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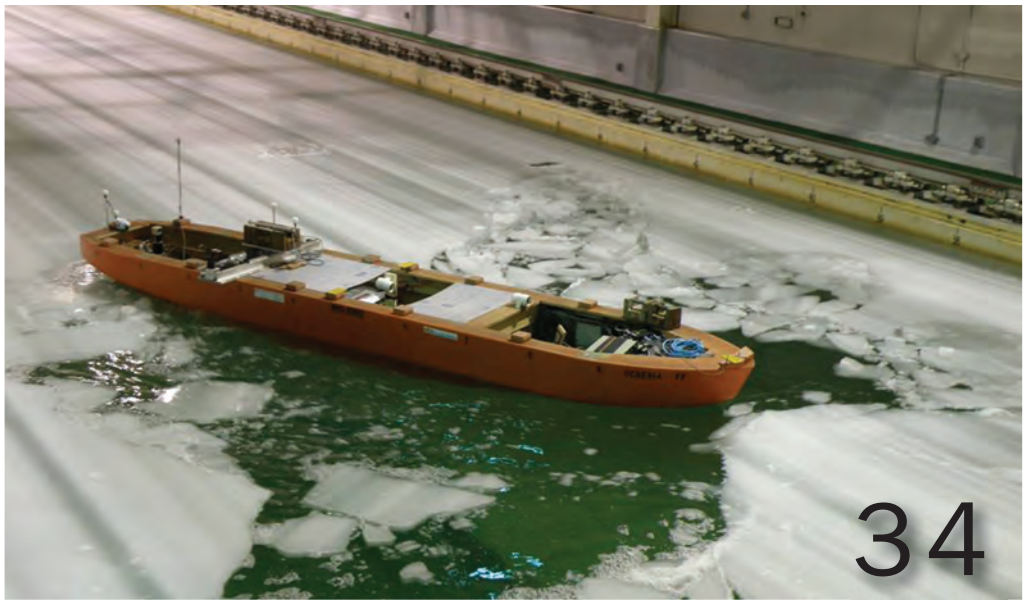

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ON THE COVER

Genting Hong Kong
Genting Hong Kong has become a cruise and travel powerhouse. This month we speak with four key Genting Hong Kong executives, including Tan Sri Kt Lim, Chairman, Genting Hong Kong, for insights on the growth strategy going forward.

(Photo: Crystal/Genting Hong Kong)

Cruise Shipping

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William began working for the Associated Press in Oslo. In 2003, he left the AP to oversee and write for a number of print and electronic energy industry publications in the Norwegian capital. He has written thousands of offshore-focused reports from his North Sea vantage point. He lives and works in Oslo. He started writing for Maritime Reporter in 2014.

Schweikert
Tim Schweikert has been appointed as the President & CEO of GE's Marine Solutions since January of 2015. Previously he had held various leadership roles across GE businesses including GE Transportation, as well as leading GE's efforts in contributing to the revitalization of Africa's infrastructure.

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GREG TRAUTHWEIN, EDITOR & ASSOCIATE PUBLISHER

The cruise shipping sector has been on a global tear, and while it is generally the kiss of death to think, or say, 'there nothing that can stop it now,' all signs point to a vibrant and growing cruise market. According to the Cruise Lines International Association (CLIA) *'State of the Cruise Industry Outlook 2017,'* the cruising industry in 2017 will carry a projected 25.3 million passengers. If this projection proves true it would continue an unprecedented march forward, a steady growth curve and up with more than 40% growth from the 17.8 million passengers carried in 2009.

The United States continues to provide the lion's share of the world's cruisers, with CLIA counting 11.28 million cruisers from the U.S. in 2015, which is nearly 50% of that year's global total of 23.18 million. But while the U.S.-led, bigger ship segment continues to grow in earnest, there are several subtle and not-so-subtle changes in the cruise sector that will define this travel and leisure industry for the coming generation.

On the 'not-so-subtle' side, the cruise industry's gross projected numbers paint a clear picture: CLIA reports that cruise lines are scheduled to debut 26 new ocean, river and specialty ships in 2017 representing a cumulative investment estimated to be about $7 billion, and from 2017-2026 CLIA says that the industry is expected to introduce a total of 97 new cruise ships totaling an estimated investment of $53 billion through 2026 (options pending, of course).

But, what is perhaps not so obvious are the changing demographics and dynamics of the 'cruiser.' While "Cruise Shipping" traditionally has revolved around ever-larger oceangoing ships, there is a strong growth in both the River Cruising and specialty Yacht Cruising markets. The hallmark here are smaller vessels with more specialty itineraries. Smaller vessels offer some distinct advantages, starting with a higher price point per passenger that comes with the exclusivity, but also the ability to more rapidly identify itineraries and build vessels quickly to run those routes. In 2015 there were 184 River Cruise Ships according to CLIA's records (and as a reminder, CLIA includes 60 cruise lines and more than 95% of global cruise capacity), with 13 new river cruise ships on order for 2017.

Genting Hong Kong – our cover feature this month– has been on an acquisition and spending spree which has seen it grow its business considerably. While it is best known for its Star, Crystal and Dream cruise brands, the company is a travel and leisure giant serving multiple markets, and today it is even a shipbuilder courtesy of its strategic acquisition of several German shipyards to build for its maritime needs. A quartet of Genting Hong Kong executives were gracious in sharing their insights on the strategy, and the story starts on page 30.

And as cruise shipping continues to grow, so too does the economic impact surrounding its activities. According to CLIA cruise industry expenditures generated $117 billion in total output worldwide, supporting 956,597 full-time equivalent employees who earned $38 billion in income in 2015. Impressive impact for a niche business started in the 1970s, and a shining star in the maritime sector.

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2017 New Cruise Ship Orderbook

Year	Ocean	River	Ships Ordered	New Capacity
2017	13	13	26	30,006
2018	15	2	17	29,448
2019	20	2	22	51,824
2020 to 2026	32	0	32	119,510
Total	**80**	**17**	**97**	**230,788**

* 26 New Ships on Order (as of December 2016)
* Total Investment of $6.8B+ in New Ocean Vessels in 2017

(Source: CLIA)

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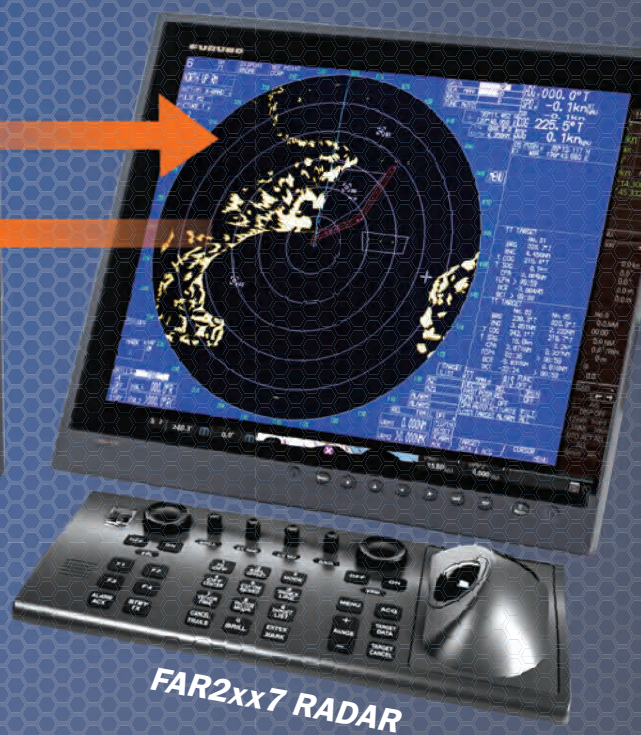

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Pilot Wars

In Texas, two challenges to a local pilot system are in play. Across the U.S. Gulf Coast, stakeholders are watching closely.

To hear the stakeholders tell it, an ongoing challenge to the rate increase requested by the Gal-Tex pilots in Galveston, Texas and another effort which involves a direct challenge to the legality of the state pilot monopoly in the same jurisdiction are both happening independent of one another. Attorneys representing the challenging parties in both cases say the timing is purely coincidental. Nevertheless, the fact that both disputes are happening at the same time and in the same place bring (perhaps unwanted) attention to an otherwise typical situation that exists at every deep draft port in America.

The tenet that states have the right to control commerce on their own waterways is and has been a given, for a long, long time. State pilot associations handle all registered traffic and usually, in the absence of a robust and/or well-known federal pilot presence, all the enrolled traffic, as well. And, in most places, the crumbs represented by Jones Act deep draft traffic aren't enough to make a living in any event.

Safety & Low Rates

At irregular intervals, state pilot organizations ask for rate increases, often couched in terms of what "everyone else is making elsewhere" and usually, but not always, those increases are rubber-stamped and approved. It isn't unusual to see individual pilots make $500,000 annually, but I haven't actually looked at that number closely in quite a few years. Suffice it to say that it is good, secure work, if you can get it.

It is also difficult work in most, but not all places. Those who defend the at least outwardly fat salaries point to the enormous responsibilities involved and usually ask, "What price can you put on safety?" It is a compelling argument. The usual mantra is that competition typically invites bargain basement pricing which then skimps on safety and encourages less-qualified mariners to do the work at a discount, endangering public safety.

I can't think of a single major port in the United States where more than one local organization splits the work in a competitive fashion. 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.

History

Stakeholders have tried to get rates rolled back in other places. It wasn't too long ago in Florida (2014, actually) that the Board of Pilots Commissioners Rate Review Committee voted (remarkably) to approve an application to decrease the pilotage fees for cruise ships at the Port of Miami by 25 percent. Subsequent to that, however, a stay from the District Court of Appeals was granted. I haven't heard a word since. If pilot rates in Florida have since been rolled back and I didn't hear about it, then the world has truly turned upside down.

Turning back to the hopeful federal pilots in Galveston, I can only think of one place where an organization has competed for any time at all with an established state pilot group. It was in Tampa Bay, Florida, in the early 1980's. Setting the stage, I was sailing Second Mate on a grimy, 43-year old Jones Act coastal chemical carrier. A 'maverick' pilot from the local group formed his own little group, complete with an apprentice pilot (with a federal license) and was intent on competing in the same harbor. A local newspaper – I sure wish I could find the clip – I think had a political cartoon of two 'pilots' having a fistfight on the bridge of a ship. Funny.

I was very young at the time and found the entire thing to be rather amusing. I also found out that (in most places) you couldn't actually form a competing group – unless you first had a state issued license – and this guy was one of the first, if not the very first to do it.

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Beyond that, you couldn't become a state licensed pilot unless – wait for it – you were trained by a state licensed pilot. Inconveniently, the new competing group's leader, having just split from the other group, had a state license. It made for a very dicey situation. My employers – a recognizable oil and refining group – decided to play both sides of the fence. And, to be fair, we were a Jones Act tanker, so any federal pilot could've guided us, in any event. Did he ever guide any registered traffic? I don't know. As for my ship: one voyage, we'd take the original legacy group; the next time, the new upstarts.

I distinctly remember the time that our breakaway pilot came on board with his "apprentice" – the federal pilot – in tow. He informed our Captain that the "apprentice" would take the ship into the berth (under his close supervision). Our Captain THEN informed HIM that his orders were that the only person allowed to pilot the vessel would be the state licensed pilot. An uncomfortable ride to the berth ensued.

This week, I contacted a local attorney who had been involved with the entire affair during those years. Reportedly, as many as 14 lawsuits spawned from the disagreement – and he told me this week – eventually (and incredibly), the two groups merged again. I asked him, "Why?" He answered simply, "Economics." But, also according to that same local Tampa Bay attorney, that tussle went for three years. I was gone by then – just another unemployed Jones Act sailor – my ship having been sent to scrap before it all came to a final boil.

Spotlight on Galveston

In a nutshell, two different but equally important issues are now before the Board of Commissioners of Pilots for Galveston County Ports. First, two cruise ship operators – Royal Caribbean and Carnival – and the Florida-based Florida-Caribbean Cruise Association (FCCA) are challenging the recently approved rate hike granted to the local pilots. Separately, a group of five local marine professionals have asked for the board to consider their qualifications to become local state pilots. In the latter case, it is important to note that these mariners are not asking to join the Gal-Tex pilots; instead, they want to form their own competing group.

As previously reported in this space, the federal 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, at least here in the Lone Star state, is about to get tested.

Justin Renshaw, a Houston-based attorney representing (on, he says, a 'pro bono' basis) the pilot applicants, told MarPro that his request for an official application form from the state of Texas was met with the application form for the local Gal-Tex pilots. And, he says, that's not who his clients are applying to work for. The latest hearing, held on 13 January, was by all accounts rather contentious. It was also well attended with stakeholders from all sides of the equation. Quite simply, the five applicants looking for state approval for the right to guide local tonnage in and out of port, will, if approved, provide suitable competition for the established legacy group already in place.

Separately, we also spoke with attorney Tim Strickland, who represents FCCA and the two cruise companies in the other matter. His clients oppose the rate increase granted by the local pilot commission in late August. Strickland declined to go into specifics on the actual merits of the case and instead pointed us to the public records available in Galveston County. Fair enough. He did tell us, "It's about the process, the letter of the law and procedures that need to be followed."

The two spats have attracted a great deal of attention, both locally and across the Gulf Coast. If the disagreements can't be settled out of court, Galveston will be at the heart of the first serious challenge to the concept of state pilot monopolies in some time.

The fate of the five applications for a state commission is probably secondary to the real question: can a state unreasonably withhold a license from nominally qualified mariners just because they don't belong to the local organization? Maybe we're about to find out. After that, any rate increases asked for and/or approved by the local pilot commission might just be irrelevant. That's because competition often has a funny way of establishing what the real value of any service or goods should be.

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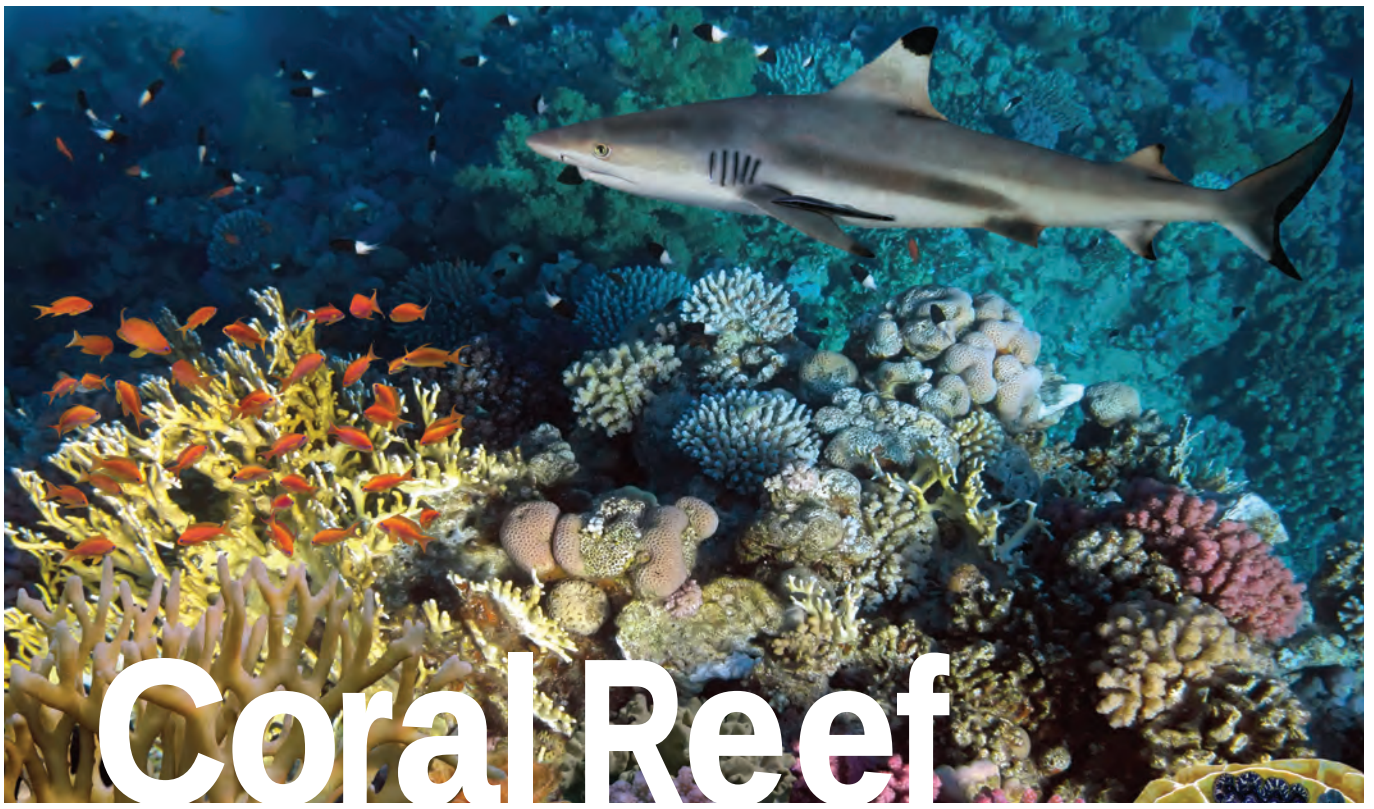

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Coral Reef

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Stony corals are marine invertebrates with somewhat unique life cycles. For the most part, they reproduce sexually, broadcasting gametes into the water. Often, an entire coral colony or reef will spawn on the same night. Coral may also reproduce asexually by producing genetically identical polyps. Fertilized gametes drift in the current until, hopefully, they alight on a hard surface like a rock suitable for attachment. The gamete then develops into a polyp, producing a basal plate that affixes itself to the hard surface. Tentacles develop around the mouth, while the exterior of the polyp produces a skeleton of calcium carbonate called a calyx. Coral tend to reside in large colonies that develop into reefs over time.

Coral fossils date as far back as the Cambrian period, more than 500 million years ago. Most coral fossils are of species that have since gone extinct, and there were long periods for which no coral fossils have been identified.

Many corals develop a symbiotic relationship with algae. The algae provide oxygen and energy to the coral and aid the polyp in calcification through secretion of calcium carbonate. The coral protects the algae from other predators, while providing it with carbon dioxide and waste containing vital nitrogen. The coral's primary source of nutrition, though, is obtained by the tentacles capturing plankton from the surrounding water.

The calcification rate of coral is heavily dependent upon environmental factors, particularly exposure to sunlight.

The symbiotic algae seem to secrete more calcium carbonate in sunlight than at night, in cloudy weather, or when the water is turbid.

Stony corals may be classified into ten general forms. Branching corals have branches and secondary branches. Digitate corals resemble fingers, with no secondary branches. Table corals are table-like structures with fused branches. Elkhorn corals have large, flattened branches. Foliose corals have broad plate-like portions rising above the substrate. Encrusting corals form a thin layer above the substrate. Submassive corals have knobs, columns, or wedges protruding from an encrusting base. Massive corals are ball-shaped. Mushroom corals resemble the tops of mushrooms. Cup corals resemble egg cups.

Coral reefs are found mostly in warm, shallow water, but also form to a lesser extent in deeper water and in colder water. Each coral colony tends to consist of a single species or, sometimes, several closely related species, basically a mono-culture. The reefs themselves though are complex biomes, home to a wide variety of plants and animals. Seaweed, sea grasses, plankton, and algae thrive on coral reefs, providing food for numerous fish, crustaceans, and other animals, many of which take shelter within the crevasses of the reef. The smaller animals attract larger predators, increasing the diversity of life along the reef.

As older coral dies, new coral grows on top of the calyx left behind. Thus, reefs tend to grow slowly upward. Given sufficient time, coral reefs can become quite thick.

The largest extant coral reef is the Great Barrier Reef off the east coast of Australia. The Indo-Pacific region is home to over 500 reef-building species, while the Atlantic region contains 62 known species. Fossil evidence indicates that the Atlantic region, particularly the Caribbean, have greater coral diversity until the closure of the natural seaway connecting the Atlantic and Pacific through what is now Central America. The barrier reef off Belize is quite extensive.

Coral reefs are broadly categorized as having one of three structures. Fringing reefs are the most common, projecting seaward from the shore and forming borders along the shoreline and nearby islands. Barrier reefs are roughly parallel with the shore, but with a lagoon (sometimes deep) between the reef and the shore.

