

September 2016

MARITIME REPORTER AND ENGINEERING NEWS

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CHOKES POINTS ARE FLASH POINTS

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THE COVER

Maritime Security

The littoral combat ship USS Fort Worth (LCS 3) conducts patrols in international waters of the South China Sea near the Spratly Islands as the People's Liberation Army-Navy [PLA(N)] guided-missile frigate Yancheng (FFG 546) transits close behind. Tensions between the U.S., China and Russia has conspired to create a number of Choke Points that could become Flash Points, effecting overall maritime security. Story starts on page 28

(U.S. Navy photo by Mass Communication Specialist 2nd Class Conor Minto/Released)

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GREG TRAUTHWEIN, EDITOR & ASSOCIATE PUBLISHER

This edition is coming to fruition literally as I'm packing to head out the door to SMM in Hamburg, Germany, steps ahead (I hope) of Tropical Storm Hermine. SMM is, as most of you already well know, the premiere maritime event in the world, period. And even though several key markets are currently down – and it appears that Hanjin Shipping is nearly 'out' with a reported \$5.5 billion in debt and creditors threatening to turn off the cash flow – from all indicators SMM is shaping to be the busiest week in Hamburg since I've been attending the event since 1992, if my appointment calendar can be considered an accurate barometer.

For this edition of SMM I am particularly excited as we will introduce our "Maritime Reporter TV" concept, featuring a series of targeted video interviews with technology and business leaders across the entire sector, including ship and boat owners, ship and boat builders, naval architects and marine engineers. This will manifest itself first and foremost on our flagship MarineLink.com after SMM in mid-September, so keep a look out there and in this space for additional details.

This being our "Maritime Security" edition, we felt that there was no better time to dig into the burgeoning maritime security situation in Asia. As anyone with a pulse and a mind to follow international news knows, the world has become an increasingly contentious place, and as Edward Lundquist points out in his story starting on page 28, there are many contentious 'flash points', namely the East and South China Sea, that have the potential to ignite. Wherever you stand on the matter is actu-

ally not particularly important, but it is critical to realize and plan for running business as normal as possible as this valuable, high-volume sea lanes attract increasing hostile attention.

Sticking to that side of the globe but in a much more peaceful manner, this month I am happy to offer size, scope and insight to one of the world's largest ship owners and logistics companies, Nippon Yusen Kaisha (NYK). When I was in Tokyo earlier this year at the Sea Japan 2016, I had several excellent meetings with some influential government and industry personnel. My thanks to Yasuo Tanaka, Senior Managing Corporate Officer and his team for hosting Maritime Reporter at NYK's Tokyo headquarters for time well spent getting background on the creation and insight on the future of NYK, which at the time of this writing controlled a fleet of more than 840 ships with annual revenues of more than \$24 billion.

We often write about how legislation shapes the maritime industry, specific to the level of investment needed by ship owners to ensure their fleets are up to snuff with new technology and technique to meet regulation. The NYK's of the world are not content to sit back and simply follow the rules, instead NYK is a true industry leader in the investigation and integration of best technology and best practices to ensure that its fleet of ships are run efficiently, effectively and with great respect to the environment and sustainability. Turn to page 34 for our one-on-one with Mr. Tanaka, who discusses candidly his company's strategy to stay ahead of the curve ... and still remain financially viable.

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Two for the Price of One

For the pure pageantry and drama of it all, it's tough to beat a harbor pilot rate request hearing. Unless of course, you are talking about an effort to challenge the traditional state pilot model commonly found in U.S. deep draft ports, from coast-to-coast. It turns out that we'll not only have both scenarios playing out on this side of the pond, but both 'discussions' will also take place in Galveston County, Texas.



JOSEPH KEEFE

According to an Enewsletter (8/19) received from the West Gulf Maritime Association, the Board of Commissioners of Pilots for Galveston County Ports will meet on August 22 to convene in a public meeting at the Port of Texas City. Reportedly, the board will determine procedures for the substantive hearing on the application for a rate increase submitted by the Galveston-Texas City Pilots. Let the fun begin.

Separately, and on August 18, a total of seven applications for state pilot licenses/certificates were purportedly submitted to the Board of Pilot Commissioners for Galveston County, Texas. The mariners, according to their representative, all have federal licenses; two for the waters in question. Hence, the applicants can pilot enrolled U.S.-flag deep draft tonnage (in some waters), but currently, minus the 'state' ticket, they are barred from engaging registered foreign traffic. Registered tonnage, of course, makes up the overwhelming majority of deep draft traffic plying U.S. ports.

The group of seven – presumably hoping to provide competent, suitable and reasonably priced competition to the established group in place – won't be the first to try this kind of maneuver, but this time, they'll go at it in a slightly different manner.

The pilot hopefuls base their argument for a State Issued license, in part, on the premise that "Perpetuities and monopolies are contrary to the genius of a free government, and shall never be allowed,

nor shall the law of primogeniture or entailments ever be in force in this State." That – apparently – is Texas state law. Now, I have no idea what all that means, but it sounds pretty ominous. But, since the phrase contains the word 'monopolies,' let's assume that the premise of the monopoly for state pilots everywhere is about to get tested.

Justin Renshaw, a Houston-based attorney representing the seven applicants, told us that the timing of the applications, submitted at roughly the same time as the state pilot's own rate increase application, was purely coincidental. That may well be the case. Nevertheless, the confluence of the two applications, arriving almost simultaneously on the desks of the Board of Pilot Commissioners for Galveston County, does more than just amount to a sudden, perhaps unexpected blizzard of paperwork. It also gives the Board a great deal to think about.

Let's also assume for a moment that all seven applicants are incredibly well qualified for the licenses that they seek, with impeccable credentials and experience to bring to the table. Beyond this, if they were granted those state licenses, that they would form a formidable competitive group which would give shippers and vessel operators something they've never had before: a choice. That choice might also translate into a more reasonable price for local pilotage. A Board of Pilot Commissioners that in theory represents the interests of all parties, would have to give careful consideration to that possibility.

Secondly, the timing of the rate request and the seven outside pilot applications also puts the Pilot Commissioners in another interesting spot: A roughly simultaneous 'yes' vote for the rate increase and a 'no' vote to the seven professional mariners sends a decidedly negative message to shippers who might like to see (a.) more available pilots and (b.) a rate system that more closely reflects a market economy.

To be sure, the old (tried and true) argument is that pilot rates and state pilot organizations shouldn't have to compete in an open market because the low bidder for any job is likely not going to be the safest. To be fair, it's been tried in other places. Take Long Island Sound, for example: a Balkanized, poorly regulated group at one time formed the basis of a local pilot system that predictably had pilots unilaterally competing against one another, sometimes as the vessel was within sight of the sea buoy. No one wants that.

The 600 pound gorilla in the room – here and across the fruited plain from coast-to-coast – is the cost of pilotage for deep draft, blue water traffic. It wouldn't be a stretch to say that the average annual salary for a state pilot in the United States approaches \$500,000. Are they worth it? Maybe a better question to ask is: What price can you put on safety, right? Nevertheless, much of those movie star wages are a function of the monopoly that the typical state pilot enjoys. You can't deny it – not with a straight face.

This summer, the Board of Commissioners of Pilots for Galveston County Ports will apparently have some interesting decisions to make. As a general statement, rate increase petitions by state pilot organizations are rarely denied. Sure, it happens. Granting one at the same time as turning away seven 'qualified' pilot candidates is another thing altogether.

At the end of the day, the seven applications for a state commission are probably secondary to the real question: can a municipality or state unreasonably withhold a license from nominally qualified mariners just because they don't belong to the local organization? We're about to find out.

Two for the Price of One: a rate increase request and a challenge to the concept of the state pilot model. This, and the prospect of competing pilot organizations in the Lone Star state. It just doesn't get any better than this. Sit back and enjoy the ride.

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DENNIS BRYANT

Anthropogenic (manmade) sound is creating havoc among marine mammals and other aquatic species. These creatures have very sensitive hearing, which they rely on to find food and mates and (for some) to communicate and navigate. Sound waves can travel much further and with much less loss of strength in water than in air. In pre-industrial times, the oceans were relatively quiet. Sailing ships generated almost no subsurface noise. A whale's call could be heard by another whale hundreds of miles away in ambient conditions. The substantial and growing amount and volume of anthropogenic noise in the ocean comes from a variety of sources including commercial and naval shipping, fishing, recreational craft, sonar, seismic surveying, blasting, and marine construction. Due to the volume or energy levels at which sonars and seismic surveys (such as air guns) generate their sounds, these sources seem to have the greatest immediate impact on marine mammals. Other manmade sounds, though, have long-term impacts. Cavitation from ships' propellers now generate a ubiquitous level of noise in the ocean that can oftentimes mask natural sounds.

IMO

In 2012, the IMO adopted and made mandatory the Noise Code so as to reduce the level of noise exposure to individuals on commercial ships. The Noise Code had been preceded by noise guidelines. The Noise Code applies to new construction and the guidelines address conditions on existing vessels.

In 2009, an IMO Correspondence Group, chaired by the United States, submitted an extensive report on noise from commercial shipping and its adverse impact on marine life. In 2014, the IMO Marine Environment Protection Committee (MEPC) approved guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life.

These guidelines focus on the prima-

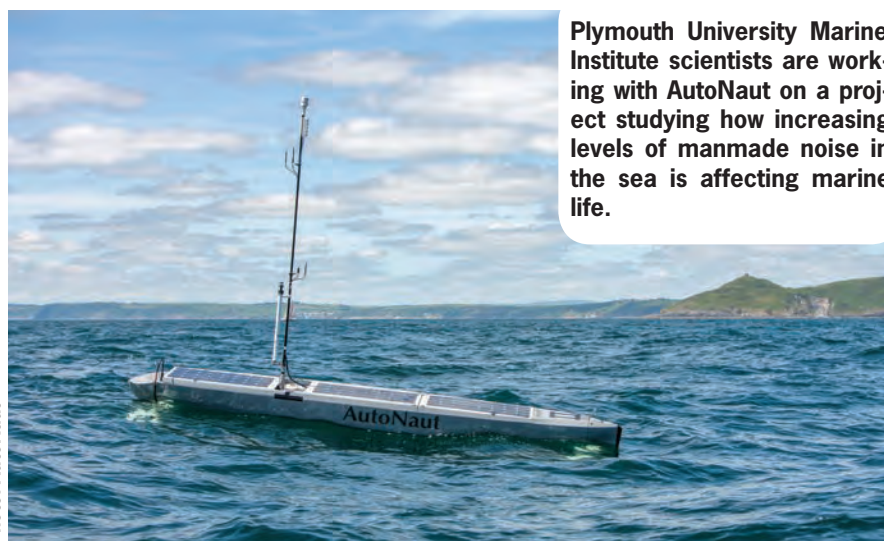


Photo: AutoNaut

Plymouth University Marine Institute scientists are working with AutoNaut on a project studying how increasing levels of manmade noise in the sea is affecting marine life.

ry sources of underwater noise – those associated with propellers, hull form, onboard machinery, and operational aspects. They recognize that much, if not most, of that noise is caused by propeller cavitation. The guidelines also recognize that the largest opportunities for reduction of underwater noise will be during the initial design stage, but noise reduction is still possible for existing vessels, particularly on the occasions of propeller replacement and hull work, such as installation of a bulbous bow.

NOAA

Recently, the National Oceanic and Atmospheric Administration (NOAA) published an extensive technical guide for assessing the effects of anthropogenic sound on marine mammal hearing. For decades NOAA has been conducting analysis of the sources and impacts of manmade noise in the ocean. Those studies as well as numerous others from different sources reveal that the impact of manmade noise on marine mammals and other aquatic life is pervasive.

A wide-ranging NOAA report on anthropogenic noise in the marine environment, written in 2000, contains a detailed analysis of the sources of manmade noise in the ocean and its effects on marine mammals, marine fishes, and other taxa (sea turtles, flora, invertebrates, and birds). It notes that 'quiet ship' technology has been developed but is not wide-

ly used by the commercial sector. That may be about to change. NOAA is developing a plan for reducing anthropogenic noise in the ocean that includes proposals for rulemaking to require reductions in noise-making activities. Noise from some of these activities, such as marine construction projects, is currently regulated through the Marine Mammal Protection Act and its requirement for incidental harassment authorizations prior to commencement of projects that may result in the 'taking' of marine mammals. This requirement has not previously been imposed on commercial shipping.

The plan under development reportedly will call for developing noise limits for a variety of sources. Regulations could build on the 2014 IMO underwater noise guidelines and set design requirements for new construction, with limited retrofit measures for existing ships. Hopefully, any such steps would be coordinated worldwide through the IMO negotiation process.

Geographic Approach

More immediate, though somewhat geographically limited, steps could be taken in the same manner as is currently done with the critically endangered North Atlantic right whale (NARW). If supported by adequate data, which does not currently exist, underwater noise standards could be established for various sections of US waters, based on the

presence of certain marine life, particularly marine mammals. Ships would then be prohibited from transiting those waters while generating underwater noise above the designated level. This could force either speed reductions or the adoption of noise-reducing technologies. While any unilateral approach adopted may be enforceable within internal waters and the territorial sea, enforcement of underwater noise restrictions against foreign vessels outside the territorial sea would be problematical without IMO cooperation. The IMO in 1998 adopted a mandatory ship reporting system requested by the US government for ships transiting through waters off the east coast of the United States so as to reduce the risk of those ships striking NARWs. Subsequently, the IMO adopted or adjusted Traffic Separation Schemes (TSS) in these same waters so as to improve NARW protections. If presented with sufficient evidence and justification, the IMO may well support a mandatory underwater noise reduction measure.

The marine industry should not wait to have external bodies impose potentially unrealistic standards on its operations. Rather, it should be proactive in the examination, development, and adoption of realistic measures to reduce underwater noise generation by ships. Owners should require that their new ships be designed to incorporate 'quiet ship' technology. Remember that it takes energy to generate noise. The less noise that a ship generates, the more efficiently it will be operating.

The Author

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Accurate Predictions for Noise Levels of Cavitating Propellers Now Possible

As underwater radiated noise levels in the oceans increases, MARIN has investigated just how much cavitating propellers are to blame.



FRANS HENDRIK LAFEBER

Traditionally, underwater radiated noise is mainly of interest for naval vessels and fishery research ships. Nowadays, however, there is a growing concern that marine life is affected by the rise in background noise levels in the oceans. Marine mammals and fish use sound to communicate and to sense their environment and this requires low background noise levels. The rise in noise levels is being caused by an increase in shipping, among other factors. Therefore, the EU has included underwater radiated noise emanating from shipping in the methodological standards for a healthy marine environment.

There is, however, a lack of knowl-

edge about the actual noise levels produced by (merchant) ships, although it is known that one of the dominant noise sources is the cavitating propeller. The EU FP7 Suppression Of underwater Noise Induced by Cavitation (SONIC) project aimed to assess and mitigate the impact of shipping noise on the marine environment. MARIN, which was the coordinator of the project, focused on the further development and application of computational and experimental tools to predict propeller cavitation noise and on generating ship traffic data for noise maps based on Automatic Identification System (AIS) data. The SONIC project was funded by the 7th Framework Pro-

gram of the European Commission and ran between 2012 and 2015.

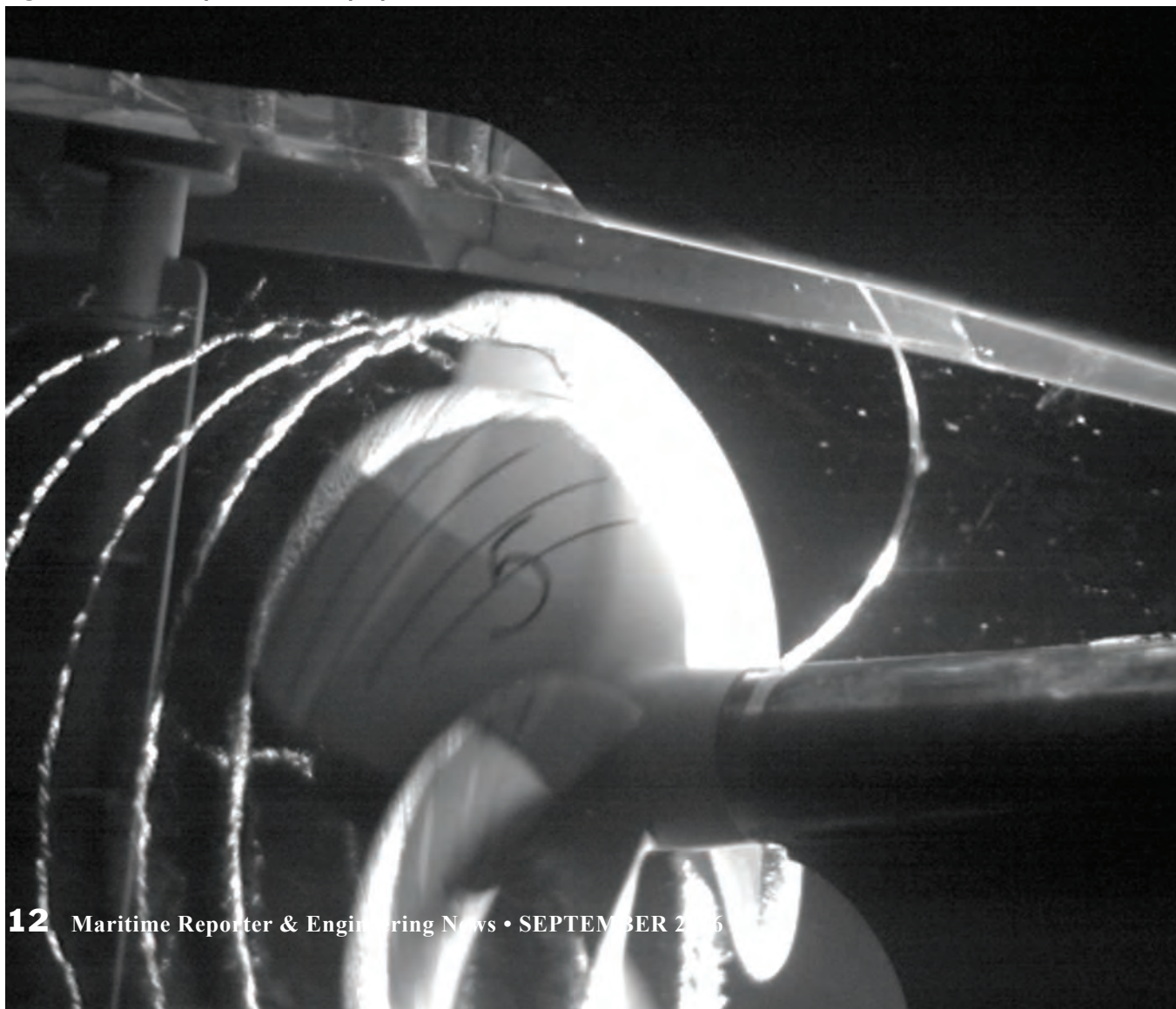
A variety of methods can be used to predict underwater radiated noise from cavitating propellers. The computational procedures used by MARIN in the SONIC project rely on a potential flow method (PROCAL) for predicting the propeller loading and the sheet cavitation dynamics. Different semi-empirical methods use this input to predict the underwater noise due to tip vortex cavitation and sheet cavitation. A full RANS-based method for noise prediction using the Ffowcs Williams-Hawkings acoustic analogy is also in development but it was too early to use it for this project.

A cruise ship, container vessel and small research catamaran were computationally analyzed. Good agreement was obtained with available full scale data of the cruise ship and catamaran, whereby the data for the catamaran was obtained in the SONIC project. For the container ship a comparison was made with data from model tests performed by HSVA (Hamburg, Germany) and these also gave an acceptable agreement.

In the first phase of the project, measurements were performed in MARIN's Depressurised Wave Basin to determine the influence of reverberations at low frequencies. A simple correction procedure for this influence was developed and validated. For the catamaran MARIN performed hull pressure and underwater noise measurements using the silent towing carriage in the basin for a range of ship speeds. The cavitation pattern of the propellers at the highest speed is shown in Figure 1. The results of the model-scale measurements were close to the full-scale data.

