February 2021

MARITIME REPORTER AND ENGINEERING NEWS

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Industry on Ice
Shown is the LNG powered, 185,000 GT cruise ship Costa Toscana, floated out last month at Meyer Turku.

Photo: Courtesy Meyer Turku/Costa
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Features

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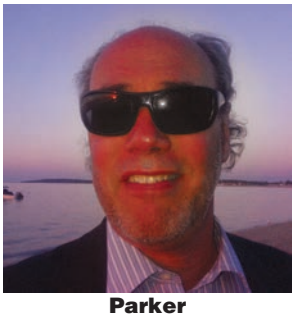

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It seems somewhat surreal that nearly a full year has passed since the world entered fully into the grip of COVID-19, punctuated by the tone of this year's cover versus last year's look inside Royal Caribbean's data driven business model. In fact, the last business trip that I took in 2020 was to south Florida about this time last year to meet with the team of RCCL executives to discuss their strategy in depth as featured here: https://magazines.marinelink.com/nwm/MaritimeReporter/202003/. While 2020 is in the rearview mirror, the effects of COVID-19 linger, and the once surging cruise industry continues to struggle. For our cruise coverage in this edition Barry Parker does what he does best: diving into a topic through a financial lens, and it doesn't take a Big Six accountant to realize that this particular financial picture is not pretty. While I normally associate *'cash burn rate'* with Silicon Valley start-ups, it was interesting to note in Parker's report that Carnival Corp. announced an expected cash burn rate of $600 million per month in 2021, though with $9.5 billion in cash at end 2020, it has the liquidity to ride out 2021 in a zero-revenue environment. As vaccination rates climb and pent-up travel demand comes to the fore, it would be a stretch to imagine that 2021 will be a 'zero-revenue environment,' but it can be assumed that the market 'rebound' will evolve slowly, with consultants Maritime Strategies International (MSI), estimating cruise passenger levels to increase to 11.9m this year, an increase of 59% year-on-year, but still substantially below the 29.6m cruise passengers recorded in 2019. Our full report starts on page 26.

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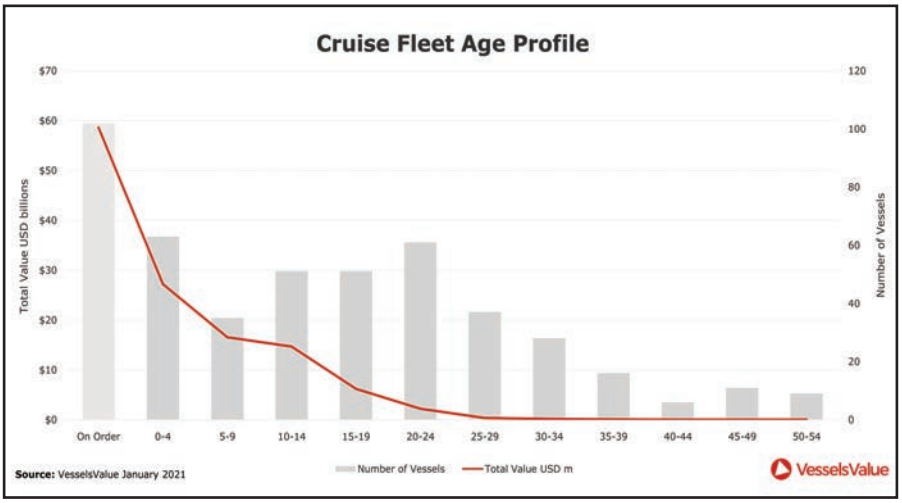
The Cruise Market

There have been few industries hit harder by the pandemic than the global cruise industry. We look at the current fleet and orderbook with our friends at VesselValue. **For a full industry report by Barry Parker turn to page 28.**

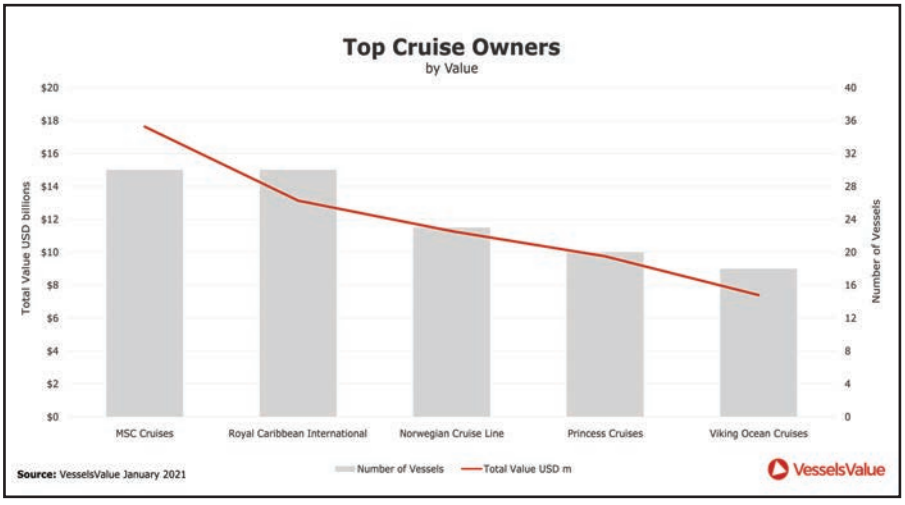
Cruise Fleet Age Profile

Age Group	# of Vessels	$
On Order	102	$58,575
0-4	63	$27,207
5-9	35	$16,537
10-14	51	$14,682
15-19	51	$6,207
20-24	61	$2,200
25-29	37	$342
30-34	28	$149
35-39	16	$61
40-44	6	$27
45-49	11	$41
50-54	9	$26
Grand Total	**470**	**$126,054**



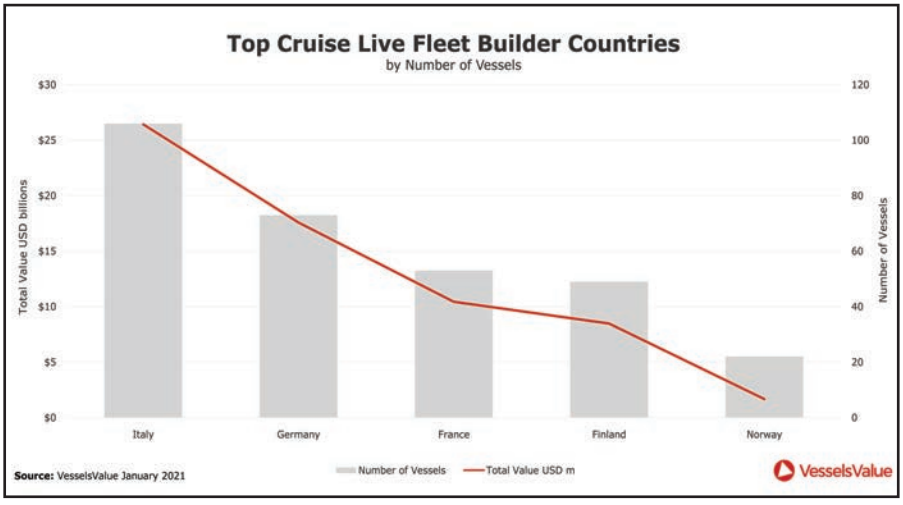
Top Cruise Owners by Value

Company	# of Vessels	$
MSC Cruises	30	$17,630
Royal Caribbean Intl	30	$13,133
Norwegian Cruise Line	23	$11,285
Princess Cruises	20	$9,757
Viking Ocean Cruises	18	$7,398
Grand Total	121	$59,203



Top Cruise Orderbook Builder Countries by Number of Vessels

Company	# of Vessels	$
Italy	40	$26,979
Germany	13	$8,976
France	12	$10,977
Finland	9	$5,915
China	9	$2,751
Grand Total	83	$55,598



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Maritime Global News	24,215
Maritime Jobs	43,515
Maritime Logistics Professional	28,858
Maritime Propulsion	20,767
Maritime Reporter & Engineering News	59,804
World Energy News	45,916

On the Bridge: NavFleet Launched

NAVTOR launched NavFleet, touted by the company as a "breakthrough application" developed over the past two years in collaboration with shipowners and designed to open up a new horizon of possibilities for fleet management: real-time operational insight, performance optimization and enhanced business decision making.

NAVTOR has made its name through the development of a suite of e-Navigation products, delivered, updated and connected through a cyber secure ecosystem that is designed to unite shoreside and vessel teams. This provides the platform for NavFleet, which is designed to seamlessly integrate real-time data from vessels, fleets, offices and business-critical sources within a single shoreside application.

The result: a complete, common situational awareness, with the ability to continually monitor and refine vessel performance. Or, as NAVTOR CEO Tor Svanes said: "complete control."

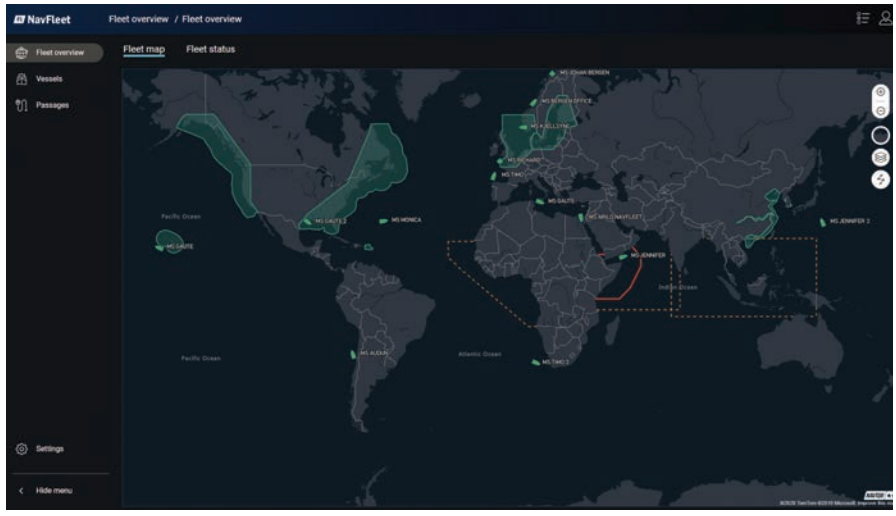

Image: NAVTOR

Benefits: The Big Picture

"Our e-Navigation mission has always been to simplify operational tasks, while enhancing efficiency, safety and business performance," said Svanes. This may be a new arena for NAVTOR, but Svanes explains that it's built on the same principles, technology, infrastructure and experience to deliver benefits for shipowners on fleet management.

"Using our cyber-secure certified gateway, NavBox, and cloud computing resources we can enable remote teams to work as one – accessing data relating to, for example, vessel sensors, weather, passage planning, route optimization, engines and fuel consumption, in real-

"Complete control" is the way that Navtor CEO **Tor Svanes** assesses his company's recent introduction of NavFleet.

Image: NAVTOR

time. In this way, users have a simplified interface where everything is connected, enabling them to see the 'big picture' rather than working to gather and analyze separate data streams in isolation. This unlocks smarter shipping for everyone… and the benefits of that are almost unlimited," said Svanes.

Performance optimization is a key NavFleet selling point. For example, if a shoreside team knows what rpm produces a speed of 10 knots in good weather conditions, vessel engines could be set accordingly and ongoing speed monitored. If speed doesn't meet expectations a hull performance issue could be identified, with bio-fouling producing frictional drag, hampering performance, and impacting on fuel consumption and efficiency. NavFleet is geared to deliver this insight.

But according to Svanes, this is just the tip of the iceberg. The new awareness also enables easier compliance, alongside simplified reporting and administration, with the ability to automate key reports. Amongst these will be the mandated EU MRV/IMO DCS reports, which can be produced at the touch of a NavFleet button from later in 2021. A new approach to operational report handling will allow reports (e.g. noon reports) to be sent directly from vessels, but accessed from anywhere through the application.

In addition, NavFleet's real-time monitoring capabilities will help office-based teams determine if vessels are falling short of KPIs or deviating from passage plans, facilitating swift remedial action. This ability makes it easier for owners to adhere to the covenants in charter party agreements, potentially avoiding performance claims and strengthening working relationships.

"We see this as a natural progression for NAVTOR and a further means of translating some of the principal benefits we've brought to e-Navigation into the context of overall fleet and business management. This is a new chapter for our company and, we believe, an essential application for enabling smarter, more sustainable and profitable shipping organizations."

Since opening its doors in Egersund, Norway in 2011, NAVTOR now operates a global network of eight full-time offices and has more than 20 international distributors, supporting customers in more than 60 countries, with products and services onboard around 7,000 individual vessels.

Tip #21

MarTID 2021

A Call to Action

The 2021 Maritime Training Insights Database (MarTID) survey is about to be launched. This is a unique and pivotal time in maritime training. The pandemic has forced us to adapt our training and has accelerated training innovations. This year's survey is uniquely important for its ability to help us learn from these unprecedented changes to training practices. If we do not survey and document the changes resulting from the pandemic, we lose a unique opportunity to learn. Therefore, the industry needs you to take 20 minutes to complete the survey at **www.MarTID.org**. Your contribution will enable the creation of 2021's comprehensive, freely distributed, global maritime training practices report that you, the members of our industry rely on more heavily each year.

This year has been, and continues to be, both a difficult and transitional year for maritime training. The world-wide pandemic has created training challenges throughout the industry. The impacts have ranged from difficult to existential for maritime operators and education & training institutes. For seafarers, the impacts have been similarly varied and difficult. These challenges have brought the need for adaptation and innovation. Many of the forced changes, no doubt, are inferior but necessary initiatives to keep training going in less-than-optimal circumstances. Others are positive, accelerated innovations which are beneficial and will persist post-pandemic. We need to understand and document these new initiatives.

It is with the above in mind that this year's special topic for the annual Maritime Training Insights survey focuses on the impacts on training resulting from the pandemic. We need you to tell your 2020/2021 training story. Most importantly we are surveying how seafarers, operators and maritime training institutions have adapted in reaction to the pandemic, both temporarily and indefinitely. In addition to this year's focus on the effects of the pandemic, the survey covers a consistent, core set of data to track important and long-term trends in maritime training practices.

The maritime training practices survey and its resulting annual report are non-commercial initiatives supported by the

With COVID-19 & the fate of seafarers globally in 2020, it is critical to understand seafarer training & education. Take the 2021 survey @ www.MarTID.org

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World Maritime University, New Wave Media, and Marine Learning Systems in partnership together. This year, like last, we have created three separate surveys: one to be completed by seafarers, one by vessel operators, and one by maritime training institutions. The more responses we have, the more accurate and useful the data in the report. And the early trend is excellent – the 2019 survey received twice the responses of 2018. The 2020 survey roughly doubled again. Please help us double the responses once more for the 2021 survey.

