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GREAT SHIPS OF 2020

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NO. 12 / VOL. 82 / DECEMBER 2020

34

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Seri Everest is the first in a series of 98,000 cbm VLECs.
Photo: **MISC Berhad**

24

Great Ships [*of all time*]

Declaring the "Great Ships of All Time" is a thankless task, endlessly debatable. But Rik van Hemmen gives it a try in his feature "The Ship Designer's Curse" which discusses the ships he deems worthy of Federal preservation.
By Rik van Hemmen

30

Great Ships [*of 2020*]

To say that the year 2020 has been 'odd' is a dramatic understatement. In step, we've culled our of "Great Ships" to five: **Sakura Leader**, the worlds's first Digital Smart Ship; **CMA CGM Jacques Saade**, the world's largest [23,000 TEU] LNG-fueled containerships; **MOL Gas Agility**, the world's largest LNG bunkering vessels; **Island Victory**, the most powerful [& green] multi-purpose OSV; and **Seri Everest**, the world's largest ethane carrier.
By Greg Trauthwein

The Trends that Defined 2020 [*& will define the next generation, too*]

11

The Seafarer

The shameful treatment of seafarers, the inability to effect crew changes is a situation that demands cohesive international action. Now.

14

Offshore Wind

The emergence of the offshore wind industry in the U.S. could transform the offshore, maritime, ports & logistics markets for a generation.

16

Containership Fires

As the ships get larger, the risk for fire grows exponentially, particularly troubling is the issue of misdeclared cargoes. It's about logistics procedure, it's about technology.

18

Decarbonization

Reducing emissions from ships at sea will take a concerted investment in new procedure and technology.

20

Autonomy

While work towards crew-less ships continues, there will be countless automation advances along the way.

40

Logistics Puzzle

The seamless, efficient interconnectivity of sea, road, rail & air will continue to drive hardware and software innovation.

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POWER

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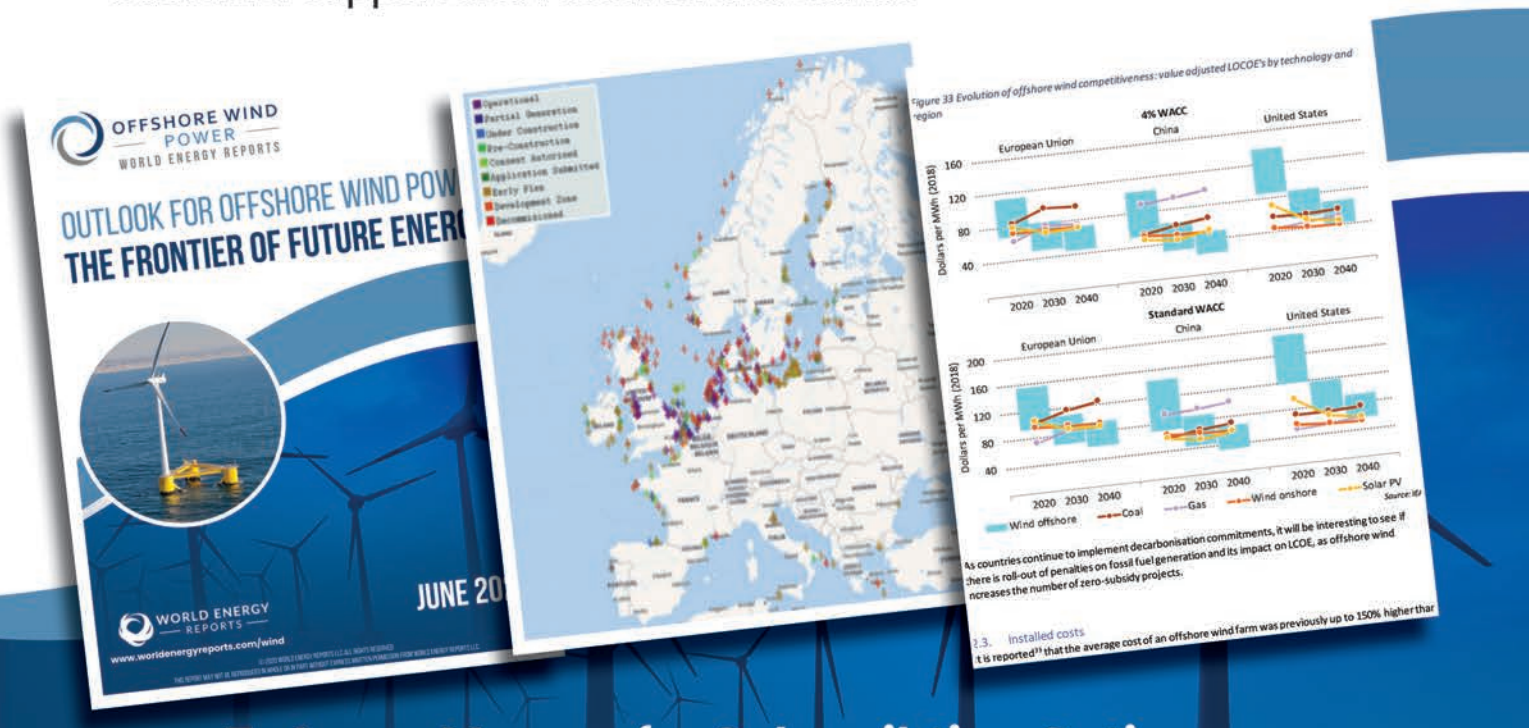

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Cover Photo: Credit Philip Plisson

There are not many adjectives left to properly summarize the year 2020. This has been a global situation that I assume most of you did not – could not – believe was ever possible, in its depth, breadth and duration. But we all know that just because the calendar says 2021, it doesn't mean that all of the COVID-19 pandemic issues simply disappear. Far from it. With this edition we take a look at both what was, and what will be, discussing the trends that will drive this market for the coming year(s).

Leading off is **Rik van Hemmen's** look at eight Great Ships that he argues should be eligible for Federal Preservation. Having done this for nearly 30 years, I know two things for certain: [1] everyone loves a good maritime/ship history story, and [2] there never can or will be consensus on the 'greatest ship of all time.' But Rik is a gamer, and he delivered the list of eight, starting on page 24. Following Rik, starting on page 30, are profiles of our Great Ships of 2020. While the debate can rage over which is the best-of-the-best, there is no denying that each of the five profiled – Sakura Leader; CMA CGM Jacques Saade; MOL Gas Agility; Island Victory; and Seri Everest are all special and unique in their own regard.

Throughout the edition we look at the big trends of 2020 that will impact the industry for the generation to come. Number one on that list is the plight of the seafarer, or more accurately the shameful treatment of the seafarer in the world's reaction to COVID-19 and the stranding of nearly half a million seafarers on ships, unable to effectively disembark and go home, allowing for normal crew changes. The majority of seafarers come from developing countries and have little political voice to ensure that their rights are protected. But there is a growing volume of voices and support, led by **Dr. Cleopatra Doumbia-Henry**, president of the World Maritime University, who eloquently and accurately said when I recently interviewed her:

"We are all part of a chain and these people (seafarers) are important. **This is the time for us to say seafarers are indispensable to world trade.** *You need them to keep your economies afloat."*

The other big trends to watch include:

- **Offshore Wind:** In the U.S. this could transform the offshore, maritime, ports & logistics markets for a generation.
- **Decarbonization:** Hardly a 'new' trend, but one that will continue to materially impact the very essence of ship design and construction.
- **Containership Fires:** Hand-in-hand with the ever growing size of the box ships are the nagging problem of containership fires and the pervasive matter of mis-declared cargos.
- **Autonomy** While the majority of you reading this right now are not discussing nor planning for autonomy – trust it will impact your business in the years to come.

As always, I sincerely thank you for your interest and support of our various print, electronic and video titles that we produce across the maritime, offshore, subsea, port & logistics sectors.

Gregory R. Trauthwein
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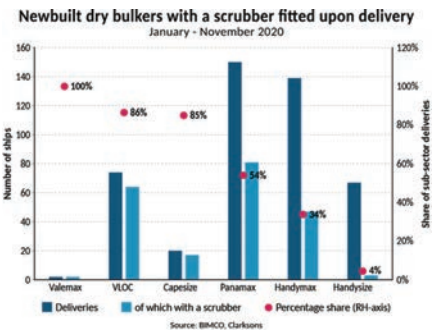


As the calendar (thankfully) turns to 2021, it's a good time to reflect on the *issue* that was top of mind when the clock was winding down on 2019: IMO2020 and the strict new mandates on sulfur emissions from ships. There were many wild prognostications regarding availability of fuel, fuel pricing and technical questions regarding ship machinery. What really happened? BIMCO offers a close look at the dry bulk newbuild market. While only three Handysize bulkers in total have been delivered from the newbuilding yards with a scrubber fitted in 2020, one in three Handymax bulkers were delivered with scrubbers installed.

> "It is worthwhile to mention that 2020 year-to-date average spot market earnings for a scrubber-fitted Capesize have exceeded that of a non-scrubber fitted capesize by $2,818 per day (+27%)."
>
> **Peter Sand,** Chief Shipping Analyst, BIMCO

Most scrubber-fitted bulkers were delivered in the Panamax sub-sector, that saw 81 units out of 150, equal to a share of 54%. When considering the share of scrubber-fitted ships within the large sub-sectors, comprising of capesize, Very Large Ore Carriers (VLOC) and Valemax, that share ranges between 85% and 100%. In just 13 cases out of the 96 ships that burn the most fuel, the shipowner opted for using VLSFO instead of making the scrubber investment. "Clearly, the marine bunker fuel price spread between low sulfur fuels and heavy sulfur fuels has been lower than initially expected. Currently at $72 per MT in Singapore, the spread is a far cry from the pre-IMO 2020 average of $185 per MT seen between August 1 and December 31, 2019," said Peter Sand, BIMCO Chief Shipping Analyst.

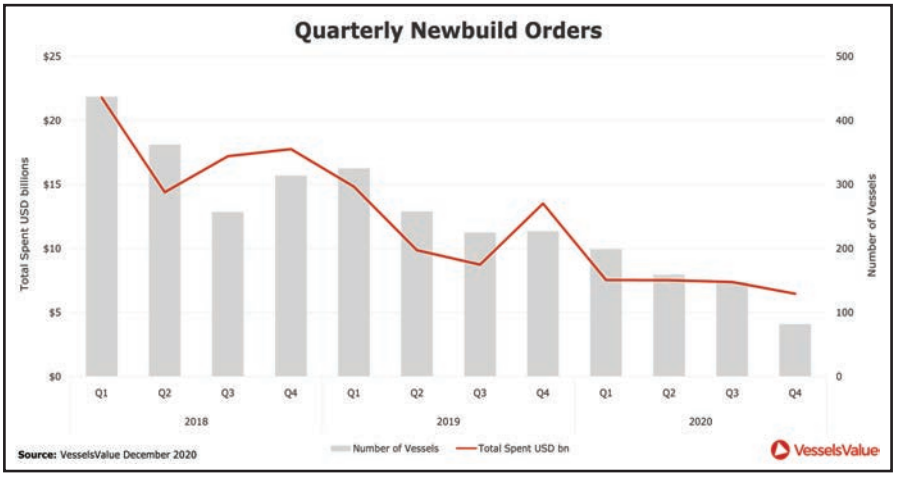
Powered by VesselsValue

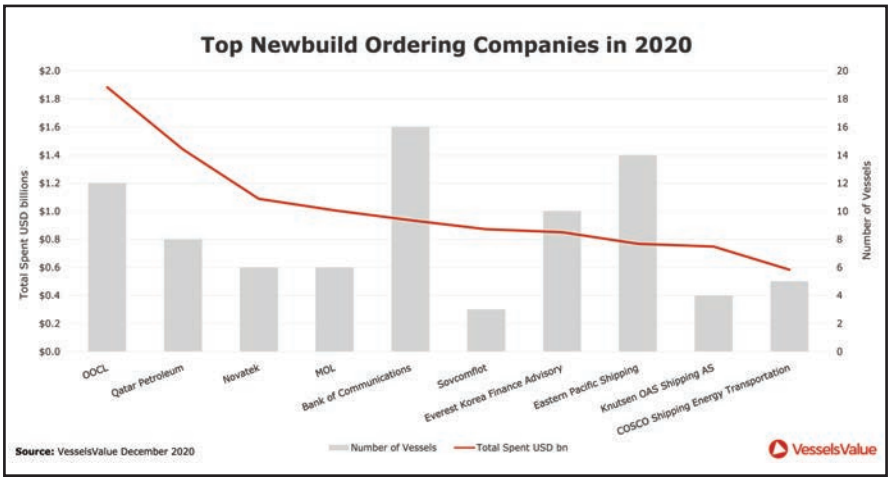
Shipbuilding 2020

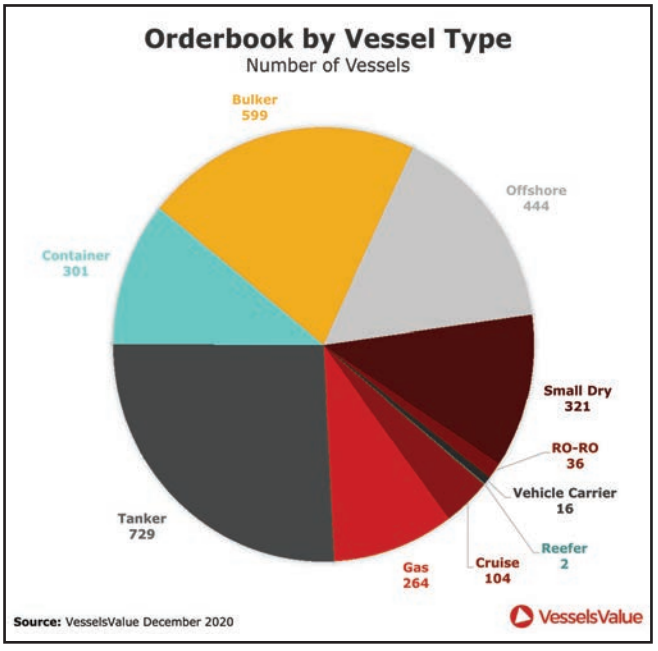
Even the longest-tenured maritime industry executives have difficulty finding the right words to describe what had transpired in 2020. Our friends at **Vessels Value** have let the numbers do the talking. While much uncertainty remains for 2021, the hope obviously is for a rebound upward from what you see to the right!

