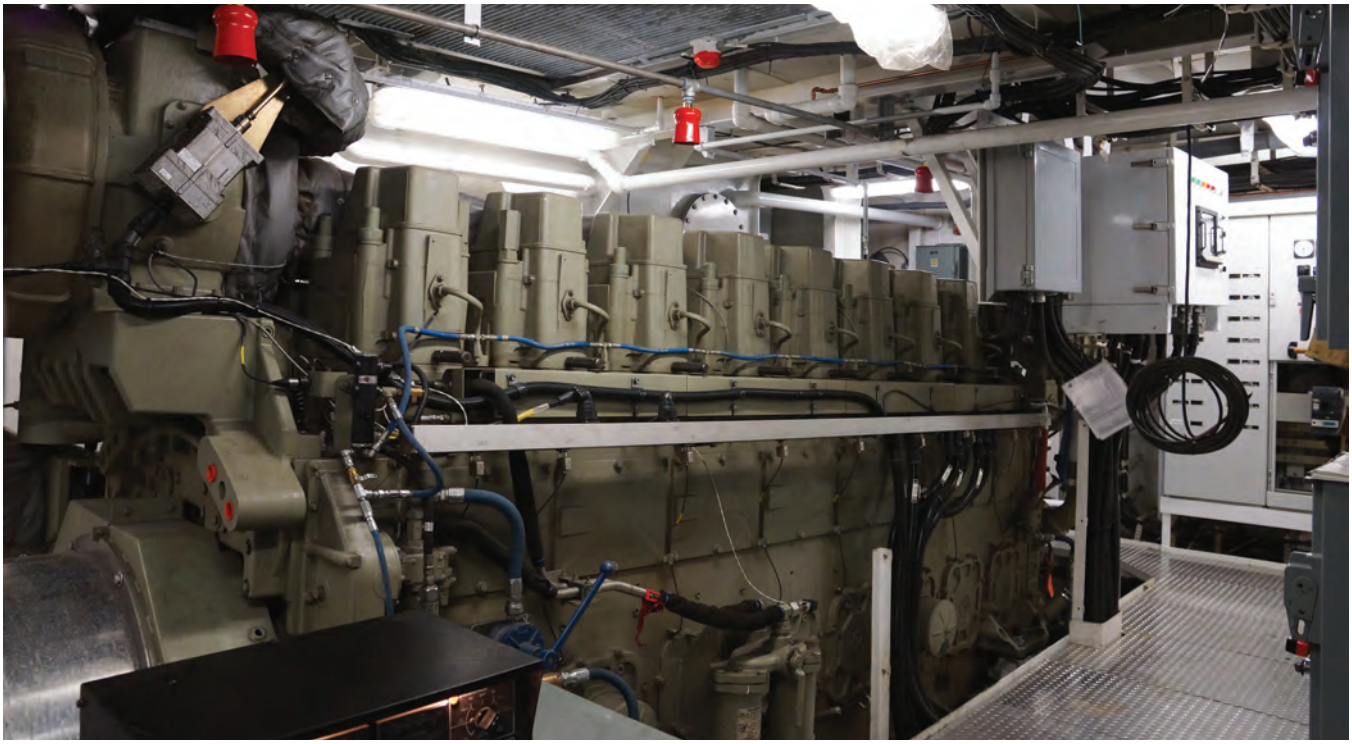
Decisions: Data Driven

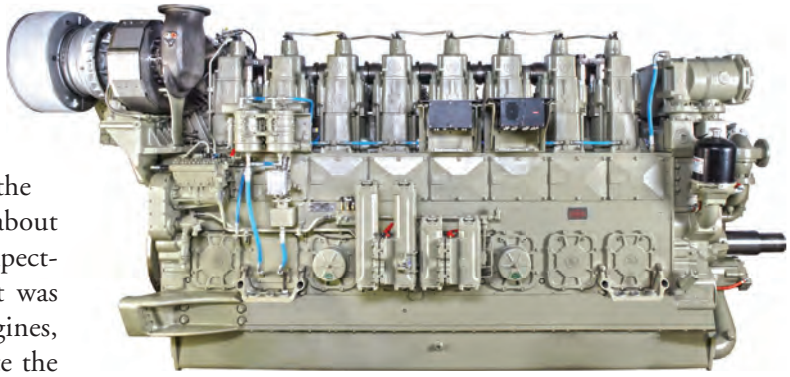
It can be a difficult decision for any operator to decide how, when and which propulsion option to select. These choices include so-called 'tier beaters,' LNG, dual fuel and of course, Tier 4 compliant SCR solutions. Hatton's Matt Zeitz answered that question with one of his own, saying, "One of the questions that I am frequently asked is 'Why is GE the only one using this technology?' The answer is that GE already had a large market for the Tier 4 engine platform due to their position in the railroad industry which allowed them to make the significant investment it took to develop the technology. Rail operators required a solution that was compact enough to fit within a locomotive car body, and that did not use urea to achieve emissions compliance."

The new GE Tier 4 engine is larger and heavier. Based on GE data, the weight increased by 9% and engine room space consumed increased by 12%. That increased size could also involve increased engine foundation strength. The GE 8L250 is nominally heavier than the CAT 3516 (not surprising comparing medium speed to high speed engines – see table 5), but, says Hatton, "There's no comparison when you consider the added weight of the aftertreatment system and urea."

On any workboat, however, space is always a concern. GE's Tier 4 engine has increased incrementally in weight and volume, but the footprint is essentially the same as a Tier 2/3 engine. Using SCR, a line haul tug or fishing vessel would need to carry a significant volume of urea compared to, say a harbor tug. Hatton adds, "Many of our customers operate in remote areas of Alaska for extended periods of time, or tow back and forth to Hawaii. Logistically, supplying DEF to vessels in these areas could be difficult."

From an OpEx perspective, the GE Tier 4 engine requires no additional maintenance, and there is no interval for a 'top end' overhaul. Hatton continues, "Certain components of the SCR system will require maintenance





or replacement ahead of a typical engine overhaul cycle – pump, dosing injector, the catalyst itself."

Separately, an operator must consider fuel consumption. An industry analysis report comparing the GE solution to the SCR solution showed that the overall fluid consumption for the SCR solution was about equal between their Tier 2 and Tier 4 engines; expected fuel savings combined with increased urea cost was a 'wash.' Hence, for a comparable Caterpillar Engines, for example, it is not any more expensive to operate the C280 Tier 4 than the C280 Tier 2 engine.

Conversely, GE has shown that their Tier 4 engines have achieved lower fuel consumption compared to the Tier 2 product. Since no urea is used, overall fluid consumption is lower. According to GE, the EGR impact to fuel consumption will be slightly better than the Tier 2 engine solution, providing potential savings.

The GE solution has the least amount of impact to the vessel. SCR solutions, in contrast, constitute significant impact to vessel design. For GE's EGR version, the only significant non-engine component that will need to be addressed is the shipyard supplied engine cooling system, which will need to reject more heat due to the addition of cooling for exhaust gas recirculation. DEF storage for SCR solutions, on the other hand, could be reduced depending on voyages, plans, logistics and operator preference. At the same time, and depending of the arrangement of the DEF storage, cargo fuel storage capacity may be displaced to allow room for DEF storage.

Zeitz points out that the SCR solution is unstable at extreme temperatures, and at least in the short term the market for it would be limited, especially in remote areas. In May, Jensen's Johan Sperling told ***MarineNews***, "A lot of people don't like urea – I don't blame them. The after treatment system can be large, it is warm; it has all kinds of things that we're not used to." That's because Urea is caustic, creating a highly corrosive environment. For example, if freezing is a concern, additional tank and blanket heating might be needed. Conversely, if temperatures rise above 122°F (50°C), ammonia is formed, causing degradation of the DEF solution. After 6 days of being stored at 122°F (50°C) or greater, the maximum limit of ammonia is exceeded. Therefore, a cool, well-ventilated DEF storage should be considered.