When visiting **www.MarTID.org** on your way to complete the survey, take the opportunity to review some of the revelations contained in the 2020 training practices report. There you will find some fascinating data. For example, the report details the top training drivers, how training budgets are changing, and where some of the money is going. Additionally, the survey contains useful information on the major new maritime training initiatives underway and being planned by operators and training institutions across the globe. If you are involved in training, this list may provide some outstanding ideas to consider at your organization.

The 2020 report also focuses on practices and approaches to training quality that will be of interest to every organization focusing on continuous improvement in training outcomes. In that report are ideas for training quality improvement and data that can be used by any organization to benchmark their training quality efforts.

Whether you work as a training executive for a vessel operator, as a faculty member or administrator at a maritime training institute, or as a seafarer, we need your survey responses. Please visit **www.MarTID.org** to fill out the survey and then watch for the release of the 2021 report.

Until next time, thank you and sail safely!

The Author

Goldberg

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Read 2020 MarTID survey results: https://www.marinelink.com/news/martid-maritime-training-budgets-continue-481079

Mike Corrigan

CEO, INTERFERRY

Mike Corrigan, the ubiquitous leader of Interferry, has a broad base of energy and maritime industry experience, including his stint as CEO of BC Ferries. Corrigan shares with Maritime Reporter & Engineering News *his thoughts on a broad range of issues facing the ferry industry: COVID-19, emerging international regulations, and yes, maritime training and education initiatives throughout the world ferry industry.*

By Greg Trauthwein

Looking back to your tenure atop BC Ferries, can you discuss this through a training and education lens?

At BC Ferries, safety and training was an integral part of my role and passion. I came in as the first chief operating officer in 2006 and had to restructure the whole safety program and safety culture. We took a blended learning approach, as when you're trying to train 4,500 people across a vast geography, at 47 terminals and 36 ships, it was a huge challenge. I'm happy to report that near the end of my tenure, we had succeeded and, in fact, had won international awards for safety and for training.

What specific measures that were implemented?

We worked with Marine Learning Systems in looking at a blended approach to learning. With the number of employees we had spread across our system, and needing to get them all up from a familiarization standpoint to a new level of training, we had to think differently. It was obvious there was always going to be that component of classroom learning, hands-on learning, learning on the vessels, and learning at the terminals, but to get them up to where we needed to get be, we needed to, we incorporated (online) virtual training, which proved to be very successful. Ultimately, each company has to look at their unique geography and situation to determine what training systems are better for them.

I know the Interferry membership is diverse, from small operators in developing countries to the largest international fleets. Can you give an overview of the 'state of training' in the passenger ferry business today?

Since I joined the ferry industry it has increased tenfold. We've looked to the airline industry as the beacon in terms of what we needed to do, implementing many of their techniques and training modules. I'm proud to say today that the vast majority of ferry operators in the developed world are at or approaching where the airline industry is, and there's been a lot of time, money and resources expended.

Can you give us an update and an overview of the pandemic's impact on your industry as of today?

We're looking at a 90% drop in passenger and vehicle traffic, but ferry operators (continue) providing lifeline and essential services to the communities they serve by moving cargo and precious goods while the rest of their ferries remain virtually empty. They are incurring huge losses to do the right thing and to continue to provide services to their communities, and these losses are unsustainable over the long-term. Operators need to have those ships at or near capacity to be able to turn a profit and stay in service over the long-term.

We understand that the IMO has taken an interest in domestic ferry safety. Can you give us an update on this, with insight on why would a local operator would feel compelled to follow non-obligatory international standards?

The ownership structure is such that you've have Interferry members that are extremely large – billion dollar companies – that are owned by private individuals. You've got other companies that are as large that our publicly or government-owned. So it's a real hodgepodge of ownership structures at Interferry. But one thing's for sure, everybody cares about safety. And when we talk about domestic ferry safety, we're talking about safety that has not really been regulated by the IMO.

The International Maritime Organization, as the name would suggest, is about regulations for international marine

" We're looking at a 90% drop in passenger and vehicle traffic, but ferry operators (continue) providing lifeline and essential services to the communities they serve by moving cargo and precious goods while the rest of their ferries remain virtually empty. They are incurring huge losses to do the right thing."

Mike Corrigan,
CEO, Interferry

Source: Interferry

MARITIME REPORTER TV **Watch the full interview with Mike Corrigan on MR TV:** bit.ly/3qXyGDi

travel. One thing we've pushed the IMO for is to get involved in domestic ferry safety as it pertains to the developing world. So each country is responsible for safety within its borders or boundaries. Countries like Canada, the U.S., the European Union, Australia, New Zealand, have top-tier safety systems (already) in place. We're trying to get the rest of the world there through domestic ferry safety initiatives, and the developing world needs assistance in that. Interferry has provided that through some of our programs, but we pushed the IMO hard and now they've put on the agenda to develop model regulations that can be used to help developing countries get further up the safety curve much quicker. We are encouraged by that, and we want to be a big part of that solution going forward.

I'm not looking for you to play favorites, but when you look at operators in the developing world can you share some examples of companies that you see "doing it right" in terms of training, education and safety?

Absolutely. I think the best example that I could provide would be Archipelago Philippine Ferries. Chet and Mary Ann Pastrana, who are strong supporters of Interferry. In fact, Chet's on our board of directors of Interferry. We've had a conference in Manila in 2016. Their training programs – not only for a developing country but for a developed world – are second to none. They've done an outstanding job of a blended learning approach and really have raised the bar exponentially on safety in the Asia-Pacific region. They've done that in conjunction with rebuilding their fleet too. I mean, there's still many ferries that operate in the Philippines that are wooden boats, if you can believe that. But Chet and Mary Ann have rebuilt pretty much their entire fleet to world-class standards, and they've put a world-class safety program in place too.

Interferry also has a project in the Philippines around safety called FerrySafe One. We want to take that learning and help other countries like Bangladesh, Indonesia, and ultimately Africa, to get further up the safety curve as fast as possible because it's in everybody's best interest. Interferry is the voice of the ferry industry worldwide, and we need to do everything in our power to improve safety around the world.

45th Annual Interferry Conference Fast Facts

- **What** 45th Annual Interferry Conference
- **When** October 2-6, 2021
- **Where** Santander, Spain
- **Host Sponsor** Brittany Ferries
- **Main Hotel** Eurostars Real Hotel
- **Registration** Opens on May 1, 2021.
- **Why** The annual Interferry Conference is the longest running international event devoted to the ferry industry, and has been held in venues around the world for more than 45 years. Conference sessions address the latest topics of specific interest to the ferry industry including regulatory, technical, operations and commercial issues for both large and small operators.
- **https://interferryconference.com**

Coast Guard Authorization Act

On 1 January 2021, in an unusual New Year's Day session, the Senate (following similar action by the House) overrode President Trump's veto and enacted into law the National Defense Authorization Act (NDAA) (H.R. 6395). In addition to the provisions relating to the Department of Defense, the bill contains numerous maritime sections, including Authorization Acts for the Coast Guard (USCG), the Maritime Administration (MARAD), and the Federal Maritime Commission (FMC).

The Coast Guard Authorization Act allows for acquisition of an additional National Security Cutter, a Polar Security Cutter (i.e., heavy icebreaker), and, subject to the availability of funds, three additional Polar Security Cutters and four additional Fast Response Cutters.

The Coast Guard is directed to not enforce the requirement for merchant mariner documents with respect to 'non-operating individuals' including those engaged on board for the sole purpose of carrying out spill response activities, salvage, marine firefighting, or commercial diving business or functions from or on any vessel, including marine firefighters, spill response personnel, salvage personnel, and commercial divers and diving support personnel. This resolves a continuing problem of how to legally accommodate these important persons who are not traditional mariners but whose temporary presence onboard is vital. In order to eliminate the backlog in processing of vessel certificates of documentation, the Coast Guard is authorized to extend the duration of such certificates for a period of not more than one year.

Large passenger vessels that embark or disembark passengers in the United States are required to have a physician on board to treat passengers; be in compliance with the Health Care Guidelines for Cruise Ship Medical Facilities established by the American College of Emergency Physicians; and ensure that the initial safety briefing given to the passengers on board the vessel includes (A) the location of the vessel's medical facilities; and (B) the appropriate steps passengers should follow during a medical emergency.

The Coast Guard is directed to establish a two-year pilot program for the establishment and enforcement of safety zones in the exclusive economic zone (EEZ) for special activities, such as space activities and offshore energy development. While enforcement actions regarding US vessels and US nationals will not present problems, there may be issues regarding enforcement actions regarding foreign vessels and foreign persons, as international law imposes limits on the authority of a coastal state beyond its territorial sea.

The Coast Guard is directed to establish a national policy for vessel traffic services (VTS), including the standardization of titles, roles, and responsibilities of VTS personnel and organizational structure; the establishment of measures for monitoring, informing, recommending, and directing vessel traffic; standardization of training for VTS personnel; and the establishment of certification and competency evaluation for VTS personnel. A continuous risk assessment program is to be developed to evaluate and mitigate safety risks for each VTS area. A nationwide VTS personnel training program and a standard competency qualification process for VTS personnel is to be applied. In sum, the US VTS program is to standardized and professionalized.

Towing vessels operating as harbor assist vessels and response vessels included on a vessel response plan (VRP) are exempt from any additional requirements of subtitle II of title 46, United States Code, and chapter I of title 33 and chapter I of title 46, Code of Federal Regulations (as in effect on the date of the enactment of this Act), that would result solely from such vessel operating outside the Boundary Line for the above operations. This provision eliminates the conundrum created when towing vessels became subject to inspection.

It is the sense of Congress that the Arctic is a region of strategic importance to the national security interests of the United States, and the Coast Guard must better align its mission prioritization and development of capabilities to meet the growing array of challenges in the region; and that the increasing freedom of navigation and expansion of activity in the Arctic must be met with an increasing show of Coast Guard forces capable of exerting influence through persistent presence. Reports to Congress are required concerning the Arctic capabilities of the US armed forces and on the Arctic search and rescue capabilities of the Coast Guard. The Arctic Shipping Federal Advisory Committee is established to provide policy recommendations to the Secretary of Transportation on

positioning the United States to take advantage of emerging opportunities for Arctic maritime transportation.

Largely implementing the recommendations of the National Transportation Safety Board's investigation of the fatal Conception casualty, the vessel inspection laws have been amended to increase requirements for covered small passenger vessels with overnight passenger accommodations.

Maritime Administration

The Maritime Administration Authorization Act includes a provision amending the processes for waiving navigation and vessel inspection laws. Waivers requested by the Secretary of Defense must be necessary in the interest of national defense to address an immediate adverse effect on military operations and a written explanation must be provided to Congress within 24 hours. Reports concerning all other waivers must be posted on the internet. The Act also establishes a Maritime Transportation System Emergency Relief Program as well as a Tanker Security Fleet Program.

Federal Maritime Commission

The Federal Maritime Commission Authorization Act requires the FMC to annually submit to Congress reports that describe the Commission's progress toward addressing the issues raised in each unfinished regulatory proceeding, regardless of whether the proceeding is subject to a statutory or regulatory deadline. It also establishes the National Shipper Advisory Committee to advise the Commission on policies relating to the competitiveness, reliability, integrity, and fairness of the international ocean freight delivery system.

Miscellaneous

In a wholly separate portion of NDAA, Congress amended the Outer Continental Shelf Lands Act to make it clear that the jurisdiction of the United States extends to installations and other devices permanently or temporarily attached to the OCS seabed erected thereon for the purpose of exploring for, developing, or producing resources, including non-mineral energy resources. This provision makes it clear that the coastwise trade laws apply to offshore wind and solar energy facilities. The maritime portions of NDAA cover pages and pages of the legislation. Space limitations prevent a discussion here of all those provisions or even a thorough analysis of the few highlighted here.

Those interested should review the legislation in depth.

The Author

Bryant

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

Demystifying Cyber Security

© pinkeyes/AdobeStock

Recent cyber attacks to the U.S. Government, the IMO and Maersk, amongst others has caused the world to pay attention to criminal cyber activities by foreign states, terrorists and criminals. The cyber attack against CMA CGM shut down services for close to two weeks. Two days later, on October 30, the IMO was held hostage by a cyber attack. These attacks follow attacks earlier this year against MSC and COSCO.

As of January 1, 2021, all vessels that have a safety management system must address cyber security in order to maintain ISM certification. The IMO guidelines for cyber security can be found in MSC-FAL.1/Circ.3. This high-level guidance is just the foundation for a proper cyber security program for owners/operators. The circular highlights the importance of protecting vulnerable systems such as:

1. Bridge systems;
2. Cargo handling and management systems;
3. Propulsion and machinery management and power control systems;
4. Access control systems;
5. Passenger servicing and management systems;
6. Passenger facing public networks;
7. Administrative and crew welfare systems; and
8. Communication systems.

The thought of having cyber security responsibilities can be chilling to some and burdensome to others. Personally, whenever I think of cyber security I think of some college kid in their parent's basement trying to get the password to my bank account. The truth is that hacking scenario, while it still exists, is not the predominant cyber crime in the world today. Cyber crimes may be conducted by organized crime, nation states, terrorists, or industrial espionage. On the other side of the fence are the "white hat" hackers whose job it is to find the weak links in a corporate cyber security chain. They expose weaknesses without exploiting them.

One does not need to be versed in code and hacking to be an efficient cyber security officer. Cyber security is as much about the protection of the system through the hardware as it is through the software. To demystify this field, I checked in with Cyber Security Specialist Cliff Neve, who retired from the USCG Cyber Security unit.

The maritime industry is vulnerable to attacks on both our Information Technology and our Operational Technology. If this is the first time that you are hearing this, you may be just as confused as when Mr. Neve explained this to me. Information Technology (IT) is the software that runs our computers, ECDIS, phone, etc. Operational Technology (OT) is the software and computers that are called upon to operate equipment. OT governs our engines, regulates the angle of our satellite antenna, and governs the processes of our 3D printers.

Cyber security is about protecting our access points, but according to Dean Constantine hacking the IT network is only one concern. Cyber criminals have also developed the capability of hacking into our OT, or Operational Technology. Our hardware, like engine controls, steering gear, etc are vulnerable to outside attack from hitherto unknown vectors.