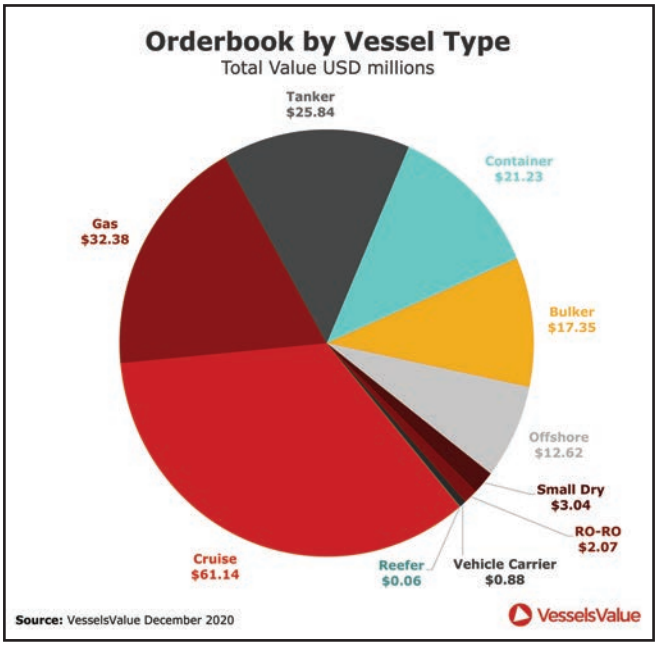
Quarterly Newbuild Orders

Order		# Ships	USD bn
2018	Q1	437	$21.78
	Q2	362	$14.39
	Q3	257	$17.21
	Q4	314	$17.76
2019	Q1	325	$14.84
	Q2	258	$9.87
	Q3	225	$8.74
	Q4	227	$13.51
2020	Q1	199	$7.54
	Q2	159	$7.52
	Q3	148	$7.39
	Q4	82	$6.46
Total		**2,993**	**$147.01**









"We are all part of a chain and these people (seafarers) are important. This is the time for us to say seafarers are indispensable to world trade. You need them to keep your economies afloat."

Dr. Cleopatra Doumbia-Henry,
President, World Maritime University

"Only 5 or 6 years ago, the average wind farm size was around 100MW. At World Energy Reports we forecast the average to be around 600MW by 2025."

Philip Lewis,
Director of Research, World Energy Reports

Tip #19

Assess ... Always

In last month's Training Tips for Ships, we spoke about the value of creating a culture of learning. Even though many organizations have yet to achieve a healthy learning culture, the concept itself is not controversial. The value is self-evident and universally understood.

By Murray Goldberg

This month, we go a little further to discuss a culture of assessment. And while some readers may bristle at the idea of near-ubiquitous workplace assessment, the idea is a natural consequence of implementing a culture of learning. How can a culture of learning be shown to be effective if we do not assess? It cannot be. Here we will discuss why a culture of assessment is important, what it entails, and the key to ensuring it is viewed as an asset by your officers and crew.

Why is a culture of assessment important? The answer is because if learning is important, then assessment is equally important. Most directly this is true because there is no accurate way of determining whether our learning activities are having their desired effects unless we assess our learners. Learning activities, in the absence of assessment, are like a vessel without a compass, charts or ECDIS. We can point the vessel in a direction and engage propulsion, but there is no way to know whether we are getting closer to our goal. Assessment tells us whether our learning activities are working.

Assessment tells us whether people have the knowledge and skills they need to perform efficiently and safely. Assessment provides metrics that support continuous improvement. Assessment helps to establish a culture of goal setting, pride, career advancement and accomplishment. Assessment creates opportunities for discussion, employee engagement, and feedback. And assessment, paradoxically, takes the stress out of assessment; if it is done in a context of positive and supportive values, then it becomes commonplace and simply part of the how we improve.But how do we de-stress assessment and create a positive and productive view of being assessed? There are many aspects to this, but the key is demonstrating a deep commitment to using assessment to support employees rather than penalize them. Officers and crew must understand what is being done, how it will be done, why it is being done, and most importantly, how it will benefit them as individuals. They must understand that these assessments are part of a supportive company culture and that they are separate from any required promotional or regulatory assessment. These assessments will be used only to target professional development, to create new career advancement opportunities, and to continually improve company safety and performance. They can never be used punitively. In this way, when assessments are supported by a culture of growth and learning, not a punitive culture, they can be viewed as professional growth opportunities. Furthermore, these "supportive" assessments will make the performance of any required promotional or regulatory assessment much more successful and stress free.

So, what, and when, do we assess? The short answer is to assess whenever the opportunity arises, making it simply a part of how work is done. Assessments can be done regularly using short, possibly randomized (though targeted) online exams. Drills are also an excellent and often overlooked opportunity for team and individual assessment. All training exercises should be assessed. And, of course, on the job performance provides numerous opportunities for assessment as nearly every task could potentially be assessed. The only limit is making someone available to perform the assessment. This often falls to training officers or other training personnel. But peer assessment, where coworkers assess one another, is also an excellent model for supportive assessments. These are all opportunities for discussion and learning. Establishing a culture of assessment is a large topic which warrants further discussion and consideration beyond the scope of a short article. Hopefully, however, this helps stimulate that discussion.

Until next time, sail safely and keep healthy!

The Author

Goldberg

Murray Goldberg is CEO of Marine Learning Systems which provides software and services to optimize knowledge, skills and behavior in maritime operators.
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2020 Trends

Owners & Operators: Do the Right Thing

Due to a confluence of factors, COVID-19 has adversely impacted merchant mariners more than virtually any other profession.

By Dennis Bryant

The merchant marine is an international profession from a wide variety of countries, so there is no one nation standing up to represent them. The ships on which they sail are registered in numerous nations, heavily weighted toward small countries with limited influence on the world stage. The ports at which the vessels call tend to be more concerned about the health of the local community than the welfare of seafarers, ignoring the fact that the cargoes carried keep their economies running. Some ports and nations ban crew changes outright, while others place such onerous conditions on crew changes as to make the process extremely difficult and expensive. Owners and operators are widely dispersed and virtually anonymous in many cases, making them generally imperious to public pressure. Some, possibly most, owners and operators want to facilitate crew changes, but charterers often insist on charter provisions making that difficult. Despite all the obstacles cited above, regular changes of crews on merchant vessels are necessary, just as regular maintenance is required to keep the vessels from breaking down. It is incumbent on owners and operators to undertake crew changes despite the bureaucratic obstacles and added expense. They did not tie up their vessels when the price of bunkers rose. Rather, they adapted. That same type of adaptation is called for now.

The International Labour Organization (ILO) adopted the Maritime Labour Convention (MLC 2006) and virtually every nation has become party thereto. That convention provides, among other things, that the maximum duration of service periods on board following which a seafarer is entitled to repatriation shall be less than 12 months. When the COVID-19 global pandemic first struck, flag and port nations were encouraged to grant a reasonable degree of discretion in the enforcement of time limits such as this. That discretion is being abused by owners and operators and ignored by many nations. Australia has signaled that enough is enough. Inspection of a bulker there found that three crew members had been onboard for over 12 months, four had been onboard for over 16 months, and two had been onboard for over 20 months. The operator assured the port state control (PSC) officer that the crew members would be repatriated the next day. The next day, the operator advised that repatriation plans and fallen through and that the crew members would be repatriated in the next port. The PSC officials issued a direction notice stating that the vessel could not depart until all nine seafarers had been repatriated. Repatriation occurred the following day. The lesson here is that crew changes are not impossible. Given sufficient incentive, owners and operators will comply with their legal and moral obligations, despite the inherent difficulties and higher costs resulting from the global pandemic. It is unfortunate, though, that such drastic port state measures were required.

The Australian Maritime Safety Administration (AMSA) then issued a notice stating that, through 28 February 2021, no extensions of seafarer service without taking leave beyond 14 months will be accepted by AMSA unless the master or owner demonstrate to AMSA that: (1) all possible efforts have been made to repatriate the seafarer without success; (2) the seafarer has provided written confirmation accepting the extension; and (3) a plan to repatriate the seafarer within a month has been put in place. As of 1 March 2021, the maximum duration of service periods on board following which a seafarer is entitled to repatriation shall be less than 12 months (per MLC 2006).

The choice now is clear. Either owners and operators can take the necessary steps to plan for and implement regular crew changes or port states can follow the example of Australia and mandate that course of action. The first option is preferable for all concerned.

The Author

Bryant

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

Seafarers Are Key Workers

It's "All Hands on Deck" @ WMU to Solve the Seafarer Crisis

Dr. Cleopatra Doumbia-Henry, *President, World Maritime University, discussed the ongoing seafarer crisis plus the new report from WMU,* A Culture of Adjustment, *which outlines systemic failures in the implementation of the regulatory regime for seafarers' work and rest hours.*

By Greg Trauthwein

Search as you like, but you will be hard-pressed to find anyone as passionate about all matters surrounding maritime and seafarers than Dr. Cleopatra Doumbia-Henry. Prior to taking the helm as president of the World Maritime University (WMU) six years ago, she served as the Director of the International Labor Standards Department of the International Labor Office (ILO) in Geneva, Switzerland, responsible for developing the Maritime Labor Convention, 2006. That makes the current COVID-19 induced seafarer crisis even more topical and personal, as nearly half a million seafarers remain stranded at sea, far beyond the expiration of their contracts, with no global consensus to allow for efficient maritime crew changes and transfers.

"Seafarers are key workers, they are essential to keep global commerce running," to ensure food and fuel is delivered when and where it is needed, Dr. Doumbia-Henry said in a recent interview with *Maritime Reporter & Engineering News*. "There are a few countries that have taken action (to help enact crew changes), but we still have the majority of the countries who have not taken the necessary action."

While the situation has been discussed ad nauseum, little progress has been made to help enact any semblance of normal crew changes. Hopefully this is changing as on December 2, the 193-member U.N. General Assembly urged all countries to designate seafarers and other marine personnel as key workers, a unanimously adopted resolution which encouraged governments to ensure safe ship crew changes and travel, allowing stranded seafarers to be repatriated and others to join ships. Welcoming the adoption of the resolution, IMO Secretary-General Kitack Lim said in a release "Sadly, hundreds of thousands of seafarers, who are vital to maintaining supply chains, remain stranded at sea for months beyond their contracted time. This is causing immense strain, fatigue and exhaustion and is unsustainable. This is a human rights issue. Seafarers' lives are being made impossible through the crew change difficulties and this can only have a detrimental effect on ship safety and on the supply chain, the longer the situation continues."

While the resolution is a step in the right direction, the key word is 'encouraged' as the U.N. does not have the ability to mandate action, though it can add political pressure.

"Shipping is indispensable to world trade, it is indispensable to the daily lives of people," said Dr. Doumbia-Henry. "This is a wake-up call about the important role that seafarers play."

It's "All Hands on Deck" @ WMU

The World Maritime University was created in 1983 after the IMO recognized within IMO that there was a shortage of well-qualified, highly educated maritime experts, particularly in lesser developed nations. To that end, WMU graduates are spread around the world, many occcupying top spots in their respective country's government and naval organizations, as well as maritime, shipping and port industries. It is the depth and breadth of this global alumni that Dr. Doumbia-Henry is counting on to provide information and influence to help solve the maritime industry's most pressing matters.

"I have written a lot of articles, I have made a lot of speeches and we all understand the pandemic is having a huge impact" said Dr. Doumbia-Henry. "We have to (continue to) disseminate the message, not just by me talking and making a speech, but by getting our own hands on deck, all our students from around the world."

To this end, WMU has hosted several webinars with its graduates to implore them to take action in their individual home countries or countries of domicile, to bring this matter to the fore and help to find a solution. "Most WMU students come from the developing world, said Dr. Doumbia-Henry. "They are the agents of change that can intervene, to help bring the seafarer crisis to the minds of leaders and help to devise a solution."

> "Shipping is indispensable to world trade, it is indispensable to the daily lives of people. This is a wake-up call about the important role that seafarers play."
>
> **Dr. Cleopatra Doumbia-Henry,**
> President,
> World Maritime University

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"A Culture of Adjustment"

A sweeping new report from WMU entitled 'A Culture of Adjustment,' examines seafarer work and rest hours, a report which confirms previous research that suggested recording malpractices are widespread, which seriously questions the capacity of the current regulatory framework to prevent fatigue and mitigate its effects. These deficiencies are magnified exponentially by the strain of COVID-19, and the analysis indicates that insufficient manning is the root cause of violations especially during peak workload conditions. "There is still a culture of malpractice in terms of recording of hours of work and hours of rest," said Dr. Doumbia-Henry. That malpractice is a "huge concern and it is also very dangerous," not only for the health and well-being of the seafarers but also for shipping itself. "We are all part of a chain and these people (seafarers) are important. This is the time for us to say seafarers are indispensable to world trade. You need them to keep your economies afloat."

To read the full report 'A Culture of Adjustment,' visit: bit.ly/37xz3fM

2020 Trends & the

Tremendous Potential of Offshore Wind

The promise of a burgeoning offshore wind industry in the U.S. promises to buoy the offshore energy, maritime, port and logistics sectors for the coming decade. ***Philip Lewis****, Director of Research, World Energy Reports and a sector expert, discusses the trends to watch.*

By Philip Lewis

World Energy Reports we are excited about the development of offshore wind from a fringe technology to a cost competitive option for grid and off-grid energy solutions.

