

March 2020

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The Royal Caribbean Way

(L to R): Patrik Dahlgren, SVP Global Marine Operations, Anders Aasen, VP, Global Technical Solutions & Anshul Tuteja, AVP, Global Fleet Optimization, Royal Caribbean Cruises Ltd.

Photo: Greg Trauthwein

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MARITIME REPORTER AND ENGINEERING NEWS

MARINELINK.COM

ISSN-0025-3448
USPS-016-750
No. 3 Vol. 82

Maritime Reporter/Engineering News (ISSN # 0025-3448) is published monthly (twelve issues) by Maritime Activity Reports, Inc., 118 East 25th St., New York, NY 10010-1062. Periodicals Postage Paid at New York, NY and additional mailing offices.

POSTMASTER:

Send all UAA to CFS. NON-POSTAL AND MILITARY FACILITIES send address corrections to Maritime Reporter, 850 Montauk Hwy., #867, Bayport, NY 11705.

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SUBSCRIPTION INFORMATION

In U.S.:

One full year (12 issues) \$110.00;
Two years (24 issues) \$190.00

Rest of the World:

One full year (12 issues) \$189.00;
two years \$228.00 (24 issues)
including postage and handling.

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Part of the reason I love my job is the cavalcade of events to start 2020, and the ability to have money, markets and the world change on a dime. No, I don't like nor enjoy the pain and suffering brought by global disease. But seriously, I'd like a show of hands of those that could have predicted the breadth, depth and length of the current COVID-19 virus and its impact on everything.

While the world is awash in analysis, I think it will be some time until we get an accurate picture – if even possible – of the cumulative economic carnage that is spreading globally. By all accounts, it will be short lived and fiscal ships will right themselves ... the big question is 'when'?

It was less than two months ago that we were talking about the global cruise market, its historic growth in fleet, tech and destinations, with projections on how fast and high it could grow. Now, you can't open the news without seeing the handful of ships and their passengers stranded in quarantine, quite literally with no place to go. By recent estimates the big cruise lines have shed 40% of their market value since the start of the year, and the industry collectively is undoubtedly strategizing on the next step when this current crisis resides.

Ironically, I was recently in Miami in the offices of Royal Caribbean Cruises to meet with a trio of ship optimization executives to discuss RCCL's digitalization strategy to meet emission and efficiency goals. I met **Anshul Tuteja**, AVP of Global Fleet Optimization, in late 2019 in New York City at a small roundtable hosted by ABB.

Cover Image:

© Royal Caribbean Cruises

He invited me down to Miami to meet with him, **Patrick Dahlgren** and **Anders Aasen** – the collective heads of RCCL's Global Maritime Organization – for some exclusive insights on how the cruise line is making tech development decisions based on data.

It was a worthy trip indeed, and starting on page 40 you can read about RCCL's digital journey, including some amazing projects which have resulted in significant energy savings.

The other big feature in this edition was a little closer to home ... in fact a 25-minute ferry ride across New York Harbor on the Staten Island Ferries to meet with **Jim DeSimone**, who has led the iconic ferry service for more than 16 years. This is a follow-on feature to our shorter bit last month on Staten Island Ferries' maritime training practices, and this month we focus on fleet development and maintenance, including a trio of "Ollis" class newbuilds currently under construction at Eastern Shipbuilding. **DeSimone** is well-known to many reading these pages, and he doesn't disappoint with his characteristic candor and insight. I also had the chance to spend some time with **John Waterhouse**, Chief Concept Engineer at Elliott Bay Design Group, who shared some of the finer points of the new designs that are geared to keep these ferries running efficiently and effectively for 40 years or more.

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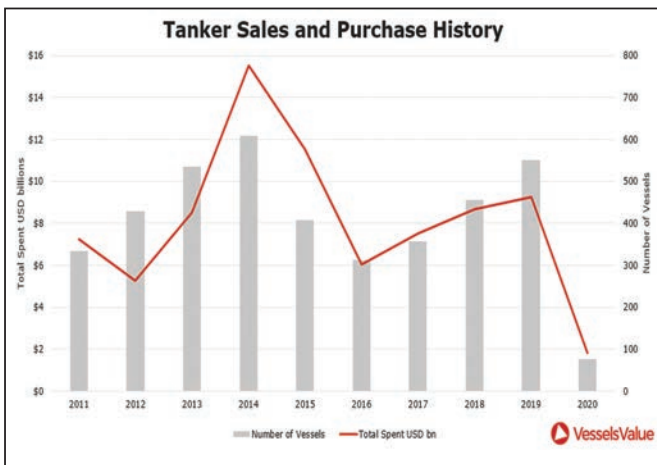
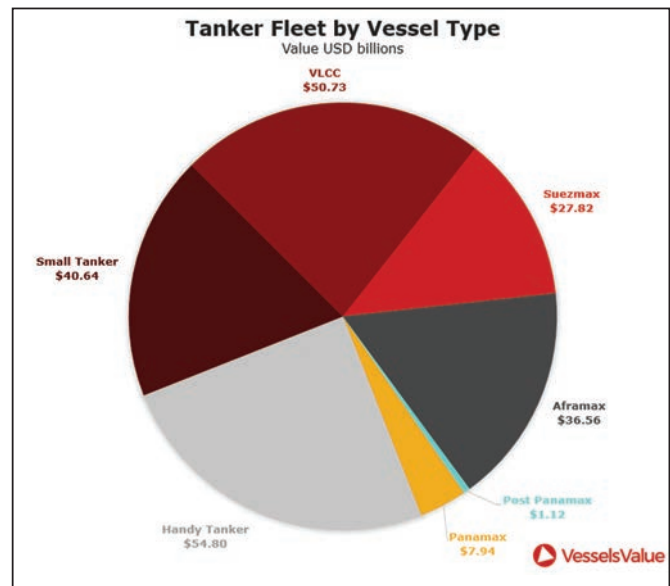
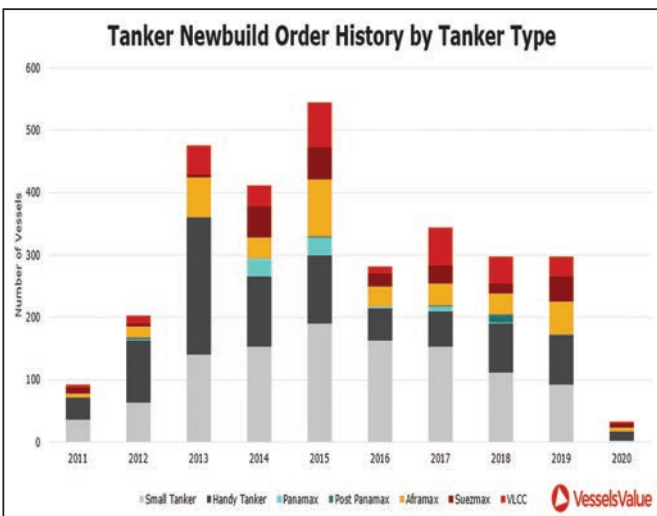
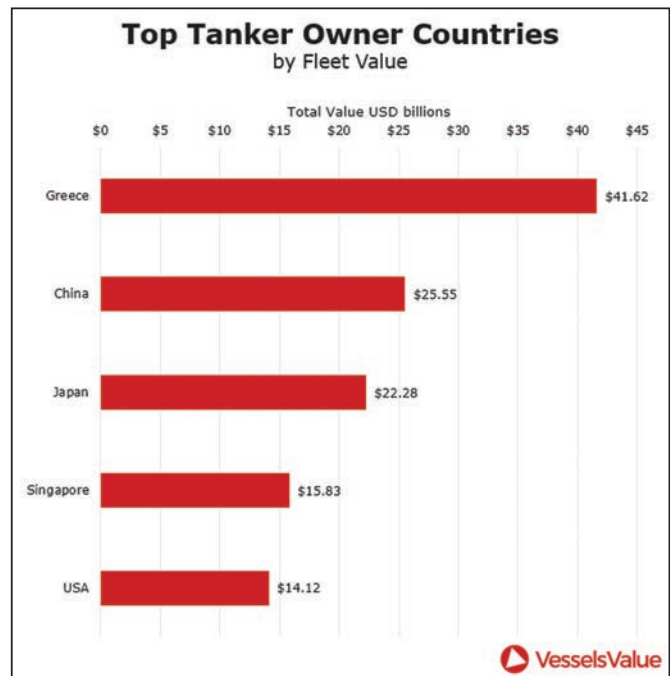
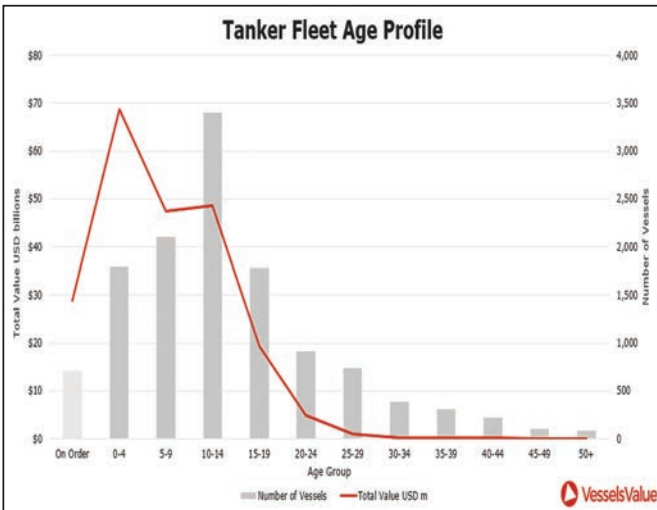
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A Tanking Tanker Market

As the hysteria surrounding the COVID-19 virus continues to swirl, our editorial staff had to break out the thesaurus for new words beside “plummet” and “plunge.” Although it is widely agreed that the market fluctuations across all industries are temporary, no one can, with any degree of certainty, define just how long “temporary” may be. At the end of February tanker charter rates had plunged more than 80%. Here we, with help from our friends at VesselsValue, we offer a more appealing insight on tankers.



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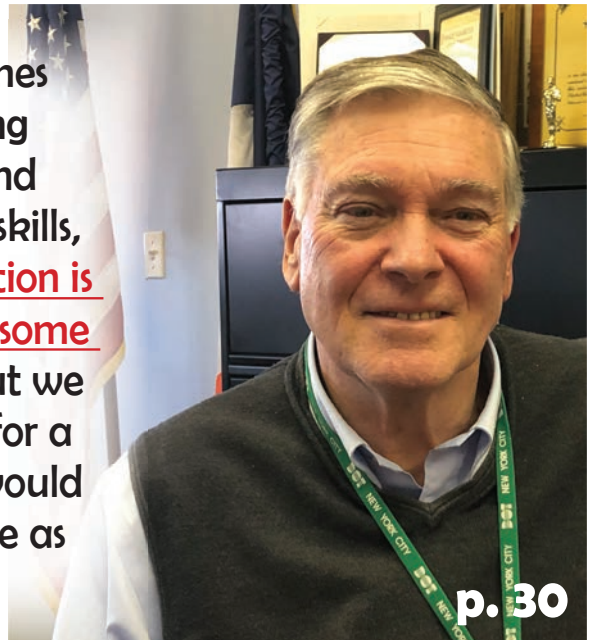
Photo: EBDG

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The ferries were designed with a number of “resiliency features” in mind, as in the wake of 9/11 and Superstorm Sandy the vessels would be used if necessary to help evacuate New York City.

John Waterhous, Chief Concept Engineer at EBDG

“When it comes to promoting a captain and assessing their skills, human evaluation is subjective and some of that’s ok. But we were looking for a solution that would be as objective as possible.”



Greg Trauthwein

p. 30

Jim DeSimone, Staten Island Ferries

“Vessels that leverage the RDS (ABB Ability Marine Remote Diagnostic System) package benefit from clear maintenance savings as digitally connected on-duty engineers can solve cases remotely 24/7, which reduces visits to vessels by at least 30%.”

Marcus Höglblom, Head of Passenger Vessel segment at ABB Marine & Ports



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“(with) data-driven decision making on hull coatings, we have seen a gain of 3-5% in propulsion efficiency since the inception of hull coating strategy”

Anshul Tuteja

AVP Global Fleet Optimization, RCCL



Anshul Tuteja

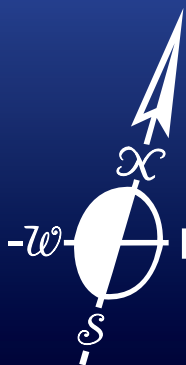
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Tip #10

Don't Handcuff Your Trainees Let them wonder free!

Do any of your e-learning modules force learners to spend a certain amount of time on a page before advancing to the next one? Do they force readers to answer one or more questions before advancing to the next page? Do they prevent access to the final exam until every learning page has been visited at least once? Do they enforce a prerequisite structure that prevents access to more advanced learning material until the prerequisite material has been completed?

If you have answered “yes” to any of these questions then 1) you are not alone, and 2) you need to seriously consider removing those restrictions.

Many well-meaning e-learning content providers and content developers impose these kinds of restrictions on learners proceeding through on-line courses. The thought is that these restrictions can ensure that learners have seen (and hopefully have learned) the material before advancing to the next topic or taking the exam. It is intended to produce better learning

outcomes and increase test scores.

Unfortunately, in reality, it does little other than create a great deal of frustration for the learner. It can cause them to dislike the process and can perpetuate the feeling that training is an ill-conceived and poorly executed but necessary evil to be endured rather than enjoyed. There are few things that can kill curiosity and enthusiasm for a subject more quickly than waiting for the “next” button to become active on a page despite there being nothing more to be learned. Learning is **never** enhanced by forcing a trainee to stare at material they don't wish to see at that moment. To think that doing so creates some advantage is mistaken. It is detrimental.

One of the magic aspects of e-learning is that it naturally conforms to differences in learners. Some come to the material having a strong background, while others come with little. Some come with excellent learning skills, while others come with little academic experience. A properly structured e-learning experience will let fast learners learn quickly. It will let knowledgeable learners pass by materials they already

MarTID 2020: Deadline Extended

The 2020 MarTID survey of mariner training practices is extended to **March 31, 2020**, and your participation is vital to its success. For a full background on the initiative, visit: <http://scholar.wmu.se/martid>

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know. Furthermore, it will enable the curious to skip ahead, and go back to review. It will allow the learning experience conform to the learner. Enthusiasm for learning needs to be inspired and supported, not frustrated.

The basic solution is therefore obvious. Remove all navigation restrictions from your e-learning pages. Let learners advance through the pages without regard to timing and without the need to first answer related questions. Even let them skip straight to the exam if they wish to do so. Do not handcuff your trainees but instead let them explore the material and assessments in the order and at the pace that makes most sense for them and that supports their curiosity.

There is no rationale nor is there any research that supports adding these navigational restrictions. Regardless, there are concerns that are often raised: If we let the learner skip over a page of content, then how can we be sure they learned it? If we let them advance to new material before learning the prerequisites, it will confuse them. If we allow them to attempt the final exam before having spent sufficient time on the learning materials, how can we be sure they are prepared? And finally, if regulatory requirements insist that a course be a particular number of hours, how else do we meet this requirement in an e-learning context?

We can address all these issues, and we will do so in next month's Training Tips for Ships!

Until then, sail safely!

The Author

Goldberg

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NEW VIKING SHIP
 This rendering shows what the new Viking expedition ships will look like, including the hangar for launching small vessels.
 Photos: Viking

NOAA-Viking Public Private Partnership ... a Win-Win for Research

T

here was important cruise news in January: Viking – a premier European ocean and river cruise company – will offer two new “destination-focused travel experiences,” starting in 2022. One set of cruises becomes Viking’s first foray in the inland

North American market, in this case the Great Lakes. Another set of cruises will head to the Arctic and Antarctica. Viking is building two new vessels: the Viking Octantis and the Viking Polaris, under construction now in Norway, by Fincantieri’s VARD.

In a press release Viking writes that it has created “the thinking person’s expedition.” Indeed, Viking has partnered with the University of Cambridge’s Scott Polar Research Institute, whose scientists will undertake fieldwork on board. Beyond the cruise partnership opportunities, Viking has also endowed a professorship at the Institute and is helping to fund graduate studies. Cornell University’s Lab of Ornithology is a partner. And, so is NOAA - the US National Oceanic and Atmospheric Administration.

For maritime research, Viking’s new offerings are striking. Ditto for people who track cruise industry developments. In past years, industry officials have been anticipating Viking’s entry into North America. The company’s reputation is such that its investments and presence send strong signals, across

the industry, about the health and vibrancy of the cruise business.

Viking’s Great Lakes news may have a familiar ring. That could be because in late 2018 Viking was reportedly close to concluding the steps needed for new Mississippi River cruises (see *Marine News*, January 2019). Unfinished though, were critical moves for Viking, based in Switzerland, to comply with strict U.S. carriage laws, in this case the Passenger Vessel Services Act (PVSA), which controls the coastwise transportation of passengers between U.S. ports. The PVSA is to passenger service what the Jones Act is to freight. The two laws are sometimes referenced interchangeably. Each requires that vessels used in U.S. coastwise commerce are American owned and American built. The Jones Act additionally requires American crews. Exemptions don’t come easy.

In 2019, for its Mississippi effort, Viking was reportedly seeking a “charter agreement,” for operations, with a U.S. company. It was supposedly working with an American firm in New Orleans to build new vessels.

That work has not paid off, at least yet. A Viking representative did say, via email, that Viking is “actively working with our partners to launch on the Mississippi River, but at this point in time we do not have any details to share.”

Now come the Great Lakes cruises. Not completely in the

U.S., but the ships' itineraries include U.S. territory, and Canadian. One can't help but ask: does this comport with PVSA mandates? The vessels are not American made. They are not American owned. By those measures they could not operate on the Mississippi. But what about in international waters, i.e., the Great Lakes? The key factor, according to Viking, seems to be that the vessels will not transport passengers between U.S. ports.

When asked about PVSA issues a Viking spokesman wrote in an email:

"Viking operates in full compliance with the PVSA. None of the itineraries has both embarkation and disembarkation in U.S. ports. The voyages begin either in the U.S. (Milwaukee or New York City) and end in Canada (Thunder Bay or Toronto), or the reverse. Viking operates similar U.S.-Canada itineraries. (Its) Viking Star has two planned sailings in September 2020, which operates between New York and Montreal, also stopping in Quebec City, Saguenay, Gaspé, Halifax and Boston."

On the Mississippi, Viking's itinerary would stay within the U.S.; hence the need for American built/American owned vessels. In contrast, the Great Lakes cruises are considered foreign cruises, a Viking spokesman explained.

For its part, NOAA is eager to start its Cooperative Research and Development Agreement with Viking, which will last five years. NOAA has at least one other such partnership. In 2019, for instance, NOAA's Atlantic Oceanographic and Meteorological Laboratory (AOML) installed and tested autonomous carbon-dioxide-measuring instruments aboard the Celebrity cruise ship Flora, when it sails to the Galapagos Islands.

"We are very excited about the ways that our scientists can expand their research in the Great Lakes with sensors and testing aboard the new (Viking) ship," said Deborah Lee, director of NOAA's Great Lakes Environmental Research Laboratory. "We also welcome the chance to help people learn about the richness and maritime heritage of the Great Lakes as well as the environmental challenges it faces." NOAA's new partnership aligns with its Ships of Opportunity (SOPs) or Volunteer Observing Ships (VOSs). A "fleet," if you will, of non-research ships providing unique and valuable opportunities to collect maritime data. Otherwise known as win-win.

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Tom Ewing is a freelance writer specializing in energy and environmental issues. He started writing for *Maritime Reporter & Engineering News* in 2018.