MARIN also contributed to the development of a methodology to generate noise maps based on AIS. Each (large) ship continuously transmits AIS data, including its identification, position, course and speed. To compute the noise levels in an area within a certain time frame the AIS-data is combined with mathematical models for ship noise and noise propagation that also take into ac-

Figure 1: Cavitation pattern on the propeller of the research catamaran



The Author

Frans Hendrik Lafeber is Team Leader Analysis & Prediction Ships at MARIN, the Maritime Research Institute Netherlands. MARIN offers simulation, model testing, full-scale measurements and training programs, to the shipbuilding and offshore industry and governments. For more information:

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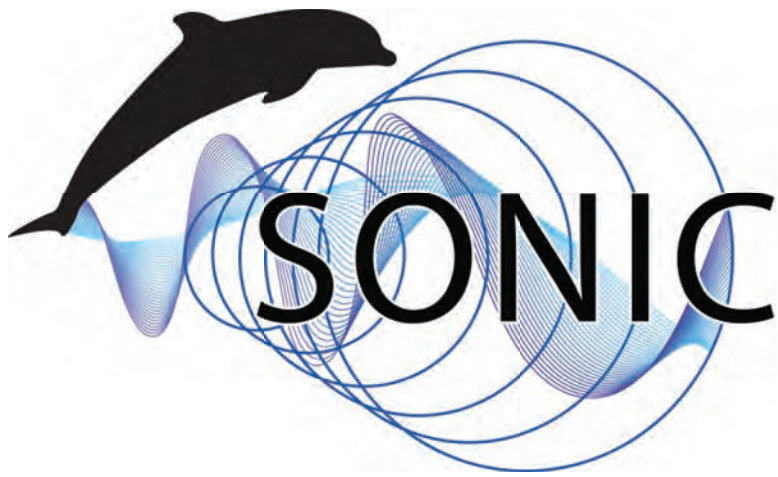
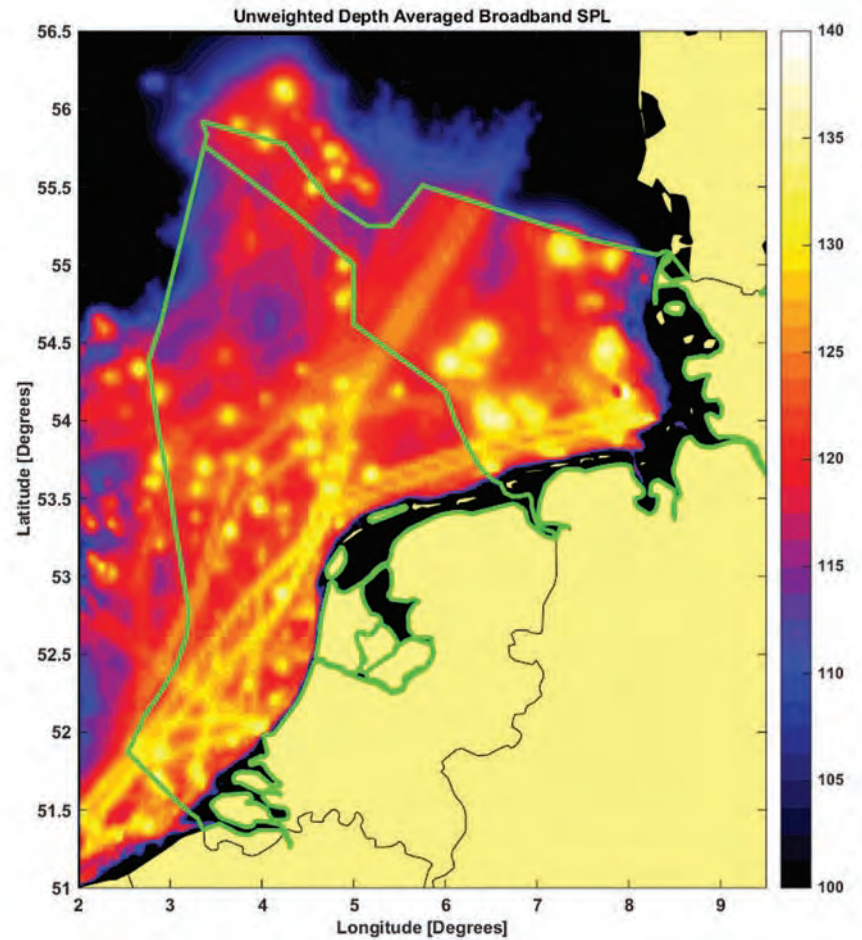


Figure 2: Noise map of the Dutch and German EEZ's in the N. Sea.

count bathymetry. A noise map is created by weighted averaging of the calculated noise levels over depth and frequency, an example is shown in Figure 2. Different marine species are affected by different noise frequencies, therefore the noise maps can be created for different frequencies. This type of maps can be used to investigate the influence of noise mitigation measures for the shipping industry as a whole. The final noise maps were generated by the Dutch research organization TNO.

Within the SONIC project MARIN has shown that propeller cavitation noise

can be predicted well but more validation data for a wider range of ship types is needed. Results from the SONIC consortium and the EU FP7 'Achieve Quieter Oceans by shipping noise footprint reduction' (AQUO) consortium are summarised in a common guidelines document for regulation, which is publicly available from the SONIC website. An early assessment of whether the propeller design meets noise requirements - as for instance, defined by DNV-GL's 'Silent Class' - can be made using computations and model tests. See www.sonic-project.eu for more information.



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What the Heck is ‘Privity’?

Is the Limitation of Liability Act Still Relevant?



JEFFREY S. MOLLER

In the aftermath of the El Faro disaster, that vessel’s owners exercised their right to file a petition to limit their liability in accordance with the U.S. Shipowner’s Limitation of Liability Act, 46 USC §30501, et seq. This evoked negative press and social media reaction with a now-familiar refrain: Why should a shipowner escape full liability for a disaster by hiding behind a 19th-century (i.e., outdated, antique, ancient) statute? One might well ask whether or not the Limitation Act has outlived its usefulness, but this author’s belief is that the statute need not be repealed. Modern safety management systems, communication systems, and vessel tracking systems have served to make it far more difficult for owners to limit their liability and the procedural benefits of the statute are helpful to all concerned. It may, however, be time for the U.S. to become signatory to the existing up-to-date international treaty.

The U.S. Limitation of Liability Act was passed in 1851, and modeled upon an English statute existing since 1734, a time before corporations had come into routine and legally respected use. The modern corporation is now a very common form of limitation of liability. Although under certain circumstances one can “pierce the corporate veil” and impose liability directly upon the shareholders of a corporation, for the most part the corporate form of business organization is well established and unquestioned today as a means by which investments can be made without imperiling other assets. Essentially, the Limitation of Liability Act provides the same type of protection as does the corporate form. It can serve to protect assets other than the amount of capital invested into a particular ship. It provides a means of “breaking” limitation that is arguably less difficult than piercing the corporate veil, allowing for limitation only if the cause of the disaster was without the



Photo: NTSB

“privity and knowledge,” i.e., the direct involvement, of the owner’s shoreside management.

The U.S. Limitation of Liability Act is thought to be onerous primarily because, in its basic form, the statute can limit the vessel owners’ liability to the value of the vessel after the incident. There have been infamous cases where after a vessel sinking the only thing recovered is a life preserver. El Faro’s sinking in deep water is the most recent such example. Considering the fact that hull insurance proceeds are not a part of the limitation fund and that protection and indemnity (P&I) insurance exists universally, allowing the shipowner (and its insurers) to escape scot free can appear to be grossly inequitable. The U.S. statute was amended after a notable 20th-century passenger vessel disaster to assure

some minimal recovery to victimized passengers even in a total loss situation, but has not otherwise been substantially changed since its passage.

Why was the law passed in the first place? According to the legislative history, the statute was enacted in order to encourage capital investment in U.S. flag shipping at a time when, not unlike the present, the amount of capital required to purchase and equip a ship was relatively large and the profit margins relatively thin. As indicated above, it was modeled upon an English statute. U.S. owners had complained that the laws in other countries provided limitation protection for their shipowners and had therefore created a non-level competitive playing field. Encouraging private investment in the shipping industry also had a defense-related purpose which is arguably as im-

portant now as ever. In times of war, the movement of men and material to and from theater is most often performed by commercial vessels that are chartered to (effectively commandeered by) the U.S. government. Unless a sizeable commercial U.S. flag fleet exists in peacetime, there could be significant problems coping with an outbreak of hostilities.

Most other modern seafaring nations have replaced their domestic statutes and become signatories to an international treaty (or convention) (first formed in 1957 and most recently amended in 1996) which limits shipowners’ liability. Clearly there remains a global consensus that allowing shipowners to limit their liability in certain circumstances can serve worthwhile purposes. Of course, the amount of the limitation fund under that international convention, as recently

amended with effect in 2015, is substantially greater than that under U.S. law. The international convention does not allow the owner to limit its liability to the post-casualty value of the vessel, but instead requires a minimum fund based upon the vessel's tonnage. The owner of a 50,000 GRT vessel could, under the current convention, be required to pay an amount in excess of \$42m even if it succeeds in proving an absence of causative privity/knowledge.

One key procedural benefit of the U.S. Limitation Act is the so-called "concur-sus" of claims. In order to exercise its right to limit liability, the vessel owner must file a petition and create a fund within six months of the receipt of notice of a claim. The court then issues an order staying any and all other existing litigation and requiring all potential claimants to file their claims in one forum. This "concur-sus" is a sort of reverse class action which can avoid the expense of multiple litigations and the risk of inconsistent verdicts. It also assures that the limitation fund will be distributed in an

equitable way among all claimants.

The antiquated language referring to "privity and knowledge" has been roughly translated for modern purposes as "participation and control." The time-tested legal axiom is that "control is the sine qua non of liability." In other words, it is only appropriate to blame someone for an outcome if they had had substantial control over the precipitative events. In the days when the limitation of liability statutes were initially passed, it was understood that an owner had a duty to make its vessel seaworthy, but lacked effective control over the vessel once it put to sea. It was therefore thought that the owner ought not be liable beyond the value of its investment in the ship for the independent negligence of the captain and crew. In days when communication with a ship at sea was impossible and knowledge of the ship's whereabouts sketchy, the shipowner very often lacked privity or knowledge with respect to the occurrence of an accident.

Today's shipping world is much different, of course. AIS tracking devices and

transponders accessible by a cellphone "app" make it possible to know a vessel's whereabouts, course, or speed at any time anywhere in the world. Modern voyage planning tools, including weather routing systems, make it difficult to claim that bad weather is unforeseeable from shore. And modern communication devices, including email, cellphones, and satellites make it impossible for an owner to claim that it had no effective means by which to direct the ship's master in real time.

It can therefore be said that a shipowner's right to limit liability has been so severely circumscribed by recent technological events, that the U.S. statute need not be repealed. The potential for an "inequitable" result is severely limited and the statute's procedural/judicial benefits are of continuing value. The rare owner who can truly prove that it was actually without any control over the cause of an accident should still be afforded limitation. However, it may be well past the time, given the existence of hull and P&I insurance, for the United States to

join with the other leading seafaring nations in signing the existing international convention in order to assure a certain minimum recovery to victims in total loss situations involving on-board negligence. Given our beloved country's propensity to go its own way with respect to such treaties, however, the author is not inclined to hold his breath.

The Author

Jeffrey Moller is an experienced maritime law practitioner who has parlayed over 30 years of tort litigation experience into successful representations in shoreside toxic tort and environmental contamination cases.

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The image is a composite of four photographs arranged in a 2x2 grid, with a central circular graphic. The top-left photo is labeled 'SHIP' and shows a ship's bridge with multiple electronic displays. The top-right photo is labeled 'FLEET OPERATIONS' and shows a person in a control room looking at several computer monitors displaying maps and data. The bottom-left photo is labeled 'SHIP TRAFFIC CONTROL' and shows a person at a workstation with multiple monitors. The bottom-right photo is labeled 'ACADEMY' and shows two people in a training environment with large screens. In the center, a circular graphic with a red arrow contains the text: TRACKING, OPERATIONS, ANALYTICS, and CENTRAL STORAGE & MOBILITY.

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Fuels of the Future

Choosing your fleet's future fuel wisely



WAJDI ABDMESSIH

The imposition of a global 0.5% sulfur cap may be less than four years away. This clearly will eliminate residual fuel from the available fuel options unless you have fitted your vessel with a scrubber or other exhaust gas treatment technology in order to comply with MARPOL Annex VI emission regulations.

At the start of 2015, permitted sulfur levels in emission control areas (ECA) dropped from 1% m/m to 0.10% m/m. Although this was a large reduction, the switch was relatively easy to make as suppliers were capable of creating new blends from residual and distillate fuels to meet the 0.10% limit and refineries also produced new ECA compliant hybrid fuels. Indeed, given the background of falling fuel prices, many vessels simply made a switch to low sulfur distillate fuel. All these options provided an alternative way for vessels to comply with the regulations without making large investments in scrubbers or in retrofitting to use liquefied natural gas.

Looking ahead to the maximum global sulfur limit of 0.50% m/m (outside ECA zones) by 2020 or 2025 (the date will be decided in 2018 following the results of an International Maritime Organization (IMO) study), there will be no residual fuel oil that can meet the MARPOL Annex VI regulation for SO_x, PM and NO_x without the use of scrubbers, and therefore alternative fuel options must be considered.

Biofuel

Biofuel has become part of the alternative fuel mix of the future due to its low carbon print, and the fact that it offers a considerable reduction in greenhouse gas (GHG) and sulfur (SO_x) emissions, and has a higher cetane rating than some petro-diesels, which can also improve performance.

The draft version of ISO/DIS 8217 has

PARAMETER		RESULT	RMG380	UNIT	METHOD
Density @ 15 degC		985.1	991.0	kg/m ³	ISO 12185
Viscosity @ 50 degC		379.2	380	mm ² /s	ISO 3104
Flash point		86.7	60	degC	ISO 2719
Pour point		3	30	degC	ISO 3016
Sulfur content		2.41	3.5	% m/m	ISO 8754
Micro Carbon Residue		14.99	18	% m/m	ISO 10370
Ash content		0.03	0.1	% m/m	ISO 6245
Total Sediment, potential		0.03	0.1	% m/m	ISO 10307-2
Water content		0.10	0.5	% v/v	ISO 3733
Vanadium (V)		81	350	mg/kg	IP 501
Sodium (Na)		23	100	mg/kg	IP 501
Aluminum (Al)		6	---	mg/kg	IP 501
Silicon (Si)		8	---	mg/kg	IP 501
Zinc (Zn)		0	15	mg/kg	IP 501
Phosphorous (P)		0	15	mg/kg	IP 501
Calcium (Ca)		6	30	mg/kg	IP 501
Acid Number		0.45	2.5	mg KOH/g	ASTM D664
Calculated values					
Aluminum + Silicon		14	60	mg/kg	Calculated
Net Specific Energy		40.458	---	MJ/kg	Calculated
CCAI		846	970	---	Calculated
Injection Temp to obtain 10 mm ² /s		146	---	degC	Calculated
Injection Temp to obtain 15 mm ² /s		128	---	degC	Calculated
Injection Temp to obtain 20 mm ² /s		118	---	degC	Calculated
Injection Temp to obtain 25 mm ² /s		110	---	degC	Calculated
Quantity Difference*		0.319	---	MT	Calculated
Other Parameters					
Iron (Fe)		20	---	mg/kg	IP 501
Nickel (Ni)		23	---	mg/kg	IP 501
Magnesium (Mg)		0	---	mg/kg	IP 501
Lead (Pb)		0	---	mg/kg	IP 501
Potassium (K)		0	---	mg/kg	IP 501

* Quantity difference based on quantity and density provided on BDN

Report Date: 10-Dec-2015

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introduced to the distillate fuel specification new grades called DF Grades (DFA, DFZ and DFB) which include biofuel in the form of fatty acid methyl ester (FAME) with up to 7.0 % volume. It has also increased the limit for the "de minimis" definition level to 0.50% v/v instead of the previous volume of 0.10% v/v.

This is a smart way of increasing the distillate fuel supply volume by up to 7% in the market without major investment.

While adding biofuel to the mix is a positive step for the marine fuel industry, it also introduces some new quality challenges. Biofuel is known for its increased lubricity, Cetane number, and

the excellent reduction in emissions of various pollutants and global warming gasses, such as CO₁, CO₂, hydrocarbons and particulate matter.

However, it also has some less beneficial properties.

Biofuel is hydrophilic, which means it has a great ability to absorb water. Therefore water and excessive moisture must be eliminated when using biofuel and this can be very difficult to achieve in the marine environment.

Biofuel will absorb the water if present, and this can lead to wax dropping from the fuel as well as filter plugging.

Besides the hydrophilic characteristic of the FAME, there are other major pa-

rameters in relation to biofuel that could be problematic for a marine diesel engine.

To safeguard the end user, the ISO/DSI 8217 draft has stated that the FAME used in the biofuel blending must be in compliance with the requirement of EN 14214 or ASTM D6751. The major reason for this is to ensure that some of the properties of the FAME remains within the specification, as a high level of these properties if blended with distillate may cause major problems.

These parameters are tested under the ASTM D6751 but it is not required under the ISO/DSI 8217 distillate marine fuel table (1). The parameters are detailed below (with accompanying effects):

- **Free Glycerin, which has maximum of 0.02% m/m:** High levels of free glycerin can cause injector deposits, as well as clogged fueling systems, and result in a buildup of free glycerin in the bottom of storage and pipe systems.

- **Total Glycerin, with a maximum of 0.240 % m/m:** To determine the level of glycerin in the fuel and includes the free Glycerin and the Glycerin portion of any unreacted or partially reacted oil or fat. High levels of total Glycerin (mono-, di-, and triglycerides) can cause injector deposits and may adversely affect cold weather operation and filter plugging.

- **Sulfated Ash, 0.020 max % mass:** Ash-forming materials may be present in biodiesel in three forms:

(1) Abrasive solids, and (2) Unremoved catalysts, these two can contribute to injector, fuel pump, piston and ring wear, and also to engine deposits.

(3) Soluble metallic soaps, which have little effect on wear but may contribute to filter plugging and engine deposits.

To safeguard your investment it is recommended to test the DF grades for these parameters to ensure the safe handling of the fuel onboard the vessel.

As we can see, the fuel quality issue

is becoming increasingly important as more 'problematic' fuels enter the supply chain. This is not the result of deliberate actions but because many new fuels types are coming onto the market without a new infrastructure in place to handle and segregate what in some cases can be incompatible products or biofuel free products.

While the distillate fuel sector is experiencing many changes – and many more are to come - residual fuel is still the major element of the market, and is dependent on new developments in scrubber technology in order to survive as a key marine fuel in the next few years.

One of the most problematic parameters in residual fuel is catalytic (Cat) fines.

Cat Fines

Cat fine levels have increased in recent years across all residual fuel grades and have become the major contributors to engine damage. Other old problems still

exist, but to a less extent, such as polymer contamination and poor ignition fuel. More than 60% of the high sulfur fuel has been found to contain cat fines higher than 30 mg/kg, and 12% contains more than 61 mg/kg, which exceeds the maximum specification limit for the ISO 8217:2010 RMG and RMK grades. Some 74% of the high sulfur fuels tested have cat fines level greater than 20 mg/kg. Some of the cat fines damage has been blamed on poor filtration, purification and fuel management on board the vessel. Therefore vessel managers must assess the efficiency of the fuel treatment plant in order to mitigate the risk of high cat fines by taking samples before and after purification or at the engine inlet in order to ensure that it is under the recommended level as well as taking note of cat fines particle count distribution.

You must know your vessel purifier efficiency rate as it can vary from 25% to 70%. Unless you check this, you may unintentionally introduce a high level of

cat fines to the engine, thereby increasing the potential for engine wear.

Polymer contamination, although it is a relatively rare occurrence, can cause severe operational and mechanical problems. This can be avoided by testing for polymers as part of your fuel quality monitoring, which should consist of simple filtration and FTIR/microscopic analysis.

For safe operation and fuel optimization you need to know what is in your fuel, and the supplier fuel quality certificate may not actually represent what you have taken onboard the vessel.

In today's market you cannot afford not to test your fuel.

I would also say know your engine, be open to all types of fuels, and work with your engine manufacturer, your fuel supplier and your fuel testing provider to set the parameters that will work for your specific engine and operating conditions.

Use the ISO specifications as a guideline and add what is needed to safe guard

your investment. You will be surprised how much you can save, and protect the environment, by doing so.

The Author

Wajdi Abdmessih, Founder & Owner of Seahawk Services, a new name (but a long history) in the fuel testing and inspection business.



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Grand Bahama Shipyard Ltd. Investing in the Future

(Photo: Grand Bahama Shipyard Limited)



MR spent time with Graham Couser, VP of Sales and Marketing, Grand Bahama Shipyard Ltd. (GBSL), for updates and insights on how this yard is faring in the current market and investing for the future.

As the largest ship repair yard in the Caribbean, Grand Bahama Shipyard Limited, Couser said the yard is committed to continual investment based on customer's needs, in markets good and bad. "The cruise market remains buoyant and upbeat with growth planned into the next few years," said Couser. "However, with regard to the tanker, offshore and container market segments, these remain challenging to say the least."

This year the yard addressed customer demand by upgrading workshops, purchasing new machinery and tooling, as well as expanding its wet berth capabilities to relieve pressure off dry dock utilization and move vessels out of dry dock and into service faster. In all, GBSL invested in three key pieces of equipment in January of 2016.

- GEDA Equipment and Personnel Elevator to relieve pressure off the dock

cranes: The elevator is capable of moving two tons of materials or equipment, allowing a quick commute from the dock floor to specific deck levels and job sites. It allows for the dock cranes to be dedicated to the movement of containers and waste skips to and from the upper deck maintaining a clean and safe work environment. The elevator adds to the overall efficiency of the operation and speeds the supply of materials to specific levels of the deck and significantly aids the very tight schedules.

- Manitowoc 1800 Crane gives GBSL, for the first time, the capacity to lift major structures and components at our North Beach Wharf. Before, those items had to be disassembled by the supplier into smaller units for lifting while the vessel was in dock. Recently GBSL lifted 10 diesel gensets, complete in their fully outfitted housing, weighing 60 tons with the Manitowoc 1800 Crane.

- Hull and Tank Blasting Equipment: Munkebo 2000 Abrasive Recovery System, Flow UHP Blasting Equipment and the WATERJET ROBOTICS Blasting Robots. This additional new equipment allows GBSL to complete extensive hull treatment work efficiently and effectively reduces "on dock" repair time usually driven by hull and tank surface preparation/blasting.

While investing in equipment is critical for any shipyard, so too is investing in people, and to that end GBSL announced strengthening of its leadership team. Joining GBSL are Ian Ross, a HSEQA vice president, Don Keirce, vice president of operations, Adrian Baboi Cruise Project Development Consultant, Charles Nugent Yard Development Manager. In addition, three international sales consultants have been added to the Marketing and Sales Division.

Finally, the company launched a new

website www.grandbahamashipyard.com.

Recent Deliveries

In 2016 the major dry-docking projects included: Liberty of the Seas, Prinsendam, Carnival Sunshine and Norwegian Dawn. Following are a briefing on each, with insights on major work completed.

Liberty of the Seas:

- o 23 days Dry Dock on Floating Dry Dock No. 2

- o Fabrication of an aluminum accommodation block comprising two decks. This is to house 41 luxury suites and subsequently fitted on to Deck 12. This was a major project that started three months prior to the dry dock. GBSL, supported by Polish Aluminum specialists, Aluship, constructed the prefabricated block in two pieces on the North Beach Wharf, the units were then barged

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to dry dock no. 2 and lifted on to the vessel. Once fitted, the unit was handed over to the engaged outfitting contractor for completion of the suite's interiors.