On the Water, Now

Bob Dorn owns and leases out three tugboats that collectively employ a total of eight, inline 8 GE engines. The Hatton Marine client was effusive in his praise of the GE brand, saying, "The more I dove into it, GEs were by far the best choice. When we were going through this process (Engine selection for his new builds) fuel was at four dollars a gallon, and the engines that I've operated for over 30 years burn about 5,000 gallons a day. I was hoping to burn 4,000 gallons a day with GE, and at 4 dollars a gallon I figured that's a great savings—we can save $4,000 a day. It turns out that instead of 4,000 gallons a day they were burning 2,700 gallons a day. That meant a savings of $10,000 dollars a day on fuel, and you have these vessels for 30 to 40 years that's an amazing savings over time."

Dorn touches upon one additional (perhaps unexpected) benefit of the GE engines. He explains, "The Coast Guard has done lots of studies on crew fatigue and one of the outcomes of that is a lower frequency sound is easier to live with so everybody loves working on a GE engine boat as opposed to high speed or two stroke engine vessels. I've been happy with the decision we made (GE engines) and the customers we have like them a great deal."

An extensive test cell at the Grove City plant verifies the performance and compliance of each engine, before it is shipped. In GE's locomotive sector, that engine performance is monitored in real time continuously and that same advantage is being developed and discussed for GE's marine engines, as well. At that point, the proven utility of this Tier 4 solution might be as common as the 850+ GE locomotive engines, from which this marine offering emanated. In the meantime, Tier 4 compliance just got a little easier; in the yard, on the water, and beyond.

Table 5

	GE 8L250	C280-8	3516C
Weight (kg) of Tier 2 solution	20,000	19,000	9,000
Volume (m^3) of Tier 2 solution	28	24	13
Additional Weight (kg) of Tier 4	23,356	99,254	65,596
Additional Volume (m^3) of Tier 4	4	103	65
Additional weight impact for tier 4	17%	522%	729%
Additional volume impact for tier 4	13%	432%	502%

Credit: ZF Marine

Z-DRIVE COLLABORATION ON THE INLAND WATERWAYS EXPANDS

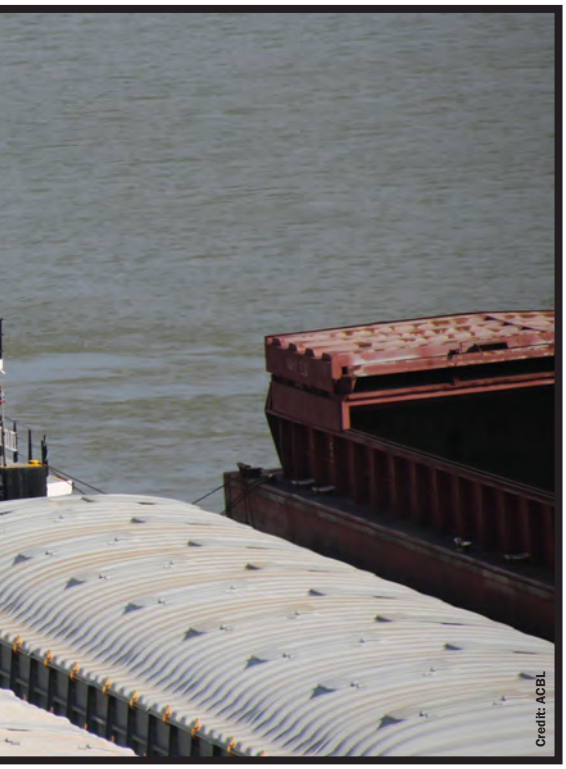
American Commercial Barge Line's leadership and early adoption of ZF Marine's z-drive propulsion technology underscores a growing trend on the inland waterways.

By Joseph Keefe

American Commercial Barge Line (ACBL) has been around a long time – since 1915, to be exact – and along the way has developed into one of the dominant players in the inland marine transportation industry. With a passion for safety and a green footprint, ACBL has always embraced technology and innovation. That point was obvious when it made the decision to outfit at least 15 of its towboats with ZF Marine's Z-drive systems.

The Z-Drive installations are but a small part of a $500 million fleet and equipment investment that ACBL has undertaken over the course of the last five years. Today's ACBL fleet includes about 4,200 barges powered by 175 towboats. Only a small number of those ACBL towboats are Z-drive propelled, but the percentage of ACBL's fleet that has made the change eclipses that of the U.S. flag pushboat population.

That all of these systems came from ZF Marine speaks volumes. For its part, ZF Marine supplies propulsion



system components for a myriad of military and commercial vessels and workboats, in a power range from 10 to 14,000 kW. The product portfolio includes a comprehensive range of transmissions, propellers POD-drive systems, steering systems and CAN-bus-compatible, electronic control systems, azimuth thrusters, tunnel thrusters, bow thrusters and sail drives.

As ZF penetrates deeper into z-drives for brown water, early adopters have found performance gains, increased maneuverability, and reduced fuel consumption with this technology. With over 150 Z-drive units already delivered on the inland waterways alone – the first to Southern Towing back in 2009 – the ZF thruster equipped fleet has well over 1 million operating hours, and counting. Nevertheless, says ZF Marine's Marketing and Communications Manager Martin Meissner, "ZF is not content to sit on its hands, annually investing about 5% of its sales in research and development."

The ABC's of ACBL's Early Adoption

In a white paper released in 2014 by The Shearer Group, Ed Shearer and Greg Beers described the next generation of inland vessels, what will drive design changes and the advantages of azimuthing stern drives – or 'Z-Drives,' for short. The authors pointed out that towboats on all the inland waterways and Gulf Coast have traditionally been built using main engines connected to reduction gearboxes connected to long drive shafts passing through the towboat hull.

The Shearer Group touts the advantages of using z-Drives on inland towboats, including decreased installation time, increased fuel efficiency, increased trip time efficiency, decreased maintenance downtime, and higher customer satisfaction. In fact, savings in fuel and trip time from ten to thirty percent have been shown to be possible – in theory and actual towboat operation.

According to Bill Foster, ACBL's Senior Director of Engineering, the ACBL fleet currently boasts 13 Z-drive boats and two more are on the way (newbuild). And, he told MarineNews in June, ACBL had two primary reasons to go with the Z-drives. "Our two primary reasons centered on safety – specifically to achieve improved handling to reduce operational risk. Also at the top of that list was fuel economy," he said, adding, "Our expectations for reliability are the same for both Conventional and Z-Drive boats."

Regarding performance, Foster says, "Our experience has been that the boats save fuel compared to conventional propeller/rudder designs (savings 10-20% depending on the service the boats are in)." He continued, "We have one boat in dedicated fleet service and have a recognized productivity enhancement, and improved operational safety. Currently we are at about 10% with Z-drives, and depending on the service and our continued positive experience with Z-drives this is very likely to continue to grow in the coming years."

Z-Drives: stirring up that brown water

Two Z-Drive tugs can theoretically take the place of four conventional tugs during the typical ship docking operation. But, how does that 'power metric' translate to inland pushboat operations? We asked Foster in June and he explained, "We expect that four to five Z-drive fleet boats will replace six conventional fleet boats, but in the mainline and dedicated boat trades, the value proposition will be more returned do to the improved handling, and reduced fuel consumption, a like HP Z-drive or conventional towboat is still a requirement." Foster then asked a question of his own, saying

Bill Foster,
ACBL's Senior Director of Engineering

Martin Meissner,
ZF Marine Propulsion Systems Miramar, LLC

"The big question is what size of a large HP Z-drive boat would be needed displace the large 9,000-11,000HP lower Mississippi boat, and can it balance the need for large tows Northbound and southbound in the open river."