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Image courtesy of Maid of the Mist Corp

Mission to Zero

The Case for Ferries

Ferries lead the zero-emission technology charge for a reason



Short routes and regular port visits provide opportunities for shipboard stored energy technology, and it is the commercial case that is turning the tide towards zero emissions where the ferry market is concerned. Supported by shoreside charging infrastructure, a fully charged battery pack can

be used to propel a ship along a predictable route at relatively low operating cost and little wear and tear, with the vessel quietly recharged at the quayside.

The appetite for ferry electrification has recently been captured by the Maritime Battery Forum, which counts 177 contracted ferries (car and/or passenger vessels) with batteries. Among these, 101 ferries are in operation today, and 76 are under construction.

Pioneering Change

The first 'all-electric' vessels to be built in the U.S. are two

new Maid of the Mist tourist ferries, which feature a propulsion system from ABB. These Niagara Falls tour boats will be powered by a pair of battery packs with a total capacity of 316 kWh, split evenly between two catamaran hulls and creating two independent power systems for full redundancy. The vessels will charge between every trip while passengers disembark and board. Shoreside charging will only take seven minutes, allowing the batteries to power electric propulsion motors that will themselves be capable of a total 400 kW (563 HP) output. This will all be controlled by ABB's integrated Power and Energy Management System (PEMS), which will optimize the energy use on board.

Existing Vessels, Sustainable Future

However, whether small or large, most short distance ferry boats and routes can be electrified. In 2018, for example, two ForSea Ferries operating between Denmark and Sweden became the largest battery powered ferries in operation, follow-

ing an ABB-led conversion. Another notable ABB project is the conversion of the 1965-built ferry San Cristoforo sailing in Lake Maggiore in Italy, which will see an installation of a complete power and propulsion system to enable the vessel's operation in hybrid and zero-emission modes. The turnkey modernization utilizes ABB's solutions including batteries and energy storage control system.

Saving Costs and Cutting Emissions

In recent testimony to a U.S. Congress subcommittee, ABB outlined how economics support the case for ferry electrification. While achieving zero-emissions means higher outlay, operational costs would also be lowered. ABB has modeled costs for ferries with various propulsion setups; an all-electric system could payback in as little as six years.

As with electric cars, wider deployment and further research and development only act to lower the upfront capital cost of the zero-emission option.

The emissions argument remains as compelling as ever: ABB's model battery-powered ferry envisages a significant cut in annual CO2 emissions when compared to a conventional setup.

Beyond Ferries

More broadly, it's fair to point out that most 'alternative' propulsion arrangements today are centered around an electrified system, whether they consist of diesel or LNG electric hybrids, full battery power or fuel cell-based solutions.

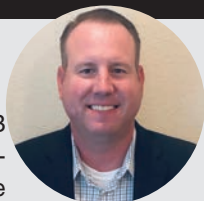
If one size seldom fits all, ABB believes the future of marine vessels will therefore certainly be electric, digital and connected. Whether the power source is fuel cells, batteries, ammonia-fueled generators, or a wave energy harvesting system, electric powertrains will be able to integrate them.

What this means is that an electric-based powertrain is futureproof as new energy sources are developed, a feature of special relevance here in the US, where Jones Act vessels can expect to undergo multiple repowers over their sometimes 50+ year lives.

The Author

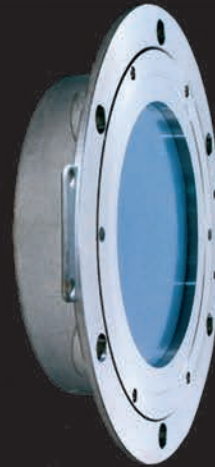
Strupp

Bruce Strupp has recently joined ABB Marine & Ports with extensive experience in many aspects of the maritime industry. He is responsible for leading all activities in North America including market Intelligence report, regional strategy and initiatives.



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The Challenges Ahead with COVID-19 & Maritime

The COVID-19 epidemic, which was first called the novel Coronavirus and then the 2019-nCoV, is spreading fast around the world. It is more contagious than the 2002 SARS outbreak, its cousin, but not as lethal. Unfortunately, its impact on the maritime community seems to already be greater than that of SARS.

Ships are being required to submit Maritime Declarations of Health prior to arrival. Ships that called in Chinese ports during the previous 14 days or have persons on board who have been to China during the previous 14 days are either prevented from entering numerous ports or their activities in port are curtailed. Some ships with infected persons on board are being banned – one cruise ship was turned away by four different countries before finally finding refuge in Cambodia. Cruise ships have largely withdrawn from calling in many East Asian ports. Crew changes are impacted across the entire maritime industry.

International trade is slowing. Health measures in China are leading to decreases in manufacturing and power consumption. As a result, raw materials for production and for power generation (such as coal and LNG) is less necessary, reducing imports. With manufacturing down, exports from China are decreasing. It is currently impossible to forecast how long this downturn will continue.

The major problem is our lack of knowledge about the virus. There is currently no vaccine to prevent it and no medicine to cure it. Medical kits to diagnose the illness are in short supply and don't have a 100% success rate, as the outbreak is so recent. Traditional care largely works, but there are exceptions, particularly among the young, elderly, and those with compromised immune systems. But COVID-19 is capable of striking down perfectly healthy individuals also. Medical professionals estimate that an infected individual can no longer transmit the virus to another person 14 days after contracting the condition, but this is not known for certain. Medical professionals do not yet know whether a pre-

symptomatic but infected individual may transmit the virus. It is also unclear how long the virus can remain potent after landing on a surface such as a table or handrail.

Authorities are only starting to consider the problem of passing this contagious virus along. Consider the following scenario: A crew member or passenger acquires the virus and (it is supposed) is able to pass the condition to others for 14 days. After 13 days, that infected individual passes the virus to another crew member or passenger. The 14-day watch period begins anew. This theoretically could go on until everyone onboard has become infected and gone through the 14-day infectious stage.

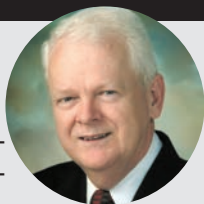
The primary means of transmission from person-to-person seems to be through coughing and sneezing, but coming into contact with an infected person may be sufficient. A Japanese health care worker was recently diagnosed with the virus after conducting an inspection on a quarantined cruise ship.

Health officials fear that COVID-19 will become widespread – a community virus. Thus control measures such as quarantine, isolation, and surveillance are being implemented to buy time in hopes of finding a cure and better treatment medicines. Those measures have had limited success to date, as the number of reported cases keeps growing and it is clear that there are numerous unreported cases. The situation continues to change, so pay attention.

Summary

The real problem, though, would be the disruption in trade. Due to the (hopefully short-term) reduction in international trade, many ships could be without cargoes (and possibly crews, support personnel, and bunkers). Ships could end up delayed in departure ports because the arrival ports are not accepting ships therefrom. Alternatively, the ship could be required to anchor out for an extended period awaiting clearance – recalling the ancient quaranta giorni or 40 day delay imposed by Venice. This has already occurred to cruise ships off Tokyo, Hong Kong, and Saint Lucia. Other ports have announced that entry will not be allowed for ships carrying persons who have been in China in the previous 14 days. All of this is adding fresh meaning to the concept of “restraint of princes.”

The Author

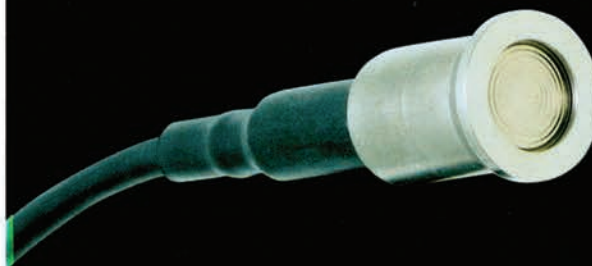


Bryant

Dennis Bryant is with Bryant's Maritime Consulting, and a regular contributor to *Maritime Reporter & Engineering News*.

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Photo: Weeks Marine

Big Ship Ready

Port Dredging Kicks Off 2020

The end of the 2019 saw some unprecedented funding measure pass through Congress and signed into law by President Trump. The Gulf and East Coast have continued to receive significant funding to help deepen and widen navigational channels and gateways. One of the projects passed into law included the Gulf Coast Regional Demonstration Project. Some of the ports receiving funding and underway include Mobile, Baltimore, Houston, Port Everglades and Norfolk. All these projects funded by Congress draw a direct correlation to the expanded Panama Canal. The newly expanded Panama Canal now allows ships three times the size of what they were in 2016 to transit through its waterways. And all those Neo-Panamax ships are destined for ports along the east and gulf coasts. Let's look at some of the ports and projects:

The Gulf Coast Demonstration Project

In December 2019, the FY2020 Energy and Water Development appropriations bill was signed into law as part of H.R.1865 and included a new regional dredge demonstration program for the central Gulf Coast. The program, administered by the Corps, was created to explore innovative ways of executing dredging in a logical and sequenced manner to seek efficiencies and cost savings and minimize disruptions to critical construction and maintenance dredging requirements across the nation. On February 10, 2020 the U.S. Army Corps of Engineers allocated \$274,300,000 for the Port of

Mobile in its FY2020 Work Plan, officially providing the resources to dredge Alabama's Port of Mobile. The funding – which accounts for the full federal share of the project cost – will initiate and complete construction of the deepening and widening of the navigation channel. Following the required preliminary steps, construction is expected to begin later this year. In addition, \$85.35 million was allocated in the FY20 work plan to initiate construction of deepening the Mississippi River Ship Channel, Gulf to Baton Rouge (Louisiana) to 50 feet.

The Port of Baltimore, Maryland

The U.S. Army Corps of Engineers, Baltimore District, announced in February that Great Lakes Dredge & Dock Company began dredging approximately 5.5 million cubic yards of material from five channels and the York Spit; all of which are associated with the Baltimore Harbor.

Commenting on the project, U.S. Army Corps of Engineers Colonel John Litz, Baltimore District Commander said: "Baltimore Harbor channels rely on maintenance dredging to serve and strengthen the region and the nation, energize the economy, and reduce navigation safety risks." The amount of material being removed would cover the field at M&T Bank Stadium, goalpost to goalpost, to a height of nearly 2,600 feet, or high enough to stack more than six Baltimore World Trade Centers. "Many diverse commodities import and export from the Port of Baltimore on a daily basis, such as specialized cargo and containers that broke records in 2019,"

finished Colonel Litz.

In coordination with the State of Maryland, around 2.15 million cubic yards of material dredged will be beneficially reused at the Paul S. Sarbanes Ecosystem Restoration Project at Poplar Island located on the eastern side of the Chesapeake Bay. In addition, roughly 635,000 cubic yards of material will be placed at the Masonville Dredge Material Containment Facility. And, in coordination with Virginia, about 2.68 million cubic yards of material dredged from the York Spit Channel will be placed in the Wolf Trap Alternate Placement Site, Northern Extension.

In the Corps 2020 work plan, Baltimore also received a New Start designation for the Seagirt Loop Canal to initiate a feasibility study.

Port of Houston, Texas

The Port of Houston received over \$70 million this year through the Army Corps of Engineers operation and maintenance work plan. The funding will be used for ordinary maintenance dredging and to help prepare for an eventual \$1 billion deepening and widening project for the Houston Ship Channel. Plans include widening the Galveston portion of the Houston Ship Channel from its existing width of 530-feet to a width of 700 feet. To this end, the Port of Houston also received funding from the Army Corps' Investigations account to initiate preconstruction, engineering and design plans for widening and deepening the channel.

In February, the Coalition for a Fair and Open Port presented the Port of Houston Commission with a proposal to use port-issued bonds and an industry paid fee structure to fund \$500 million of the deepening and widening. According to the Coalition, the bonding and fee proposal would cover the industry's upfront costs. However, the fees to ocean carriers could not be collected until the deepening and widening project was completed. The Coalition comprises energy companies.

Port Everglades, Florida

In the Army Corps of Engineers 2020 Construction Work Plan, Port Everglades received \$29.1 million as a New Start designation for its Port Everglades Navigation Improvements Project. The Port Everglades Navigation Improvements Project is currently received a signed Chief of Engineers Report from the U.S. Army Corps of Engineers in 2015 and U.S. Congressional authorization through the Water Infrastructure Improvements of the Nation (WIIN) Act in December 2016.

Port Everglades intends to deepen the main navigational channels from 42 feet to 48 feet (plus 1-foot required and another 1-foot allowable over-depth for a total of 50 feet),

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Photo: Great Lakes Dredge and Dock

and to deepen and widen the entrance channel and parts of the Intracoastal Waterway so that larger ships can transit and pass safely by docked cruise ships.

The New Start funding will be used to build a new facility for the U.S. Coast Guard Station Fort Lauderdale so the Intracoastal Waterway can be widened by 250 feet at a chokepoint where large Neo-Panamax ships currently experience operating restrictions that affect the vessels' ability to transit. The Coast Guard Station reconfiguration is the first phase of the larger dredging project.

Norfolk, Virginia

Weeks Marine (Weks) and Cottrell Contracting kicked off the New Year full throttle ahead, dredging at Thimble Shoal and the Norfolk Inner Harbor Channels. Recently, Weeks installed a new Liebherr crane assembly and clamshell bucket for the job. According to the Army Corps of Engineers, Cottrell Contracting began dredging the Norfolk Harbor Inner Channel and channel to Newport News the last week of December. In October, the Port of Virginia executed a contract with New Jersey-based Weeks Marine to begin the deepening of the western side of Thimble Shoal Channel. The work



Photo: Weeks Marine

includes dredging the shipping channels to 55 feet — with deeper ocean approaches — and widening them up to 1,400 feet in specific areas.

The dredging project will enhance accessibility to the Port of Virginia while providing significant benefits to the national economy and national security. The deepening effort got under way in 2015, when the U.S. Army Corps of Engineers and the port agreed to share the cost of evaluating the benefits of dredging the Norfolk Harbor to a depth beyond 50 feet.

Weeks is utilizing the clamshell bucket dredge 551 with a huge scooping capacity. Weeks's clamshell dredge 506 with its new Liebherr crane and bucket assembly arrived at the site a couple of weeks later. This Spring, Weeks will enlist its new trailing suction hopper dredge the TSHD MAGDALEN on the project to clear out the middle of the channel.

Weeks will be digging down to about 56 feet. The port will also widen the channel to 1,400 feet to allow for two-way ship traffic. Currently, the channel allows just one large ship transiting at a time. On the inner harbor, the U.S. Army Corps of Engineers, Norfolk District announced in January that it will manage the operations and maintenance project as part of an effort to remove shoaling, allowing safe and unrestricted navigation for the largest commercial and military vessels transiting into and out of the Port of Virginia. Officials expect Cottrell's dredging operations to take about five months to complete the

work.

The contract, awarded in August to the Chesapeake-based Cottrell, permits the dredging of 1.1 million cubic yards of sediment from the federal channel. Cottrell will pump dredge material by

pipeline to Craney Island Dredged Material Management Area in Portsmouth. Cottrell is dredging to a depth of 52 feet below mean lower low water, a formula based on the lowest tide's average height measured over a 19-year period.

The Author

Doyle

William P. Doyle is CEO & Executive Director of the Dredging Contractors of America.



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Channel Deepening & Widening

Managing the Physical and Economic Impact of Channel Deepening and Widening on Surrounding Structures & Pipelines



he U.S. economy is growing, with the lifting on the export ban on crude oil in 2015 opening new markets worldwide. Combined with the Panama Canal expansion that opened in 2016, the reasons are clear why U.S. ports have worked toward increasing the depth and width of their channels to al-

low for larger ships with greater capacities. The equation is generally: bigger ships = more throughput = increased profitability.

But what are the impacts around a channel after it's widened? The ripple effects may go further than you think.

Managing the Impact of Channel Improvement Projects on Structures and Pipelines

With more water to impact them, structures around an expanded channel may need improvements, and pipelines under the channel may need relocation to make way for dredging. Streamlining the process to account for these changes takes a considerable amount of early coordination and collaboration amongst stakeholders.

Many disciplines of expertise are required to make these channel deepening projects happen — from engineers (coastal, geotechnical, structural, electrical, civil and more) to environmental scientists and permitting specialists who help comply with the federal, state and local regulatory laws to protect the environment.

Ripples Affecting Docks, Bridges & Bulkhead Structures

Many structures are situated on or around shipping channels such as dock facilities (including wharf and jetty platforms, mooring and breasting structures, approachways and catwalks) bridges, navigation towers, coastal floodwalls, piers and bulkheads. When channels are expanded, each of these structures is influenced by the ripple of more water in a deeper and wider channel. As the original built environment changes, owners of these structures must reassess their structural and geotechnical integrity.

Facility Capacity

If dock owners want to take advantage of the expanded channel and service larger, more efficient ships, they need to determine the serviceability of their facilities. These larger ships typically require additional mooring and berthing capacities, berthing depth and overall size (length and width) adjustments, and at times, modifications and/or upgrading of the existing mechanical equipment like loading arms, hoses, piping and gangways. For the facility to handle increased structural and throughput loads, owners must undertake studies like passing vessel analyses, maneuverability assessments, integrity analyses of existing structures, equipment operational envelope studies, mass balance studies and existing component condition assessments. These studies can be involved and require a methodical process. They often take considerable time to complete. Facility owners can save time and money when accounting for these studies early in the planning and execution stages of channel deepening and widening projects.

Pipeline Relocation Ripple

Countless pipelines and tunnels run underground in and around shipping channels. Pipelines that may be uncovered or disturbed during dredging must be moved, requiring pipeline operators to plan for impacts on their businesses. As with impacted terminal facilities and docks, engineering analysis of soils, environmental mitigation and new permits are required for each pipeline relocation. From an overall cost and project schedule perspective, there are significant benefits in pipeline operators and port authorities working together during data acquisition, and particularly in geotechnical and regulatory phases. Early engagement of channel improvement project stakeholders and consultants is helpful as pipeline operators anticipate forecasted pipeline outage times during relocation.

How Is All of This Funded?

A variety of sources — public, private and public-private partnerships — fund channel improvement projects.

Government Versus Private Funding

When more private funding is involved in an improvement project, it typically decreases the time needed to get the project designed and constructed because there are less procedures and requirements. If the federal government is involved, the minimum standard for deep draft navigation projects is divided into 75% federal and 25% non-federal funding. For most cases when federal funds are involved, the federal government pays for the ongoing maintenance of the ship channel after the deepening and widening improvements are completed. Channel maintenance — continued dredging to keep the channel in the desired location — over the years can far exceed the initial capital improvement costs, so partnership with the federal government can save considerable expense over the project's life. Project stakeholders need to weigh the options carefully to find the best funding balance.

Who Pays for the Ripples?

Dock and structure improvements are typically the owner's responsibility to maintain and upgrade as needed whether the owner is benefitting from the channel deepening and widening project or not. All navigation projects operate under their own

guidelines and regulations. Therefore, there is no standard for funding pipeline relocations. Cost apportionment for publicly funded channels will be different from private channels. Cost sharing for channels developed by the federal government and supported by a local sponsor (likely the port) will change based on when the channel project was "authorized" by Congress. The current guidance indicates the local sponsor is responsible for half the pipeline relocation cost, and the pipeline owner is responsible for the remainder. Upgrades to pipelines are the pipeline owner's responsibility. In rare cases, the local sponsor or the federal government will remove abandoned pipelines.

Economic Impact to Pipeline Operators

While substantial work and investment is required to relocate pipelines, many pipeline operators see an economic benefit when the effort leads to greater quantities of their product shipping to new markets. But what about the pipeline owners who may not benefit from the channel deepening and widening projects? Those pipeline operators incur unintended costs for little to no return on investment. Collaboration between all channel deepening and widening project stakeholders can



Photo: Scott Dobry Pictures

minimize costs for pipeline owners and others. For example, all stakeholders need to understand what's happening in the subsurface through geotechnical engineering investigations — though pipeline owners may need deeper geotechnical information for pipeline relocation designs than ports. To reduce expenses, those impacted could share the mobilization, demobilization and equipment costs for completing the geotechnical borings once. Not all stakeholders will require exactly the same data, but with careful communication and planning, resources can be combined and costs shared.