Atoll reefs start out as fringing reefs around volcanic islands. In this case though, the island gradually submerges, leaving a large lagoon surrounded by the coral reef, sometimes with breaks in the reef allowing connections between the ocean and the lagoon. Many of the Marshall Islands in the Central Pacific are built on the tops of old atoll reefs and enclose large lagoons. Kwajalein Atoll encloses one of the largest atoll lagoons in the world.

Coral reefs protect the shore and lagoon by absorbing the full force of the waves and dissipating that energy. The shore is thus protected from erosion and the lagoon can develop an ecosystem quite different from that outside the reef.

Corals and coral reefs worldwide are currently facing a variety of threats. In some locations, there is a commercial coral mining industry. Nutrient runoff from agricultural and urban areas is altering the habitat. Overfishing has reduced the diversity that the reefs require to grow. Bottom trawling through coral reefs often tears up and destroys the coral. Industrial activity, such as dredging, has destroyed large portions of some reefs and created increased sediment that smothers and kills the coral.

More broadly, the increased ocean temperatures have stressed many reefs. Acidification has leached the calcium carbonate out of the calyx of many corals. Sea level rise threatens to put some of the deeper reefs below the level where they can receive the requisite amount of sunlight. Coral bleaching is a growing problem, with many corals losing them characteristic colors and turning white or gray

Various measures have been taken to protect coral reefs. The Great Barrier Reef and the Florida Keys are among the coral reefs worldwide that have been designated by the IMO as particularly sensitive sea areas (PSSAs). The United States prohibits lightering of petroleum cargoes in waters above the Flower Garden Banks coral reefs in the Gulf of Mexico.

A coral reef, though, is a more complex ecosystem than a particular species of animal. Thus, a systemic approach is necessary to provide meaningful protection. Several nations, including Australia, Kiribati, the United Kingdom, and the United States, have designated large-scale marine sanctuaries or marine protected areas that include significant coral reefs. While the degree of protection afforded coral reef ecosystems in each of these sanctuaries or areas varies, these measures are steps in the right direction to protect this unique natural resource.

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Oily Water Separator Systems
Practical Advice

Magic Pipes, 15 PPM alarms, crew familiarization, improper entries in the Oil Record Book, Oil Record Book not maintained: these are all terms used by various Port State Control (PSC) officers worldwide when referencing the Oily Water Separator. When PSC so decides, it also has the option of making one of these an ISM deficiency, adding another black mark against a vessel. Nevertheless, even with such an important piece of equipment and the records documenting its proper use, both are often neglected. Avoiding the pitfalls associated with this mandatory equipment is an important skill to learn, even in the case of the sharpest, most dedicated engineer.

The origin of the requirement for an Oily Water Separator System comes from the International Conference on Pollution of the Sea by Oil, written on 12 May 1954. Article III of the convention lays out the groundwork for the discharge of oily waste from a vessel. The standards of the 1954 conference have evolved significantly over time, eventually becoming the more stringent standards of today. For example, in 1954, the standard discharge from a vessel could be no more than 100 parts per million. Today's standard is just 15 ppm. The convention also heralded the first time that the use of an Oil Record Book had been required. The original conference was a UK requirement and laid the foundations of MARPOL Annex I. This UK conference was one of the foundations of our current oil pollution prevention standards. For the purposes of this primer, 50 engineers of various ratings – from QMED to Chief Engineer – the Engineering departments of two maritime universities, as well as an Oily Water Separator OEM were all surveyed. Virtually all of the engineers surveyed stated that the only training received on board was familiarization training from their relief or the Chief Engineer, with only a few receiving training at their national maritime university. Out of 50 engineers surveyed, 58 percent of them believe that more extensive training is necessary. The other 42 percent are satisfied with the traditional model of on board training and familiarization given by the Chief Engineer. The engineers wishing for more training requested better OEM-generated manuals, DVD's and/or flash drives. Some engineers would like to see a manufacturer representative on board to conduct instruction in the use of the OWS, as well as further instruction in to the requirements of MARPOL Annex I.

In looking at the Paris and Tokyo

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MOU's, only about two percent of the deficiencies noted by Port State Control had anything to do with MARPOL Annex I in the years 2013 and 2014. That said; of all the Port State Control Form B's reviewed, nearly all involved non-functioning, malfunctioning, or bypassed Oily Water Separators, which resulted in a detention.

While it is possible to receive a dispensation for repairs from the flag state, that's not always the case, and a vesseldetained awaiting parts and repair can cost valuable time and money. Additionally, these types of detentions can trigger the Flag State or Recognized Organization to require an Intermediate ISM audit. That's because an infraction into vessel pollution is almost inevitably considered a Safety Management deficiency as well. The devil is in the details, but when it comes to Coast Guard, PSC, and/or accident inspections, one thread becomes very clear: the Oil Record Book is the gateway into determining if the Oily Water Separator is actually used, and if it is used, is it used appropriately. MEPC.1/Circ 736/REV.2 provides instructions and examples in to the proper entry requirements of the Oil Record Book.

Addressing this situation head on, the 58 percent of engineers who wish to see change would like to see the equipment manuals on board with colored picture diagrams, as well as have the units labeled and color coded to ensure that each part of the system can be easily identified. Adjustments such as these are easy enough to implement at very little cost to the vessel owner or manager. The remainder of the engineers expressed a desire for more detailed training provided at either the university or the company level. Not to sound like a disgruntled deckie, but if we were to look at what the requirements that are under Table A/II-1 and Table A/II-2, ECDIS is a standalone requirement going so far as to require deck officers to have the training in the type specific units that are on board the vessel. The IMO believes that type specific and generic training, working in conjunction with each other, is necessary to reduce the amount of casualties that can be caused by the over reliance on ECDIS. Having sailed on a number of vessels with ECDIS, prior to the carriage requirement, the only way to learn the system prior to these requirements was to read the manual and hope that your relief left decent turnover notes. In my experience this often left to conflicting use of the system by the various officers of the watch who may have been shown the usage of the system differently.

Looking at OWS systems as critical equipment – like GMDSS, or ECDIS, for example – then it would follow that at the very minimum there should be a generic training covering the basic science such as the physics and principles behind the operation of the OWS system. Another overlooked aspect of this issue involves such variables such as the types of oils, lubricants, detergents – which vary greatly from vessel to vessel and port to port – and their collective impact on the hardware. Engineers not equipped with the knowledge of how this plays a factor in operations will have a difficult time operating the same equipment with competence, or in compliance.

As we progress with technological advances, toward more unmanned machinery and autonomous operations, greater burden will be placed on those left on board to run this critical equipment. If more than half of the engineers surveyed believe that we should be doing more in regards to training, then perhaps it is time to listen to them.

Last Port of Call for the U.S. Merchant Marine?

About the Author

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Part II in a two-part series, continued from the January 2017 edition of ***Maritime Reporter & Engineering News***
http://magazines.marinelink.com/magazines/MaritimeReporter/201701/flash/

Government Ownership

If reliance on the foreign commercial market is risky because of uncertain reliability, then what of U.S. Government ownership of a fleet of vessels? That has also been on the menu since the early 20th century. President Woodrow Wilson proposed in September 1914 that the U.S. Government acquire commercial cargo vessels. Congress disagreed, which delayed enactment of the President's proposal until the Shipping Act, 1916. A compromise was struck to permit U.S. Government ownership as a war time measure – but all vessels so acquired had to be sold to private owners within five years of the end of the war.

The war time experience did not put President Wilson's original idea in a favorable light. The rush to build ships at any cost resulted in enormous economic waste and most of the vessels constructed were not finished until the war was over. Moreover, in the immediate aftermath of the war, the cost to the Government to operate the vessels in the commercial market became a pressing economic burden. This led to the Merchant Marine Act, 1920 which laid down the principle that private ownership was preferred over government ownership as noted above.

Although U.S. Government ownership was rejected in principle, the U.S. Government practice has been schizophrenic. The heroic World War II cargo vessel building effort resulted in another massive sell off to private owners after the war just as occurred after World War I. Many hundreds of vessels were kept in reserve in a National Defense Reserve Fleet pursuant to the Merchant Ship Sales Act of 1946. Their purpose was to provide a surge capability under U.S. Government control to meet national emergency shipping requirements.

This was an easy choice to make in 1945 because the funds had already been expended to build the vessels and it was recognized that there would be a significant surplus of war-built vessels after commercial sales. So, the foundation of the U.S. Government-owned fleet -- 1,421 vessels on July 1, 1945 (growing to a peak of 2,277 vessels in 1950) -- was World War II-built vessels well into the 1970's. That fleet served extensively during the Korean War (778 vessels over an 18-month period) and again in the Vietnam War (161 vessels over a five-year period).

However, the fleet aged over time and was not replenished at a rate that would have resulted in a modern reserve fleet. Moreover, the size of commercial vessels increased substantially and new vessel types were introduced (most particularly container and roll-on/roll-off vessels) making the fleet increasingly obsolescent. The reserve fleet has struggled to keep up.

To address these issues, the Ready Reserve Force, a subset of the NDRF, was formed in 1976. Maintenance funds would be concentrated on this subset of the most modern and militarily useful vessels. In the deployment for Operations Desert Shield/Desert Storm, "the largest concentrated sealift activity since World War II," 78 of the 96 RRF vessels were activated.

Today, the fleet of RRF vessels is down to 60 surge vessels, 14 operated by the U.S. Military Sealift Command and 46 operated by the U.S. Maritime Administration. In theory the RRF should be a relatively modern group of vessels and particularly vessels that may not have much every day commercial utility. But the theory is being stressed by a lack of resources. The average age of the RRF vessels is over 40 years. The average age of privately owned U.S.-flag roll-on/roll-off vessels in the Maritime Security Program is about 15 years.

The obvious advantages of a U.S. Government ready reserve of vessels are that it is absolutely under U.S. Government control and it can be populated with vessels which are particularly militarily useful either as to type or modifications or both. This latter advantage has proven to be difficult to sustain because of a lack of funding. For example, the newer U.S.-flag roll-on/roll-off vessels in the Maritime Security Program each have a capacity of over 500,000 square feet whereas the largest RRF roll-on/roll-off vessels managed by MARAD have about 300,000 square feet (and most have substantially less than that).

The disadvantages are that keeping a fleet in standby status is expensive in comparison to subsidizing a fleet of operating commercial vessels and also not as absolutely assured as it might first appear.

On cost, the Admin. Jaenichen testified on November 17, 2015 that it costs approximately $390 million per year to maintain 60 RRF vessels in inactive status. In contrast, the Maritime Security Program, which provides stipends to support 60 militarily useful commercial U.S.-flag vessels, cost $186 million in fiscal year 2015 (which is scheduled to grow to almost $300 million in FY 17 as a result of recently enacted legislation). The main difference is that commercial owners have a profit motive to operate their vessels as efficiently as possible. Moreover, the main source of trained U.S. citizen merchant mariners for the RRF are these very same MSP vessels. Without MSP, the cost of having full complement reserve crews for the RRF vessels would increase the cost of the government-owned vessels substantially.

Also, the RRF only provides vessels and does not provide a transportation or logistics service. The commercial fleet provides end-to-end transportation because that is what commercial customers demand. So, everything from inland transportation to terminal operations must come from someplace else, at a cost, if the only source of reserve sealift capability is the RRF. Admin. Jaenichen estimated in 2014 Congressional testimony that it would cost the U.S. Government at least $2 billion to replace the 60 privately owned vessels in the Maritime Security Program and more than $40 billion to replace the international logistics capability obtained via the ocean carriers in that Program.

On assurance of access, the issues in the past have come in the form of technical vessel break-out problems and lack of available mariners. During Operations Desert Shield/Desert Storm, the first large scale activation of the RRF since it was created, there were significant activation delays for a variety of reasons ranging from inadequate maintenance to a lack of available shipyard capacity to undertake repairs. Similar

problems occurred with the NDRF in the Vietnam War – about 70 percent of the vessels activated in 1965 suffered significant lost time casualties when activated. Although improvements have been made in light of the experience, vessels in reserve status are not likely to ever have the same day one reliability as vessels in ongoing service.

Assurance is also affected by the availability of trained personnel. One of the primary concerns expressed by MARAD and USTRANSCOM about the declining number of U.S.-flag vessels engaged in the foreign trade is how that reduces the pool of available mariners to man RRF vessels – which both agencies have indicated is currently only barely sufficient. Past manning problems during periods when the manpower pool to draw from should have been sufficient, however, should be cause for additional concern.

National Commitment

So, in summary, reliance on the foreign commercial market is risky and uncertain and reliance on U.S. Government ownership is expensive and not necessarily assured – particularly if problems with the commercial fleet are not addressed because it is the source of manpower for the government-owned fleet. That leaves the best choice as the same one the United States has had since at least the early 1900's – and that is to support a privately owned U.S.-flag fleet in foreign commerce for military auxiliary, economic security and mariner training and employment purposes.

The U.S. Congress took a significant step in the right direction when it enacted the Consolidated Appropriations Act, 2016, signed by President Barrack Obama into law on December 18, 2015. That Act increased the stipend paid to the 60 U.S.-flag vessels enrolled in the Maritime Security Program from $3.1 million per year per vessel for FY 2016 (increased to $3.5 million in the same law) to $5 million per year per vessel for FY 2017 through 2020 and even more in FY 2021. The dramatic increase is a recognition that the U.S.-flag fleet trading in foreign commerce needs significant help now.

But that help alone is not enough. As indicated in a MARAD Report to Congress in April 2015 and by Admin. Jaenichen to Congress on November 17, 2015, the U.S.-flag shrank and is shrinking because of a decline in cargoes reserved to such vessels by U.S. cargo preference laws. According to Admin. Jaenichen, the decline in cargoes has had "the most dramatic effect on the U.S.-flag fleet."

Unless that decline is reversed or other substantial measures are taken to reduce the cost disadvantage faced by U.S.-based ship owners or provide compensating support, the fleet will continue to suffer and decline. A fulsome and substantial strategy is needed taking a lesson from the 1930's.

At that time the private merchant marine also faced an existential crisis as the existing support system (mail subsidies) was rife with inefficiency and corruption. President Franklin Roosevelt took the bull by the horns and proposed moving to an entirely new subsidy system. The solution was not universally popular and met with determined opposition in Congress. In the end, however, the Merchant Marine Act, 1936 became law which "proved to be critical to the eventual Allied victory in the Second World War." A similar concerted and sustained effort will be needed to support the privately owned U.S.-flag fleet because without a renewed national commitment, this may very well be the last port of call for the U.S. merchant marine.

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TOP 10 SOUTH EAST ASIAN NATIONS
RANKED BY VALUE

Country	No. of Vessels	Gross Tonnage (m)	Total Value USDbn
1. Japan	4,316	150.28	$79.5
2. China	4,839	156.77	$67.4
3. Singapore	2,611	64.58	$38.0
4. South Korea	1,504	51.04	$20.8
5. Taiwan	919	33.62	$13.3
6. Malaysia	642	9.72	$8.4
7. Hong Kong	435	19.42	$8.2
8. Indonesia	1,268	10.63	$4.6
9. Vietnam	714	4.73	$2.6
10. Thailand	437	4.27	$1.6
Total	18,037	506.99	$246.1

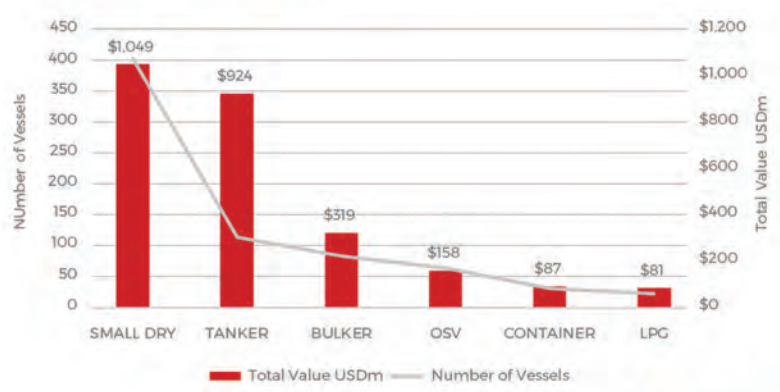
VesselsValue

SPENDING BY ASIAN COUNTRIES
IN 2016

Country	No. of Vessels	Average Age	Total Spent USDm
China	170	11	$3,340
South Korea	55	10	$731
Singapore	51	9	$714
Japan	25	8	$625
Indonesia	36	14	$344
Vietnam	23	13	$161
Hong Kong	17	10	$115
Taiwan	13	19	$71
Malaysia	4	11	$21
Philippines	5	19	$12
Chinese Taipei	1	22	$4
Grand Total	400	11	$6,138

VesselsValue

SHIP TYPE BREAKDOWN
OF VIETNAMESE FLEET



VesselsValue

Vietnam

Population	95,261,021 (July 2016 est.)
World Rank	15

Major Urban Areas

Ho Chi Minh City	7.298 million
Hanoi (capital)	3.629 million
Can Tho	1.175 million
Haiphong	1.075 million

Merchant marine:

Total:	579
By type:	
barge carrier	1
bulk carrier	142
cargo	335
chemical tanker	23
container	19
liquefied gas	7
passenger/cargo	1
petroleum tanker	48
refrigerated cargo	1
roll on/roll off	1
specialized tanker	1
Registered in other countries	86

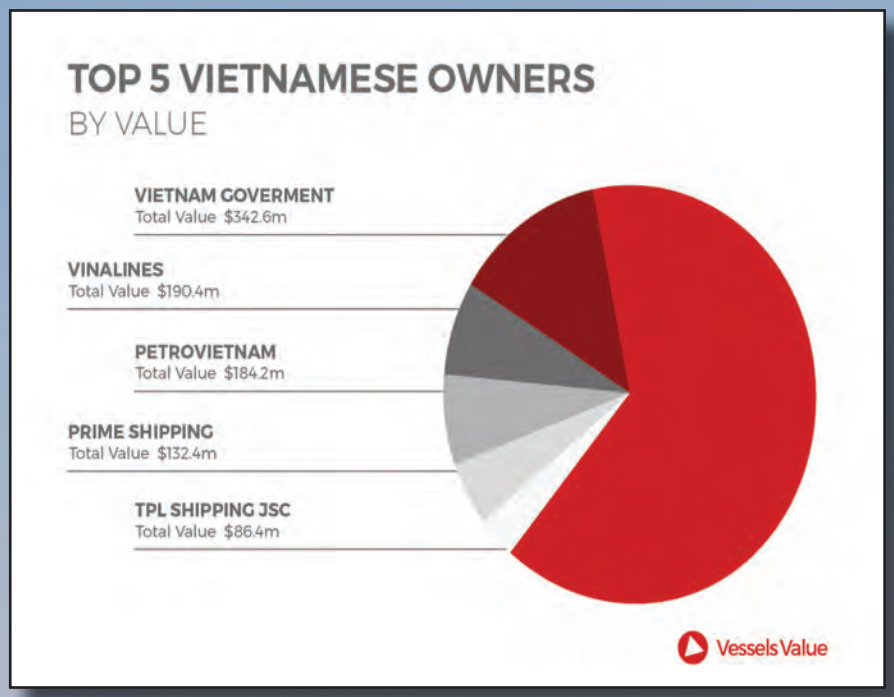
(Cambodia 1, Kiribati 2, Mongolia 33, Panama 43, Taiwan 1, Tuvalu 6) (2010)
country comparison to the world: 20

Ports and terminals:
Major seaport(s):
Cam Pha Port, Da Nang, Haiphong, Phu My, Quy Nhon
River port(s): Ho Chi Minh (Mekong)
Container port(s) (TEUs):

Haiphong	1,018,794
Saigon New Port	3,071,777

Source: Central Intelligence Agency, The World Factbook (https://www.cia.gov/library/publications/the-world-factbook/geos/vm.html)

Image: © Kovalenko I / Adobe Stock



Brazil Cruise Slump

Aerial view of the new Rio Port Cruise Passenger Terminal.

Photo: PortoMaravilha

BY CLAUDIO PASCHOA

Brazil is still attracting cruise lines, such as Norwegian Cruise Line, which is bringing a ship to Brazil for the first time in the 2016/2017 season. However, hard numbers do not bode well for the industry as the number of cruises dropped by more than half in four years, with a stagerring 54% decrease in the number of regular cruise ships on the Brazilian coast. In 2012, the season had 15 regular ships, while this year there will be only seven, and the number of passengers boarding at Santos port will be 42% lower.