- o Considerable (10,216 sq. m.) hull blasting was performed using The Flow UHP Blasting Equipment. Afterwards, two coats of Anti-Corrosive (AC) and two coats of Silicone (FRC - Foul Release Coating) to Flat bottom; two coats of AC and two coats of FRC to Vertical Sides; three coats of AC to topsides were applied using the airless spray unit using Hempel paint.

Prinsendam

- o 12 day Dry Dock on Floating Dry Dock No. 3
- o Considerable (10,216 sq. m.) hull

blasting was performed using The Flow UHP Blasting Equipment. there after, two coats of Anti-Corrosive (AC) and two coats of Silicone (FRC - Foul Release Coating) to Flat bottom; two coats of AC and two coats of FRC to Vertical Sides; 3 coats of AC to topsides were applied using the airless spray unit, International Marine Coatings

- o Approximately 37,946kg (37 tonnes) of tank top and steel work was replaced.

Carnival Sunshine

- o 11 day dry dock on floating dry dock no. 2
- o Hot and Cold PW piping was replaced, Georg Fischer pipework installed on Deck 2 throughout passage-

way for Cabins. GBSL +GF+ Qualified Installers assisted owner technicians on the installation of the pipework.

- o Considerable (11,888 sq. m.) hull blasting was performed using The Flow UHP Blasting Equipment. there after, four Coats (two Coats of Anti-Corrosive - AC and two coats of Self Polishing Coating - SPC) were applied using the airless spray unit, with Hempel Paint

Norwegian Dawn

- o 27 days of dry dock on floating dry dock no. 2
- o Considerable (13,981 sq. m.) hull blasting was performed using The Flow UHP Blasting Equipment. there after, four Coats (two coats of Anti-Corrosive (AC) and two coats of Self Polishing

Coating to flat bottom, vertical sides, boot top) three Coats to top sides. Two coats of Anti-Fouling (AF) and two coats of Anti-Corrosive on bulbous bow and bow thruster area using the airless spray unit. Paint Manufactures: Nippon on flat bottom, vertical sides and boot top and International on top sides

- o A riding squad was provided: Riding squad (6 persons) sent 1 week in advance to Grand Cayman. It included two certified welders, three platers and the Cruise Service Manager, Craig Stark. To install steel frame work on Mooring Deck prior to the vessel's arrival in preparation for azipod removal for azipod maintenance. Azipod repair Included Port and starboard slewing bearings that were replaced.



(Photo: Grand Bahama Shipyard Limited)

“The cruise market remains buoyant and upbeat with growth planned into the next few years. We look forward to future revitalization projects of cruise vessels which are currently in the planning stages for work scheduled at GBSL. However, with regard to the tanker, offshore and container market segments, these remain challenging to say the least. We are confident that these market segments will recover in the near future.”

Graham Couser, VP of Sales and Marketing, Grand Bahama Shipyard



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CARNIVAL INSPIRATION

U.S. WEST COAST



Photo: Vigor

United States West Coast

A Maritime Hub Grows

The U.S. shipbuilding industry is as broad and diverse as the country itself, spanning from the smallest workboats to large oceangoing ships, as well as the most technically sophisticated naval ships in the world.

Last month the General Dynamics NASSCO hosted Maritime Administrator Paul “Chip” Jaenichen for a tour of the San Diego-based shipyard, where SEACOR Constitution – a 610-ft. tank ship was recently launched. This trip was significant as it highlighted California as the 5th highest state in total private sector direct employment for shipbuilding and repair industry in the U.S. Jaenichen shared data from a report by the U.S. Maritime Administration (MARAD) that shows the U.S. shipbuilding and repair industry in California supports nearly 35,000 jobs, and contributes \$2.3 billion in labor income and \$3.6 billion in U.S. GDP.

“The Administrator’s remarks while visiting NASSCO demonstrate not only the local importance of the shipbuilding and repair industry for California, but also the critical support on a national level the shipyard industrial base provides to economic and national security,” said SCA’s President, Matthew Paxton.

As reported in the Maritime Administration report, The Economic Importance of the U.S. Shipbuilding and Repairing Industry, the private shipbuilding and repair industry in 2013 supported over 399,000 jobs, contributing \$25.1 billion in labor income and \$37.3 billion in U.S. GDP.

NASSCO

General Dynamics NASSCO, is headquartered at 2798 East Harbor Drive, San Diego, Calif., employing 4,362 as of June 2016, with 33 open positions. NASSCO historically has held a unique position in U.S. shipbuilding circles as it

has succeeded where many others have failed: adeptly building commercial and military vessels in the same shipyard.

General Dynamics NASSCO has long been a leader in the ship design, construction, and repair industry. In 2015, the company made world history and shattered industry standards with the delivery of the world’s first two dry cargo containerships to be fueled by liquefied natural gas (LNG). To date, these containerships are the most environmentally-friendly, most cost-effective containerships of their kind—anywhere in the world.

Also in 2015, the company delivered two revolutionary classes of vessels: the ECO Class product tanker and the Navy’s first Expeditionary Sea Base. Just recently, the U.S. Navy awarded NASSCO the contract to build the fleet’s next generation of oilers.

NASSCO also provides complex repair and maintenance services – particularly in support of the U.S. Naval Fleet. Strategically located in four U.S. ports and with a global presence, the company is well-positioned to service its current and future customers.

Finally, NASSCO invests in its people. The company offers on-the-job training and after hours development opportunities for all employees. In addition, as a result of the company’s embedded Total Safety Culture, NASSCO maintains the lowest incident rate records among shipyards of its size in the U.S.


As with most any shipyard, General Dynamics NASSCO counts its people as its number one strength, and to that end the company offers training and development opportunities for prospective and current employees from various backgrounds and skill sets.

Individuals hired as students undergo an eight-week, paid trades training program to prepare them for the NASSCO workforce. Incoming students often

have little to no background in maritime industry trades such as welding and outfitting.

NASSCO maintains a Professional Development Program open to both internal and external applicants. The program involves a two-year rotation throughout

various organizations within the company including but not limited to engineering, production and management. The program provides employees with a holistic view of the different disciplines of the company’s shipbuilding, design and repair operations, while establishing



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strong relations throughout the company and preparing participants for their future career path. The company also provides internships for college students.

Matson Navigation Company, Inc., a subsidiary of container shipper Matson, Inc., recently signed a contract with NASSCO to build two new combination container and roll-on/roll-off (Con-Ro) vessels for its Hawaii fleet at a contract price of \$511 million for both vessels with deliveries scheduled for the end of 2019 and mid-year 2020. Matson is calling these vessels the Kanaloa Class in honor of the ocean deity revered in the native Hawaiian culture and will name each of the new vessels after predecessor ships from its 134-year history. The first vessel will be named Lurline, the sixth Matson vessel to carry that name, while the second vessel will be its fifth named Matsonia.

The Kanaloa Class vessels will be built on a 3,500 TEU vessel platform, which is 265m long, 34.9m wide (beam), with a deep draft of 11.5m and enclosed garage space for up to 800 vehicles. In addition, the new vessels will have state-of-the-art green technology features, including a fuel efficient hull design, environmen-

The Dakota Creek-built R/V Sally Ride.



Photo: Scripps Institution of Oceanography at UC San Diego

tally safe double hull fuel tanks, fresh water ballast systems and dual-fuel engines, meaning that they will be able to operate at speeds up to 23 knots on either conventional fuel oils or liquefied natural gas (LNG) with some adaptation for LNG. These advancements are important to Hawaii as a means to reduce fuel consumption, and will result in significant emissions reductions over time.

The two Kanaloa Class ships will replace three diesel powered vessels in active service, which will be moved

to reserve status. With delivery of the Kanaloa Class ships, along with its two new Aloha Class ships, Matson will have completed the renewal of its Hawaii fleet, allowing it to retire its seven older steamship vessels that will no longer comply with environmental regulations in 2020 without substantial modification.

Vigor

Go north on the U.S. Pacific Coast and you will find another innovator in the form of Vigor, with locations in Oregon,

Washington & Alaska, headquartered at 5555 N. Channel Ave., Portland, Ore. Vigor has been an active consolidator of West Coast shipbuilding and repair assets in recent years, and today the company employs 2500, with 70 current openings. Vigor is an increasingly diversified company offering shipbuilding, high performance aluminum vessels, ship repair, blasting and coating, machining and complex fabrication services at 10 locations throughout the Pacific Northwest and Alaska. It is motivated

Bay State Construction at General Dynamics NASSCO.



Photo: NASSCO

by three simple words: “Industrial Jobs Matter,” to its workers, their families, the communities and the country.

While striving to make the company more competitive, it remain focused on what really matters: Vigor’s people. This interest is manifested in investment in training and facilities to provide workers with the opportunity to grow and cross-train in new areas. Vigor has diversified to better weather the ups and downs of any one market segment and provide more job stability for its people. Vigor has invested in the critical infrastructure necessary to compete on a global level.

Dakota Creek Industries

On August 26, 2016, R/V Sally Ride arrived from its shipyard birthplace in Anacortes, Wash. – Dakota Creek Industries Inc. – via a stop in San Francisco, to its home port at the Scripps Nimitz Marine Facility in Point Loma. The ship is owned by the U.S. Navy and operated by Scripps Institution of Oceanography at UC San Diego—one of the world’s most renowned ocean, atmosphere, and earth system research centers.

R/V Sally Ride is one of the world’s most technologically advanced oceanographic research vessels and will put that technology to work in missions throughout the northern Pacific Ocean. With it, seagoing scientists will work toward goals of fundamental importance to society: preserving the fisheries that are vital to the world’s food supply, discovering new chemical compounds that are the basis for antibiotics and cancer therapies, avoiding the large-scale instability in natural systems that is a consequence of climate change, and filling in the jigsaw puzzle of global tectonics that lets us understand the risk of seismic events where we live.

The ship is one of three University-National Oceanographic Laboratory System (UNOLS) vessels operated by Scripps Institution of Oceanography at UC San Diego. As with 18 other vessels in the UNOLS fleet, it is available for use by oceanographers, geoscientists, biologists, and atmospheric scientists around the country.

R/V Sally Ride is designed to provide “environmental intelligence”—knowledge to aid the planet and its inhabitants in a time of environmental crisis. A better understanding of the ocean is essential for safe, effective U.S. naval operations, and for global economic and environmental well being.

Port of Long Beach: New Twin Fireboats

Robert Allan Ltd. was awarded a contract in the summer of 2011 to prepare plans and specifications for a pair of fireboats for the Port of Long Beach, Calif. Due to operational proximity, the Los Angeles fireboat Warner L. Lawrence (a 2001 Robert Allan Ltd. design) heavily influenced the owner’s requirements. The first RAnger V-3300 fireboat Protector went into service in June of 2016 with the second vessel Vigilance expected in mid-2017. These new fireboats feature Voith cycloidal drives in a tractor configuration, designed to provide exceptional maneuverability and the ability to fight fires in any orientation. High speed was not a priority for this project; low wake and good seakeeping were deemed to be of greater importance. During the design phase, Robert Allan Ltd.’s in-house CFD capabilities optimized the hull form, ensuring the vessel meet two important criteria: minimum wake when traveling both ahead and astern at eight knots and good heavy weather seakeeping ability. The total aggregate pumping capacity of each vessel is 41,000 gpm, with the single largest monitor capable of delivering 12,000 gpm a distance of almost 600 ft. The vessels are also capable of providing over 30,000 gpm of water shore-side through 4-in. hoses to support land-based firefighting operations.



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RV Meen Shandhani



International FRV for Bangladesh

IMC's latest fisheries research and survey vessel design was built in Malaysia for the Bangladesh Department of Fisheries. RV Meen Shandhani arrived in Bangladesh in June after completing extensive sea and fishing trials and its delivery voyage.

The Australian consultancy's naval architects and engineers drew on a wealth of relevant experience, data and expertise when developing the research vessel's design. Formed in 1994, IMC and its principals have a long interest in, and association with, the fisheries sector. Managing Director Justin McPherson worked in Australia's Northern Prawn Fishery before training as a naval architect and the company's design library now includes projects covering longliners, purse seiners and pearling vessels, as well as research vessels such as

the 35.8m RV Solander and 22.6m RV Naturaliste. IMC is currently finalizing a prawn trawler design to address the Australian fisheries' ageing fleets.

Meet Meen Shandhani

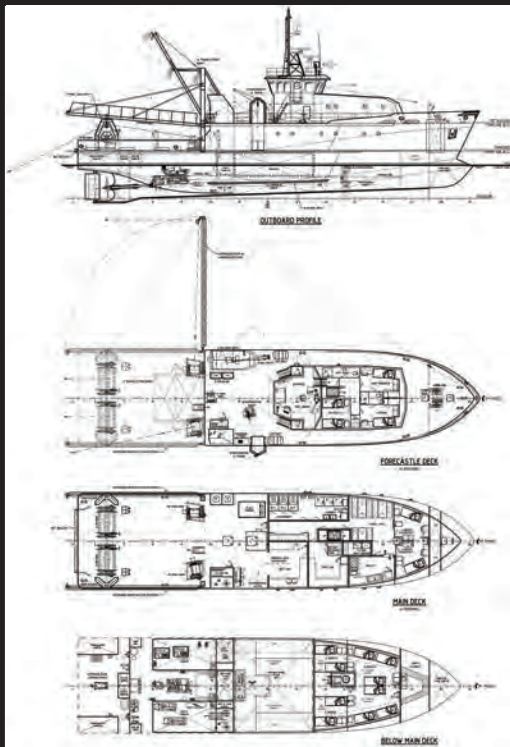
Built at the Sumber Samudra shipyard, the 37.8m Meen Shandhani is capable of mid-water, bottom and otter board trawling; as well as oceanographic research including sea bottom and water sampling. The main deck layout reflects these diverse capabilities, with a net roller, trawl gallows and twin 2000m capacity single drum net winches, each capable of eight tons pull at 22m per minute, located aft to support stern trawling. Outriggers for otter board trawling are integrated into a large A-frame lifting boom further forward. Central to all trawling operations are a pair of trawl winches, each of which can store 2,400m of 16mm steel

wire rope and provide 10 tons pull at 22.5m per minute.

Bottom, midwater and shrimp trawl nets are of Korean design manufactured in Malaysia by Jaya Nets, while the otter boards are from BMI in Korea. BMI also supplied two of the snatch blocks, with the remainder of the suite being Blueline units from Denmark. Forward of the trawl winches, beneath the shelterdeck, there is a stainless steel/aluminum semi-contact plate freezer to port, while IMC designed an alcove into the starboard side. The alcove enables specialist hydrographic tools such as conductivity, temperature, and depth (CTD) packages and water sampling equipment to be safely deployed and retrieved, with lifting accomplished by a dedicated A-frame and hydraulic winch combination located on the deck above. The equipment can be transferred into the purpose-

designed wet lab immediately forward of the alcove using an overhead Toyo monorail and electric hoist system. Further reflecting the important scientific and sampling work the vessel will undertake, a dry lab is located ahead of the wet lab. This space also includes a dedicated instrument store. The remainder of main deck is used for accommodation, with a large combined crew amenities and laundry space; galley; and mess/recreation space; as well as two cabins, each providing two berths for scientific personnel.

The shelter deck area also provides the access to the vessel's 90 cu. m. fish hold. Located just forward of amidships on the lower deck the hold can be cooled to -22°C. IMC's design also incorporates an 11 cu. m. refrigerated sea water (RSW) tank that can be maintained at -1°C. Bitzer compressors and condens-



ers, and Desmi condenser pumps, are used for the RSW, plate freezer and fish hold refrigeration systems.

Aft of the fish hold are tank spaces, including double-bottom fuel tanks and the RSW tank, and the research vessel's large machinery space. Propulsion power comes from a single Cummins QSK38-M engine with the heavy duty rating of 1,400 hp at 1,800 rpm.

This drives a fixed pitch propeller through a 6:1 reduction Hitachi Nico/Twin Disc MG-5506 gearbox. Mentrade supplied the propeller, stern tube, shafting, and rudder package. Engine control and steering systems are from Kobelt.

The machinery space also houses a pair of 150kW, 50Hz generators powered by Cummins QSB7-DM engines and the two 75kW hydraulic power packs for the fishing deck equipment. A workshop area is located against the bulkhead that separates the machine space from the steering gear compartment, which also houses fresh water tanks port and starboard.

Accommodation for 20 crew is located forward of the hold and accessed from the deck above via an enclosed stairwell. Four berth cabins are positioned either side of the stairs, with a 12 berth cabin located further forward.


Ahead of this is a ship's store, and forepeak ballast tank. The same stairwell also leads up to the officers' accommodation on the fore-castle deck where there is a twin berth cabin, an officers' washroom, and single berth cabins for the captain and chief engineer who share an ensuite head.

Stairs lead up and aft to the wheelhouse, within which the navigation electronics are primarily Furuno (including X- and S-band radars, DGPS navigator, log, GPS plotter/echo sounder) with Raytheon Anschütz selected for the autopilot and GPS; Hapcon for the bridge navigation watch alarm system; and Haiyang for the AIS. Furuno also supplied a color scanning sonar and Doppler cur-



rent indicator, while a Samyung unit was specified for the net recorder. The only exceptions to the use of Furuno communications equipment are the SARTs (Samyung) and EPIRB (McMurdo). A four camera HKVision CCTV system is also fitted.

Outside on the fore-castle deck are the hydrographic winch and associated control station, plus a 4.2m Hwayan rigid in-

flatable work/rescue boat and associated davit. Meen Shandhani is classed by Bureau Veritas with I * Hull * Mach Special service / Research ship Unrestricted Navigation. Its steel hull has a molded beam of 9.2m, depth of 4.6m and design draft of 3.3m corresponding to a deadweight of just over 194 tons. It is expected to commence extensive fisheries resource surveys in the Bay of Bengal shortly.



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Choke Points are Flash Points

This summer the world is closely watching several contentious flash points that have potential to ignite.

By Edward Lundquist






The behavior and rhetoric of China and Russia regarding vital shipping lanes in international waters have been alarming. Disputed sovereignty claims and efforts to enforce them have the maritime world on edge. China's nine-dash line claims about owning the entire East and South China Sea have created a dilemma for themselves and the other nations in the region.

The Philippines v. China case with the Permanent Court of Arbitration in The Hague commenced on Jan. 22, 2013, when the Philippines served China with a notification and statement of claim "with respect to the dispute with China over the maritime jurisdiction of the Philippines in the West Philippine Sea."

When the International Court ruled in favor of the Philip-

pines, that China had no historical claim to disputed islands, China doubled down, and said they would not relinquish their self-anointed sovereignty, and have stated that anyone who sails or flies there in attempt to assert freedom of navigation would be a provocation and worthy of a strong (read that to mean military) response.

Nevertheless, China has still been invited to participate in RIMPAC 2016. And Chief of Naval Operations Admiral Jonathan Richardson has taken a proactive approach of going to China to visit his counterpart and to tour the Peoples Liberation Army-Navy naval academy and other facilities. It may not be extending the olive branch, but Richardson is making a positive and first step. China could seize the opportunity and halt construction for the time being.



Aircraft assigned to Carrier Air Wing (CVW) 9 fly in formation above USS John C. Stennis (CVN 74) and the guided-missile destroyer USS Stockdale (DDG 106) during an air-and-sea-power demonstration. Providing a ready force supporting security and stability in the Indo-Asia-Pacific, John C. Stennis is operating as part of the Great Green Fleet on a regularly scheduled 7th Fleet deployment.

But, according to *Xinhua News Agency*, Adm. Wu Shengli, head of the PLA-N, said China won't stop construction. "The Nansha Islands [Spratly] are China's inherent territory, and our necessary construction on the islands is reasonable, justified and lawful."

Putin has employed subterfuge mixed with brinksmanship to execute some dramatic moves that makes him even more popular at home, and undermines the West and make the high ground occupied by America, NATO and the EU appear unstable. He has sought to fracture the solidarity of the west—Brexit, and an unstable Turkey, weakens that solidarity—and those nations sitting along the fault line are puzzled as to who they should trust, or at least turn to for leadership.

What does it mean for the maritime world?

Back to Asia, there is a lot at stake surrounding a small island. A huge volume of world trade passes through the South China Sea and East China Sea. Control of those seas effectively can serve to control commerce. Unlike a land border, a chunk of land at sea comes with a bonus—a 200-mile EEZ that extends around it on all sides. There are significant resources involved, from fish to oil and gas. True, the EEZ's can be hemmed in by other EEZ and territorial areas, but China has been more than liberal in claiming their share of an adjacent EEZ. Claiming the entire sea not only strengthens them, but denies those benefits to other nations.

China has published special supple-

ments in the *Washington Post* and other media to claim their peaceful and benevolent use of those claimed islands. Why, they argue, would anyone not want the advantages of China's benign and munificent leadership of this territory, with such benefits as research opportunities, navigational aids, and search and rescue capabilities of value to all? And, besides all that, the faux journalistic accounts continue, the International court has no jurisdiction.

China and the Philippines are both signatories to the UNCLOS treaty, which establishes the mechanisms to adjudicate such disputes. But stating that the arbitration is not legitimate places China in a difficult position of being unable to use such judicial remedies in the future. For China, adherence to international law is

selective, based on self-interests.

From a naval point of view, the South China Sea nations and their navies are sailing on a difficult course. They want to avoid further antagonizing China and its economic might. But they look to the U.S. to stand with them as China flexes its muscles. The Philippines and Vietnam, for example, have drawn themselves closer to the U.S., and American ships, aircraft and ground forces have conducted more and bigger exercises to build capability and create interoperability to Asian partners. These exercises, the largest of which is the Rim of the Pacific (RIMPAC) exercises in and around Hawaii and the U.S. California coast, also create solidarity, and send a message that "we stand together." In fact, China has been invited to participate in

Construction of fighter-jet hangars

appears complete at the southern end of the runway and is well-advanced along the middle of the airstrip. At the northern end, construction on a final set of hangars is still in the early stages. Two medium hangars and one large hangar are being constructed toward the southern end of the runway.