How Do We Prepare for the Ripples of Channel Projects?

Channel improvement projects ripple into many different areas and require much attention and coordination among port owners and the owners of structures, facilities and pipelines which are affected. Coordination, communication and cooperation between the various stakeholders along a channel often lead to a more efficient port. This can also result in a more profitable business environment for the beneficiaries of the channel improvement project, and result in more efficient handling of goods and services for the end user and/or market being served.

The Authors

Moore

Brent Moore manages HDR's ports and maritime practice on the Gulf Coast and is experienced in all aspects of marine projects from planning to design to construction administration.



McLellan

Neil McLellan is a senior project manager at HDR who leads multi-disciplined maritime teams along the Texas and Louisiana Gulf Coast. He has nearly 40 years of coastal engineering experience, including work on the multi-year Port of Houston Channel Development Project and a federal feasibility study to deepen the Brownsville Ship Channel.



Thanks to contributing authors:

Paul Bearden, Christine Magers and Scott Marr.

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Cloud Technology

An Enabler in the Digital Revolution

The shipping industry is finally embracing technology that is changing how companies operate. Despite lagging behind other industries, the shipping industry is currently experiencing an exciting period of digital transformation, with cloud technology and mobile apps welcomed by leading global shipping companies, changing ship management forever.

Companies are increasingly using mobile apps to manage all aspects of their business – to automate tasks, manage their processes, resourcing and to improve the wellbeing of seafarers, a trend that is expected to continue as the benefits become ever more apparent.

Driving this change is the increased availability of reliable connectivity at sea and cheaper costs, which is enabling more companies to access affordable fleet management cloud solutions and mobile apps.

Companies no longer need to rely on paper-based systems and can start to take advantage of digital solutions and use smart phones to manage their operations.

What are the benefits for shipping companies?

Firstly, the technological revolution is benefiting crew enormously. According to Futurenavics Maritime's Crew Connectivity 2018 survey of more than 6,000 seafarers, 75% now use the internet at sea – an increase of 32%, or more than half a million more crew (520,000, to be exact) since the 2015 survey.

Seafarers are typically using three devices on board, with smartphones the most popular device, as well as laptops and even smart watches and fitness trackers, says the report. This is enabling crew to keep in touch with family and friends when they are away at sea, which is hugely beneficial to their overall wellbeing.

A study this year by international maritime charity Sailors' Society and Yale University found that more than a quarter of seafarers show signs of depression, while 45% of them had not approached anybody for help.

Having stable internet access allows them to communicate regularly with families and loved ones at home, plus they can use mobile apps to meet a range of needs, from mental health support and wellbeing, to knowing their rights and protecting the marine environment.

The Futurenavics Maritime report highlighted that there

are major business benefits too, and the industry has acknowledged the pivotal enabling role connectivity plays in every aspect of their operations. Investment in technology is growing as a result as shipping companies develop better understanding of how technology can help their business.

According to the Navis Business Bellwether report, which tracks the perceptions, intentions and mindset of the global maritime industry, approximately 90% of respondents expect their company to increase technology spending this year and 56% indicate spending will increase by six percent or more.

Secondly, one of the biggest advantages of having improved connectivity and the use of cloud solutions and apps is being able to share data in real time. This is fundamentally changing how companies operate.

In the past, accessing data and accurate information was a big challenge that often

wasted time and resources. Without the cloud, different teams would be inputting and storing data in different systems, and data may not have been accessible or accurate or shared effectively with others.

This needed to change. Having accurate and up to date business critical information in one place and accessible to staff on or offshore is key to improving communication and collaboration between crew members on and off the ship.

Cloud technology is improving decision making and eliminating the need for additional data exchange. Staff no longer need to spend time sending emails back and forth, requesting or forwarding information.

Management decision making is also improved. With one source of true data, operators have a complete 360-degree overview of their fleet and entire operations which means they can react immediately and confidently to accurate information.

Thirdly, another major benefit is that cloud software doesn't require big expense on new infrastructure and staff don't need to have great IT skills. Most shipping cloud software is intuitive and requires minimal training. This can encourage companies previously reluctant to introduce new technolo-



According to Futurenavics Maritime's Crew Connectivity 2018 survey

75% of seafarers use the internet at sea

Photo: Hanseaticsoft

gies to give it a try.

How are shipping companies using the cloud and apps?

Shipping companies are increasingly adopting cloud-based systems and using mobile apps on their smart phones to automate and improve tasks, from purchasing and stock planning, through to crew management and complying with regulations such as keeping track of waste, sewage and sludge disposals. Just as other industries have utilized apps, now shipping companies are using apps to manage their processes in a more accurate and reliable way. They can be particularly useful for areas such as purchasing, where companies benefit from web-based ordering and gain real time insight into budgets and operating expenses.

Companies are also using cloud-based solutions and apps to manage maintenance, so they can track and monitor jobs and repairs and add them to the system so they can be actioned immediately if needed. Plus apps are in demand for inspection reports, crew management and scheduling and stock taking.

Staff wellbeing can also be addressed using cloud applications. For example, Hanseaticsoft offers a module within their Cloud Fleet Manager platform where the shifts and rest periods of crew members can be tracked and monitored to ensure companies comply with industry guidelines and standards.

Shipping companies are finally getting on board with cloud technology and increasingly using apps. This is

bringing real benefits in terms of time saving and improved procedures on board, which in turn is driving huge efficiencies.

While many are sensibly taking a modular and gradual approach to in-

troducing cloud solutions and apps, it's clear the speed of digitization in the industry is accelerating. This is long overdue but the future looks bright for companies willing to invest and place their trust in technology.

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The Author

Buchmann

Alexander Buchmann founded Hanseaticsoft in 2009 to develop software solutions for shipping companies.




New York State



The OLLIS Class
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Photos: Staten Island Ferries/ESG

ate of Mind

A large orange and blue ferry ship is docked at a pier. The ship has multiple decks with windows and is surrounded by cranes and other maritime equipment. The background shows a body of water and a distant shoreline under a cloudy sky.

It takes a thick skin to live in New York City, let alone to run its Staten Island Ferry service. **James C. DeSimone**, Deputy Commissioner, Ferry Division, New York City Department of Transportation, has been charged with running the ferry service for the last 16 years. We met with him for his insights on the challenges of keeping the iconic ferry running safely and efficiently.

By Greg Trauthwein

▼ “When people start to talk about 2050 it still seems far off. But if we are sitting here now in 2020 talking about building a new class of vessels, these vessels will likely be operating up to or through 2050.”

Jim DeSimone has led a maritime life, with his time equally split between the private and public sectors. His maritime affiliation is literally in his blood, as his father Guy J. DeSimone was a 1936 graduate of and long-term, highly regarded professor at the New York State Merchant Marine Academy – which later became SUNY Maritime College – in the Bronx. In fact, Guy J. DeSimone is a SUNY Maritime Heritage Hall Inductee, credited with transitioning a nautical school into a fully accredited college. “We grew up on the campus,” said DeSimone, “around boats and on the water, so I always kind of figured it was my natural career path.”

After graduating SUNY Maritime, DeSimone sailed mostly on tankers, serving in nearly every capacity from Able Seaman through Master. He and his wife were enjoying the commercial shipping life living in Florida when the opportunity

came to return to his roots as the captain of the training ship and the commandant of the cadets at the Maritime College in the Bronx, NY. While he enjoyed his tenure helping to shape the next generation of mariners, after 10 years in academia, DeSimone was itching to get back to the commercial side, where he landed first as a senior vice president with Great Lakes Towing, followed by a stint as a Vice President of Operations for NY Water Taxis. Then, unexpectedly, the position with Staten Island Ferries opened up in the wake of the most significant accident in Staten Island Ferry history, the ferry Andrew J. Barberi allision of October 2003, an accident which included a number of fatalities and serious injuries. “For the city to go outside the system to hire was huge,” said DeSimone. “At the time, both the mayor and city council had a strong mandate to improve ferry operations, and to make

All in the (Maritime) Family: Left: RADM Michael Alfutis, President, SUNY Maritime College, with Jim’s brother Rich DeSimone and Jim DeSimone. Right: “An Officer, Gentleman and Educator” is how a plaque at the entrance of Fort Schuyler reads honoring **Guy. J. DeSimone**. Jim DeSimone’s Heritage Honoree plaque hangs next to his father’s.



Photos courtesy Jim DeSimone



FERRIES

changes in the wake of this accident.”

By the Numbers

The Staten Island Ferry is an iconic part of New York City’s history and future, carrying more than 25.2 million passengers on a five-mile, 25-minute trip per year, for free, courtesy of about 40,404 trips made annually between Whitehall Street in lower Manhattan to the St. George Ferry Terminal on Staten Island. The system operates eight vessels on the route, from the largest, 5,300-passenger Barberi class vessels (2), down to the smaller 1,100-passenger Austin class vessels (2), with a trio of 4,400-passenger Molinari class vessels; and the 3,000-passenger, 1965-built Kennedy. (There are currently three 4,500-passenger Ollis class ferries under construction, with the first to deliver in the Autumn of 2020).

Helping to ensure the vessels and terminals keep operating 24/7/365 is a

workforce of about 650, including 400 vessel personnel; 100 in maintenance covering all trades with the balance in administration and terminal staff.

The Staten Island Ferry is run by the City of New York for one pragmatic reason: To transport Staten Islanders

to and from Manhattan. “In the private sector, businesses exist for one purpose: to make a profit ... and there’s nothing wrong with that,” said DeSimone. “Government exist to provide services...By and large it was a pretty good system, but it was somewhat stuck in



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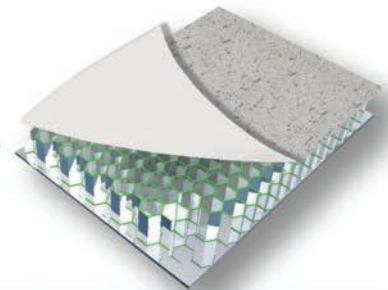
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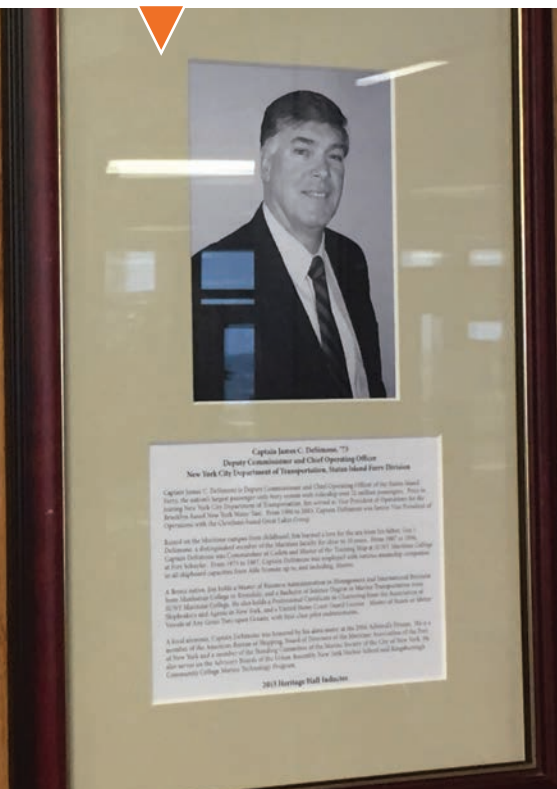
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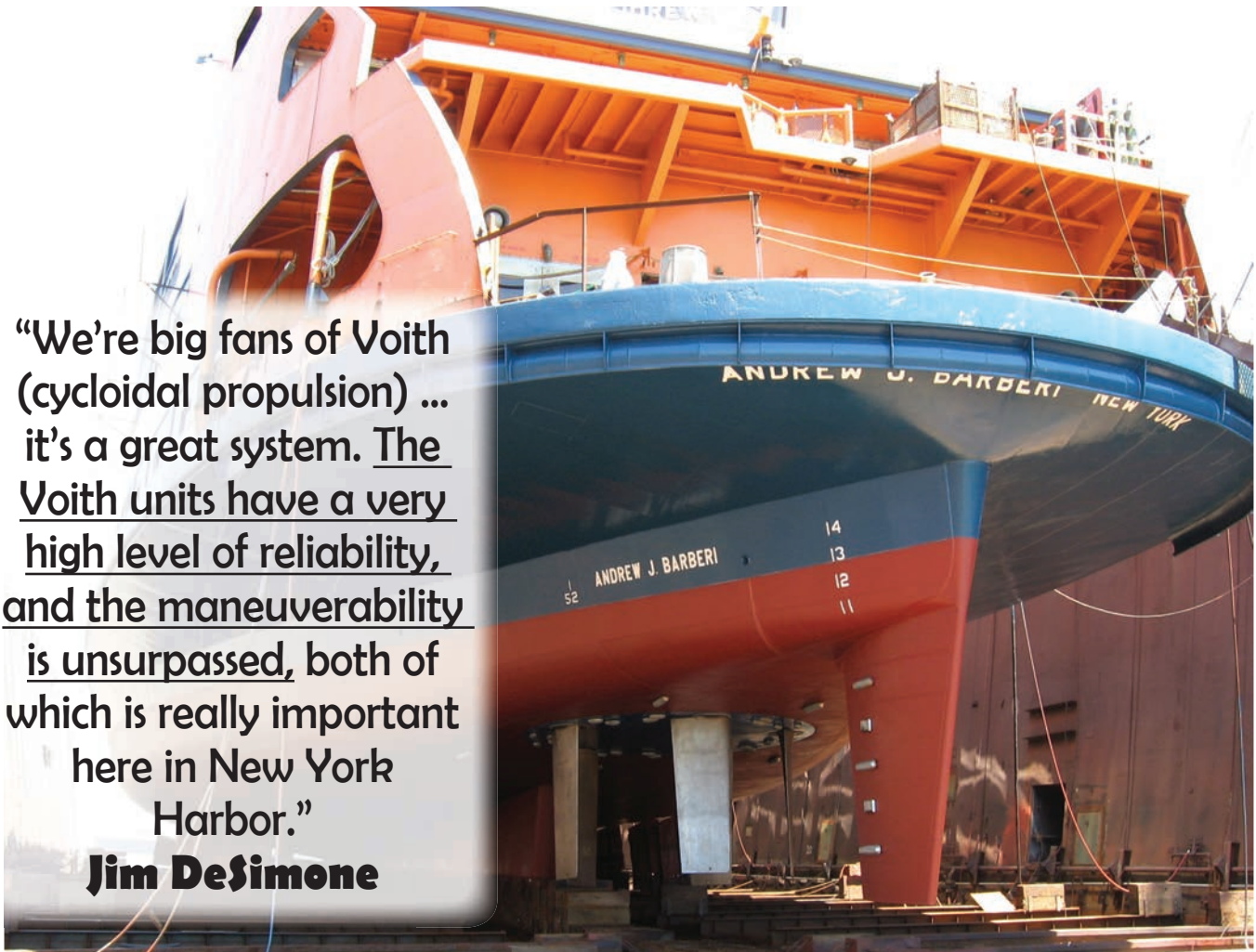
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“We’re big fans of Voith (cycloidal propulsion) ... it’s a great system. The Voith units have a very high level of reliability, and the maneuverability is unsurpassed, both of which is really important here in New York Harbor.”
Jim DeSimone



Photos: Staten Island Ferries/ESG

the past technologically,” said DeSimone. “They didn’t have speed logs, ECDIS systems and the like on the ferries, and they certainly didn’t have a Safety Management System.”

A Time for Change

The October 15, 2003 incident provided a wake-up call for the ferry service, and DeSimone and his crew set about making changes, from the foundation of a new Safety Management System that took nearly 18 months to devise and implement, to a top to bottom review of maritime training and education.

“When I started here (training) was based on mentoring and shadowing,” said DeSimone. “Since then, all of the training, mentoring and shadowing has been standardized. Today we have three mates that do all of the training for new marine employees to ensure that training is as consistent as we can possibly make it.”

Standardized training for Captains and Assistant Captains is docking in every slip – from Manhattan to Staten Island to the organization’s maintenance piers – on every class of ferry

and then signed off on by the captains.

In addition, Staten Island Ferries has worked with Marine Learning Systems on a blended learning and training platform for new deckhands and mates.

Staten Island Ferries owns and operates its own simulator, with another due to enter service soon, that is geared toward Bridge Resource Management (BRM) and ECDIS training. It seeks to maximize its training return by, for example, outfitting the new simulator with the actual equipment that will be featured on the new-builds. It also sends crew to SUNY Maritime for training as needed, with MITAGS carrying the heavier workload for Staten Island captain and assistant captain training courses in and out of the simulator.

“MITAGS has the Navigation Skills Assessment Program (NSAP), with all of our operating officers participating,” said DeSimone. In today’s world, before anyone gets moved up to an assistant captain or captain, they must complete the NSAP program in addition to evaluations from other captains and administration.

“When it comes to promoting a captain and assessing their

▼ “Karl Senner, LLC supplied the Reintjes Dual-Input Combining Gearboxes onboard the new Staten Island Ollis Class Ferries. Each ferry is equipped with two Reintjes DUG 3000P combining gearboxes. Each gearbox is driven by two 3,000hp EMD 12-710 tier 4 diesel engines, and drives a single Voith Schneider propeller on each end of the vessel.”

Karl Senner
President, Karl Senner LLC

skills, human evaluation is subjective and some of that’s ok,” said DeSimone. “But we were looking for a solution that would be as objective as possible.” NSAP, combined with human evaluation, provided the solution. In tandem with the design and implementation of the Safety Management System were several additional changes, including:

- A reshuffle of the interior hierarchy to make it look and act like a commercial shipping company, creating roles such as Director of Operations, Director of Engineering and Director of Safety & Security.
- Introducing a computer-based maintenance and inventory system. “When I joined in 2004, Staten Island

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The Ollis Class Ferries

Eastern Shipbuilding Group, Inc. (ESG) launched the SSG Michael H. Ollis (Hull 219) in November 2019, the first of three new Staten Island Ollis Class Ferries for the City of New York Department of Transportation (NYCDOT) Staten Island Ferry Division.

The Ollis Class Ferries are named after fallen soldier of the U.S. Army 10th Mountain Division at Fort Drum, ‘Climb to Glory’, Army Staff Sgt. Michael H. Ollis, a Staten Island native killed in Afghanistan on August 28, 2013, serving during Operation Enduring Freedom. The first of the series, Hull 219, is named in his honor. Staff Sgt. Michael H. Ollis, of the 2nd Battalion, 22nd Infantry Regiment, 1st Brigade Combat Team, 10th Mountain Division (Light), stepped into the path of a Polish officer, blocking him from the suicide vest of an insurgent who had raided Forward Operating Base Ghazni. Ollis has received several honors posthumously including: Distinguished Service Cross, Purple Heart, Bronze Star, Silver Star, The Audie Murphy Medalion, Polish Gold Star Medal of Honor, and the Afghanistan Star from Poland for his valor. He was 24 years old.

“Karl Senner, LLC is proud to supply the REINTJES Dual-Input Combining Gearboxes onboard the new Staten Island Ollis Class Ferries,” said Karl Senner, President, Karl Senner, LLC. “Each ferry is equipped with two REINTJES DUG 3000P combining gearboxes. Each gearbox is driven by two 3,000hp EMD 12-710 tier 4 diesel engines, and drives a single Voith Schneider propeller on each end of the vessel. We look forward to being able to ride the iconic vessels for decades to come and to a continued relationship with NYDOT.”