Separately, some owners who adopted the Z-Drive solution found operational efficiencies that allow them to install up to 20 percent less power with steerable thrusters versus traditional FPP props. For ACBL, Foster reports, "In our experience we have found a few applications where this is possible, but it is still not an accepted practice in the market that the bulk of our Z-drive boats are trading in."

Looking Ahead

According to Foster, to date, ACBL has only built (ZF-powered) boats in one Horsepower/size segment of the fleet. As to when that might change, he said, "There are six other HP classes that we have only conventional drive. The cost to build new; and our ability to extend the life of the existing assets will slow the expansion into other areas." And while some stakeholders say that Z-Drive propulsion will soon overtake conventional drive methods on the U.S inland rivers, Foster hedged his bets when asked for his assessment. Even as an early adopter with encouraging results to start, he cautioned, "It is possible, but it will take many years before it is widely accepted as the standard. The immense infrastructure of spare parts, and set up of the support for conventional boats will hinder the transition."

To that end, ZF Marine last year announced that it was growing its presence in Louisiana by securing a new location for their Gulf of Mexico/Inland Waterway sales and service operations. Present in greater New Orleans since late 1996, the original office was the first satellite location outside of ZF's North American marine headquarters, providing support for the commercial vessel industry in the Gulf of Mexico.

Twenty years later, the new location, located in Elmwood, LA, is almost triple the size of the current facility. It will also allow the firm to ramp up service to inland waterway customers.

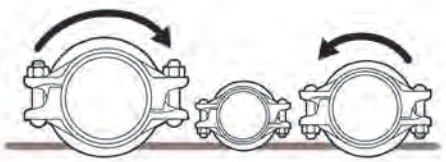
Boasting support for repair and overhaul activities, the new office will provide localized spare parts as well as complete swing unit warehousing. The facility will also be able to support training activities for all of ZF Marine's product families. The location is planned to open in the second quarter of 2017. But, says ZF's Meissner, offices and equipment are only one part of the ZF story.

"Each project has a Project Manager that 'quarterbacks' the entire activity. In-house Naval Architects and Application Engineers work with the shipyard and the vessel owner to review and approve each application," he said, adding enthusiastically, "Field Engineers and Technicians help coordinate and check the physical installation of the complete system, bringing the system online, and participate in both builder's trials and customer acceptance trials. Once the vessel is in service we have a local support network that can meet the needs of our customers with time sensitive parts and service support wherever the vessel is."

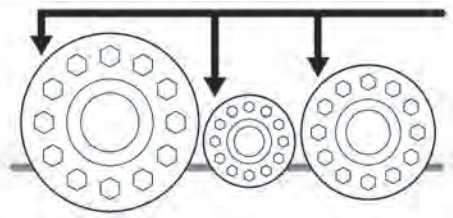
What happens next in terms of inland penetration for ZF will depend on a lot of things, none more important than demonstrating to a traditionally conservative market that future support will match and exceed early adopter successes. Firms like ACBL will accept nothing less, and for his part, Meissner, in a video interview with ***Maritime Reporter's*** Greg Trauthwein in late 2016, said simply, "We're doubling down on the inland waterways." That kind of trust, matched by collaborative support, bodes well for the future of Z-Drives in brown water.

Grooving the Way: Back to the Future

Anything but new, the Victaulic method of pipe-joining has been around for a long time. Armed with myriad type approvals from most IACS groups, Victaulic's output will no doubt (and soon) form a part of your marine equipment for a long time to come.



By Joseph Keefe



The conservative and staid domestic waterfront, especially where it intersects boatbuilding and repair, recently set sail for increased efficiencies, driven in part by emerging technologies, but also through improved management and new assembly techniques. It was in 2013 that Boysie Bollinger's son, Chris Bollinger, then a member of the Bollinger senior management team, proclaimed, "Boatbuilding is evolving into something that will more closely resemble manufacturing, as we know it in other industries." Today, Bollinger is a leader in robotic shipbuilding, right here at home on the Gulf Coast. Separately, other similarly positive developments are also underway.

History Repeats Itself

Today's need to become more efficient, cost-conscious and to provide higher quality output mirrors a similar situation which played out more than 75 years ago. The advent of World War II forced U.S. builders to more quickly produce merchant hulls in quantity, and with good quality. Eventually, more than 2,170 Liberty Ships and later, 531 Victory Ships were produced – at the sometimes astounding speed of one every 30 days. That process was surely sped along was through the use of Victaulic pipe couplings.

The John W. Brown, one of two surviving fully operational Liberty ships, was launched in Baltimore on September 7, 1942. In 1983, Project Liberty Ship acquired the Brown and, in 1988, moved the vessel to the harbor of her birth where it serves as a memorial museum ship. But, Liberty ships were not expected to last even five years; never mind 75. The longevity of the Brown can be credited to many things – the all-volunteer crew that returned it to operating condition, for one. Another element includes the vintage ballast lines, joined so many years ago with Victaulic grooved couplings.

For more than 70 years, the lines have remained leak-free. There is no known record of any maintenance being performed on the ballast lines, and the grooved couplings visible today are the original couplings installed in 1942. This carbon steel piping of the ballast system consists of flexible malleable iron Victaulic couplings, which at the time were referred to as standard couplings for grooved steel pipe. Victaulic Style 77 flexible grooved couplings are the equivalent of these couplings today. Indeed, Victaulic promotional brochures for marine applications can be sourced as far back as the 1920's.

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Ballast Battles: no problem

The same benefits that Victaulic brought to that class of vessel long ago are no less important today. That's because an estimated 60,000 vessels will need ballast water treatment systems (BWTS) in the next five years, and mathematically, there is not enough yard capacity or skilled labor to meet expected demand. That's where Victaulic comes in. In 1942, speed and ease of installation was probably the most important factor in selecting grooved joining systems. That hasn't changed. More importantly, and although some owners remain unaware of this system, it isn't anything new.

For Jones Act tonnage fleeing to Asian yards for a less expensive fitting, Victaulic manufactures not only here in the United States, but also in Mexico, Poland and China, as well. Wherever you go to refit – or build from new – Victaulic parts can be efficiently and economically obtained. But, what if you are one of the 60,000 vessels that can't find dry dock space? In that case, a Victaulic-enabled BWTS system might be installed at sea, without having to deal with hot work.

In space-challenged pumprooms (where BWT equipment will be shoehorned), space is already at a premium. The reduced footprint of a Victaulic coupling will help to find room for BWTS equipment not originally envisioned by a builder, ten years prior. In fact, Victaulic coupling's 360-degree orientation capabilities, together with its smaller profile compared to a flange, make the installation of grooved systems ideal for any confined space. That's because traditional flanges are twice the outside diameter of the pipe they are attached to.

A six inch valve assembly that utilizes a grooved-end butterfly valve, grooved-end pipe and two rigid couplings to connect the components weighs approximately 35 pounds, representing a 58 percent weight reduction over the flanged assembly. Beyond this, a DIN 150 ballast line installed showed a weight reduction of 30 percent when Victaulic was used instead of traditional joining methods. 52 slip-on flanges, bolt sets and gaskets, versus 60 rigid couplings accounted for major weight increases in the welded/flanged system. Moreover, weight reductions by using grooved pipe couplings are achievable across a range of pipe sizes.