The 2010/2011 season of cruises hit the record for ships on the Brazilian coast: 20. Since then, this number has fallen year on year, and this season, which started on November 21, will

Cruise Shipping: Port of Call

be the worst since the 2004/2005 season, when only six cruise ships came to the country. In the face of the economic crisis, port infrastructure problems and the high cost associated with operating in Brazil, cruise lines end up directing their vessels to other more competitive countries. Of the ships Brazil lost from last season, two went to Cuba, the newest and much awaited destination for cruises, and one to China, a market that has grown considerably. However, even with these setbacks, optimism for the upcoming season still prevails among local operators and foreign cruise lines, but the sector understands the hurdles it faces in Brazilian waters. In addition to the high tax burden and port charges (about 40% more expensive than anywhere else in the world), one of the main complaints is the low quality of port infrastructure at destinations which would be attractive to cruise lines. As an example of the costs involved in cruise ship operations in Brazil, in the 2014/2015 season, the total economic movement (direct and indirect) totaled $641,054 million. Of this total, $339,049 million was generated by the expenses of companies with bunker fuel, port taxes and other taxes, purchases of supplies, commissioning of travel agencies and tour operators, water embarkation and garbage disposal, salaries paid, in addition to marketing and office expenses, among others. The total expenses of cruise ships and crew members in the cities and ports of embarkation/debarkation and transit were $302,101 million.

Fifteen ships that will pass through the Port of Santos passenger terminal (Concais). Of these, four cruises are regular, these being MSC Preziosa, MSC Musica, Costa Fascinosa, Costa Sovereign, CVC and another 11 ships will only transit, one more than the last two seasons. Concais will receive four transit ships for the first time: Norwegian Sun (NCL), Crystal Serenity, Amadea and Fram (Hurtigruten). In total, there will be 92 stops. Last season, the total number of ships in transit had already been higher than those on regular stopovers. During that period, there were 10 vessels in transit and seven regular vessels in Santos. This year, there will be 15 ships, 11 in transit and only four regular. The forecast is for 455,741 passengers to travel through the Maritime Passenger Terminal (between boarding, debarkation and transit) in Santos. However, there will be a 42% drop in the number of passengers that will board and debark at the Santos quay, when compared to the previous season. In the 2015/2016 season, there were 700,408 passengers. This season, the forecast is for 409,796 passengers to board and debark in Santos.

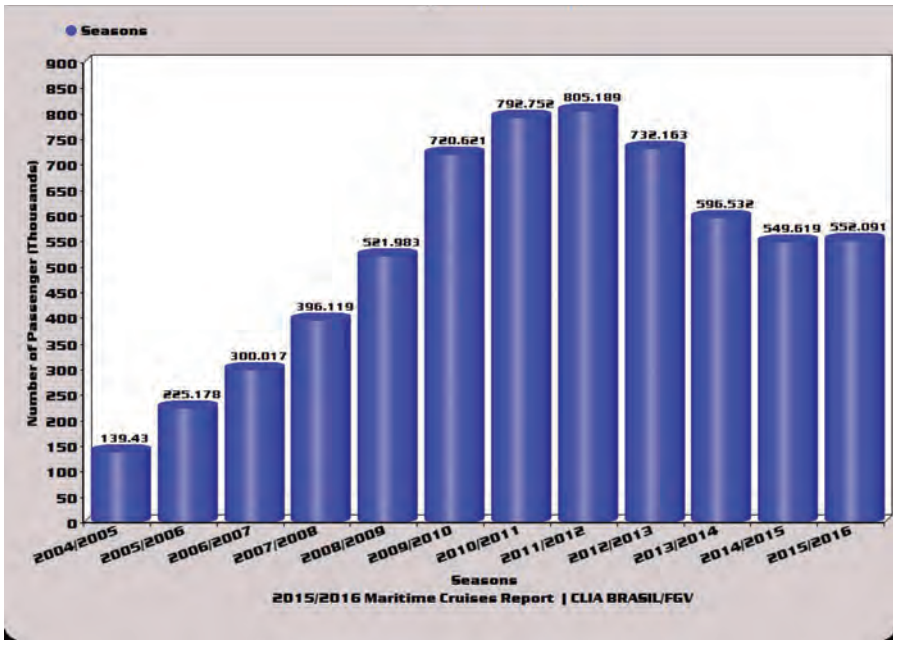
The vessels will sail through 13 destinations in Brazil, and 13 other locations in South American countries, including Argentina, Chile, Uruguay and Port Stanley (in the Falkland Islands, which is a British overseas posession). The itineraries will have a minimum duration of three nights and a maximum of 20 nights. Abremar (Brazilian Associations of Maritime Cruises) points out to the high costs charged by Brazilian ports as one of the reasons for this drop in the number of cruise ships in Brazil. The search for increased competitiveness for Brazil to attract more ship owners, is one of the fronts of the Association's work. Abremar is debating with the Federal Government, the Legislative and Judiciary powers, and suppliers in the search for an environment with legal certainty, costs and taxes similar to those found in other cruise friendly countries. Italian cruise line MSC, one of the traditional players in the Brazilian cruise ship mar-

Photo: Claudio Paschoa

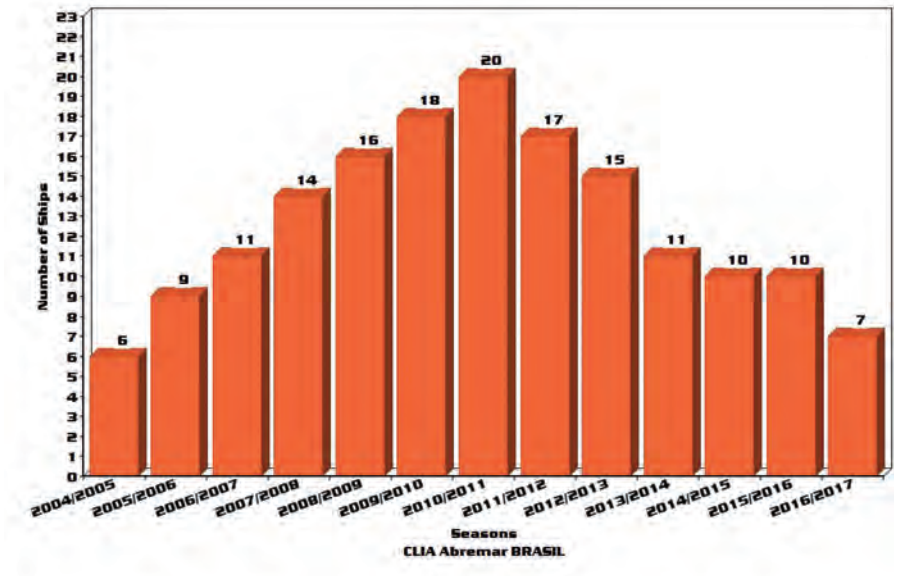
ket has reduced its stake, from five ships last year, to only three ships this year. MSCs commercial manager in Brazil, Bruno Cordaro, says that this retraction was only "momentary," as a new MSC expansion plan will add 11 new ships to the fleet next year. "Increasing the fleet, Brazil will certainly have more ships," he says.

Cruise passenger terminals have also received various complaints from passengers, these complaints range from cleanliness to transportation problems, with some docks being so remote as to need buses to take guests from the ships to the terminal proper. The terminals in Santos and Rio de Janeiro are usually considered the best and the Rio terminal was very recently refitted for the Olympic Games, when a chartered cruise ship hosted the U.S. Olympic Basketball team and other VIP's. As previous studies have shown, the Port of Santos continues to be the main port for boarding and debarking in Brazil, followed by Rio de Janeiro. Other important destinations were highlighted by ship owners as having high demand for cruises, these were locations such as Salvador (Bahia), Búzios (Rio de Janeiro) and Ilhabela (São Paulo). Destinations are benefited in different aspects by the cruise ships, with increase in the flow of tourists to the destination cities, which moves the local economy, generates jobs, and stimulates the entry of foreign capital. Cruise lines flagged the following factors as hindrances to growth in the sector, in order of importance: High operating costs (ports and pilotage), lack of adequate infrastructure at the ports (piers, bathymetry and others), tax burdens (labor, visas, trade unions, environmental taxes, etc.), bureaucracy, lack of new destinations, and an unfavorable economic and political moment.

Number of Passengers Per Season



Number of Regualr Cruise Ships Per Season



Building Big

BY ERIC HAUN

Maritime Reporter & Engineering News recently visited Finnish shipbuilding giant Meyer Turku, whose sights are set on building bigger.

It is safe to say that when shipbuilding commenced in the town of Turku, Finland in 1737, the company building wooden boats a the time could not have envisioned the behemoth vessels that would eventually be built by the site's current occupant, Meyer Turku.

The Meyer family, operator of the German shipbuilding company Meyer Werft, took over the nearly 300-year-old Turku yard in September 2014 together with the Finnish government (which purchased 30% of the share capital through the Finnish Industry Investment Ltd.). It was renamed Meyer Turku Oy, and eventually the company exercised an option to take complete control of the yard in May 2015. Since the takeover, Meyer Turku has produced several ships, including the 99,000+ GT ships Mein Schiff 4 and Mein Schiff 6 for TUI Cruises, and most recently the dual-fuel cruise ferry Megastar for Tallink delivered in January 2017 (see related story, page 50.)

Though the yard has the capability to produce other types of vessels, Tapani Pulli, Deputy to the CEO, explained, "We are purely in the cruise ship building market at the moment as its growth has been stable and is also expected to continue to be stable."

Meyer Turku, which together with sister shipyard Meyer Werft in Papenburg, Germany, holds roughly one-third of the world's cruise ship orderbook, is poised to build bigger as it fulfills its order book stretching through 2024.

New builds produced at Meyer Turku will grow increasingly larger in the coming years, with three 100,000-110,000 GT ships for TUI for delivery through 2019; up to 180,000 GT for Carnival's four ships due from 2019 to 2022; and then up again to an estimated 200,000-210,000 GT for two ships to Royal Caribbean Cruise Line in 2022 and 2024.

And with one slot open in early 2023, Pulli said large cruise ships over 150,000 GT remain the builder's focus.

The ships for Carnival and RCCL are "the really big ones, the ones that will start generating the growth in our future," he said.

"With this order book," Pulli said, "the growth will continue above 300,000 GT per year from 2022, and this means a triple employment effort compared to the last years."

This will require facility upgrades and a workforce increase at Meyer Turku, which currently employs roughly 1,600, all of whom are Finnish excluding management.

The yard's production ramp-up is also good news for its surrounding subcontractors. "The domestic value of our

Mein Schiff 5 float out
The cruise ship was delivered in June 2016.

The Meyer Turk Order Book

Ship	Owner	Delivery	GT	LNG capable
Mein Schiff 6	TUI Cruises	2017	100,000	No
New Mein Schiff 1	TUI Cruises	2018	110,000	No
New Mein Schiff 2	TUI Cruises	2019	110,000	No
Unnamed	Carnival	2019	180,000	Yes
Unnamed*	Carnival	2020	180,000	Yes
Unnamed	Carnival	2021	180,000	Yes
Unnamed*	Carnival	2022	180,000	Yes
Unnamed*	RCCL	2022	200,000 (est.)	Yes + Fuel Cell
Unnamed*	RCCL	2024	200,000 (est.)	Yes + Fuel Cell

*MOU only

product is about 80%," Pulli said, "and of those companies who supply cabins and interior areas almost all are Finnish."

In 2014 and 2015, the yard's full-time employment effect, including the shipyard and network companies, was around 5,000 people.

By 2021-2022, when the yard will be producing one large cruise ship every eight months, the shipbuilder expects this number to surpass 15,000.

"Our network will have to follow us and supply this growth together with us," Pulli said.

Looking at the yard's current orders, another noteworthy trend is the shift to dual fuel LNG-capable vessels from 2019, and then further on the utilization of fuel cell technologies starting in 2022.

Not only are these technologies an answer to regulation changes and customer demand, but also a selling point, part of Meyer Turku's evolving competitive advantage, particularly against a budding threat from potential cruise ship builders in Asia.

"We have been studying [the use of fuel cells] already for awhile, and we have a very small test plant in one of the Viking Line ships already running," Pulli said.

"We try to be a step or two ahead."

Tapani Pulli

Deputy to the CEO, Meyer Turku

Photos: Meyer Turku Oy

ABB AZIPODS HELP TO PROPEL A NEW GENERATION OF

ARCTIC CAPABLE CRUISE SHIPS

Polar Express

BY ERIC HAUN

Images: ABB

ABB AZIPOD DO

Power range:
- 1.5-7.5 MW per unit

Gearless power train
- Induction motor, or
- Permanent magnet motor

Hybrid cooling
- Up to 45% performance increase
- Up to 70% power without cooling

Electric steering
- 4 redundancy options

Adjustable strut height
- Minimizes / eliminates headbox

Shaftline proven technology
- Redundant seal
- Online bearing monitoring

Leveraging its experience in the distinct polar and cruise vessel segments, ABB and its Azipod are at the forefront of the booming polar passenger vessel market. As world travelers continually seek access to more exotic and exciting destinations, evolving cruise shipping trends have triggered an order boom for passenger vessels capable of plying some of the most treacherous Arctic and Antarctic routes. Required for this new class of ships is a range of equipment and technologies that enable safe and comfortable sailing through polar waters. Answering the propulsion call is ABB, a world leader within the polar and passenger vessel markets, whom *Maritime Reporter & Engineering News* was recently visited at its Helsinki location, ABB Marine House.

ABB's electric podded azimuth thruster Azipod has a 25-year history in the maritime industry, serving a large variety of vessel types ranging from cargo ships to offshore support vessels and drill ships. No stranger to icy conditions, ABB's know-how for ice going vessels runs deep, and the company possesses a long supply history for cold water vessels. Currently there are more than 60 Azipod-equipped vessels in operation or on order for work in icy waters, including the high-tech LNG-powered Finnish icebreaker Polaris delivered last year, and SCF's 299-meter heavy ice class LNG carrier Christophe de Margerie.

Likewise, ABB is no stranger to cruise and passenger ships. Azipods were first installed on a cruise ship in 1998, paving way for some 60 subsequent cruise ships to date, including the world's largest: Royal Caribbean's 1,187-foot-long, 226,000-gross-ton Oasis class ships. In the cruise market, ABB's most recent Azipod order came from Genting's Star Cruises brand, whose two new 204,000-gross-ton Global Class vessels due for delivery from 2019 are specially designed for the Asian cruise market.

Of all modern large cruise ships, icebreakers and high ice-class cargo vessels, roughly two-thirds are fitted with Azipod propulsion, according to ABB. "The main market for Azipod is large cruise and the opening new seaways in the north," said Sakari Sorsimo, Senior Vice President, Head of ABB Business Unite Marine and Ports Finland.

Leveraging this presence and experience in both the polar and cruise segments, ABB is now positioned to serve an emerging class of polar and sub polar passenger vessels and has even launched a new Azipod designed specifically this market, the Azipod DO, which Sorsimo said is designed for "smaller, lighter ice class vessels," and is available from 1.5-7.5 MW.

"We are designing [the Azipod DO] here in Finland, but manufacturing in China," Sorsimo said. "And for this, we already have contracts for polar cruise vessels."

In the expedition cruise segment, ABB currently has orders to supply Azipods for the world's first passenger vessel to be constructed explicitly to Polar Code standards, and most recently the world's largest expedition yachts with ice class.

The polar class passenger vessel Scenic Eclipse is currently under construction at Croatia's Uljanik shipyard for Australia's Scenic group and is due for delivery in August 2018. The 10-deck luxury cruiser will be outfitted with two 3 MW Azipod units, propelling the 168-meter-long, 16,800-gross-ton vessel through polar waters during the summer months. Scenic Eclipse will be classed by Bureau Veritas.

Three new 20,000-gross-ton expedition mega-yachts for Genting Hong Kong brand Crystal Cruises will each be powered by two Azipod units, enabling the Polar Class 6 luxury ships to navigate in icy conditions. The three Endeavor Class vessels will be built by MV Werften in Germany starting in 2017 and delivered in 2019, 2020 and 2021. ABB will supply the complete power, propulsion and automation package for these vessels, each classed by DNV GL.

"We are doing quite high ice class on the DO pod, so we have a unit that has to perform both in the ice and in the open water with extremely high comfort," said Marcus Höglblom, ABB Vice President for Passenger Ship and Azipod Segment. "These vessels will be able to cruise anywhere in the world – from Antarctic to Arctic – for a very demanding customer."

Cruise Shipping: Technology

Image: SKF

SKF ALLOWS CRUISE SHIPS TO

Cut Drag with a Blow-up Cushion

An inflatable device that reduces drag on cruise ships could help operators cut fuel costs while maintaining passenger comfort, said Christopher Schnäckel, technical director for stabilizers at SKF

Passengers on cruise ships pay a lot of money to be ferried to exotic locations. They are looking for memorable experiences – and seasickness is not one of them.

Fortunately, below the water line, a pair of enormous stabilizer fins helps to reduce roll in heavy seas and improve passenger comfort. These types of stabilizer – which retract into the hull of the ship when not in use – are also used on other vessel types such as ferries or expedition cruisers.

However, they have a downside. The recess in the hull – into which the fin retracts – can cause considerable drag when the ship is in motion. Reducing this drag would boost efficiency and cut fuel consumption – helping customers to reduce costs while boosting their environmental credentials.

With this in mind, SKF has now developed a revolutionary inflatable cover for hull openings, which eliminates the majority of the drag. The Dynamic Stabilizer Cover (DSC) is a 'cushion' that inflates to fill the recess in the hull and form a smooth surface. It covers the hole whether the fin is inside or outside the hull, reducing local drag by around 90%. On a cruise liner, this could minimize the fuel consumption up to two percent.

Kevlar Mesh

The DSC is made from a Kevlar mesh covered with neoprene rubber, and is inflated using compressed air from the ship's existing pneumatic systems. The materials are already well proven in applications such as amphibious military vehicles and inflatable dams. They must withstand tough conditions – and this is tested to the maximum when a ship is travelling at 22 knots.

The first iteration of the design was installed on a cruise liner, and tested over the course of two months. This flagged up a problem: While the covers worked in normal operation, extending or retracting the fin while sailing at full speed (tested up to 22 knots) could harm the DSC. The shipowner therefore had to reduce the vessel's speed to a safe speed. So although the prototype worked, it didn't live up to the standards SKF engineers sought.

Further development began immediately. The goal was to raise the safe speed of operation—or better yet, to eliminate any such limitation entirely.

So SKF began work on a second, more robust design, changing the design from a single-chamber system to one with multiple chambers, all of which can be filled with air. The result is greater stability, allowing higher vessel speeds while extending or retracting the fin. The new version has been successfully tested in a tank in Hamburg, and will now be fitted to a cruise liner for field testing. If successful, SKF expects to launch the full version in mid-2017. It previewed the DSC at the recent SMM trade fair in Hamburg. In the event of the cushion failing, for example, a diver could be dispatched overboard to remove it with relative ease – and ensure that the fin remains in operation.

Big Potential

SKF believes that the DSC has huge potential: there are hundreds of retractable stabilizer fins installed on cruise ships, and currently no way of covering the hole to reduce drag. SKF's system that can be retrofitted to existing vessels with minimal time and maximum ease: the DSC can be welded into place in around one week.

Every fin stabilizer the company builds from now on will come with built-in compatibility for DSCs. However, this does not mean a shipowner has to use the covers. Should he decide to retrofit DSCs—to reduce costs because of rising oil prices, for example— they can do so without docking the vessel. Divers install the cushions, then the controls are integrated with those of the existing fin stabilizer. Stabilizers already in use can be retrofitted, too.

The DSC was originally developed for cruise liners. Variants for ferries and expedition cruisers are now in the pipeline and will also be available in 2017. So by mid-2017, ships could be powering through the water with just a little more efficiency – which is good news for both passengers and operators.