The three Ollis Class double-ended 4,500 passenger ferries, are from a design provided by Elliot Bay Design Group, with each ferry featuring four ABS Electro-Motive Diesel (EMD) 12-710 @ 900 rpm EPA Tier 4 marine propulsion engines with two engines powering one ABS Reintjes DUP 3000 P combining gear and one (1) ABS 36 RV6 ECS/285-2 Voith Schneider Propeller at each end of the vessel. Power generation is provided by three ABS, EPA Tier 3 marine continuous duty diesel generator sets, Caterpillar C18 driving 480 V, 60 Hz, 3-phase generators rated at 425 kW at 0.8 P.F. @ 1800 rpm.

Ollis Class Ferry Main Particulars	
ESG Hull #/Name	H219 - SSG MICHAEL H. OLLIS
	H220 - SANDY GROUND
	H221 - TBD
Length, o.a.	320 ft.
Length on Design Load w.l.	308.4 ft.
Beam, molded	70 ft.
Beam over guards	70.3 ft.
Depth at main deck at side	21.5 ft.
Design draft	13 ft.
Installed horsepower	9,980 hp
Fuel oil capacity	30,000 gal.
Min. seating capacity	2,551
Max. passenger capacity	4,500
Crew	16
Classification	ABS



Photo: Staten Island Ferries

FERRIES

Ferries did not have any engineering service agreements. Today we have on-call engineering service contracts for the boats and the terminals.”

- **The creation of a new security plan.** “Staten Island Ferries is considered one of the highest profile ‘soft’ maritime targets in the U.S.,” said DeSimone. Staten Island Ferries is also unique in that it owns both the vessels and the terminal operations, so “our security plan is a hybrid plan, with combined vessel and terminal facilities security.”

Building New Ferries

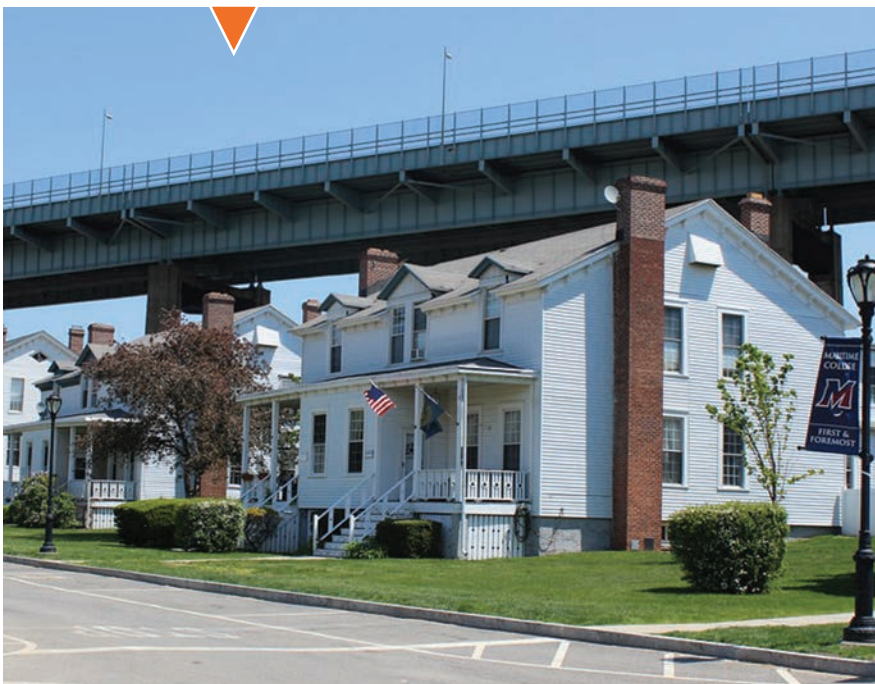
The decision to build new vessels is never taken lightly due to the tremendous upfront and life-cycle costs of an asset that is designed to last more than 30 years, or in the case of Staten Island Ferries 40 to 50 years, while operating in the harsh marine environment.

“The rule of thumb is if the cost of a life extension is 51% of the newbuild

cost, you build new. If it’s 49% or less, you extend the life of the current vessel. When we did our evaluation, our life-extension costs were close to 70%, and with passenger demand forecasts, the decision was easy (to build new).”

Currently Staten Island Ferries has a trio of 4,500-passenger, double-ended newbuilds with cycloidal propulsion under construction at Eastern Shipbuilding in Florida, with the first scheduled for delivering later in 2020, the last for delivery in early 2022. “We’re big fans of Voith (cycloidal propulsion) here,” said DeSimone. “It’s a great system. My first exposure to it was the first ship I sailed on when I graduated Maritime, a research ship.” Today the ferry system operates four vessels with the Voith system, the Barbieri class and Austin class. When making the decision on how to propel the new Ollis class of vessels, DeSimone and his team came in with an open mind knowing that maneuverability and reliability

Growing up Maritime: Jim DeSimone grew up, literally, on the campus of SUNY Maritime, where his father **Guy. J. DeSimone** was a long-time, distinguished professor.

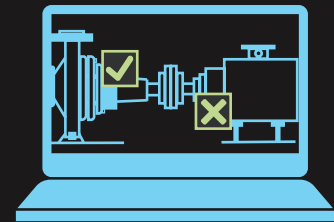


Photos courtesy Jim DeSimone

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The new ferries were designed with a number of “resiliency features” in mind, as in the wake of 9/11 and Superstorm Sandy the vessels would be used if necessary to help evacuate New York City.

John Waterhouse,
Chief Concept Engineer at EBDG

Better Ferries *by (EBDG) Design*

Elliott Bay Design Group (EBDG) served as the design lead on the new “Ollis” class of Staten Island Ferries. “We started with them at the end 2014 to make a preliminary design investigation,” said **John Waterhouse**, Chief Concept Engineer at EBDG. EBDG evaluated the overall operation, including the condition of existing vessels, crewing, maintenance routine, as well as a demand study for forecast growth. While the big orange passenger vessels may look identical to the general public, the process to design an asset intended to operate efficiently for 40-plus years entails much detailed planning. First and foremost, the new 4,500-passenger vessels had to interface seamlessly with existing terminals to ensure that the free ferry service maintains its “brisk schedule,” said Waterhouse.

In addition, the new ferries were designed with a number of “resiliency features” in mind, as in the wake of 9/11 and Superstorm Sandy the vessels would be used if necessary to help evac-

uate New York City.

According to Waterhouse, part of this resiliency is the Voith Schneider propulsion units, which allow “a great deal of maneuverability and control of the vessel when coming into places that might not be its normal dock.” In addition, the new design features side doors so that they can load passengers alongside instead of solely through the ends of the ferry. Some design alterations are simple tweaks with a big impact. For example, by looping in the Staten Island Ferry maintenance crew, the EBDG team found that on some vessels “there are more than 100 different types of light bulbs used. One of the goals on the new boats was to reduce that number,” said Waterhouse.

While safety ranks number one in Staten Island Ferry operations, maintaining its schedule is a close second. To that end, Waterhouse and the EBDG team took nothing for granted and examined the embarkation and debarkation process holistically. “They operate a fairly tight schedule, so anything that delays

the loading and unloading of passengers impacts their schedules,” said Waterhouse. “We took a lot of time observing their different boats and looking at the kinds of things that slow passengers from moving on and off the vessel.”

According to Waterhouse, the EBDG team tried to take into account the diversity of people using the ferry: Is it a daily commuter? Is it a mom with a stroller? Is it a tourist who has never been in NY, maybe never ridden a ferry? How do people decide which door to take? What are their sightlines so that they don’t pause just inside a door?

“It was all, in one sense, very subtle changes,” said Waterhouse, noting sightlines, wide doorways and ample spacing of ‘things’ to give people time to make decisions on where they wanted to go. “One thing we observed: the John F. Kenney is probably the favorite boat in the fleet, and I think a large part of that is because of the way it’s laid out, and the way people can move around in it.”

– Greg Trauthwein

are the top two factors, and the decision was an easy one based on a comprehensive propulsion trade off study and decades of experience. “The Voith units have a very high level of reliability, and the maneuverability is unsurpassed, both of which is really important here in New York Harbor” said DeSimone.

Cutting Emissions

Public organizations such like the Staten Island Ferries are under pressure, too, to reduce their carbon footprint. “When people start to talk about 2050 it still seems far off,” said DeSimone. “But if we are sitting here now in 2020 talking about building a new class of vessels, these vessels will likely be operating up to or through 2050.”

The new Ollis class ferries will be Tier IV. “We had an emissions projects here with the port authority (more than 10 years ago) which essentially funded the emissions upgrades on the Staten Island Ferries,” said DeSimone. At the time, the port was engaged in a dredging project to accommodate larger container ships, and the port authority needed to offset emissions to complete the project. “The Austin class actually was one of the first in the nation with an SCR system,” said DeSimone. “The new Tier IV vessels will have urea injection, too.” Publicly owned vessel operators must take particular care when integrating new technologies, as reliability of service is paramount. Case in point, the Staten Island Ferries trialed bio-diesel more than a decade ago, but while bio-diesel comes with environmental promise, there are also problems, as DeSimone explained. “The use of bio-diesel in the marine environment is very limited. In our case, we have medium speed, higher horsepower engines with fuel purifiers onboard. The purifiers tend to take the ‘bio’ out of the fuel, and the purifier filter clean-up became a huge issue. If the filters aren’t kept clean, you bog the engines down and increase maintenance issues.”

But DeSimone and his technical team keep an open mind, looking for proven technologies that can help it achieve its mission safely, cost-effectively and in step with evolving legislative mandate. While the large, orange double-ended ferries carrying nearly 5,000 people are the vision that most have of the Staten Island Ferry Service, there is another smaller specialty ferry that, upon its replacement, will serve as the testing ground for a new all-electric solution.

The ferry Cosgrove currently runs between City Island and Hart Island, Bronx, a contract with the coroner’s office to deliver bodies to the ‘Potter’s Field’ there. At the time of this interview, the design for the new ferry was just about complete and ready to go out for bid on a new all-electric plug-in ferry, measuring roughly 60 x 40 ft., to replace Cosgrove. “We thought that would be a good opportunity to look at electric in step with the IMO initiative to cut emissions,” said DeSimone. “This one is small enough that the technology – the batteries and motors – are commercially available. For the rest of our fleet, the technology is simply not there yet.”

When it comes to emission reduction, DeSimone and his team are not remiss to look at new and emerging technology. But caution is heightened as reliability is paramount for this public service. “I think it’s important that we have proven technology,” said DeSimone. “We’re not going to experiment with the backbone of our fleet.”



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Photo: Royal Caribbean Cruises Ltd.

Data Driven Tech Selection

Royal Caribbean Cruises Ltd. (RCCL) has set an aggressive environmental benchmark for itself: By 2025 it aims to further reduce its fleet's actual carbon intensity by 25%. This goal, if achieved, will put RCCL 10% above and five years ahead of the levels mandated by the International Maritime Organization (IMO) for 2030. The bar is high and the goal is an actual reduction of carbon footprint – not offsets, not 'green washing.' *The path to its success is paved with digitalization.*

By Greg Trauthwein

“We had an email chain (on a specific coating technology recently) and they asked ‘what is your opinion?’. “We both said ‘we don’t have an opinion, ask Anshul.’ He has all of the data.”

Patrik Dahlgren, SVP of RCCL’s Global Marine Organization



Though cruise shipping represents a scant percentage of the world fleet in total, it is the public face of shipping for many, as its luxuriant, billion+ dollar ships sail directly ‘downtown’ to major cities globally. But being ‘20/20’ in public vision is a double edge sword; on one hand it raises public awareness and helps to power a brand’s potential growth; on the other, it puts a target on your back, or more accurately your stack, as environmentalists and legislators push for reduced emissions from the ships. RCCL is a long-tenured global leader in the cruise sector, with six brands currently under the its umbrella comprised of 62 ships with 15+ ships

on order. Designing vessels for a rigorous 30+ year work schedule and keeping the fleet in good working order is a 24/7/365 job, ably conducted by Patrik Dahlgren, SVP of RCCL’s Global Marine Organization (GMO), and a team of 150, a team based on land in Miami, Hamburg, London, Shanghai and Madrid, with nearly 1,000 trained professionals physically on the ships at sea. All told, RCCL’s GMO provides technical, nautical, energy management, asset management as well as “a long list of portfolio services” for the entire fleet.

As the commercial marine industry traverses a transcendent period with decarbonization and digitalization leading

the charge, RCCL’s GMO team predictably has its plate full to source, test and install technologies and systems to help it meet its goals on efficiency and emissions. “We have more than 200 individual technical projects that are currently open and in the portfolio right now,” said Dahlgren. “Some are energy efficiency, some lifecycle projects; and this is not just all R&D.”

Chill Out

The maritime industry is generally portrayed as conservative and slow to change. “Because of how the industry works you are looking at replacing technology that (in some cases) is 20 years

A dark blue advertisement for CANAL. The background features a glowing, abstract pattern of blue and white particles, resembling a starburst or a digital data stream. The word "CANAL" is written in large, white, sans-serif capital letters. Below it, the text "Advanced Marine Electrical Engineering" is followed by "Hybrid & ZeroE Power Solutions and Full Lifecycle Engineering". A list of services follows: "Study | Design | Integrate | Build | Install | Commission | Service". In the bottom left corner, there is a logo for "ISO 9001:2015 Certified Quality Management System". In the bottom right corner, the website "www.canal.ca" and phone numbers "905.685.9293 | 1.844.814.0620" are listed.



“Out of all of the efficiency projects that I have ever done, this (chiller replacement project) is the best return on investment that I’ve ever seen for energy savings.”

Anders Aasan, VP Global Technical Solutions



The chiller solution provided to RCCL by Multistack.

of its data analytics projects in house, it increasingly relies on key technology partners to help it find innovative solutions.

“The last few years we have had more of an open mind to look beyond the traditional marine suppliers for solutions,” said Dahlgren.

A good example is when RCCL analyzed energy use on the hotel side of its operations and zeroed in on its air conditioning chillers, as AC consumes up to 50% of the hotel side of power. RCCL teamed with Multistack, a company that started 10 years ago on landside, non-marine installations, to design a system which shifted from one large chiller to eight smaller compressors per chiller unit, a solution which not only increased redundancy and reliability, but helped it save 30-50% in AC energy consumption.

“Out of all of the efficiency projects that I have ever done, this is the best return on investment that I’ve ever seen for energy savings,” said Anders Aasan, VP Global Technical Solutions.

But companies seeking to partner with RCCL on technology development proj-

old,” said Dahlgren, citing some 486 IBM computers that are still “operating things.” Shifting from old to new tech is not simply ‘remove, plug and play,’ rather “it is a complete paradigm shift of what you can do with the new technology,” he added.

This is where the collection, processing and use of data – and Anshul Tuteja, Associate VP Global Fleet Optimization – come into play. RCCL has been aggressively moving to use data as the disruptor and a driver, starting more

than four years ago when Tuteja join the RCCL team from Maersk Line.

“We have a multiple sensor network on board. It’s a neural network, like in your brain cells. It brings (raw data) to a consolidated machinery automation system station, and from that station we collect all the operational data tags. We collect billion data tags from our fleet yearly. There are on an average 2,000 different variables that we collect from a ship daily.”

While RCCL conducts the majority

Photo: Multistack

ects are forewarned to come to the table with tangible numbers and proof, particularly where claims of energy savings are concerned.

“Ask Anshul, he has the data”

Coatings used on the RCCL fleet is another point of intense focus, particularly for Tuteja and his data analytics team, as making a mistake on the coatings for a ship can have a considerable impact on hull fouling thus increased drag and fuel consumption. Coatings are a particular concern because of the cost in time and money to put the ship in drydock, blast off the old coatings and apply new ones. All told, while the paint itself might cost around \$300,000, getting stuck with the wrong coating and a fouled hull could cost up to \$2-3 million more in fuel due to the additional drag in the five years between drydockings, according to Tuteja. From the perspective the RCCL GMO team, coating manufacturers have entered a dynamic period of rapid-fire new formulations and product development in the quest to keep hulls clean and reduce fuel consumption; increasingly sophisticated coating mixtures that often come claims of fuel savings.

“We use our system to verify the vendors,” said Aasen. “The vendors come to us and claim a 6% savings. Anshul pulls out the numbers and it’s actually 4%. He pulls out the data and there is no discussion.”

“We had an email chain (on a specific coating technology recently) and they asked ‘what is your opinion?’” added Dahlgren. “We both said ‘we don’t have an opinion, ask Anshul.’ He has all of the data. The data shows what’s right and wrong. This has nothing to do with my opinion about any coating.”

The data driven approach has helped RCCL winnow down its number of paint suppliers from close to 10 to “a few selected suppliers based on their product performance,” said Tuteja.

To help deliver even better results RCCL partnered with Maersk Line and its fleet of nearly 600 ships on a coating strategy to share data to make the selec-

tion of coatings more analytical, less anecdotal. “We sit on the data, we have all of the ships connected, we see ship by ship how much fouling they have year after year between drydocks, we see which coating technology each has ... and then we can plan,” said Dahlgren.

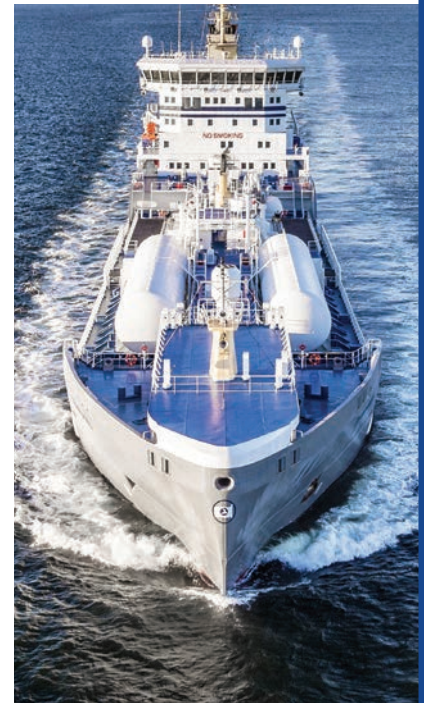
“If the paint doesn’t perform in years

two through five, it’s going to have a big repercussion on our fuel efficiency,” said Tuteja. While RCCL is quick to demand proof of product performance claims, it realizes the power of partnership and is open to data sharing with valued partners to help augment and improve its own data, and ultimately the

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“We don’t want AI to replace the human brain. It must work in tandem. What we’re doing is trying to assist the onboard crew to make better informed decisions. It’s about the right data to the right people at the right time to make the right decisions.”

Anshul Tuteja,
AVP Global Fleet Optimization

Captain Henrik Loy & Ovation of the Seas in 2016. RCCL seeks to use technology to assist – not replace – decision making of ship crews.

Fuel of the Future

While vessel efficiency, energy conservation and emission reduction are at the core of most every RCCL GMO project, they, like most ship owners and operators, are in a quandary regarding the clear means and method to achieve ever tightening emission reduction mandates. RCCL spends billions of dollars each year to fuel its fleet, and though the path is fuzzy, the mission is clear. “One of the biggest challenges that we have today is emissions reduction,” said Aasen. While the year 2050 and the IMO’s mandate for a 50% absolute reduction in greenhouse gas (GHG) emissions may seem a lifetime away, ships being built today will likely still be operational in 2050. To achieve maximum value for the asset over its lifetime, and with no clear vision of how the ships will be fueled three decades from now, a certain amount of flexibility must be considered from the outset.

“Scrubbers are the route we chose for now, but I really hope we are not building scrubber ships 10 years from now,” said Aasen, citing cost and a host of is-



Photo: Royal Caribbean Cruises

performance the product and of the ship. “If they are able understand how their coatings are performing throughout the lifecycle of the coating, then they can improve how they invest in their R&D,” Tuteja said. “If we win, they win; it’s a mutual benefit.”