Shipyards that have used grooved couplings in place of flanges on selected systems have recorded weight savings of 12 tons on OSV tonnage. The benefits of grooved technology can translate into more deadweight capacity, additional passenger load and/or less fuel consumption. It goes without saying that lighter assemblies are easier handle during installation and/or maintenance. After the fact, where excessive vibration can decrease the lifetime of a piping system, the elastomeric gasket contained within the grooved coupling reduces noise and vibration.

Finally, and with some estimates of BWTS installation costs reaching as much as $1.5 million USD (not to mention lost opportunity costs), a comparison of a DIN 150 ballast line installed using Victaulic grooved products versus traditional joining methods showed a 66 percent reduction in installation time required (293 man hours). Time is money, and every second spent unnecessarily in drydock is time that any vessel – in any trade – isn't earning revenues.

Advantages:

Creates rigid, permanent, leak-tight joints in seconds	Lighter than standard flanging
No flame, arc or cutting oil / or hotwork permit needed	Smaller volumetric footprint
Simple system limits extensive training requirements	Faster than welding, traditional methods
Pipe joining can be accomplished while underway	Time = Money (reduced installation time)
Elastomeric gasket & pipe grooving reduces leaks	Reduced vibration

Type Approvals for Myriad Applications

Victaulic's mechanical pipe-joining systems have achieved approvals from IACS classification societies such as ABS, BV, DNV, GL, the Korean Register and Lloyd's Register for Vic-Press, the flame-free press system for joining small-diameter stainless steel pipe. With these approvals, shipbuilders will be able to take advantage of Vic-Press as a means of joining stainless steel pipe in new-vessel construction, retrofit and repair operations. The system is approved for use in class III piping systems for marine and offshore applications. And, the utility of this type of piping system has the potential to significantly ease the pain of the coming BWTS installations.

Beyond the IACS approvals, the scope of tasks now allowed for use of Victaulic solutions has expanded exponentially. Available in both rigid and flexible forms, grooved mechanical pipe couplings may be used in lieu of welded/flanged methods in 30 systems, subject to installation criteria established by each certifying agency.

Beyond BWTS

Not every vessel will need a ballast water treatment system. But, owing to the uncertainties surrounding the sVGP and proposed VIDA legislation, workboats nevertheless need to think about the unintended consequences of poorly connected or worn piping. With 27 discharge streams governed by EPA's VGP, there's a Victaulic solution for any and perhaps all of those worries. Take McAllister Towing, for example, who avoided a date with the drydock, not too long ago.

Leveraging Victaulic's methods, McAllister was able to accomplish repairs not just quickly, but at a lower cost and in a safer manner than conventional methods. The Robert E. McAllister, a harbor assist tug built in 1969, has seen a lot of action over time. In this case, a bolted sleeve type coupling on the Robert's engine cooling water supply line sprung a leak, and maintenance personnel needed a way to fix it quickly, once and for all. It wasn't the first time that joint had leaked, and if they tightened it as they had in the past, there was no guarantee the seal—or for that matter, the coupling—would hold.

Credit: Victaulic

McAllister considered welding the pipe, but in this case, they also didn't have the luxury to go into the drydock. Instead, Victaulic visited the tug to review the situation, and recommended the Style 99 Plain End Roust-A-Bout Coupling to replace the bolted sleeve couplings.

With multiple IACS type approvals, Style 99 is advantageous for retrofit and repair services because there's little upfront tooling cost. The lack of extensive pipe-end preparation means the coupling can be installed quickly, limiting downtime. In fact, the repair was completed dockside in just over an hour, all without the need for a certified welder and/or hot work permit. The cost was limited to the price of the couplings, which was well within the repair budget. As a result, McAllister has done the same type of repair on many other of the firm's tugs.

Victaulic Vetted

The same characteristics of grooved piping systems that accelerate installation also make system maintenance a similarly simple task. That said, and because they do not require retightening, these couplings eliminate much of the routine maintenance associated with flanges. Chances are – witness the John W. Brown – you won't need to deal with that joint ever again, but if you do, you'll double your CapEx savings on the back end.

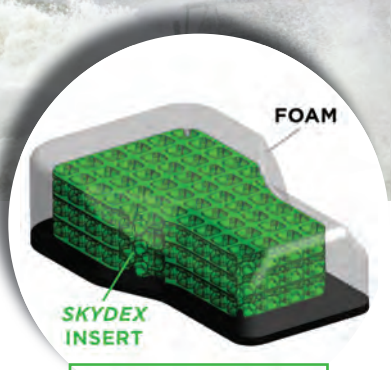
It is still the case that many operators are unfamiliar with Victaulic and grooved couplings for piping, in general. Those unsure about the concept can, however, be sure that it has been thoroughly vetted and stood the test of time. Shipyard repair challenges haven't changed much over the past 75 years, while the reasons for these issues certainly have. Through it all, Victaulic has always been part of the solution. **www.victaulic.com**

A Sampling of Victaulic Type-Approved Applications:

Fresh Water	Sanitary	Sea Water Cooling
Bilge Pipes	Fire Main	Compressed Air
Potable Water	Ballast Water	Vents, Overflow, Sounding

(*) ABS Matrix / source: Victaulic

Credit: Flying Focus



SKYDEX cushion inserts utilize polymer based geometries in innovative shock mitigating marine seats

Shock Mitigation Strategy for Fast Repetitive Shock & Whole Body Vibration

A workshop designed to raise awareness about Repetitive Shock & Whole Body Vibration on Fast Craft brings knowledge to the maritime sector.

By John Haynes, Operations Director of Shock Mitigation

In April, more than 80 maritime professionals attended two unique one day events focused on the sub IMO/sub 80 foot vessel sector in Southampton, UK. The fast moving *Repetitive Shock & Whole Body Vibration* (RS & WBV) Workshop brought together an international group of experts armed with the latest knowledge to identify problems that affect the maritime sector worldwide.

Defining Shock Mitigation

The Workshop opened by centering on the concept of shock mitigation, which is to make a violent collision or impact less intense. A shock mitigation strategy is essential for all craft that undertake open sea transits or operate in rough water. Since the 1990's, the focus has mainly been on developing mechanical suspension seats to reduce the effects of vertical accelerations. Areas requiring further investigation include fore-aft, lateral and vector forces, plus improving seat cushion performance and comfort.

The opening presentation highlighted that a serious challenge for the builders and designers of next generation RHIBs and high speed craft is to deliver platforms that balance high performance with the physical demands on crew and passengers. With the arrival of unbreakable boats – plus a surplus of engine power – feedback from the human body is the crucial input that designers and naval architects must consider for tomorrow's fast boat versions.

Dr. Tom Gunston of the ISO Standards Seat Testing Working Group also explained how laboratory testing and understanding the metrics related to repetitive shock and whole body vibration can reduce the incidence of injury. The objective of this session was to bring together a body of information that end-user organizations and industry can utilize in order to develop a holistic approach to shock mitigation on fast boats.

Robust Designs, Ergonomic Features

The next session was presented by Hans van der Molen, Head of Technical Projects and Innovation for KNRM, the Royal Netherlands Lifeboat service. He explained why their vessels are being designed to the most rigorous standards, saying, "As KNRM rescue vessels have to be deployable in all weather conditions, seakeeping and stability are the most crucial factors in safety. For the crew, however, comfort and user-friendliness are also key features."

The innovative 19 meter (62-foot) rescue vessel, 'NH1816,' was built by Damen Shipyards Group in collaboration with the Maritime Technology faculty at Delft University and De Vries Lentsch Naval Architects. This vessel combines all of the technical, ergonomic and operational features that KNRM wanted in a new design. The new rescue vessel is intended to be the replacement for the current 19 meter Arie Visser-class vessels. Specific requirements to be met by the new fleet, compared to Arie Visser Class, include significant reduction of vertical and horizontal accelerations. Designers are aiming for a minimum of 40% reduction in G-forces and significant noise reduction, set at maximum 75Db. Besides the reduction of vibrations, design also focuses on an especially ergonomically sound wheelhouse design, including wheelhouse

climate control and other increased crew comfort items.