Most people are unaware that the first offshore wind turbines were installed some 30 years ago and that the activity in the first two decades was dominated by northern European countries. **(See Figure 1)** Because of the activity, supply chains were developed in this region.

The last decade saw the industrialization of offshore wind and the entry of China and to a lesser extent Taiwan as significant market players.

The first half of this decade is seeing a surge in offshore wind capacity as wind goes more global, with new players like the US and Japan adding capacity to the system.

A good example of a developing offshore wind market is the UK, where we hear Prime Minister Johnson setting a target of 40,000 MW of installed offshore wind capacity by 2030. At World Energy Reports we expect the UK to move from around 11,000MW of installed capacity at the end of 2020 to close to 24,500MW by 2025. The surge in capacity additions will be underpinned by several gigawatt scale mega projects.

It is not too unrealistic to talk about a green industrial revolution in core offshore wind markets, like the UK – we have seen the establishment of local manufacturing and more importantly operations and maintenance support infrastructure witnessed by port developments and re-developments, onshore monitoring and control bases, and offshore inspection, repair and maintenance activity. **(See Figure 2)**

This positive economic development will be seen again and again in all emerging offshore wind markets and will offer many positive benefits for local economies.

With the wider global acceptance of offshore wind, at World Energy Reports we see some interesting trends developing.

- First, offshore wind is playing a larger role in grid supply in key markets;
- Secondly, offshore wind is seen as a solution for a range of off-grid applications such as decarbonisation of power supply to oil and gas operations and hydrogen production; and
- Thirdly, is the dawn of commercial scale floating wind farms that access better quality wind resources and provide some exciting supply chain opportunities.

Turbines (and projects) Get Bigger

Offshore wind is becoming more mainstream and as it does,

Figure 1

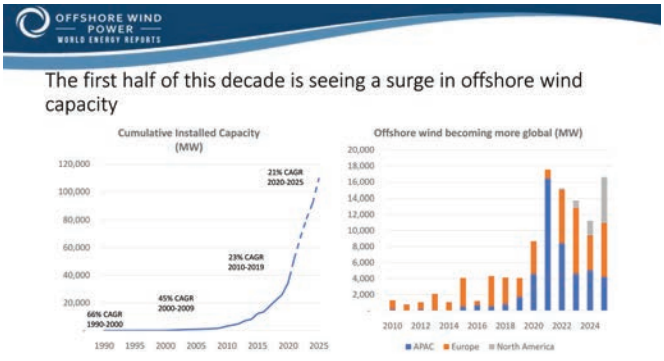
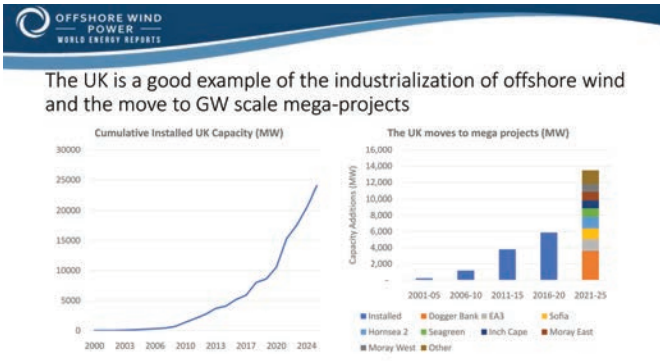


Figure 2



"Only 5 or 6 years ago, the average wind farm size was around 100MW. At World Energy Reports we forecast the average to be around 600MW by 2025. "

Philip Lewis,
Director of Research, World Energy Reports

Watch Phil Lewis on Maritime Reporter TV: bit.ly/3fPqjWd

the average project size is increasing, which is a key driver for overall cost reduction. **(See Figure 3)** Only 5 or 6 years ago, the average wind farm size was around 100MW. At World Energy Reports we forecast the average to be around 600MW by 2025. This will include multi-gigawatt developments, like the UK's Dogger Bank, which will reach 3,600MW of capacity when its three phases are installed by 2025.

Large capacity is more easily achieved with larger turbines. As examples:

- Dogger Bank will use GE's Haliade-X 13MW turbine. We also expect to see these units on the Skipjack and Ocean Wind projects in the US and possibly Asa Branca 1 in Brazil
- We see Siemens Gamesa 14MW units planned for Sofia in the UK and Coastal Virginia in the US – this supplements the Siemens Gamesa 11MW platform to be installed on Hollandse Kust South and North from 2021, followed by Gode Wind 3 & 4 and Borkum Riffgrund 3 in Germany
- At least 27 projects will use the MHI-Vestas 9.5MW platform and 10MW variant from 2020-2026. The recently announced takeover by Vestas of MHI's 50% in their MHI-Vestas offshore wind turbine JV is likely to result in Vestas rolling out a new very large offshore wind turbine platform. MHI stays involved with Vestas with a 2.5% equity stake in Vestas and a seat on the board
- Outside the "Big 3" western turbine OEM, the leading Chinese OEMs are testing ever larger turbine models with Dong Fang due to install a prototype of its 10MW model and Ming Yang planning to make its 11MW platform commercially available in 2022. It is also worth noting that Ming Yang has announced plans to develop a 10MW typhoon-resistant floating wind turbine as it keeps its eyes on the growing potential for the East Asian floating wind market.

At World Energy Reports, we are closely monitoring the opportunities and challenges for the larger turbines. **(See Figure 4).** Broadly speaking:

- The installation fleet has an ongoing challenge to provide tonnage that meets the requirements of heaver lifts to higher heights, whilst meeting their investor return requirements.
- As projects get bigger and use bigger turbines, smaller projects will still need to source smaller turbines, which leaves room for the existing unmodified installation fleet.
- OEM's don't necessarily want to supply small / demonstration projects i.e. floating wind – this potentially opens the door for players outside of the leading OEM to build market scale.

Figure 3

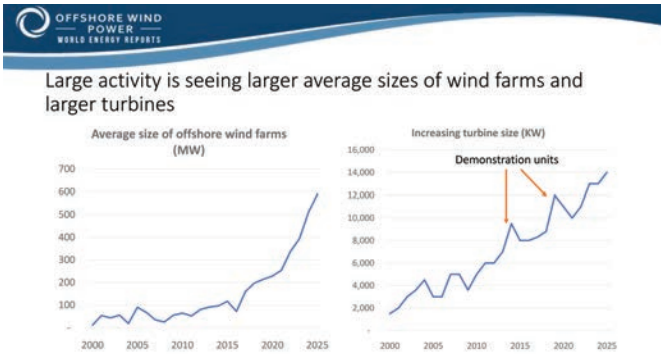
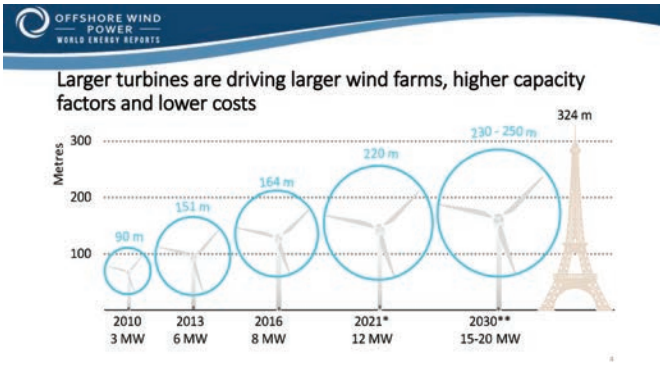


Figure 4



2020 Trends & tackling the scourge of

Containership Fires

The proliferation of serious fires onboard container ships in recent years has shocked the shipping industry. Here we examine the causes and impact of such fires and the urgent efforts being made by a wide variety of stakeholders to solve this seemingly intractable problem.

By Andrew Gray

Over the last decade there has been a 70% fall in ship total losses[1]. This has been widely credited to long term improvements in ship safety management and loss prevention programmes. Counter to this trend, there has been a substantial increase in the number of fires in containers carried onboard container and RoRo ships. One troubling statistic is that on average there is a fire onboard a container ship every week[2], with a major container fire occurring on average every 60 days[3]. Nine major container ship fires were reported in 2019[4]. By comparison, despite an overall fall in casualties in the first half of 2020, 10 such incidents were reported[5].

This situation has been linked to both supply chain issues, including the widespread non-declaration and misdeclaration of dangerous goods cargoes, and inadequate fire-fighting systems onboard many of these vessels. About 10% of laden containers or 5.4 million containers being shipped annually are estimated to contain declared dangerous goods[6]. Of these, about 1.3 million containers may be poorly packed or incorrectly identified, indicating the scale of potential risk[7]. A 2020 study by the New York based National Cargo Bureau (NCB), supported by Maersk amongst others, revealed that of 500 containers inspected, 2.5% of DG containers imported to the USA were found to include misdeclared cargoes which represented a serious risk[8]. Another study found there may be about 150,000 volatile containers in the supply chain annually[9]. Non-declaration or mis-declaration of cargoes is generally understood to arise from shippers' attempts to pay lower freight or circumvent restrictions on the carriage of dangerous cargoes.

Dealing with fires onboard

There has also been widespread concern about the suitability of existing ships' fire-fighting systems to deal with container fires. A 2017 study highlighted that systems originally developed for fighting fires in general cargo ship holds have proved to be unsuitable for container vessels[10].

Smoke detection and CO2 fire-extinguishing systems developed for large open holds may be completely ineffective within the confines of individual containers stowed beneath hatch-cover pontoons which are not gas-tight. There are calls for more sophisticated fire detection systems, utilising infrared cameras or thermal sensors installed both below deck and on deck.

While the containment of a fire within a limited number of containers remains the approved method of firefighting onboard a container ship, the equipment available is often unsuitable. Many stakeholders warn that new technical solutions are needed to make this approach effective. These issues have only been magnified by the steadily increasing size of container ships from 10,000 TEU vessels in 2005 to ultra large container ships in excess of 20,000 TEU today.

Improvements have been made to new vessels constructed after January 1, 2016 under amended SOLAS regulation II-2/10, but there are calls for substantial changes to existing ships' firefighting systems[11]. These include utilizing the ship's structure to create more effective fire compartments while installing enhanced below deck and on deck water water-based systems to cool the ship's superstructure and prevent fire spread. On deck, monitors should be installed to create water curtains which can cool the maximum height and width of container stacks, particularly on the very much larger container ships now at sea[12]. Other innovative fire-fighting systems are being deployed such as HydroPen, which drills though the container door and then switches mode to spray water inside the container[13].

Without adequate ship's firefighting systems, the ability of a container ship's crew to respond to and contain a blaze is severely limited. Despite the undoubted bravery and professionalism of crews in tackling such fires, external assistance is invariably required. The ship may be a considerable distance from shore and, even when outside assistance arrives, such fires may take weeks to be brought under control. Meanwhile, a further concern is the pressure placed on the

"One troubling statistic is that on average there is a fire onboard a container ship every week[2], with a major container fire occurring on average every 60 days[3]."

Photo: Indian Coast Guard

resources of the global salvage industry in dealing with the rising numbers of major container fires.

As a specialist shipping law firm, we are only too aware of the increasingly severe consequences of large container ships fires. Not only have such events resulted in the injury and death of many crew members and others over the years, but the environmental implications and financial losses continue to be significant. Apart from needless injury and loss of life, potential losses from a container ship fire might include hull damage, total loss of the ship, cargo and container loss and damage, claims between ship owners, charterers and slot-charterers, environmental damage prevention and clean-up, salvage costs, wreck removal, fines, investigation and legal costs. With the increased size of container ships and their carrying capacity, a large container fire will severely impact the global marine insurance and P&I market with the sheer value of the property at risk, not to mention the GA effort of trying to collect security, vastly scaled up for the largest container ships. With present claims potentially running into tens or even hundreds of millions of US$, there is the fear that a total loss of a 20,000 TEU vessel and her cargo might exceed $1 billion. A considerable burden is also placed on the salvage industry and external firefighting services, with the significant challenge of fighting such fires due to the increased beam and stack heights of the larger container ships.

In addition, ports of refuge face the nightmare of how to deal with say 10,000 burned-out container shells and their cargo, many of which are not insured and abandoned. For example, exemplary support was recently given by the Singapore MPA and PSA in providing a port of refuge to MOL Charisma, the latest victim of this year's major container fires. The human and financial carnage inflicted by a single undeclared or misdeclared cargo in a badly stowed container onboard a modern container ship cannot therefore be overstated.

Solutions

Major efforts are however underway to deal with this problem from both the supply chain side and in improving the firefighting systems onboard.

In an ideal world every cargo loaded in every container would be checked before shipping, but the cost of such an undertaking would be immense. At the same time, there are calls for more widespread spot checks by IMO member states and shipping lines to help identify undeclared or misdeclared cargoes.

Leading stakeholders are also working together to develop systems which reduce risk. The Cargo Incident Notification System (CINS) has over a number of years shared information on cargo related incidents and identified commodities which commonly cause problems during transportation[14].

A number of shipping lines are using artificial intelligence to develop increasingly sophisticated algorithms to search through their booking systems to identify potential misdeclaration, including Hapag-Lloyd's Cargo Patrol, Exis Technologies' Hazcheck Detect and ZIM's ZimGuard.

Other ventures include the Maritime Blockchain Labs (MBL) Misdeclaration of Dangerous Goods pilot, using blockchain technology to verify documentation and demonstrate the end-to-end delivery of dangerous goods[15].

Meanwhile, IUMI and other major stakeholders have co-sponsored a submission to the IMO Maritime Safety Committee's 102nd session to amend SOLAS in respect of improved detection, protection and firefighting capabilities onboard container ships[16].

Further pressure may also need to be brought to bear on rogue shippers by building a world-wide consensus for those misdeclaring dangerous container cargoes to face criminal sanctions in their home country, with jail time for deliberately endangering life and the marine environment.