Chiefs of U.S. and Chinese Navies Agree on Need for Cooperation

Chief of Naval Operations (CNO) Adm. John Richardson met with People's Liberation Army (Navy) (PLA(N)) Commander Adm. Wu Shengli during professional and social events held July 18 at navy headquarters in Beijing.

The goal of the engagement was to improve mutual understanding and encourage professional interaction between the two navies.

"I appreciate the opportunity to visit China and to meet with Adm. Wu in person—there is no substitute for these types of face-to-face meetings," said Richardson. "My goal is to forge a relationship built on frankness and cooperation. Given the responsibilities that our navies have, we must work together and speak candidly—when we agree as well as when we have differing opinions."

"I am very happy to receive you here today," said Wu. "We attach great importance to your visit. Your visit to China, at our invitation, shows how both sides put great priority on maritime issues."

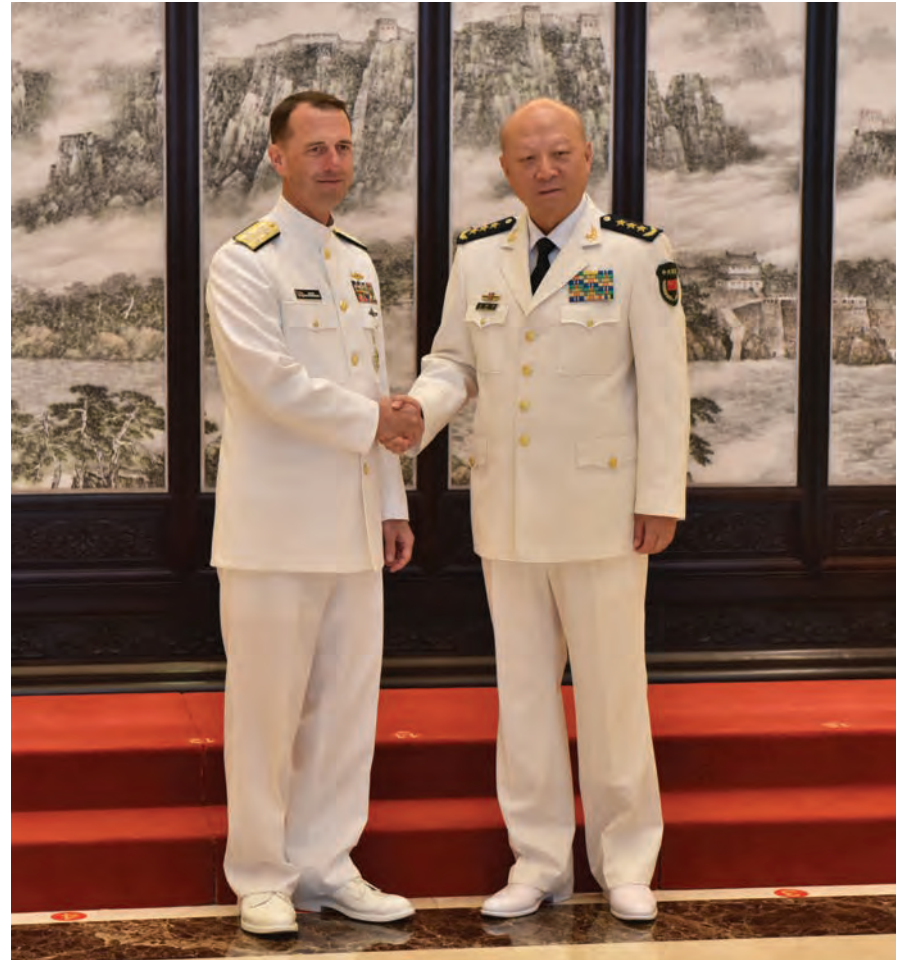
The two leaders had frank and substantive conversations on the importance of operating safely, in accordance with international law; future opportunities for the two navies to engage; and the South China Sea.

The visit, which has been in works for months, was Richardson's first visit to China as the chief of naval operations and his first in-person meeting with Wu. Over the last year, the two admirals have held three discussions via video teleconference.

CNO also traveled to Qingdao, home of the Chinese North Sea Fleet, where he is scheduled to visit the Chinese Navy's submarine academy and tour the aircraft carrier Liaoning (CV-16).

CNO Adm. John Richardson

(left) meets with Adm. Wu Shengli, Commander of the People's Liberation Army Navy (PLAN), at the PLAN headquarters in Beijing.



(U.S. Navy Photo by Mass Communication Specialist 1st Class Nathan Laird/Released)

RIMPAC. "We issued the invitations, and we have not taken the step of disinviting them," said Secretary of Defense Ash Carter in April.

China participated in RIMPAC 2014 with four ships, but also stationed a spy ship nearby to collect intelligence, something it claimed was "within its rights." And that's a true statement, although America could have rightly taken it as an affront. It is participating again this year, one of 28 nations contributing warships to the exercise.

In the case of China, it is trying to assert the kind of power it now believes it is due because of its economic might. Russia has stepped up patrol and flights in a way that recalls the Cold War. Putin has talked about using tactical nuclear weapons, and has claimed that NATO's defensive systems to protect against Iranian ballistic missiles aimed at Europe pose an existential threat to Russia. The difference is that Russia's economy today cannot support the kind of military might that Putin aspires to, and claims he has. For Russia, with depressed petroleum export prices that the economy depends on, and significant sanctions in place resulting from the illegal annexation of Crimea, it may be acting out as

a distraction for the people at home, or make geopolitical statements without the ability to back them up.

China chose not to participate in the arbitration, which made sure they did not have a voice in the proceedings. In order to make a good show of ignoring the ruling, China has said the U.S. is behind the "farce."

"The award is null and void and has no binding force," China's Foreign Ministry said in a statement.

And that is true. There is no way to enforce the ruling.

However, the U.S. has maintained that it takes no position in the territorial disputes surrounding the islands and features in the South and East China Seas.

"We don't recognize anyone's sovereignty claim in the Spratly Islands, or more broadly, in almost any of the South China Sea islands in dispute," said Rear Adm. Mark Montgomery, director for operations for the U.S. Pacific Command. "And we believe that there must be a negotiated agreement to the sovereignty in relationship with each of these features, be they low tide elevations, high tide elevations, or islands. And we don't believe that the Chinese reclamation efforts, or their subsequent militarization



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of these facilities, contributes to a negotiated solution, and, as such, we have diplomatically lodged our disagreement, and we've diplomatically discussed our disagreements with the Chinese."

Montgomery said the East China Sea presents an equally challenging problem with sovereignty disagreements. "The significant difference with the East China Sea is that the U.S. treaty partner is a significantly more capable air-maritime force in the Japanese Maritime Self-Defense force. And I think that has a stabilizing effect there. But that does not mean that all risk is removed from the East China Sea."

Also alarming is China's militarization of its newly claimed islands, a charge that China has also dismissed. "China's deployment of national defense facilities on its own territory is reasonable and justified," said spokesman Hong Lei. "It has nothing to do with the so-called militarization."

Russian Recklessness

Throughout history, adversaries have created pretexts to escalate conflicts. We may be witnessing this today with Russian ships and aircraft conducting provocative and unprofessional maneuvers with its ships and aircraft.

If the U.S. takes the bait and reacts, it can be portrayed as "starting it." If it doesn't do something, it can be portrayed as weak. One such recent provocation involved a Russian frigate that was purposefully interfering with a U.S. carrier strike group while conducting combat operations against ISIS. The Russians showed video that appears to show their frigate steering directly for the starboard quarter of USS Gravelly, but in the narrative state that the U.S. ship is cutting directly in front of them in a "dangerous and unprofessional manner."

The Russian frigate was flying the international signal claiming to be re-

stricted in her ability to maneuver, and directing other ships to remain clear, but would then freely maneuver herself in a way that seemingly demonstrated no restriction.

A Russian news service, *Sputnik*, quoting the Russian Defense Ministry, said, "U.S. destroyer Gravelly made a close encounter with a Russian warship in the eastern Mediterranean on June 17 at a distance of 60-70 meters [197-229 feet] on the port side and crossed the Yaroslav Mudry's course along the bow at a dangerous distance of 180 meters [590 feet]," the ministry said.

Watching the YouTube video posted by Russia, it appears that the Russian Frigate is turning into the starboard quarter of the U.S. combatant, making it appear as if the Gravelly was cutting across the bow of the Russian ship when in fact the Russian ship was headed into the American ship.

Putin wants more such confrontations.

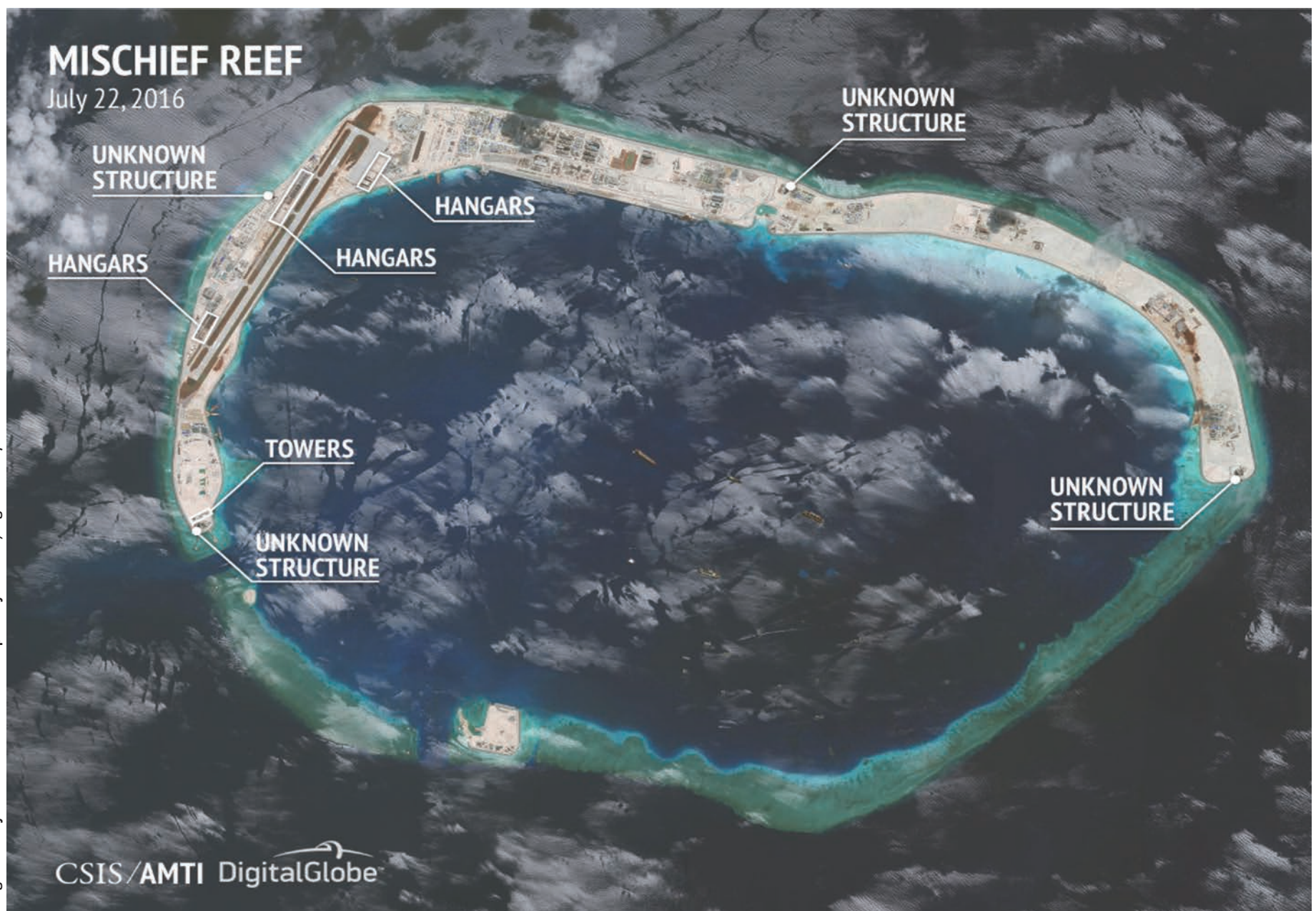
When his commanders in the Baltic Fleet refused to operate in an unsafe and un-seamanlike manner to antagonize NATO units, he fired all of them in a Stalin-esque purge.

The *Moscow Times* reported that the Russian Defense Ministry announced it was purging the entire senior and mid-level command of the Baltic Fleet for dereliction of duty and corruption. The June 29 report said the Baltic Fleet leadership showed "serious shortcomings in the organization of combat training, daily activities of their forces, failure to take all necessary measures to improve personnel accommodations, and distorted reports on the real state of affairs [in the fleet]." There were also reports of a cover-up involving a collision of a Russian submarine with a Polish patrol boat, the Russian report said.

Western reports said Putin fired the commanders because they wouldn't confront NATO ships at sea. The *Daily*

Construction of hangars at Mischief Reef

is at an earlier stage. Small hangars are being built along the length of the runway, while three medium hangars and one large hangar are being constructed along the apron at its northern end.



Mail in the U.K. reported, “Up to 50 officers of the fleet were fired alongside Vice Admiral Viktor Kravchuk and his chief of staff Rear Admiral Sergei Popov after they reportedly refused to follow orders to confront Western ships.”

The Baltic is of vital importance to the Baltic Sea nations and Europe. Half of Finland’s international trade is with her Baltic Sea neighbors. The Swedish port of Gothenburg, at the entrance to the Baltic, is the commercial transportation hub not only for Sweden, but for all of Scandinavia. 72 percent of all goods coming or going to Sweden pass through a Swedish port, and 40 percent of Russia’s trade passes through the Baltic Sea. There are also numerous pipelines and cables.

Navy officials have noted an increased level of Russian submarine activity in the North Atlantic, Baltic, Mediterranean and Black Sea. “We’ve had the Russian Kilos transit through, that’s been very public,” said Adm. Mark Ferguson in January, and who recently completed his tour of duty in June in command of Allied Joint Force Command Naples and U.S. Naval Forces Europe-Africa. “And they have stated their goal of putting six in the Black Sea. We think those boats will operate in the Med, and so we see their activity increasing here.”

“They’re racing against time, because of the impact of sanctions, of the diplomatic and economic isolation, and their own demographic issues and economic issues,” Ferguson said. “It’s very clear that they view NATO and the European Union as an existential threat to them. They look to the West and they see unity, they see liberal democracies, they see the rule of law and constitutional government and they see this value system that is perceived as an existential threat to their government.”

“From time to time, U.S. vessels enter the Black Sea,” said Foreign Ministry official Andrei Kelin as reported in the state-run RIA Novosti. “Obviously, we do not appreciate it and, undoubtedly, this will lead to retaliatory measures.”

The Black Sea is not a Russian lake. Other nations have coastlines along the sea, and the Black Sea has a significant area that is international waters. “In those areas which are international in the Black Sea, everybody should have an opportunity to conduct commerce over water or to be able to safeguard their critical infrastructure, whether that be oil-gas pipelines, or communication connectivity under the Black Sea,” said Vice Adm. James Foggo, Commander of Striking Forces NATO and the U.S. Sixth Fleet. “So it’s a very important region for a number of different countries.”

Foggo said naval presence in the Black Sea is important. “We operate the standing NATO maritime groups periodically in the Black Sea with our partners from Romania, Bulgaria, Turkey, the Ukraine, and Georgia. The nation of Turkey has been absolutely critical in maintaining lines of communication in and out of the Black Sea as one of the primary [nations] responsible for the Montreux Convention which controls access and size of ships, tonnage of ships as they move in and out of the Bosphorus. And I think they’re doing a superb job of that. And that is critical to sea lines of communication. It is a choke point, and it should remain open so that commerce and also naval vessels can get in and out to maintain security.”

While we may continue to see strident and even outrageous statements by both Russia and China in the months ahead, let’s hope the actions are less strident.



(U.S. Navy photo/Released)

Provocative Fly By

A Russian Sukhoi Su-24 attack aircraft makes a very low altitude pass by USS Donald Cook (DDG 75) April 12, 2016. Donald Cook, an Arleigh Burke-class guided-missile destroyer forward deployed to Rota, Spain, is conducting a routine patrol in the U.S. 6th Fleet area of operations in support of U.S. national security interests in Europe.



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Maritime & Logistics Giant Holds Firm in a Tight Market

Tokyo-based Nippon Yusen Kaisha (NYK) Group is not only one of the world's largest ship owners with a diverse fleet of more than 800 ships, it is a growing global maritime logistics powerhouse. Maritime Reporter & Engineering News visited with Yasuo Tanaka, Senior Managing Corporate Officer, Naval Architect, in Tokyo for his insights on the company's continued efforts to invest in operational efficiency.

BY GREG TRAUTHWEIN





Photo: NYK



Photo: Greg Trauthwein

Yasuo Tanaka

Senior Managing Corporate Officer, Naval Architect

"We are trying to utilize a lot of data to improve our operations, and we have had some success in making vessel operations more efficient, and applying this knowledge to other areas as well. **It is not a simple process.** In order to effectively utilize data, you have to collect it and you have to visualize the data. But most importantly you have to use the information to actually make changes in your business. That is arguably the most important element. And also the most difficult. It is a challenge primarily from the human element aspect. Most people doing their job would likely argue that they are doing a good job. But when you bring in the data element and perhaps a change of procedure, some may resist. **But data driven changes can help to provide different visions and solutions to a common problem. Getting organization to buy-in and change is the real challenge.**"

The story of NYK cannot start without a look at the numbers, because the numbers tell the story in a most impressive fashion. (Note: The following numbers are taken from the company's 2015 Annual Report as well as reported numbers as of April 2016). Founded September 29, 1885, from humble beginnings NYK has grown into a global goliath. It starts with \$24 billion in revenue; 33,520 employees and 840 ships with an aggregate of more than 66,000,000 dwt. That fleet includes 408 Bulk Carriers, 123 Car Carriers, 104 Containerships and 68 Tankers, to name a few. And that's just the maritime fleet. The Logistics business includes 484 distribution centers in 40 countries, a cumulative 2.25 million square meters of warehouse space, 23 container ports, 19 RoRo terminals and

18 aircraft.

It is this breadth and depth that has been central in the company's ability to hold its own, particularly in recent years as markets have not been kind to ship owners, according to Tanaka. "Many ship operators this year are suffering, NYK is keeping its head above water." Also, Tanaka credits the company's overall mindset as integral to it maintain focus and continuity of quality of service in times good and bad. "Most important is we have to support our clients with a long-term view," said Tanaka. "This helps us to be a better company, to provide better technology and creative solutions: Taking a long-term view is our mindset."

NYK & the "Super Eco Ship 2030"

Central to that long-term view is a con-

certed and intelligent investment in new technology, technology investment intended to not only make operations more efficient but also more environmentally friendly.

"I think the most important point is sustainability," said Tanaka. "Global warming and environmental issues are at the forefront, and it is estimated that 4% of total Green House Gases are coming from shipping. Four percent is not a small number, and we must (as a shipping industry) do this ourselves. It is about transparency; it is about environmental responsibility."

In the maritime sector, tech investment in the name of safety, the environment and efficiency has gained considerable traction in recent years, spurred mainly by legislation. But upgrading vessels in response to legislative mandate is only

half the story, as true tech leaders in any sector help to blaze a technology trail with investment above and beyond that mandated. NYK is one such technology leader, as evidence by an impressive breadth and depth of technology investment and creation.

Testament to this is the Monohakobi Technology Institute (MTI), which was established by NYK Line in April 2004, and is a Tokyo-based research and development arm with 63 employees. "MTI was formed when top management of NYK identified environmental issues as the driving force for ship development and design," said Tanaka. ("Monohakobi" roughly translates to "Quality Transport.") (*Four R&D projects which NYK and MTI are jointly participating in were selected by the Ministry of Land, Infrastructure, Transport and Tourism

1885

Yubin Kisen Mitsubishi Kaisha and Kyodo Unyu Kaisha merge on September 29 to form Nippon Yusen Kaisha (NYK); new company inaugurates operations on October 1 with a fleet of 58 steamships.



1893

Japan's first long-distance liner service begins on Bombay route.



1914

Tokushima Maru, first Japanese ship to pass through the new Panama Canal.



1920

New York branch opens.



1926

Twin red stripes on white background becomes official funnel mark.



1939

NYK acquires Kinkai Yusen Kaisha Ltd.



Photo: NYK

(MLIT) in Japan for “2016 Support Projects for R&D in Advanced Safety Technology of Vessels.” See related story on page 40).

NYK and MTI have taken a holistic approach to efficient and environmentally benign ship technology and design, with the introduction of a number of key developments that are far beyond the concept phase, including:

- Electronic Controlled engines
- Wind-Powered Generators
- Alternative Marine Power (AMP) {Shore Power}
- Solar Power for ships
- Air Lubrication system for propulsion efficiency

The culmination of these R&D efforts are real products and systems that being

actively installed and used on working ships today. This is not simply research for the sake of research, with results emanating from test tank and computer simulation trials. The company does have its one “pie in the sky” ship shape, the NYK Future Ships or Super Eco Ship 2030 concept, which it utilizes as a base to showcase all of its new ship technology products. While the vessel is only a model, calculations suggest that the incorporation of multiple technologies, including: the Air Lubrication systems to reduce hull resistance; pre- and post-swirl appendages to improve propulsive efficiency; power plant efficiency with hybrid turbo charger and waste head recovery system; and NOx Reduction via SCR and EGR conspire to reduce CO2 by 69%.