Next up was Professor Jelte Bos of TNO, the Dutch Organization for Applied Scientific Research. He noted that while high speed craft technology develops continuously, resulting in increasing vessel capabilities, human evolution stays far behind. As a result, the performance of the system as a whole is determined more and more often by the human factor. Technological developments have also resulted in a shift of interest with respect to human health, comfort and performance from whole body vibration to repeated shocks.

The increasing impact of these shocks is largely determined by the forces exerted by the slamming boat through the seat to the vertebra. A health risk is then not only caused by single impacts crushing vertebra and intervertebral discs, but also by repeated shocks over longer periods of time, up to years. Accumulation of minor and recoverable injuries may then finally result in irreversible injury.

Bos added, "The effects of single impacts can be analyzed and predicted fairly well using biomechanical models taken from the automotive sector. These analyses can help in setting better health criteria, as well as to design better suspension seats. However, the long-term effects of repeated shocks are obscured by a lack of knowledge. Because these effects often remain under the skin until it is too late, a major challenge therefore concerns the charting of the dose-effect relationship. This will however require a shift of focus and interest from hydro mechanical issues to human medical factors."

Risk Management: Protecting Personnel

Dr. Thomas Coe is a Senior Consultant with Frazer-Nash Consultancy currently on secondment to the Naval Design Partnership as the High Speed Craft Group Manager and Technical Lead of the UK Ministry of Defence Maritime (MoD) Whole Body Vibration Project. This project focuses on the so called DLOD (Defence Lines of Development) approach which maps well on to the EU/UK control of vibration at work regulations. This DLOD approach has helped the MoD to focus on the multiple facets of managing the issue of protecting people from harm. This includes risk assessment, health monitoring and targeted training.

Coe's presentation showed the Repetitive Shock and Maritime Whole Body Vibration (RS and MWBV) Conditioning Program developed by the Royal Navy. The exercise program brings together a series of exercises to assist crews and passengers to prepare themselves for transits on fast craft. With the objective being to reduce fatigue and injury, the RS and MWBV Conditioning Program has been developed from fundamental research by medics and physical training instructors in collaboration with the Maritime WBV project. The presentation also considered the wider MoD approach to health monitoring.

Lessons Learned

All good things must come to an end and this day concluded with a panel discussion featuring James Taylor, the CEO of SKYDEX Technologies, Paul Taylor, CEO of SHOXS and Julian Morgan, Technical Director of KPM Marine. The discussion centered around 'Learning from On Water Trials, Testing and Other Transport Sectors to Improve Crew Safety.'

James Taylor showed what SKYDEX engineers have learned from developing cushion decking and shock mitigating seat cushions for various transport sectors. Metrics demonstrate how foam cushions can be replaced with innovative SKYDEX cushions, utilizing proprietary polymer structures, to reduce the effects of RS and WBV. For the marine sector, this improved protection can be achieved with no weight gain and within the existing seat footprint on jockey seating for RHIBs, on conventional wheelhouse seating, as well as to further improve the performance of suspension seating.

Paul Taylor looked at the issue of sightlines and the lessons that SHOXS have learned from developing high performance suspension seating solutions for military organizations on both sides of the big pond. As Taylor noted, when working with large groups of people, it is important to develop seating to accommodate all body sizes. He showed significant differences between the sightlines of a 5th percentile (small) person compared to a 95th percentile (large) person. He further advised that a solution to improving sightlines is raising occupants off the deck using footrests.

Finally, and no less important, Julian Morgan gave an insight into lessons learned by KPM from gathering big data as part of seat versus hull classification. As a collaborative design and manufacturing company, they focus on seat design criteria including the human interface, whole body vibration and crash testing plus legal issues and regulations. He showed data that KPM have gathered from wind farm support vessels. The data has enabled them to develop suspension seat classification for matching seat performance to vessel performance.

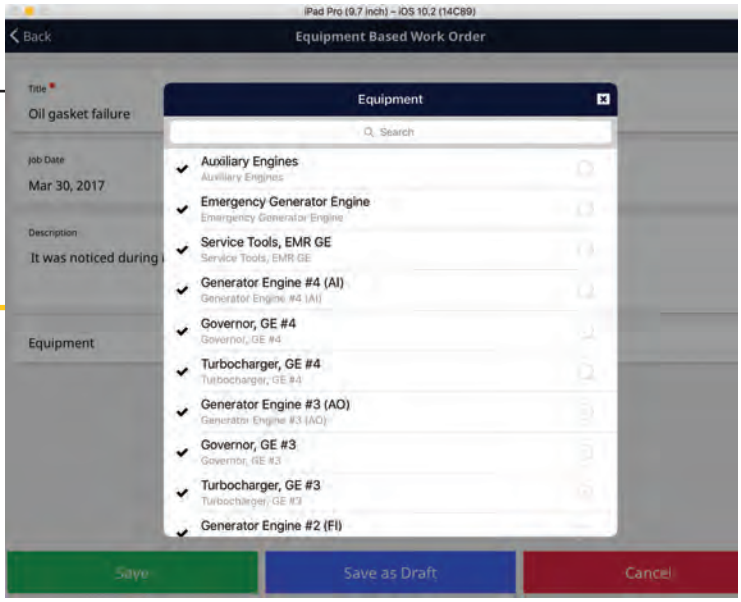
Workshop topics focused on visible issues today, plus hidden areas of concern that the professional maritime sector may need to face tomorrow.

The workshop was designed to challenge the audience for burning questions. The result was a number of constructive discussions. The RS & WBV Workshop clearly showed that as boats become faster and tasks more challenging, human factors are a growing concern for professional organizations worldwide.

Tech file

NS Workboat:

ABS mobile application is purpose-built for the workboat, inland sectors.



ABS Nautical Systems, the ABS enterprise fleet management software suite, has launched a new mobile application, NS Workboat. The latest in a line of new tools that ABS has developed to help workboat operators gain compliance with the pending Subchapter M regulations, the 'app', which leverages the Nautical Systems enterprise software, is a mobile solution that is purpose-built for the workboat and inland-shipping sectors, where ease of use is of paramount importance.

Simple Interface Supports SubM Compliance

ABS discussions with stakeholders revealed a demand for easy-to-use solutions designed with crews in mind. The ABS NS Workboat App a simple interface is designed to support day-to-day, allowing users to manage the process for Sub M requirements while improving the accuracy of compliance reporting.

The Coast Guard's Sub-M regulations gave owners multiple options to achieve compliance, recognizing the varied operating environments for the 6,000-odd vessels affected. One way to gain compliance with Subchapter M is for vessel owners to qualify for a certificate of inspection from the U.S. Coast Guard. Another option is to implement a Towing Safety Management System (TSMS). On the auditing side, the owner has several options to demonstrate compliance with Sub M requirements. They can comply by using a safety management system (SMS) within the ISM Code, the AWO's Responsible Carrier Program, or through a custom-made SMS reviewed by an authorized third party such as ABS.

Regardless of how owners comply, data will need to be collected and new procedures will need to be implemented. In response, ABS offers a wider portfolio of class-centric products and services, including supporting the regulation with ABS Nautical Systems software. The NS Workboat application is delivered preconfigured with the user's choice of the Sub M compliance options. A cloud-based solution offered by subscription on iOS or Android operating systems, deployment to the cloud minimizes further IT investment.