References

[1] Allianz Safety and Shipping Review 2020
[2] Gard conference – Container ship fires – 31 October 2019
[3] TT Club – Campaign for Greater Container Safety – March 2019
[4] National Cargo Bureau (NCB) white paper – 6 July 2020
[5] Cefor - ibid
[6] Gard Insight – Tackling cargo misdeclaration – 21 March 2018
[7] TT Club – ibid
[8] NCB – ibid
[9] TT Club – ibid
[10] IUMI Position Paper on firefighting on container vessels and proposal on firefighting systems by the German Insurance Association (GDV) – 18 September 2017
[11] IUMI Policy Agenda – 10. Safety of container vessels – 24 August 2020
[12] IUMI and GDV - ibid
[13] Gard conference – ibid – Rosenby Engineering HydroPenTM distributed by Viking Life-Saving Equipment
[14] TT Club - ibid
[15] https://wearebloc.io/labs/
[16] IUMI Policy Agenda - ibid

2020 Trends

Decarbonization is Blowing in the Wind

The global shipping industry is going to face a big challenge during the coming years when regulators, investors and stakeholders demand the drastic reduction of CO2 and other GHG emissions during ship operations. But in reality, the change is already underway.

By Konstantinos Fakiolas, CEO, FinOcean

Since 2013, any newbuild ship over 400GRT has been obliged to comply with a specific Energy Efficiency limits – the well-known Energy Efficiency Design Index (EEDI). It is about to enter an accelerating phase propelled by the recently released IMO GHG reduction strategy. Today, this portion of EEDI compliant fleet is around 22-23%, exhibiting a 15-25% reduced fuel consumption on same design conditions compared to older tonnage and creating a two-tier fleet categorization – 'eco' and 'non-eco' ships. For the existing non-eco fleet built before 2014 (about 64,000 ships over 400 GRT), there are not many options to achieve prompt compliance with the IMO GHG and EU-ETS phase-out. Speed reduction is an obvious choice, but that along might bring commercial deficiencies, especially compared to eco-ships that can sail faster. Other low-cost options include hull appendages optimization (energy saving devices), improved engine tuning, meticulous voyage optimization and performance monitoring, weather routing; but again these can offer a range of 3-10% max fuel consumption reduction, far from a least 20% as to be required for the first 2023 IMO GHG phase; especially difficult for larger ships.

If the power reduction has a commercial disadvantage and since the global fleet is equipped with combustion engines as prime movers that use fuels, a logical option is to seek for alternative fuels with lower carbon footprint than marine diesel oil or heavy fuel oil. While the alternatives (LNG, LPG, Methanol, ammonia, hydrogen) can help, the retrofit costs – $3-$5 million for the smallest ships – is still quite high.

From Sail to Steam to Diesel … to Sail?

Wind-assist ship propulsion (WASP) technologies is an option to consider. Wind assist propulsion technologies are technologies using the available ocean and coastal winds for assisting propulsion, suited for retrofitting ships which have already a powerful prime mover and which have not been designed for as full wind-propelled ships.

The current such technologies comprise of smart mechanical sails, which are specifically designed to develop aerodynamic forces through a much smaller surface area than conventional soft sails, while they do not have rigs or other reefing, furling or twisting rope mechanisms, making the installation easier.

Rotors are composite material rotating cylinders which exploit the Magnus effect, thus generating high lift forces due to the pressure field variation that they artificially generate around the perimeter of the cylinder, coming from a self-rotation imposed by a relatively small power consumption they need. Their maximum size installed so far is 30m x 5m and smaller rotors are workable for certain ship sizes.

The wing sails are airplane wing-shaped aerofoils, which can either be reefable or fixed, and rotate around their vertical axis to find each time the optimal angle of higher lift (and higher forward thrust force) generation. Compared to rotors, they have about four times larger surface area for a same total thrust force.

Suction wings are operating like the wing sails, but they have instead an egg-shaped, thick chorded aerofoil, which generates a lot of drag during a cross flow stream applied on them, but when an internal ventilator operates and sucks internally the wing's surface air, the disturbed boundary layer is reducing dramatically and their lift force becomes very high. They can have a smaller size than rotors and produce the same lift and thrust force, with less power consumption.

All these are deck-mounted systems, which might interfere with cargo operations, impose bridge visibility restrictions, or having air draft limitations.

The propulsion kite is another interesting technology which works off-deck, at a high altitude over 150m where wind forces are 1.5-2 times stronger and with no ground level windage resistance interactions.

Because of its dynamic movement and the high-altitude strong winds, the Kite can produce remarkably high relative

speeds on its surface thus generating very high lift for a much smaller surface. The only limitation of performance is the Kite parachute material strength.

The Kite seems ideal for ships that have crammed deck superstructures, cargo cranes or other operational limitations.

Despite being a newly adopted application there are about 15 ships in waters today that run with wind assisted propulsion systems, and more are contracted, thus expected to double by 2022. Every such technology under certain wind conditions (speed and direction) will deliver a propulsion thrust (and power) spectrum for a given ship and deck arrangement, basis the aerodynamic physics applied.

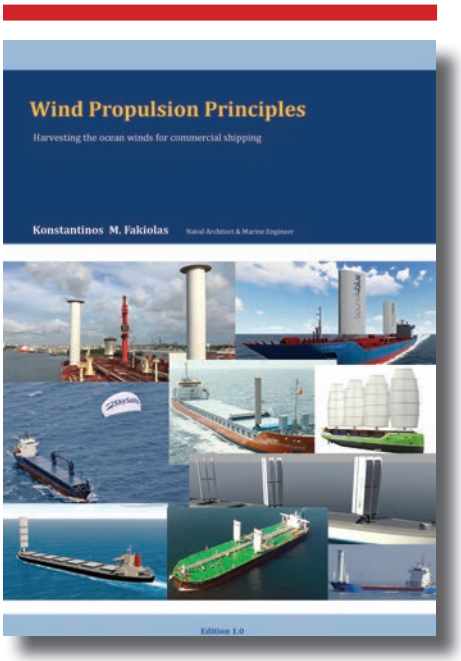
Then, certain restrictions such as interaction effects, windage resistance, boundary layer alterations, hull heel and leeway generation and limits for ships safety, rudder effect and propeller efficiency reduction, all will apply aggregately on the theoretical figures for the specific ship.

It then depends on the utilization of the system: the more it is used, the higher the annual energy yields. The utilization is dramatically improved by continuous voyage optimization and weather routing, where studies have shown that it can raise the benefits by even an extra 40% in specific routes.

From various projects assessed so far, considering different ship types and arrangements, considering global wind statistics, frequent trading routes and average sailing speeds, it seems that wind propulsion systems can deliver a range of 5-8 tons/day fuel consumption savings per ship size, considering a theoretical forward thrust force with all restrictive parameters as mentioned above factored in. If a ship has an average specific fuel consumption of 200 gr/kWh for the main engine – which is a typical realistic consumption taking into consideration engine margins, engine condition and fuel quality (we are talking about existing ships here, over 7 years old), a realistic propulsive efficiency of 0.6 and a sailing speed of 12kn, this translates to a net forward delivered thrust of abt 100kN – 165kN.

Such range of net forward thrust can be generated within the proven statistically high global wind intensities range of BF 4-6 (i.e an average 20kn wind speed) by 2 – 3 rotors on deck, or 3-4 wing sails or a 400m2 airborne Kite system.

For a 170m, 28,000 dwt handysize cargo ship, this is a 30% fuel saving in such above average conditions per time used, and for an Aframax tanker it is a 15%, all considering a stable speed of 12kn. All that for a total capex of $1-2.5 million, depending on the arrangement.



Wind Propulsion Principles is a complete handbook dealing with all currently applied wind propulsion technologies on board, seen through the lenses of the aerodynamic and hydrodynamic effects, ship operations in weather, design implementation and investment yield assessments, so that a unified roadmap for decision making is available to the shipping community.

Find more info here: bit.ly/3g9JcTM

Setting Up the System

The key question here for assessing the Annual energy yield of any system and configuration and optimize the Investment, is the 'Time Used'. And this is directly depended on the how and when the operators will finally use the system on board.

To integrate properly a wind propulsion technology on a ship, the most suitable arrangement has to be studied which will fit on deck without interrupting cargo operations or pose other operational obstacles (i.e. such as bridge passage limitations), but also arranged in a way to work without impairing the ship's course keeping, maneuvering abilities and stability limits.

This requires detailed performance prediction analysis, naval architecture and engineering studies which are recommended to be performed by wind propulsion specialists even on feasibility level before any investment decision on wind-assist propulsion is made.

To maximize the energy yield potential of deck fitted wind propulsors beyond the ship's existing hull seakeeping limitations – since existing ships were not designed considering aerodynamics force of high magnitude and dynamics as input values – it is possible to retrofit them with extra hull appendages such as extended bilge keels, stern fins or others, which are again a subject of engineering analysis.

For those ship owners and operators that wish to investigate further the potential of wind-assisted propulsion, understand the working principles of the technologies, review the criteria which need to be satisfied and identify the factors to be considered for both existing and newbuilding ship applications, the first shipping Industry publication is available since the summer of 2020.

2020 Trends

In the Pole Position

While work on maritime autonomy has proceeded at speed globally, a pair of U.S. companies – Metal Shark and Sea Machines – have jumped to the fore in delivering solutions that have evolved from the research & development department to work on the waterways.

By Greg Trauthwein

Photo: Metal Shark

When talk turns to "autonomy" in the maritime sector there are more questions than answers. It is generally agreed that the technology is ahead of both legislation and business concerns, such as insurance. It is also generally agreed that short, local 'point A to point B' routes will emerge more quickly; while true autonomy on large oceangoing international ships is a generation or more away. The path to crew-less ships is a long one, defined more by small steps than gargantuan leaps. For insights, we sat (virtually) with two leaders, **Michael G. Johnson**, Founder and CEO of Sea Machines, and **Chris Allard**, CEO, Metal Shark – two companies that were recently selected by the U.S. Coast Guard

> "This is hard stuff; it's not automation ... this is autonomy ... many data streams coming together, more complex algorithms, prioritization of messages, data shedding ... we bring machine learning and AI into our computer vision side of our product. "

Michael G Johnson
Founder, CEO, Sea Machines

Sea Machines

to supply a new autonomous test vessel – for insights on the pace and direction of maritime autonomy in 2021 and beyond.

In late September 2020 the United States Coast Guard (USCG) selected Metal Shark and Sea Machines to supply an autonomous test vessel to the USCG Research and Development Center (RDC). The welded-aluminum 29 Defiant craft is the latest product of Metal Shark's Sharktech Autonomous Vessels division to be equipped with Sea Machines SM300 autonomous-command and remote-helm technology. The new vessel will then be homeported at the RDC's facility in New London, CT.

"Sea Machines is a five-year-old company, and I think one of the first business trips we made was to the Coast Guard R&D Center," said Johnson. "One of the things about the Coast Guard we felt from the very beginning is that there was a strong interest, to where we felt that they were encouraging us to move forward with this technology," to help address some of the challenges inherent in human-error accidents across the maritime space. "Autonomy (is a) big value driver to bring predictability to operations, de-risking operations and making them safer."

While Sea Machines' technology is agnostic to boat manufacturer or platform, it has built a close relationship with Metal Shark in recent years. "We have a really good setup with the Sharktech boat with the Sea Machine system on the Metal Shark 29 D, and from my understanding, they (the USCG) saw what we had and they basically said: 'We want that.'"

"I tend to think of Sea Machines as a like-minded company," said Chris Allard, CEO, Metal Shark. "They are forward-leaning, they're quick, and they're doing new things often outside of being asked to do it. They'll see a market opportunity and just do it. (I see Sea Machines as a) cultural fit with our company; we're in different spaces but both spaces need each other."

Opportunities Abound

While the market for autonomy is in its early infancy, there are many areas where it could potentially manifest quickly, including data collection/survey; surveillance and protection around fisheries, and commercial passenger and crew vessels, to name but a few. "The big area that we're working on now is crew transport vessels," said Johnson. You will see a lot of them for really the first movers are in the wind farms. It's a very routine because the wind farms stay in one area, one spot, there's a fixed base and it's a back and forth operation. It's a routine operation where autonomy brings a lot of value.

Metal Shark is amply diversified across commercial, gov-

ernment and military markets. "We see a different adoption across different segments," said Allard. "(The military is) jumping straight towards autonomy and it's completely changing the mission and the capability. I think we're at the turning point of autonomous systems going from that R&D stage to that full rate adoption." On the commercial side, as has been the general track on other tech adoption, it's more of a slower, progressive ramp up." While Johnson agrees that the military space is taking the early lead, he and Allard are most bullish on the commercial sector premised on volume. "The commercial space is a follower to the military space, but (once the technology matures) the adoption rate is going to come at us quickly. The other side of it is the commercial space is just so much larger than the military naval space from numbers of vessels."

In the commercial space, 'autonomy' is not on the radar of most operators, particularly with the challenges of simply staying in business today due to challenges presented courtesy of the COVID-19 pandemic.

While the general commercial maritime operator is not fully up to speed on autonomous systems – or for that matter even asking about them at this point, Allard emphasizes an understanding of the scope of "autonomy" in the big picture. "Sometimes I hate to say this in front of them (Sea Machines) on the risk that he'll raise prices, but in the scheme of things, the autonomy system is a relatively small portion, price-wise, of what can be a multi-million dollar asset. It can start to be comparable to the cost of a wage for a year or a small increase in safety or fuel economy. So, I think that the tipping point, when you look at the relative cost of the technology to the high capital cost of the asset, is going to really play in the favor of autonomy."

Hurdles Ahead

While advanced autonomy depends on the confluence and connectivity of multiple new technologies, according to Johnson (and many others) the biggest challenge ahead is not technological, rather cultural.