When a ship is delivered RCCL closely monitors the ship performance, and “once we have the reliable data we create the baseline, and once we have that baseline we can track the performance of the ship,” Tuteja said. “In this whole

process – the data-driven decision making on hull coatings – we have seen a gain of 3-5% in propulsion efficiency since the inception of our hull coating strategy.”

Hand-in-hand with coatings is frequency and effectiveness of hull cleaning, “because no matter how good the coating is, you’re going to need to clean your hull.” In this regard Tuteja sees great promise in the future of an efficient robotic hull grooming for the RCCL fleet.

sues surround the durability of materials throughout the system and auxiliaries on RCCL's 28 ships outfitted with scrubbers. In choosing scrubbers, Aasen said that quality of material is a critical consideration to avoid repairing or replacing components earlier than anticipated.

"We paid a premium for our scrubbers, because we wanted a hybrid – closed loop and open loop – that comes with a neutralizing agent," said Dahlgren. "Even with all the tests showing that scrubber discharge into the ocean is not harmful, we made the conscious decision that we would not discharge anything unless we are at least 12 miles offshore – hence the hybrid solution."

The hybrid solution emerged from internal environmental conscious rather than regulatory mandate, and the price premium is stiff. "Cost wise it's about \$2 to \$3 million more (on the Capex), and about \$60-100/MT of fuel scrubbed, depending on the sulfur percentage content of the fuel," said Tuteja.

"We see the scrubbers as a good transition because it uses residual fuel," said Dahlgren. "So you see the sulfur oxides coming out, you see a 10-20% reduction of Particulate Matter (PM), ... so the scrubbers provide a better emission reduction solution than simply going with MGO."

RCCL sees too that there is not a single fuel solution. LNG has potential, but the scalability is "still not there," said Dahlgren. "We're trying to look for the alternative fuels of the future, we're looking in many directions at the moment but we haven't found the single solution."

Melding New & Old

"Digitalization is no longer the future, it's already here and part of all that we do," said Dahlgren. But he quickly points out that technology in and of itself is not the answer. Digitalization and the advent of autonomy will augment, not replace experienced captains, engineers and crew. "What's missing is that some of the tools we've developed, it's gone so fast, that you sometime forget that it'll be a veteran engineer, which

is the person that's going to use it. You need to do a lot of co-development not just with the vendor, but also include the end user, the experienced engineer, to combine 'experienced brains with the new artificial intelligence' to build out these new solutions."

Potential clashes in the 'technology versus seafarer' question can be seen throughout the commercial maritime landscape, as vessel owners increasingly receive and develop reliable tools to manage more vessel functions from shore. Captains, who are professionally



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RCCL & ABB: Podded Propulsion Pioneers

By eliminating the rudder as well as traditional fixed propellers, RCCL not only improved maneuverability of its giant ships, but also cut fuel consumption by 10-15 percent.

Pictured is **Marcus Höglblom**, Head of Passenger Vessel segment at ABB Marine & Ports.



Photo: ABB

When asked to identify the marine technology that has most significantly transformed ship operations, **Anders Aasan**, VP Global Technical Solutions, Royal Caribbean Cruises Ltd. doesn't hesitate: "podded propulsion systems; with the size of the ships today, it would be very difficult to maneuver them (in and out of ports) with traditional propellers and rudders." By eliminating the rudder as well as traditional fixed propellers, RCL not only improved maneuverability of its giant ships, but also cut fuel consumption by 10-15 percent. RCCL's partner for pods is ABB.

"RCCL is one of ABB's pioneering customers that make their choices based on clear vision for shipping's safer, more efficient and sustainable future," said **Marcus Höglblom**, Head of Passenger Vessel segment at ABB Marine & Ports. In 1997 Royal Caribbean Cruises ordered its first Azipod propulsion system to be installed on board the largest cruise vessel of its time, MS Voyager of the Seas. "The system consisted of three Azipod units, with combined propulsion power of 42 MW. Since propulsion

claims more than half of the energy used by RCCL ships, remarkable operational fuel saving was accounted by improving efficiency and the maneuverability," said Höglblom.

"The pod improves efficiency, and it improves the maneuverability significantly," said **Patrik Dahlgren**, SVP of RCCL's Global Marine Organization (GMO). "When you build really large cruise ships like when we started with the Voyager class, there were two Azipods and one fixipod." The fixipod was left off of subsequent newbuilds, and the Azipods continued to be mounted in pairs, with the redundancy providing backup propulsion if one fails. "If you lose one shaft or one propeller on the traditional ship, it's very difficult to maneuver," Dahlgren said. "If you lose one Azipod versus two, you can still maneuver fairly well. You can still sustain most of the itineraries even with one pod."

While ABB and RCCL have pioneered pods, the scope of ABB's supply to the cruise line is diverse and deep. "There is a wide range of ABB's electric, digi-

tal and connected solutions that have been supporting sustainable, efficient and safe operation of RCCL's vessels for over two decades," said Höglblom. "Many of the RCCL's vessels feature ABB's complete electric power plant concept – a solution that encompasses electricity generators, main switchboards, distribution transformers and a remote control system for maneuvering the Azipod units from the bridge. The combination of Azipod propulsion and ABB's electric power plant concept makes it possible to configure all the equipment for optimized performance, resulting in increased efficiency and lower emissions."

"Additionally, many of the RCCL's vessels feature the ABB Ability Marine Remote Diagnostic System (RDS), which deploys sensor-driven onboard monitoring software that fully integrates with analytics ashore. Vessels that leverage the RDS package benefit from clear maintenance savings as digitally connected on-duty engineers can solve cases remotely 24/7, which reduces visits to vessels by at least 30%."

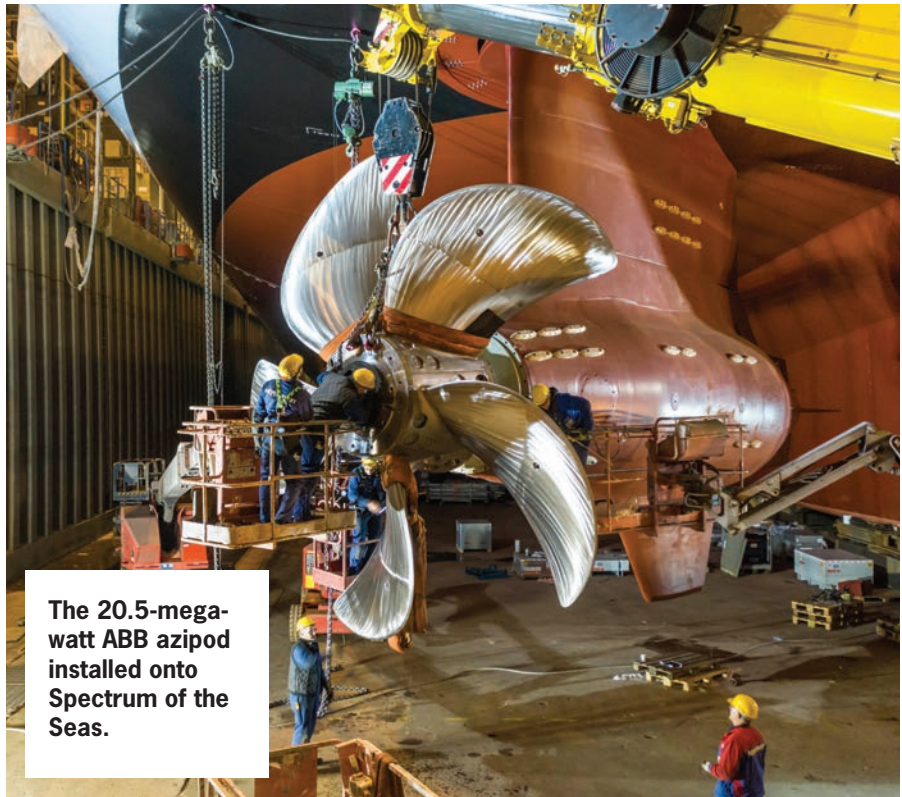
and legally responsible for the vessel and all souls onboard, are accustomed to having their word be final.

Melding new tech solutions, such as precise weather routing, can help to dramatically improve vessel performance and fuel efficiency. To this end, the RCCL GMO team is particularly keen to not simply dictate a route to the captain of a ship, rather work with the captain and the bridge team to suggest alternatives for consideration. It's a fine line, but a necessary walk in the quest to leverage both experienced people and emerging technology. "There will always be a need for that experienced maritime person and mind," said Dahlgren, a former ship captain himself. "New technology should make easier some traditional jobs, it should not take over from the experienced engineer. There needs to be a combination of both."

Tuteja puts the RCCL philosophy simply: "The human brain is at the core. We don't want AI to replace the human brain. It must work in tandem. What we're doing is trying to assist the onboard crew to make better informed decisions. It's about the right data to the right people at the right time to make the right decisions." As the RCCL GMO team develops and evaluates new technologies, it is keen to engage the captains and chief engineers early and often for their insights and feedback, to not only ensure the viability and value of the new tech but to help facilitate change management among veteran crew.

"Look at your phone," said Tuteja. "There are millions of apps, but you don't download them all, you only download the ones that adds a value to you on a daily basis. The same is true for the captain and chief engineer: they're only going to use something that they believe adds value, optimizes the operation and reduces administrative burden."

In summarizing RCCL's broad use of data to run ships more efficiently, bolstering the bottom line and cutting emissions, Dahlgren summarizes: "This has been an incredible journey, with a return that has been financial, emission reduction, and reliability. It has been amazing."



The 20.5-megawatt ABB azipod installed onto Spectrum of the Seas.

Photo: Royal Caribbean Cruises

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Brazil Market Gains Momentum

By Claudio Paschoa

After years of stagnation, the Brazilian Cruise Market is again starting to show some signs of growth. Since the 2012/2013 season, a continuous reduction in the flow of cruises along the Brazilian coast led to a decrease in the number of ships and consequent lower supply of beds and routes, amid a drop in the number of passengers embarked. This decrease was due to the unfavorable moment that the local economy was facing and the consequent reduction in local guests. During the 2018/2019 season, seven ships operated on the coast for 841 days (5.4% more than the previous season), carrying a total number of approximately 462,000 passengers. The 2019/2020 cruise season is in full swing and it is going to be a longer season. The first ship to dock on the Brazilian coast was the MSC Fantasia, on November 15, in Salvador, and the last will be the Costa Fascinosa, on April 14 in Santos for an eight-day Easter Cruise; the first time that Brazil will have an Easter Cruise. Despite this short-term recovery, the Brazilian market is still a long way behind its peak of 805,000 passengers back in the 2011/12 season. Yet, the new government is supporting the local cruise industry. “We want ports specifically built for tourists. It’s not acceptable any more to receive passengers in between containers,” said the Minister of Tourism, Marcelo Álvaro Antonio. The longer, 2019-2020 season will have 928 days of navigation to destinations much desired by local and foreign tourists alike, with Rio de Janeiro, Santos, Búzios, Salvador, Ilha Grande, Ilhabela, Ilhéus, Balneario Camboriú,

Portobelo, Cabo Frio, Recife, Angra dos Reis, Maceio, Ubatuba and Fortaleza. The list is complete with the news of the season, Itajaí, in Santa Catarina, which once again is receiving ships and will have departures and arrivals. “If estimates are confirmed, this season will be the third consecutive period of growth, after five consecutive seasons of retraction. The sector generated \$483.4 for the national economy in the 2018/2019 season. It is expected that in 2019/2020 this impact will be \$510.5 million,” said Marco Ferraz, president of CLIA Brazil.

The number of ships in the Brazilian cruise season started reducing in 2011/2012 until reaching seven vessels in 2016/2017, number maintained in the current season. The industry has been continuously reacting by increasing the efficiency of ships and routes, by increasing the average number of cruisers per ship per season and recently by renovating cruise ship ports and bettering port services. In early 2019 there were expectations that there would be 8 ships for this season, but in the end MSC pulled one ship to home port in Buenos Aires, Argentina.

For this season, MSC brought the Seaview (the largest and most modern vessel to sail in Brazilian waters), Symphony, Fantasy and Poetry, in addition to MSC Musica, (Not counted as part of the Brazil fleet as it departs from Buenos Aires, Argentina), but the MSC Musica will have stops in Brazil. The Italian shipping company Costa operates the Pacifica and Fascinosa, and Pullmantur offers trips aboard the Sovereign - chartered by CVC Tours. Together (Including the MSC Musica),

the ships offer 531,121 beds, along 144 routes and 575 port stops. There already is a forecast that there will definitely be 8 ships for the 2020/2021 season.

Business opportunities generated by cruises are not restricted only to ports cities, but also to other cities, which may not even be located in coastal areas. This is due to details concerning the local productive chain, which contracts services and purchases products in different regions of Brazil, in addition to cruise and tour sales, which are mostly done by travel agents spread across the country. The cruise industry generates economic impacts through expenses incurred by travelers, crew and by ship owners during the cruise season in Brazil.

With the objective of expanding port infrastructure for cruise tourists, the Minister of Tourism, Marcelo Álvaro Antonio, announced in August that the BNDES (National Bank for Economic and Social Development) is studying the viability of making available a credit line to build 15 ports in Brazil, many of which may be dedicated cruise ports during the cruise season.

That would be very important because there are very few ports in Brazil with modern and efficient infrastructure catering to the cruise industry. “We expect cruise travel to increase by 6% in the 2019/2020 season, which would represent the third consecutive period of growth in Brazil. To keep up with this rapid growth, Brazil has taken significant steps to receive ships in new ports, increasing capacity and improving the overall experience for travelers,” said Marco Ferraz.



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Eye on Cruise Ship Design

Vessels of all size and variety sport increasingly spectacular design elements

By Barry Parker

Cruise pundits and travel professionals have increasingly come around to the view that the vessels are as much a part of the overall “experience” as the ports of call, both nearby and far away. Vessel designers must deal with the utilitarian aspects of vessel architecture, but also must consider the ephemeral side of vessel design, where the vessel itself becomes the destination (or provides an integral complement to port visits) and must therefore offer something memorable.

At a time that lifestyle-driven Virgin Voyages has now taken delivery of *Scarlet Lady*, its first of four vessels, from Fincantieri, (with Ritz Carlton’s entry into the market not far behind) one need only look at advertisements in the travel media to see this interplay in action.

Interiors matter, all across the wide spectrum of cruise brands and demographics. Quite simply they are passenger facing, an essential portion of the overall passenger travel experience.

In *Virtuoso Life*, a publication aimed

at affluent travelers, Regent Seven Seas Cruises (a brand within Norwegian Cruise Line Holdings, along with Oceania Cruises, which describes its vessels as “designer inspired”) invites potential customers to experience an “intimate atmosphere,” with “intricate design details <that> create an elegant and relaxing space” in its suites.

The advertisement highlights touches such as “Fine stones and marble, custom furniture...” and other hallmarks of luxury. Sometimes, the interior and exterior

Fine Dining
Cafe Al Bacio on
Celebrity Edge.
Image: Celebrity



“Entertainment on board needs to be spectacular, with the wrap-round LED screens and state-of-the-art lighting technology for ‘World Stage’ theaters on HAL’s Koningsdam and NieuwStatendam comparable to the latest Las Vegas hotel attractions.”

Trond Sigurdsen
Chairman of YSA Design



Photo: YSA Design

blend together; Celebrity Edge (delivered late 2018) and Celebrity Apex (entering service in April 2020) offer an ‘infinite veranda’, which as implied, “...with the touch of a button, your entire living space becomes the veranda.”

Carlos Reyes, the Weston, Fla.- based Managing Partner at Tomas Tillberg Designs said “The conceptual approach of a vessel developed for a mass market and a smaller vessel developed for either high-end or expedition are completely different. The guest of each product is looking for a completely different experience and the priorities of each one are distinctive. For instance, the high-end products have a high ratio passenger/crew, even 1-to-1, which of course demands a larger areas allocated for crew accommodations relative to mass market vessels in proportion.”

Noting that the smaller vessels (which fit into the river and expedition segments) may emphasize landside geographies, he said “The high-end guest of a smaller vessel, does not expect endless alternatives to be entertained on board all-day long, he expects a relaxed and fulfilled time on board in different ways. The guest of an expedition vessel is also completely different, a guest who expects the opportunity to explore remote and unique places ... not paying top priority to the specifics of the accommodations because he takes for granted that those will be extremely well thought out and appropriate.”

Curated art collections, now de rigueur across multiple demographics (not merely at the ultra high end), can be found on both new and refurbished vessels. Celebrity Edge, repositioning to the Mediterranean in April 2020, features a vast assemblage of photographs, sculpture and

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“immersive spaces.”

The collection includes “Jiao Long” the delicate and elaborate sculpture of a galleon made from artificial pearls, which was created by British artist Ann Carrington, which Celebrity explains was installed “... to enhance the space and celebrate the history of travel.” A set of large size photographs in the Café Al Bacio, by an Australian artist, Alexia Sinclair, are also aimed at celebrating travel and journeys.

Design specialists, some not surprisingly, with landside “hospitality” pedigrees have been able to infuse their expertise into the creation of unique onboard environments that draw passengers in.

Trond Sigurdson, Chairman of YSA Design, based in Oslo, tells Maritime Reporter, “YSA Design keeps a close eye on latest hotel trends, which to an extent influence expectations when it comes to the luxury of the spa, the dining experience and the comfort of the grand cabin.” He emphasized the dramatic, saying, “Entertainment on board needs to be spectacular, with the wrap-

round LED screens and state-of-the-art lighting technology for ‘World Stage’ theatres on HAL’s Koningsdam and NieuwStatendam comparable to the latest Las Vegas hotel attractions.”

For his part, Reyes originally worked in hotel design.

“When it comes to fabrics, the range of choices for ships is limited, compared to landside hotels, because of rigid requirements on flammability and toxicity from the International Maritime Organization (IMO).”

This was borne out in comments from Anke Kondek, President Schmitz Textiles, a producer of performance textiles, who explained that: “In the case of decorative fabrics on a cruise ship, the strict regulation by fire standards in the form of IMO certification is an additional factor...” adding that: “These standards require both technical and high financial investments on the part of the producers and represent a significant barrier to market entry not only for textile producers.”