Image: Carnival

Digitalization Dream

Wärtsilä, Carnival Sign $1B Deal

Wärtsilä and Carnival Corporation & plc signed a 12-year, nearly $1 billion agreement that stipulates all engine maintenance and monitoring work for 79 of Carnival Corporation's vessels (cumulatively approximately 400 Wärtsilä engines covered) will be handled by Wärtsilä, and ongoing planning will be a collaboration between both. The agreement includes Wärtsilä's Dynamic Maintenance Planning (DMP) and Condition Based Maintenance (CBM), services based on capturing digitalized data streams from every engine, after which this data is analyzed. The goal: real-time optimization of the equipment while predicting operational and maintenance demands. With the DMP and CBM in place, vessel and fleet operations are optimized and engine overhaul intervals potentially extended.

Rising Star

Genting Hong Kong is a rapidly growing global travel brand, spreading its wings – literally and figuratively – into ocean cruise, yacht, river cruise, air and shipbuilding. Maritime Reporter & Engineering News *speaks with key executives at Genting Hong Kong:* ***Mona Lai****, SVP Corporate Communication;* ***Gustaf Gronberg****, SVP Shipbuilding & Marine Operations; and* ***Jarmo Lakso****, Managing Director, MV Werften, for insights on the future growth strategy.*

BY GREG TRAUTHWEIN

Genting Hong Kong has been an active newsmaker in the cruise sector during the past year. As a start, for our readers that may not be familiar with the company and its brands, can you supply an overview of your activities in the cruise ship owning and cruise ships building segments.

ML Genting Hong Kong is a corporation principally engaged in the cruise business along with leisure, entertainment and hospitality activities.Genting Hong Kong is the pioneer in the cruise industry in Asia with two ships for the "Star Cruises' brand in 1993. It acquired Norwegian Cruise Line in 2000 and introduced a more relaxed and free style cruising, multiple restaurants, no tipping, majority Asian staff and other innovations for the cruise industry in North American. With the growth of the Asian cruise business, Genting Hong Kong divested most of its holdings in Norwegian Cruise Line and redeployed the funds received to order two 150,000 gross tons ships in 2013 with one delivered late 2016 and another to be delivered in late 2017, and these two ships will form the fleet for a new Asian Luxury brand named "Dream Cruises." Genting Hong Kong also bought the Crystal Cruises, *"The World's Most Awarded Luxury Cruise Line"* in 2015 which have ocean, river and yacht cruises as well as B-777 with all first class seats for luxury world air cruises. Due to the large number of orders for cruise ships and limited yards able to build them, Genting Hong Kong decided to buy three large German shipyards in 2016, named collectively as "MV Werften" in order to be able to have early delivery of cruise ships for its three brands.

Can you give a short description of each brand, discussing how each is distinct.

ML **Star Cruises** is a contemporary cruise line for the Asian market with mostly year-round homeports in Singapore, Hong Kong, Penang, Keelung (Taipei), Manila and Shanghai. A pioneer in the regional cruise industry, Genting Hong Kong was incorporated in September 1993, operating its fleet under Star Cruises, to take on a bold initiative to grow the Asia Pacific region as an international cruise destination. Star Cruises has built its reputation on offering first-rate Asian hospitality throughout its fleet.

Dream Cruises is the first-ever Asian luxury cruise line with two new vessels Genting Dream (November 2016) and World Dream (November 2017) and they are homeport in Hong Kong, Guangzhou and Singapore. Each Dream Cruise ship have about 150

Crystal Clear

The Crystal brand was acquired by Genting Hong Kong in 2015. Under the guise of Edie Rodriguez (inset right) CEO & President, Chariman, Crystal Luxury Corporation, Ltd. has evolved to a broad luxury travel brand that includes ocean cruises, yacht expedition, river cruises and luxury air.

(Photos: Genting Hong Kong)

(Credit- Neil Roberts, Paragon Pixels)

Dream Palace Suites, which has butler service, typical of a luxury cruise line such as its sister brand "Crystal Cruises." Dream Cruises delivers the highest level of guest service and spacious comfort in the Asian region and provide passengers with more choice, comfort and value to create a perfect dream voyage.

Crystal Cruises is the world's leading luxury cruise provider, having earned more "World's Best" awards than any other cruise line, hotel, or resort in history. In 2015, Crystal embarked on the most significant brand expansion in the history of luxury travel and hospitality, which introduced two new classes of cruising – Crystal Yacht Cruises and Crystal River Cruises and reaching new heights with Crystal Luxury Air with AirCruises offered on a B-777 on various itineraries around the world. Crystal Ocean Cruises with two luxury ships, Crystal Symphony and Crystal Serenity offers extensive itineraries traversing the globe, ranging from five days to 100-days World Cruises.

What does your current cruise ship fleet look like, in regards to number of ships, age, size and itinerary?

ML Star Cruises currently operates fleet of six vessels including SuperStar Virgo, SuperStar Gemini, SuperStar Aquarius, SuperStar Libra, Star Pisces and The Taipan. They range from 3,000 to 75,000 Gross tons with about 2,000 lower berths. Star Cruises brings passengers to about 25 destinations in Singapore, Hong Kong, China, Malaysia, Taiwan, Japan, Australia, Thailand and Vietnam.

Dream Cruises operates Genting Dream which debuted in November 2016 with over 70% of staterooms featuring private balconies and more than 100 connecting rooms, ensuring family friendly convenience. A "ship-within-a-ship" concept, Dream Palace contains 142 spacious suites offering European style butler service and special privileges. Genting Dream is dual homeport in Guangzhou and Hong Kong with itineraries to Vietnam and Japan.

Crystal Cruises' fleet currently consists of two luxury ocean vessels, Crystal Symphony and Crystal Serenity, operating global itineraries; Crystal Esprit for Crystal Yacht Cruises, with itineraries in the Seychelles, Adriatic Sea and the Caribbean; and, Crystal Mozart for Crystal River Cruises, operating on the Danube River.

New Construction: Discuss in overview the current orderbook of new cruise ships for all of the Genting Hong Kong brands.

Cruise Shipping: Genting Hong Kong

Seamasters

Genting Hong Kong takes to the oceans with its (from left) Dream, Crystal and Star cruise shipping brands.

(Photos: Genting Hong Kong)

GG Star Cruises has ordered two "Global Class" ships, each measuring 204,000 gross tons with about 5,000 lower berths for delivery 2020 and 2021 and they will be positioned in Asia. Crystal Cruises has ordered four river ships with two river ships delivered by this year and another two river ships in 2018 for cruising on the Rhine and Danube Rivers. Crystal Cruises also ordered three "Endeavor Class" polar expedition yacht with the first to launch in 2019 and they will sail most of the time in the north or south poles. All of these newbuilds will also take place in our MV Werften shipyards. Finally, Dream Cruises' second new ship, World Dream, is currently under construction at Meyer Werft and will make her debut in the Asia in November this year.

Why specifically was it decided to consolidate this shipbuilding capability in Germany?

GG 75% to 80% of the value of a cruise ship is from up to 800 suppliers/contractors and these clusters of suppliers/contractors are concentrated around the Baltic, France and Italy. As Genting Hong Kong has built almost all its ships with Meyer Werft in Germany over nearly 20 years, it is only natural that Genting sought German shipyards which are able to build cruise ships with suitable investments. Germany is also where the largest cluster of marine equipment suppliers is located and has excellent Government maritime coordination policies. MV Werften has three yards, which have covered halls and production is not affected by the weather, leading to high productivity. With about 1,500 experienced management and workers, which will be increased in the future, MV Werften is well placed to successfully build cruise ships.

The company has a 10 year production plan and there will be good returns on the investment in the shipyards and fits perfectly with the long term Company's global cruise strategy.

Can you provide in overview the breadth of Genting Hong Kong's shipbuilding capability today, with insight on current or planned investment to improve or grow this capacity in the coming months and years.

JL MV Werfen, Genting Hong Kong's three shipyards in the German State of Mecklenburg-Vorpommern in Wismar, Warnemunde and Stralsund, is managed in Wismar and will focus on building large new ships. To make MV Werften into one of the world's most modern and efficient cruise shipyards, we will invest another 160 million euros in a thin plate laser welding line, a cabin module factory, a new covered section block building hall, the modernization of manufacturing control systems and new executive and employee offices and facilities.

Looking at the maritime/shipbuilding side, what technologies do you count as the most important advances in delivering safe and efficient ships

GG Star Cruises is the first cruise line to have its own simulator for training of our officers and the installation of video recording in the bridge in 1995. We will continue this tradition with plans for a global fleet-wide control and training center in Wismar with remote monitoring of equipment and bridge for all our new ships.

We work continuously with our marine suppliers in adopting the state-of-the-art technologies and systems which will keep all our passengers safe on all our cruise ships.

Star Cruises has been the pioneers in the field of safety and security. Video recording of the bridge into the VDR's with capabilities to view shore-side was implemented at the early stage, and already 1997 Star Cruises become the first shipping company ever to build and operate our own Bridge Simulator. Implementation of the Pilot Co-Pilot system on the bridge with minimum always two certified officers at any time was already in place at our first cruise in December 1993, this is now an standard in most major cruise lines. Also since the first day of operation we have had complete security screening equipment's onboard to ensure screening can be done in all ports of call, included any small tendering islands which do not have the equipment's. Ghurkhas from Nepal was hired to ensure the best security.

As a part of our selection process for hiring Captains and Officers, we contracted Marine Profile to do a psychosocial screening which in certain extent is similar to what are used in the aviation. We will continue this tradition with plans for a global fleet-wide control and training center in Wismar with remote monitoring of equipment and bridge for all our new ships.

We work continuously with our marine suppliers in adopting the state-of-the-art technologies and systems which will keep all our passengers safe on all our cruise ships.

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Looking at the entertainment side of the ships, which technologies do you count as most 'sought after'?

GG Fast and cheap Internet connectivity and ability to use mobile devices to access cruise ship services, such as information, reservation, order and others will be the most sought after technologies in the future.

Five Minutes with

Tan Sri Kt Lim

Chairman, Genting Hong Kong

Last year Genting Hong Kong acquired shipbuilding capacity in Germany. When and why was the decision made to become a shipbuilder?
With the rapid growth of the world cruise industry, especially in China, this has led to cruise ship order book reaching an all-time high, with orders placed as far out as 2026, nearly 10 years from now. In order to ensure that the company can build the required number of cruise ships for three brands in the next decade, it is strategic that we acquired shipyards that can build our cruise ships on a timely basis without pricing pressure from the limited number of yards which can build mega cruise ships. Ownership of the yards provides certainty that we can build a fleet of high quality cruise ships at a pace dictated by our growth rather than constrained by supply.

Which economic indicators do you monitor to future plan, and what do those indicators say now?
We look at most economic indictors, particularly the long term ones as the orders of cruise ships will result in delivery 4 to 5 years in the future. Unlike the aircraft industry, it is not possible to start any large cruise fleet buying existing tonnage due to the sheer economies of scale of large cruise ships. With most of the world, particularly in Asia at a much lower GDP per capita but with growth which are several fold higher than developed countries, the opportunities of growth in Asia will be much higher. This is the region where we are now focused our future on.

As experts in the Asia cruise market, how does this market differ from European, Mediterranean and North American markets?
Each country and region have their own particular unique market characteristics. For example, German cruise lines are quite different from U.S. cruise lines in terms of design, operation, food and service standards. Therefore, Star and Dream Cruises ships are also very unique for the Asian market as the design started grounds up with the Asian market in mind.

When looking at the ships that you build today, how are they most similar, and most different, than the oldest ships in your fleet?
The Global Class ships for Star Cruises will set a new pace for cruise ships built for the Asian market, in both size and facilities. They will be very different from the older ships in our fleet. Detailed particulars will be released closer to the delivery date in 2020.

Where do you see potential for growth, and how is this affecting the ships you design and build.
Cruising is increasing worldwide at a steady pace. Although everyone speaks of the rapid growth of cruising in Asia, the rapid growth is from a small base. The absolute number of berths required will be more for the much larger fleet servicing the developed countries in the Caribbean, Alaska and the Mediterranean. As we are focussed on the Asian region, Genting Hong Kong will continue to build cruise ships, which are "Asian at heart, yet international in spirit". For example, language plays an important role in ensuring that our Chinese guests feel at home while on board any of our ships and, as dining is a very important part of the local culture, Chinese guests are very discerning when it comes to their many types of regional cuisines.

What is the biggest challenge to building and maintaining a successful Cruise Shipping Brand?
There are many successful brand strategies but for us, it is identifying the Asian needs; building ships addressing those needs and delivering the service at the right price point of this particular market.

– Greg Trauthwein

Shipbuilding
Genting Hong Kong made a major investment in shipbuilding, acquiring shipyards in Germany. Pictured is Lloyd Werft.

Ice Kings

BY ANDREW SAFER

The CCGS John G. Diefenbaker model remotely-controlled by a former icebreaker captain while it was being tested in the ice tank.

(Photo: National Research Council of Canada)

Model Testing Ship-Ice Interactions in the St. John's Ice Tank

In a cavernous room in the heart of a research centre in St. John's, Newfoundland at 8 am, the air temperature is -20 C while the water temperature is hovering at zero. National Research Council of Canada (NRC) staff are preparing the Ice Tank to test the integrity of a newly designed ship's hull and propulsion system by subjecting a model to a battery of maneuvers and encounters with ice. One of the largest in the world, the Ice Tank is 90m long, 12m wide, and 3m deep. Once ideal conditions for "growing ice" are achieved, a fog of a proprietary ice-making mixture is hand sprayed into the air as a mist that freezes and then falls onto the water's surface. On contact, the droplets morph into fine smaller crystals that begin to grow vertically downward, matching the formation of ice in Nature where its columnar structure develops from snow or ice crystals. The NRC ice was specifically designed to fracture vertically, like ice in the real world.

In the 1980s, scientists at NRC developed the special concoction to avoid using salt water, which is corrosive and would negatively impact the Ice Tank's elaborate infrastructure. Facilities Manager Ian Robbins explains that the ice formula, referred to as EGADS, includes a) water, b) ethylene glycol (antifreeze), c) aliphatic detergent (soap), and d) sugar (no longer part of the recipe). EGADS was developed to mimic the scale properties of sea ice. The mechanical properties of real sea ice that matter to an icebreaking vessel – its flexural strength, compressive strength, cracking behavior, friction, etc. – are all emulated at model scale by the model EGADS ice that is formed in the Ice Tank. The model scale ice was compared to tests on real sea ice from the Arctic in order to validate the recipe.

Growing initially at a rate of 2-3mm every three hours, a 20mm ice sheet takes 8-10 hours to form. The material is stronger than desired, so to weaken it, the testing team turns off the refrigeration plant and turns on the heat. Their aim is to hit the ice strength target between 9 and 10 am. A bubble carriage blows air bubbles into the tank from the bottom. They become frozen in the ice, lessening the density. The target ice thickness, which reflects the real-world conditions the vessel will be working in, is dictated by both the scale factor used for the model and the test plan that is developed in consultation with the client.

Dr. Jim Millan, NRC Director of Research and Development, explains that a typical icebreaker-testing project might require anywhere from a few ice sheets to 20 or more, which support testing over a 1- to 12-week period. Once the contract is signed and the test plan is developed, designers and electronics, software, and instrumentation technicians and engineers work together as a team to design and build the model hull, appendages, propulsion system, sensors, autopilot control, and any other specialized systems that need to go into the model to make it work. From start to finish, in five to eight weeks, depending on complexity, the model is built in a purpose-built facility and is ready for testing. Once the software and electronics and instrumentation systems are installed to run the model and acquire data, the model is tested.

The majority of NRC's models are built at a scale ranging from 1:25 to 1:40. Froude scaling laws are used, which ensures that forces and other quantities measured at model scale can be used to reliably predict the same quantities at full scale. "The closer to real (full) scale," notes Dr. Millan, "the model gets too big. The beauty of physical modeling," he adds, "is that if you get the strength and thickness of the ice right, you get the physics for free." A 150m ship at 1:25 model scale would be 6 metres long, whereas the same ship modeled at 1:10 would require a model that is 15 metres long, which is too big for the tank. Sometimes they build more than one model to compare design features. For an icebreaker, there could be two kinds of bows, represented either by two models or by one model and two bows, which are alternately bolted on. With smaller models, Dr. Millan says, it can be difficult to fit all of the electronics, sensors, and other on-board equipment inside.

Plotting the data that's acquired throughout the test process is not being done in order to find a single number – the answers are more complex and require specialized analysis and interpretation of the results. "A very specialized graduate degree in engineering is required to plot the trends," says Dr. Millan. "There could be a particular outcome, or you could have variables that are a function of multiple parameters, such as thickness, strength of ice, and the speed you're trying to go through the ice. The question could be: How does power vary as a function of each parameter?" To achieve this, NRC runs a refrigeration plant and has staff who take samples and test flexural strength and the friction of the ice. "It's like a huge science exper-

iment," Dr. Millan observes. "and there are people with up to 30 years' experience who are able to operate in a multidisciplinary team." The work is done behind the scenes, so that "when the client comes in, the joystick is ready to grab" (to drive the model), and the data collection can begin.

Before initiating the model testing route with a client, NRC investigates available historical data to see if the questions that are being asked can be satisfactorily answered that way. Using specially-developed numerical modeling programs such as NRC's Particle-in-Cell (PIC) pressured ice model, they can also predict some results ahead of the model test. Such modeling can help to guide the model test to ensure it focusses on the most important test conditions. . All models – numerical and physical - require validation. Froude's scaling methods for ships in open water are "extremely well validated", observes Dr. Millan, and have been used for 150 years. However, such data for icebreaking vessels is not as readily available . NRC's historical icebreaker performance data, and the validation of their physical modeling work, can be traced to a number of sea trials conducted on eight different vessels in a variety of ice conditions in Canadian waters. "What we're doing with the physical models has already been validated by these eight vessels," Dr. Millan explains. The small amount of historical data that's available, he adds, is due to the considerable expense of instrumenting ships in real-world conditions. "My vision for the future will depend on the collection of large quantities of field data," he adds— "not to get away from using physical modeling, but to make it better." NRC has done testing and evaluation work for Newfoundland's four offshore oil projects, each having been tested in the Ice Tank . The numerical and physical modeling they've used for offshore structures have been validated by structure data collected in the Beaufort Sea in the 1980s and 1990s. This sort of data is even rarer than icebreaking ship data, Dr. Millan notes.

When, in 2010, the Canadian Coast Guard (CCG) was working on the preliminary design of Canada's Polar Icebreaker CCGS John G. Diefenbaker, they sought the assistance of NRC. The vessel, which measures 150m length, 20m beam, and draft of 10.5m, will be built to extend the season of current icebreakers in the Canadian Arctic from seven to nine months. CCG staff studied both Canadian and US historical ice and weather data going back 60 years to determine the variety of ice conditions, and, in consultation with NRC, established the design criteria. The vessel needed to be capable of breaking 2.5 metres of level ice while making continuous progress at 3 knots. The characterization of ice included flexural strength, density, and temperature profiles. "We looked at the different physical phenomena that could occur in the real world using the historical data," recalls Derek Buxton, project manager of CCG's Polar Icebreaker Project. "That included pressurized ice, ridges, rubble fields, and the historical movement of ice floes through the Canadian Arctic archipelago." Ice Tank testing was carried out in three phases: 1) towed experiments: the model was attached to the carriage for measuring resistance to ice in different conditions, 2) controlled mode: it was detached from the carriage, conducting maneuvers that icebreakers are required to do, and 3) demonstration phase: testing specific maneuvers like breaking out from being frozen in ice and extricating itself. Underwater high-definition video displayed on a monitor showed how ice moved along the vessel and how it was introduced into the propellers. Mr. Buxton and his colleagues and NRC staff viewed this in real time.

To conduct tests in broken ice, NRC Facilities Manager Ian Robbins and his staff used handsaws to cut 5m floes (representing 100m full scale), and electric chain saws to cut thicker ice. To create pack ice that represents 20m thick ice at full-scale, "we jam ice together to simulate a brash ice pack or ridge with a sail and keel," explains Mr. Robbins. Then they turn the plant on to freeze the consolidated mass for four or five hours. Using a free-running model, they see how long it takes for the model to break through with a ramming maneuver, and to extract itself.

Mr. Buxton notes the difficulty of reconciling the differences between the Ice Tank and the real world, such as basing the tests on a level homogeneous 2.5m ice thickness "which just doesn't exist". The solution was to rely on the expertise within CCG. An operational working group to support the project was composed of commanding officers from icebreaking vessels with over 300 years combined experience in the Canadian Arctic.