"There's a number of hurdles, and I think the biggest one or one of the biggest ones is just the status quo," said Johnson. "We have a robust industry that's been built upon 50, 100 years of operations and methodologies. When you bring new

Sea Machines

> "In the scheme of things, the autonomy system is a relatively small portion, price-wise, of what can be a multi-million dollar asset. It can start to be comparable to the cost of a wage for a year or a small increase in safety or fuel economy."

Chris Allard
CEO, Metal Shark

Metal Shark

Watch Chris Allard and Michael Johnson discuss trends in autonomous boats on Maritime Reporter TV: bit.ly/33wkvvJ

technologies forward, you're first looked at with skepticism."

He emphasizes the importance of continually evolving the technology. "Another of the hurdles is, to be honest …this is hard stuff," said Johnson. "It's not automation; automation today is usually more of a single signal data response, like say a governor on an engine. But this is autonomy and autonomy is many, many data streams coming together, more complex algorithms, prioritization of messages, data shedding, and a lot of these areas like, we bring machine learning and AI into our computer vision side of our product. Many of these are new fields of engineering."

Autonomy for All

The Sea Machines approach to autonomy differs substantially, for example, from the automotive industry, where groups of technologists work on solutions for just one brand of vehicle, for example.

"When you look at other autonomy companies in other sectors, they're usually wedded to a vehicle type," said Johnson. "You have 250 autonomy engineers that are working at Tesla, and they're building autonomous systems that work on a Tesla; or looking at one of our investors at Toyota, they probably have the largest autonomy team, but they're building for Toyota."

What Sea Machines has done is standardize its product, building a number of libraries for the interfaces to support, for example, the different propulsion types. When he looks at the commercial maritime sector, Johnson sees a massive but fragmented market, a market that looks more like the U.S. trucking market with thousands of smaller companies working alongside a smaller number of larger companies.

"We've worked to build a standardized product, a product that can then be installed in a number of different vessel types; working with a number of different propulsion types; working with feeds from different sensors."

Sea Machine's flagship product is the SM-300. "At the end of this year, we'll release 1.8," Johnson said. "We are product driven company with advanced technology at the core, but we really measure ourselves by our product. By the end of this year, we should be at system number 54 commitments, and well over 40,000 nautical miles (where) we've tested the system."

Johnson's team today is a team of 30, and he anticipates growing about 40%. Just as importantly, Sea Machines will soon launch a major new innovation. "Next year we'll release our first computer vision as a sensor product. A big step to empower the technology further is to be able to perceive the environment better, get better situational awareness and for three years now, we've centered on vision. Our first computer vision sensor next year will first be available within our SM-300 system."

Great Ships of all time

The Ship Designer's CURSE

By Rik van Hemmen

For the Design issue Greg asked me to write about a favorite ship design. I have no favorite ship design, or should say there are simply too many that are truly worthy of mention. But when considering favorite designs, ship designers (and builders) do carry a strange curse. Unique among engineers (and artists, architects, and industrial designers) their creations only live for about 30 years. With very few exceptions, in their own life time, ship designers get to see the disassembly of most of their creations. I am not aware of any other creations that are so readily tossed aside. While cars or vacuum cleaners, are mass produced and often tossed aside in 10 years or so, the best of them do end up in museums. Good buildings tend to last much longer and so do bridges, dams and other large engineering structures. However, only a very small portion of ships survive past 30, and even then, these are not the necessarily the best designs, they may have simply persisted in putting off their demise for random reasons.

In effect, we naval architects and marine engineers are the Christos of the engineering world. Our impact is of the fleeting kind.

Occasionally maritime nuts like us are asked to assist in the preservation of "Historic" (old) vessels in perpetuity.

Undoubtedly there are ships that are so unique that they should be preserved, but preserving ships is really, really expensive and, while from a historic perspective, it is important to preserve them, I am also seeing too many maritime museums fighting for the same dollar and ending up with insufficient funds to keep their vessels from deteriorating into non-preservable states. One scary example is the deterioration of the Cruiser OLYMPIA in Philadelphia. This is a truly rare and significant vessel, and if we are going to preserve any vessels at all, this one should be high on the list.

Undoubtedly, the maritime profession, community, and industry deserves a level of public recognition at the national level for its achievements and the only way to achieve that is to have physical representatives of the art available for educational purposes, but we have to be, oh so, careful at where the money is spent.

We really need to engage in some type of triage, but let me first point out that in vessel preservation there are actually a number of tiers. Small craft preservation is not a pressing problem since it is generally performed by enthusiasts, and while I do pain for the loss of some very important small craft, overall, small craft preservation is at about the same state as automobile preservation. 100 years from now we will have lost some worthy vessels, but I am sure there will still be some Alden schooners out there and some Sparkman and Stevens 12 Meters and more than a few Nat Herreshoff 12 1/2s.

Even in the larger yacht range there will be excellently preserved examples funded by the really wealthy.

And then there will be regional vessels preserved by incredible volunteers who will continue to soldier on. One of my very favorites is LST 325 in Evansville, Indiana. This is the type of vessel that can be (barely) maintained by a local community. The CHARLES MORGAN also could be fitted in this category. Another excellent example is the Barque ELISSA.

Above:
USS Constitution is tugged out to Fort Independence on Castle Island. (U.S. Navy Photo by Mass Communication Specialist 3rd Class Casey Scoular/ Released)

Below:
John W. Brown, a 441-ft. liberty ship in Baltimore. U.S. Coast Guard photo by Petty Officer 3rd Class Grace Baldwin.

Beyond that size or complexity range, the costs just explode and a national strategy is needed. So which vessels should be included in such a national strategy?

Since I have never seen a list like that, I'll make one, but please don't shoot the messenger. I made this list to focus attention, not to minimize the efforts by too many people in our community in preserving our heritage.

I actually made a list like this a number of years ago and it was slightly different and contained 10 ships. The changes occurred when I re-examined and refined the list on further consideration. (Let's call it design refinement).

Meanwhile, let's also consider that certain very important designs are already lost forever. There are no preserved early container ships. Container ships changed the world, but the early ones now only exist in pictures. Maybe we should put dibs on one of the SL-7s, now serving as the Algol class US Sealift vehicle carriers. They were not the first, but they were the ships that were built when the world recognized that there was no going back to breakbulk and while not a resounding commercial success, they were the product of real commercial maritime can-do, went on to a second life serving the nation and have a great story to tell.

And this is why the SS United States is not on this list. Too much of her story is an emotional fabrication. In essence, every ship is special, but we have to be realistic. The SS United States was nothing special when she was conceived, she was nothing special by design, she already was a white elephant when the contract was signed, she was well built by Newport News, and basically worthless when she entered service. Just because she hung around does not mean she is worthy of preservation. Ironically, the liner that should have been preserved, the Normandie, was destroyed under the SS United States designer's watch before the SS United States was designed.

Remember this list is Version 1.1. Great design is continuous refinement, we owe our profession nothing less than that.

For each column I write, MREN has agreed to make a small donation to an organization of my choice. For this column I nominate the Independence Seaport Museum www.phillyseaport.org. The Olympia really needs and a haircut and a shave.

Rik's List of Ships to be Federally Preserved

1. **USS CONSTITUTION.**
   I don't think there is any debate here and as a US Navy ship she is safe. She is historically significant, but also a lesson in clever design.

2. **SS JOHN BROWN.**
   The best-preserved Liberty Ship. A tribute to too many people, nations, shipbuilders and designers.

3. **SS LANE VICTORY.**
   The best-preserved Victory Ship. By too many people across the world considered to be one of the best money earners ever designed and an object of hope and renewal in post war years.

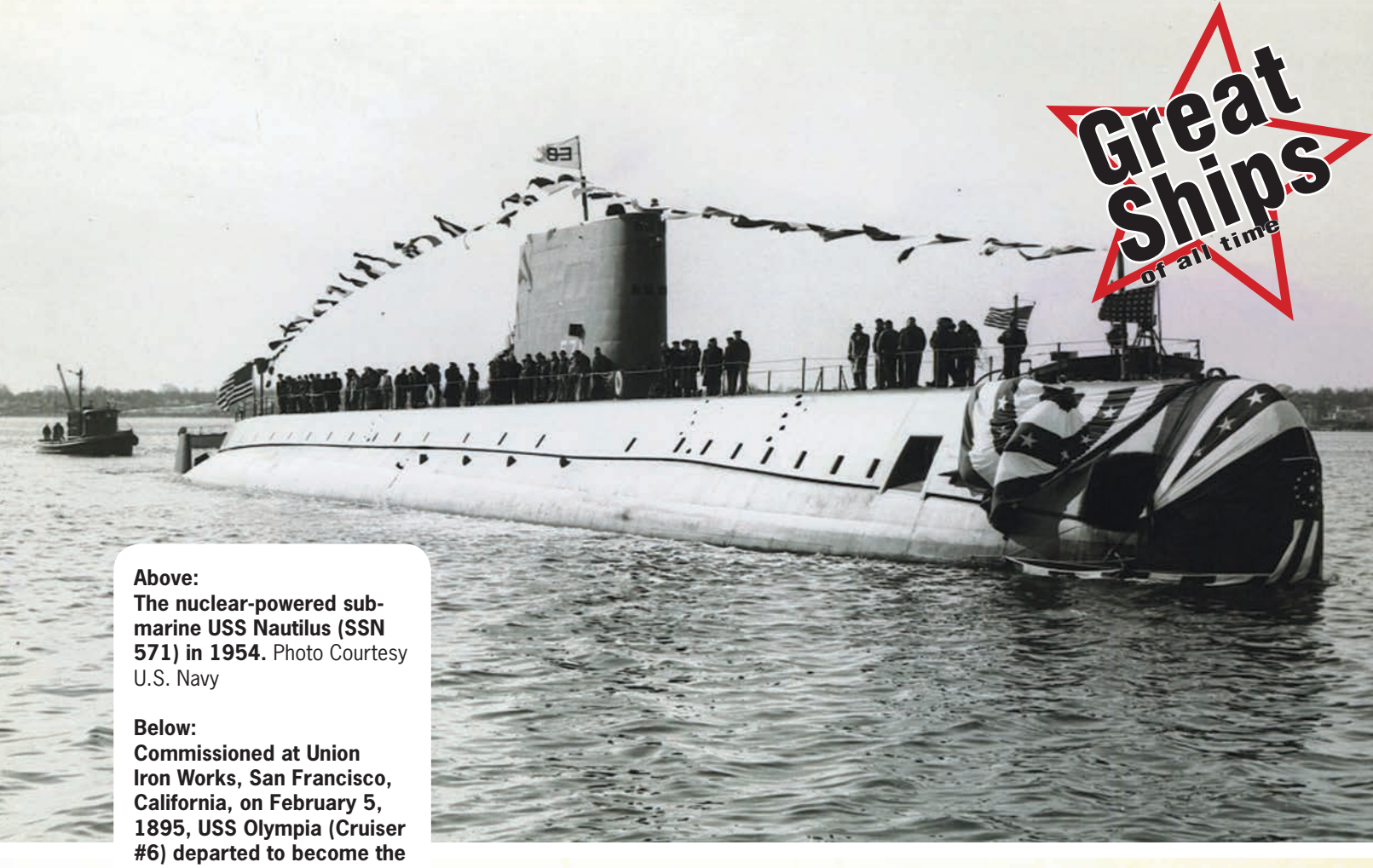
4. **USS OLYMPIA.**
   A very rare vessel by herself, and with a truly illustrious history to boot.

5. **USS INTREPID.**
   One can debate forever which remaining carrier is more historically significant, but INTREPID is secure at her dock in New York City. Preserving more carriers is simply doubling up.

6. **USS NAUTILUS.**
   One of the nation's greatest design and construction stunts. Hands down.

7. **Just one of the IOWA class battleships.**
   So far, all four Iowa class ships are still around. But do we really need to preserve four? Despite my personal preference for the USS NEW JERSEY, I'd have to vote for the USS MISSOURI. On this deck WWII ended.