The dangers of installing software cannot be understated. Not all apps that your nerd friend recommends are safe. Or for that matter, updates from the computer manufacturer or operating system provider. According to another expert, Christopher Owen, Bios updates should always be vetted through your in house personnel prior to installing. Bios determines things such as when the fan turns on, how energy is distributed through the computer, ect. It is akin to regulating our heartbeat.

Add on to that the questionability of manufacturer updates as a state sponsored terrorism, and your head may swim. The world has recently begun to accept Zoom as the dark overlord of conducting meetings. Photobombing, Zoom style, has been highlighted during the pandemic. Much like crashing a party, uninvited attendees will drop in on your meeting, or hijack it. The question has been asked, why has nothing been

done about this? Simply put, because no one had to. Prior to the pandemic services such as Zoom were utilized marginally. Now they have become the standard. Simple settings such as setting up a waiting room to admit users and password protect your meetings can go a long way. Citing concerns some companies have switched to alternate meeting platforms.

Following training, it is imperative to maintain the system. Basic things on board such as updating the systems with authorized updates, conducting malware, spyware, and virus detection software, rebooting the computer frequently enough to allow updates to process.

The hiring of a cyber security expert cannot be understated. When ISPS rolled out, security experts were hired around the world to conduct vessel security assessments and assist in writing vessel security plans. If owners and operators have not yet done so, that should be done to comply with the amendments to the ISM code.

Much like our physical security, the first step in maintaining cyber security on board is education and repeated training. Not the kind that is done on a computer with a slide player that you can click through, get to the quiz, and be done in under five minutes. The training must be comprehensive and engaging. Educating the user in what safe practices are such as not opening suspicious email, not plugging devices into a ship computer, not allowing use by unauthorized persons,

As a society we have accepted the integration of technology into our everyday lives and businesses. Instantaneous communication and access to information at all hours of the day or night have created a near dependency on our connected technology. As much good as this technology does, simple things to preserve it's integrity is just as important as staying hydrated in the summer and wearing a hat in the winter. Much like standing watch, we must remain alert and vigilant at all times to the possibility of what could be, while working towards keeping what we value safe.

The Author

Bonvento

Matthew is an Assistant Professor of Nautical Science. Previously he served as Senior Manager for Safety, Security, Regulatory, and Quality Compliance for Vanuatu Maritime Services.

Wirelessly & Seamlessly

Connecting Shipboard Data Sources

ScanReach

ScanReach sits at the epicenter of the digitalization trend. John Roger Nesje, Chief Executive Officer, Scandinavian Reach Technologies AS, discusses the path forward as ScanReach helps to enable a multitude of safety, efficiency and wireless IoT capabilities in complex and confined steel environments.

By Greg Trauthwein

To start, how is ScanReach unique in this space?

There are a lot of system solutions providers when it comes to software. However, we are a bit different as we the software and we have hardware too.

What, specifically, was the problem you saw, and how do you aim to solve it?

We saw that it is difficult to collect signals from inside a vessel that are not already connected via cable. We are focused on (delivering) the data that is not available today, data that we can bring to life with our onboard wireless connectivity solution.

When you look at the market in total, where do you see the best opportunities for ScanReach?

The first product is Connect POB: "POB" for Personal On-Board, and "Connect" is our way to say that you can connect your Personnel On-Board. It's a system that allows you to locate people onboard during emergency. We can show on the bridge, and even in the main office on land, exactly where these people are located. That's the first solution, a safety solution. Our customers today are diverse, as we have fish carriers, fish factory vessels, offshore support vessels, as well as dry bulk and container ships. Of particular note, we also have received our explosion proof certificate for the wrist-

band, which helps to open the oil tanker, LNG/LPG markets, amongst others.

So if you're doing this wirelessly, I would imagine that the installation process is simplified?

Since our solution does not require a large installation, our market is all existing vessels. We have specially designed our hardware to be easy to retrofit to any vessel in the world. A typical 'installation' for a large vessel is completed before lunch in one day during normal operations.

Can you describe what, exactly, is included in your system?

We need to put on board small radios to be able to create a wireless network. We put on radios to avoid cables, and we spread the radios around in the vessel. We walk around in the vessel and we put these radios up in many rooms. We spread them around to create a good coverage network, so we are able to pick up signals from Bluetooth devices, as well as from our wristbands. So that's it: the wristband and the radio nodes. Finally, we need a central computer on the bridge to be able to present the data, to present the location of people, to present alarm when somebody pushes the button.

We understand that Innovation Norway last year awarded ScanReach some financing. Can you discuss the package?

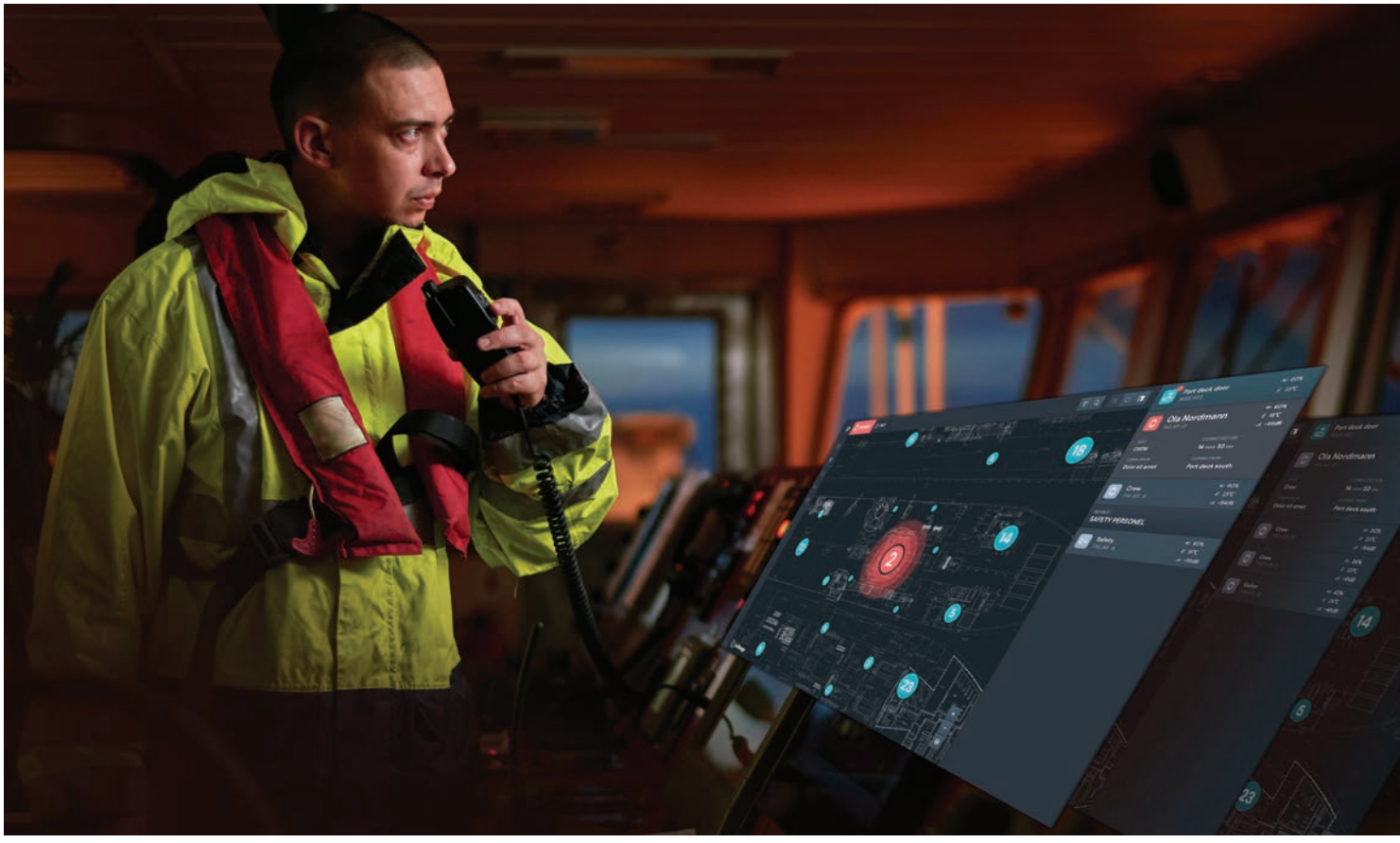
In March 2020, when the Norway (and the rest of the world) closed almost everything due to the COVID-19, we made five applications for five different projects. Two of them are connected to Personnel On-Board control, one for use in the offshore oil and gas market on the rigs and platforms. (Our technology is easily transferable for) use on board a rig or platform, however, we needed to adapt to the oil and gas rules and regulations and specific requirements.

The other Personnel On-Board control project that we have from Innovation Norway is for offshore wind, which is a fast-rising market. They have the same challenges (tracking people) when they are going from a maintenance vessel to the windmill and then back. The idea behind that project is that we are making a map, not only of the vessel and where people are on board the vessel, but which people are going from the vessel to the windmill, and when the

"Connect POB ... is a system that allows you to locate people onboard during emergency. We can show on the bridge, and even in the main office on land, exactly where these people are located."

John Roger Nesje,
CEO, ScanReach

MARITIME REPORTER TV **Watch the full interview with John Roger Nesje on MR TV: bit.ly/2MIS6wR**



ScanReach

The five pilot projects approved for finance support by Innovation Norway include:

- Enhanced personnel protection for the offshore wind industry
- Retrofitting ships for real time monitoring of fuel consumption
- A retrofit solution for environmental monitoring of hazardous areas and rooms on board vessels
- Wireless sensor solutions for automatic Man Over Board (MOB) and fall detection, and
- Enhanced personnel protection for the oil and gas industry.

vessel are approaching the windmill offshore installation, they can easily see, which windmills do they have people on board?

What were the other three projects?

We have our fall detection and man overboard project that helps to develop more accurate positioning of people that fall overboard. Since everyone onboard will have this wristband, we can see where they are. It also works for falls inside the vessel. Then we have two projects that are more connected to IOT/digitalization. One project is specific to fuel, as we look to present an easy, low-cost installation for fuel monitoring. For vessels in the world fleet, the only tool for measuring fuel is the noon report. We believe that if the captain could easily see the fuel consumption instantly on the bridge, it would be more like you have in your car. In testing the system, it took only a half an hour from we went on board a vessel until we had their fuel consumption on a computer on shore. The fifth and last project, that is collecting environmental signals. There are a huge amount of sensors that are distributing signals, for example on Bluetooth. But on board a vessel – if you would like to understand the oxygen level, or H2S4 level, a dangerous gas – if you would like to understand the level of that gas in certain areas, it is a bit difficult today because you need a cable to all these sensors, or you need at least to put up a WiFi hub in the room. However, with our radios, you can pick up these signals throughout the vessels, and present it on the bridge.

Erden Eruc, Six Summits &

Human Powered Global Treks

Erden Eruc is a man on a 'human-powered' mission, a mission which Elliott Bay Design Group recently assisted with donated design services as he plans for the next leg of his "Six Summits Project." Next up: a solo row across the Pacific Ocean, a bike ride to Tibet and climbing Mt. Everest.

By Greg Trauthwein

Photos Courtesy Erden Eruc

A Seattle resident, Erden Eruc's solo circumnavigation by human power quest, which started as a quiet obsession in the late 1990s, became a life mission following the death of Göran Kropp, who died while rock climbing with Eruc in September of 2002. Born was the Six Summits Project, which has Eruc traveling too … by human power … six continents and then scaling that continent's highest peak.

"I have been active all my life as an athlete," said Eruc. "I was introduced to mountaineering by my father at age 11 and always busy with athletics."

In 1997 he came across a world map that was hanging on the wall of an IT lab in Silver Spring, Maryland. "I traced my finger across that map, and I wanted to take the journey to Turkey where I'm from originally. So I gave it a name, 'Journey Home,' and that became a quiet obsession. That's how it all started."

Six Summits Project

When Eruc decided he was going to circumnavigate the globe by human power, he started reading about such journeys and came across a book, Ultimate High by Göran Kropp, a Swedish adventurer who had bicycled from Sweden to Nepal in 1996 to climb Everest solo. "He came to Seattle for a presentation, I met him, and his first two questions to me were: 'when are you starting?' and 'do you have sponsors?'"

The meeting would be a turning point for Eruc, as he and Kropp had the chance to go climbing together for the first time five years later in September of 2002, when they had an accident.

"He fell and he died, I was his belayer," said Eruc. "That became the turning point for me, and on the way back from his funeral in Stockholm, on the plane, I drew the world map on a piece of paper, the proverbial napkin, and marked the highest summits on each continent and sketched a path connecting these, saying that I would reach each one of these by human power, as Göran."

The Six Summits Project was born.

The first was Mount McKinley in 2003, when Eruc bicycled up there, summited the mountain, married his fiance in Homer, Alaska, and then bicycled back. During his five-year circumnavigation (from 2007 to 2012), Eruc summited Kosciuszko in Australia and Kilimanjaro in Africa.

"So what remains are Everest, Elbrus, and Aconcagua," said Eruc.

Everest is next on the list, and the plan today is for him to leave from his home in Gig Harbor in the Spring of 2021 and launch from the shores of California for an 11-month-long row across to mainland Asia, the shores of China, followed by a bicycle ride to Tibet to climb Mount Everest.

While the challenge of Six Summits attracts him, it is the fundraising that sustains him.

"We have a nonprofit called Around-n-Over, and my mission on this crossing will be to raise awareness about plastics in our oceans," said Eruc. "I'm an ambassador for the Ocean Recovery Alliance, and we focus on beach cleanups and reducing plastic use in corporations and in installations and facilities like stadiums. Plastics Disclosure Project is one of their offerings. So all these ideas and hope for solution is what I would like to convey during my crossing and in my blogs during the crossing."

http://www.HumanPoweredJourney.com
http://www.Around-n-Over.org

EBDG Donates Design Services

When Elliott Bay Design Group learned about Erden's plan through a mutual friend in the design and engineering community, EBDG was excited about the potential to play a small but valuable role. As 'boat geeks', the idea of a next-generation vessel that would cross oceans under the power of a single human was intriguing. Learning about Erden's own design and engineering background and the details of his past record setting adventures made the opportunity irresistible.

As the new boat would be a series of refinements to his current boat, we knew that collaboration in a 3D environment would be the right approach. First though, we would need details of his current boat but because it was built by hand there were no drawings to work from. We began the design process by performing a detailed 3D scan we then imported into our modeling software.