Based on Ice Tank tests of both a slope-sided hull form and one that had a knuckle at the ice waterline, CCG picked the latter, which demonstrated superior maneuvering characteristics and self-extraction capabilities.

The preferred propulsion system had two traditional shafts on the outside

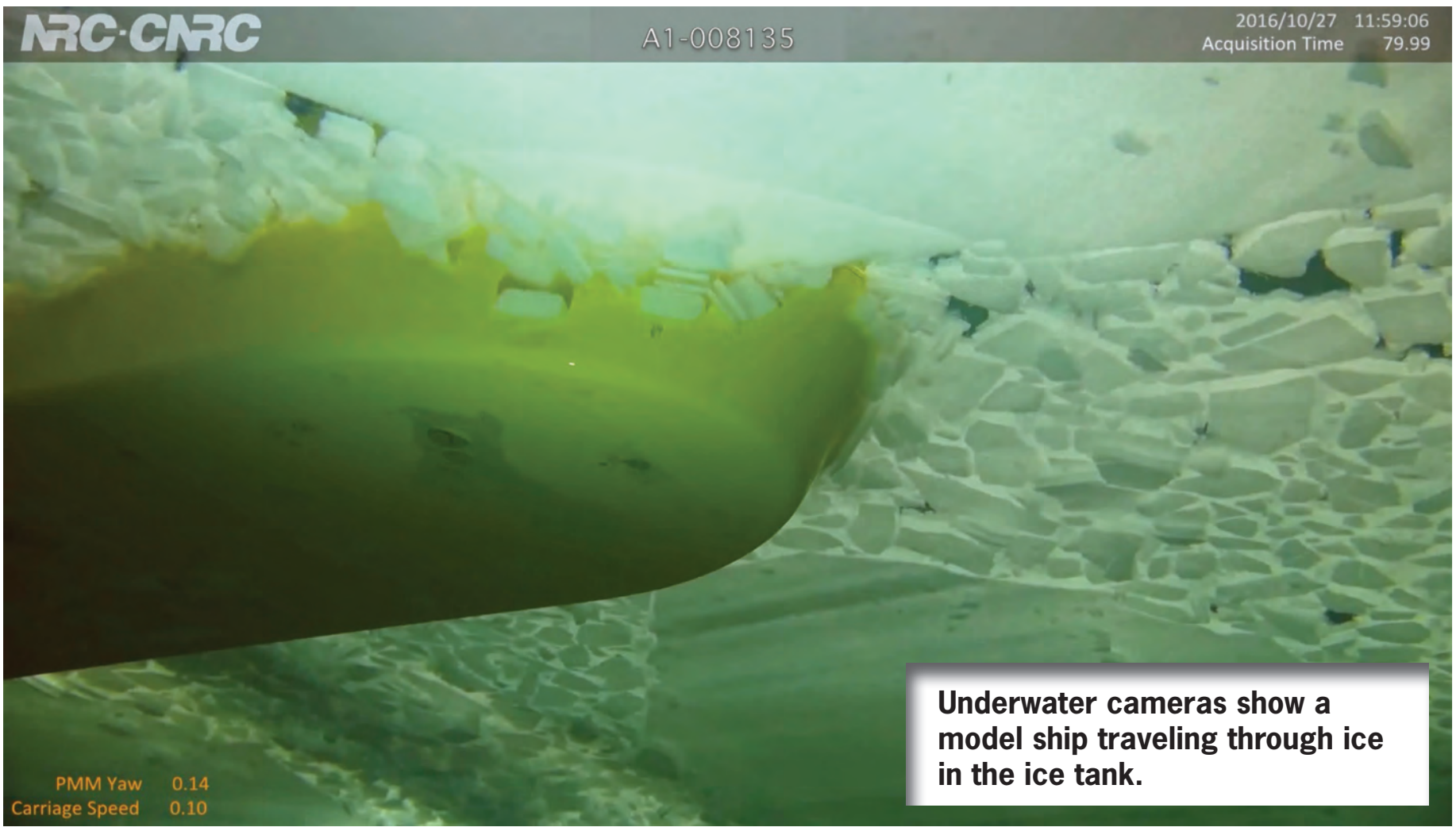

Photo: National Research Council of Canada

Underwater cameras show a model ship traveling through ice in the ice tank.

(port and starboard) and an azimuthing thruster at the centerline, compared to the one with three traditional shafts and a rudder. Tests revealed some challenges and permitted the design to be tweaked to ensure optimal performance. In one instance, "We went back to the drawing board," Mr. Buxton says, "and modified the stern arrangements—the shape and pod strut configuration, which dramatically improved the astern icebreaking performance."

NRCC built three different models, which were tested, modified, and then tested again to determine the final design. Asked his impression of the facilities, Mr. Buxton says, "Tremendous. Phenomenal. It's the only place in the world where you can do three types of testing in one facility," referring to the Ice Tank, Tow Tank, and Ocean Engineering Basin, where various sea states can be introduced on a variety of headings. One: 25 scale models were tested in the Tow Tank and Ice Tank, and a 1:33 scale model was tested in the Ocean Engineering Basin. The model testing of the Diefenbaker spanned three years, ending in 2013.

NRC runs a refrigeration plant and has staff who take samples and test flexural strength and the friction of the ice. ***"It's like a huge science experiment, and there are people with up to 30 years' experience who are able to operate in a multidisciplinary team."*** *The work is done behind the scenes, so that "when the client comes in, the joystick is ready to grab" (to drive the model), and the data collection can begin.*

James Millan, Director of R&D, Ocean, Coastal and River Engineering, NRC

Photo: National Research Council of Canada

Mentioning there are very few relevant examples of icebreakers in the real world, and even less data, Mr. Buxton says, "These guys are superb. They have the experience. On a project of this magnitude, it was tremendously important for us to have a competent partner." He adds that on a project of this scale, it is considered international best practice to test in more than one facility, so CCG had some tests carried out at the AARC Ice Tank in Helsinki. "We got corroborating results," he says, "which speaks to our overall confidence in the work that was done."

Dr. Millan notes that the project cost for model testing and evaluation is generally in the hundreds of thousands of dollars, but could run much higher depending on the number of models and ice sheets required to collect the data needed to answer the client's questions. Considering that the total estimated budget for the Diefenbaker project is $1.3 billion, Mr. Buxton said that the sizable investment "was a small price to pay for the assurance that it provides."

The EAGLE has Landed

Image: Eric Haun Maritime Reporter TV

It may come as some surprise, but EAGLE BULK SHIPPING is a progressive leader in the use of big data to monitor and manage its fleet. Jonathan Dowsett, Senior Fleet Performance Manager, explains in a recent interview with **Maritime Reporter TV.**

BY GREG TRAUTHWEIN

For our readers not familiar, who is Eagle Bulk Shipping?

Eagle Bulk Shipping Inc. is a US based owner and operator of 40 Supramax size bulk carriers. Both commercial and technical management is handled in-house. We are the third largest owner of Supramax bulk carriers in the world."

And as Senior Fleet Performance Manager, what precisely is your job?

My job is to look at all kinds of data and to leverage that data into intelligence for Eagle, to help make better decisions more often. We are optimizing everything, from routing, to the type of anti-fouling paint we put on the hull, to when we dry dock our ships. You name it … if we can collect relevant data we can try to model the decision space and use data to reach a decision rather than a feeling or convention. My job is very much about using data to make decisions.

The current conundrum we see is too much data. What do you do with the data once you have it?

Onboard our ships we are collecting information on everything from ship speed to weather to fuel consumption. We can even look at more detailed things like specific pressures in specific cylinders on the main engine. All this data is sent shore-side regularly; once it's shore-side, we are combining it with other datasets like hindcast weather data and pulling it through many different models… models for optimal fuel consumption at a specific speed, draft, and weather conditions, for example. This allows us to compare the fuel consumption we expect from the ship against what the ship is telling us it's consuming.

So how is that information 'actionable?'

In that example, when you have a difference in fuel consumption, you immediately have actionable information and can start to dig into the underlying data to determine where the difference stems from."

So how does your operation look on the shore side of things?

On the office side we have operators who are giving speed instructions to the ships. In the past it would be one speed or another, but by leveraging the data we're receiving from the ship and combining it with voyage specific financial data, it becomes clear that there are a full range of speed instructions and a specific speed instruction that optimizes the outcome of the voyage. This is getting very detailed, but if you do this enough times with enough parameters, you have these little savings that can add up into a very large impact fleet wide over the course of a year.

As I'm sure you can attest, times are tough for many sectors in shipping at the moment. How do you see this approach as beneficial to your business?

Yes it is a bad time for bulk carriers and bulk operators, so you need to differentiate yourself. A critical way to do this is to embrace business intelligence. This is the way the industry is going. If you're not going to embrace business intelligence and performance management then you will be left by the wayside. You will lack the intelligence that others have. The Containership and Cruise ship sectors embraced this 5-10 years ago, and they really have seen the light. I don't think there is a single one of those owners that is not doing this.

From your experience, what do you see as potential impediments to adoption of "Big Data?"

Now this has cascaded to where tanker owners and bulk owners are doing it. It is tremendous change. Shipping is very conservative, emotionally driven, with people operating as they always have, and now you have to embrace this new technology and this new approach which suggests that perhaps you shouldn't simply conduct your operations as you always have: the data shows you should do this, or a model shows that you can make a little more money by doing it this way."
I think the people and the companies that are not willing to adopt this approach run the risk of falling far behind and being left by the wayside."

There is much talk on big data, connectivity, the Internet of Things and autonomous operations. When you look down the road, what do you see?

I think you already hear a lot about big data and autonomous ships, but I won't go that far. Instead I'm more interested in the short term extrapolation of where we are going. Instead of having the crew onboard send in data once every 24 hours, you're going to see it coming in multiple times per second. We're going to be able to make corrective actions in real time. Instead of having a ship operating at a sub-optimal speed or a sub-optimal trim for a week, it'll be two minutes and the office will realize this is something we could improve. It will go back to the crew almost immediately so that the crew is seeing it in real time. So I think you're going to see a much shortened time horizon from the time it takes to leverage data into good decision making. Going beyond that, you're going to have so much data coming in and so many models to pull it apart that we're going to have insights into operational and technical inefficiencies that we don't even know about today. All of this information moving in real time between ship and shore is also going to open up exciting predictive capabilities so that continuous improvement will move from being reactive to proactive."

Jonathan Dowsett is a graduate of Webb Institute with a Bachelors - Naval Architecture and Marine Engineering and the University of Cambridge with a Masters - Engineering for Sustainability. Previously he was with Maersk in Copenhagen.

Jonathan Dowsett (L) interviewed with Maritime Reporter TV at ShippingInsight 2016 in Stamford, Connecticut

"We are optimizing everything, from routing, to the type of anti-fouling paint we put on the hull, to when we dry dock our ships. You name it ... if we can collect relevant data we can try to model the decision space and use data to reach a decision."

Image: Eagle Bulk Shipping Inc.

Photo: Rolls-Royce

Esa Jokioinen

Blue Ocean Team Leader, Rolls-Royce Marine

Esa Jokioinen leads Rolls-Royce Marine's Blue Ocean Team, a team that looks five to 10 years into the future to evaluate evolving technology trends, helping to determine where the company will invest. Jokioinen sat in Maritime Reporter & Engineering News' New York City headquarters to discuss the look of maritime's future: ***All arrows point toward Digitalization.***

BY GREG TRAUTHWEIN

When Esa Jokioinen and his Rolls-Royce Blue Ocean Team look at future technology trajectory, he admits that there are some things related to energy storage (batteries), new fuel and exhaust cleaning that hold promise. But he is adamant that there is not a bigger 'disruptive' technology trend than digitalization.

"We have a new ship intelligence business unit at Rolls-Royce that addressed three different things: Health Management Solutions (of the ship including equipment, systems and the ship itself); Optimization and Decision Support; and Autonomous and Remote Operations."

A driver for increased digitalization onboard ships is akin to land-based trends: the proliferation of better, cheaper connectivity. But the benefit is cost savings and operational efficiencies, too.

"Today I think the cost of connectivity for vessels is about 0.5 to 1.0% of total ship operation costs," said Jokioinen. With increasing demand for connectivity, prices will come down but overall the cost per ship should nudge above that 1% threshold as increasing numbers of products and systems get connected.

While it can be expected that overall connectivity costs per vessel and fleet will rise with increased usage, Jokioinen shares the belief that the benefits and cost avoidance that comes as a result will dwarf any additional costs. "We know that this is a cost-conscious business, and no one is swimming in money, particularly now," said Jokioinen. The current economy in the maritime sector likely means that the evolution will mean a multi-year ramp up, but Jokioinen said that in 10 years, connectivity on every vessel will be significantly different than today.

Lessons Learned

The marine industry often looks to the global aviation market as a standard-setter of sorts, in terms of commonality of equipment and efficiency through-

Image: Rolls-Royce

oX land-based control center.

out the logistic chain. In evaluating the evolution of digitalization in the maritime sector, Jokioinen and his team are taking cues from all transport sectors.

"There are many parallels to be found," particularly if you look at what is happening in the road vehicle market and the evolution of trucking toward autonomous convoy operations in the next 15 years. "They are working to drastically cut the cost of transportation on wheels," which could result in a modal shift to more cargo on the road. Taking it a step further, Jokioinen reasons that to be truly effective you must consider the entire logistics chain.

"We want to understand how digitalization affects the entire ecosystem of shipping, and in fact the entire logistics chain. We think that when you combine all of the data together, that will yield the biggest efficiency gains (and cost savings)." A truly transcendent effect of digitalization in the maritime sector could hit directly home with one of the long-held traits of the industry, which is best characterized by a majority of vessels held by smaller operators with smaller fleets. As the efficiencies of digitalization are magnified by tremendous investment and gains in efficiency by the world's largest companies, smaller outfits will be required to transform or perish. "There might be an incentive for smaller ship owners to establish a digital alliance, a digital marketplace, an 'Uber of the Seas' if you will," said Jokioinen. He said that while a shipowner's operational data is traditionally closely held and proprietary, opening up to the new digital reality could open many new efficiency gains as well.

Ship Design

Changes in operations are not the only ones facing the maritime sector, as the evolution toward digitalization will open new possibilities for autonomous and remote operations, changing with it some of the common features on commercial boats and ships. "I see more opportunities than challenges," said Jokioinen. There is an opportunity when you take away all human support systems, for example, as it simplifies the design and creates more space for cargo. In addition there will be opportunities to optimize the hull and the placement of machinery, as many of the current rules are premised on human occupation of certain spaces and the safety and comfort of the crew.

Challenges of unmanned ships start with reliability of machinery, as there obviously is no one onboard to fix even simple problems. More reliable or redundant machinery will add costs. Another potential challenge lies outside of the realm of Rolls-Royce Marine, of for that matter any single product/system supplier, in that seamless digital integration will rely on common standards for digital connectivity.

Despite the myriad of bridges to cross, Jokioinen and his colleagues are secure in the continuation of the digitalization trend and its overwhelmingly positive impact on efficiency and cost. "I think on some smaller vessels, short sea shipping, you will see demonstrators by the end of the decade."

Digital Technologies &

Turning Around Marine Prospects in Uncertain Waters

BY TIM SCHWEIKERT,
PRESIDENT & CEO, GE MARINE SOLUTIONS

The start of every year calls for time to reflect on the last. The offshore and marine industry can look back on 2016 as one of the most bruising in recent memory. The downturn has been tough and drawn out, with increased divestment, more stringent environmental regulations and a prolonged shipbuilding cycle that has resulted in overcapacity.

However, challenges can be harnessed as a force for progress. The downcycle has pushed the industry to reshape its competitive landscape, probably a change that has been overdue. Looking forward, 2017 will not be an easy year; but recovery is on the horizon and it will be a time for critical decision-making and planning for the future.

Crucial to this will be ensuring fleet readiness, including how and when stacked assets can be cost-effectively reactivated. Ensuring optimal fleet performance to control costs and compliance with environmental regulations while reducing the level of reporting, where possible, will also remain top of the agenda for most ship owners and operators.

In a market that is still volatile, the timing of these decisions will be a challenge. The worst-case scenario is that, as an industry, we are not ready to make these decisions, or we are not adequately prepared to run with opportunities as the market recovers. It may be much talked about, but the time really is right for the digital revolution in offshore as the industry heads towards a new start. Digital solutions help to de-risk decisions, bring practical, actionable insights into vessel and fleet performance and provide proven opportunities to optimize operations in a sustainable way.

Breaking down data silos and data complexity are the first crucial steps. Through embedded sensors that enable the collection of data on critical vessel systems, using software analytics it is now possible to gain insights on future performance. Through analyzing these insights, vessel operators can anticipate and address problems before they cause an operational disruption.

Thanks to advanced algorithms and a strong data-processing capability, digital analytics tools can map out a "digital twin" of a physical asset—be it a propulsion motor, an engine or an entire vessel—based on its normal operational data profile. Drawing a comparison between the "digital twin" and the vessel's real-time data, digital software is able to spot inefficiencies as well as detect potential failure, up to weeks ahead. This gives operators time to mitigate potential problems in advance, enhancing a vessel's operational efficiency through reduced downtime and increased productivity.

The predictivity will also enable the industry to switch from calendar-based planned maintenance to condition-based maintenance, saving companies significant maintenance expenditures. Insights on the performance of a critical piece of equipment will allow tailoring maintenance to a specific piece of equipment. This will assure that maintenance actions are only implemented when needed to assure optimal reliability and reduced life cycle costs.

The access to real-time insights from vessels enables onshore experts, no matter where they are in the world, to remotely diagnose problems and advise on next steps immediately. This approach not only provides vessel owners with fast access to the knowledge of experts globally, but can also save a significant amount of time, as one engineer, for example, is able to analyze and diagnose multiple ships concurrently from a centralized control center, reducing the need for multiple specialists onboard vessels. With the backdrop of a skills shortage looming in the industry, this connectivity maximizes the reach of an individual's expertise and can help ease the impact of downsized teams.

Data analytics tools also enable energy-efficient operations, as software can forecast weather and wave conditions, helping inform the heading and operational mode with optimized fuel consumption, a crucial advantage in complying with increased environmental regulations. With the objective of capitalizing on this emerging digital opportunity, GE has developed SeaStream* Insight asset performance management solution. Working in collaboration with Maersk Drilling, GE will help deploy SeaStream Insight on one of Maersk Drilling's rigs with an aim of increasing productivity through big data and reducing maintenance costs by up to 20 percent. This partnership is a prime example of how digital technologies are shaping the future of the offshore marine industry. While uncertainty may be the new norm in the marine industry, through digital technologies, we can seize the opportunity to lead the transformation of the marine industry.

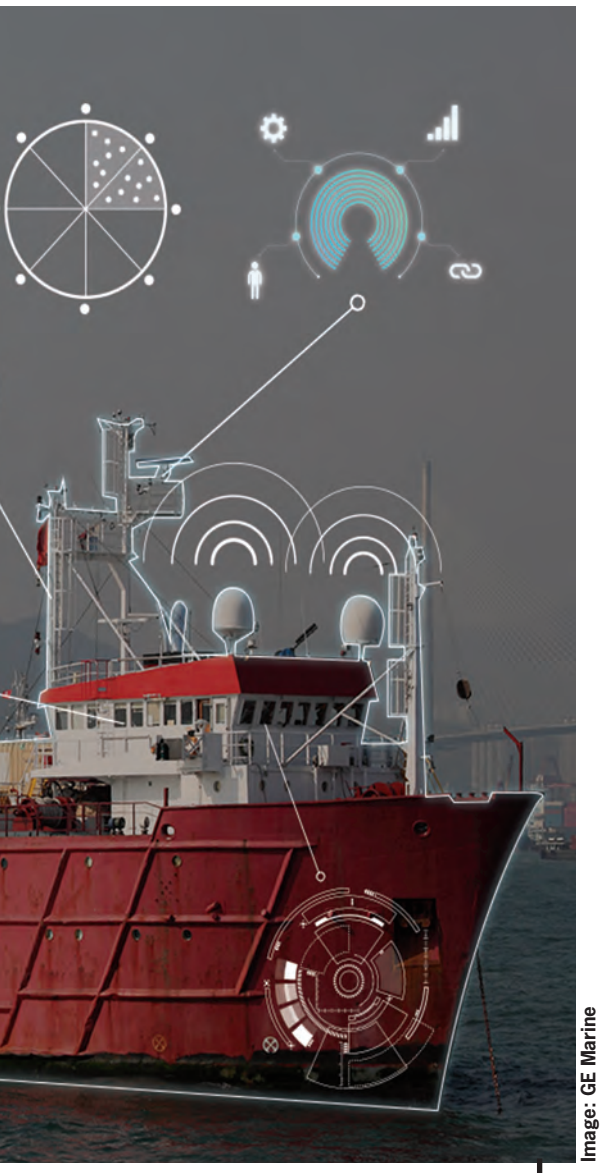

Image: GE Marine

Digital solutions help to de-risk decisions, bring practical, actionable insights into vessel and fleet performance and provide proven opportunities to optimize operations in a sustainable way.