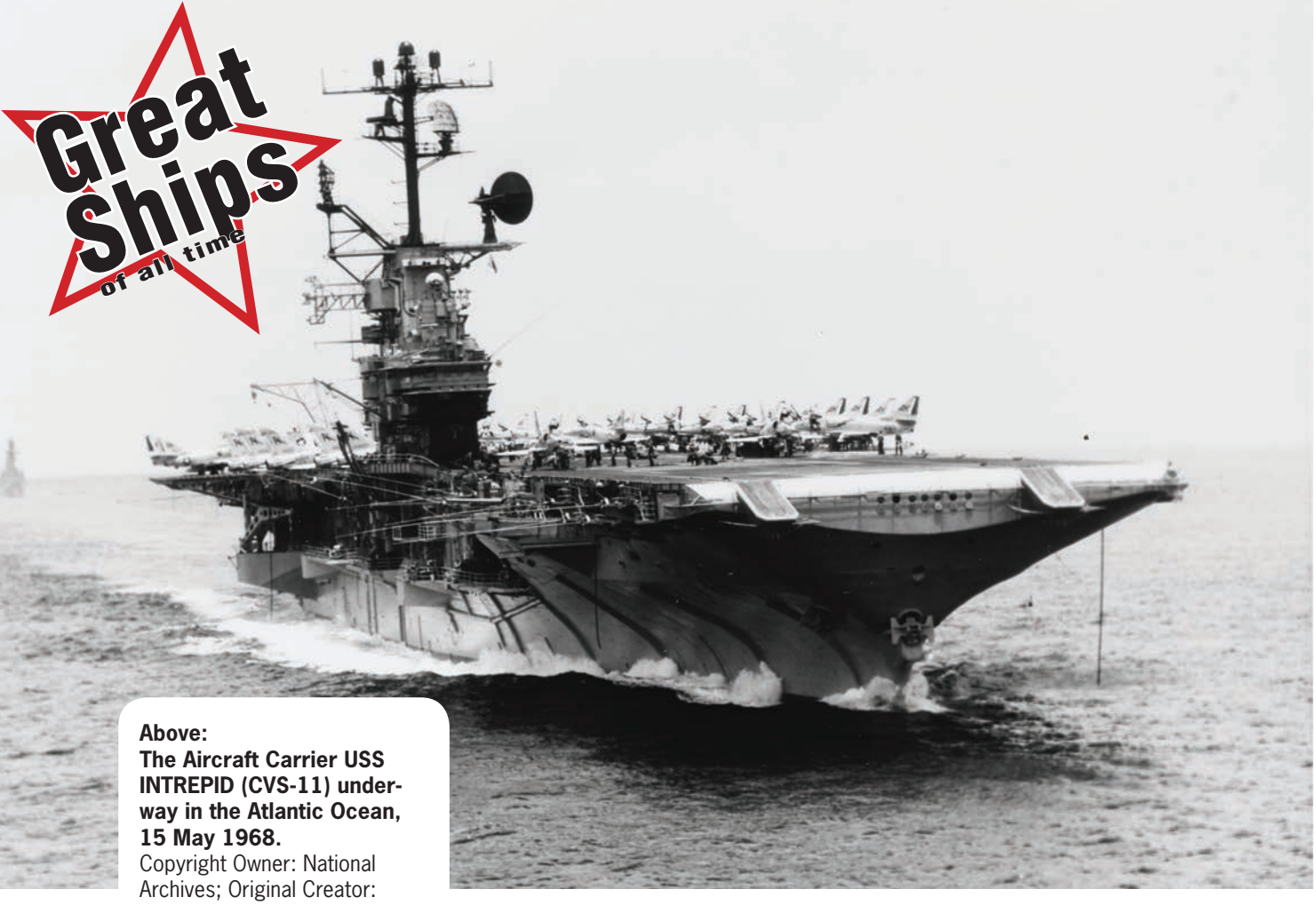
8. **NS SAVANNAH.**
   I am partial to her for quite a number of reasons. If the USS NEW JERSEY will find her maker, why not put NS SAVANNAH at her dock in Camden, NJ? She was built right there at one of the great US shipbuilders. She was explicitly built as a ship of peace with no intent of turning a profit or fighting a war. Moreover, she is a reminder that commercial nuclear ship propulsion is still not off the table. And she is just too pretty for words.



Above:
The nuclear-powered submarine USS Nautilus (SSN 571) in 1954. Photo Courtesy U.S. Navy

Below:
Commissioned at Union Iron Works, San Francisco, California, on February 5, 1895, USS Olympia (Cruiser #6) departed to become the flagship of the Asiatic Fleet. Serving in the Spanish-American War, she participated in the Battle of Manila Bay, on May 1, 1898, where Commodore George Dewey stated his famous instruction, "You may fire when you are ready, Gridley". Courtesy of the Library of Congress. National Museum of the U.S. Navy, Naval History and Heritage Command, National Museum of the U.S. Navy

Great Ships of all time



Above:
The Aircraft Carrier USS INTREPID (CVS-11) underway in the Atlantic Ocean, 15 May 1968.
Copyright Owner: National Archives; Original Creator: Photographer, Photographer's Mate First Class McClain

Below:
NS Savannah is a reminder that commercial nuclear ship propulsion is still not off the table.
Credit: MARAD

USS Iowa (BB-61) Fires a full broadside of nine 16/50 and six 5/38 guns during a target exercise near Vieques Island, Puerto Rico, 1 July 1984. [Note concussion effects on the water surface, and 16-inch gun barrels in varying degrees of recoil.] Official U.S. Navy Photograph, from the the Department of Defense Still Media Collection; Photographed by PHAN J. Alan Elliott.

Great Ships of 2020

NYK

Sakura Leader

The world's first Digital Smart Ship (DSS)

On October 28, 2020, NYK took delivery of Sakura Leader, a pure car and truck carrier (PCTC) capable of navigating oceans with only LNG as the ship's main fuel. This delivery marks a step toward achieving NYK's environment management target, which is to reduce CO2 emissions per ton-kilometer of transport by 50% by 2050. The vessel was built at the Shin Kurushima Dockyard of Shin Kurushima Toyohashi Shipbuilding Co. Ltd.

The ship is the first large LNG-fueled PCTC to be built in Japan. Vessel modification and the switch to LNG will make the ship up to approximately 40% more energy efficient (by reducing CO2 emissions per unit of transport) compared to ships using conventional heavy oil fueled engines. The vessel is also expected to reduce sulfur oxide (SOx) emissions by approximately 99% and nitrogen oxides (NOx) by approximately 86% compared to ships using conventional heavy oil fueled engines. The vessel will be contributing to clean marine transport by carrying vehicles.

The ship was accredited by Nippon Kaiji Kyokai as the world's first Digital Smart Ship (DSS), a ship class notation confirming that the vessel is equipped with advanced digital technology.

This particular accreditation was for DSS (Energy Efficiency), which applies to the analysis of energy consumption efficiency; DSS (Machinery Monitoring), which applies to engine monitoring, data processing on board, and data transmission to land; and DSS (Connected Ship).

Sakura Leader Main Particulars

Name	Sakura Leader
Type	PCTC
Builders	Shin Kurushima Dockyard, Co., Ltd.
Owners	NYK Line
Designers	Shin Kurushima Dockyard, Co., Ltd.
Material	Steel
Delivery Date	October 28, 2020
Classification	ClassNK
Length, (o.a.)	199.95 m
Length, (b.p.)	196 m
Breadth, (molded)	38 m
Depth, (molded)	35.54 m (Accommodation dec)
Draft, (designed)	9.55 m
Main engines	Win GD 8X52DF

NYK

Great Ships of 2020

CMA CGM Jacques Saade

LNG-Fueled • 23,000 TEU • 400 x 61 x 78 m

Credit Philip Plisson

By any measure, CMA CGM Jacques Saade is 'Big.' The ship recently joined the CMA CGM fleet, an innovative ship on multiple levels that has garnered global attention as the first 23,000-TEU containership in the world to be powered by liquefied natural gas (LNG). This is the first of a series of nine 23,000 TEU container ships for the French containershipping legend, named after the founder of CMA CGM, Jacques Saadé; a continuation in the trend of ever-larger and more sophisticated containerships

A few of the more notable features include:

• **Fore:** At the bow, the bulb has been completely integrated to the vessel's profile: the bow is straight and tapered, a first for a vessel of this size.

• **Aft:** At the stern, the propeller and the rudder have been redesigned for an optimized performance. The propeller is equipped with a Becker Twisted Fin system, designed to improve performance by optimizing water flow and significantly reducing energy consumption. Due to this innovation alone it is estimaged the ship will boast a 4% reduction in CO2 emissions.

• **LNG Tank:** The tank is a key part of the vessel. Its 18,600 cubic meters of stainless steel offer a fuel volume and capacity that allows full round trips between Asia and Europe. The construction of the tank is a technological feat in and of itselft that required the assembly of 1,649 stainless steel panels.

The job to insulate the tank alone took approximately nine months, and consisted consists of manufacturing a thermal cocoon that allows the natural gas to be maintained in a liquid state at -161°C. Two layers of insulation and a second membrane envelop the tank and are equipped with very high-tech sensors to ensure that the LNG storage conditions remain optimal and meet all safety requirements.

Stored in a liquid state in the tank, the natural gas is converted to a gaseous state to power the ship's engines. This process of gasification and pressurization of the gas is a complex process as it must be adjusted in accordance ith the engines' consumption, which depends on the speed of the vessel and the electricity consumption on board. The development of this regulating system is one of the key aspects of this ship.

• **It's Digital:** The ship's cockpit contains many digital applications. Augmented reality screens on the bridge providing real-time information to officers such as the vessel's rate of turn, distance from the quay or even transverse speeds; a tactical screen for a better view of the charts and dynamic navigation briefings; the "path prediction"» system, which enables the location of the ship to be predicted with a high degree of accuracy within the next three minutes, taking into account the current rate of turn and speed, as well as helm and speed orders.

This facilitates docking maneuvers and allows the Captain to better understand the ship's movements; and last but not least, the "smart eye" projection system (a set of cameras) allowing the vessel to be viewed at 360°.

Great Ships of 2020

MOL

MOL Gas Agility

The world's largest LNG Bunkering Vessel

Gas Agility is the world largest LNG bunkering vessel with 18,600 cu. m. MARKIII-flex type membrane tanks built at Hudong-Zhonghua Shipbuilding (Group) Co., Ltd. in China. The vessel is equipped with four sets of 8L20DF engines for electric propulsion and two sets of azimuth thrusters and a bow thruster for navigation. A Harmonized Control system for the thrusters is a key technlolgy for maneuvering safely and efficiently for berthing, unberthing, position-keeping and approach during LNG bunkering. A joystick maneuvering system his installed to control the propulsion thrusters which allows the vessel to move by keeping heading and speed even in difficult sea condition, assisting for safe approaches to the jetty and ship side of LNG fuel receiving vessel for ship-to-ship bunkering. The vessel is designed for No Pilot and No Tugboat assistance. So that this ship should have extra flexibility of LNG bunkering, the membrane LNG tanks are designed as no filling/discharging restriction and sub-cooling type re-liquefaction system is extra equipment for controlling tank pressure and LNG liquid temperature. This system consists with LNG chilling system for controlling temperature/pressure of LNG vapor phase with spraying chilled LNG and also control temperature in LNG liquid phase. For safety mooring while ship-to-ship bunkering, mooring tension monitoring system is installed as LNG fuel receiving vessel does not have it, which is integrated in mooring winches.

MOL Gas Agility Main Particulars

Name	Gas Agility
Type	LNG Bunkering Vessel
Builder	Hudong-Zhonghua Shipbuilding (Group)
Owner	Mitsui O.S.K. Lines, Ltd.
Operator	MOL LNG Transport (Europe) Ltd.
Designer	Hudong-Zhonghua Shipbuilding (Group)
Delivery Date	April 30, 2020
Classification	Bureau Veritas
Length, (o.a.)	135.9 m
Length, (b.p.)	131 m
Breadth, (molded)	24.5 m
Depth, (molded)	16 m
Draft, (designed)	6.6 m
Draft, (scantling)	6.8 m
DWT (at design draft)	8,859 MT
Speed	12 knots
Fuel Type	Dual Fuel (LNG and MGO/MDO)
Generator engines	Wärtsilä 8L20DF x 4 sets
Total installed power	5,680 kW
Bow Thruster	Wärtsilä CT150H x 1 sets
Propellers	Wärtsilä WST-18FP x 2 sets
Radars	Furuno FAR-2827 / FAR-2837S
Depth Sounders	FURUNO FE-800
Auto Pilot	Yokogawa PT900A-P-K2T
AIS	Furuno FA-170
GPS	Furuno GP-170
Mooring equipment	TTS
Fire detection system	Consilium
Motor starters	Terasaki
Lifeboats	Norsafe
Liferafts	Viking
Coatings	Jotun
Ballast Water Management System	Wärtsilä
LNG Sub-cooling System	Air Liquide
LNG Ship to Ship Transfer System	KLAW
IAS	Kongsberg

LNG manifolds are designed as two vertical positions on each side of the vessel, the higher position manifolds with 10-in. is for LNG loading and the lower position manifolds with 8-in. is for LNG bunkering and its capacity is 1,600 cu. m./hr. bunkering rate. As for the ship-to-ship LNG transfer system, an Emergency Release Coupler (ERC) is located onboard and cryogenic flexible hose with Quick Connect and Disconnect Coupler (QCDC) will be led to LNG fuel receiving vessel manifold.

While "Gas Agility" was being built, LNG fueled container vessels were built in the same shipyard, they were the primary LNG receiving vessels Gas Agility is designed for. It made the design of both ships be harmonized ensuring and achieving safe/efficient operation with close communication for design as there was no significant physical distance in the shipyard. Demonstration for alongside and connection with real both ships was taken place at the final stage of construction.

Island Offshore

Great Ships of 2020

Island Victory

Most Powerful (& green) Multi-Purpose OSV Ever

Norway's Island Offshore broke free from the enforced conservatism of the E&P sector, adding not just a new ship to its fleet, but one that re-writes the rulebook in capabilities, technology and despite its size and power, environmental credentials.

Simply put, Island Offshore's new deep water installation Vessel 'Island Victory' is the most powerful multi-purpose offshore vessel ever built; a point proven during bollard pull tests conducted by its builder VARD last November with a towing power of 477 tonnes recorded, smashing the existing record of 423 tonnes.

"Island Victory's brute strength enables heavy duty, deep water mooring using a single vessel, when before, two or three would be needed to carry the loads and achieve the same outcome," said Tommy Walaunet, Managing Director, Island Offshore "We need the power and deck space for mooring operations and transport of wires and chains, but when compared to using multiple vessels for the same job, Island Victory can do it using less fuel and with lower emissions."

A true multi-purpose behemoth, with a length of 123 meters and breadth of 25 meters, Island Victory boasts a 250-ton offshore crane, accommodation and diverse client facilities for 110 people, and a working deck measuring 1200 sq. m.

Island Victory joined the Island Offshore fleet as a three-year company restructuring plan enters its final phases and Mr Walaunet is confident that the decision to invest in such an extensive undertaking was the right one.

"As a privately-owned company we are fortunate to have investors with an understanding of, and appetite for risk," he explains. "This gives us the ability to identify and drive new opportunities with concepts that bring something new to the market."

The introduction of Island Victory and Island Clipper (it's new W2W vessel) shows that something is being done right at Island Offshore's HQ in the well-known offshore industry town of Ulsteinvik on Norway's west coast. And while the eagerly awaited 'recovery' or signs of a new offshore boom are certainly not on the near horizon, forward thinking fleet diversification is seeing some players return to a semblance of stability.