Using the point cloud produced by the 3D scan, we created a 3D surface model of the hull and deck that matched the existing vessel. A modified version of the hull form was then modeled and faired. The goal of the design change was to produce a hull with the same overall dimensions and largely similar hull shape, but with a rounded bilge as opposed to the hard chines of the current boat.

Once the new hull form was finalized, frame shapes were determined from the computer model and full-size station mold patterns were created for the new strip-planked hull to be built on.

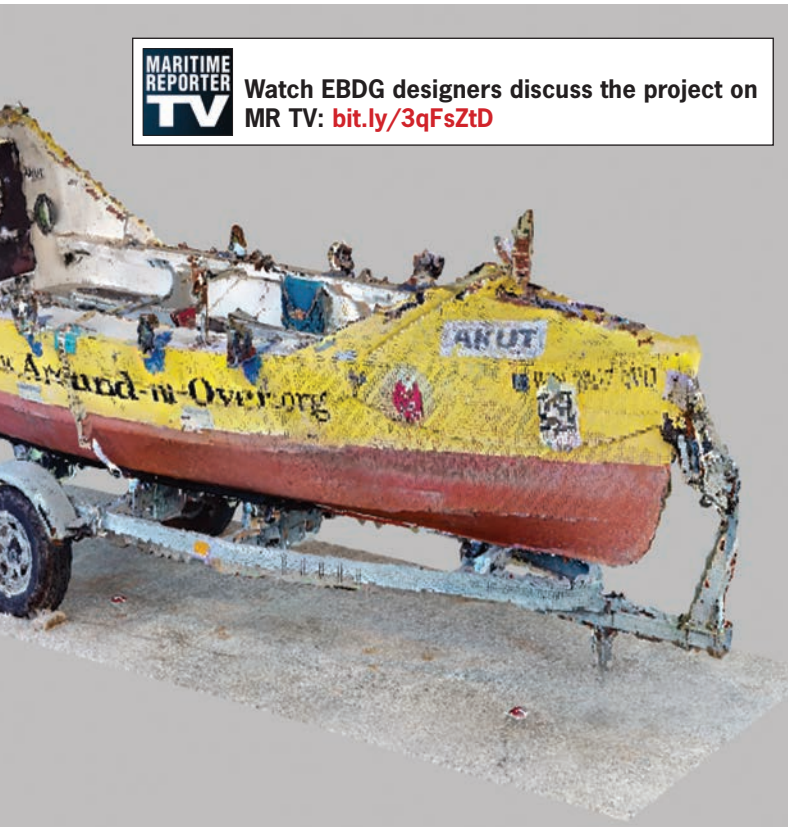
As of this writing, and due to multiple factors, Eruc decided to stick with his original boat as there simply was not enough time and money to build a new one to be on the water in the Spring of 2021.

"Elliott Bay Design Group offered to do a 3D scanning of the hull and capture that accurately so that I can then build a forms, cross sections, and then go from there. I needed an accurate starting point and they gave me a foot up. So I'm grateful for their contribution," said Eruc.

This image shows a point cloud of the vessel as captured by the 3D scanner.
Image: EBDG

Editor's Note: Eruc was grateful for EBDG's contribution, but following this interview, because time and funding was short, he opted to modify his existing boat to launch in the Spring of 2021.

MARITIME REPORTER TV **Watch EBDG designers discuss the project on MR TV: bit.ly/3qFsZtD**



CRUISE SHIPPING 2021: The Fight for Survival

Source: Port Everglades

By Barry Parker

In early 2021, the somber news from the cruise sector continued. For some cruise brands, their own version of "lockdowns" will have spanned an entire year. By late January, 2021, Carnival and others were hesitantly pegging their restarts for April/May 2021, and for some markets, late summer, under a Conditional Sail Order promulgated late last year by the Centers for Disease Control and Prevention (CDC).

What else to do but look ahead?

In preliminary earnings guidance, Carnival Corporation (NYSE: CCL), CEO Arnold Donald, stressed that the market leader was "… well positioned to capitalize on pent up demand and to emerge a leaner, more efficient company, reinforcing our industry leading position." The damage wrought by the industry's shutdowns in the wake of the Covid-19 pandemic has been staggering, spawning a defensive posture of vessel scrapping, delayed vessel deliveries, fresh equity raises, refinancing of existing debt with high yield obligations, or even sales of brands to outside investors (as CCL competitor RCL did with its Azamara brand), to bolster cash reserves for riding out the financial storm. Carnival Corporation, with 87 vessels in brands including Cunard, Princess and Holland America, was reporting a loss of $2.2 billion during the quarter ended Nov 30, 2020; Royal Caribbean, with a smaller fleet (61 vessels at end 2020) and a roster including the Celebrity brand, booked a loss exceeding $1.3 billion during the quarter ended Sept 30.

In terms of cash burn, Carnival said average monthly cash burn rate for Q4 2020 was $500 million, and the Q1 2021 number 2021 to be approximately $600 million/month, and its Chief Financial Officer noted that, with $9.5 billion in cash at end 2020, "we… have the liquidity in place to sustain ourselves throughout 2021, even in a zero-revenue environment."

The CCL assertion comports with security analyst estimates; Truist Securities (BB&T Corporation and SunTrust Banks), in a late 2020 research briefing, estimated that the company had 17 months of staying power. Their New York-based analysts, C. Patrick Scholes and Gregory J. Miller, wrote: "Investors at the moment, despite continued bad news on sailing delays, consensus estimate cuts, and dilutive equity and debt offerings that impair longer term ability to drive earnings, are looking past these negatives and taking the (very) long view on the eventual vaccine-driven recovery." In the same report, after noting the uncertainties regarding the timing of widespread vaccine roll-outs, they cautioned that: "…we believe that cruise companies will need to raise additional capital to stay afloat, further depressing earnings." An example of the deleterious impact on earnings came with RCL's $201 million

Source: RCCL

sale of Azamara to the private equity firm Sycamore Partners-with RCL noting: "The transaction will result in a one-time, non-cash impairment charge of approximately $170 million."

What might the future hold?

CCL's Mr. Donald, in the earnings guidance, stressed that: "The company expects future capacity to be moderated by the phased re-entry of its ships, the removal of capacity from its fleet and delays in new ship deliveries." Executives in the sector were quick to point to "pent up demand", but the demand side of the voyage back to pre-pandemic levels will be a long one. The consultants Maritime Strategies International (MSI), wrote, in a January, 2021 report: "This year, we expect cruise passenger levels to increase to 11.9m, an increase of 59% year on year, but still substantially below the 29.6m cruise passengers recorded in 2019." The majors were pushing back start dates for itineraries originating in the U.S. In a January, 2021 report, the Truist analysts mentioned the second half of 2021 as a possible start date for "revenue sailings" out of North American cruise hubs.

What will Change?

As cruising resumes in a big way, what will be different on the vessels and also at ports serving them? The short answer is "quite a bit." Throughout the business, all the shipowners are implementing an array of new protocols informed by the medical profession.

As the pandemic began to spread, in March 2020, the Cruise Line Industry Association (CLIA) had made unsuccessful efforts to ward off impending shutdowns of the business, including a meeting with then Vice President Mike Pence (head of the Trump administration's Coronavirus Task Force). Shortly thereafter, two other cruise majors, Royal Caribbean (RCL) and Norwegian Cruise Line Holdings (NCLH), joined forces and assembled a team of medical experts, the Healthy Sail Panel, with the mission "…to closely examine every aspect of the cruise ecosystem, and recommend the most effective, scientifically sound ways to make the cruise experience healthier and safer."

In September 2020, the panel, which also included representatives from the operational side of RCL and NCL, then submitted a 70 page report, to the CDC, which had issued the first "No sail" orders in March (and asked each line for plans to keep crews safe), providing recommendations "…rooted in the best scientific and public health information available…".

The panel's guidance dealt with five areas, beginning with screening, testing and exposure reduction for passengers, onboard matters (sanitation, ventilation, responses and contingency planning), safety for crews, and matters related to safety at destinations. The Healthy Sail effort underscores the sector's important efforts to forge real links with the mainstream health establishment; one of its two co-chairs, Michael Leavitt, now running a consultancy with a Washington, D.C. presence, was Secretary of Health and Human Services in the early 2000's in the George W. Bush administration.

The classificatoin societies are also playing a leadership role. One important initiative is the Cruise-Safe certification,

"The operational impact of the health protocols are significant as solutions need to be developed for each of the areas of concern in health management. These changes could include creating or updating protocols, rearranging or establishing passenger and crew flow patterns, updating available medical response and isolating capabilities and adding equipment in line with the updated protocols."

Joep Bollerman, LR's Global Manager for Passenger Vessel Support

Source: Class LR

a joint undertaking of the Class DNV GL and the Singapore Tourist Board.

According to DNV GL: "The CruiseSafe certification will provide assurance of high standards of health and sanitation, ensuring that stringent and enhanced hygiene and safety protocols are in place at all touch points during a vessel's journey. The framework is built upon DNV GL's Certification in Infection - Maritime (CIP-M) program and incorporates global health and safety standards as well as national safe management measures and certification guidelines."

They explain that CIP-M "…provides a framework to help maritime companies improve their management of infection risk, demonstrating that procedures and systems are in place for the proper prevention, control and mitigation of infection."

As cruising returned in Singapore, it was mandatory for cruise lines to obtain the CruiseSafe certification before they are allowed to resume operations out of the Lion City's cruise terminals. The CruiseSafe program was implemented by Dream Cruises (Genting), whose World Dream departed Singapore on a "Super Staycation" cruise in early November, with 50% capacity. RCL is also offering short cruises out of Singapore, on its Quantum of the Seas, initially with a maximum 50% of capacity.

Lloyds Register (LR) has developed Class Nota-

Source: Class LR

↑ **Stay Safe and SHIELD** cover these six core areas for enhanced controls where higher health risks exist

tions SHIELD and SHIELD+, explaining that SHIELD and SHIELD+ are voluntary ShipRight descriptive notations that provide a detailed survey and inspection of the key areas where health risks are elevated, as well as against the six categories (highlighted in the graphic). Additionally, LR is offering Marine Stay Safe, which it describes as "….a tailored health verification program that can help determine if vessels and marine-based structures are maintaining high levels of safety, cleanliness, quality and good hygiene…," also providing " a consistent review of policies against any of the six categories to highlight enhanced risk areas so that operators can make the necessary improvements related to operational efficiency and processes, especially for passenger and crew safety."

LR, which consults with the Institute of Cruise Ship Medicine (ICSM), points out that it "…has offered health risk mitigation services within the land-based hospitality industry for many years…" and views its activities directed at the cruise business as an extension of its work with hotels." Joep Bollerman, LR's Global Manager for Passenger Vessel Support , based in Miami, Florida, told *Maritime Reporter* that "The operational impact of the health protocols are significant as solutions need to be developed for each of the areas of concern in health management. This may be a confirmation that already existing protocols are sufficient but in many cases action is required, ranging from some fine tuning or major changes to be implemented. These changes could include creating or updating protocols, rearranging or establishing passenger and crew flow patterns, updating available medical response and isolating capabilities and adding equipment in line with the updated protocols."

Source: Carnival Media

Saga Cruises, a UK-based niche brand aimed at the 50+ age bracket, has come onboard, with SHIELD, pointing out that: "Ultimately LR's continued assurance enables us to demonstrate an enhanced level of health safety to our passengers, crew and other stakeholders." The marketplace seems to agree; after a late January announcement requiring that its customers be fully vaccinated, its bookings (with a start date pushed back into May) have reportedly surged. Other cruise lines were said to be looking into a vaccine requirement.

Among the Carnival brands, a January, 2021 filing indicated that: "Costa and AIDA have a comprehensive set of health and hygiene protocols that has helped facilitate a safe and healthy return to cruise vacations… modeled after shoreside health and mitigation guidelines as provided by each brand's respective country, and approved by all relevant regulatory authorities of the flag state, Italy. Protocols will be updated based on evolving scientific and medical knowledge related to mitigation strategies. Costa is the first cruise company to earn the Biosafety Trust Certification from Registro Italiano Navale (RINA). The certification process examined all aspects of life onboard and ashore and assessed the compliance of the system with procedures aimed at the prevention and control of infections."

RINA explains that: "The Biosafety Trust Certification is based on the International Standard Organization's systematic approach to management systems combined with scientific best practices against the spread of infection" Costa and AIDA were both poised for restarting cruises in March, 2021. MSC Cruises, privately listed, was resuming Mediterranean sailings out of Italy for its MSC Grandiosa and MSC Magnifico.

Investing in Upgrades

Across the fleets, capital investments have been made, including redesigned and upgraded medical facilities, with specific isolation areas onboard. Reconfigured ventilation systems are bringing in air from the outside, where possible; where inside areas use recirculated air, filters have been upgraded to capture smaller particles. Ultraviolet irradiation and electrostatic spraying have been added to the disinfecting mix. Joep Bollerman from Class LR told *Maritime Reporter*: "Crew Training and familiarization is an important step once protocols are finalized and added or modified equipment maintenance needs to be included in existing planned maintenance solutions to ensure equipment reliability."

Digital technology is playing a role as well; electronic check-ins were already on offer, pre- pandemic. Now, there are new possibilities, Carnival's ground-breaking Ocean Medallion (used on the Princess brand), designed for enhanced passenger experiences, can also provide a tool for contract tracing and tracking.

In late 2020, Royal Caribbean introduced its Tracelet, a wristband that was debuted on Quantum of the Seas. Besides tracing, its capabilities enable better management of onboard social distancing. Smart-phone applications, some already introduced pre-pandemic, will take on greater importance as the cruise brands seek to reduce paper flows (and the need to physically sign documents) and to reduce touching of surfaces (for example a light-switch in a cabin).

The cruise ports are also making changes, expanding contactless interfaces, stepping up cleaning protocols, and building social distancing into their procedures. At Port Everglades, in Florida, digitalization has brought a degree of seamlessness to the transition from terminal to vessel, with the port saying: "We continued building a new state-of-the-art parking garage through the pandemic so it would be ready when cruising resumes. The Heron Garage will service Terminals 2 and 4 in the northern section of the Port. Terminal 2 is Princess Cruises' Ocean Medallion prototype."

Outlook for FPSO Orders Over The Next Five Years

As of mid-January 2021, there were 110 projects in the planning stage that could require an FPSO as a production system.

By Jim McCaul – IMA/WER

COVID-19 will continue to skew the floating production systems market for the coming 24 months, while buying power for a large portion of FPSO contracts will be centered in Brazil and Guyana/Suriname. These two areas are expected to account for more than 60% of the FPSO contracts awarded between 2021 and 2025.