* Indicates a trademark of the General Electric Company and/or its subsidiaries.

Siemens

Industry 4.0 on the High Seas

BY DAVID GRUCZA, DIRECTOR, SIEMENS DRILLING & MARINE, U.S.

Werner von Siemens' mission to lay 50,000 nautical miles of transatlantic cables might not have been destined to fail – but at least one business rival tried to make sure that it would. It wasn't enough to merely execute a risky project that had never been done before. The crew aboard the Faraday, the ship that Siemens and his brothers commissioned, also had to move faster than saboteurs who planted false reports in the press and even broke cables. And it was in this pressure-filled environment that Siemens turned to another recent invention of his to enable his crew to work around the clock: a electrical generator, placed on the deck, to light up the night skies.

This spirit of deploying new technology and innovation on the high seas is just as relevant 143 years later – even if the challenges are much different, which thousands of leaders from the maritime industry, including naval architects, shipbuilders and owner/operators talked about recently at the International WorkBoat Show in New Orleans. Today the marine industry is working towards solutions for propulsion, environmental regulations, safety standards, and global trade by embracing the technological advancements currently reshaping the industrial world: what we call Industry 4.0.

Industry 4.0 is the fourth industrial revolution where the brainpower that has gone into creating apps for smartphones is creating applications for smart factories. An array of new tools emblematic of the digital transformation – advanced robotics, 3D printing, design software, and big data networks connecting

Continued next page

Image: Siemens

people, machines, systems, processes, plants, and customers -are enhancing competitiveness globally and meeting rapidly changing customer demands. Siemens' customers embracing digital enterprises are experiencing a 50 percent reduction in time to market, a 30 percent reduction in engineering costs, and 50 percent higher throughput. But this isn't just happening in factories; it's happening in the marine industry. This year, the world's first electrically-powered car ferry went into service, taking vehicles and people four miles across the Sognefjord in Norway.

And it had zero emissions. Batteries are charged on each side of the fjord with electricity, provide from a mix of the country's renewable resources such as hydro and wind power.

Another Industry 4.0 development is using one common platform to collect and consolidate operational ship data from different system suppliers and in common data formats in order to supply applications via a simple and standardized interface. The applications can help optimize ship operation and performance. For example, software is used to transmit vast amounts of ship or event fleet operational data, back to an onshore control center for analysis and optimization. Monitoring systems at sea allows for quick response to issues, thus increasing reliability and uptime, while reducing costs. We also see Industry 4.0 influences in the port of Dutch Harbor, Alaska, location of the Discovery Channel's popular reality television series, Deadliest Catch. The recently commissioned Blue North commercial fishing vessel is now operating out of Dutch Harbor and is now one of the world's most highly automated ships, able to catch, process and package fresh cod on-board in a Industry 4.0-like factory on the seas.

Finally, product lifecycle software (PLM) is being used to design the most highly complex ships. Performance and build-time is sped through the collaboration of designers, engineers, production specialists, partners and suppliers, so shipyards can optimize performance. While on the seas, operators are using advanced software to integrate all operational equipment through seamless and controlled data acquisition.

143 years ago, a technological solution, borrowed from another industry, enabled the Faraday to thwart its antagonists and launch a new era of global communications. But take notice in 2017: the ocean economy is estimated at $1 trillion, and the world's oldest industry is bringing Industry 4.0 to the high seas to boost resource efficiency, reliability, and productivity.

Sifting the hype of Smart Shipping

BY FRANK COLES
CEO, TRANSAS

In traditional candor Transas CEO Frank Coles voiced his views on "smart shipping" – from big data and cyber security to unmanned ships – at 2017 SMART4SEA Conference & Awards. We excerpt his comments here, or tune to **Maritime Reporter TV** *and watch Coles on video discussing similar topics at: http://www.marinelink.com/videos/video/transas-ceo-sees-a-big-future-for-big-data-100095*

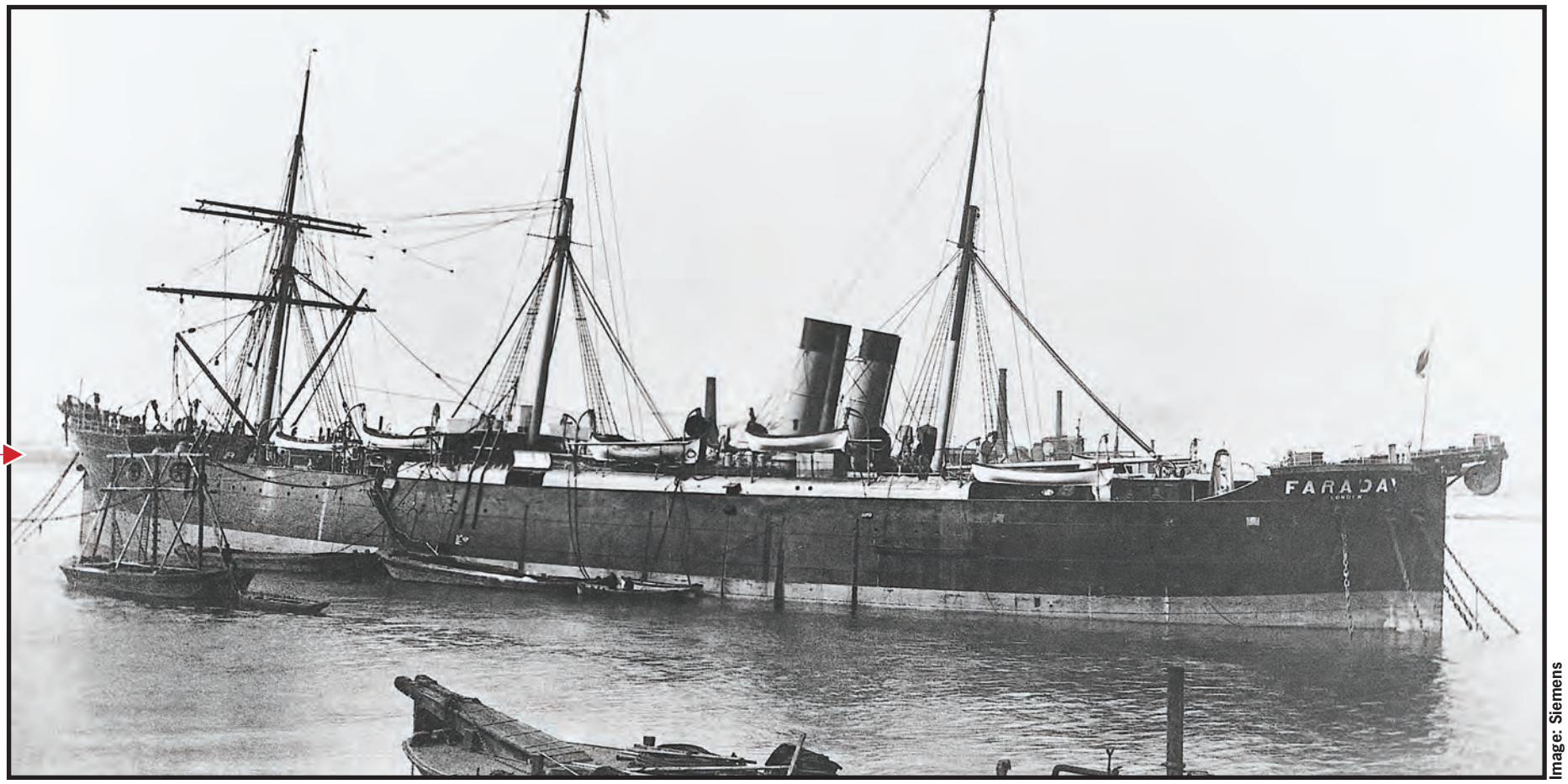

Image: Siemens

We live in a world where we hear the words, smart ships, connected ships, unmanned ships, automated ships, etc. We hear statements about a digital shipping world and a forecast of new business models in shipping. It's a confusing world, a fast moving world. What is the reality and how do we sift through the hype?

The part we all call shipping, ship owning and technical operations is really the asset ownership, the asset management and is a small niche in the whole picture. We have elements in this that are going digital – like charts, like navigation, training – but it is not happening anywhere near as fast as the more lucrative logistics side of the shipping business. Maybe we just have not provided the right model for the ship owners and operators yet.

Before we can really consider an unmanned ship we need to resolve several key elements of the business of ship operations. We need a workable ecosystem, we need connectivity and we need acceptable cyber security. It is my proposition that none of these exist today.

In my view our ecosystem is dysfunctional, the link between ship and shore currently adds pressure to the ship and crew, it does not add value. Traffic control and communications to other elements of the ships operations has no standards. We should consider the manner in which the airline ecosystem works. A properly controlled ATC, a well established plane to operator communications system and also growing connectivity between the machinery and the manufacturers. They are not drone planes but properly established automation and protocols to operate safely.

Even if the plane was a drone, it would still need to share the air space. Do we honestly think countries would allow unmanned and uncontrolled aircraft and ships to pass through their air space or territorial waters?

Connectivity is critical to a successful automated or unmanned ship, and we are nowhere near the required level of capability for this to occur. While there is increased capacity and a growing price competition in the satellite communications market it is not at the levels it needs to be for the general shipping industry. Maritime communications need to be given the same pricing as the aviation industry. This will enable the industry to embrace the connected ship into a smart ship. But, this alone is not going to create an unmanned or more remotely operated ship. There are other issues associated with getting to that point, like complexity of the install, confusing choices in installation and the requirement for a cyber secure and robust connection.

In effect we need the reliability of the Fleet broadband equipment and system with the bandwidth of an always on pipe that is cost effective for remote maritime operations. There remains however the final question of cyber security.

Cyber security is nothing more than smart IT procedures and process using certified equipment. If you install an ECDIS or a GMDSS unit, or a radar or indeed any other required and designated piece of bridge equipment, it needs to be certified by Class and pass through a large and significant list of regulations. Today's modern ship to shore communications used for operations and being touted for unmanned ships contains no such regulations and as such is the weak link in the chain.

The GMDSS network installation is highly regulated, the VSAT networks are not. Neither Fleet Broadband or Iridium systems have any certification program, tied to the various regulatory bodies. So while the ECDIS or the other bridge sensors have sophisticated protection, the bent pipe connection to the shore remains exposed on many levels. While many may not like a closed system like Inmarsat, maybe it is the best option for securing and setting the standards for connectivity for security.

A final word on cyber security:

- **The human** is the biggest danger, the more access we give them, the higher the risk.
- Then there is the cyber missile, **the thumb drive**, able to destroy an ECDIS or any system in seconds.
- **AIS**, the system by which many seem to be building digital solutions, in my opinion is a high risk strategy. Attack Infiltrate Spoof is a better way to think of AIS.

If shipping, or rather asset management is going to be digitized, it needs a revolution. If we are going to see a new model, with possibly ships owned by large financial institutions, managed by huge operations centers, driven by a remote Master, and routing controlled through ship traffic decision support centers…. It may need new technologies, new communications and new people.

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KVH "Watch"

Conceived in its never-ending drive to progressively service its customers, KVH is working on a proprietary Internet of Things (IoT) solution for the commercial maritime market. Code-named "Watch," KVH's IoT application is designed to collect, compress, process, transport and analyze system data from ships, with the promise to deliver a broad swath of customizable efficiency solutions. ***Robert Balog****, SVP, Engineering and* ***Michael Mitsock****, VP of Marketing discuss the plan with* Maritime Reporter & Engineering News.

BY GREG TRAUTHWEIN

While the maritime industry is generally classified conservative in terms of technology uptake, the tide is changing as some of the world's biggest ship owners aggressively leverage data available from ship operations, covering everything from machinery and system health to navigation, in an effort to save money and increase efficiency. On the equipment side, the days of performing service premised on the calendar is giving way to 'condition based maintenance' (CBM). On the navigation side, solutions are increasingly becoming prescriptive, analyzing previous performance given route, weather, course and speed.

Information Overload

A large modern commercial ships can have up to 6,000 points of monitoring and generate in excess of 60MB of data per day. In step with land-based trends, those numbers are projected to continue rising. As the number of users and the flow of data from ship to shore increases, naturally the cost of transmission will come down too. But problematic still will be the sheer quantity of data, or more accurately stuffing all of that data efficiently and cost-effectively through existing satellite communication pipelines. "That is a discussion shaping around IoT in every industry: how do you take a mass of data and shrink it down to something that is usable?" said Mitsock. For the commercial maritime sector, KVH is developing a solution, code named "Watch," which is scheduled to come to market in 2017.

Problem Solving

KVH is a ubiquitous presence in the maritime VSAT sector, last year recording milestones in shipping its 6,000th TracPhone system for the mini-VSAT Broadband service, and its 200,000th mobile satellite antenna shipped for its TracPhone and TracVision product lines. The company is uniquely positioned in regards to IOT solutions as it manufactures, installs and services the antenna systems and ancillary equipment, as well as provides the VSAT pipeline. The development of its "Watch" IoT solution is an outgrowth of KVH's customer service mantra of always providing a 'Positive Customer Experience,' said Mitsock. But KVH ran into a problem as it continued to grow its business, specifically, data flow and bandwidth, as the KVH antenna alone generates about 10MB of data per day. "The bandwidth is the issue, as we had to find the means to maximize that connection," said Balog. "Even though we have a much faster connection, we have to always think: 'what are we going to do with all of this data?'"

The solution is simple to state, complex to deliver: move more data processing to the ship, and be more selective in determining the information to be sent. According to Balog, a key is edge processing

Today the routine is to move data from ship to shore, then run the data through a parser to get a summary of the antenna's operation. Step one of the KVH solution is to move the data parser to the ship, and simultaneously use a software solution to effectively reduce the file transmit size from 10MB to about 800 bytes. To optimize the process even further, the shipboard system is able to monitor network data load, transmitting data at optimum times.

Balog said once KVH solved its own problem, it became clear that by making its solution flexible that this solution could include data flows from other ship equipment and systems. The key to success, however, comes in working with individual vessel owner / operators to determine data priorities for each owner, each ship, each fleet. "The need came out of developing something for ourselves, and we thought, 'let's make it flexible,'" and look to integrate data streaming from other shipboard equipment and systems. With a broad global footprint KVH had a broad field to find a willing technology partner to help develop the system. While full details on the exact nature of the commercial ship(s) under test could not be shared, KVH did concede that "there is a beta test in progress, a beta test capturing all shipboard

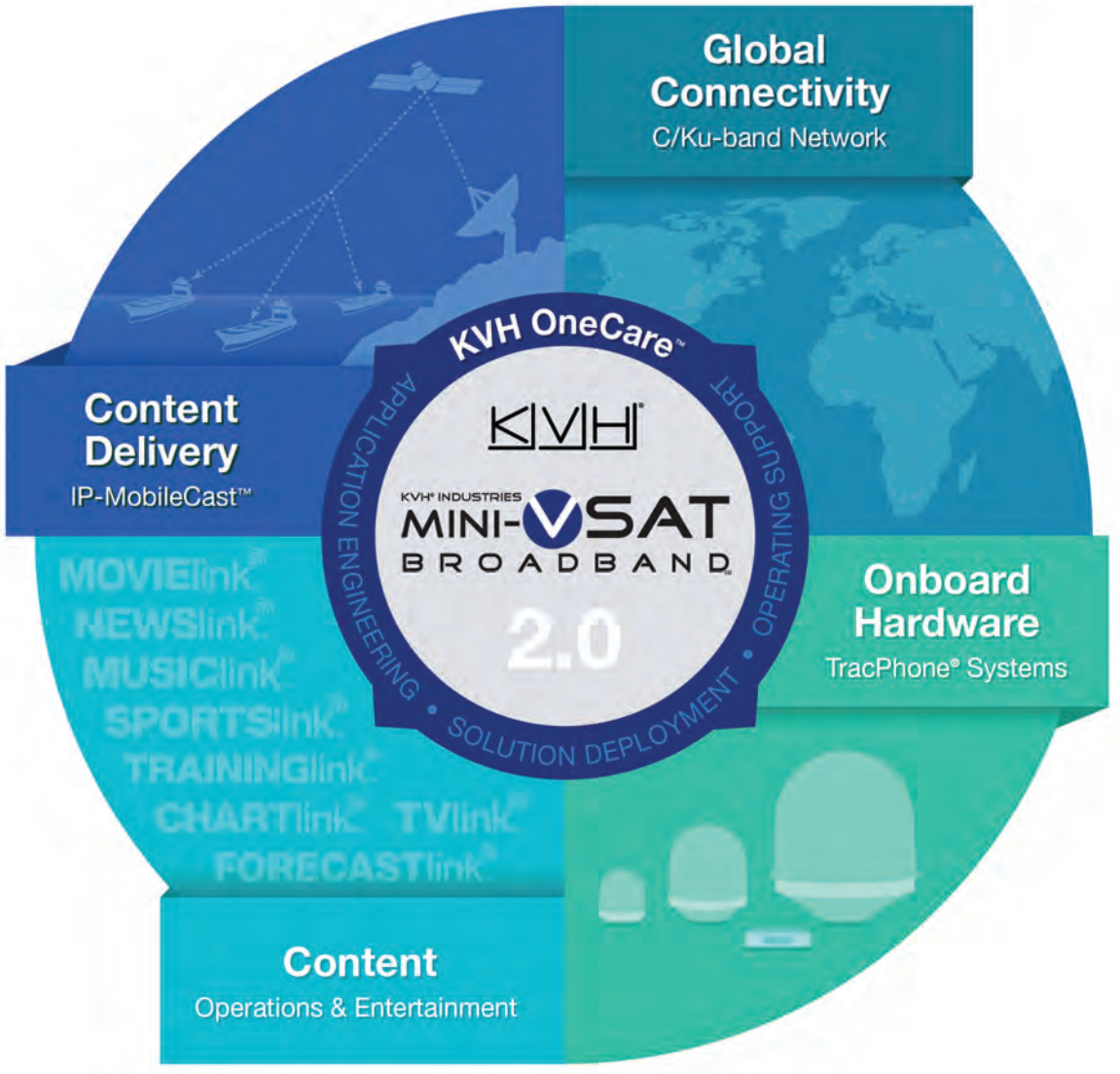


Image: KVH

Image: KVH

Robert Balog
SVP, Engineering

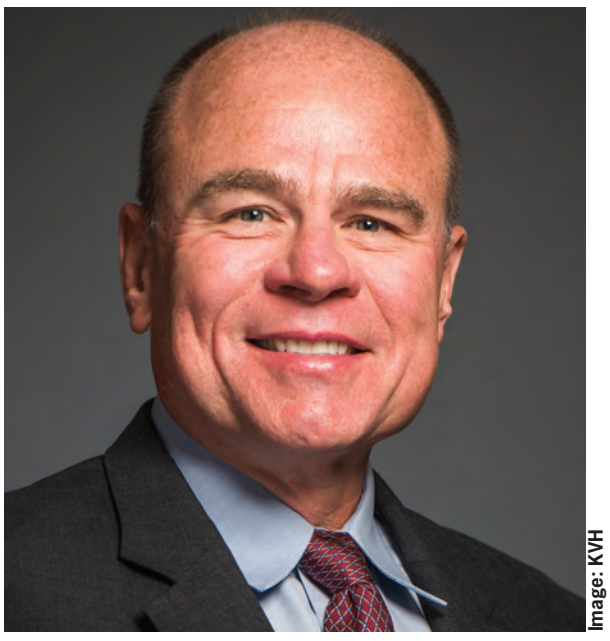


Image: KVH

Michael Mitsock
VP of Marketing

data from dozens of sensors on a brand new, modernized, sensor-laden commercial vessel."