Island Victory Main Particulars

Name	Island Victory
Owner	Island Offshore Management AS
Type	Deep Water Installation/Anchor handling – DP II
Design	Kongsberg Maritime UT 797 CX
Ship Builder	Vard
Material	Steel
Delivery	February 2020
Class	DNV GL
Cargo deck area	1,200 sq. m.
Rig chain lockers (7 lockers)	2,765 cu. m.
Rig chain lockers incl. moon pool lockers	2,200 cu. m.
Moon pool capacity	max 800 T
Accommodation	110
Bollard Pull	477 T
Moon pool	8.0mx 7.2 m. (L x B) (526 m3)
Work ROVs	2x Fully integrated WROV and LARS system permanently installed on board, for depths up to 4000 meter (1side/1moonpool)
1x Offshore AHC crane	250t/17m-20t/40m- wire length 3000m
1x Deck crane	6t/20m- 12t/10m
2x Cargo rail cranes	PS RR Capacity 2,8t/3,2m- 15,4m outreach 15t/3m / -SB RR Capacity 2,8t/3,2m- 15,4m outreach 15t/3m
Typical work	Heavy anchor handling operations / Deep subsea installation work / BP 477 tonn / SPS Class (Special Purpose Ship)
NOFO	Act as NOFO 2009 oil recovery vessel - ORO capacity: 2500 m3
Length, (o.a.)	123.4 m
Breadth, (molded)	25 m
Depth, (molded)	10 m
Draft, (designed)	8 m
Draft, (scantling)	8
DWT (at design draft)	5899
DWT (at scantling draft)	6264
Speed	max 18.75 knots
Fuel Type	Fuel oil
Main engines	2x RR Bergen B32:40V16PCD 8000kW each + 4 RR Bergen C25:33 L9 2880 kW each + 2 x MTU 16V4000M34 1999 kw each
Total installed power	31518 kW equal to 42 880 HP
Bow Thrusters	2x RR TT2650 DPN CP 1600kW each | 1x RR Azimut Swing up TCNS092/62-220 2000kW - stern 2 x RR 2400 DPN 1200 kW
Waterjets	-
Propellers	2 x RR CPP 144A4D Ice 5400 mm Ø
Bearings	Wartsila/Cedervall shaft bearings
Gears	Scana Volda
Generators	4 x Marelli MJRM LB8 (gen set)
Engine controls	Kongsberg RR Bergen
Radars	Furuno
Depth Sounders	Furuno
Auto Pilot	Marine Technology
Radios	Sailor
AIS	Furuno
GPS	Furuno
GMDSS	Sailor
SatCom	Marlink
Mooring equipment	Konsgberg winches
Fire extinguishing systems	Danfoss Semco
Fire detection system	Consilium
Heat exchangers	Alfa Laval Nordic
Motor starters	
Lifeboats	Harding Safety/Palfinger Marine
Liferafts	Viking Safety Equipment
Coatings	Akzo Nobel
Ballast Water Management System	Optimarin

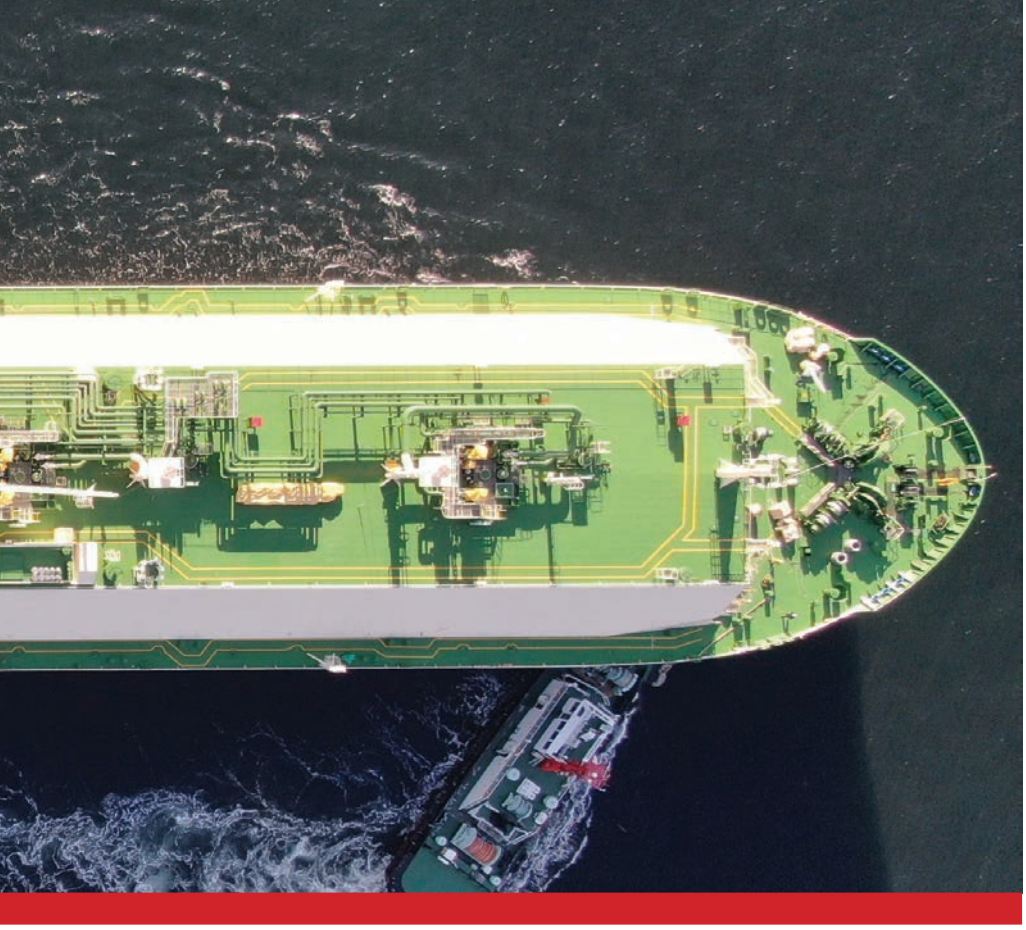
Seri Everest

World's Largest Ethane Carrier

Seri Everest, the first in a series of three 98,000 cbm Very Large Ethane Carriers (VLECs) built at Samsung Heavy Industries Co., Ltd. (SHI) and delivered to MISC Berhad on October 30, 2020. Seri Everest is the first from a series of six VLECs that MISC purchased in July 2020. As a second generation VLEC, Seri Everest is one of the largest vessels of its kind in the world.

With the delivery of MISC's first VLEC – Seri Everest, she has set a new benchmark in the ethane market. Seri Everest has the capacity of transporting ethane in large volumes over long distances, while ensuring the highest level of safety and reliability. At present, Seri Everest is the largest VLEC operating in the market, and MISC will be the largest transporter of Ethane in the world upon delivery of all her sister vessels, in this series. Seri Everest incorporates the latest state-of-the art technologies in various forms including multi-gas deep well pumps, reliquification plants, and Boil-off gas (BOG) compressors that increases the efficiency of the GTT's Mark III Membrane Type cargo containment system and effectively reduces the vapor pressure in the cargo tanks. This VLEC is powered by a MAN B&W 7G60ME-C9.5-GIE Gas Injection Ethane engine, complemented with the latest Pump Vaporizer Unit (PVU), making it one of the very few vessels in the world with ethane burning capability. Seri Everest was also delivered with LNG Ready notation by ABS, proving the robustness of the vessel. Staying true to the owner's agenda towards a decarbonized future, Seri Everest was built with green technology features which include energy efficiency, emission reductions and biodiversity management. These features also include the installation of the Selective Catalytic Reduction (SCR) system for the main engine and diesel generator to comply with the latest IMO Tier III requirements. The VLEC is also equipped with IMO and USCG approved, Electrolysis indirect type, ballast water treatment plant complying with the requirement of IMO MEPC 169(57) & 174(58 and built in accordance with International Convention for Sea and Environmentally Sound Recycling of Ships to ensure proper end-of-life disposal.

Seri Everest is chartered to STL for a firm period of 15 years and is managed by Eaglestar Shipmanagement Gas (S) Pte. Ltd. As the second generation VLEC, Seri Everest and the other five VLECs are the largest vessels of its kind in the world. The VLEC's serve as a



Great Ships of 2020

MISC Berhad

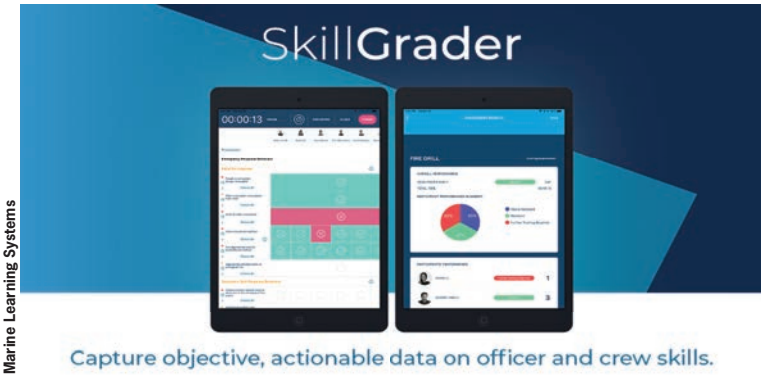
more economical and viable solution for large-scale ethane transportation with more than 98,000 cbm of total cargo capacity. Korean shipyards Samsung Heavy Industries and Hyundai Heavy Industries, are building the remainder of the five VLEC's scheduled to be delivered in the first half of 2021.

Seri Everest Main Particulars

Name.....Seri Everest
Type ..... Ethane/LPG Carrier
Builder.....Samsung Heavy Industries Co., Ltd.
Material..... Carbon Steel
Owner.....Seri Everest (Singapore) Pte. Ltd.
.....(A 100% wholly owned subsidiary of MISC Berhad)
Operator..... Eaglestar Shipmanagement Gas Pte. Ltd.
Designer.....Samsung Heavy Industries Co., Ltd.
Delivery Date .....October 30, 2020
Classification.....American Bureau of Shipping (ABS)
Length, (o.a.).....229.977 m
Length, (b.p.).....223 m
Breadth, (molded) .....36.5 m
Depth, (molded).....22.4 m
Draft, (designed).....11.8 m
Draft, (scantling).....12.2 m
DWT (at design draft).....56,652.5 MT
DWT (at scantling draft).....59,641.7 MT
Speed.....19.38 kts (ballast), 19.04 kts (laden)
Fuel Type .....Ethane/LSMGO/LSHFO
Main engines ..... Hyundai
Total installed power ..... 18,050 kW x 97 RPM
Propellers.....Fixed Pitch Propeller x 1
Bearings.....Intermediate Shaft Bearings,
..... Self Lubricated type FW cooled
Generators..... Hyundai, 3 x 1,880 kW x 900 RPM
Engine controls..... Kongsberg
Radars.....Furuno 1 x S-band with ARPA,
.....1 x X-band with ARPA
Depth Sounders .....Consilium 1 x E-2
Auto Pilot.....Yokogawa 1 x Double electric circuit type
AIS ..... Furuno, FA-170
GPS..... Furuno x 2
Radio ..... Furuno
GMDSS..... Furuno VHF, INMARSAT C
SatCom..... VSAT INMARSAT
Mooring equipment.... 16 x Electro-Hydraulic Winches,
.....2 x Windlass
Fire extinguishing systems.....NK , Drypowder, CO2,
..... Wet Chemical & Foam
Fire detection system.....Consilium
Gas Detection .....Consilium hydrocarbon detector,
..... Riken Keiki Portable gas detectors
Heat exchangers.....Alfa Laval
Lifeboats .....HLB fully enclosed hinged gravity type
Liferafts..... 4 X 12 person, 1 x 6 person
Coatings .....International Paint
BWMS..... Purimar Electrolysis, indirect type
Cargo Containment System .....Membrane type (GTT MARK-III) Stainless steel sheet (AISI 304L) and reinforced PU foam insulation, 4 tanks
Reliquification Plant .. Reliquefaction plant has cooling capacity to cover expected heat transfer rate of abt. 340kW with C-Ethane, (expected BOR is 0.12% per day) based on GTT's estimation.3 BOG Compressors Burckhardt
Cargo Pump ..... Svanehøj' deepwell pump x
..... 2 per tank x 650m3/h
Nitrogen Generator.....1 xPSA Type 3,200 Nm3/h1
...x Membrane Type 50 Nm3/h with 10m3 buffer tank

Tech Files

Innovative products, technologies and concepts



Marine Learning Systems

MLS SkillGrader: Objective Assessment

Marine Learning Systems introduced SkillGrader, a mobile application designed to enable vessel operators and training institutions to objectively evaluate officer and crew skills, and to generate instant reports on workforce insights. SkillGrader is designed to support simple and objective evaluation of mariner performance. Assess any observable skill, such as routine drills, simulation training, assessment of qualification, or on-the-job performance. SkillGrader replaces subjective and cumbersome paper-based assessments with a digital solution that runs on both tablets and mobile devices. It provides an instant report after each assessment for immediate debrief and coaching opportunities. It also electronically stores all results through an on-demand dashboard for future reference, to support audits, and to help reveal crew skill trends, gaps, and metrics for operational improvement. SkillGrader was initially developed as a collaboration between Marine Learning Systems and the training and assessment experts at Carnival Corporation.

Watch MLS CEO Murray Goldberg discuss SkillGrader @ bit.ly/3ol9uWd

or Visit: https://skillgrader.com/maritime

Maritime Radar Training in the Cloud

As all industries work on digital solutions to deal with COVID-19 induced restrictions, Kongsberg Digital launched a new cloud-based simulation service for maritime radar training, an eLearning tool designed to enable instructors to manage and control exercises with realistic radar simulations to students, who now can practice and prepare for their exams anytime, anywhere and at their own pace.