Plug & Play

No software is required onboard the vessel. Because the program is based on the daily activities of the crew and offered on a familiar mobile device, only training is required. Great Lakes Dredge & Dock (GLDD), Bering Marine Corp and Genesis Energy are among the first subscribers. Operational data is automatically captured by crewmembers during regular operations, simplifying back-office operations and supports accuracy of compliance reporting. For example, bringing together all health, safety, quality, environment and maintenance programs under one software program provides crews with a way to ensure that everyone has access to required tools and data.

The NS Workboat application rounds out a complete set of solutions as the deadline for compliance with Subchapter M regulations draws near. On January 1, all companies that operate towing vessels over 26-feet in length (over 300 GT) will be required to hold a Certificate of Inspection and to comply with a complex set of regulations that cover everything from construction and operations to safety equipment and recordkeeping.

Gaining compliance will be a resource-intensive process, one that is further complicated if the owner has to coordinate multiple service companies and suppliers. Unique in the U.S. marketplace, ABS is a central resource for all Sub M requirements, providing engineering plan review services that cover all aspects of design review, including structural arrangements, machinery, piping, electrical systems and equipment, fire protection and lifesaving equipment. Using ABS Engineering means an owner will not need to send drawings to multiple individuals or entities based on the scope or discipline of their engineering licenses.

As a Recognized Organization and an approved third-party organization, ABS can provide a custom approach that supports SubM compliance during plan review, construction and throughout the service life of the vessel. Moreover, approval of plan reviews so operators can avoid multiple submissions to the Coast Guard can be provided. As technology and increased connectivity complicates all aspects of vessel operations, class must offer a deeper portfolio of technical services. Software such as NS Workboat is one part of that requirement.

First NYC Ferry in the Water in the Big Apple

Incat Crowther announced the christening of the first ferry in NYC Ferry's fleet, as a subsequent pair of vessels arrives in New York. The first vessel has been christened Lunch Box, following a naming competition held amongst New York school students. Lunch Box is the first vessel in a fleet of 26 meter catamaran ferries commissioned by Hornblower Cruises to form NYC Ferries, a government initiative to bring an affordable, city-wide ferry network to the Big Apple. Over the coming year, the fleet will grow to some 20 vessels and the network will grow to 6 routes. A concession stand offers food and beverage service to commuters, who will also be connected by free onboard wifi and supported by multiple device charging stations. The vessel will be one of the cleanest operating in American waters, with efficient Tier 3 certified main engines, dry exhausts, and vinyl coating in lieu of toxic solvent-based paints.

The 26 meter Catamaran at a Glance ....

Length Overall: 85' 4"	Draft (hull): 3' 4"	Engines: 2x Baudouin 6M26.3 P3 rated
Length Waterline: 80' 5"	Draft (prop): 6' 1"	Generators: 2 x R.A. Mitchell
Beam Overall: 26' 3"	Depth: 8' 10"	Fuel Oil: 1500 gallons
Speed (Max): 27 knots	Crew: 2	Passengers: 150

Gladding-Hearn Delivers Fifth Vessel to Circle Line

Gladding-Hearn Shipbuilding, Duclos Corporation, has delivered the second of three new sightseeing vessels for Circle Line Sightseeing Cruises, Inc., in New York City. This follows the shipyard's delivery of three sister ships to the company in 2009. Like the earlier vessels, the new 599-passenger all-steel vessel, designed by DeJong and Lebet, N.A., in Jacksonville, Fla., measures 165 feet in length and features a 34-foot beam. With a top speed of 14 knots, the vessel is powered by twin Cummins QSK-38M1 diesel engines, delivering a total of 2600 hp and connected to ZF W3355 gear boxes, spinning 60-inch, 5-bladed bronze propellers. For dockside maneuvering, the vessel is equipped with a 125 hp Wesmar bow thruster,

powered by an electric motor. Two 140 kW generators supply the ship's service power. The vessel carries 8,200 gallons of fuel and 4,000 gallons of potable water. Heating and air-conditioning are supplied by a 278,000 Btu diesel-fired boiler and four 15-ton water-cooled chillers.

Leland, Michigan Takes Dredging into Own Hands

Leland, Michigan, on the shores of Lake Michigan, is one of the jewel communities of the state's Northern Lower Peninsula. For many decades, the harbor contracted dredging services to keep the marina clear at permitted depths, often with funding from the U.S. Army Corps of Engineers (ACOE). In fact, Leland Harbor has had to dredge its harbor mouth and channel 49 times in the last 53 years. With federal funding for the job drying up, the community took matters into their own hands and purchased a new 10-inch Wolverine Class cutter suction hydraulic dredge, manufactured at DSC Dredge's Greenbush, Michigan, facility. Taking delivery of its Wolverine Dredge in mid-April 2017, a crew of Leland township employees received full training over the next week, so that they can now rely upon their own resources – at a minimal annual cost – to keep the harbor cleared.

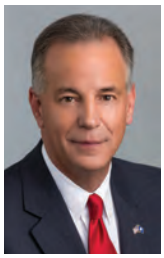

Paxton, Hunter & McCreary


McAdams


Cannon


Clark


Temple


Angelle

SCA Honors Cochran, Hunter & Names BAE's McCreary Chairman

The Shipbuilders Council of America (SCA) recently honored Sen. **Thad Cochran** (R-MS) and Rep. **Duncan Hunter** (R-CA) as recipients of their prestigious Maritime Leadership Award. SCA also named **Richard McCreary** of BAE Systems as the new chairman of the association. Cochran and Hunter were recognized as exemplary leaders from Congress who have demonstrated dedication and support of the U.S. shipbuilding and repair industry. "The shipbuilding and repair industry, which provides more than 400,000 jobs nationwide, sustains the critical industrial base that enables the U.S. to build and repair its own fleet of commercial and military vessels." said McCreary.

XL Catlin Names McAdams as Chief Underwriting Officer

XL Catlin announced the promotion of **Rob McAdams** to Chief Underwriting Officer for Global Marine. Previously, Mr. McAdams held the role of UK/ Ireland Marine Leader. McAdams has 20 years experience in the insurance industry. Prior to joining XL he held positions at Reliance National in New York. He is an Associate of the Chartered Insurance Institute, and a Chartered Property & Casualty Underwriter.

FLIR Systems Appoints Cannon as President & CEO

FLIR Systems announced that **James J. ("Jim") Cannon** has been appointed President and Chief Executive Officer. Cannon succeeded Andy Teich, who retired after 33 years of service. Cannon previously served for more than 16 years in a variety of senior leadership positions at Stanley Black & Decker.

Clark Joins NC Ports as COO

North Carolina Ports recently announced the arrival of **Brian E. Clark** as its new Chief Operating Officer. Clark's previous experience includes service as Managing Director for APM Terminals at Port Elizabeth. Clark also spent four years as Project Director for APM Terminals at Mobile's container terminal.

Newport News Shipbuilding Names Temple VP of Strategic Sourcing

Huntington Ingalls Industries announced that **John Temple** has been appointed vice president of strategic sourcing at the company's Newport News Shipbuilding division. Temple, an Apprentice School graduate, began his shipbuilding career in Newport News' pipe department. Five years ago, he earned the "Master Shipbuilder" designation, which celebrates shipbuilders who have worked 40 years of continuous service. He most recently served as vice president of contracts and supply chain management at the Savannah River Site in South Carolina, a DoE site that Newport News Shipbuilding manages as part of a joint venture.