Data Screening

According to Balog, *selecting the data that you don't want* is equally important to selecting the data you do want, effectively edge processing the big data in a means to receive only a summary of the data you need. Increasingly sensor vendors, of example, are putting additional analytics (Sensor Based Analytics) in the sensors themselves to help crunch the data, minimizing the amount needed for transportation. Mitsock put it in practical terms: "If a pump is operating normally, do you need notification every 10 minutes that the pump is working correctly? Probably not. The pump only 'raises its hand' if something is going south, as opposed to reporting every 10th of a second that everything is just fine." On the other hand, if a main engine is having a performance problem, that information could be critical to ship and crew safety, as well as savings on both maintenance and fuel, for example. The customization and prioritization of the data, ultimately, is up to the vessel owner/operator to decide.

With the ability to more easily crunch, prioritize and send data, one of the chief challenges remains sorting through all of the systems and sensors to ascertain the desired information, and ultimately getting all of the sensors and systems – digital and analog – connected and speaking the same language.

Cutting through the complexity of shipboard technology collection, processing and transmission, the premise of KVH "Watch" is simple: to provide a proactive and preemptive tool for preventing failures at sea, benefitting fleet operators with operational efficiency and cost savings.

Vard

A Real 'Riverboat'

Central Asia is a booming oil region not far from the Persian Gulf. Energy companies ply the big lake to rack up staggering barrel counts at elephantine oilfields with names like Tengiz (Kazakhstan) or Kashagan (Azerbaijan). Painstaking, oil-fueled nation-building is underway across an oil province, where very shallow water hinders plant and equipment moves by platform supply vessels. Until now — new module-carrying vessels, or MCVs will float high-capital cargoes through Russia's river system and across the Caspian shallows to Chevron's Tengiz Extension project.

BY WILLIAM STOICHEVSKI

Vard Holdings' Romanian and Vietnamese shipyards have received orders in 2016 to build 20 MCVs: 17 for ship operator Topaz Energy & Marine and three for Kazakhstan's Kazmorttransflot, or KMTF. The orders came quickly — in May (15), August (three) and September (two). Of the first 15, five are being built at Braila and four at Tulcea, both in Romania, and six went at Vard's Vung Tau Vietnam shipyard. The three vessels for KMTF, also Romanian builds, will be wider, for the Caspian's shallows. Acting as project manager, Blue Water Shipping leads the two consortia that'll own and operate the MCVs: with KMTF and with Topaz.

The 17 Vard 9 21 designs for Topaz are designed to transport modules through the Russian waterway of canals, rivers and lakes stretching from the Baltic Sea in the north to oilfields in Kazakhstan in the south. Tengizchevroil, or TCO, is the oilfield joint venture of Chevron, ExxonMobil and local partners in need of the logistics Blue Water will arrange. The MCVs — which look like stretched PSVs — will carry pre-fabricated modules to the oil and gas installations of Western Kazakhstan. Some of this process plant is being built in the Far East for transport to the Russian Far North and then through the inland waterway to the Caspian depot of Prorvo at the Tengiz oilfield.

World-wide First

"No suitable vessels for the jobs exist world-wide," says Vard Holdings executive vice president, Holger Dilling. "Needless to say, the white boxes on all our renderings are just placeholders, not big containers. But they do show the dimensions of the potential payloads, which can weigh up to 1,800 tons per unit." Dilling, who also heads Vard's investor relations, confirms Topaz asked Vard in September to design and build two more of the 123 x 16.5 meter MSVs ($40 million for two) MCVs. They'll be identical to the 15 ordered earlier in the year by the Dubai-based Gulf of Mexico player. Before these orders, Topaz controlled a fleet of 100 offshore support vessels — including 34 OSVs in Kazakhstan. The company already earns 60 percent of its revenue in the Caspian, where its market share is about 50 percent. "Due to the high physical barriers to entry in the Caspian for (regular OSVs), the market is dominated by long-term contracts," the company says. Rivals, too, know it's "difficult and costly to mobilize equipment to the region."

Vessels can only make their way to the Caspian from the north via the Volga-Baltic waterway or, from the Black Sea, via the rivers Don and Volga. Making things harder, the waterway generally freezes and closes from November to March.

Caspian Hurdles

Topaz says the purpose-built MCVs are "shallow-draft deck carrier vessels with low air draft and a high-capacity ballast system". They are diesel-electric, DP2 with "excellent maneuvering" and equipment from "leading western suppliers."

Topaz tips another reason for owning and operating MCVs: "costly, technically challenging and time-consuming modifications may (otherwise) be required to allow vessels to pass," and vessels modified or flagged in any state other than Russia must be towed (to use the Russian waterway), and that incurs "significant costs, depending on the route and availability of towage vessels."

So, at least one of the two consortia headed by Blue Water — the Topaz consortium — seems to be flagged in Russia, with the three wider MCVs to ply the Caspian only. Topaz also cautions that customs and government agency "inspections, authorizations and approvals" require pricy fees. "These restrictions represent high barriers to entry and have led to the OSV market in the Caspian region becoming highly concentrated with only nine OSV suppliers" in this, the world's largest lake at 1,000 miles long. Another obstacle to this market, for some, is the rigid local application of MARPOL 73/78 banning the discharge of garbage, sewage or oily water.

Growth by Design

Between third-quarter 2017 and the first half of 2018, Vard will deliver to Topaz its first order of 15 MCVs. It is understood that first steel has been cut for all 17 Topaz vessels and that keel-laying has been prepared for "several". The three KMTF vessels — VARD 9 28's — are due for delivery in the first three months of 2018.

"None have been built to this design or specification before," says Dilling, a nod to Vard's ability to turnaround novel designs for mid-sized vessels in short order. The orders bear testimony to the firm's new-found designer clout and owner Fincantieri's increasing faith in its Romanian yards building complete complex vessels. Vard has quietly transformed from what Dilling calls "the doom and gloom of (11) months ago" to "a brighter future". Growing its design team by 30 percent this summer has helped. "We've been able to reposition the company rather quickly," Dilling says, adding that of the 44 vessels Vard is building, 40 are VARD designs. In all, the shipbuilder has sold 175 designs, 30 outside the Group.

Vard's VP of conceptual design, Kjell Morten Urke, confirms Canadian, Croatians and French naval architects and design engineers have been brought in in response to the increased demand and to maintain a real popularity lead the Vard group seems to be enjoying. Unusually, perhaps, Urke and his colleagues don't group themselves for work by individual order or vessel type but are smartly divided as specialists working on company-wide projects: electrical, conceptual, hydrological rather than OSV, Cruise, naval and MCV. "(In that way), we're more turnkey than ever and more one-stop shop for our customers."

"In Europe, technological leadership is the only way to succeed," adds Dilling, a nod not only to Urke and his design work but to the fast-upgrading Romanian yards where pipe-fitting and automation have been introduced. More work is being channeled down from owner Fincantieri, now that the Romania operation is no longer as labor-intensive.

Country-sized

Good design means speedy vessel turnover will be possible, just as oilfield partners ramp up the Tengiz Expansion Project and other area players — Kazakh, Russian, Turkman and Iranian — crank their own poverty-killing projects.

Just as field partners declared the "future growth and wellhead pressure management project" would boost flows by 260,000 barrels of oil equivalent per day, Chevron was citing "lowered costs for goods and services" as the nod was given for the world's first MCVs. This Tengiz "modification" is really a field project that'll cost $36.8 billion: $27.1 billion for the facilities (to be brought in by the MCVs); $3.5 billion for wells and $6.2 billion for "contingency and escalation". They'll build 180 modules, a source close to the consortium says, and they'll need to be moved by sea via hubs in Bulgaria, Finland (and for the three wider vessels) Kazakhstan to a newly built Kazakh port at Prorva for assembly. "TCO (which is building and dredging the port) expects the transport of the modules to take at least three years commencing from April 2018," the source says.

While shipping costs could reside in any one of those sums, partners clearly see the payback: the project will hike TCO's oil production to 1 MM boe/d, or about half of Norway's total production. First oil is planned for 2022, but Topaz client Chevron is also developing the nearby Korolev and Karachaganak fields and controls the Caspian Pipeline Consortium with its 935-mile crude oil export line from Tengiz to tanker-loading at Novorossisk. Conceivably, these MCVs might have future pipes to freight.

Blue Water

Topaz says its 15-vessel contract win with Blue Water will earn $500 million, so there's money in MCVs. Now, the Mississippi River leads from the shipyards of Louisiana to the Gulf of Mexico's oilfields, and the Xizang River flows south to the South China Sea's.

The helpful spillover from Vard's Russian riverboats may have no end: for KMTF, diversification away from tankers; for Vard a reversal away from troubled Brazil ventures and a 2015 market shock.

Building MCVs has given Vard new legs, and more orders have come in this year than in the past two years combined. "We'll bring the company back to previous values within three years, that's our expectation," says Dilling.

For Blue Water, the MCVs mark another major logistical undertaking and potential future business. "We'll act as project managers," confirms global managing director for oil and gas, Dan Nissen, in an email. "Our role is to deliver a full logistics solutions to TCO."

Topaz confirms the MCV's could create a whole new business for the company in river transport.

"It's our conviction that the MCVs will be competitive assets in any river system," a spokesman tells us. "Topaz sees great potential in these vessels replacing the traditional tug and barge solution for river transportation.

The MCVs will be a higher quality option that is cost effective, fuel efficient and much safer."

Vard

Holger Dilling
Executive Vice President,
Vard Holdings

Photo: Meyer Turku Shipyard

Photo: Eric Haun

Photo: Wison

Photo: Robert Allan Ltd.

Photo: Easthern Shipbuilding

Photo: SeaQuest

LNG Ferry Megastar

Finnish shipbuilder Meyer Turku Shipyard delivered the LNG fast ferry Megastar to owner Tallink on January 24. The newly built ferry was to begin plying the Helsinki-Tallinn route on January 29. The 212-m Megastar uses LNG as fuel, but is also able to run on marine diesel. With LNG, the vessel will create no sulphur or soot particles and decreasing the nitrogen and CO2 emissions. Designed for the Tallinn-Helsinki route exclusively, Megastar will comply with the current and future emission regulations for the Emission Control Areas (ECA), including the Baltic Sea. Megastar's hull shape also results in substantial fuel savings during operation. Megastar is co-financed by European Union, the Connecting Europe Facility, Transport – Motorways of the sea. Megastar will take onboard 2,800 passengers and offers three travel classes (Star, Comfort and Business). For car passengers, double level loading and wider car deck access will improve the loading and unloading time. .

SCF's New Icebreaker

A naming ceremony was held January 30 for SCF Group's new icebreaking platform supply vessel (IBSV), Gennadiy Nevelskoy, named after a famous explorer of the Sakhalin Island and the Russian Far East. Built by Arctech Helsinki Shipyard, the Russian flagged 3,000 dwt Gennadiy Nevelskoy will home port in Saint Petersburg and was commissioned by SCF under a long-term agreement with Sakhalin Energy. It is the first of four vessels for operations at the Sakhalin-2 project; the other three are ice-breaking standby vessels (IBSBVs) that have a smaller deadweight (2,000 metric tons), but offer enhanced functionality and a higher people-on-board capacity. All four ships are being built by Arctech in Helsinki, who holds overall responsibility for the vessels' design, hull assembly, outfitting, testing and commissioning. The Russian Maritime Register of Shipping, which is providing technical supervision during the construction of all the four vessels, has assigned an ice class of Icebreaker 6 to the new IBSV.

Barge-based FSRU

The world's first barge-based Floating Storage and Regasification Unit (FSRU) has undocked from dry-dock in Nantong, China, announced Wison Offshore & Marine, who provided EPC services for Exmar. Upon the undocking, topside installation has been completed, which paves the way for delivery. This is the first FSRU being built in China and the facility is to become the world's first FSRU with small-scale storage capacity. This non-propelled FSRU barge has a regasification capacity of 600MMSCFD. Two SPB cargo tanks, each with a capacity of 12,500 m3, are installed in the hull for LNG storage. It is the second project on which Wison and Exmar have been cooperating following the Caribbean FLNG, the world's first FLNG project.

Tug for E.N. Bisso & Son

A new tug built by Signet Shipbuilding and Repair was delivered to E.N. Bisso & Son Inc. in mid-December. The vessel, Gladys B, is Robert Allan Ltd.'s newest RApport 2400 class tugboat design. "She is named for the wife of the founder of the company in 1946, Captain Edwin Napoleon Bisso. This powerful steel titan will serve her owner well. Built in America, built by Americans and built for progress. She will soon be known in Louisiana as the Maserati of the River," said J. Barry Snyder, President, Signet. Two MTU 16V4000-M64 main engines with EPA Tier 3 emission certification power the Gladys B, driving Rolls Royce US 205FP azimuth thrusters with 2400 mm fixed pitch

propellers. Electrical power is generated with two John Deere 6068AFM85 marine generators, with 99 ekW of power each at 480 V. Deck Machinery consists of a Markey DEPGF-42S hawser winch located on the bow and a Markey DEPC-32 towing winch on the stern. The tug is fitted with a 1,300 gpm off-ship fire pump driven via an electric motor.

The vessel is the first Robert Allan Ltd. designed tug in the E.N. Bisso's fleet, and the 10th for Signet Maritime Corporation over the past decade. The Class notation, per American Bureau of Shipping, under 90m Steel Vessel Rules is: +A1, Towing Vessel, (Fire Fighting Capability), Escort Vessel, +AMS,

Jeffrey McAllister

Eastern Shipbuilding Group, Inc. has delivered the Twin Z-drive reverse tractor tug Jeffrey McAllister to McAllister Towing and Transportation Co., Inc. on January 13, 2017. McAllister is honoring Captain Jeffrey McAllister as the vessels namesake. Capt. Jeffrey McAllister is a member of the fifth generation working at McAllister Towing. Jeff began his McAllister career in 1973 at the age of 18 when he worked as a deckhand on the fleet's offshore crew boats. His rise at the company was attained the old-fashioned way by working his way up the hawse pipe. He worked on numerous McAllister tugs stationed everywhere from Aruba, Bonaire and eventually landing in the Port of New York. In 1977 he became a tug captain and in 1986 became a docking pilot. Today, Captain Jeff is the Senior Docking Pilot for McAllister in New York. The tug will be working in McAllister's Charleston, S.C. operation and will have her christening on February 11.

RFA Tidespring

On January 12, 2017, Daewoo Shipbuilding & Marine Engineering (DSME) and the U.K. Ministry of Defense (MOD) signed the Acceptance Off Contract for RFA Tidespring, the first in a series of four Military Afloat Reach and Sustainability (MARS) vessels. The 37,000 dwt tankers are being built to supply Royal Navy vessels around the world. The MARS vessels feature advanced marine technology, including a highly flexible automated propulsion system with numerous different configurations, three abeam replenishment stations for diesel oil, aviation fuel and fresh water, an Integrated Platform Management System, a flight deck and helicopter hangar, as well as hundreds of independent compartments.

The vessel can accommodate 108 persons. SeaQuest has been engaged in this project since 2013, overseeing the construction program, from steel cutting to completion.

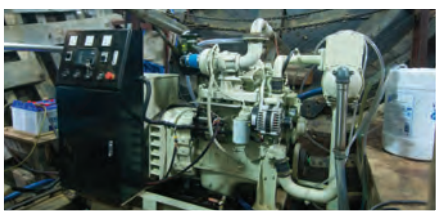


Photo: Alan Haig Brown/Cummins

Clockwise, starting top left: This sight seeing barge on the Tachin River is similar to what Khun Kanitha started with for her dinner boat; Key to overseeing construction of the dinner boat are Khun Akaraphol, Operations Manager, Khun Somphong, Executive Chef, Khun Thanyatorn, Marketing Manager and Khun Sunisa, Assistant Training and Development Manager; **Ayudhaya's wood shipwrights are among the best in Thailand;** The modern Cummins-powered genset can meet all the power needs of a modern commercial kitchen.

Teak Dinner Cruise: For the Chao Phraya River

Visitors to Thailand, like the Thai people themselves, invariably comment on the diversity and complexity of Thai food. It is the result of many centuries of refinement and a dedication to fresh ingredients. From the beach restaurants of Phuket to the riverside restaurants of Bangkok, the food is a great national theme.

One of the favoured restaurants for traditional Thai food is Baan Khanitha, with four unique locations around Bangkok. The restaurants are named for the owner, a former Thai silk fashion designer, Khun Kanitha Akaranitikul. The name means literally, "the home of Khanitha", and each is designed with that personal touch.

Much as Khun Khanitha enjoys her restaurant homes, she has longed to properly express her love of the Chao Phraya River that flows from the ancient capital of Ayudhaya and winds through the city. With the addition of Baan Khanitha Cruise she will have achieved her goal to give dinners an opportunity to take a leisurely cruise through the city while dinning on board. The river already has a number of huge dinner boats that take bus loads of tour groups on the river for a quick meal and tour. Khun Khanitha, wanting to replicate the fine dinning experience of her restaurants, decided on something quite different. In days gone by the Chao Phraya River was filled with beautifully shaped teak-wood rice barges. Some of these have had engines installed and operate as tour boats.

Khun Khanitha found one of these and had it taken up the river to Ayudhaya, where some of the best wood workers reside. She wanted the Thai tradition of teak elegance but she also wanted a state-of-the-art kitchen for her chefs. To do this, it was necessary to raise the main deck to make room in the hull for the stainless steel kitchen. Teak has become a rare commodity, but the shipwrights scoured the area for old houses and other sources of timbers that they carefully re-sawed and shaped into the desired dimensions for fabricating every thing from doors to window frames.

In melding the tradition of fine Thai food and fine teak woodwork, Khun Khanitha is creating a spectacular experience for visiting and local dinners. But when it comes to the kitchen, she has departed from the old time tradition of charcoal cooking in favour of modern gas fired cookers. For maintaining the freshness of the food she has a bank of coolers, she has installed two dish washers, one for plates and the other for glasses and stem ware. To keep the wine for the stem ware at just the right temperature the kitchen has a wine cooler. Intake and exhaust blowers along with air-conditioning will keep the below deck kitchen fresh for the kitchen crew.

As a sightseeing boat, the teak barge required only a propulsion engine and a small generator. Now, with the extensively equipped modern kitchen there was a need for much more electrical power. To be assured of a reliable source for this Khun Khanitha approached Khun Sathit Suwanprasert of DKSH (Thailand), the Thai distributor of Cummins Marine Diesels. Khun Sathit set the boat up with a Cummins 4BTA 3.9-liter generator engine powering a 30 kW Stamford generator. This will provide ample power for the kitchen but also for the vessel's lighting and entertainment systems. A factory supplied control panel, located at the engine, provides key start, emergency shut down and a full set of relevant gauges.

Set aft of the main engine in the stern of the hull amidst massive teak timbers, the powerful generator represents a fusion of all that is best in fine food preparation in a maritime tradition. As a fully equipped floating restaurant set on a brightly finished teak hull, the Baan Khanitha Cruise will represent an exciting addition to water-borne traffic on the Chao Phraya River.

Alan Haig-Brown

*All values in USD Millions	TOTAL	BULKER	CONTAINER	LNG	LPG	SMALL DRY	TANKER	OSV
GREECE	$84,079	$25,413 (1)	$7,898	$13,610	$3,321	$232	$33,539 (3)	$65
JAPAN	$80,169	$29,297	$10,115	$15,144	$4,066	$3,059	$18,432	$57
CHINA	$68,333	$22,180	$18,613	$3,072	$2,064	$3,508	$17,063	$1,834
SINGAPORE	$38,052	$7,087	$4,933	$485	$4,043	$1,165	$15,310	$5,030
USA	$34,432	$4,180	$3,243	$2,441	$245	$376	$16,281	$7,666
GERMANY	$31,544	$5,357	$15,223 (2)	$632	$1,422	$4,161	$4,246	$502
NORWAY	$30,427	$3,725	$1,443	$3,970	$3,045	$530	$11,534	$6,181
SOUTH KOREA	$21,204	$5,721	$2,575	$3,502	$1,296	$656	$7,452	$3
DENMARK	$19,492	$1,400	$8,399	$871	$1,052	$551	$6,061	$1,157
UK	$15,847	$2,184	$3,330	$5,025	$1,830	$374	$2,606	$498

Top 10 Ship Owning Nations

Despite suffering the biggest total drop in total feet value, Greek owners held onto their spot at the top with a $84.079 billion fleet, reflecting a decrease of nearly 12 percent in the cargo sectors. Greece also held onto its lead in the bulk carrier and tanker categories. "Greek tanker owners started 2016 earning more than $100,000/day on their vessels. However, the rest of the year has been predominantly bearish. By the end of 2016 the Greek fleet had shrunk by close to $11 billion," said VesselsValue senior analyst William Bennett. "Coming in second [in terms of total value lost] was the U.S.A., whose fleet lost $4 billion, less than half the Greek losses," Bennett said. Falling less than 1 percent in total value, Japanese owners were able to inch closer to the lead. Japan is the leading owner of LNG and LPG carriers. "Bulkers have had a deceptively good 2016 following the record lows at the start of the year," Bennett said. "The top three bulker owning nations; Greece, Japan and China, have seen their fleets rise by over $4 billion each. This growth has supported acquisitions following some of the lowest asset prices seen since the 1980s."