Designed to be compliant with the IMO Model Courses 1.07 and 1.08, it assists in delivery of learning objectives such as marine radar operational principles; radar navigation and plotting; use of radar in Search and Rescue (SAR); and use of ARPA. The radar simulation application is the first in a line of training applications to be released on K-Sim Connect as part of the K-Sim Navigation portfolio. Within the next few months the radar application will be supplemented with ECDIS, followed by increased functionality.

Kongsberg Digital

RightShip Debuts Maritime Emissions Portal

As the maritime community collectively fights to reduce emissions, RightShip and Pilbara Ports Authority have developed a pilot program that allows ports around the world to review their emissions profiles and develop management strategies.After partnering with The Australian Marine Environment Protection Association (AUSMEPA), and winning a $250,000 Google Impact grant in 2016, RightShip and AUSMEPA have developed a Maritime Emissions Portal (MEP), which will provide leading emissions inventory data to ports around the world. Available now for commercial use, the MEP has been designed as a tool to support port operators to better and more accurately understand ship-based emissions, and based on that evidence identify opportunities to develop management strategies.

Read the full story here: bit.ly/2JwSOHD

RightShip

Alfa Laval PureCool

Alfa Laval

Alfa Laval PureCool, part of WinGD's iCER technology on WinGD X-DF engines.

A new system for reducing marine emissions has entered Alfa Laval's Pure Thinking portfolio. Targeting methane slip from LNG engines, Alfa Laval introduced its PureCool system. More than 15 years ago, Alfa Laval introduced the Pure Thinking concept, and key systems like Alfa Laval PureBallast and PureSOx were introduced well ahead of respective regulations.

The new Alfa Laval PureCool system targets an unaddressed emission source: methane slip. This is the small percentage of unburned methane that escapes through the engine when LNG is used as fuel. Although no regulations currently exist for it, there is growing awareness of methane slip's climate impact.

"LNG is proving an important bridge fuel in the transition to a zero-carbon future," said Søren Hjorth Krarup, Business Unit President. "When combusted, LNG releases less CO2 than other fossil fuels. However, methane has a higher global warming potential than CO2, which makes the unburned fraction a concern. Regulations may or may not appear, but methane slip must be addressed if we are to reach a 50% reduction in marine greenhouse gas emissions by 2050."

Realized in partnership with engine developer WinGD, it is the main component of iCER technology, an option for next-generation WinGD X-DF engines where exhaust gas is recirculated at low pressure. With PureCool as the vital cascade exhaust gas cooling system, iCER slashes methane slip by up to 50% ¬ while creating a 3% gain in fuel efficiency. "Partnerships can bring the dramatic results needed to fight climate change," says Kalra. "This is why Alfa Laval joined the Getting to Zero Coalition, and it is why we pursue joint projects with suppliers and research partners at the Alfa Laval Test & Training Center.

PureCool fits neatly alongside Alfa Laval PureBallast (ballast water treatment), PureBilge (bilge water treatment), PureNOx LS & HS (NOx abatement), PureSOx (SO abatement) and PureVent (crankcase gas cleaning). However, it is the first Pure Thinking solution specifically for LNG and a new fuel era.

Toft Takes the Helm at MSC

MSC

RightShip

RightShip New CEO Brodsgaard Lund

Lindblad Expeditions

Lindblad Names Goodman CCO/CMO

Toft Takes the Helm at MSC

Soren Toft started his new role as CEO at MSC Mediterranean Shipping Company on December 2, 2020, reporting to Diego Aponte, MSC Group President, and Gianluigi Aponte, Founder and MSC Group Chairman. Toft will oversees MSC's global cargo businesses including ocean liner and logistics. He will also be a member of the board of directors of Terminal Investment Ltd (TiL), the terminals business which is majority-owned by MSC. Soren Toft joins MSC from Maersk, where he served as COO since 2013 and later as a Member of the Executive Board.

RightShip New CEO Brodsgaard Lund

RightShip announced the appointment of its new CEO, Steen Brodsgaard Lund, succeeding Martin Crawford-Brunt, who departs RightShip on December 18, 2020. Brodsgaard Lund will be based in Singapore and expand RightShip's global reach from the maritime hub that counts many of its customers.

Lindblad Names Goodman CCO/CMO

Lindblad Expeditions Holdings, Inc. named David Goodman as its Chief Commercial and Marketing Officer. Goodman spent 30+ years running divisions of global multi-media organizations, overseeing revenue, marketing, content creation, production, product/technology, distribution and oversight of some of the world's most recognizable brands and properties. Most recently he served as Executive Vice President, Marketing and Digital Development at Sotheby's.

Brandy D. Christian Honored

Port of New Orleans (Port NOLA) President and CEO and CEO of the New Orleans Public Belt Railroad (NOPB) Brandy D. Christian received the 2020 C. Alvin Bertel Award, which was established in 1967 and is presented each year to an individual who has made significant contributions to the Louisiana port and maritime community. Christian oversees all cargo, cruise and industrial real estate operations at Port NOLA. As the CEO of NOPB, she sets strategic direction and oversees all rail holdings.

Fritz Vilhelmsen new CPCO in Hempel

Pernille Fritz Vilhelmsen was appointed Executive Vice President & Chief People & Culture Officer and member of the Executive Management Board in Hempel A/S. She succeeds Peter Kirkegaard, who accepted a new job outside Hempel. Pernille has been Talent Management Director at Hempel since she joined from Maersk Line in 2017, and she has delivered remarkable results in a few years.

Svitzer Grows its Americas Ops

With increasing growth opportunities within the terminal towage sector of the Americas region, Svitzer is strengthening its organisational and managerial setup in order to pursue these opportunities. To support this growth accordingly in selected countries and ports, Svitzer is appointing Rutger Thulin as new Managing Director for the Terminal Towage Cluster in Americas, spanning Svitzer's operations in Canada, Peru, Costa Rica,

Statia, and the Bahamas.

Giarratano Named VP @ DSC Dredge
Nick "Nicky" Giarratano was promoted to Vice President of Manufacturing of DSC Dredge, LLC. Giarratano has severed more than 24 years in various roles in both engineering and manufacturing.

Stena Line charts 25 years in Belfast
Stena Line is celebrating the 25th anniversary (12 Nov 2020) of the relocation of its ferry services to Belfast from Larne in 1995. During this time, the Irish Sea's leading ferry company has achieved a number of key milestones including transporting in excess of 33 million passengers, 7 million cars and almost 7 million freight units. Stena Line's newest addition to its Irish Sea fleet, Stena Embla, has successfully completed a comprehensive range of sea trials in advance of going into service on the Belfast-Liverpool route in early 2021.

Joe O'Neill, CEO, Belfast Harbor and Paul Grant, Trade Director Irish Sea outside Stena Line terminal in Belfast.

Stena Line

Brandy D. Christian Honored

Port NOLA

Helmpel

Fritz Vilhelmsen new CPCO in Hempel

Svitzer

Rutger Thulin, Svitzer Americas

DSC Dredge

Giarratano Named VP @ DSC Dredge

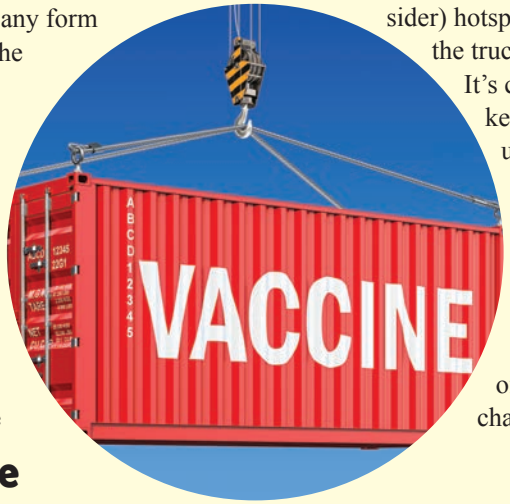
2021: Logistics Challenges Abound

Captain Andrew Kinsey, Senior Marine Risk Consultant, Allianz Global Corporate & Specialty, recently discussed with MR TV some of the trends that will shape 2021 for the maritime, ports and logistics world.

MARITIME REPORTER TV **Watch Captain Andrew Kinsey on Maritime Reporter TV at:** bit.ly/369z22a

MR TV: As we come to the end of 2020, talk now turns not simply to COVID-19 and a potential vaccine, but to the supply chain logistics and challenges that come with distributing those vaccines. How does the picture look from where you sit?

Andrew Kinsey: The picture looks complicated. It's a global demand. It's a global logistics problem. So in its scope and complexity, it is unmatched for what we've ever faced before, and it's multifaceted. We have a tremendous theft potential because of the value of (the vaccine). And then also the theft is augmented by the current economic conditions globally; we have seen an uptick in pilferage of cargoes throughout North America. But then we also have the cold chain complications of any form of shipment. So the chain of custody, the shipment, the packaging; can we effectively and efficiently transport this in the timeframe required? That comes down to that last mile challenge, as (the vaccine) has to get to the recipient in good order, at temp, within the timeline.



Vaccine distribution
© alexlmx/AdobeStocK

MR TV: This issue transcends just the maritime portion of the program.

Andrew Kinsey: From the delivery standpoint, with so much of the current air capacity grounded, it's a problem, because we are so used to having air cargo on passenger vessels, not just cargo. So with so many flights grounded, our air capacity for transport is limited. And then (you have to consider) hotspots (and ask) are the truckers available? It's complex and it's keeping a lot of us up at night to try to stay on top of it and make sure that we preplan, and we talk with the assureds. Because one of the biggest challenges on this is

Survey Attendance
© Pawin/AdobeStock

we have our traditional suppliers for this who are well-vetted and understand the risks and challenges, but as in any supply and demand free market economy, you're going to have new people popping up. So we speak with assureds often about vetting their supply chains; making sure (you know who's) carrying your cargo, and make sure it's not being subbed out without your knowledge.

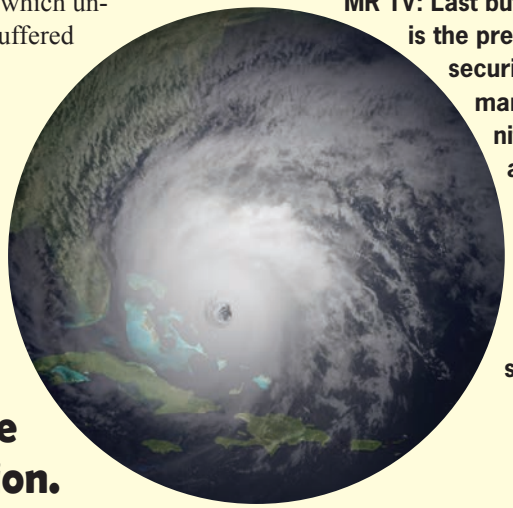
MR TV: Obviously the pandemic has created infinite challenges across all industries. In the maritime world, there are many, including in regards to global survey attendance. What have been the challenges, and perhaps more importantly, what have been some of the lessons learned that you've seen?

Andrew Kinsey: Well on the survey attendance for global, it has been access; access to sites, to vessels, to equipment, to workers. So, with that access and the lack thereof, we also are

facing the challenges of delays. And once again, these are delays because of canceled sailings, delays because of port restrictions and congestion, or delays because of site closures. And we know with the supply chain, it's a domino effect. We work with our assureds regularly to inform them it's a changing landscape. What worked yesterday will not work tomorrow. It's just going to change. It really goes back to basics, getting on the phone, making those phone calls. Sometimes it's a late at night call if it's Vietnam or Malaysia or India, but really touching base and knowing who's at the other end, who's going to support you.

MR TV: 2020 has been quite a year and it's not only been COVID-19; also the record hurricane season. What do you consider to be the best lessons learned (or not learned) as far as hurricane preparedness and response?

Andrew Kinsey: It actually goes back to one of the first things I learned at my Alma mater, the seven Ps of proper planning. One of the biggest challenges for this season was the back-to-back storms. One of the major sites we've been working with one of our assureds is Lake Charles, which unfortunately has suffered repeated storms. So you're facing accumulations. The cargo that couldn't get there because of the first storm is still sitting on barges or rail or in warehouses and it can't get there, and then it's delayed with the second storm. So that accumulation of risk, because the ships are getting discharged in that window, but the barges can't always get there or the heavy hauls. A key factor to this is to understand the deterioration of the infrastructure. When you have storms of this magnitude pass through, you are having changes in your channels, your dredging, your roads, your heavy hauls, your power lines. That's the hardware. But then also the software. Your internet, your phone, your power, all these things are out and have to be addressed and brought back up. So from a heavy haul standpoint, or from a Coast Guard standpoint, you're not going to be able to get down that channel. You're not going to be able to go down that road. Having a plan, vetting that plan, and doing a tabletop beforehand (is essential).



Hurricane Preparation.
© Sasa Kadrijevic/AdobeStock

MR TV: Last but surely not least is the prevalence of cyber security threats to the maritime community. As you know, as of January 1, 2021, all vessels with the safety management system need to address cybersecurity in their procedures. What are some of your recommendations?

Cyber Security.
© polygraphus/AdobeStock

Andrew Kinsey: At Allianz we tell our assureds: cyber is a race without a finish. It not going away and you need to stay on top of it because it's an ever-changing landscape. There are some unique challenges from a marine standpoint for cyber, but the biggest thing to remember is there are a lot of assets available for cyber (protection) throughout the cyber community. This is not a maritime only threat. This is something that every company, every entity. So you can't just go down the rabbit hole of what we have to do for marine, we're all interconnected. (So we recommend to) use the assets that are available. The Coast Guard is a great start, go there first to understand how it has to be tailored to your safety management system specifically, but reach out, drill down, there are more assets available. The Department of Homeland Security has some wonderful assets for small businesses. And then the National Cybersecurity Forum also has some excellent resources. (Effectively mitigating the cyber security threat) takes continued improvement, it takes continued vigilance. And since it's part of that safety management system, it also needs to be audited. We have to review it each year. So it's not a one and done, and it's unfortunately not going to be done, there is no real finish here.

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