These are the findings shared in a recent floating production outlook report produced by International Maritime Associates (IMA) and World Energy Reports (WER).

The 100+ page report examines business conditions likely to drive investment decisions in deepwater development over the next five years and forecasts the number and timing of orders for floating production systems through 2025.

FPSO Overview

According to WER database, 220 floating production storage and offloading vessels (FPSOs) are now in operation, on order, or available. They account for 68% of the total oil/gas production floater inventory.

While all FPSOs are intended to produce, store and offload oil on offshore fields, each is designed and outfitted for use on a specific field. The result is a diverse inventory of FPSOs – with vast differences in plant processing capability, oil storage volume, mooring system design and construction cost.

Some FPSOs are small units with <20,000 b/d oil processing plants; some are mega units capable of processing 250,000 b/d. While most are ship-shaped, a few have cylindrical hulls. Some are fitted with external or internal turrets to weathervane; others are spread-moored.

Some are designed to permanently remain on field, some to be quickly disconnected.

The cost of building an FPSO ranges from $200 million to $3 billion, depending on production plant capacity, design life, local content requirement, operating environment, and other factors.

FPSOs have a number of important advantages over other production systems. The most important is their field storage capability, which allows production in locations economically inaccessible to pipeline infrastructure. Among other advantages: water depth is not a constrain, they can operate in environments ranging from benign to harsh, FPSOs can be modified and redeployed following field depletion and leasing of FPSOs has evolved into an in-

Image above source: Sadagus/AdobeStock

dustry-accepted procurement practice to transfer financing burden, con¬struction risk, residual value risk and operational responsibility from the field operator to a contractor.

But there are disadvantages, too. Subsea tiebacks associated with FPSOs generally bring higher well maintenance costs. Redeploying an FPSO is not as easy as it may appear -- each field is different, typically requiring major modifications to the topsides plant and mooring system.

More than 90% of FPSOs now in service are located in six major regions. Brazil accounts for 29%, West Africa 24%, SE Asia 15%, Northern Europe 13%, China 7%, and Australia 5%. The remaining 7% are spread over the Gulf of Mexico, Eastern Canada, SW Asia, and the Mediterranean.

Ownership of FPSOs is almost evenly split between field operators and leasing contractors. Field operators own 53% of the total inventory; leasing contractors own the remaining 47%.

Petrobras is the clear heavyweight in the FPSO sector. Counting both owned and leased units, Petrobras has 49 FPSOs under its control – 22% of the FPSO inventory. Other major field operators utilizing FPSOs are CNOOC (13 units), ExxonMobil (12), Total (9) and Shell (8).

Major FPSO contractors are SBM, Modec, and BW Offshore. These three companies control 22% of the FPSO inventory.

Growth in FPSO Inventory

The number of FPSOs in operation or available for deployment has grown by 26% over the past 10 years - from 159 units at end-2011 to 200 units at end-2020. This reflects the net result of delivery of new FPSOs and scrapping of aging units over the ten-year period.

Expansion of the FPSO fleet has been tapering off, and the inventory of existing units has likely now peaked around 200 units. Taking into account units on order for delivery this year less FPSO removals in 2021 due to anticipated field closures, we expect FPSOs in service or available to number between 196 and 200 units at end-2021.

While another 14 FPSOs are scheduled for delivery between 2022 and 2024, the scrapping figure during the same period will likely be higher, causing the number of FPSOs in service or available to begin to slowly decline over the next two or three years. While the number of FPSOs will decline, processing capability of the overall FPSO inventory will continue to expand as incoming larger units replace smaller aging FPSOs being removed from service.

Orders for FPSOs

Contracts for 79 FPSOs were placed between 2011 and 2020, an average of just under eight FPSOs ordered annually. There has been big variation around this average – with orders ranging from a high of 14 contracts in 2014 to no contracts in 2016. Contracts for four FPSOs were placed in 2020 – three for Brazil, one for Senegal.

All told, 64 of the 79 FPSO contracts (81%) over the past ten years entailed construction or conversion of first time FPSOs. These FPSOs have not previously operated as production units. Another 15 contracts (19%) involved redeployment of an existing FPSO to a new field. Typically the redeployment contract involves major modification of the process plant and mooring system, plus general upgrade to the entire unit.

FPSOs Now Being Built

Twenty FPSOs are currently on order. Six are in the final stage of completion, with delivery scheduled over the next 12 months. Seven are scheduled for completion in 2022. Seven more are in the early stage of construction with delivery planned in 2023/24.

Eight (40%) of the FPSOs on order are being built for use offshore Brazil. The others are destined for Guyana (2), India (2), Mauritania/Senegal (2), UK/Norway (2), Israel (1), and Mexico (1). Two more orders are speculative FPSO hulls likely to be used on projects in Brazil or Guyana.

China is the dominant location for FPSO construction and conversion. Seventeen of the 20 FPSOs on order are partially or fully contracted to Chinese yards. Singapore has retained the second position, with at least partial involvement in 2 of the 20 orders. Korean yards – which had been a powerful force in this market sector -- have only one FPSO contract in progress. Topsides plant fabrication and integration is spread over a variety of contractors in SE Asia, Northern Europe and Brazil.

Planned FPSO Projects

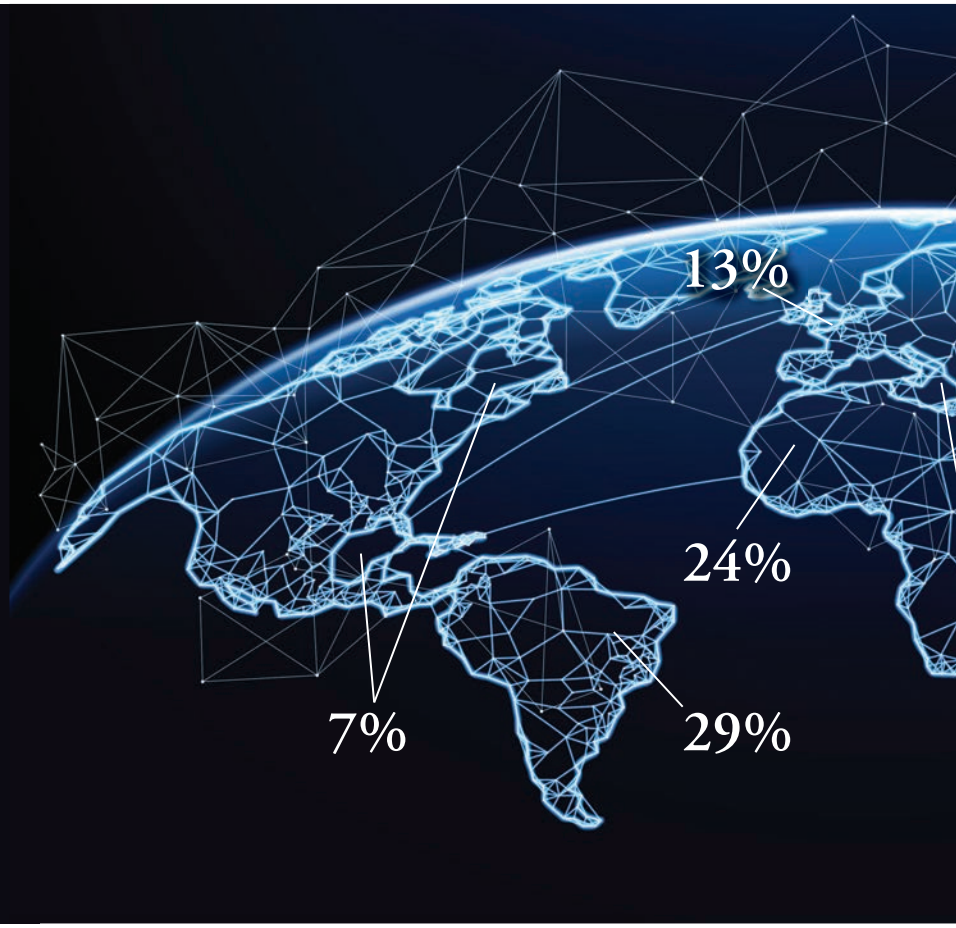
As of mid-January 2021, there were 110 projects in the planning stage that could require an FPSO as a production system. Around 38% of FPSO projects in the planning stage are located in Brazil, some of which require multiple FPSOs. Africa is in second place, with 24% of planned FPSO projects. Nigeria and Angola account for two-thirds of the African projects. Other major locations are SE Asia, Northern Europe, Guyana/Suriname and Australia.

Details for all FPSO projects in the planning queue are provided in the WER online database, information that is kept up to date on a daily basis.

Projected Orders for FPSOs

A bottom-up methodology was used to forecast the num-

More than **90%** of FPSOs now in service are located in six major regions. Brazil accounts for **29%**, West Africa **24%**, SE Asia **15%**, Northern Europe **13%**, China **7%** and Australia **5%.** The remaining **7%** are spread over the Gulf of Mexico, Eastern Canada, SW Asia, and the Mediterranean.



Source: © TAW4/AdobeStock

ber of FPSO orders. We examined each FPSO project in the planning queue to determine its probability to proceed to an investment decision by end-2025. The forecast takes into account future oil prices, capex budgets, deepwater competitiveness and other underlying business drivers in each of three market scenarios – as well as each project's status, barriers to proceeding, size and quality of reserves, operator financial strength and capex allocation strategy and other factors.

Depending on the future business scenario we expect orders for 23 to 48 FPSOs over the next five years. Our most likely forecast is 37 FPSO orders. This figure is 28% higher than the number of orders placed over the past five years, during which 29 FPSOs were ordered -- but 26% lower than the number of orders during 2011/15, when 50 FPSOs were contracted.

Orders for FPSOs will be skewed toward the later years in the five-year forecast period – reflecting the expected continuing impact of the COVID-19 over at least the next two years. Buying power for a large portion of FPSO contracts will be centered in Brazil and Guyana/Suriname. These two areas are expected to account for more than 60% of the FPSO contracts awarded between 2021 and 2025. The remaining 40% of FPSO contracts will be with customers in SEA/China, Africa, No Europe, Australia and other areas.

Based on experience of the past ten years, we expect around 20% of future FPSO projects will involve use of a redeployed unit – and the number of FPSO contracts forecast in our most likely market scenario will generate a requirement for 8 FPSO redeployments over the next five years.

This redeployment requirement will not absorb all of the FPSO looking for new fields. Currently, 25 FPSOs are in layup. Of the units in layup, 14 appear possibly suited for redeployment. Including FPSOs now off field and FPSOs that will likely end production by the end of 2025, there will be somewhere between 25 to 35 FPSOs available for redeployment during the forecast period – at least 3X the number of likely contract possibilities.

Capex associated with FPSO orders over the next five years is projected to total $56 billion in the most likely scenario -- an average capex of $11.2 billion per year.

Details for all FPSO projects in the planning stage and our assessment of which specific projects will likely lead to an EPC contract over the next five years are provided in our forecast report.

Floating Oil/Gas Production Units Installed, On Order, and Available
(As of November 2020 - excludes floating LNG and storage units)

Type Unit	Total	Installed	On Order	Available
FPSO	220	175	20	25
Barge	9	9	0	0
Semi	46	37	6	3
Spar	21	21	0	0
TLP	28	28	0	0
All Oil/Gas Units	324	270	26	28

Source: WER Database

Ownership of FPSOs as of November 2020

	In Service	Available	On Order	Total
Field Operators	104	5	8	117
Leasing Contractors	71	20	12	103
Total	175	25	20	220

Source: WER Database

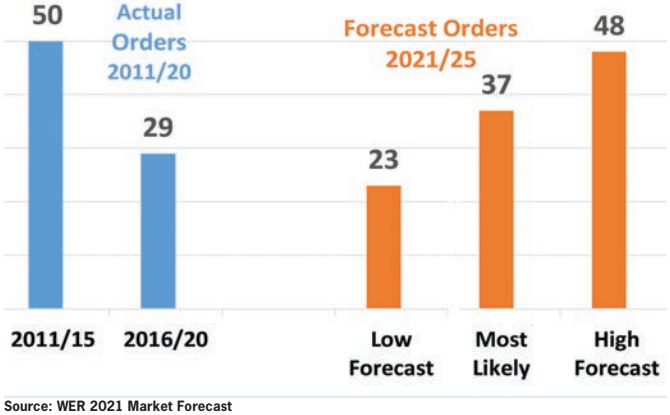
For more information about the floating production report and online database, please visit **www.worldenergyreports.com** or contact Bailey Simpson @ +1 832 289-5646

Trend in Number of FPSOs in Service or Available

As of End Year	Number of FPSOs	Growth Index *(2011 = 100)*
2011	159	100
2012	165	104
2013	174	109
2014	185	116
2015	185	116
2016	195	123
2017	193	121
2018	201	126
2019	198	125
2020	200	126
2021 (projected)	196-200	123-126

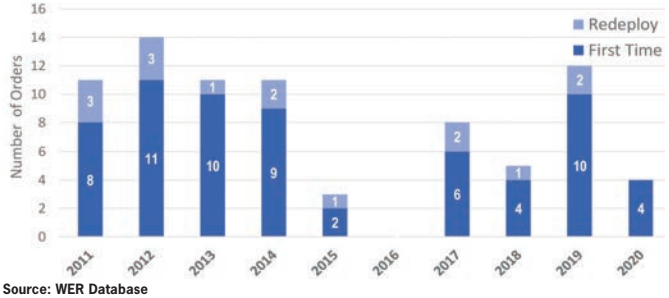
Source: WER Database

2021/25 FPSO Orders Forecast Compared to Past Contracting Pace



Source: WER 2021 Market Forecast

Number of FPSOs Ordered over the Past Ten Years



Source: WER Database

Autonomy:

Inside the building of Ocean Infinity's Armada Fleet

All images: Ocean Infinity

Back in 2017, Ocean Infinity made a novel move; deploying six autonomous underwater vehicles (AUVs), instead of just one, from a single vessel, vastly increasing the ground that could be covered in a single survey. Now the firm is taking the use of remote, robotic systems a significant step further.

By Elaine Maslin

Back in 2017, Ocean Infinity made a novel move; deploying six autonomous underwater vehicles (AUVs), instead of just one, from a single vessel, vastly increasing the ground that could be covered in a single survey. Now the firm is taking the use of remote, robotic systems a significant step further.

As we enter 2021, US-UK based marine robotics firm Ocean Infinity is launching the start of what will become a fleet of completely uncrewed ocean going vessels, or USVs. They will host and deploy other robotic systems, including remotely operated vehicles (ROVs) and AUVs, as well as towed systems and full ocean depth survey equipment. The first two in what's being called the Armada fleet will be launched early next year ready for commercial operations in the North Sea in summer 2021 and an initial 17 are planned.