LNG: The Future is Now

Today, LNG as fuel is a big issue for NYK, and last year the company received the first LNG-fueled tugboat in Tokyo Bay. On order for delivery later this year are a pair of LNG-fueled PCTC for operation in Europe at its UECC subsidiary. While NYK realizes the environmental and economic benefits of LNG-powered vessels in the long run, it also realizes the conundrum of steady fuel supply.

To this end NYK can leverage its logistics expertise, and in tandem with the delivery of the PCTCs in Europe, it is simultaneously working toward developing an LNG supply business on the continent. “This is a very big topic for us this year,” Tanaka said.

While NYK has aggressively started to invest in ships fueled by LNG, as well

as investing in the LNG bunkering infrastructure that still needs to be built globally to better facilitate the increasing mainstream use of this alternative fuel, LNG is a point of investment at NYK for other reasons, too. “At the moment LNG (is a big area of investment),” said Tanaka. “As a Japanese Shipping company, need for and importance of energy transportation will never end. Ever.”

Currently NYK has 30 LNG tankers with another 10 LNG tankers on order, a fleet spike premised on the import of U.S. Shale Gas. While energy markets fluctuate wildly, NYK sees this as a prudent investment, as it has the luxury of working with Japanese utility companies on a long-term (10 to 15 year) contract basis.

“The key really is the long-term contracts,” said Tanaka. “We ordered the



1945

Only 37 vessels (155,469 gt) remain after WWII. (185 vessels (1,131,424 gt) lost in the war).



1951

Main liner services resume.



1959

Group's first crude oil tanker, Tamba Maru, launched.



1960

Group's first iron ore tanker, Tobata Maru, launched.



1962

World's first large LPG carrier, Bridgestone Maru, completed.



1964

NYK and Mitsubishi Shipping Co. Ltd. merge to form a newly enlarged NYK Group.



Photo: Greg Trauthwein

Yasuo Tanaka

Senior Managing Corporate Officer, Naval Architect

Scrubbers are a short term option as the company evaluates what the future is going to look like. "We have more than 800 vessels, so we really can't change overnight! I think the LNG fuel is a best solution right now because there are so many resources, but to really expand its use we need a better distribution system for the fuel, because at the moment there are not so many LNG supply bases; we need to establish more." To that end NYK is actively opening LNG supply logistics infrastructure in Europe with partners to feed its PCTC ships there, and it is also looking at the possibility of establishing LNG supply in Singapore, and the East Coast of the United States.

vessels to handle the U.S. shale gas shipments, and more could be needed."

Container Shipping

While NYK's operations are diverse, it is a major player in two shipping sectors – the bulk market and the container shipping market – that have been particularly hard hit in recent years. But it is NYK's fleet diversity that Tanaka counts as a major strength when evaluating new technologies for shipboard use, as it provides ample platforms to test new tech in a variety of circumstances, sharing the intelligence across the fleet.

"As a technical person, we have a wide range of vessels from very small to very large," said Tanaka. "It helps to educate us on a wide variety of technology matters, and share technology across the spectrum."

But when it comes to identifying the single technology that has had the greatest impact on ship efficiency over the course of his career, Tanaka could not limit the answer to a single technology, rather his study of efficiency in the container shipping segment as an example.

"I compared a containership built in 1980 with a containership built in 2010, comparing ships of the same size and dimension," said Tanaka. In short Tanaka was out to determine the efficiency difference between two similar diesel engine-powered ships built 30 years apart, using the efficiency KPI, of the kg of fuel needed to move one TEU one mile. "Thirty years ago this number was 100 kg, and in 2010 it was less than 40 kg," said Tanaka. In determining why the efficiency has improved so drastically, Tanaka concluded there were sev-

eral factors with a significant hand in the equation:

- Efficiency of the diesel engine itself has improved significantly;
- Computing calculations have improved, which allows many of the structural designs to be changed, allowing same size ships to accommodate more cargo: for example the same size container vessel built in 1980 that could carry about 2,000 containers in 2010 could carry nearly 4,000 containers.
- The ship hull form, including the propeller, has been optimized for performance and efficiency.

Looking ahead, Tanaka said that NYK is laser-focus on improving the connectivity of ships, leveraging big data and

the Internet of Things to facilitate the flow of information, and in turn use that information in a constructive way to optimize individual ship and entire fleet operations. But while many arrows point toward data management as the wave of the future, in the immediate future it still counts on physical alterations to ships as a viable alternative. For example, in the case of its containership fleet, NYK like the rest of the world has slowed down its vessels, bringing ships designed for speeds of 25 knots into the 16 to 18 knot range. But slowing down the ship is far more than throttling back, as the company has already engaged in (current plans call for an additional conversion of 40 ships) the replacement of bulbous bows and the additional of stabilization fins, technologies in total which have reduced consumption up to 20%



1968

Hakone Maru, Japan's first fully containerized ship, begins service on new California route.



1990

Luxury cruise ship Crystal Harmony begins service as Group reenters cruise business.



1993

First Japan-registered double-hull tanker, Takamine Maru, launched.



1994

NYK Altair, a 4,800 TEU containership, launched.



1998

NYK acquires Showa Line Co. Ltd.



2001

Hinode Kisen Co. Ltd. becomes a wholly owned subsidiary of NYK and assumes responsibility for NYK's conventional ship business.



Photo: NYK

NYK By the Numbers

Nippon Yusen Kaisha (NYK) Line
 Head office: Tokyo, Japan
 Founded: September 29, 1885

Business Scope:

- Liner/Container Service
- Tramp & Specialized Services
- Tankers & Gas Carrier Services
- Logistics Service
- Terminal & Harbor Transport Services
- Air Cargo Transport Service
- Cruise Ship Service
- Offshore Service
- Employees: 33,520 (shoreside and Japanese Seafarers)
- Revenues (FY 2014): \$24 Billion

Logistics Business

Air Cargo / Aircraft 18
 Distribution Centers 484 in
 40 countries
 Warehouse Space 2,250,000 sq. m.

Terminals 23 Container Ports
 19 RoRo Terminals
 6 'Other' Terminals

Offshore Business

FPSO 3 (off of Brazil)
 Drill Ships 1 (off of Brazil)
 Shuttle Tankers
 NYK/Knutzen 50/50 venture

The NYK Maritime Fleet

Type	# Vessels	DWT
Containerships	104	5.99m
Bulk Carriers (Capesize)	123	23.9m
Bulk Carriers (Panamax & Handy)	285	17.4m
Woodchip Carriers:	48	2.6m
Cruise Ships	1	10,000
Car Carriers	123	2.2m
Tankers	68	11.3m
LNG Carriers	30	2.2m
Others	48	765,815
TOTAL	840*	66,363,224

*Number as of April 2016

2004

MTI (Monohakobi Technology Institute) established for the development of new technology.

2006

NYK Vega, an 8,600 TEU containership, launched. Luxury cruise ship Asuka II launched.

2009

Exploratory design for NYK Super Eco Ship 2030 released.

2010

Group enters offshore shuttle tanker business by purchasing interest in Knutsen NYK Offshore Tankers AS.

2011

Group participates in FPSO business (ultra-deep pre-salt layer off Brazil).

2012

NYK's Ship Energy Efficiency Management Plan (SEEMP) becomes the first in the world to be certified by ClassNK.

MTI Projects Recognized by MLIT

Four R&D projects which NYK and its Group company, the Monohakobi Technology Institute (MTI), are jointly participating in were selected by the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) in Japan for “2016 Support Projects for R&D in Advanced Safety Technology of Vessels.” Safer and more economical vessel operation by leveraging IoT and Big Data is highly expected in the maritime industry. These projects are also being undertaken as joint research studies with ClassNK, a general incorporated foundation. Brief outlines of the four selected projects are provided below.

1

Study on monitoring the structural health of vessel hulls for very large containerships

Participating companies: NYK, MTI, and Japan Marine United Corporation

Outline: To prevent maritime accidents in advance, a new voyage-monitoring system under study measures and collects such data as bending moment and other forces affecting containership hulls, in addition to navigation records, weather, and marine conditions. By sharing, the data between on board crew and onshore staff, it makes possible to help navigational judgement and design more rational vessel, taking into consideration hull structural strength.

2

Study on utilizing Big Data to enhance safe, economical operations by prevention of vessel machinery plant trouble

Participating companies: Japan Marine United Corporation, NYK, MTI, Diesel United Ltd., Wärtsilä Japan Ltd., Sunflame Co. Ltd., Terasaki Electric Co. Ltd., and Mitsubishi Kakoki Kaisha Ltd.

Outline: Through collaborative work among shipbuilders, vessel-related manufacturers, and maritime companies, aiming to reduce vessel machinery plant accidents, especially high-risk accidents that have major societal and cost impacts, by taking advantage of Big Data.

3

Study on technology that supports safe LNG transport by utilizing ship-shore communications

Participating companies: NYK, MTI, and JRCS MFG. Co. Ltd.

Outline: Aiming to develop (1) forecasting technologies for LNG cargo movement and for monitoring vaporization activity in storage tanks during LNG carrier operations, and (2) other fundamental technologies for Big Data applications on LNG carriers.

4

Study on collision risk judgement & autonomous operation of vessels

Participating companies: NYK, MTI, Japan Marine Science Inc., National Maritime Research Institute MPAT, Furuno Electric Co. Ltd., Japan Radio Co. Ltd., and Tokyo Keiki Inc.

Outline: The study includes development of (a) functions to facilitate judgement related to avoiding risk of collision with other vessels; (b) remote operations by land operators during emergencies; and (c) devices related to AR(Augmented Reality)** of nautical instrument information.

2013

NYK-Hinode Line Ltd. and NYK Global Bulk Corporation merge to form NYK Bulk & Projects Carriers Ltd.

2014

Contract signed to construct two dual-fuel PCTCs capable of using both marine fuel oil and LNG fuel.

2015

Japan's first LNG-fueled tugboat, Sakigake, launched.

NYK

... and today at NYK, the future is now ...



Earlier this year Japan Marine United Corporation delivered the 14,000 TEU container ship NYK Blue Jay, which is chartered by Japanese shipping company Nippon Yusen Kaisha (NYK), the first of 10 that the shipyard is building for NYK for operation on the Asia-European shipping lanes.

While on the outside NYK Blue Jay may appear a standard containership, inside it is anything but standard as it houses a world first in marine power: a dual-rated Wärtsilä X82 diesel engine designed by Winterthur Gas & Diesel (WinGD) in Winterthur, Switzerland, and manufactured by Diesel United Ltd. in Japan, which means the engine and ship can respond more quickly to changing market conditions.

“This engine was originally designed for the VLCC tanker market. But with the change of

the trading pattern in container shipping, with slower speeds, different engines were required. It became suitable for large containerships after a revision of certain technical features,” said Rolf Stiefel, Vice President Sales & Marketing, Winterthur Gas & Diesel Ltd.

“By doing the revisions of these features we developed a dual rating, which is offering the ship owner the possibility to adapt the engine to different trade patterns (speed). With this dual rating we can also make the engine very fuel efficient at these slower speeds. That is the benefit we’re offering with this engine.”

In spite of its smaller capacity, the new container ship series is designed to be able to compete in terms of operating economy with new generation of ultra large container vessels carrying around 20,000TEU.

NYK Blue Jay

14,000 TEU Ship Features Propulsion “World First”



Photo: NYK

The Winterthur Gas & Diesel Ltd. 8 cylinder X92 engine on the test bed.

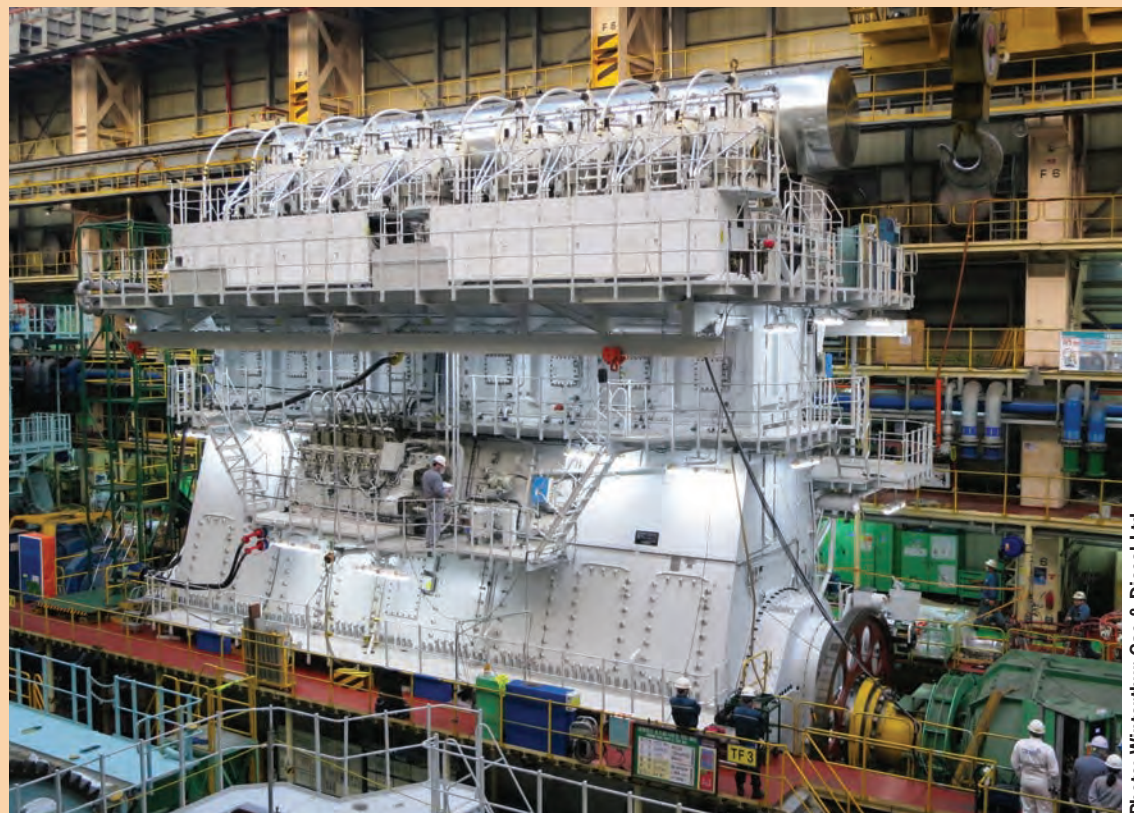


Photo: Winterthur Gas & Diesel Ltd.

The advanced propulsion concept includes a narrow dimensioned engine room allowing a hull design with exceptional hydrodynamic efficiency. And of course the central attraction is the Wärtsilä brand Generation X two-stroke diesel engine, the 9-cylinder Wärtsilä X82.

Specifically designed and developed by WinGD to meet ship owners' demands for the lowest total cost of ownership (TCO), the Generation X diesel and dual-fuel engines are conceived for maximized vessel payloads combined with low fuel consumption and emissions and for rational, economic production by WinGD's licensees.

"A holistic approach was taken when designing the Generation X engines," said Rudolf Holtbecker, General Manager, Business & Application Development. "It is designed to enable total vessel efficiency to be optimized by a careful combination of main engine parameters and efficiency, the propulsion sys-

tem and the ship hull. The capability to run lower engine speed fosters the higher efficiency of larger propellers. We took account of this in the engine design, like the Wärtsilä X82 used in the NYK Blue Jay, by employing higher stroke-to-bore ratios than in their predecessors. This not only facilitates the larger, slower turning propellers but also gives higher engine internal efficiency."

Dual-Rating

As for the dual rating feature of the Wärtsilä X82 Holtbecker said; "As we have seen in the recent past, ship owners wish to be able to respond to market conditions by having closer control over the fuel costs of their ships. In recent years this has led to owners operating their ships at lower speeds with engines running below their design ratings. With the X engines, the dual-rating option has been introduced to allow ship owners to use

their engines either with a low or a high maximum power output, further improving fuel consumption in each operating mode without major modifications."

The basis of the dual-rating feature of the X engines is WinGD's 'flex' system of electronically controlled fuel injection and exhaust valve actuation, combined with turbochargers with very wide compressor maps. The sophisticated fuel injection and valve timing systems developed by WinGD allows the engine to be optimized for two different vessel operating profiles based primarily on changes of engine system settings. The owner thus has a tool to easily adapt the vessel speed for different market conditions, always ensuring the operation with the best possible performance and economy.

"You need an engine with an extraordinarily big rating field to be able to offer the benefit with the dual rating," said Stiefel.

"The X82B has the biggest rating field on the market. From a manufacturing POV it makes no difference, but from an engineering point of view and a design POV it makes a difference. You need to study the different forces at the different load points on the engine, especially the bearing train system to be capable to absorb these high powers at diff. engine rotations and speeds. That's a more design issue."

"To change the rating of the engine you need to modify the turbocharger insides," said Stiefel. "So you would need to open the turbocharger and exchange the nozzle ring. It takes a few hours. You would also adjust the compression ratio of the engine by adjusting the lengths of the piston rod. A small mechanical modification, which altogether can be accomplished in one or two days in a port. The rest would be some electronic control modifications."

ABB Onboard DC Grid

Onboard DC Grid is the ABB power distribution system that is designed to bring new flexibility, greater efficiency and energy storage capability to a variety of ships.

The evolution of diesel-electric propulsion acceptance in the maritime and offshore realms continues in earnest, as the claims of efficiency versus traditional power plants has been proven over time in an increasing variety of ship types and

operational scenarios. But varying operational demands do not always make optimal use of AC's need for generators to run at constant rpm. This was the starting point for the development of Onboard DC Grid, a unique power distribution solution en-

abled by developments in DC protection methods, and first proposed by ABB in 2011. In early 2016, despite shipping's sustained slump, ABB reports that it has been securing orders in increasing numbers across a range of vessel types.

Operating at a nominal voltage of

1000V, Onboard DC Grid allows power sources/power levels to match vessel needs, integrating battery power/energy storage as one of those sources.

Rather than being locked at a specific frequency (usually 60Hz on ships), each power source and consumer is an AC or

John Lindtjorn, ABB Product Manager Onboard DC Grid and Energy Storage, explains how Onboard DC Grid offers owners far more than fuel savings and improved dynamic response.



DC 'island' controlled and optimized independently, allowing Onboard DC Grid to combine smart DC distribution with the advantage of AC components.

When a marine engine is operated at constant speed fuel consumption is typically minimized at around 85% load. In general, diesel electric solutions have always involved variable propulsion drive/propeller speeds. DC Grid, in addition, allows generators to be run optimally anywhere on the engine's power curve, offering a further means of fuel consumption optimization.

The first Onboard DC Grid installation on the PSV Dina Star in 2013 saw owner Myklebusthaug Offshore confirming significant fuel savings according to ABB, with savings in low load conditions reported of up to 27%. In addition, even when undertaking dynamic positioning in challenging weather conditions, the owner has confirmed that it has achieved 14% fuel savings.

DC Grid: Moving Forward

While logically it might be assumed that the prolonged slump in energy pricing would place fuel efficiency technology investment on the backburner, ABB's experience has been counter to this logic, and it reports that Onboard DC Grid orders have powered on.

John Lindtjorn, ABB Product Manager Onboard DC grid and Energy Storage, said this is because Onboard DC Grid offers owners far more than fuel savings and improved dynamic response. The sheer variety of vessel types specifying Onboard DC Grid have highlighted other telling benefits. Heading the list, he said, is the way DC Grid comes into its own in terms of energy storage, but there are others:

- more space for payload;
- fewer components;
- reduced weight;
- easier cable installation;
- lower maintenance; and
- more effective use of shore power.

Perhaps the most visually striking ship to feature Onboard DC Grid will be the Seasight ferry, due delivery by shipyard Brødrene to owner The Fjords in June. The solution is being delivered in a light weight variation for the 40m LOA carbon fiber vessel.

"Variable speed engines and shaft generators will naturally benefit the ferry market because they will help lower engine fuel consumption and emissions. However, in this case the main driver for DC Grid has been the addition of energy storage which can be

fully integrated," said Lindtjorn. "Ferries in Norway are seen as an extension of the road network, and so the 'zero emissions ferry' is an attractive concept that encourages the development of battery technology." Battery power also means Seasight can run silently at up to 10 knots in scenic UNESCO-listed fjords.

In other cases, too, Lindtjorn said Onboard DC Grid's energy storage capability has quickly become an increasingly significant driver for its uptake. "It is much easier to integrate energy storage using a DC system than it is for AC, and customers are coming to see that what they get is more functionality for the same investment."

Another reference is Exemplary, an offshore vessel under construction: the Cefront Technology concept for a ship-ship oil cargo transfer vessel (CTV). A 90m LOA vessel is being built by COSCO Nantong and COSCO GuangZhou. Here, Onboard DC Grid will allow the ship's four 3600kW ABB generators to operate at variable and optimum speeds, with a DC Grid-compatible 350kWh battery used for energy storage, backup, enhanced dynamic support and peak shaving.

"The approach simplifies the process of exploiting stored energy as a source for power in a way that is functionally integrated with the other sources on

board. An integrated power and energy management system (PEMS) lets each of the power sources play to its own strengths, thereby coaxing the most out of the system overall," said Lindtjorn.

Onboard DC Grid is also integral to the power, propulsion and automation for world's most advanced port icebreaker, built by Russia's Vyborg shipyard for heavy harbor ice conditions. Its ability to allow diesel engines to optimize efficiency while running at variable speeds is a compelling advantage when managing ice conditions.

"These are vessels that can take particular advantage of variable speed generators, which already make widespread use of frequency convertors. To be able to deliver that within a lean, more space efficient convertor configuration really counts," said Lindtjorn.

Change of Current

"I see clear benefits for applying Onboard DC Grid in combination with a battery in the coastal tanker segment," Lindtjorn said. "Owners have shown real commitment to ships that are more environmentally-friendly in this market. One entry point for DC Grid might be variable speed shaft generators, and owners can then consider the advantages of using DC Grid as a more efficient way of handling pumps, loading and unloading,

for example. In addition, response time can be improved when maneuvering, while there is the potential to improve propulsion efficiency overall when a battery pack is installed."