The nature of vessels also presents challenges, Reyes said, “Both industries

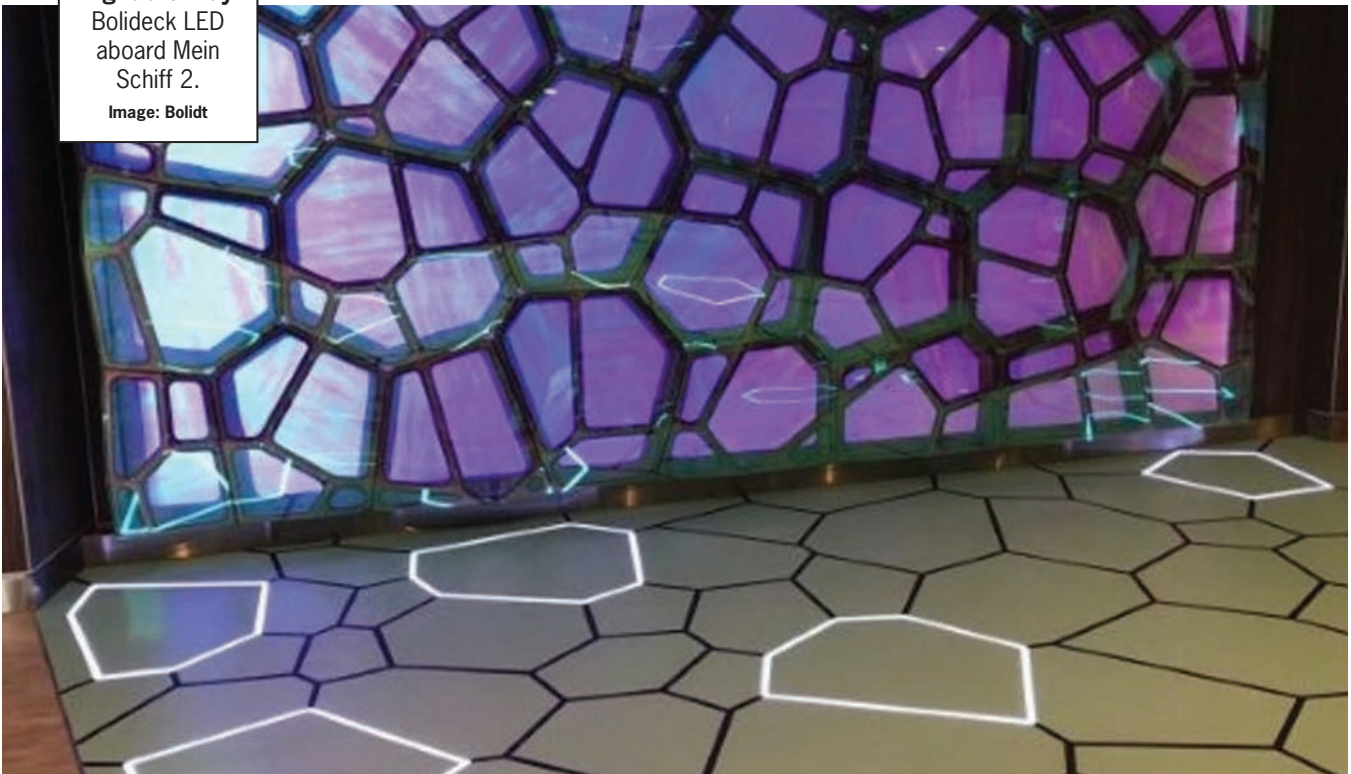
have the common goal of serving and satisfying a guest during the time they spend with them. Despite the mutual influence, the differences are very big. Even though there are very large hotels serving to thousands of guests, the percentage of those relative to their market is not as much as the percentage of cruise ships or passenger vessels serving thousands of guests relative to that industry. The cruise ships are used to offer a great experience of their guests in the thousands at a time.”

Kondek, from Schmitz Textiles (which serves both landside hospitality and a Who’s Who of the cruise business), explained an additional set of challenges for suppliers to the cruise sector, saying, “As a rule, guests on cruise ships expect an elegant hotel ambience in cabins and public areas.” But vessels require a very particular expertise. In contrasting hotels and vessels, she adds that: “... market and decision-making structures are completely different, which is almost self-explanatory in view of the entirely different challenges involved in building hotels or ships. In contrast to the

Light the Way

Bolideck LED
aboard Mein
Schiff 2.

Image: Bolidt





“The cruise lines are extremely competitive ... also from the design perspective ... the design is what differentiates one from another and make a customer either come back or choose a given product over another.”

**Carlos Reyes,
Managing Partner,
Tomas Tillberg Designs**

planning and realization of a hotel project, the value chain for the construction of a cruise ship extends globally across several continents.”

But there are practical implications as well, with Reyes explaining, “The accommodation spaces in ships are smaller than the ones in hotels, but still a cabin on a cruise ship must offer a great sense of space and comfort and also be extremely efficient to the guest and to its operation. On the other hand, public areas are more extensive in a cruise ship than in a hotel, where often offer large outdoor facilities and activities if it is a resort, or large conference and gathering facilities if it is a business hotel, but almost never to the extent of variety and percentage of the total area that is dedicated in a cruise ship.”

Expansion in the industry can be seen most dramatically by MSC Cruises, in the midst of a 13-ship newbuild program, though 2026 (including five which will be LNG powered). Design teams used by MSC Cruises have included YSA Design, which has played role in spicing up the dining areas. YSA Design created the arrangement for the Chocolaterie, inspired by famous pastry

chef Jean-Philippe Maury, aboard a trio of MSC vessels – MSC Bellissima, MSC Meraviglia, MSC Grandiosa – all of which debuted in 2019. A description in an MSC brochure points to the way that design is driven by customer experience (rather than the typical counter one might find at a landside coffee shop), the cruise line explains: “Located on the Promenade of MSC Meraviglia (operating out of Miami before embarking on a transatlantic run during April), this chocolate and coffee cafe features an open-front chocolate atelier for guests to observe fresh chocolate being made live.” The Oslo based studio has also created the venues for the Hola! Tapas Bars aboard MSC Bellissima and MSC Grandiosa (cruising Asian and Mediterranean waters, respectively) and, again, stresses the need to provide an authentic experience. YSA explained that “The use of metallic structures in the ceiling, rough bricks and copper pots that double as chandeliers create a unique warm and inviting ambience whose charm and authenticity is reinforced by the use of tactile materials.”

Designers often collaborate with particular suppliers. Such is the case with

YSA and Bolidit, best known for its Bolideck range of sustainable flooring solutions, including its well-known Future Teak product used throughout the industry. YSA Design and Bolidit have worked together on numerous cruise projects, both internal and external, on vessels such as Koningsdam, and Costa Serena, in the Carnival family, among others.

Bolidit has a long involvement in the cruise business. In recent years, it has dramatically upped its technology and creativity quotients. Two years ago, decking with a “glow in the dark” feature was introduced – Bolideck Glow; Jacco van Overbeek, Bolidit’s Director of Maritime, tells Maritime Reporter that this innovation is now in wider use among cruise customers. And last year, Bolideck LED – a unique flooring with integral LED lighting – launched and has been installed on some recent ships including TUI Cruises’ Mein Schiff 2.

A further development and ‘world-first’, using motion and movement detecting sensors, appropriately called “Sensor Deck”, is in the final stages of testing. Instead of using electrical connectors (which always would have the

CRUISE SHIPPING INTERIOR DESIGN

possibility of a short circuit), the decking is embedded with a pressure sensitive liquid. But there is also a more serious side. When tied to an alarm system, the Bolideck LED product would provide notification if passengers are entering a restricted area

Alarms aside, recent Bolidt projects showcase the fun side of cruise projects with a unique artistic slant. Aboard Mein Schiff 2, the Bolideck LED embeds LED lighting into the flooring, primarily for decorative purposes, while also providing safety benefits. Bolidt said: “It allows lighting to be programmed to operate in various patterns, with levels of control at the level of individual LEDs.” The result, they say, is the ability to generate “...an expressive color palette which lets designers unleash new levels of creativity.” On the TUI Cruises vessel, the novel product is deployed in one bar, and in passenger access areas; it is also part of a “floor diamonds” piece of artwork. While Bolidt is at the cutting edge of technology (with a recent “Innovation Center” opened alongside the

Noord River, not far from Rotterdam), the company views itself as “...an enabler for designers and artists to create beautiful spaces.”

Geographical considerations influence design in a big way. YSA Design’s Trond Sigurdson said that Costa Venezia (built 2019, 5,200 pax) is designed for Chinese guests eager to experience the style and elegance of a visit to Venice from the comfort of a luxury ship cruising in regional waters.

He explains that the vessel “...evokes both the city’s intimate alleys and the subtle majesty of its open spaces. One of its stand-out areas is the two-deck ‘Magrodome’ on the Lido deck, which was developed by YSA Design to resemble a Venetian hotel courtyard, including its own cooling water fountain and pool.”

The concerns of increasingly socially conscious travelers extend far beyond lively (and restaurants with the correct sense of place) YSA Design says: “... where the green agenda is concerned, no detail should be too small for consider-

ation...” and add that “In making materials selections, we therefore choose production methods which demonstrate lower carbon footprint ... and use only use wood from managed forests.” It also cites a cooperation with onboard air conditioning specialist SCENSO, where they increase efficiencies while reducing the hotel load, saying that cruise customers are “... increasingly looking to move on from fixed rate ventilation systems to balanced systems that work in combination with sensors and demand more active air cleaning methods ... such as ionization.”

Reyes from Tomas Tillberg Design, sums up the importance of the interiors, saying “The cruise lines are extremely competitive from many perspectives, also from the design perspective, which cause a rapid pace in the development of innovative designs and concepts. Aside from their particular service model, the design is what differentiates one from another and make a customer either come back or choose a given product over another.”

Chocolate Flow

Chocolate shop
aboard MSC
Meraviglia.

Image: MSC Cruises



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Cruise Shipping

Marine Evacuation Systems

As the cruise industry continues to prosper, so too does Survitec, a specialist in marine evacuation systems (MES). Survitec has a history of more than 160 years, with 2020 marking the centenary since RFD, now part of Survitec, was founded.

The story of RFD's technology dates back to 1920 with the introduction of an aircraft floatation product, essentially an inflatable ring, to prevent planes sinking when ditched. This technology quickly evolved to become dual purpose also providing a means to rescue aircrew in an emergency.

As technologies and methodologies became more sophisticated, self-inflating life rafts became larger and in 1979, RFD launched the first ever purpose-built marine evacuation system.

Over four decades, the original product range has been enhanced through design and acquisition, now including such brands as DSB, SurvitecZodiac and Brude.

"Survitec is the original MES design authority," said Richard McCormick, Survitec's Technical Sales Director. The primary focus of any safety equipment is safety and reliability – especially in the context of survival products including MES. "If any one component does not perform, it could jeopardize the

Survitec is a specialist in marine evacuation systems (MES).



Images: Survitec

integrity of the product or system completely, not to mention the lives of those depending on it should disaster strike,” said McCormick. “It is therefore imperative that all critical safety equipment is correctly installed, regularly serviced, maintained and regulatory compliant. Crew training is also essential to ensure correct use of the equipment.” Survitec’s MES equipment is robustly engineered, comprehensively tested and approved to the latest standards. All told Survitec has installed and deployed more than 2,500 MES units on over 800 vessels worldwide.

The Survitec Range

Survitec offers an extensive range of bespoke MES solutions to suit individual vessels, offering capacities of up to 860 persons, using slide or chute-based technology, as appropriate, from evacuation heights of up to 33m. The largest single system, for example, the Marin Ark 2, is designed to evacuate 860 people in less than 30 minutes.

One of the latest references for Survitec’s MES is the Stena Estrid, the first of Stena Line’s new E-Flexer class of RoPax vessel, which was delivered from the AVIC yard in China at the end of 2019 and entered service on the Irish Sea between Dublin and Holyhead in mid-January 2020. Stena Estrid is fitted with the 100th Marin Ark 2 MES unit.

To start the process, Survitec engineers carry out a thorough evaluation of the ship’s design, its areas of operation, and the profile of the crew and passengers likely to use the system. Each system undergoes testing to the MSC 81(70) Paragraph 12.6 performance standards, which simulate real-life emergen-

cies, corresponding to Beaufort 6 winds and over 3m significant wave heights. This is in addition to Survitec’s own in-house tests.

“Survitec is also the only MES manufacturer to hold ISO9001, MED Mod B & D and AS100 Aero certification,” said McCormick. “This is an aviation industry approval standard, which is very difficult to achieve due to the extensive approval requirements.”

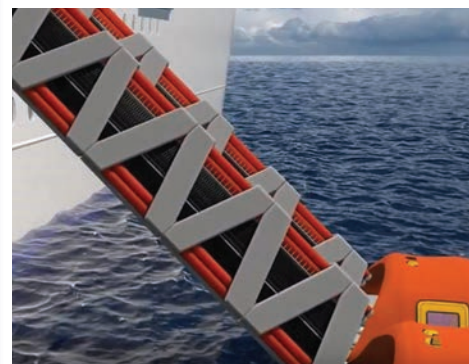
Extra quality measures are taken in the manufacturing and packing process to ensure reliability. “We visit our stowage subcontractor weekly to witness the build and all testing activity and our manufacturing process is overseen by independent quality personnel who perform in process inspection and testing, as well as end of line testing,” said McCormick. “To mitigate risk of human error once a system has been manufactured, Survitec employ experienced packers and, as an additional measure, adopt a buddy system to ensure conformity. Another additional measure is that we have an independent marshal process in place for our packing and stowage loading activity.”

Once a MES is installed and commissioned, Survitec takes responsibility for training customer’s personnel. Servicing and testing are carried out by the company’s approved service stations, each of which undergoes periodic, rigorous auditing to ensure that every MES is serviced to the same standards using the exact procedures regardless of location.

The company’s service network includes more than 500 service stations, and its online servicing platform is designed to enable fast and easy access to the full service and operational records of every system.



Seahaven inflated looking down slide.



Seahaven slide into a lifeboat.



Seahaven sailing away.

SEAHAVEN The Future is Now

Survitec’s latest innovation is the Seahaven Advanced Evacuation System (AES) designed for large cruise vessels. The AES is a slide-based evacuation system designed specifically for cruise ships, a system based on inflatable lifeboats served by multiple slides. With Seahaven, each lifeboat can accommodate 530 persons, a total of 1,060 in each system. The multiple slides are designed for quick evacuation for both able bodied and mobility impaired people, permitting groups to descend together. It is designed to be deployed in less than four minutes courtesy of its ergonomically designed launch system that does away with conventional davits.

Images: Survitec

Tech Talk

Cruise & Passenger

Cruise Shipping

Evolving from 'Supplier' to 'Partner'

Consolidation of MacGregor's cruise ship activities comes at a critical moment, as owners seek suppliers that can step up to be early-stage design partners, writes Mats Olsson, Cruise Ship Business Development Manager, MacGregor.

With latest estimates indicating that 120 large cruise ships worth \$72.7B are on order, and a surge in demand for expedition cruises has brought contracts for over 40 sub-200m length ships, the outlook is bright for this specialized market. The positives are not lost on MacGregor as it consolidates the cruise activities brought in via last year's acquisition of the TTS Group marine and offshore businesses. Both companies have been serving a prolonged building boom as 'mega' cruise newbuildings have continued to scale-up and a new breed of expedition ships has emerged.

MacGregor's 56-vessel reference list includes 23 ships on order, while TTS's reference list includes 60 vessels as well as 15 future deliveries. With capabilities extending to doors, platforms, mooring systems, cranes and winches, consolidation broadens the company's portfolio to include gangways and expands its shell door and platform portfolio. It also creates opportunities to enhance lean delivery of standard equipment to yard schedules.

In addition, the rise in scale of the largest ships and the sheer variety of expedition ship designs have demand-



ed equipment innovations to match owner ambitions. In step, MacGregor has evolved, converting owner visions into handling systems reality, and the MacGregor/TTS consolidation creates a technical partner positioned to add value from the earliest stages of cruise ship design.

Already, on the very largest ships, the ‘wow’ factor provided by attractions never before considered for deployment at sea must be based on design and engineering principles that work on ocean-going structures. High profile examples include the ‘Magic Carpet’ on the starboard side of Celebrity Edge, which was a project conceived in cooperation with the shipyard. With seating, a bar and space for live music, the 110 x 20 ft. platform can be raised above the top deck for ‘Dinner on the Edge’, aligned with Deck 14’s main pool, lowered to

▲ **The ‘Magic Carpet’ on the starboard side of Celebrity Edge offers seating, a bar and space for live music. The 110 x 20’ platform can be raised above the top deck for ‘Dinner on the Edge’ aligned with Deck 14’s main pool, lowered to Deck 5 to extend the ‘Raw on 5’ restaurant or descend to Deck 2 as a luxury embarkation station.**

Deck 5 to extend the ‘Raw on 5’ restaurant or descend to Deck 2 as a luxury embarkation station. The broader point is that the equipment supplier’s role extended back two years before delivery.

If MacGregor’s earlier involvement in the cruise ship design process is not yet the norm, it is certainly the trend, and it is one that is as apparent for expedition vessels as it is at the ‘mega’ ship end of the market. An example was the brainstorming demanded as part of MacGregor’s work with a major cruise line to develop a foldaway platform for a series of expedition ships. From the guest point of view, the outcome is an opportunity to truly immerse oneself in the Arctic spectacle. For the engineer, what is required is a sophisticated foldable, winged platform which can be extended 3m outside the vessel’s profile to provide a viewing balcony with clearance behind for a gangway system.

With next generation cruise ships heading for new destinations, the demand for technical partners to be involved early in the design project relates to hardware as well as software. Polar Class ships must be able to achieve safety and sustainability in a highly regulated environment, for example, which has consequences for watertight doors and materials, and for preferences on mechanical solutions.

Recent references include weather tight, reinforced hangar doors on board a series of expedition ships for helicopters

and hatch doors for submarines. Watertight doors have also been supplied for an ultra-luxury PC6 Polar Class expedition ship. MacGregor markets its own range of ‘Eco’ lubrication oils, but has also been focusing on all-electric shell doors where, for reputational reasons, guests visiting the pristine waters of the Arctic are likely to have zero tolerance for hydraulic oil spills. All-electric shell doors are less expensive to install and quieter than their hydraulically operated counterparts. In fact, the all-electric option is gaining ground in other parts of the cruise industry where the environmental imperative takes precedence; exemplary are the LNG-fuelled ships for both AIDA and Costa Crociere. It is also worth noting here that MacGregor has developed a special LNG bunkering door with class-approved design.

In the case of passenger access, one ground-breaking project was work to develop internal telescopic passenger gangways which offer 15° of movement up and down to accommodate a 5m-6m tidal range, such as those seen on TUI Cruises Mein Schiff series.

In summary, it is fair to say that when considering all the things that they want of a new cruise ship, MacGregor may not be at the forefront of an owner’s thinking. What is also fair to say is that owners increasingly recognize that their technology partners can help them optimize features before they go ahead and order.

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Tech Talk

Coatings & Hull Cleaning

Digitalization deployed to ensure

Clean Hulls, Lower Fuel Consumption

While owners have long recognized the link between clean hulls and lower fuel costs, lack of reliable data has slowed investments in optimizing hull performance. But with improved sensor technologies and data analysis tools, hull performance is getting a second look.

Owners seeking to lower fuel costs and comply with pending regulations on emissions and invasive species often look to equipment manufacturers to meet their needs. From new efficient engine designs to alternative fuels, scrubbers to ballast water treatments systems, owners face some expensive decisions. But with more vessels now equipped with onboard sensors and standardized tools to measure speed loss due to hull fouling, owners and fleet managers now have access to reliable data measuring the impact of hull and propeller performance over time. According to Manolis Levantis, Jotun Marine Analyst Manager, Jotun Marine has collected data on hull performance from different types of vessels on different trades for more than decade. “Jotun’s Hull Performance Solutions requires participating vessels to install sensors to en-

According to the Clean Shipping Coalition, poor hull and propeller performance accounts for around 10 percent of the world fleet’s energy consumption, translating to about \$30B in additional fuel costs for the world fleet, every year.