The company has brought some known experience onboard, including Dan Hook, who was behind the UK's ASV Ltd., an early developer of USVs now owned by L3Harris. What we realized, Hook says, is that small USV systems could only do so much so, while there was take up in the defense sector, for mine and submarine hunting, other sectors were slower to adopt such systems beyond inland, lake or coastal surveys.

"One of the limitations we observed in existing USVs was that you could only really deploy one type of sensor or go out for a week at a time," he says, which meant they could only do so much. "In building Armada, we really tried to address that. The biggest change is scale. A 21 m vessel can carry multiple sensors, the right type of ROVs and the right type of sensors and winches that customers need."

The initial vessels will come in at 21 m and 36 m long. All will come with a standard fit of permanently mounted

survey equipment, mostly housed in a subsea gondola. This will include an inertial navigation system (with integrated acoustic Doppler current profiler/Doppler velocity log), single beam echo sounders, underway conductivity, temperature and depth (CTD), Ultra-Short BaseLine (USBL) positioning, and dual-head shallow-water multibeam echosounder and sub-bottom profiler.

Modular payloads will be added on top. Initially, that will be ROV focused, ranging from Saab Seaeye Leopards, recently ordered for the fleet, to Ocean Infinity's existing Schilling and Kystdesign hydraulic ROV systems designed for 3,500-4,000 m water depth. All of them will be deployed and recovered by an all-electric, automated vehicle-agnostic system being supplied by Kongsberg – so it'll be able to deploy different ROVs, as well as AUVs. The system will deploy vehicles via the vessel moon-pool, with release and capture of the ROV/AUV below the surface, away from the vessel hull to avoid potential vessel impacts and allow for higher sea-state launch and recovery.

Some vessels will be able to take two vehicles on board, to provide flexibility but also redundancy, says Michael King, business development manager at Ocean Infinity. "We're also going to be able to tow various hydrographic and geophysical sensors, towed side scan sonars, magnetometers," he says.

The firm has a wide range of potential work in its sight, from survey to UXO capability for the offshore wind market, 2D and 3D seismic, oceanographic and metocean data acquisition and geotechnical capability. It's already working on a full ocean depth deep water multibeam system for the larger vessels, targeted at the subsea cable market. The vessel's endurance will make long surveys easily feasible. At cruising speed it's expected the 21m vessel will be able to travel 3000 nm and the 36m vessel 5500nm. More vessels will come and inevitably they will be bigger again, as the firm eyes additional opportunities, such as logistics, in addition to the survey, ROV and AUV operations down to 6,000 m it will target first. They'll also be looking to add aerial drones in the future.

"We're looking at a wide spectrum of applications," says Hook, "everything from survey, collecting data, through inspection, logistics, defense and security and we've had a lot of enquiries in each, with a lot around data collection and inspection, especially from wind farm, offshore energy and cables – telecommunications and power."

It's also been revealed that the firm is working with Shell to be able to run multiclient seep hunting projects, using AUVs deployed from the USVs, which could then support work like carbon capture and storage site monitoring.

The hardware is one thing, but remotely operating uncrewed systems also relies on communications, to be able to control the systems, and data transfer – as much of their work and the management of it is about getting data. There are a few sides to that; managing it on the vessel, managing delivery of it and then managing it at a remote control center (ROC). The first has Ocean Infinity working with various data management providers and software companies to ensure data quality, with pre-processing offshore so not all raw data needs to be sent to shore. Cyber security comes into this and the company has employed experts, including an ex-US Air Force cyber expert, and has designed the vessels from the outset with cyber security in mind.

Then, to enable remote control, each vessel will have two large satellite domes, in addition to VSAT and 3-5G communications capability. "You can miniaturize everything you want in robotics these days; you can make tiny computers and tiny computers," says King, speaking at the joint Hydrographic Society, IMCA, SUT seminar. "But the one thing you can't miniaturize is a satellite dish and the truth is a larger satellite dish gives you more bandwidth. Because we have larger vessels than traditional USVs we can mount 2-3 large domes on each and that enables us to have larger bandwidth, in turn enabling us to have true command and control and data transfer in real time, bringing everything back to a ROC where a team of experts is sorting out the data management."

While autonomy is regularly talked about, today's vessels will not be autonomous, says King, each will have a mariner in control – "full human in the loop". But it's expected that autonomy will come. "In the next few years we would expect our road map to take us to one mariner supervising two of these vessels or maybe even three," he says.

As these systems go out into the wild, a challenge could be physical security – what's to stop the vessels being attacked? This is new ground, says Hook. But, again, the vessels are being designed to prevent such an event. For a start, they've a mode to move and keep away from a threat automatically, then they're hard to board and the decks locked down, he says, and there's nothing to steal, or people to ransom, which has been a driver for past piracy events. Ocean Infinity is also looking at CCTV and an onboard PA system as well. But this will be a case of learning, as in any new business, and it's an area Hook says the company is keen to work with industry jointly on.

Another area that will develop is berthing. Unlike past USVs, these vessels will not be able to be put on a trailer and driven to a port for deployment. In some cases they'll be able to sail into a port or harbor themselves (under remote pilot control), where local suppliers could support refuel-

"In the next few years we would expect our road map to take us to one mariner supervising two of these vessels or maybe even three."

Michael King,
Business Development Manager at Ocean Infinity

Image Courtesy Ocean Infinity

ing. In busier waters, a crewed pilot vessel would come out and escort the USV into port. The company will also have a field team, to go out and support berthing, says Hook.

Initially, operations will be in UK waters with work already lined up in wind farm, oil and gas and the subsea cable sectors in the first year, says Hook. These will be managed from a new operations center the company is building in Southampton. Ocean Infinity, which currently has offices in the UK and Austin, Texas, aims to open a third in Asia, and is also actively looking where else to deploy its fleet, from Australia to Taiwan and America.

The Covid pandemic has helped generate interest, says Hook. "When looking at risk planning for the future of their business, future pandemics is now on everyone's lists," he says. "The risk of moving crews around the world and on and off of ships means uncrewed operations have definitely come to the fore."

The initial British flagged DNV GL class fleet is being built at the Grovfjord Mek. Verksted (GMV) yard in Norway. But Hook says future vessels are likely to also be built elsewhere and the company is already in talks with yards in the US, where they would be Jones Act compliant. The vessels have a hybrid-electric propulsion system, with Volvo Penta DC gensets and Danfoss DC grid control system, with high battery capacity to enable more electric and even all-electric operations where possible. Hook says other cleaner fuel options could also be considered in the future, as options mature. Even with the hybrid system could save 90% emissions compared with a conventional 65m-long offshore vessel, at 644,182 kg CO2 versus 31,101 kg for an Armada vessel, based on trials assessing a typical 21-day offshore campaign, says King.

As the company is breaking new ground (or water) in this area, it's going in 'eyes wide open', says Hook, from the physical security to berthing and regulations. "We are working with as many different people as we can, the MCA, US Coast Guard and other international governance bodies towards safe operation of larger uncrewed vessels," adds King. "We're working with DNV GL as class society and we're particularly grateful for the support from IMO and MSC meetings." The company is also part of Maritime UK and IMCA working groups and other steering groups. But, "what we need to get across is regulations have to be fit for purpose, but they also have to serve the industry as well to allow for the advantages of systems to be utilized," says King.

Meanwhile, the company is staffing up. That means recruiting people, from master mariners to specialists in cyber awareness and remote engineering. It's offering new job opportunities says Hook. And it'll soon be a norm, he says. "Right now, it feels new and novel. But in 5-10 years this is going to feel very normal," he says.

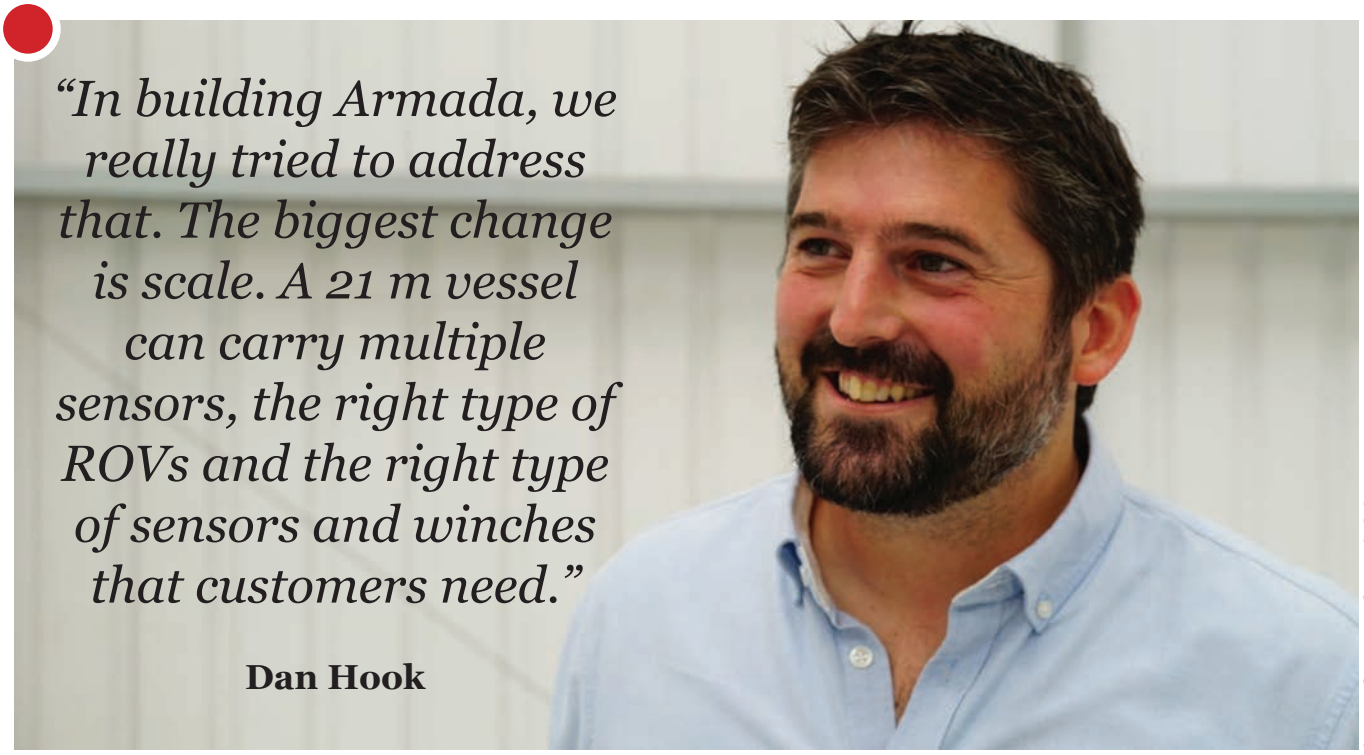


Image Courtesy Ocean Infinity

Meet Armada

US-based seabed survey and ocean exploration company Ocean Infinity said it has launched a new marine technology and data company boasting the industry's largest fleet of unmanned surface vehicles (USV). Armada, with a focus on combining technology and environmental sustainability, will initially add 15 bespoke designed marine robots to Ocean Infinity's current fleet of autonomous underwater vehicles (AUV).

Armada's fleet is currently under construction and is expected to be deployable by the end of 2020. Each unmanned surface robot will serve a wide range of industries by being fully equipped to perform a multiplicity of offshore data acquisition and intervention operations down to a depth of 6,000 meters. These robot ships will be capable of remotely deploying a wide range of the latest sensors as well as AUVs and remotely operated underwater vehicles (ROV) for visual and acoustic data acquisition. Armada's fleet requires neither people on board nor a host vessel nearby. Instead they will be controlled and operated by experienced mariners via satellite communications from state of the art onshore facilities in both Austin, Texas and Southampton, England.

The fleet approach produces up to 90% less CO2 than other conventional survey vessels, Ocean Infinity said. Oliver Plunkett, CEO for Ocean Infinity, said, "We've been driven to innovate by a desire to further reduce our impact on the environment and the time people spend at sea. We have built an outstanding team who boast world leading expertise to take this next stage of our business forward for the benefit of our clients and all those who work with us "

Dan Hook, Managing Director for Armada, said, "We are very excited to be launching Armada, which perfectly complements the other service offerings in the Ocean Infinity Group. The pioneering technology makes our operations world-leading in terms of environmental sustainability and safety, while still achieving the very highest levels of data quality and value for our clients. With no requirement for a host vessel, we are breaking new ground in the area of subsea technology and data."

Watch the Video: https://www.youtube.com/watch?v=l0ksWjlZ47o&feature=emb_logo

2021 Will Be a 'Step-change' for U.S. Offshore Wind Industry

By Bartolomej Tomic

Watch the interview with Philip Lewis on MR TV @: bit.ly/2YyaKdH

Despite being the second-largest global market for onshore wind, the United States is today a very minor player in comparison to the European and East Asian offshore wind markets, however, this is about to change.

Philip Lewis, Director of Research, World Energy Reports said in an interview with Maritime Reporter TV, that 2021 is expected to be a "step-change" for the U.S. Offshore wind industry.

But first, where are we today? Per Lewis, the U.S. currently has only two operational projects for a total of 42MW of installed capacity versus a global offshore installed base of 34,000MW or 34GW by the end of 2020. However, things are expected to accelerate from 2021 onwards.

"At World Energy Reports, we are forecasting that 2021 will deliver a step-change in offshore wind activity in the US as the journey accelerates to develop the 27GW project pipeline within this decade," Lewis said.

One project, Ohio's Great Lakes 21MW Icebreaker, is already approved and addressing final challenges, he added.

"Short to medium term activity will be delivered by 11 Northeast and Mid-Atlantic projects that are seeking federal construction permits, known as the COP stage, for ~9GW," Lewis said.

He also said that, at World Energy Reports, there is a belief that President Joe Biden's last week's executive order will provide an impetus to accelerating the federal project environmental impact assessments and construction approval process for these imminent projects that will, in turn, drive the developing Made in America domestic supply chain and support local jobs.

Biden last week signed an executive order instructing the Secretary of the Interior to identify steps that can be taken to double renewable energy production from offshore wind by 2030.

Further, Lewis said, there is a medium-term pipeline of 15 projects for close to 15.5GW located within secured federal leases and are in the site assessment phase, known as the SAP stage, and a further group of six projects at early stage planning for nearly 2.7GW. These projects are underpinned by state procurements, either already committed or planned.