One of the obstacles to the uptake of environmentally-friendly shore-power as an option for ships in port, according to Lindtjorn, has been that limited power ratings alongside force vessels to run onboard engines to cover peak onboard loads. "If you need to run a parallel system anyway, some vessels chose not to use shore power at all," he said. "Storing energy in a battery can overcome this issue; the ship can draw the current steadily from shore and adapt to peak loads using the battery."

To illustrate his point, Lindtjorn cites ABB's own selection of DC Grid for its advanced cable-laying vessel, due delivery from Norway's Kleven shipyard in 2017. "DC Grid's integrated power management plus energy storage is once more expected to cut fuel consumption significantly; but this ship will also exploit shore power to spool cables from a dockside production facility. It would be possible to use a conventional AC solution for this, but the point is that this is another example of how DC Grid's lack of complexity makes dockside spooling not so much possible as integral to the ship's capabilities."



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New Connected Seafarer Health Solution

As broadband satellite connectivity is becoming widely adopted, shipping companies are realizing that more bandwidth opens up new possibilities for improving crew life and health on board. Telemedicine is one of them. It's understood that vessel operators estimate that as many as one in two vessel evacuations or reroutings could have been avoided with better medical data. Considering an average rerouting costs \$180,000 per incident, there is huge potential for cost savings and process optimization. It is in this context that Marlink has developed XChange Telemed, at a point in time when technology is mature enough to offer an integrated maritime health management service that can assist remote doctors in decision-making, therefore improving seafarer health and benefiting ship operations.

Unveiled at SMM 2016, Marlink's XChange Telemed is a new telemedicine service designed to improve the health and safety of crew and passengers at sea, while meeting the new ILO/MLC and IMO/STCW labor regulations for health and medical treatment on board. The system provides a means for shipping companies to manage both regular and emergency medical consultations for the welfare of crew and passengers, supporting medical health at sea and reducing the risk of spiraling costs incurred due to medical emergencies on board.

XChange Telemed delivers instant remote medical support to vessels by doctors on shore. To ensure that crew and passengers receive fast, effective and interactive medical attention, the service includes a reinforced, vibration-proof hard-case Telemedical Station with CE certified medical equipment, an intuitive touch-screen user interface and a HD camera. Medical equipment provided includes electro cardiograph, blood pressure monitor, pulse oximeter and one or several of the following options: Otoscope, dermascope, stethoscope, ultrasound, eye analyser, dental examination camera, glucometer and thermometer. All medical devices are fully connected with automatic data transfer. Clear instructions and reference diagrams are enclosed to assist the remote user with data capture, viewing and sending.

Marlink has established a long-term partnership with a European CE Medical Certified Telemedicine equipment manufacturer to create a product specifically for the maritime market. For



example, rather than using ECG lead stickers which are common in hospitals, considering the humid climate on board ships, ECG clips are used instead. Other criteria in the solution design was resistance to the vessel environment (vibrations, power cuts) and the avoidance of any consumables.

XChange Telemed has been beta tested on several vessels of different types, operating in different regions, with a public medical center. Feedback from the doctors and crew has allowed Marlink to adapt and evolve the XChange Telemed service, helping to shape the product now coming to market.

The Doctor is "In"

As a key improvement for remote consultation at sea and in order to come as close to the impression that the patient is face-to-face with the doctor in his office, the system features embedded live video consultation. In addition, the integrated patient file management system can incorporate information from pre-boarding interviews (e.g. allergies, family history) and medical backgrounds. The doctor responding to an urgency call can view both the data transferred from the on board Telemedical Stations well as patient file on a central platform.

According to the applicable international law, all patient data must be confidential between the doctor and the patient. In XChange Telemed, the patient medical data is encrypted, securely transferred to shore and stored according to the strictest European medical authority standards. Only doctors from the Medical Assistance Center selected by the customer will have access to this data via an integrated medical web portal.

Without telemedicine, the standard process when a person falls ill on board is for the Health Officer to call the Medi-

cal Assistance Center, who would ask for medical information to establish a diagnosis and advise a treatment based on limited information. To transfer some relevant medical data on the patient, the Health Officer would have two options:

- 1) Dictate the medical readings and describe the observations vocally – which can be imprecise and lead to misunderstandings.
- 2) Send an email with the data as an attachment – which happens today although not legally permitted, as it does not secure patient data. Moreover, this option might not be available as most medical devices on board might not be digital or could be unable to export medical files to be transferred.

In the particular case of emergencies, doctors would be asked to advise upon single observations and non-medical descriptions provided by officers with only basic medical training. Hence doctors may rather be safe than sorry and recommend evacuation based on limited medical data, which might turn out unnecessary afterwards.

However, with XChange Telemed, the Health Officer would first use the on board Telemedical station to establish the medical measurements. All medical data is then automatically synchronized to the medical web portal and associated to the patient file. By the time the Health Officer has called the Medical Assistance Center, the doctor would have already looked at both the transmitted data and the patient file, including medical history. The doctor may be able to advise a treatment right away or ask pertinent questions in order to establish a diagnosis quickly. Additionally, the doctor can establish at any time a live video

consultation with the vessel to see the patient first hand. The video link can also be used to guide the Health Officer in his examination. Considering that the health officer will be i.e. the captain or another officer and not a primary health professional, the video link can also be used by the doctor to remind them how to use the diagnostic equipment and keep calm in a stressful situation.

For the first time in a maritime telemedicine service, customers can choose between using remote medical assistance from a compatible public Telemedical Maritime Assistance Service (TMAS) center, or an appointed doctor or a private medical organization ship owners may already have a long medical relationship with. The Marlink service is also fully flexible should the customer wish to change medical assistance provider at a later stage.

Complete, Integrated Service

With XChange Telemed and the reliable broadband link on Marlink's Sealink VSAT, unnecessary diversions or helicopter evacuations may be avoided by diagnosing and treating crew illnesses and injuries on board, with frequent follow-up by the remote doctor. While reducing down-time and improving comfort for a sick or injured person on board, the service also provides traceability of the performed actions.

Importantly for ship owners, XChange Telemed requires no up-front investment. Service continuity, 24/7 Customer Support, hardware and software maintenance are all included in a single monthly subscription fee. The service managed through Marlink XChange service delivery platform is configured to run as a top priority, taking precedence over other applications, to ensure highest possible availability.



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Mustafa



Ferguen



Reitz



Poggi



Emerson



Evans

MSRC to Search for New CEO

The Marine Spill Response Corporation (MSRC) said that Steven T. Benz, the company's President and CEO, will be retiring on April 30, 2017. The MSRC Board of Directors has launched a search for a successor. Interested candidates should contact Stephanie Tomasso of Russell Reynolds at t. 202-654-7852 or e. MSRC_CEO@russellreynolds.com.

ASRY Appoints Mustafa

ASRY appointed Magdy Mustafa as Acting Chief Executive, after the current Chief Executive announced his resignation to move back to Norway for family reasons. Mustafa, the current Procurement and Contracts General Manager will take on all Chief Executive duties in addition to his current role, effective from September 1, 2016.

Intermarine Promotes Ferguen

Intermarine, LLC named Samir Ferguen as Chartering Manager – Europe. Ferguen rejoins Intermarine from Nordana. .

Retlif Promotes Reitz, Poggi

Retlif Testing Laboratories, a global independent EMC and Environmental testing leader serving the maritime industry since 1978, promoted Richard Reitz to the position of Director of Engineering. Retlif also announced the appointment of Scott Poggi, as Director of Operations.

W&O Promotes Ulrich, Emerson

W&O, a distributor of pipe, valves, fittings as well as automation and engineered solutions, promoted two associates – Lori Ulrich to Director, Human Resources and Tammy Emerson to President, Propeller Club of Jacksonville, in addition to her sales responsibilities as Account Executive. Joining W&O in 2009, Ulrich is responsible for managing the Human Resources department for W&O's international branch network. Emerson has been with W&O since 1988, but took a seven year hiatus starting in 2001 and returned in 2008 to become an Account Executive for the

Jacksonville and Tampa branches, including the Bahamas. Emerson coordinates projects for internationally known shipyards, owner/operators, as well as the U.S. military.

Having served in the military herself as an SKCS in the Navy for over 23 years, Emerson became involved in the Propeller Club of Jacksonville in 2009. Rising through the ranks and chairing several committees, Emerson was elected President of the club on June 19, 2016. Emerson's presidency will last one year and her vision is to grow the club to include members from every segment of the maritime industry and retain current membership over her time in office.

Trident to Acquire Callenberg

Trident Maritime Systems (Trident), a portfolio company of J.F. Lehman & Company (JFLCO), signed a definitive agreement to acquire Callenberg Technology Group (Callenberg) from Wilhelmsen Maritime Services AS. Callenberg designs, assembles, integrates, and supports HVAC, electrical energy management, and insulation systems for commercial and government vessels around the world. It is headquartered in Gothenburg, Sweden and employs 900 employees in 14 countries.

Crowley Promotes Evans

Eric Evans, a veteran company executive at Crowley Maritime Corporation, has been promoted to vice president of strategy, a newly-created position that will focus on facilitating long-term growth through external business partnerships, including mergers and acquisitions.

Damen Now Offers AEC Scrubbers

Damen Shipyards Group said it has signed a sales agreement with scrubber producer AEC Maritime, meaning Damen will now be able to offer ship owners exclusive access to efficient, low maintenance and IMO-certified exhaust gas scrubber technologies. With the inclusion of scrubber solutions, Damen has added another facet to its strategy of providing ship owners with a total solu-



Damen

tion regarding the latest IMO requirements.

HMS Illustrious Sold for Scrap

The former aircraft carrier HMS Illustrious is to be recycled after 32 years of service, announced the U.K. Ministry of Defense (MOD) who sold the ship to Turkish company LEYAL Ship Recycling Ltd. for around £2 million. The MOD's initial plan for the retired aircraft carrier was to retain part or all of the ship in the U.K. for heritage purposes. A competition seeking bids for development plans was launched in 2013, and though a number of proposals were received, none proved to be viable. HMS Illustrious covered over 900,000 nautical miles between 1982 and 2014, performing a range of operations such as stabilization efforts in the immediate aftermath of the first Gulf War and delivering humanitarian aid after Typhoon Haiyan devastated the Philippines in 2013.



U.K. Royal Navy

**Obituary
Helen Delich Bentley**

"For starters, there is simply no substitute for hard work, and plenty of it. Persistence pays. And some doors are best opened with a good kick."

Helen Delich Bentley

Helen Delich Bentley, the feisty, highly respected maritime journalist, former Federal Maritime Commission chairman and five-term U. S. Congressman, died last month at home following a bout with brain cancer. She was 92.

Throughout her 70-plus year career, Mrs. Bentley had tirelessly promoted two major issues – the advancement of America's industrial/manufacturing



(Image courtesy of the U.S. Congress)

base and the maritime community that carried products to and from market – primarily through the Port of Baltimore.

An expert on maritime issues, Bentley pushed for fair trade and a strong national defense. Bentley also laid the groundwork for the establishment of the Maritime Security Program. Today, this program has salvaged a major remnant of America's merchant marine.

In 1969, then President Richard Nixon appointed Mrs. Bentley as Chairman of the U. S. Regulatory agency Federal Maritime Commission. She became the fourth-highest ranking woman in the history of America's federal government, the highest ranking woman of Nixon's administration, the first woman to serve in a key governmental position in the maritime field.



(Photo: Lockheed Martin)

Halimar Shipyard Monohull Crew Supply Vessel Delivered

Halimar Shipyard in Morgan City, La., announced the delivery of Glenn Autry, a 205 ft. aluminum monohull Crew Supply Vessel, for Barry Graham Oil Service (BGOS) of Bayou La Batre, Ala.

The project's successful completion is the result of a close collaboration between operator, shipyard, and designer Incat Crowther, which originated with the sister vessel, John Jacob, which was delivered by Halimar to BGOS in 2014.

Driving factors in the design and build process included providing a modern and fuel-efficient design meeting the latest demands of crew supply vessels in the Gulf of Mexico, while maintaining continuity with existing BGOS fleet operational features. Glenn Autry has a vast aft cargo deck of nearly 340 sq. m., which carries loads up to 450 long tons.

The main deck cabin houses 72 passenger seats, passenger shower and toilet, stores, a dedicated DP equip-

ment room, and access to the upper deck wheelhouse and below deck accommodations. A deck locker, accessed from the cargo deck, is provided for storage of deck cargo securing equipment and other safety gear. Upstairs, the wheelhouse features both forward and aft-facing control stations and smartly designed control consoles.

Below decks, Glenn Autry's crew members are accommodated in twin cabins, capable of sleeping a total of 12. Adjacent to these is a crew galley and mess area, as well as a large pantry.

The vessel's hull houses a multitude of tanks. In addition to the vessel's 15,296 gallons of fuel, 17,484 gallons of transferrable fuel can be carried. Further tanks hold the vessel's fresh water, grey water, and sewage, while dual-purpose water tanks can also be used to carry up to 42,588 gallons of rig water or ballast.

The vessel is powered by a quartet of Cummins QSK

50, EPA Tier III diesel engines, each rated at 1,800 bhp each. These drive through Twin Disc MGX 6848 gearboxes to four Hamilton HM811 waterjets via cordon shaft assemblies from Driveline Service of Portland. Glenn Autry topped out at 35 knots during acceptance trials.

The vessel is USCG Subchapter T approved and ABS classed for DP-2 service. Three Thrustmaster 150hp tunnel bow thrusters combine with the four jets and a Beier Radio DP-2 control system to give the vessel superior maneuverability. Electric power is generated from three Cummins QSB7DM gensets rated at 185 ekW.

Additionally, a FiFi-1 firefighting system is installed for the purpose of combatting off-ship fires. The system includes two FFS engine-driven pumps, each with 5300 gpm capacity, with integral clutch assemblies and remote controlled monitors.

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Ranking the U.S. Fleet

Figure 1

The Current On Order and Live U.S. Built Fleet by Type

Ship Type	No of Vessels	Total Size	Av Age	Total Value \$M
OSV	1,266	3,797,104	24.9	\$5,319
TANKER	85	4,738,200	16.9	\$5,047
CONTAINER	27	62,440	28.0	\$494
LNG	10	1,264,000	37.3	\$170
BULKER	42	1,765,000	46.7	\$107
SMALL DRY	21	200,300	48.5	\$25
Total	1,451	11,827,044	25.5	\$11,161

Figure 2

The Total Value \$bn of the Global Fleet by Builder Country

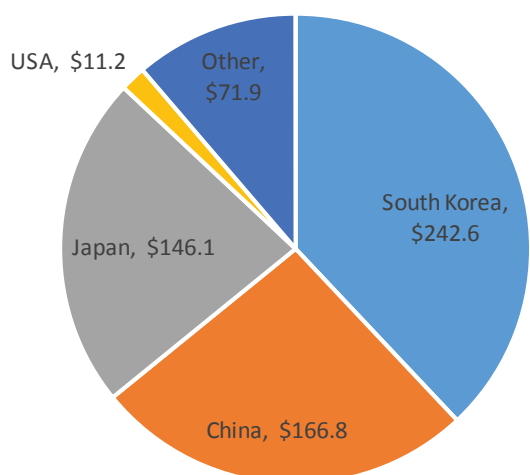


Figure 3

Where the World Fleet was Built Each Year

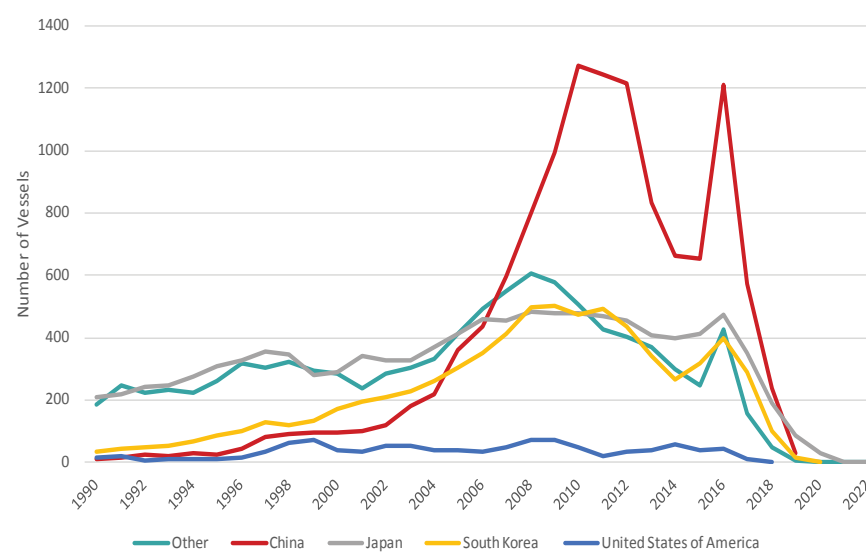


Figure 4

The Total Value (\$B) of the Global Fleet by Builder Country

Builder Country	On Order			Live			Total			% of global fleet
	No of Vessels	Avg. Age	Total Value \$M	No of Vessels	Avg. Age	Total Value \$M	No of Vessels	Avg. Age	Total Value \$M	
South Korea	568	-0.9	\$47.9	6,651	9.4	\$194.8	7,219	8.6	\$242.6	38%
China	1,692	-0.7	\$46.3	10,537	6.7	\$120.4	12,229	5.7	\$166.8	26%
Japan	868	-1.3	\$35.1	11,317	14.9	\$111.0	12,185	13.7	\$146.1	23%
USA	30	-0.4	\$1.8	1,421	26.1	\$9.4	1,451	25.5	\$11.2	2%
Other	463	-0.6	\$9.9	11,693	19.4	\$62.0	12,157	19.0	\$71.9	11%
Total	3,621	-3.9	\$140.9	41,619	76.5	\$497.6	45,241	72.5	\$638.5	

LCS Detroit Delivered



USS Detroit underway
during Acceptance Trials.

(Photo: Lockheed Martin)

Fincantieri, through its subsidiary Fincantieri Marinette Marine (FMM), and Lockheed Martin Corporation, has delivered the future USS Detroit (LCS 7) to the U.S. Navy at FMM's shipyard in Marinette, Wis. Detroit is the fourth Freedom-class ship delivered by the

consortium, and it is part of a program started in 2010, which comprises 11 units, all fully funded, on top of the two units delivered before 2010 (Freedom - LCS 1 and Forth Worth - LCS 3). The other 10 ships delivered or in production are: Milwaukee (LCS 5), Little Rock

(LCS 9), Sioux City (LCS 11), Wichita (LCS 13), Billings (LCS 15), Indianapolis (LCS 17), St. Louis (LCS 19), Minneapolis/St. Paul (LCS 21), Cooperstown (LCS 23) and LCS 25.

LCS 7 will be the sixth U.S. Navy ship named USS Detroit. Previous ships

to bear the name included a Sacramento-class fast combat support ship, an Omaha-class light cruiser, a Montgomery-class cruiser and two 19th century sloops of war. The future USS Detroit is scheduled to be commissioned in Detroit on October 22, 2016.

BAE Systems Delivers Tug to Seabulk Tankers

Built at BAE Systems' Jacksonville, Fla. shipyard, the new tug Sea Power has delivered the tug Sea Power to Seabulk Tankers, Inc. to be used to enhance the shipper's Jones Act coastal operation, powering barges that transport chemical and petroleum products between U.S. ports. Sea Power is a 141-ft.-long, 12,000-bhp, twin-screw tug that will work in tandem with a high-specification, 30,000 dwt chemical tank barge as an articulated tug and barge unit. BAE Systems and Guido Perla & Associates, Inc., of Seattle, Washington, designed the vessel. Earlier this year, the Jacksonville shipyard delivered the final ship in a class of four platform supply vessels to Jackson Offshore Operators. That ship, the MV Squall, also operates in Jones Act service to the U.S. coastal trade.