Falling from fourth to sixth, the German cargo fleet lost close to 30 percent of its value mainly due to the depressed container market. Yet, the nation remained the top owner of containerships. Bennett said, "The German container fleet shrunk by nearly $11 billion throughout 2016 after large losses in the sector. The largest softening was experienced in the Panamax and post-Panamax sectors with some vessels losing up to 60 percent of their value. German losses are fueled by this as 59 percent of their fleet consists of Panamax and post-Panamax vessels."

www.vesselsvalue.com


Lincoln Electric
Hastings


US Navy Photo
Stackley


Odfjell SE
Olsen


Seaspan
Hilder


Foss Maritime
Parrott


Hansa Heavy Lift
Dawson


Hansa Heavy Lift
Karakassis


SAFE Boats International
Champagne


MV Werften
Gruenhagen


RSC Bio Solutions
Lionberger


AAF
Tobin


Reintjes
Martin

Obituary: Donald F. Hastings, former Lincoln Electric CEO

Former Lincoln Electric chief executive officer (CEO) Donald F. Hastings passed away on Dec. 27, 2016, at the age of 88. Hastings had a 44-year career at Lincoln Electric. He joined the company in 1953 as a trainee in its welding school after earning a degree in economics from Pomona College and a master's degree in marketing from Harvard Business School.

Stackley Acting Secretary of US Navy

Sean J. Stackley assumed the responsibilities of acting secretary of the U.S. Navy. Stackley will carry out the day-to-day responsibilities of the secretary of the Navy until the incoming Trump administration nominates, and Congress confirms, a replacement.

Brunswick Leadership Changes

Boston Whaler President Nick Stickler has assumed temporary day-to-day leadership at Brunswick Commercial & Government Products (BCGP) following the departure of BCGP General Manager, Jennifer Butera, and Director of Sales, Jeremy Davis.

Odfjell SVP Olsen Steps Down

Odfjell SE said its Senior Vice President Helge Olsen will step down from his role as Head of Ship Management, effective January 9, 2017. Harald Fotland, SVP Odfjell Tankers, has been appointed to temporarily cover the position as SVP Ship Management until Olsen's successor is in place.

Seaspan Marine Appoints Hilder

Seaspan appointed Paul Hilder to Vice President, Marine Operations. Hilder is ultimately accountable for overseeing the operational efficiency and safety of all vessels and marine crews.

Parrott Takes the Helm at Foss

John Parrott assumed the role of President and CEO of Foss Maritime on January 1, 2017. He fills the spot left by retiring President and CEO Paul Stevens.

Jaenichen Joins HMS Global as COO

HMS Global Maritime added former Maritime Administrator Paul "Chip" Jaenichen, Sr. of the U.S. Department of Transportation as its new Chief Operating Officer (COO).

Dawson, Karakassis Take the Helm

Steve Dawson and Alex Karakassis have been appointed Managing Directors of Hansa Heavy Lift GmbH, taking over from outgoing CEO Roger Iliffe, with immediate effect. Dawson will oversee Hansa Heavy Lift's engineering, technical, and operational activities, and Karakassis, who remains Chief Financial Officer, will oversee the company's commercial and financial activities. Both have been with Hansa Heavy Lift since its inception in 2011. Iliffe has left to pursue other opportunities.

SAFE Boats Names Champagne SVP

SAFE Boats International has appointed Hartwell Champagne as its new Senior Vice President of Operations. Champagne joined SAFE Boats in 2013 and has been a key member of the company's executive team. Prior to his new assignment, Champagne was the General Manager of the company's Large Craft Production facility in Tacoma, Wash. where the U.S. Navy's Mk VI Patrol Boats are manufactured.

Gruenhagen Joins MV Werften

MV Werften appointed Richard Gruenhagen (54) as Managing Director of Finance and Administration effective February 1, 2017. Gruenhagen graduated from Indiana University, is a Certified Public Accountant (USA), has many years of experience as Executive Financial Management Professional.

RSC Bio Solutions Expands

RSC Bio Solutions announced the addition of several key team members in the business development and sales departments. The company welcomes:

- Damian Seipel, account executive
- Chris Griffin, business development manager
- Mark Fretz, business development manager
- Paul Treese, regional sales manager
- Lauren Lionberger, global ommercial director
- Paul DeVivo, independent strategic advisor

UAE Shipyard: Albwardy Damen

Albwardy Marine Engineering and Damen Shipyards Sharjah have officially brought both brands together under one umbrella. Under the new name, Albwardy Damen, the United Arab Emirates-based shipyard will continue to construct newbuild steel and aluminum vessels as well as provide the same ship repair services to its marine and oil and gas customers in the Middle East.

Oldendorff to Open Copenhagen Office

Lubeck headquartered dry bulk shipping company Oldendorff Carriers said it plans to open an office in the maritime cluster in Hellerup, Denmark by June 2017.

Metal Shark Wins Again

Metal Shark was awarded two separate contracts to produce passenger vessels for the Potomac Riverboat Company division of Entertainment Cruises, and for the New Orleans Regional Transit Authority. For the Potomac Riverboat Company, Metal Shark will produce four 88 ft., high speed/low wake, 149-passenger aluminum catamarans. For the New Orleans Regional Transit Authority (RTA), Metal Shark will produce two 105 ft., high speed/low wake, 149-passenger aluminum catamaran ferries.

Martin Heads New Reintjes U.K. Branch

REINTJES opened a new branch office in the south of England to service markets in the U.K. and the Republic of Ireland. In charge is Philip Martin.

Vigor to Develop Alaskan Shipbuilders

Shipbuilder and repairer Vigor has teamed up with the maritime workforce development network Maritime Works for a public, private and philanthropic initiative called Advancing Alaskan Workers, which will train Alaska's next generation of advanced manufacturing workers. The initiative strives to combat the high turnover rates seen at Vigor's Ketchikan shipyard and elsewhere that result when non-Alaskans are recruited to fill the state's critical skills gap. In 2016 Vigor employed 191 people at the Ketchikan Shipyard, up from 21 employees in 1994. Now with large contracts to build two Alaska-class ferries for the Alaska Marine Highway System, as well as other large projects forecasted for the future, Vigor said it is working with Maritime Works to proactively build a skilled local workforce to meet the demand.

Fuel Monitoring, Management

Enginei fuel monitoring systems provide fuel data analysis and reporting options to provide vessel owners and operators with detailed engine performance. Alongside fuel consumption, the enginei system also provides a low cost method of measuring vessel emissions, including CO2, NOx and SOx profiles. Emissions monitoring can be assessed against individual engines and can be used in relation to a vessel's performance against SECA zone, SEEMP and IMO regulations.

www.enginei.co.uk

Image: Enginei

Shell Alexia 140

Following its formulation and laboratory testing in 2015, the new Shell Alexia 140 has completed months of shipboard trials with a Shell Marine customer. The new lubricant, Shell Alexia 140, is an ultra-high BN oil with a BN of 140. It is targeted for use on its own or as part of an onboard lubricant blending or mixing system. MAN Diesel and Turbo (MDT) told this year's CIMAC in Helsinki that it had been trialing 'ACOM' (Automated Cylinder Oil Mixing), the two-stroke marine engine major's pilot scheme to establish best practice in matching lubricant BN to fuel sulfur content while minimizing lubricant feed rates. A Shell Marine customer was selected for the first batch of trials.

www.shell.com

RSC Bio Solutions' FUTERRA

RSC Bio Solutions launched its new product line of bio-based lubricants, FUTERRA. A hydrocarbon renewable EAL derived from a plant-based material, FUTERRA is designed to offer superior performance in both wet and dry environments, holds up to extreme conditions in contact with water in high-pressure and extreme temperatures and has higher durability, which results in greater system efficiency, fewer change-outs and extended equipment life, according to the manufacturer. RSC Bio Solutions said FUTERRA offers ultimate system and seal compatibility and is miscible with legacy fluids, so it does not disrupt operations schedules, increasing system uptime and efficiency.

http://rscbio.com

Ashcroft Pressure Gauge

Ashcroft has introduced the 8008A pressure gauge fit for hydraulic systems, compressors and many other demanding applications. This new instrument geared toward industrial OEMs meets the recognized specifications of EN837-1 and ASME B40.100. A corrosion resistant stainless steel case along with liquid fill vibration dampening help extend the service life.

ashcroft.com

Image: Ashcroft

DuroShell LPG/E Condenser

Alfa Laval DuroShell is a specially engineered plate-and-shell heat exchanger with unique design capabilities. Already used in the offshore oil and gas industry, it is now being introduced for marine duties such as LPG/E cargo reliquefaction. An innovative construction and a patented roller coaster plate pattern make DuroShell more robust, allowing it to condense cargo with a higher ethane content.

www.alfalaval.com

Image: Alfa Laval

Reintjes Hybrid Gearbox

Reintjes recently demonstrated its new BAE HybriGen Zero system. Reintjes, with its U.S. distributor Karl Senner, LLC, highlighted its hybrid step-up gearbox for retrofit. Customer advantages are made possible by a front-engine mounted gearbox combined with a permanent magnetic electric generator up to 300 kWe. With its high torque this electric motor / generator could be used as a starter to substitute the air-starting system.

www.reintjes-gears.de

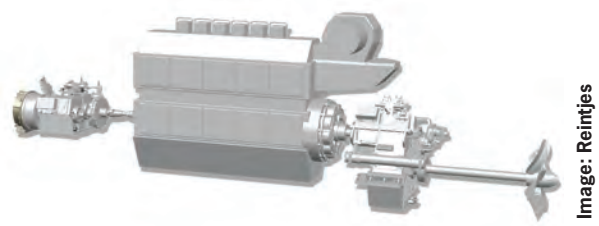


Image: Reintjes

Explosion Proof LED Fixture

Larson Electronics released a 70 watt explosion proof LED light fixture mounted on an adjustable beam clamp to simplify mounting on existing beams. The EPL-LP-70W-LED-HDBC-20-EPP beam clamp mounted LED fixture is weatherproof and comes with an adjustable aluminum mount, making it suitable for industrial applications, maintenance, cleaning and servicing duties, as well as hazardous work areas.

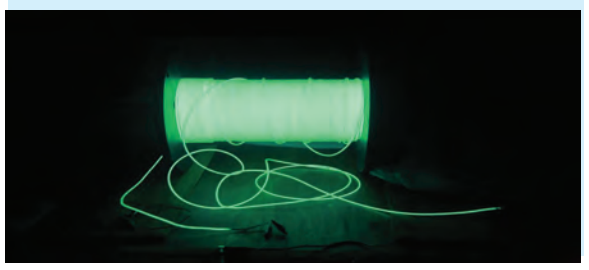
www.larsonelectronics.com

Image: Larson Electronics

Lumiflex Cable Light Tech

Lumiflex Corp., located in the Bay Area CA has a patented cablelight technology that could take visibility of subsea umbilicals, ROV tethers and the like to a new level. Its patented technology can take any strength/data/power/control (or any combination of those) cable and embed it down the middle of our cool-to-the-touch, spoolable, industrial strength, 360 degree light emitting profiles.

www.rescuecablelight.com



Martek Launches iVital

Martek Marine launched a telemedicine service, iVital. Should a seafarer fall ill, or suffer an injury, other crew members use a dedicated tablet computer to immediately contact a doctor with an in-depth knowledge of delivering treatment at sea and trained to the level of an A&E consultant. The doctor is then able to assess the stricken sailor through iVital's High Definition video call service.

www.martek-marine.com

Image: Martek

MARITIME REPORTER AND ENGINEERING NEWS

2017 EDITORIAL CALENDAR

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
Tugnology: 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

MARITIME REPORTER AND ENGINEERING NEWS

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

**Editoral calendar content may be subject to change

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

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

BARGE FABRICATION

McDonough Marine Service, 3500 Causeway Blvd., Suite 900, Metairie, LA , USA , tel:(504) 780-8100, fax:(504) 780-8200, pstant@marmac.net

BOAT BUILDING AND DESIGN

All American Marine, 200 Harris Avenue, Bellingham, WA , USA , tel:(360) 647-7602, fax:(360) 647-7607, jhudspeth@allamericanmarine.com

CORDAGE

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

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DMW MARINE GROUP, LLC, 1123 St. Matthews Rd Chester Springs, PA 19425 USA , USA , tel:(610) 827-2032, dw@dmwmarinegroup.com contact: Doug Weidner, dmwmarinegroup.com/

DECK MACHINERY- CARGO HANDLING EQUIPMENT

Allied Systems Company, 21433 SW Oregon Street, Sherwood, OR 23462, USA , tel:(503) 625-2560, cranes@alliedsystems.com, www.alliedsystems.com

DRILLS

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

DRIVESHAFTS

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

DRY DOCK TRAINING

DM Consulting, 12316 Dormouse Road, San Diego, CA 92129, USA , tel:+1 858-705-0760, joe@drydocktraining.com

EDUCATION

San Jacinto College, 8060 Spencer Highway Pasadena, TX 77505

ENVIRONMENTAL SOLUTIONS

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

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

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

LIFESAVING 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
Tandemloc, 824 Highway 101(FONTANA BLVD) HAVELOCK, NC 28532

MARINE EQUIPMENT

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

Smith Brothers, Inc., P.O. Box 124, Galesville,, MD , USA , tel:(410) 867-1818, fax:(410) 867-7813, smithbarge@comcast.net

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)

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MILITARY PATROL CRAFT MANUFACTURERS

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

Tampa Defense USA, 4350 62nd Avenue North, Pinellas Park, FL , USA , tel:(813) 792-2114 / (813) 843-8737, robert.stevens@tampa-yacht.com

MONITORING SYSTEMS

SPM Instrument, Inc., 780 Bailey Hill Rd. Suite #3 Eugene, OR. 97402 , USA , tel:541-687-6869, info@spminstrument.com , www.spminstrument.com

NAVAL ARCHITECTS, MARINE ENGINEERS

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PAINTS AND ANTI FOULANTS

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PIPING INSTALLATION AND SERVICES

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PROPULSION CONTROL SYSTEMS

BAE Systems - HybriDrive Solutions, 1701 North Street, Endicott, NY , USA , tel:(607) 770-2083, carol.gorenflo@baesystems.com

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

SEATING

The Springfield Marine Company, 1093 N. Cynthia Drive, Suite #1 Nixa, MO 65714

SHIP REPAIR

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

SHIPBUILDING-REPAIRS, MAINTENANCE, DRYDOCKING

St. John's Shipbuilding, 560 STOKES LANDING ROAD Palatka, Fl. 32177 , USA , tel:386-328-6054, sganoe@stjohns-ship.com contact: Steve Ganoe, www.stjohnsshipbuilding.com

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SURFACE PREP TOOLS

Water Cannon, 4300 West Lake Mary Blvd. Units 1010-424 , USA , tel:321-800-5744, sales@watercannon.com , www.watercannon.com

WASTE WATER TREATMENT

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

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

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In this position, a large part of your work will take place onboard operating cruise vessels or onboard cruise vessels in shipyards all over the world.
Vice President, European Government & Public Affairs
Full Time , Senior Management / Corporate Officer

Category: Shoreside Operations

Job Location: Rue Montoyer 40, 1000 Brussels Belgium Brussels, Belgium, 1000 Belgium
Contact
Global Human Resources & Administration
Email: ttompkins@cruising.org
Work Phone: 202-759-6764
Rue Montoyer 40, 1000 Brussels Belgium Brussels, Belgium, 1000 Belgium
Skills:
Education and Professional Qualifications:
•Undergraduate degree required, advanced degree a plus.
•A minimum of 15 years of experience is required.
•Excellent written and verbal English language skills and fluency in at least one other European language (e.g., French, Italian, Spanish, German).
•Excellent knowledge of international and European maritime policy.
•Expert knowledge and understanding of the political and procedural workings of the EU institutions EP/COM/ Council.
•Excellent relationships with relevant MEPs, top decision makers of the EU Commission (DG MOVE/ ENVI), permanent representatives of MS preferred.
•Experience interacting and negotiating with government and industry officials, and a record of successfully influencing the outcome of legislation or regulatory policy.
•Experience leading a multidisciplinary team of professionals and motivating them to exceed expectations and deliver outstanding results.
•Successful experience presenting to and persuading CEO-level executives and Boards of Directors or their government equivalents.
•The ability to interact with high level contacts and build consensus on long-term policy issues facing the maritime industry, to initiate the appropriate actions for the organization, and to discuss and present the policies of the organizations in the appropriate forums
Description:
Lead CLIA's strategic advocacy vision and policy priorities in Europe while overseeing regulatory matters, legislative affairs and lobbying, and public affairs issues management. Demonstrate through quantifiable metrics, delivery of CLIA Europe's policy and public affairs issues management priorities. Ensure alignment and coordination with CLIA Global on advocacy and public affairs positioning.
Specific Duties:
•Develop annual strategic priorities and programs in the areas of regulatory policy, lobbying, and public affairs in conjunction with the Secretary General, CLIA global, relevant CLIA Member Committees.
•Representing CLIA Europe in day-to-day dealings with the European Commission, Parliament, Council and other bodies/ agencies as appropriate.
•Establish quantifiable metrics for measuring success and establish regular communication to the CLIA Europe ExCom and General Assembly on the status of Government and Public Affairs matters and priorities.
•Lead Government and Public Affairs staff and manage departmental budget.
•Serve as the lead for crisis response in Europe as outlined in the CLIA Global Crisis Response Plan. Lead industry delegations in dealing with senior officials at regional and national regulatory and enforcing bodies. Support efforts of CLIA at the international level (such as the International Maritime Organization (IMO), International Labour Organization (ILO), World Tourism Organization.), as well as in other venues and in dealing with the maritime sector, and other administration

representatives of European nations. The second part is not clear to me
•Legislative advocacy on behalf of the CLIA Members to develop regulations that are favorable to both the cruise industry and the relative involved parties. Act as the European point of contact for all day-to-day matters related to the European institutions that influence, develop or execute policy making.
•Lobbying or influencing, we cannot negotiate with authorities
•Provide advice and guidance to the Secretary General and CLIA office leaders around Europe on European matters and help develop and implement subsequent responses.
•In coordination with relevant CLIA Global leaders, oversee the preparation and presentation of CLIA policy and support industry policy positions to and with international, regional and national legislative, regulatory and rule-making bodies. This should be done by global I suggest to support except if it refers to Europe
•Develop relationships with counterparts at relevant European-based shipping associations and other industry organizations with stakeholder interests in the cruise industry as appropriate.
•Participate in EU Commission stakeholder groups and other public meetings as needed and appropriate.
•Serve as an on the record spokesperson on news media inquiries involving policy and public affairs issues.
•Represent CLIA at various events, participating on panel discussions and providing keynote remarks.

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1	Blohm+Voss GmbH	www.blohmvoss.com	49 40 3119-0
21	Boll Filter Corp.	www.bollfilterusa.com	(248) 773-8200
14	CMA Shipping 2017	www.cmashipping2017.com	(203) 406-0109
51	Commercial Marine Expo	www.comarexpo.com	Please visit us online
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49	DM Consulting	www.DryDockTraining.com	Please visit us online
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7	Furuno USA, Inc.	www.FurunoUSA.com	Please visit our website
19	Grand Bahama Shipyard Limited	www.grandbahamashipyard.com	(242) 350-4000
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17	Hempel A/S	www.hempaguard.hempel.com	45 45 88 3800/45273676
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