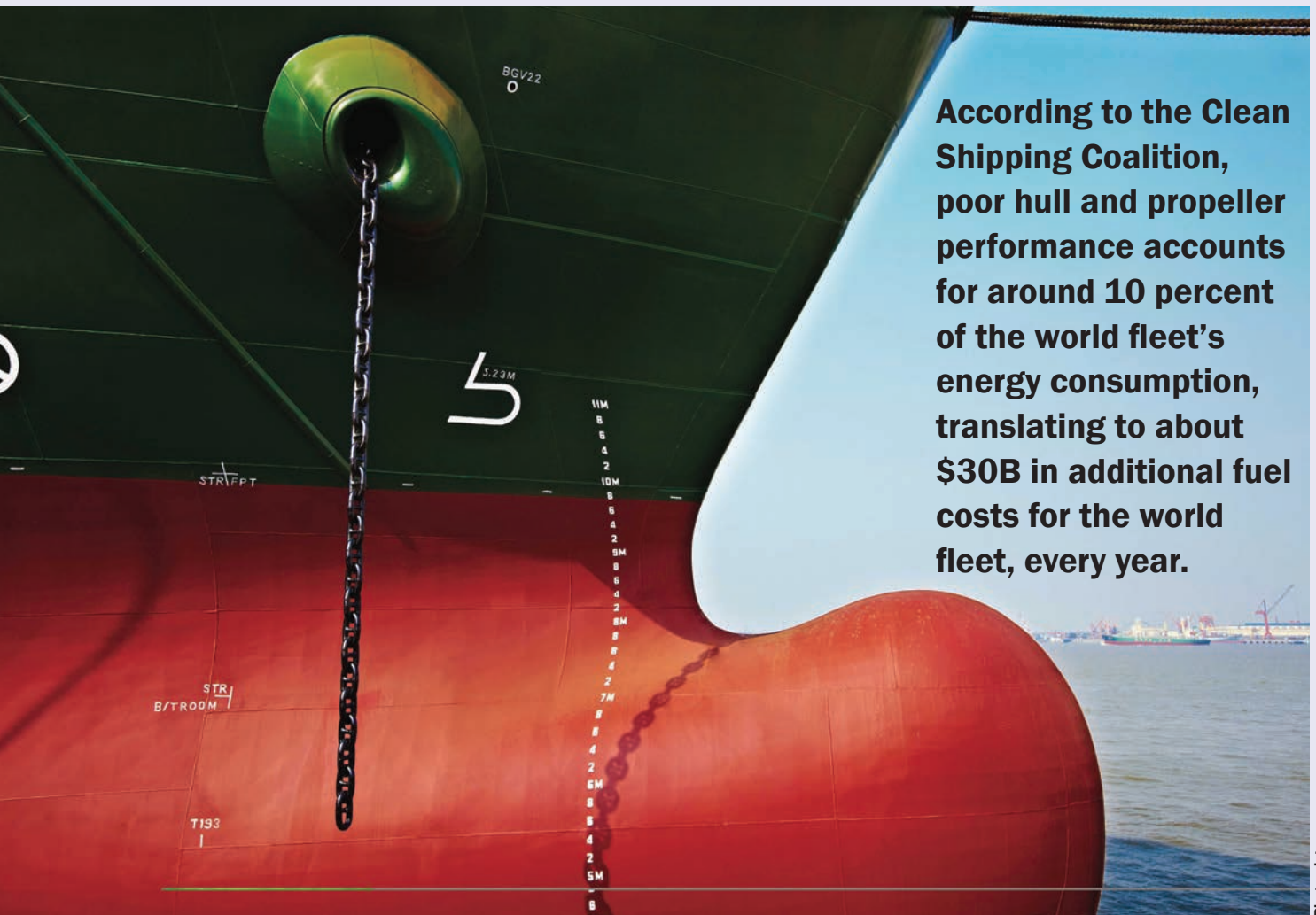


Photo: Jotun

able performance monitoring based on standardized principles (ISO 19030) for the measurement of changes in hull and propeller performance,” he said. “Since then, the company has amassed one of the industry’s most comprehensive data sets on hull performance.”

Levantis says that hull and propeller performance have a much larger impact on vessel efficiency than previously thought. “We estimate that the average yearly speed loss for all vessel types and trades, regardless of what anti-fouling is used, is about six percent,” he says. “For a typical bulk carrier, compensating for this speed loss would require an increase of power of up to 18 percent, resulting in higher fuel costs and GHG emissions.” Levantis is careful to note that Jotun’s data is taken from owners and fleet managers who are committed to improving hull performance. “When you consider that low freight rates over the past five years have discouraged many owners from investing in premium anti-fouling or sensor technologies, the market speed loss average may exceed six per cent.”

\$1.5M in Fuel Savings

While Jotun does not usually share customer data, the company worked in cooperation with Gearbulk in 2016 to measure hull performance. GearBulk, which operates the world’s largest fleet of open hatch gantry and semi-open jib

craned vessels, shared historical performance data from the cargo ship Penguin Arrow dating from January 2000, allowing for a full comparative analysis.

After installing sensors and applying Jotun’s premium anti-fouling, (SeaQuantum x200), Jotun was able to monitor speed loss over a 60-month period. The results indicated a speed loss of just 0.5 percent, resulting in an estimated fuel savings of \$1.5 million and a corresponding reduction of CO₂ emissions of 12,055 tonnes.

“Our data conclusively proves the link between hull performance and fuel efficiency,” said Levantis. “And with the IMO’s pledged to reduce the total annual GHG emissions by at least 50 percent by 2050 compared to 2008, we believe hull performance will play a greater role in helping owners and fleet managers comply with pending regulations.”

The Cost of Fouling

According to the Clean Shipping Coalition, the only international environmental organization that focuses exclusively on shipping issues, poor hull and propeller performance accounts for around 10 percent of the world fleet’s energy consumption, translating to about \$30 billion in additional fuel costs for the world fleet, every year. Burning this fuel adds 0.3 percent to shipping’s total greenhouse gas output, which, according to the IMO, is about 2.2 percent

of the world’s total – about the same output as Germany.

Failure to prioritize hull performance not only result in additional fuel costs, but also may expose owners to claims related to charter party agreements or additional costs for periodic underwater hull cleanings. At the same time, port authorities in Australia, New Zealand, California and the EU have become increasingly sensitive to biofouling risk, placing new requirements on owners.

Next-gen Hull Maintenance

While new anti-fouling technologies have drastically reduced speed loss between drydockings and more ports are offering advanced ROV hull cleaning services, pending regulations on emissions and invasive species will require a more proactive approach to hull maintenance. Increasingly, owners are seeking solutions to manage hull performance more effectively between dry dockings, when fouling occurs. After all, removing slime before marine organisms can attach to the hull would not only improve vessel efficiency and lower GHG emissions, but also help control the spread of invasive species.

“The industry now has access to historical data that makes a strong business case for optimising hull performance,” says Levantis. “As an analyst, I believe what can be measured can be managed – we don’t have to guess anymore.”



Lady A, Lady D | 37m Catamaran Passenger Ferries | Builder: Wight Shipyard Co Operator: Ultramar



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24/7 Voyage Security Risk Assessment

Risk Intelligence provides security data, information, analysis and assessment to enable safe navigation in areas of risk in an increasingly uncertain world. Tom Mulligan reports

Since its founding in 2001, Denmark-headquartered security information specialist Risk Intelligence has developed a fully integrated risk assessment and planning tool that provides valid, actionable intelligence to any fleet, on land, in port or at sea, 24/7/365. The company has three information and intelligence products that together assess security risks at sea, in ports and on land to serve the needs of stakeholders in the trans-

portation of goods by sea from point of production to point of sale:

- MaRisk, introduced in 2008, provides 24/7 maritime incident updates and security alerts as well as statistics, recommendations and guidance plus satellite fleet tracking to evaluate areas of risk at sea;

- Since 2015, PortRisk has been reporting 24/7 on port incidents when relevant and providing port data with IMO code, ISPS level etc. As well as security risks in port, PortRisk provides vulnerability and threat assessments, including city threat assessments and guidance for crew changes, as well as port security and emergency information;

- And the company's latest product, LandRisk, introduced last year after Risk Intelligence's 2018 IPO, is an end-to-end supply chain security solution designed to improve visibility and

awareness of disruptions, customize the user's risk profile and enhance the resilience of their supply chain, and optimize sourcing and logistics. In support of this, Risk Intelligence recently signed an agreement with the Transport Asset Protection Association (TAPA) to raise the visibility of cargo theft incidents by incorporating a vast number of TAPA's recorded theft incidents into its Risk Intelligence System.

How it works

So how does Risk Intelligence accomplish this? The company has an international Duty Watch Team updating the Risk Intelligence System 24/7/365 with intelligence gathering, verification and initial analysis and assessment for alerts and incident reports. The Duty Watch Team operates on a shift basis to give literally full-time coverage: after 8 hours of operation in Denmark, the watch passes to the North America of-

Risk Intelligence System data being assessed at the company's Hellerup offices, near Copenhagen.

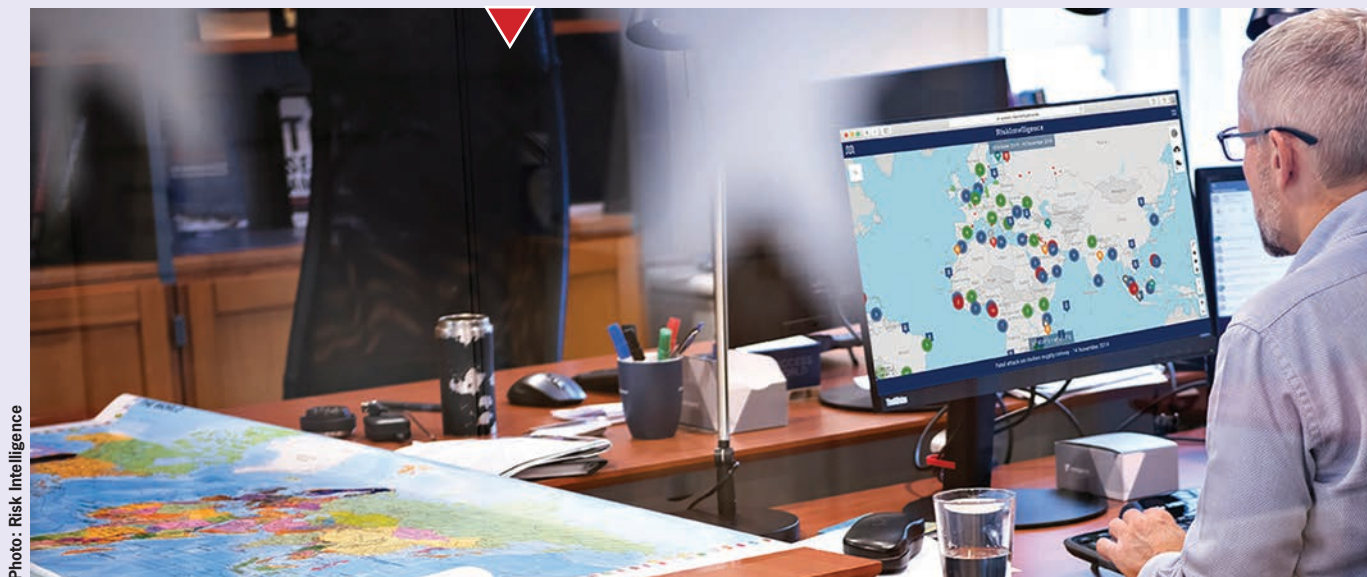


Photo: Risk Intelligence

fice; after the next 8 hours, Singapore takes over.

Risk Intelligence has a broad range of maritime transportation stakeholders amongst its clients: the company's shipping clients operate more than 7,900 vessels or 14.7 percent of the 53,800

world merchant fleet vessels engaged in international trade, while its oil & gas clients include all the Western oil majors. Insurance clients include such major companies as Norwegian War Risk (DNK) and Norwegian Hull Club. Its Government clients include eight NATO countries.

Data analysis


But data and intelligence are of little value unless analyzed. Risk Intelligence's analysts gather intelligence, information and data to produce intelligence threat and risk analysis through

verification, analysis and assessment. The Risk Intelligence System includes threat assessments on all relevant countries, sea areas, ports and cities as well as LandRisk areas and zones, while in addition other assessments are made for the company's weekly and monthly reports as well as bespoke threat and risk assessments for its clients. About 10-15 percent of all ports and offshore terminals on PortRisk are assessed through onsite port surveys: recent examples include reports on the security statuses of Mogadishu, Lagos, Port Harcourt, and Douala.

Voyage Risk Assessment Reports are another of the services the company provides: two recent examples include a survey of maritime security incidents in West Africa, 'Gulf of Guinea 2007-2018'; and several publications assessing the ever-changing security situation

in the Persian Gulf and Iran, including a decision brief produced in June 2018, 'Tanker transits through the Persian Gulf'; a July 2019 Whitepaper, 'Shipping operations in the Persian Gulf'; and 'Briefing Paper on Possible Iranian Retaliation', produced after the killing by the US of General Qassem Soleimani of Iran's Revolutionary Guard Corps on January 3 this year but before Iran had taken any retaliatory action.

Risk Intelligence's operations therefore not only use high-quality intelligence on uncertainty and risk to mitigate risk to crew and operations or avoid areas of risk but also use this high-quality intelligence on uncertainty and risk to improve maritime transportation stakeholders' commercial positions and help them take better-informed decisions about business in areas of risk.




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Furuno

Furuno's New Satellite Compasses

Furuno introduced two new compact Satellite Compasses. The SCX20 and SCX21 have added Baseline Target Architecture for multipath mitigation accuracy. The four-antenna array of the SCX20 and SCX21 Satellite Compasses are configured in a manner that creates six unique baselines from which to calculate accurate heading information, even in severe environments. The SCX20 connects to the ship's NMEA2000 backbone directly, while the SCX21 connects to onboard equipment via three fully configurable NMEA0183 ports. Both models provide accurate Time, Position, 1.0° Heading accuracy, COG/SOG, Roll/Pitch/Heave, ROT (10 degrees/second), 3-Axis Speed, and air temperature and pressure data. Their compact and rugged housing weighs only 2.2lbs (1kg), and pole mount kits are available to provide a simple installation on any vessel.

MAN Propulsion for Canadian Navy Tugs

Ocean Industries Inc. has ordered 8 × MAN 12V175D-MM, IMO Tier III-compliant engines in connection with the construction of 4 × 24-meter ASD tugs for the Royal Canadian Navy. The vessels are set respectively for delivery to Canada's major naval bases at Esquimalt, British Columbia and Halifax, Nova Scotia, with each location set to receive two tugs.

Under the contract, MAN Energy Solutions will also provide SCR (Selective Catalytic Reduction) technology for the engines, facilitating Tier III compliance, as well as ship service diesel-generator sets. Work on these components will take place at MAN's facility in Denmark, while its Canadian division will integrate the systems and additionally provide training, testing and support during harbor acceptance and sea-acceptance trials. Known as the Naval Large Tug (NLT) project, the new IMO Tier III vessels are based on a proven Robert Allan Ltd. RAmports 2400 design.



MAN Energy Solutions



Victaulic QuickVic

The 2" Victaulic Style 107N QuickVic Rigid Coupling is now approved by BV for: water seal/scrubber effluent, seawater, freshwater, deck drains (internal), water tanks/dry spaces, and others.



Viega MegaPress

Engineered to make connections in 16 seconds or less. Elbows, couplings, no-stop couplings, reducers, tees, reducing tees, adapters, reducing adapters, unions, caps and flanges, in sizes from from 1/2" to 4".



Rubber lined butterfly valves

W&O Supply's rubber lined butterfly valves are available in many variations: Wafer, Lug, Mono, Double Flanged Types with a flange connection of 5K, 10K, 16K, 20K, PN6, PN10, PN16.



End-Suction Centrifugal Pump

Carver Pump's horizontal end-suction pump is engineered to handle water, oils and chemicals in marine, process and general industrial applications. Hydraulic performance extends to 2,500 GPM.



Kongsberg for Mystic

Kongsberg Maritime won contracts worth \$32 million to equip three adventure cruise ships, with a fourth to follow, for Portuguese cruise company Mystic Cruises. Built by West-Sea Viana Shipyard in Portugal, the vessels are to be used for expeditions in the polar regions.

The 126-meter, 9,300-metric-ton luxury craft will join an existing trio of sister ships to bring the fleet to seven identical vessels, the first of which – World Explorer – entered service in 2019. Designed by Italian naval architect Giuseppe Tringali, the ships have an operating cruise speed of 16 knots and have hulls and propellers strengthened for use in ice, making them suitable to visit destinations which are not accessible to larger cruise liners. Each has luxury suite and cabin accommodation for an exclusive 200 passengers.

Kongsberg Maritime will deliver main engines, auxiliary engines, motion control, propulsion, power electric systems, automation and control systems. The equipment is scheduled for delivery on a per-vessel basis throughout 2020 and 2021.

Sperry Navigat 2500 & 3500

Northrop Grumman Sperry Marine launched NAVIGAT 2500 and 3500, its next generation high accuracy, maintenance-free Fiber Optic Gyro (FOG) compasses. The NAVIGAT family of compasses provide heading measurement in all kinds of dynamic conditions with compatibility to Sperry Marine CompassNet, the first networked heading management system. NAVIGAT 2500 and NAVIGAT 3500 are based on solid-state technology with no moving parts, offering compact size and low weight. They have very high 'mean time between failures' of 150,000 hours with no annual maintenance. The units have rapid alignment time once installed and unlike HRG compasses whose performance in harsh environments can become degraded over time, NAVIGAT FOG compasses have no moving parts and are said to provide a higher level of long term accuracy, especially for heading, roll/pitch, rate of turn and heave. NAVIGAT 2500 and 3500 are fully compatible with CompassNet. With simplified cabling, rapid installation and increased redundancy, CompassNet supports easier integration with existing sensors and third party equipment with reduced installation time and a phased upgrade path.



Sperry Marine



'Big Berty'

Australian Pump introduced Bertolini's new CAX Series heavy duty triplex pumps, offering pressures up to 750 bar and flows up to 25 liters a minute at 1,000 rpm. The pump head is stainless steel (316).



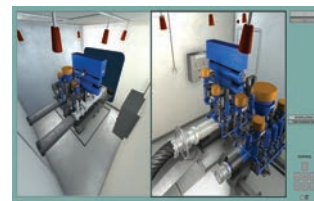
Mag Drive MICROPUMP

The MICROPUMP range of magnet drive gear pumps has been extended, for fluids handling applications with system pressures up to 103 Bar (1500 psi) and maximum differential pressures to 8.5 Bar.



Hybrid Transmission

ZF Marine expands with its first hybrid transmission, ZF 5200 A/V PTI, that can be installed in the ship in both V (V drive) and A (down angle) positions. It can transmit primary drive outputs of up to 3,500 hp.



LNG Systems Simulator

Wärtsilä's new LNG Bunkering & Supply System simulator aims to improve the level of training, and thereby safety, for operators of LNG systems. It covers all operations related to the use of LNG fuel.

In the Yard



Nauticor, Fassmer Cooperate On Newbuild RV
Hamburg-based LNG supplier Nauticor and Fr. Fassmer located in Motzen/Berne start cooperation in newbuilding and retrofitting projects for ships with LNG engines. This initial LNG bunkering operation for the “Atair” illustrates the importance of cooperation for projects, such as the first German research vessel running on LNG. Nauticor and Fassmer started working together back in 2015 when the newbuild ferry “Helgoland,” the first ferry with an LNG engine built in Germany, received its first LNG from Nauticor (then under the name Bomin Linde LNG) at Fassmer.

“K” Line Delivers Coal Carrier Tohoku Maru
Kawasaki Kisen Kaisha, Ltd., (“K” Line) has delivered the Tohoku Maru, a 91,000 DWT-type special coal carrier at Oshima Shipbuilding Co., Ltd. Tohoku Maru is same type as “K” Line’s specialized fleet for transport of thermal coal known as the “Corona-series.” The “Corona-series” consists of epoch-making coal carriers equipped with wide beam and shallow draft, which are said to be the most suitable type to enter ports of Japanese Thermal Power Stations to discharge cargo.



Scarlet Lady Delivered

Scarlet Lady, the first of four ships which Virgin Voyages ordered to Fincantieri, was presented at the shipyard in Genoa Sestri Ponente last month. Ironically the ship arrives during the height of the COVID-19 virus hysteria, which forced the ship to skip a planned stop in New York City on a shakedown cruise with nearly 1,000 ‘family & friends,’ onboard, rather heading straight for Miami. The ceremony in Italy was attended, among others, by the

President and CEO of Virgin Voyages Tom McAlpin, by the Governor of the Liguria Region Giovanni Toti, by the Mayor of Genoa Marco Bucci, all welcomed by the Chairman of Fincantieri Giampiero Masolo, and its CEO Giuseppe Bono.

Scarlet Lady is 110,000 gross tons, measuring 278 x 38 m. Valiant Lady, the second in the series, is currently under construction in the same yard, scheduled for delivery in 2021.