NOIA Applauds Selection of Angelle as BSEE Director

National Ocean Industries Association (NOIA) President Randall Luthi last month expressed its approval of selection of **Scott A. Angelle** as Director of the Bureau of Safety and Environmental Enforcement (BSEE). "NOIA applauds Interior Secretary Ryan Zinke's selection of Scott A. Angelle as Director of the Bureau of Safety and Environmental Enforcement (BSEE). Angelle's unique combination of political acumen, experience, and knowledge of the offshore industry make him an excellent choice to lead BSEE," Luthi said in a prepared statement.

IMCA Adds Three to Management Team

The International Marine Contractors Association (IMCA) announced that **Harke Jan Meek**, Chief Commercial Officer at Heerema Marine Contractors, has been named IMCA's President and Chairman of the Board. **Iain Grainger**, Vice President Commercial at McDermott International, becomes the new IMCA Vice President. Separately, IMCA announced the appointment of **Eric Roan** as its regulatory representative in North America. Roan has over 20 years of marine and offshore oil and gas industry experience, including four years as a U.S. Coast Guard Port State Control Officer. He holds a BS in Marine Transportation from the U.S. Merchant Marine Academy and an MBA from Rice University.

Martek Appoints Technical Manager

Martek Marine announced the appointment of drone specialist **Martin**


Luthi


Meek


Roan


Appel


Young


Chittenden


Smith

Appel as UAS Technical Manager. Martin comes to Martek with a wealth of industry knowledge. An accomplished and well-regarded UAS Senior Maintenance Officer, a Subject Matter Expert (SME) for drones greater than 150kg and an Instructor and System Integration Project Officer, Martin benefits from a long UAS maintenance and operations background.

Jason Young to Lead Vesper's Americas Expansion

Vesper Marine announced a new vice president of sales for Americas, and the opening of its U.S. office. **Jason Young** will focus on customer service and new account development for Vesper Marine. Additionally, Vesper Marine has engaged sales and marketing group, Richards Marine Marketing, to represent the business throughout the West Coast and Canadian markets. Prior to his Vesper Marine appointment, Young served as outside sales director for CWR Electronics.

Hendry Marine Launches Business Development Team

Hendry Marine Industries (HMI) announced that **Kristen Chittenden** has been appointed Director of Business Development, and **Eric Smith** has been named VP & Chief Commercial Officer. Chittenden has served as Associate General Counsel for Hendry Marine for the past three years. She is currently pursuing her Master's in Business Administration at the University of Tampa. Smith was previously Chief Commercial Officer for Overseas Shipholding

Crowley Awards Scholarships to SUNY Cadets


Ennerfelt

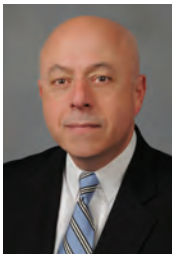

McCracken


Napoliello


Szczecinski

Crowley Maritime Corp. awarded four State University of New York (SUNY) Maritime College cadets with Thomas B. Crowley Memorial Scholarships to help further their educational opportunities. Recipients **Jacob Ennerfelt**, **John Szczecinski**, **Gabrielle McCracken** and **Kent Napoliello**, who will each sail with Crowley this summer, were chosen based on their demonstrated leadership skills, financial need and plans to pursue a career in marine engineering or shipping after graduation. Ennerfelt is a third-class cadet majoring in mechanical engineering and pursuing an engine license. Szczecinski, a third-class cadet, is studying marine operations and pursuing an engine license. Third-class cadet McCracken is majoring in marine environmental science with a minor in meteorology and oceanography, while also pursuing a deck license. Napoliello is studying marine transportation and pursuing a deck license. Since 1984, Crowley has provided more than $3 million dollars in scholarship funding for more than 1,000 students.


Tregurtha


Allegretti


Sappio

Group where he was responsible for business development, as well as the chartering and commercial operations of the company's 24-vessel fleet.

AWO Elects Tregurtha as Chairman

The American Waterways Operators (AWO) elected a new slate of leaders during AWO's Spring Convention. **Edward J. "Ted" Tregurtha**, President – Moran Towing Corporation, was elected Chairman. **Tom Marian**, General Counsel at Buffalo Marine Service, Inc., was elected Vice Chairman. Tregurtha succeeds outgoing Chairman **James F. Farley**, Vice President – Industry Relations, Kirby Corporation. AWO President & CEO **Tom Allegretti** welcomed and thanked the new Board, saying "… You will hold your seat in a pivotal time in AWO's history. We will call on you repeatedly to lend us your intellect and to make sound judgments as we confront the challenges of this age and seize the opportunities of this time."

Fidelis Group Holdings Hires Mathies as Senior Marine Underwriter

Fidelis Group Holdings, LLC (FGH), with its subsidiary Continental Underwriters, announced the hiring of **Dennis Mathies** as Senior Marine Underwriter. Mathies will be based in their Houston, Texas office. He comes to FGH with over 45 years of experience in the marine industry, most recently as Zone Manager Vice President of Starr Marine. Before joining Starr, he was with Reliance National and MOAC, respectively.

SeaCube Container Leasing Appoints Sappio as CEO

SeaCube Container Leasing announced the appointment of **Robert F. Sappio** to the position of Chief Executive Officer. Sappio joined SeaCube as COO in 2014. Prior to that, Sappio held positions as President of the Americas Region for Rickmers-Linie and Managing Director for Alvarez & Marsal. Prior to Alvarez & Marsal, Sappio spent nearly 30 years at APL, serving most recently as Senior Vice President. Separately, SeaCube also announced the appointment of **Hugh MacDiarmid** to Chair of the Board.

AEU Executives Named to SCA, LCA Roles

The American Equity Underwriters announced that two employees – **John A. "Jack" Martone** and **Ryan LeVeque** – have been named to the board of directors of the non-profit Longshore Claims Association. Martone, senior vice president of AEU Advisory Services, previously served in various positions for 27 years with the U.S. Department of Labor, Office of Workers' Compensation Programs, as Chief, Branch of Insurance, Financial Management, and Assessments and as Acting Director, Division of Longshore and Harbor Workers' Compensation. LeVeque, who serves as a claims supervisor with AEU, has nearly two decades of experience managing California, Alaska and Oregon state workers' compensation, USL&H and Jones Act claims. LeVeque received a Bachelor's degree from the University of Oregon.

AEU Executives

LeVeque Martone Stuardi

MV Tommy H

Foss ABS

Separately, AEU also announced that Managing Director **Rob Stuardi** has been elected vice chairman of the Industry Partners Committee for the Shipbuilders Council of America.

Campbell Acquires Certain ACBL Assets

Campbell Transportation Company announced that they have signed an agreement with American Commercial Barge Line LLC to acquire certain affreightment contracts along with 155 barges and 4 towboats that will operate on the Ohio River system. Once the acquisition has been completed, Campbell Transportation Company will own and/or manage over 1,100 barges and 50 towboats on the inland waterways, along with four shipyard facilities and a marine construction company. The transaction, subject to customary closing conditions, is anticipated to close by the end of the second quarter of this year.

Foss Maritime Enlists ABS for SubM Support

ABS has been awarded a Third Party Organization (TPO) contract by Foss Maritime to support compliance with United States Coast Guard (USCG) Subchapter M requirements. Foss Maritime owns and operates a fleet of tugs and offers maritime transportation and logistics services. The contract positions ABS as Foss' TPO, providing a complete suite of Subchapter M services, including TPO surveys, ISM and Load Line compliance, and audits of its Responsible Carrier Program (RCP).