Longer-term: New York, California, Hawaii, and even Louisiana

According to Lewis, longer-term, a clear pipeline will come from projects coming from future offshore leases from the New York Bight on the Atlantic Coast, Humboldt and Morro Bay off California, Oahu North and South off Hawaii and later Oregon in the Pacific and even Louisiana in the Gulf of Mexico. Per EIA, Louisiana ranks among the top 10 states in both crude oil reserves and crude oil production, accounting for about 1% of both U.S. total oil reserves and production.

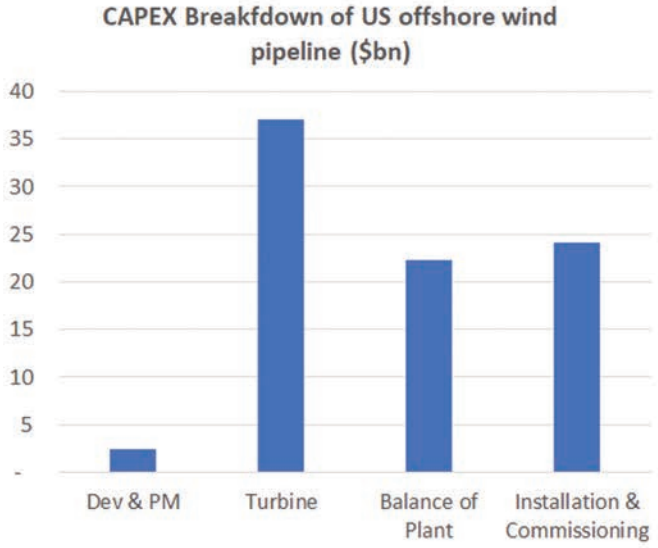
The areas mentioned above are subject to federal preparatory activities in advance to lease activities and will drive project activity in the 2030's.

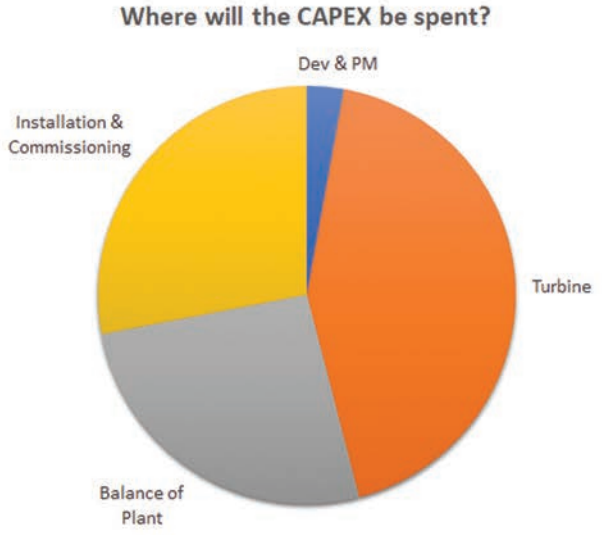
Investment of $86 Billion - 2,000+ wind turbines

The 27GW Atlantic Coast pipeline calls for over $86bn of CAPEX and a recurring annual OPEX of $2.5bn a year once delivered.

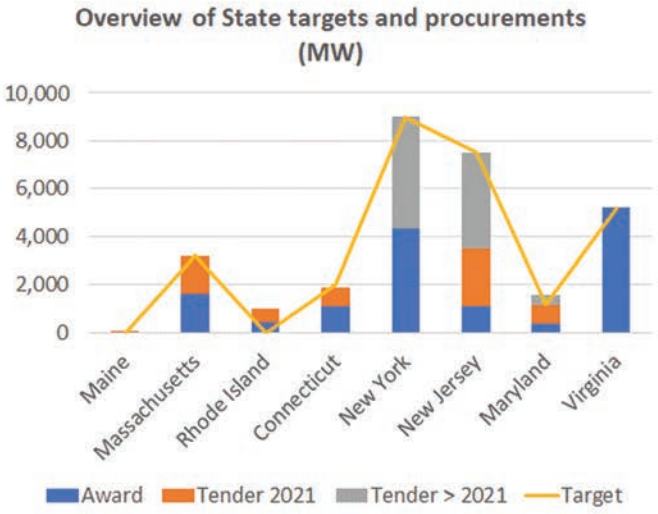
The 2,000 plus wind turbines forecast to be manufactured represent the single largest CAPEX forecast, covering $35bn of wind turbine component supply.

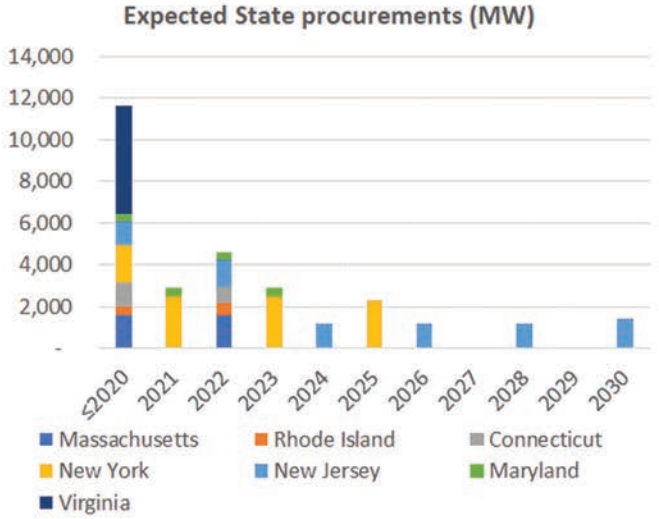
Of this amount, some $2.6bn forecast CAPEX will be needed to manufacture the towers sitting on top of the foundation monopile or jacket transition pieces that sup-





Source: World Energy Reports





Source: World Energy Reports

port the turbines. Plans have already been announced for one factory in upstate New York and we see that further opportunity remains for domestic supply of this component. Lewis said.

"The 2,000 plus wind turbines will be supported by over $5bn of steel monopile and jackets foundations or concrete gravity base foundations and connected to each other and to shore by over $6bn of array and export cable supply, as part of the over $22bn balance of plant category," Lewis added.

Per World Energy Reports, over $24bn of CAPEX will be spent on installation and commissioning activities, including over $8bn on cable installation, $3.7bn on foundations installation, and over $1.8bn on turbine installation.

"These projects provide a significant domestic opportunity for engineering companies, manufacturers, contractors, vessel operators, survey and inspections companies as well as for project lenders," Lewis said.

To support the expected uptick in offshore wind activity, World Energy Reports has analyzed the port infrastructure development plans and has identified over 45 ports in nine states as possible options for marshaling and construction activities, with already over $1bn of CAPEX identified to develop the infrastructure in identified ports. In addition to this, WER identified 38 locations as possible O&M bases.

"Once the projects in the pipeline are delivered, we forecast an annual recurring Operations and Maintenance OPEX of around $2.5bn, of which around $1.2bn will be required for turbine maintenance and servicing, and $650m for the foundations, cables, and substation maintenance, which includes an amount of vessel chartering of crew transfer vessels (CTV) and service operations vessels (SOV). Outside of the turbine maintenance work, we expect an additional $60m recurring annual offshore and onshore logistics activity," Lewis said.

NSMV Program Advances

Philly Shipyard Wins Two More

Photo Courtesy MarAd

By Greg Trauthwein

Last month the U.S. Maritime Administration (MarAd) authorized the construction of two additional National Security Multi-Mission Vessels (NSMV), to replace aging training vessels at Maine Maritime and Texas A&M Maritime Academy. This brings the total to four ships authorized for construction at Philly Shipyard, with MarAd previously authorizing the construction of two NSMVs for SUNY Maritime College and Massachusetts Maritime Academy.

In May 2019, MarAd awarded TOTE Services, LLC a contract to be the Vessel Construction Manager for the NSMV program, and in April 2020, TOTE Services awarded Philly Shipyard, Inc. a contract to build up to five NSMVs with fixed prices and schedules. If all options are exercised, the cumulative contract will be about $1.5 billion and stretch to 2025.

Government Ship, Commercial Build Approach

When planning for the ship started more than 10 years ago, the maritime schools were summoned to help produce an overview of all training requirements needed for a new construction ship. Building new versus acquiring and converting an existing ship was the first major consideration, as building new obviously comes with a higher price tag, but offers tangible benefits.

When considering the new NMSV Kevin Tokarski, Associate Administrator for Strategic Sealift, Maritime Administration, USDOT estimates that "85% of that ship is used completely for training purposes," where the number on previous ships that were modified was much lower, maybe 25%. "So the value proposition of building new is maximizing the training value capacity out of the ship," said Tokarski. "Everything was designed from the ground up for effective training and living on the ship. There could have been cheaper solutions, but it (the cheaper solution) would have had a much shorter life."

The last time MarAd built a ship was the early 1950s, and early sentiment was to have the Navy run the shipbuild program. But the Navy build mindset is decidedly not commercial, and to keep costs in check the decision was made to take the commercial approach, hence the decision to engage a Vessel Construction Manager.

"We've been managing the Ready Reserve Force program where we use commercial ship managers, and it has been evidenced over the years that it produces a better product, at a higher level of readiness at a lower cost compared to

government run, government contracted," said Tokarski. He said that a commercial entity was the best, most cost-effective means to build a ship of this nature: "Build a ship to this design at this cost, and don't be late," said Tokarski. "That's what we wanted to go after in doing this."

From the shipyard side, Philly Shipyard offers considerable experience delivering commercial ships.

"In our 20-year history, PSI has built 30 large ocean-going vessels for commercial use under the U.S. Jones Act. Of the 30 ships, six were container ships for Matson Navigation, and two were Aframax tankers for SeaRiver Maritime, ExxonMobil's marine affiliate," said Steinar Nerbovik President and CEO, Philly Shipyard. "The remaining 22 were medium-range 46k and 50k deadweight oil tankers for Overseas Shipholding Group (OSG), Crowley Maritime, and American Petroleum Tankers, a subsidiary of Kinder Morgan."

The last ship built at PSI was delivered to Matson in March 2019. "Following that project, we had no new orders and had to downsize from 1,200 workers to less than 100," said Nerbovik. "In April 2020, we won the contract for the National Security Multi-Mission Vessel (NSMV) program from TOTE Services, as vessel construction manager for the U.S. Department of Transportation's Maritime Administration (MARAD). We presently have 200 workers in the shipyard, ramping up to 800 by the end of this year and up to 1,400 in 2022."

"We have teamed up with leading equipment and system suppliers like General Electric (GE) for the complete electric propulsion system including diesel engines from Wabtec in Pittsburgh," said Nerbovik. "The detail design as well as pre-planning and purchasing is progressing and the main focus going forward is strong productivity without compromising health, safety, and environment (HSE) and quality. Production has already started with the first milestone on December 15, 2020 when we cut steel for the lead NSMV. The NSMVs are being constructed using commercial design standards and commercial construction practices."

The NSMV will feature numerous instructional spaces, a full training bridge, and have space for up to 600 cadets in a first-rate maritime academic environment at sea. The NSMV is also designed to be a national asset that includes medical facilities, a helicopter pad, the ability to accommodate up to 1,000 people in times of humanitarian need, and RoRo and container storage capacity for use during disaster relief missions. "The shipyard has teamed up with experienced designers and equipment/system suppliers while working hand-in-hand with TOTE Services through all contract specifications to understand all of the owner's requirements," said Nerbovik. "Further, we need to ensure we translate all specifications and basic design into a successful detail design; perform thorough planning of all activities; successfully complete the purchasing of all equipment, systems, and services; and properly manage the production workforce so we are able to build the vessels on-time, on-budget, safely, and with the best quality."

Once built, maintenance of the ships will be a job and investment of both the Federal government and the schools, as Tokarski notes the 'readiness' of the NSMVs will be higher than standard training ships given their dual role as disaster relief. Once built, the Federal government and the maritime schools will each have a hand in the upkeep and maintenance. "These are National Defense Reserve Fleet Vessel; it is a government owned ships on custodial loan to the schools," said Tokarski. The Federal government covers the major repair and maintenance – drydocking and machinery fixes – while the schools fund the necessary upgrades to provide the ship a homeport, as well as crewing and routine upkeep.

Photo: Konecranes

New Life for Old Port Cranes

Retrofits of new features into existing ports cranes can produce operational efficiency and safety gains not included on cranes delivered 15-20 years ago, including Ship-to-Shore (STS) Rubber Tyred Gantry (RTG) and Rail Mounted Gantry (RMG) types. Here, **Dmitry Lapin**, *Knowledge and Development Manager, Port Services, Konecranes, looks at retrofit options.*

By Dmitry Lapin

Sooner or later, the owners of ports cargo handling equipment are going to face a number of technical and organizational questions about the future. After 15-20 years of operation, the steel structure and mechanical components of most port lifting machines still function well. However, these cranes often become obsolete for several reasons:

1. Lack of spare parts and technical support for discontinued components. The next generation of electronics and computerized parts becomes available every 5-7 years.

2. More stringent safety requirements. Regulations for the safety of personnel, cargo and lifting equipment are tighter when compared with the rules of 15-20 years ago.

3. Improvements in ergonomic and operational design. Technological developments have given modern lifting machines a range of features that make the work of operators easier.

4. Environmental concerns. Modern companies and their customers want to reduce carbon emissions (such as those produced by cranes with a diesel genset) and use environmentally friendly materials in the manufacture of their equipment. There is a need to bring old cranes into line with current requirements.

In essence, crane owners at ports tell crane manufactur-

PICTURED ABOVE: A drive and control system retrofit is an efficient and economical solution. At only 15-30% of the price of a new crane (depending on the options), a port gets a crane with new, modern control and diagnostic systems, remote monitoring functions and full spare parts support.

ers that "We want our old cranes to have the same systems and features as new cranes, and it should not be expensive." An existing crane can have new technology added to it through a retrofit or a modernization. The main difference between the two methods – retrofit or modernization – is that the retrofit has a higher level of standardization, usually around 70-95%.

In other words, a retrofit is mostly a ready-made standard product which is applicable to a specific model, make, or type of crane – sometimes even all the cranes in a terminal or company fleet. To install this product on a specific crane, it takes about 5-30% of the engineering work of a modernization. By contrast, a modernization is a unique product, designed for one crane only. The retrofit is a mass product. If the retrofit can be applied to several cranes in a fleet, it only needs to be designed once, which provides significant savings, lowering the overall price, and making it a more competitive option.