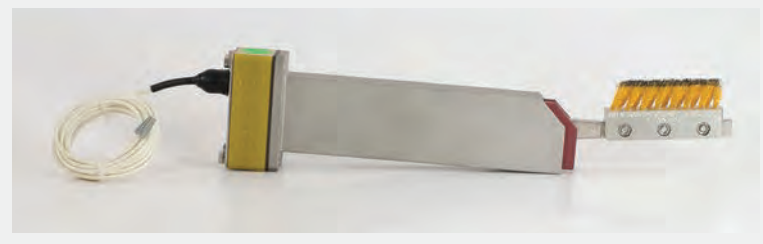


Photo: BAE Systems

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JANUARY

AD CLOSE: DEC 21

The Ship Repair & Conversion Edition

Market: Fishing Vessel Quarterly
Technical: Marine Salvage & Recovery
Product: Ship Repair Tools
Design: Passenger Vessels: Ferries & Riverboats
Roundtable: Maritime Propulsion Directory & Guide
Special Report: Bunker Fuel
Region Report: The Pacific Northwest

BONUS DISTRIBUTION:

PVA Maritrends: Jan 29-Feb 1, Seattle, WA
 ASNE DAY: Feb 14-16, Crystal City, VA
 Euromaritime: Jan 31-Feb 2, Paris, France

FEBRUARY

AD CLOSE: JAN 24

The Cruise Industry Edition

Market: Shipbuilding: Cruise & Passenger
Technical: Satellite Communications
Design: Marine Pollution Mitigation
Roundtable: IoT: The Internet of Things
Special Report: Cruise Ports of Call
Product: Green Marine Fuels & Lubricants and Emission Technologies
Region Report: Vietnam

BONUS DISTRIBUTION:

Seatrade Cruise Global: Mar 13-16, Ft Lauderdale
 Intermodal Asia 2017: Mar 22-24, Shanghai, China
 Inland Waterways Conference: Mar 7-8, Cincinnati
 Green Ship Technology Conference: Mar 21-24, Copenhagen
 INMEX Vietnam: Mar 29-31, Ho Chi Min City, Vietnam

MARCH

AD CLOSE: FEB 21

The Green Marine Technology Edition

Market: U.S. Navy Quarterly
Market: Maritime Simulation Technologies
Technical: Energy Efficient Drives
Product: Marine Coatings & Corrosion Control
Design: Port & Ship: Loading and Unloading Technology & Equipment
Roundtable: Tanker Owners
Special Report: Ballast Water Technology
Region Report: Singapore

BONUS DISTRIBUTION:

CMA Shipping: Mar 20-22, Stamford, CT
 NACE Corrosion: Mar 26-30, New Orleans, LA
 Sea-Air-Space: Apr 3-5, National Harbor, MD
 Gastech Japan: Apr 4-7, Tokyo, Japan
 SeaAsia: Apr 25-27, Singapore
 Commerical Marine Expo: Apr 26-27, New Bedford, MA

APRIL

AD CLOSE: MAR 21

The Offshore Annual

Market: Fishing Vessel Quarterly
Technical: Fuels, Lubricants & Additives
Product: Deck Machinery, Winches and Ropes
Design: Workboat Design & Construction
Roundtable: Energy Port Focus
Special Report: Marine Medicine
Region Report: Japan

BONUS DISTRIBUTION:

Inland Marine Expo: May 22-24, St. Louis
 Tugology: May 23-24, Rotterdam, Netherlands
 Bari Ship 2017: May 25-27, Imbari, Japan
 NAVExpo: May 10-12, Lorient, France
 ASNE Intelligent Ships Symposium: May, Philadelphia
 Portsecure 2017: May

MAY

AD CLOSE: APR 21

The Marine Propulsion Edition

Market: Shipbuilding: Oceangoing Ships
Technical: Cyber Security
Design: Hybrid Drives
Product: Navigation: Electronics, Radar & ECDIS
Roundtable: RIB & Patrol Boat Report
Special Report: U.S. Coast Guard Annual
Region Report: Norway

BONUS DISTRIBUTION:

Norshipping: May 30-Jun 2, Oslo, Norway
 Electric & Hybrid Marine World Expo: Jun 6-8, Amsterdam
 MAST Asia: Jun 12-14, Tokyo, Japan
 SeaWork: Jun 13-15, Southampton, UK

JUNE

AD CLOSE: MAY 24

The Annual World Yearbook

Market: U.S. Navy Quarterly
Technical: Dredging
Design: Fire Safety Systems
Product: Pumps, Valves, Pipes & Insulation
Roundtable: Maritime Academies & Training Centers
Special Report: The Yachting Life (YachtingJournal.com)
Region Report: Greece
Special Section: Maritime Reporters Buyer's Guide

BONUS DISTRIBUTION:

Marine Money Week: Jun 20-22, New York, NY

2017 EDITORIAL CALENDAR

JULY

AD CLOSE: JUN 23

The Marine Communications Edition

Market: Fishing Vessel Quarterly
Market: Tugboat, Towboat & Barge
Technical: Oil Spill Response & Recovery
Product: Maritime Software Solutions
Design: Offshore Accommodation
Roundtable: Ship Management
Special Report: Marine Electronics Equipment & Supplier Guide (MarineElectronics.com)
Region Report: Europe

AUGUST

AD CLOSE: JUL 25

The Shipyard Edition

Market: Shipbuilding: The World Report
Technical: Heavy Lifting Solutions: Maritime Cranes, Winches, Windlasses & Capstan
Product: Ballast Water Technologies
Design: Icebreakers
Roundtable: Big Data
Special Report: Cruising Europe
Region Report: Russia
BONUS DISTRIBUTION:
Seatrade Europe: Sep 6-8, Hamburg, Germany
NEVA 2017: Sep 19-22, St. Petersburg, Russia
Offshore Marine & Workboats: Sep 25-27 Abu Dhabi, UAE

SEPTEMBER

AD CLOSE: AUG 24

Maritime Port & Ship Security Edition

Market: U.S. Navy Quarterly
Technical: Drones
Product: Clean Water Technologies
Design: Interior Design: Onboard Amenities
Roundtable: Environmental
Special Report: Offshore Deepwater: Structures & Systems
Region Report: Denmark
BONUS DISTRIBUTION:
Shipping Insight
Danish Maritime Days: Copenhagen, Denmark
OTC Brazil: Oct 24-26, Rio de Janeiro, Brazil
KORMARINE: Oct 24-27, Busan, Korea

OCTOBER

AD CLOSE: SEP 22

The Marine Design Annual

Market: Fishing Vessel Quarterly
Technical: Marine Firefighting, Safety & Salvage
Product: Software Solutions: CAD/CAM
Design: Naval Architecture & Marine Engineering
Roundtable: Ship Classification Societies
Special Report: Propulsion, Thrusters & Gears
Region Report: The Netherlands
BONUS DISTRIBUTION:
SNAME: Oct 23-28, Houston, TX
Europort: Nov 7- 10, Rotterdam, Netherlands
Marintec China: Dec 5-8, Shanghai, China

NOVEMBER

AD CLOSE: OCT 25

The Workboat Edition

Market: Shipbuilding: Workboats
Technical: Alternative Marine Fuels
Design: Offshore Wind Power
Roundtable: Marine Coatings & Rust Control
Special Report: Top 50 Marine Equipment Distributors
Product: Deck Machinery, Winches & Ropes
Region Report: U.S.A.
BONUS DISTRIBUTION:
Workboat Show: Nov, New Orleans, LA
Interferry 2017: Split, Croatia
Clean Gulf: Dec 4-7, Houston, TX

DECEMBER

AD CLOSE: NOV 22

The Great Ships of 2017

Market: U.S. Navy Quarterly
Technical: The Autonomous Ship
Design: Marine Engine Guide (MaritimePropulsion.com)
Roundtable: Ship Registries
Special Report: Prolific Ship Owners & Buyers
Product: Welding & Cutting Equipment
BONUS DISTRIBUTION:
Surface Navy Association 2018: Jan 2018, Crystal City, VA



Five Minutes with **Dan Gardner** Director, Mobileweight, LLC

Shipping industry veteran Dan Gardner is director of Mobileweight, which helps to streamline processes and create efficiencies for the container shipping industry. The firm's first-of-its-kind mobile application and online portal Mobileweight aims to offer a reliable, fast and easy way to comply with SOLAS and electronically file the VGM with ocean carriers. Gardner weighs in on the latest SOLAS VGM requirements which entered force on July 1 and discusses their potential impact across the container shipping sector.

By Eric Haun



What are some of the most common concerns regarding the SOLAS VGM requirements?

We're working with hundreds of shippers around the world, but in terms of U.S. exporters' concerns, there are several. One of the more common concerns is how to comply with the SOLAS VGM Amendment in terms of how cargo will be weighed in the physical world. Specifically, what access to scales will companies have, where are they located and how they will access them in a timely and accurate manner?

Another concern revolves around Standard Operating Procedures for transmitting container-specific VGM information. In essence, shippers have been trying to figure out the best method for sending VGM data, manually or electronically, and in the case of the latter, how they will get that done. The last concern revolves around cost. Peo-



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“... in the U.S., people may be relying too heavily on the terminal-weighing solution that was approved by the Coast Guard in its “Equivalency to Regulation” statement issued back in April. **While viable, there are a lot of variables.**”

ple are still unclear on what charges will be levied from scale operators, forwarders and other service providers related to the VGM process.

In general, how prepared is the industry for the new SOLAS VGM rules?

If you look at things from a U.S.-perspective, I'd say, “somewhat prepared;” on a global scale, I'd say, “not very prepared at all.” Of course, the 90-day period for a “practical and pragmatic approach” to implementation issued by the International Maritime Organization gives shippers who failed to be ready for July 1 time to catch up, but there's a danger that too many companies have interpreted this period (incorrectly) as an invitation to not do anything. With so many companies kicking the VGM can down the road during the 90-day period, we will only be able to tell how well people have prepared after the 90 days are over. With that said, there are already reports coming out of places like China that show a very low level of preparation.

Also, in the U.S., people may be relying too heavily on the terminal-weighing solution that was approved by the Coast Guard in its “Equivalency to Regulation” statement issued back in April. While viable, there are a lot of variables in the terminal-weighing approach, like possible terminal congestion, on-terminal charges, and most pressingly - the handling of on-dock rail. The inability to terminal-weigh on-dock rail is an issue

for which there is no solution right now. In the short term, as the 90-day period expires and terminal-specific weaknesses are exposed, people will have to come up with long-term solutions.

What are some of challenges of the VGM requirements, and what can be done to overcome them?

I think we need to break down the challenges into different categories to truly understand the complexity of the SOLAS VGM amendment. The first is for an exporter to understand the physics of their particular export profile. For example, how many ports does the exporter ship from, how many terminals are on those ports, how many steamship lines do they work with and what are the terminal/carriers' policies specific to VGM? The second challenge is the technology side of VGM. Submitting VGM data manually is a dicey proposition, so it comes down to finding a technology solution that is ubiquitous, timely and cost effective. The final challenge would have to be the administrative/operational side of things; particularly how an exporter incorporates the VGM process into ongoing export activities, and tracks everything they have to do related to VGM.

How does the global nature of the shipping industry complicate the road to compliance?

Let's not forget that 171 nations have signed on to the SOLAS VGM

amendment. As such, that means that the maritime eco-system in each of those 171 countries has to come up with solutions around specific ports, the terminals on those ports, access to scales, the technology they may or may not use to receive VGM data...a whole slew of considerations. Not all countries have the same maritime or intermodal infrastructure as the U.S., nor do they have the means with which to enforce VGM on a country-wide scale. Taking all those things into consideration, uniform, across the board compliance with VGM is going to be difficult to achieve, even with a 90-day grace period.

Short term and long term, what impact will the VGM rules have across the supply chain?

In the end, companies still have to buy and sell goods internationally. So, not unlike the U.S.-specific ISF 10+2 filing requirement for maritime imports, people will work the VGM requirement into their supply chain processes. In the end, it is about making adjustments to existing processes, so it will take some trial and error, but it will work. What is already a bone of contention with some shippers are the charges that are surfacing related to VGM filing and compliance. A number of large forwarders have come out with their VGM service portfolio and pricing, along with a number of ports and terminals around the world. Like any other new service in a capitalist model, the pricing will come down to what the market will bear, but

there are already some unhappy shippers out there.

For readers unfamiliar, what is Mobileweight? How does it help streamline the VGM compliance process?

In the simplest of terms, our service is all in our name, Mobileweight. We offer a web based application that allows exporters anywhere in the world to capture, transmit and confirm container-specific VGM data to a carrier. So, an agricultural exporter in Nebraska can literally be standing next to a weigh bridge and upon weighing the container, key VGM data into our app on a smart phone or tablet and send it to the carrier via the INTTRA network. Or, an exporter in Seattle can be at a scale, take a picture of the weight certificate and our patent-pending technology will convert the picture into an EDI message and send it to the carrier. In both instances, the message is sent to the carrier via the world's most reliable maritime e-commerce B2B platform: INTTRA. So, VGM is taken care right at the point of weighing and any mysteries or concerns around weighing on a terminal become a moot subject. Additionally, Mobileweight will send confirmation emails and text messages to as many recipients as the user wants. It's a feature we included to ensure the user can instantly update all interested parties and streamline bookkeeping efficiency and accuracy. The whole idea is to make it easy to file VGM no matter where you are or where the container is going.

Dometic Innovates

Dometic develops products that make life on the water more comfortable and productive. An engineering leader of innovative products for the global marine industry with the largest worldwide sales and service network, products include air conditioning, ventilation, air purification, water purification, and sanitation. Compact, modular, and shell-and-tube chillers are customized for up to 2.4 million BTUs of climate control. The firm has about 300 employees.

For a 72' Signet tug boat, Dometic designed a custom chiller system with a compact, efficient, brazed-plate heat exchanger for the condenser. This was pos-

sible because this class of vessel uses a secondary heat exchanger (keel cooler) which keeps seawater away from the condenser. Recently the firm recently expanded the Pompano Beach facility to include an additional 33,000 sq. ft. of factory floor space. The firm provides engineering and manufacturing of marine air conditioning systems (self-contained, split systems, and chillers), ship-wide ventilation and fire dampers, watermakers and water purification systems, in-duct air purification, and sanitation systems, including VacuFlush, MasterFlush, and RushFlush toilet technologies.

www.dometic.com/usa



Image: Dometic

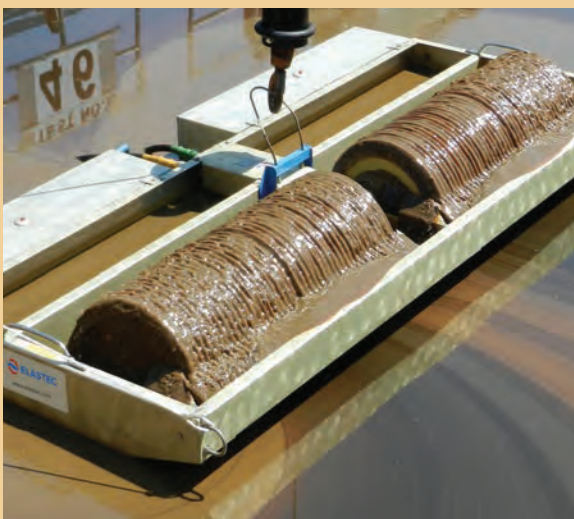


Image: Elastec

Elastec: Cleaning Up the Spills

Located in Carmi and Fairfield, Illinois and Cocoa, Florida, Elastec manufactures water pollution control products specializing in oil spill recovery equipment. Established in 1990 with the invention of the ELASTEC Drum Skimmer, the U.S. Clean Water act inspired Elastec to expand its product line to include floating booms, turbidity curtains, vacuum systems, work boats and portable incinerators. Elastec's new Omni Cat is a waterway maintenance catamaran designed to help municipalities comply with nonpoint source pollution. To control silt and sediment pollution during marine construction, Elastec also manufactures turbidity curtains. A recent project near the Golden Gate Bridge has earned Elastec an environmental award. The firm has about 110 employees.

www.elastec.com

Terragon Waste Mgmt.

Earlier this year Terragon Environmental Technologies Inc. announced that it had gone into contract with Crystal Cruises and Lindblad Expeditions, to supply one MAGS V8 for the Crystal Serenity, and one for the National Geographic Orion. The Crystal Serenity is a luxurious cruise ship that can accommodate about 1,000 passengers, and has been voted the number one cruise ship in the world by Conde Nast Traveler readers. MAGS will be an additional tool to enhance onboard waste management, as well as producing energy from waste. The National Geographic Orion, is vessel built specifically for exploration travel, and accommodates about 100 passengers. The ship has a unique glass bottom that enables spectacular underwater views. MAGS will be the main technology for the conversion of waste to energy. The ship travels to some of the most remote and pristine areas of the world, and it is of utmost concern for the company to ensure the surrounding waters, air, and marine life are protected from any negative environmental disturbances.

Terragon develops and commercializes products to enable off-grid sustainability. The company's vision is to enable the "zero-waste discharge" habitat, whereby all waste streams are used to generate valuable resources for the site that is creating the waste.

www.terragon.net



Image: Terragon



Image: Eltorque

Eltorque QT50 Actuator

Eltorque launched a new super-compact valve actuator. The QT50.

"With the QT50, Eltorque has responded to (industry) request by developing the smallest actuator in its class, at 2/3 of the weight and 1/3 the volume of competing products," said Arnstein Kjesbu, CEO, Eltorque. According to the company the QT50 still delivers the same performance as other Eltorque products: maintenance free, IP68 protection rating, market leading functionality and feedback, time saving installation and commissioning, and the option of hybrid cable connectivity. Designed for butterfly and ball valves primarily in the DN25-DN80 range, the QT50 actuator features CANbus, digital or analog control interfaces, improved visuals, and a unique planetary gear, all made to fit in the smallest possible packaging.

www.eltorque.no

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Damen Balcon EC 1500

Two innovators in delivering unique solutions for the maritime sector, Damen Green Solutions and Evoqua Water Technologies will launch the DAMEN BALCON EC 1500 powered by the SeaCURE ballast water management system (BWMS) at SMM Hamburg. The BALCON containerized deck house has been developed as a direct result of customer demand for fast plug and play installation in the yard. BALCON is touted as an ideal 'plug and play' solution, with the absolute minimum of downtime for the vessel. BALCON is also well-suited for tanker vessels (with submergible bal-

last pumps), where there is typically no space available for placement of the BMWS. It can also be used as a temporary system on vessels that are nearing the end of their life cycle and only need to bridge a short period before they are being taken out of service. With a footprint of 20-ft. container for a 1,500 cu. m./hr. treatment capacity, the BALCON solution is touted as ideal for ship owners and operators with limited space below deck. The arrangement is optimized for maintenance, and can be assembled and tested offsite to shorten build time on board.

Image: Damen



Image: Biomicrobics

MarineFAST Type II

The MarineFAST Type II Marine Sanitation Devices (MSDs) and HS-MSD Wastewater Treatment Systems handles a wide variety in loading typical of service and treats any combination of sewage, including: conventional and vacuum toilets, laundry, garbage disposals and showers. The MarineFAST technology uses a hybrid method of fixed and submerged treatment processes to both treat wastewater and provide a system for management of biosolids. The MarineFAST systems are inherently self-regulating, with no adjustments or operator required. The MarineFAST BioSolids Management System (BMS) is an optional device for longer periods between pump outs. Surge loads at change of watch and temporary changes do not adversely affect effluent quality; and, the performance of the MarineFAST system. The MarineFAST MSD and HS-MSD treat wastewater from the facilities (galley(s), head(s), sink(s), drain(s), etc.) help lessen the environmental impact of contaminants, and keeps the vessel in compliance through changing regulations, including graywater discharges from commercial vessels.

jcisneros@biomicrobics.com

Mirmorax Analyzer

Mirmorax AS launched its Desktop Oil-in-Water Analyzer – the DT250. The portable instrument, based on Mirmorax's third generation ultrasonic technology, provides sample analysis as well as live measurements of oil and solids in produced water. The Desktop Oil-in-Water Analyzer will also be particularly suited to challenging fields that host separation from different tie-backs with various oil types in the same produced water. Key benefits to include:

- Accurate and robust oil-in-water analysis with the ability to handle chemicals and various oil types. The new instrument simultaneously detects oil and solid particles; calculates the mean size of oil particles and solids; and provides other crucial input information, such as the temperature and salinity of process water.
- A low maintenance, robust and easy-to-use system that can be set up in minutes and either be used as a sample analyzer or as a by-pass analyzer providing continuous measurements. The instrument can analyze fresh produced water samples or samples that has been stored for a longer time. The instrument is lightweight, is ideal as a portable test instrument that can be mobilized quickly (fulfilling the weight and size requirements for offshore helicopter transportation) and comes in a robust, weatherproof case.

www.mirmorax.com



Image: Mirmorax



Image: Turner Design

WSS, Turner Design Partner

Wilhelmsen Ships Service (WSS) signed a partnership with Turner Designs USA to market its Ballast-Check 2 PAM Fluorometer to shipowners worldwide. Easy to use, cost effective and capable of providing rapid results, the hand-held device enables crew to check the quality of treated ballast water for compliance with the D2 standard of the IMO's Ballast Water Management (BWM) Convention. Turner Design's fluorometer - widely used by authorities around the world for testing water quality - is simple, uses no chemicals and provides reliable results in less than a minute. It offers shipowners and operators a rapid indication of the efficacy of their ballast water treatment (BWT) systems. Ballast-Check 2 is a Pulse Amplitude Modulated (PAM) fluorometer measuring fluorescence emitted by algae in the 10 to 50um size range. It supplements WSS' existing testing solutions for E Coli and Enterococci bacteria. The system was officially being launched as part of the WSS product range at SMM Hamburg.

www.wilhelmsen.com

Potable Water Tank Inspections

Intertek's remotely operated vehicle (ROV) potable water tank inspection service allows the use of ROVs to inspect their large-capacity water tanks. Potable water tank inspection must be carried out periodically to mitigate health risks on marine vessels. Typically, potable water tanks are taken out of service to be emptied and inspected directly by personnel, a process which can be hazardous and time consuming. www.intertek.com/ep



Image: Intertek

FCI: Fresh Water Available 24/7

FCI Watermakers' fully-automatic, customizable Neptune series reverse osmosis desalination units are built in the U.S. Neptune models produce from 1,200–9,500 gallons of fresh, pure water every day. With belt-driven commercial grade pump and motor assemblies, they're designed to run nonstop, a key feature where onboard work schedules often dictate water demands.

www.fciwatermakers.com



Image: FCI

Thordon's RiverTough Bearings

After nine years of operation in the harsh, abrasive waters of Alaska's Yukon River, aboard Inland Barge Service's pushboat Ramona, Thordon Bearings' RiverTough water-lubricated tail-shaft bearing system has emerged completely free of wear and tear. The exceptional performance of RiverTough bearings in waters renowned for high content of gritty glacial silt came to light when the 16m workboat's cracked struts underwent repair in dry-dock.

www.thordonbearings.com

THORDON
THORDON BEARINGS INC.