Automatic Ferry enter service in Norway

What is touted as the world’s first adaptive ferry transit conducted during normal service took place last month on a vessel fully loaded with passengers and vehicles, demonstrated fully automatic control from dock to dock, Kongsberg Maritime announced. The landmark crossing, a key step forward in the integration of autonomous technology into everyday shipping operations, was made possible by collaboration between shipping company Bastø Fosen, Kongsberg and the Norwegian

Maritime Authority (NMA).

The ferry Bastø Fosen VI will now use adaptive transit functions developed from Kongsberg Maritime’s advanced systems to enhance the daily operation of its Horten-Moss service, while continuing to carry a full complement of crew.

According to Kongsberg, the technology offers a platform for optimized fuel consumption and reduced greenhouse gas (GHG) emissions, as well as experience tangible operational cost savings.

Canaveral Pilots Partner with Glosten/Ray Hunt for Electric Pilot Boat

Canaveral Pilots Association (Canaveral Pilots) has partnered with naval architecture firms Glosten and Ray Hunt Design (Ray Hunt) on a pilot/demonstration project for the design, construction, and operation of an electric pilot boat. The boat will feature a battery-electric propulsion system with an emergency 'get home' diesel engine. Once in service, it will serve as one of two primary boats for supporting pilotage operations in Port Canaveral.

During the feasibility-level engineering, the team established that a Ray Hunt hull form outfit-

ted with a Glosten-designed battery propulsion system will achieve the speed and operating range required to support normal pilotage operations in Port Canaveral. "We are happy with how this is taking shape," said Morgan Fanberg, President of Glosten. "Ray Hunt brings a wealth of knowledge on planing hulls and pilot vessels, specifically. Combining that with our own experience in electric propulsion systems, we hope to provide an excellent working solution for Canaveral Pilots." Specific design details remain confidential at this stage, but the minimum performance criteria established by Port Canaveral included a cruising speed of 18 knots and an operating range (on battery propulsion only) of 24 nautical miles. Currently, there are no pilot boats operating in the U.S. with hybrid or fully electric propulsion systems. "The technology isn't necessarily new. The challenge is managing total weight in relation to the hull form and the required operating profile," says Winn Willard, President of Ray Hunt.



Glosten

The fully-integrated digital system on Bastø Fosen VI automatically performs all docking and crossing functions to a high and repeatable level of accuracy, ensuring that best practice is followed to the smallest detail on every transit. The result is more exact timekeeping and improved customer satisfaction: during trials in December, Bastø Fosen VI consistently arrived within two seconds of the scheduled time. Øyvind Lund, CEO, Bastø Fosen, said, "Today, at the press of a button, one of our vessels left the quay in Horten, crossed the Oslo fjord and docked in Moss, all completely automatically."



Kongsberg

Hempel Taps Lindström as COO



Hempel

Hempel Taps Lindström as COO

Katarina Lindström will join Hempel as Executive Vice President & Chief Operating Officer from August 1, 2020 as the coatings manufacturer aims to double in size over the next five years.

Obituary: George R. Duclos

George Raymond Duclos, age 86, passed away on February 15, 2020. The son of the late Raymond and Albertine (Bertha Chenard) Duclos, he was born in 1933 in Fall River, MA. At 22 years old, George joined Gladding-Hearn Shipbuilding in Somerset, MA. With the support of his partners and his family (especially his wife, Pauline), George grew the business to become recognized worldwide as the premier builder of small commercial vessels including high-speed catamaran ferries, pilot and patrol boats, tugboats, and research vessels. The company had built nearly 400 vessels upon his retirement in 2011. If asked, he would say his greatest joy and satisfaction came from working with his family and all the talented people at the shipyard.

Obituary: Wilhelmsen Passes Away

Wilhelm Wilhelmsen (1937-2020) passed away on February 22. Through a long career, he was a very well-

respected business leader and spokesperson for Norwegian shipping and the maritime industry at large.

Wilhelm Wilhelmsen represented the fourth-generation family owner of the Wilhelmsen group, a maritime industry group established by his great grandfather in Tønsberg, Norway in 1861. Although he had many positions in the company from a very young age, he formally joined as partner in 1964. In 1992, he accepted the position as chair of the board. Except for a short period as group CEO, he held the top position in the company until 2010. He remained active until the day he passed away.

Obituary: William “Johnny” Bull, Sr.

William John “Johnny” Bull, Sr., 77, passed away on February 14, 2020 at the Baton Rouge General Mid City “Butterfly wing”, after a battle with cancer. He enjoyed many years working in the Dredging industry with his brother-in-law and best friend, Thomas J. Wetta III Founder and Vice President of Dredging Supply Company, Inc. and was proud of the many beach projects he helped rebuild. He retired from Dredging Supply Company in 2013, now commonly known as DSC Dredge LLC, where he frequently declared that his favorite part of the job was “uncle” since he felt honored to work with nephews Bill and Bob Wetta.

Calhoun to Lead WCI

Waterways Council, Inc. (WCI) Senior Vice President Deb Calhoun has taken over as Interim President/CEO, effective February 18, 2020, following the retirement of President/CEO Michael J. Toohey, who led WCI since 2011. An executive search firm will select a permanent President/CEO.

Fitzgerald to Rejoin Crowley as COO

Ray Fitzgerald will rejoin Crowley Maritime Corp. as chief operating



Gladding-Hearn, a Duclos Company

Obituary: George R. Duclos



WCI

Calhoun to Lead WCI

officer effective March 1. Fitzgerald began his career with Crowley in 1987 and spent 13 years with the company – many of them in a vice-presidential commercial role within the liner services group. He then joined the Wallenius Wilhelmsen organization and over the past 20 years served in a variety of senior leadership roles.

McAfee Leads Resolve Alaska

Resolve Alaska, the northwest operating arm of the Resolve Marine Group, has appointed A.W. McAfee as its new Managing Director. McAfee will be responsible for overseeing Resolve’s operational response and recovery activities.

Madely Joins Ecochlor

Michael “Mick” Madely has joined ballast water treatment systems manufacturer Ecochlor in the newly created position of Vice President of Global Service. He will initially work out of the Ecochlor Connecticut USA office.

Younger Wins Engineering Award

Buck Younger, Vice President of Engineering with VT Halter Marine, was named the Marine Engineer/Naval Architect of the Year by the Mobile Area Council of Engineers (MACE). VT Halter Marine, Inc. (VT Halter Marine), is a company of ST Engineering North America.

Kirby Buys Savage Inland Fleet

Kirby Corporation signed a definitive agreement to acquire Savage Inland Marine’s towboat and tank barge fleet for approximately \$278 million in cash and the assumption of leases. Kirby will acquire Savage’s inland fleet consisting of 46 towboats and 90 tank barges with approximately 2.5 million barrels of capacity, and will also take over Savage’s ship bunkering business and barge fleet services along the Gulf Coast. Savage’s offshore marine

business and certain shoreside services including dock operations, management and logistics remain unaffected.

SGS, RCCL Enter Deal

Subsea Global Solutions (SGS) entered into a new agreement with its long term client Royal Caribbean Cruises Ltd. (RCCL) to provide underwater hull maintenance and repair services for its fleet of 58 ships trading under six different brands (Royal Caribbean International, Celebrity, Azamara, TUI, Silversea, and Pullmantur). SGS has been supporting the RCCL Group for more than a decade with various key underwater services spanning from hull cleanings and propeller polishes in strategic locations to very complex repairs world-wide with mission critical gear and equipment like tunnel thrusters, stern seals, stabilizer fins, and rudders. SGS Executive Director Harun Duzgoren said; “We are consistently investing into new technology and our people, and are confident that our new online reporting platform, coupled with our growing number of expert diver/technicians (140+) and a network of fully owned offices (13 worldwide), will help RCCL’s efforts in the areas of energy efficiency, digitalization, and environmentally friendly shipping operations.”



Ecochlor

Madely Joins Ecochlor



VT Halter

Younger Wins Engineering Award



Crowley

Fitzgerald to Rejoin Crowley as COO



Resolve

McAfee Leads Resolve Alaska

PETROSPOT

MARITIME WEEK AMERICAS



PANAMA

EVOLUTION OR REVOLUTION?: THRIVING IN A TIME OF MAJOR REGULATORY AND COMMERCIAL CHANGE

TRAINING: 18-19 MAY 2020

CONFERENCE: 20-21 MAY 2020

Maritime Week Americas is the biggest and most popular annual bunkering event in North, South and Central America and the Caribbean because of its top-quality content and unrivalled networking. *MWA 2020* in Panama will lift the bar even higher.

With the dramatic change brought on worldwide by the implementation of the IMO 2020 global sulphur cap on 1 January and the high sulphur fuel carriage ban implemented from 1 March – not to mention the upcoming IMO MEPC meeting and sharpened focus on shipping's decarbonisation – *MWA 2020* will examine the impact of regulation on international shipping, oil and bunker markets and try to shed some light on the future.

After a hugely volatile and unpredictable first quarter, what can be expected once markets have settled and price differentials have found their natural equilibrium? With TSP, compatibility and bio-component issues increasingly overshadowing concerns over sulphur content, what is the outlook for fuel quality and availability?

Gender equality will feature high on the *MWA 2020* agenda as will education and training.

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2020 Calendar of Events

NACE Corrosion

Mar. 15-19
Houston, TX
<http://nacecorrosion.org/>

Intermodal Asia 2020

(Rescheduled to July 14-16)

Mar. 17-19
Shanghai, China
www.intermodal-asia.com

Ferry Safety & Technology

Mar. 18-20
New York, NY
ferrysafetyconference.squarespace.com/

Asia Pacific Maritime

(Rescheduled to Sept. 30-Oct. 2)

Mar. 18-20
Singapore
www.apmaritime.com/

OTC Asia

(Rescheduled to August 17-20)

March 24-27
August 17-19, 2020
Kuala Lumpur, Malaysia
<http://2020.otcasia.org/>

Envirotech for Shipping Forum

Mar. 24-25
Rotterdam
www.envirotechforum.com

CMA Shipping

Mar. 31. - Apr. 2
Stamford, CT
maritime.knect365.com/cma-shipping/

Sea-Air-Space

Apr. 6-8
Baltimore, MD
<http://www.seaairspace.org/>

Clean Waterways

Apr. 7-19
Indianapolis, IN
2020.cleanwaterwaysevent.org/

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Apr. 21-23
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The poster features a dark blue background on the left with a ship's mast and rigging, and a golden-yellow background on the right with silhouettes of fighter jets flying over a sunset. A large, semi-transparent upward-pointing arrow is centered at the bottom.

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“Freedom” – the absence of subjection to foreign domination or despotic government

It has been decades since international relations in the world order dictated true competition for sea control, sea lines of communication, access to world markets, and diplomatic partnerships. However, it is becoming increasingly alarming that nations such as Iran, China and Russia seek to accumulate/consolidate power and re-define international maritime norms, potentially at the peril of diplomatic, economic, and military bonds that link NATO allies and critical partners.

Iran claims control of the Strait of Hormuz and has put the threat of closure or denial at the core of its asymmetric war strategy. In a 2019 statement in response to the U.S. plan to end waivers on Iranian oil exports, Alireza Tangsiri, head of the Iranian Revolutionary Guard Corps navy force confirmed that the Straits of Hormuz was a critical arrow in Iran’s proverbial military quiver. Tangsiri remarked that “If we are prevented from using it; we (Iran) will close it. In the event of any threats, we will not have the slightest hesitation to protect and defend Iran’s waterway.”¹

Renewed tensions between Iran and the United States, heightened further following the Trump administration’s decision to target Iranian Major General Qasem Soleimani, have renewed Iranian narratives about closing the Straits of Hormuz in an effort to break another set of renewed western sanctions. Carrying one-fifth of the world’s traded sweet crude oil, a possible interruption of oil and gas exports through the strategic waterway would have a significant, negative, impact on the global economy.² Moreover, it is not only oil. According to the International Energy Association, huge amounts of natural gas are also transported on that route with an estimated 33 billion cubic meters of gas, including from Iran and Qatar, passing through the Strait of Hormuz each year.³

Likewise, China’s attempts to rationalize and assert control of 80 to 90 percent of the South China Sea, including waters allocated to neighboring sovereign states under the U.N. Convention on the Law of the Sea (UNCLOS) are equally troubling.⁴ As author Bill Hayton aptly describes it in book *The South China Sea: The Struggle for Power in Asia*, the South China Sea is “both the fulcrum of world trade and the crucible for conflict.”⁵ The challenge posed by China’s re-

fusal to abide by international law in the South China Sea may potentially re-define the practical application of the concept of maritime freedom. Beijing is bullying its way through its selective application of UNCLOS to a maritime entitlement five times larger than permitted via the convention (China ratified UNCLOS in 1996) and customary international law, carving out an illegitimate sphere of influence.⁶ In effect, if Beijing gets its way, the South China Sea will become a seaward extension of Chinese territory and the ruling Chinese Communist Party will ipso facto dictate what foreign vessels and aircraft can and cannot do.⁷ The cascading effects for other critical SLOCs, from the Persian Gulf to the ever increasingly more accessible Arctic routes, could be severe if other coastal states, such as Iran and Russia, decide to press their own revisionist interpretations of maritime law.⁸

Many Russia watcher and analysts support the premise that Russia, through its confrontation with the Ukrainian Navy in the Kerch Straits in November of 2018 and its subsequent restrictions on shipping, is similarly trying to rewrite the rules in the Sea of Azov, just as China has done in the South China Sea. Experts such as James Holmes, a professor of maritime strategy at the United States Naval War College, agree that the Russian actions in the Black Sea region pose a challenge to international maritime law.

“It’s an effort to set a precedent that Russia can then apply to other seas that it would also like to dominate if not control, much as the South China Sea is an expanse that China would like to ‘own,’ ” he said. “If Russia can define the Azov Sea as Russian territorial waters, there is no reason in principle it could not do so in the wider Black Sea, the Baltic Sea, Sea of Okhotsk, et cetera. So this is an easy win for Moscow and an easy place to set that precedent.”⁹

In all of the examples above, the international norms and UNCLOS regulated system of maritime trade, commerce and military endeavors has come under direct challenge. In all such cases, it is incumbent upon maritime nations that believe in the freedom of the sea and require international sea based trade to maintain their quality of being, help defend this centuries-old concept that the high seas are a global commons. International waters belong to everyone and no one, with few, minor and narrowly defined exceptions. No state



(U.S. Navy photo by Mass Communication Specialist 2nd Class Michael H. Lehman/Released)

Freedom of Navigation
The guided-missile destroyer USS Lassen (DDG 82) escorts the merchant vessel Tomahawk through the Strait of Hormuz.

owns it, and no state can make laws dictating what others do there.¹⁰ Operations, such as the ones listed above, threaten the freedom of the seas, seek to intimidate neighboring states and coerce weaker nations into violation of international law.

On a daily basis, surface naval forces of the NATO Alliance's nations and partners are conducting peaceful operations across the globe. These joint forces at sea protect freedom of maneuver, secure the sea-lanes for global trade and economic growth, defend and promote key national interests and prevent competitors and adversaries from leveraging the world's oceans against us. The navies of the democratic and peaceful countries of the world and the international maritime community share concern over safeguarding strategic sea lines of communication.

Versatile and scalable naval forces fulfill these crucial roles, which are the necessary preconditions to ensure the free movement of trade and commerce and to safeguard the interests of NATO and partner nations all the while maintaining a strictly defensive posture. The persistent forward presence

and power projection of the Alliance's naval forces backed by credible combat capability deters potential aggression and seeks to limit regional frictions from escalating to greater levels of conflict. These forces strengthen conditions that enable mutual prosperity.

The freedoms to use the maritime domain—the oceans, the littorals, waterways, and seafloor; the rise of global information systems, especially the role of data in decision making and the security of data supporting operational decision making are shared fundamental areas of concern, not only for the individual nations and the Alliance in general, but also for the maritime industry.

Security in the global maritime commons is not a given. Without a comprehensive, shared understanding of what is occurring in the maritime domain, achieved through a robust Maritime Situational Awareness (MSA), vital opportunities to detect and mitigate threats or critical vulnerabilities at the earliest opportunity may be lost. A comprehensive MSA network is required to facilitate information sharing and can only

be established with the cooperation of military forces, national law enforcement agencies, and close cooperation with the international maritime transportation industry. Understanding Pattern of Life is critical to identifying abnormalities that may be indicators to hostile or subversive actions.

The lack of modern and agile global and regional governance structures has generated friction between the globalized corporate sector, maritime authorities and military policy-makers that undermines the maintenance of persistence relationships necessary to enhance true maritime situational awareness. In an increasingly inter-connected, inter-dependent and rapidly changing globalized world, there continues to be an absence of persistent relationships between the ever-increasing number of key stakeholders in the global maritime community of interest.

Operating according to disparate mandates, objectives, areas of responsibility and jurisdiction, there is an obvious need to develop a shared network and develop a collaborative contribution to achieve a comprehensive MSA capability in which all stakeholders' requirements are met and enhanced. In the maritime domain, our continued freedom of the global commons requires an understanding of persistent relationships, time, space, risk, oceanography, the global supply chain, critical infrastructure and the environment, as well as

the nature of the risk, and the capabilities, readiness and location of one's competitors. So as James Holmes so eloquently states, these clashes are not merely about the Strait of Hormuz or the South China Sea.

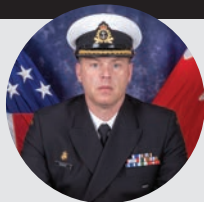
The world's oceans and seas comprise a single interconnected body of water. Seagoing nations must stand on the principle that maritime freedom is likewise indivisible. If the maritime community in general relinquishes its inherent freedoms in the global commons in one body of water for the sake of placating a predatory coastal state such as China, the global maritime community stands the risk some other strong coastal state will mount similar challenges in some other strategic waterway.

The maritime community needs better cooperation and situational awareness between key stakeholders and regimes (merchant shipping community included). As such the Combined Joint Operations from the Sea Center of Excellence is acting with key academic, industry and military partners, to advance the interests of the maritime community and to promote information exchange and networking across all stakeholders through discussion at the Maritime Security Regimes Round Table being held at the Slover Library in Norfolk, VA 29th to 30th April 2020. For more information, please contact us at usff.cjos.coe@navy.mil.

The Author

Capt. Bonnar

Captain Todd Bonnar, MSC, CD joined the Canadian Armed Forces as a Direct Entry Officer in 1997. After completing Maritime Surface Officer classification training in HMCS VANCOUVER in 1998, he was selected to represent Canada in an exchange with the Royal Australian Navy in HMAS HOBART and HMAS ANZAC during which time he participated in the UN Peace Keeping Mission to East Timor. In 2017 he represented Canada as Chief of Staff and Deputy Commander of NATO's high readiness maritime Task Group, Standing NATO Maritime Group One, participating in Operation REASSURANCE in the Baltic Sea and Operation SEA GUARDIAN, NATO's enduring counter-terrorism and security operation in the Mediterranean, earning the Meritorious Service Cross for his leadership of the Task Group. He holds a Bachelor of Social Sciences Degree from the University of Ottawa and a Masters of Defence Studies with a focus on Chinese Domestic Policy, from the Royal Military College of Canada. He is a graduate of CF Joint Command and Staff Program 36.



Footnotes

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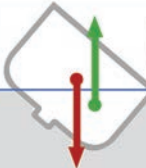
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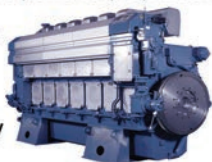
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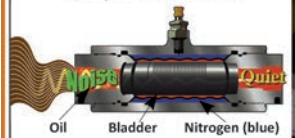
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Image depicts the launching of the SSG Michael H. Ollis at Eastern Shipbuilding on Nov 15th, 2019.

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Generic product image, not actual gearbox for this project.

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