Mitsubishi's 1,800 RPM, EPA Tier 3 Marine Engine

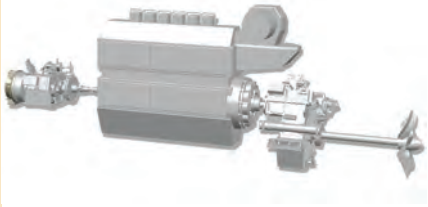
Mitsubishi Turbocharger and Engine America's (MTEA) 684 hp @ 1,800 rpm (510 kW @ 1,800 rpm) engine complies with EPA Tier 3 regulations. The new S6R-Y3MP-TAW-1 model is a propulsion-certified unit ideal for heavy-duty workboat repower applications, such as with tugboats and offshore vessels. The high horsepower, high displacement and high mass solution achieves Tier 3 compliance in a fully mechanically controlled package.

www.mitsubishi-engine.com

REINTJES Revolutionizes Hybrid Market

REINTJES recently demonstrated its hybrid competence with their new BAE HybriGen Zero system, which offers reduced operating costs, reduced emissions, and reduced maintenance costs. With its high torque, this electric motor / generator can also be used as a starter to substitute the air-starting system. Furthermore the usage of the PTO provides the possibility to switch off the onboard gen sets during operation.

www.reintjes-gears.com



TreadBrite Edge Gel Removes Soil, Rust, and Heat Tint/Weld Burn

Madison Chemical's TreadBrite Edge Gel cleaner removes soil, laser scale, rust, and heat treat scale, including heat tint/weld burn by simultaneously cleaning and brightening the surface through an etching process. This viscous gel is designed for use on aluminum, mild steel, stainless steel and copper. Well suited for field repair work, TreadBrite Edge Gel can speed "sign off" on equipment installation and commissioning.

www.madchem.com

MOB Transmitter Ideal for Shoreside Workers

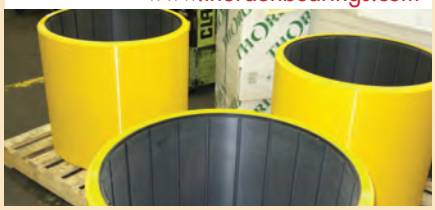
The ALERT418 Man-Overboard Alarm System from Emerald Marine Products protects workers at marine terminals when working around water, especially when out of sight. An added layer of protection for both the employee and company, when immersed, the ALERT418 Transmitter sends an instantaneous signal to the ALERT Man-Overboard Receiver, automatically triggering a piercing 95dB alarm and bright red flashing light on the receiver's display.

www.emeraldmarineproducts.com

Thordon's Cutterhead Shafts withstand the Test of time

After ten years and more than 100,000 operating hours dredging up silt, sand, rocks and stones in some of the toughest marine environments imaginable, the Thordon Composite bearing installed on a dredge cutter head shaft has emerged unscathed. In drydock where the NMDC-owned dredger is being upgraded, Thordon Bearings' Dubai-based distributor, Ocean Power International, expected that even the 'unbreakable' might need replacing after such demanding workloads, but it didn't.

www.thordonbearings.com



Rolls-Royce Propulsion for USCG OPC

Rolls-Royce will provide a range of equipment, including MTU marine generator sets, to the U.S. Coast Guard's Offshore Patrol Cutters. Rolls-Royce will supply the USCG OPC fleet's controllable pitch propellers (CPP), shaft lines and Promas rudders. Rolls-Royce will also supply bow thrusters, steering gear, fin stabilizers and MTU marine generator sets. Four EPA Tier 3 compliant MTU 12-cylinder Series 4000 (1000kW) generator sets will also be provided.

www.Rolls-Royce.com

AkzoNobel's Marine Coatings App

Marine coatings customers will now enjoy anytime, anywhere access to critical data with the AkzoNobel Marine Coatings' International mobile app. The app provides customers with increased convenience and flexibility in accessing the company's wealth of coatings data. Designed to provide access to application guides, technical datasheets, product brochures, information cards and regional contacts, it available on the Apple app store.

www.akzonobel.com/corporate-product/marine-coatings

3M SecureFit Protective Eyewear 600 Series

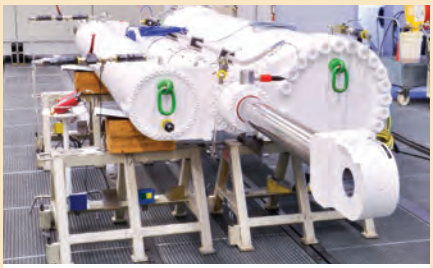
Job sites are unpredictable, with environmental conditions and tasks that can vary widely from day to day. In response, 3M Personal Safety Division has expanded its SecureFit Protective Eyewear line by offering more features and deeper personalization with the debut of the new 3M SecureFit Protective Eyewear 600 Series. New options include Scotchgard Anti-fog Coatings and Photochromic lenses that darken when exposed to UV light outdoors.

www.3m.com

Nova Scotia Fishermen Rely on Mustang Survival

The Gulf Nova Scotia Fleet Planning Board (GNSFPB) has made major investments in safety equipment which includes 1,200 Mustang Survival immersion suits. As part of a $1.3 million spend, the GNSFPB is aligning with new safety requirements for commercial fishing vessels introduced by Transport Canada, which will go into effect this summer. Mustang Survival immersion suits are designed for flotation and hypothermia protection when every second counts.

www.mustangsurvival.com



Bosch Rexroth's Innovative Split Hoist System

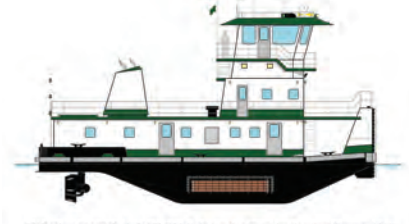
Bosch Rexroth's split hoist heave compensation system supports a higher working load, while improving system efficiency by 80%. A passive in-line heave compensator supports the load and passively compensates for some of the ship's movement. The passive in-line system is hoisted and held by an existing winch or crane. An actively controlled winch, mounted on deck, compensates for the remaining movement of the load.

www.boschrexroth.nl

First U.S. Tug Installed with Veth Z-Drives

Barbour JB Shipyard of St. Louis, Missouri, has laid the keel for a new harbor tug, the first here in the USA that will be powered by Veth Z-drives. Twin Disc is the distributor for Veth Propulsion in the US, exclusive of the Gulf Coast region. The tug will be powered by twin 750 hp Cummins diesels and Veth VZ-700 Z-drives.

www.twindisc.com



68' harbor tug with Veth VZ-700 Z-drives designed by Sterling Marine, LLC

AquaBlue Multi-Metal Cleaner for Fast Degreasing

Madison Chemical's AquaBlue alkaline detergent for removal of dirt, oil, grease, sulphurized cutting oils or metalworking fluids exhibits superior penetrating and wetting properties. An excellent water-based cleaner, it is ideally suited for machinery, equipment and engines, allowing a single cleaner/degreaser to replace specialty cleaning products, thus reducing inventory costs and streamlining the process. It can be used as a soak, in ultrasonic tanks, and with pressure washers.

www.madchem.com

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Photo courtesy of Foss Maritime

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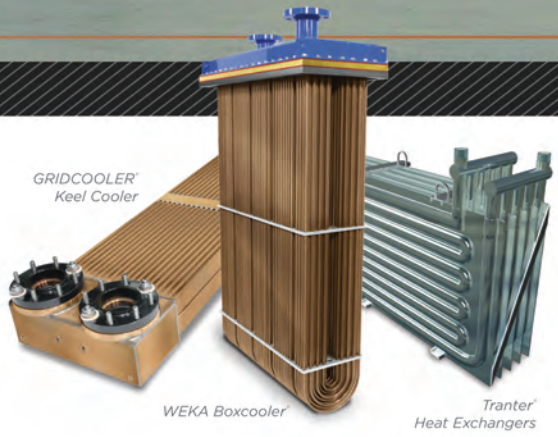

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