Image: Thordon

CMR's BWTS Control Panels

A new modular approach for Ballast Water Treatment Systems (BWTS) and marine control panels has been developed by CMR Group. Goldfinch is an advanced engineering process that is based around standard and modular panels for BWTS, enabling OEMs to expand and improve their offering through reduced lead times and cost savings. Using Goldfinch can reduce time-to-market lead times by 75%. www.cmr-group.com



Image: CMR

Muffler Cools Water Inside

Marine Exhaust Systems' Thinline Linear Muffler features a throughport raw water bypass. The quiet, patent-pending design handles excess engine cooling water inside the muffler, and avoids the pitfalls of aging and often inaccessible connections and clamps. A bypass cavity built into the compact muffler handles water that is not required for exhaust cooling.

www.marine-exhaust.com



Image: Marine Exhaust

Next Generation Bilge Filter

Oilsmart filters are the same as used on the SkimOil IMO certified BRUTE marine oily water separators, and can hold three times as much oil as previous generation organoclay filters. At 1/10th the size and cost of an oily water separator (OWS), the low cost bilge filter is a compact and efficient alternative for those who don't have room or need for a standard OWS for oily bilge water.

www.thebilgefilter.com



Image: SkimOil

RSC Bio Solutions Gear Oil

RSC Bio Solutions' EnviroLogic 210EP readily biodegradable gear oil is approved for use in Thrustmaster gearboxes and thrusters. Thrustmaster has extended its existing relationship with RSC Bio Solutions EnviroLogic 210EP is a non-sheening, readily biodegradable synthetic ISO 100 grade gear oil that offers anti-wear and extreme-pressure properties, excellent corrosion and rust protection.

www.thrustmaster.net



Image: RSC Bio Solutions

BA150E Mobile Ballast Pumps

Mobile ballast pumps are used for pumping water into and out of a series of chambers within the hull of a barge. The BBA Pumps BA series has different models, all models are equipped as standard with a vacuum system, enabling their use as multifunctional self priming pumps in a wide range of applications, up to 450 tons/hour.

www.bbapumps.com



Image: BBA Pumps

Marine Leak Detection Kit

Left undetected, watercraft leaks can disrupt operation and cause equipment breakdown and environmental pollution. Spectrolin's Marine Leak Detection Kit (OPK-400M) is designed to efficiently locate fuel, oil and hydraulic leaks in small marine craft. Packaged with two colored fluorescent dyes, it differentiates between multiple leaking fluid systems.

www.Spectrolin.com



Image: Spectrolin

BUYER'S DIRECTORY

This directory section is an editorial feature published in every issue for the convenience of the readers of MARITIME REPORTER. A quick-reference readers' guide, it includes the names and addresses of the world's leading manufacturers and suppliers of all types of marine machinery, equipment, supplies and services. A listing is provided, at no cost for one year in all issues, only to companies with continuing advertising programs in this publication, whether an advertisement appears in every issue or not. Because it is an editorial service, unpaid and not part of the advertisers contract, MR assumes no responsibility for errors. If you are interested in having your company listed in this Buyer's Directory Section, contact Mark O'Malley at momalley@marinelink.com

ANCHORS & CHAINS

Anchor Marine & Supply, INC., 6545 Lindbergh Houston, Texas 77087, tel:(713) 644-1183, fax:(713) 644-1185, david@anchormarinehouston.com

ANTI-CONDENSATION COATINGS

Mascoat Products, 4310 Campbell Rd., Houston, TX, USA, tel:(713) 465-0304, fax:(713) 465-0302, wconner@mascoat.com

APPROVED U.S. COAST GUARD MARINE SANITATION DEVICES

Environmental Marine, Inc., 711 Colyer Rd., Bronson, KY, USA, tel:(606) 561-4697, bobkenison@aol.com

AUTOMATIC IDENTIFICATION SYSTEM

Saab AB (publ) TransponderTech, SE-589 41 Linköping, tel:46 13 180000, fax:46 13 182377, Info.transpondertech@saabgroup.com

BALLAST MONITORING

KING-GAGE Systems / King Engineering (tank level & draft monitoring), 8019 Ohio River Blvd, Newell, WV, USA, tel:855-367-2494, marine@king-gage.com, www.king-gage.com

BARGE FABRICATION

McDonough Marine Services, 3500 Causeway Blvd., Suite 900 Metairie, LA 70002, tel:(504) 780-8100, fax:(504) 780-8200, dwalkowski@mcdonoughmarine.com

COATINGS/ CORROSION CONTROL/ PAINT

Hempel A/S, Lundtoftegårdsvej 91 2800 Kgs. Lyngby, tel:45 4593 3800, fax:45 4588 5518, marine@hempel.com, www.hempel.com

Tri-State Coating and Machine Co. Inc., 5610 McComas Road, PO Box 296, Salt Rock, WV V4W 3S8, USA, tel:1-800-477-4460, fax:304-736-7773, brichmond@tsmnc.com

COMMUNICATIONS

David Clark Company (Wireless Headset Communication Systems), 360 Franklin Street, Worcester, MA 77060, USA, tel:(800) 298-6235, www.davidclarkcompany.com/marine

CORDAGE

Helkama Bica Oy, Lakimiehenkatu 4, KAARINA FI-20780, Finland, tel:+358-2-410 8700, sales@helkamabica.fi, www.helkamabica.com

COUPLINGS

Centa Corporation, 2570 Beverly Drive #128, Aurora, IL 48331, USA, tel:(630) 236-3500, fax:(630) 236-3565, bobl@centacorp.com

CRANE - HOIST - DERRICK - WHIRLEYS

Essex Rental Corp., 1601 NE. Columbia Blvd. Portland .OR 97211

Lifting Gear Hire, 9925 Industrial Drive Bridgeview, IL 60455

DRILLS

Hougen Inc., 3001 Hogan Drive Swartz Creek, MI 48473

DRIVESHAFTS

Centa Corporation, 2570 Beverly Drive #128, Aurora, IL 48331, USA, tel:(630) 236-3500, fax:(630) 236-3565, bobl@centacorp.com

Driveline Service of Portland, Inc., 9041 NE Vancouver Way, Portland, OR 97211, USA, tel:(503) 289-2264, fax:(503) 289-5838, info@driveshafts.com contact: Kevin McCaffrey, www.driveshafts.com

EDUCATION

San Jacinto College, 8060 Spencer Highway Pasadena, TX 77505

ENVIRONMENTAL SOLUTIONS

Environmental Solution, Inc., P.O. Box 788, Wake Forest, NC 99835, USA, tel:(919) 740-0546, john@totalbiosolution.com

Evonik Resource Efficiency GmbH, Active Oxygens, Rodenbacher Chaussee 4, D-63457 Hanau, Germany, tel:+49 6181-59 5326, fax:+49 6181-59 75326, juergen.meier@evonik.com, www.evonik.com/peraclean-ocean

FILTERS/FILTER SYSTEMS

UT 99 AG Oil Mist Separators, Schaubenstrasse 5 CH-8450 Andelfingen, Switzerland, tel:+41 52 397 11 99, fax:+41 52 397 11 90, info@ut99.ch, www.ut99.ch/en

GAS GENERATION SYSTEMS

Generon, 16250 Tomball Parkway, Houston, TX, USA, tel:713-937-5200, jalford@generon.com
IGS Generon, 16250 TOMBALL PARKWAY highway 249 Houston, TX 77086

GROUNDING & EARTHING BRUSHES

Sohre Turbomachinery, Inc., 128 Main Street, Monson, MA, USA, tel:413-267-0590, fax:413-267-0592, tsohre@sohreturbo.com contact: Tom Sohre, www.sohreturbo.com

HOISTS

Kleeco, 10110 S. M43 HIGHWAY Delton, MI 49046

HYDRAULIC SYSTEMS

Jastram Engineering, 135 Riverside Drive, North Vancouver, BC, V7H 1T6 Canada, tel:Office: (604) 988-1111 Cell: (604) 808 - 6281, csimon@jastram.com

INTERIOR DESIGN

Metalcolour Sweden AB, Box 510, SE-372 25 Ronneby, Sweden, tel:+46 457 781 00, fax:+46 457 666 75, info@metalcolour.com, www.metalcolour.com

INTERIOR MATERIALS

Metalcolour Sweden AB, Box 510, SE-372 25 Ronneby, Sweden, tel:+46 457 781 00, fax:+46 457 666 75, info@metalcolour.com, www.metalcolour.com

LIFESAIVING EQUIPMENT

CM HAMMAR AB, CM Hammar AB, August Barks gata 15, 421 32 Västra Frölunda, Sweden, tel:+46 31 7096550, info@cmhammar.com, www.cmhammar.com

LIFT EQUIPMENT

Kleeco, 10110 S. M43 HIGHWAY Delton, MI 49046
Lifting Gear Hire, 9925 Industrial Drive Bridgeview, IL 60455
Tandemloc, 824 FONTANA BLVD Havelock, NC 28532

LIGHTING SYSTEMS/ EQUIPMENT

Larson Electronics LLC, 11035 Jeanell Drive Kemp, TX 75143, tel:(903) 498-3363, cred@larsonelectronics.com

MARINE EQUIPMENT

Alfa Laval Inc., 955 Mearns Road, Warminster, PA 18974, USA

MARINE TRANSPORTATION

Central Boat Rentals, Inc., P.O. Box 2545, Morgan City, LA, USA, tel:985-384-8200, fax:985-384-8455, earl@centralboat.com or gary@centralboat.com

MECHANICALLY ATTACHED FITTINGS (MAFS)

Viega, 100 N. Broadway 6th Floor, Wichita, KS, USA, tel:904-315-3899, fax:888-782-6188, paul.switzer@viega.us contact: Paul Switzer, www.viega.us

MILITARY PATROL CRAFT MANUFACTURERS

Brunswick Commercial & Government Products, 420 Megan Z Avenue, Edgewater, FL 80204, USA, tel:(386) 423-2900, kelsey.nemeth@whaler.com, www.brunswickcgp.com

NAVAL ARCHITECTS, MARINE ENGINEERS

Bristol Harbor Group, Inc., 99 Poppasquash Road Unit H, Bristol, RI, USA, tel:(401) 253-4318, fax:(401) 253-2329, kribeiro@bristolharbargroup.com

Brunswick Commercial & Government Products, 420 Megan Z Avenue, Edgewater, FL 80204, USA, tel:(386) 423-2900, kelsey.nemeth@whaler.com

JMS Naval Architects, 34 Water Street, Mystic, CT 22203, USA, tel:(860) 536-0009 EXT 16, fax:(860) 536-9117, RickF@JMSnet.com contact: Rick Fernandes, www.jmsnet.com

The Shearer Group, Inc., 99 Poppasquash Road, Unit H, Bristol, RI, USA, tel:(401) 253-4318, fax:(401) 253-2329, kribeiro@bristolharbargroup.com

NITROGEN GENERATORS

Air Product AS, Vige Havnevei 78, 4633 Kristiansand, Norway, P.O.Box 4103 Kongsgaard, 4689 Kristiansand, Norway, tel:+47 38 03 99 00, norway@airproducts.com, www.airproducts.no

PAINTS AND ANTI FOULANTS

Sherwin-Williams, 101 W. Prospect Avenue Cleveland, OH 44115, tel:(216) 515-4739, klarmstrong@sherwin.com contact: Kim Armstrong

PRESS FITTINGS

Viega, 100 N. Broadway 6th Floor, Wichita, KS, USA, tel:904-315-3899, fax:888-782-6188, paul.switzer@viega.us contact: Paul Switzer, www.viega.us

RUDDER BEARINGS & BUSHES

Tenmat Inc., 23 Copper Drive, Unit 5 Newark, DE 19804

RUST AND PAINT REMOVAL

Rustibus, 2901 WEST SAM HOUSTON PKWY, NORTH SUITE E-325, HOUSTON, TX, tel:832-203-7170, fax:832-203-7171, houston@rustibus.com, www.rustibus.com

SATELLITE COMMUNICATIONS

MARLINK, Lysaker Torg 45 Post Box 433 NO-1327 Lysaker NORWAY, tel:+47 22 58 20 50, customercare@marlink.com, www.marlink.com

SENSORS

R.M. YOUNG COMPANY, 2801 Aero Park Drive, Traverse City, MI, USA, tel:(231) 946-3980, fax:(231) 946-4772, met.sales@youngusa.com

SHIP REPAIR

Malin International, 320 77th street, Pier 40/41 Galveston, TX 77554

SOUND DAMPING INSULATION COATINGS

Mascoat Products, 4310 Campbell Rd., Houston, TX, USA, tel:(713) 465-0304, fax:(713) 465-0302, wconner@mascoat.com

STEEL, PIPE, ALUMINUM & ALLOY SURPLUS - PURCHASING

Texas Iron & Metal, 865 Lockwood Drive, Houston, TX 36652, USA, tel:713-672-7595, fax:713-672-0653, maxr@texasironandmetal.com contact: Max Reichenthal, www.texasironandmetal.com

STEEL, PIPE, ALUMINUM & ALLOYS

Texas Iron & Metal, 865 Lockwood Drive, Houston, TX 36652, USA, tel:713-672-7595, fax:713-672-0653, maxr@texasironandmetal.com contact: Max Reichenthal, www.texasironandmetal.com

STEERING GEARS/ STEERING SYSTEMS

Jastram Engineering, 135 Riverside Drive, North Vancouver, BC, V7H 1T6 Canada, tel:Office: (604) 988-1111 Cell: (604) 808 - 6281, csimon@jastram.com contact: Chris Simon, www.jastram.com

STERN TUBE BEARINGS/ BUSHES

Tenmat Inc., 23 Copper Drive, Unit 5 Newark, DE 19804, Newark, DE, USA, tel:302-633-6600, marco@tenmat.com

VACUUM TOILET SYSTEM

Jets Vacuum AS, Myravegen 1 6060 Hareid, tel:47 700 39 100, fax:47 700 39 101, post@jets.no, www.jetsgroup.com

VALVES

Wager Company Inc., 570 MONTROYAL RD Rural Hall, NC 27045

WASTE WATER TREATMENT

Scienco/FAST - Marine Sanitation, Water Treatment, 12977 Maurer Industrial Dr., Sunset Hills, MO 33309, USA, tel:1-314-756-9300, solutions@sciencofast.com, www.sciencofast.com

WATER JET SYSTEMS

Marine Jet Power Inc., 6740 Commerce Court Drive Blacklick, OH 43004-9200, USA, Columbus, tel:(614) 759-9000, www.marinejetpower.com

WELDING AND CUTTING EQUIPMENT

Profile Cutting Systems USA, Boulder Creek, CA 95006, tel:(831) 338-8251, john@pcusa.pro, www.pcsmachines.com

WINCHES & FAIRLEADS

Superior-Lidgerwood-Mundy, Corp., 302 Grand Ave. Superior, WI 54880, tel:(715) 394-2383, stenerelli@lidgerwood.com contact: Sean Tenerelli

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The Maritime Industry's Leading Employment Website. For more information contact: Jean Vertucci at vertucci@marinelink.com



BioBlend Renewable Resources is seeking unique partnerships for lubricant distribution expansion. As an experienced manufacturer, with proven technology and products, we are poised for additional growth. The bio-lube market is growing rapidly, and projected to grow even faster over the next 10-20 years.

BioBlend has proven products with performance advantages; both in-field and from an environmental perspective. BioBlend technologies allow customers to meet and exceed performance expectations while supporting renewability and sustainability objectives.

Interested parties should contact:

Jim Pezoldt

jim.pezoldt@bioblend.com

(W) 406-586-9150

(M) 406-321-2483

**Damage Control Officer
Military Sealift Command**

Salary: \$88,230 Per annum , Full Time , Mid Career

Category: Shoreside Operations

Announcement #: 16-123-02EXOC

Title, Series, Grade (Code) Damage Control Officer, WM-9914-29 (123)

Base Salary: \$88,230 Per annum

Type of Appointment: Excepted Service Career-Conditional

Opening Date: June 6, 2016 Closing Date

Open continuously with periodic cut-offs

Location: Military Sealift Command (MSC) Vessels Worldwide

Who May Apply: Open to all qualified United States citizens who are not currently employed with Military Sealift Command (MSC) as civil service mariner (CIVMAR) employees. Relocation expenses are not authorized for this position.

Duties: Damage Control Officers (DCOs) conduct training based upon MSC and USCG training requirements, ship drills, ship inspections and/or casualty investigations for the MSC civil service marine workforce. They may be assigned to a MSC training center, field site, or on an Afloat Training Team. Duties include, but are not limited to developing/revising training instructions, guides, etc.; participating/conducting training courses; participating in or assisting afloat training teams; acting as safety supervisor during field exercises, conducting inspections and drills aboard ships; writing instructional, investigation and/or inspection reports with recommendations; providing technical advice on damage control issues; and/or maintaining and repairing school facilities and equipment as necessary. DCOs also represent MSC interests at conferences germane to MSC training and readiness. DCOs report to a Damage Control Leader.

Candidates selected required to sail 30-45 days on annual basis during high relief request seasons and mission contingencies. When assigned to a ship, DCO comes under the administrative supervision of the ship's Master. Everything in this Position Description is considered to be an essential function of this position. Performs other duties as assigned. Carries out EEO policies and communicates support of these policies to subordinates.

Minimum Eligibility Requirements: Must be a United States citizen of at least 18 years of age and possess and maintain a valid: 1. U.S. Passport with a minimum of seven (7) months remaining of expiration date. 2. United States Coast Guard (USCG) Merchant Mariner's Credential (MMC), with a minimum of ten (10) months remaining of expiration date with the following endorsement(s): Any Unlicensed Rating in the Deck Department, Able Seaman Unlimited, or Any Unlicensed Rating in the Engine Department, Licensing/Certification requirements:

- USCG license endorsed as: Master or Chief Mate (Any Gross Tons Upon Oceans) or Chief Engineer or First Assistant Engineer (Steam, Motor, or Gas Turbine vessels of Any Horsepower),
- STCW Certificate that accompanies the USCG License.
- Applicants with an Engineer's license must also possess a Universal EPA Ozone Depleting Substances certificate.
- Applicants with a Deck license must also possess a current Radar Observer Unlimited endorsement or certificate.
- A Federal Communications Commission GMDSS Radio Operator's License/certificate.

Evaluation Criteria: Applicants who meet the minimum eligibility requirements described above will be further evaluated. Documented knowledge, skills, and abilities, education, training, and awards contained in the application package and resume will be reviewed and rated to determine the degree to which applicants possess the required knowledge, skills, and abilities listed below that are essential to perform the duties and responsibilities of the position for which applications are being considered.

1. Knowledge of shipboard safety, antiterrorism-force protection, lifesaving, firefighting and damage control equipment, programs and procedures to conduct training and drills. 2. Ability to communicate orally and in writing to develop and write technical papers and instructional materials, to represent MSC in conferences, conduct training, drills and, inspection and investigative reports. 3. Ability to plan, organize and execute training evolutions. 4. Ability to analyze, direct and evaluate shipboard operations and training evolutions. Related MSC, military, and/or commercial experience, etc., will also be part of the rating process.


1. CIVMAR positions are subject to drug urinalysis testing. 2. Able to obtain and maintain security clearance eligibility and assignment to a sensitive position. 3. Able to successfully pass the physical examinations (arranged by MSC) and maintain MSC medical requirements. Participate in vaccine immunization; including a tuberculosis (TB) screening test is also required. TB screening is not provided at the MSC-arranged medical examination, but can usually be obtained from your personal medical provider or free at any local public health clinic. If you have previously had a positive TB skin test (i.e. a CONVERTER or REACTOR), another skin test is not required. You must instead provide the medical department written proof that you have completed treatment with medicine (i.e. INH), or that you have started treatment with medicine, or that such treatment is not warranted as determined by competent medical authority. 4. Attend and successfully complete all mandatory training courses, including personal survival, which requires the ability to float in the water for a minimum of sixty (60) seconds. 5. Be ready, willing, and able to physically perform the duties of this position worldwide at all times. 6. Be ready, willing, and able to work in a shipboard environment and wear protective equipment

worldwide at all times. 7. Entry-level positions require candidates to pass an English language competency test. 8. Participate in direct deposit/electronic funds transfer as the standard method of payroll payments. 9. Capable of speaking, understanding, reading and writing the English language. NOTE: a. The tentative offer of employment will be rescinded if the selectee fails to report to any of the scheduled appointments, fails the physical examination, fails the language competency test, fails the drug test, fails to disclose employment information, fails to report to new employee orientation, or is unable to obtain a security clearance. b. On a case-by-case basis, an applicant who accepts a tentative offer of employment will be required to provide a VA Rating Decisions and/or Office of Worker's Compensation Program (OWCP) Scheduled Awards.

How To Contact Us: If you require technical support, please use the support tab located in the top right corner of the Start the Process page www.sealiftcommand.com/start-the-process. This will generate an email a message for you to submit your issue. Emails will be responded to during business hours M-F 0800 – 1700 CST. If you have any questions regarding the position or to follow up on an application submitted, please email us at civmar@sealiftcommand.com or call us at (757) 341-4610 or (757) 341-4611, or our toll-free recruitment hotline at 1-877-562-7672 during the hours of 0700 to 2000 EST.

NOTE: FAILURE TO PROVIDE REQUIRED INFORMATION REQUESTED FOR THIS POSITION WILL ADVERSELY AFFECT YOUR ELIGIBILITY. Federal job applicants who make a false statement in any part of the application could be turned down for the job, fired after beginning work, or subject to fine, imprisonment (U.S. Code, Title 18, Section 1001), or other disciplinary action. Employment of Federal Civilian Annuitants: Selection of CIVMAR annuitants for MSC positions must be approved by the Director for Civilian Human Resources. Annuitants serve at the will of the appointing officer. Benefits Information: In accordance with section 9902(h) of title 5, United States Code, annuitants reemployed in the Department of Defense shall receive full annuity and salary upon appointment. They shall not be eligible for retirement contributions, participation in the Thrift Savings Plan, or a supplemental or re-determined annuity for the reemployed period. Discontinued service retirement annuitants (i.e., retired under section 8336(d)(1) or 8414(b)(1)(A) of title 5, United States Code) appointed to the Department of Defense may elect to be subject to retirement provisions of the new appointment as appropriate. (See DoD Instruction 1400.25, Volume 300, at <http://www.dtic.mil/whs/directives/>) Annuitants are not eligible for recruitment and retention incentives. YOU MAY NOT BE HIRED IF YOU FAIL TO REPORT: 1. Previous security clearance issues (intents to deny or the revocation of security clearances). 2. Debts. 3. Previous felony convictions where actual time was served in jail for more than one (1) year. Any questions relative to this issue should be directed to the CIVMAR Support Center at **866-562-7672**.

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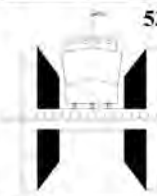


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