The four reasons that cause cranes to become obsolete has guided development of the four main types of retrofits:

1. Drive and control system retrofits.
2. Power supply system retrofits.
3. Automation and operator-assisting retrofits.
4. Safety-assisting retrofits.

Each of these types of retrofits can be installed separately or in combination with other types of retrofits. For a deeper understanding of the retrofit concept, let's consider each type separately.

Drives and Control System Retrofits

Most old crane control systems which rely on technology such as contactors, relays, thyristor DC drives, and some frequency converter AC drives, are technically and physically outdated. Manufacturers no longer provide spare parts and technical support for obsolete components. Repair work for old electric and electronic components is quite expensive and sometimes not even possible. All this leads to crane downtime.

Owners with several identical cranes sometimes use one of them for spare parts. However, this cannibalizing can only ever be a temporary solution. When they have both old and new cranes in their fleet, owners quickly realize that the modern diagnostic systems on new cranes help identify faults faster, improving crane reliability and uptime. Even so, their old cranes are still in good condition and do not yet need to be replaced.

The question is: "How is it possible to keep the old crane reliable and improve its functionality on a budget?" The answer is: "Retrofits." Konecranes has been adding retrofits to port cranes since 2013. Over a seven-year period to 2020, the drive and control system retrofit was installed on 154 rubber tired gantry (RTG) cranes worldwide. The retrofits' concept and scope were defined to maximize standardization in modular design and the specification of components.

A standard drive and control system retrofit includes:

- New electrical control panels (including frequency converters) in the crane electrical room
- New crane management system (CMS)
- New operator's touch panel to replace the obsolete one
- Upgraded programmable logic controller (PLC) components to support Ethernet, Profinet and Profibus protocols
- Updated PLC software
- New 3G/4G modem for remote diagnostic and monitoring functions

Optional extras include:

- New braking resistors for frequency converters

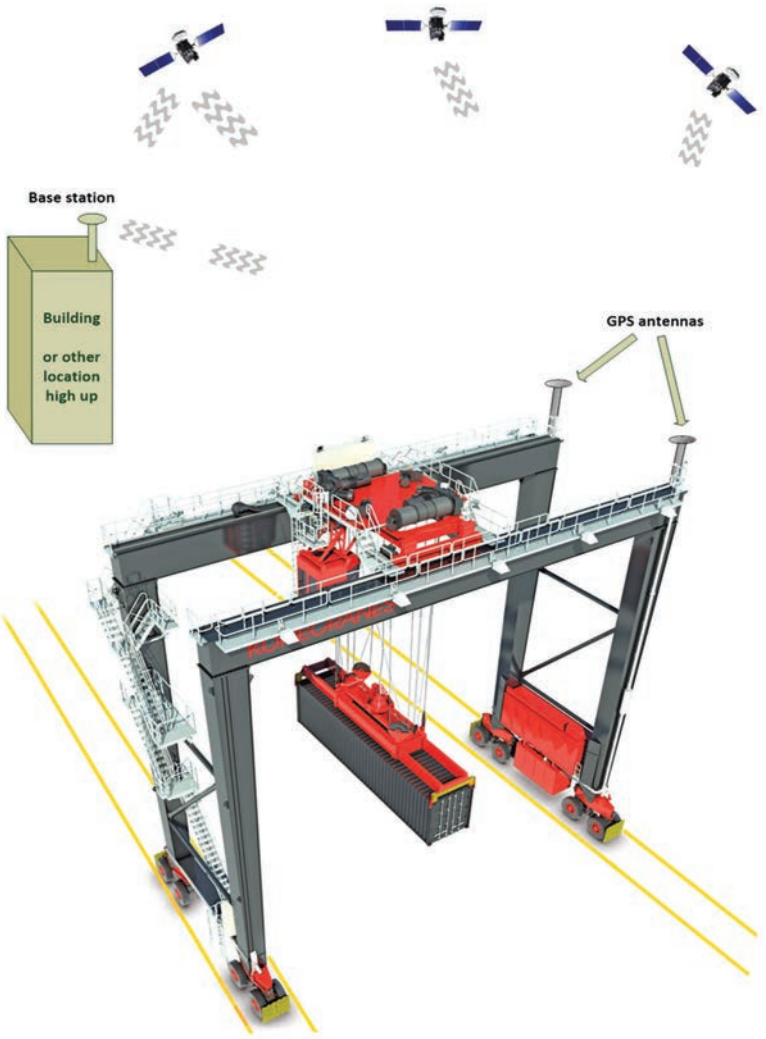


Photo: Konecranes

• New trolley cable chain (or festoon)
• New operator control devices (e.g. change analogue joysticks to digital)

Other retrofits, such as safety, automation and power supply systems, can function as additional options for the drive and control system retrofit. The modular design of these retrofits make them easy to integrate into the general crane control and diagnostic system.

Konecranes assembles and tests all retrofit components at the company factory in southern Finland. All testing is done before shipping to reduce equipment downtime. Depending on the options, a retrofit will keep the crane out of service for an average of 7-10 days during installation and commissioning. A drive and control system retrofit is an efficient and economical solution. At only 15-30% of the price of a new crane (depending on the options), a customer gets a crane with new, modern control and diagnostic systems, remote monitoring functions and full spare parts support from Konecranes. It uses high-speed standard data transfer via Ethernet and Profinet, and a modular PLC software structure allows smooth integration with other systems. For example, a crane could be connected via Ethernet with the terminal operating system (TOS). This lets the TOS exchange data with the crane, which is the first step towards terminal automation.

Power Supply Retrofits

As environmental regulations around the world have become stricter, the demand for power retrofits has grown. Reducing carbon emissions is the main goal of lower-emission diesel engines, hybrid systems (with batteries or supercapacitors for storage), or full electrification.

Full electrification of the crane, equipped with a diesel-electric power supply, is the most expensive but also the most environmentally friendly option. The high cost is due to the mechanical and electrical alterations to the crane coupled with adjustments to the yard infrastructure, including cabling, new transformers, crane feeding, and so on. Cranes have not been using hybrid power systems for long, although the automotive industry has been installing them on cars for over 10 years. It uses a diesel-electric set with lower power, compensating for power consumption peaks with energy from storage. While the crane idles, the generator builds up the energy storage. A hybrid system saves fuel and causes lower emissions compared to conventional diesel-electric power.

However, hybrid power must utilize high-capacity energy storage to be efficient. Lithium Ion batteries and supercapacitors are costly and have a limited lifetime. Sometimes, investment in a hybrid system never pays back because fuel savings are less than the price of the system. To mitigate this problem, some countries (such as the USA) provide funding for retrofits that reduce emissions. Owners of diesel electric cranes are very willing to retrofit their equipment to run on hybrid or fully electric power if the government will support them in the change.

The busbar and cable reel retrofits are the two main ways to convert an RTG crane to fully electric operation. A busbar retrofit needs a lot of yard modifications, including an electrified fence down the side of the yard, feeding points and other technical changes. For this reason, it is recommended for large terminals with a lot of cranes. On the other hand, most of a cable reel retrofit is attached to the side of each crane. The cable reel retrofit is recommended for small terminals.

Conclusion

The main benefits of retrofits, when compared with conventional modernizations, are:
• **Modularity** – more standardized solutions with less custom design leads to cost savings and a lower price for the end customer
• **Integration** – the same retrofit concept can be integrated into different crane types and brands
• **Succession** – one retrofit opens the way to more retrofits, building on a long-term investment in automation and reliability.

Photo: Konecranes

PICTURED LEFT: A single accident can prove to be very expensive

Photo: Vestdavit

It's Battle Stations for Boat Handling

The reliability of davits used to launch rapid-response craft from a naval vessel can mean the difference between success and failure of a military or humanitarian mission.

The clock is ticking. Timing is critical. As is the covert Nato mission in the dead of night to intercept suspected armed pirates en route to attack a UN humanitarian aid ship moored off Eritrea to supply refugees caught up in the Ethiopia crisis. Human lives, as well as valuable cargo and assets, are at risk. While this is a hypothetical scenario, it reflects real-life challenges for navies and coastguards in tackling such missions that are critically dependent on rapid deployment of high-speed craft, as well as the functionality of technology used to launch such vessels.

Readiness is key and this necessitates the reliability and efficiency of davit systems to perform repetitive missions at sea in a failsafe manner, as well as effective follow-up maintenance to ensure these systems continue to work efficiently.

"The sea is a very difficult environment in which to conduct military missions as one is up against a dual enemy: volatile marine conditions as well as the actual enemy," said William Goodall, a former surface warfare officer in the British Royal Navy and now area sales manager with Bergen-based davit supplier Vestdavit. "It is therefore vital that a davit system is available for operations as and when required, that it functions correctly and has the widest possible operational window so that it can be deployed in extreme sea state conditions if needed."

Navies use a variety of launch craft for a range of tasks, tasks that demand a high level of durability, reliability and regularity for davit systems, which can be used as many as 12 times a day for launch and recovery of craft in the case of fishery inspections. Delivery of dependable boat-handling systems requires these to meet both technical and performance specifications that enable them to respond as expected in real-life situations. "The system has to deliver when you press the button, with highly motivated personnel and equipment all ready to go," said Goodall, who served tours of duty in the South Atlantic, Pacific and Persian Gulf where energy security was a priority, as well as carried out patrols in British and Norwegian waters, during his eight years in the Royal Navy.

Vestdavit has a long record in supplying davit systems, having delivered more than 2000 such systems since 1965 including recent reference deliveries on vessel newbuilds for the U.S., French and Australian navies, as well as the U.S. Coast Guard.

Goodall points out that a pair of davits supplied for two British naval warships, HMS Echo and HMS Enterprise, in 1997 are "still going strong" even as upgrades are now being considered for the vessels that have a design lifetime of 25 to 30 years.

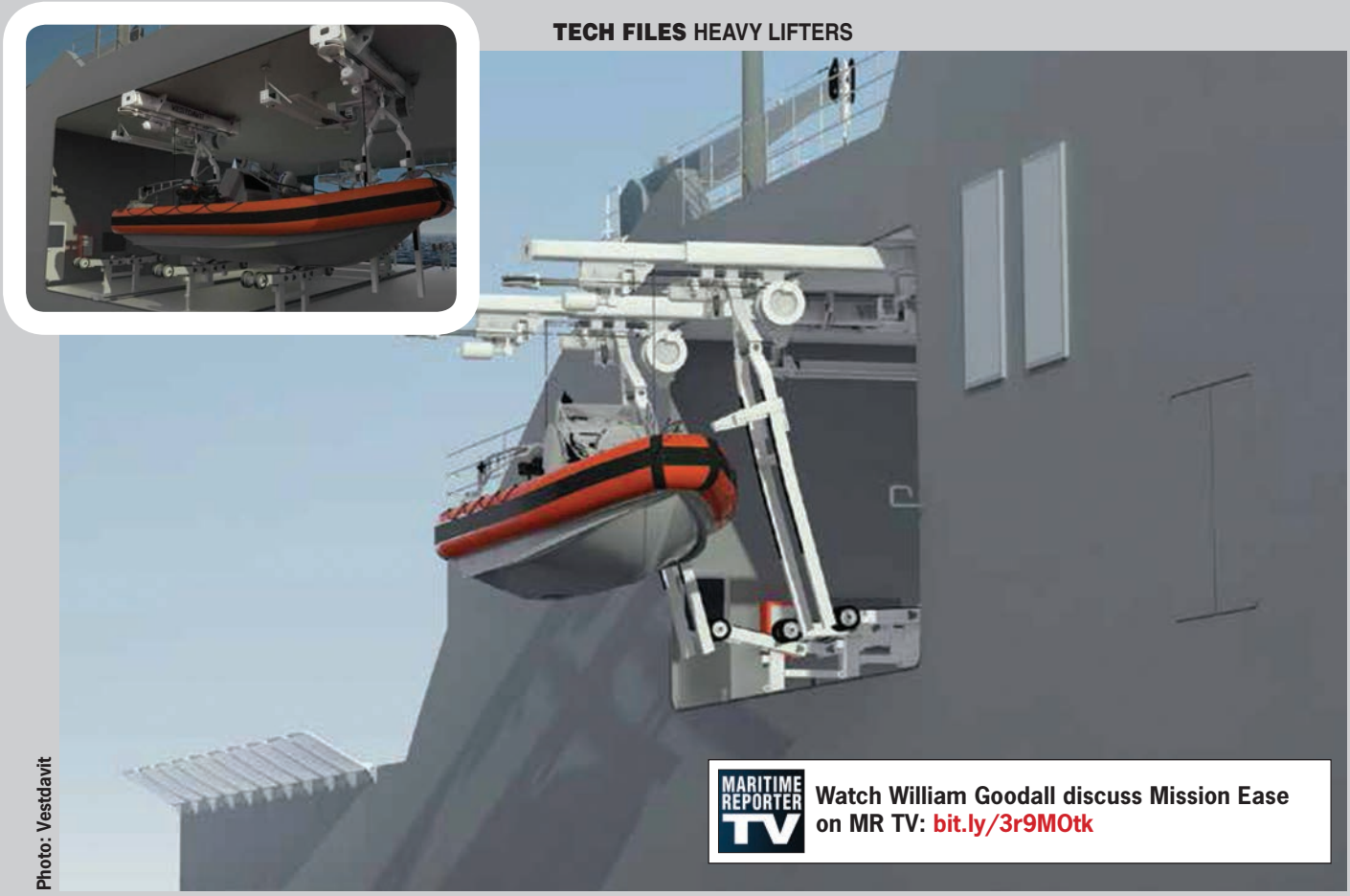


Photo: Vestdavit

MARITIME REPORTER TV **Watch William Goodall discuss Mission Ease on MR TV: bit.ly/3r9MOtk**

He attributes the "impressive longevity" of Vestdavit's systems to durable components and regular preventive maintenance involving both weekly checks, and annual and five-yearly inspections in line with IMO guidelines.

This is necessary to counter the stresses and strains from repetitive operations in tough sea conditions on a davit's moving parts, such as shock absorbers and winches, to ensure it remains fit for an operational window of up to sea state six. The functionality of such components is also vital to safeguard both personnel and valuable equipment inside the craft being dropped to the water, such as a remote-operated vehicle that may be used to detonate a mine at sea.

Vestdavit has also developed davits for hostile environments like the Arctic with measures such as protective housing and hot cables to de-ice components to withstand temperatures as low as minus 40 degrees Celsius, enabling polar vessels to operate in extreme and remote conditions.

This was demonstrated last year with a pair of Vestdavit's PLR-5002 davits on Norwegian Coast Guard vessel KV Svalbard that was used to retrieve data sensors in the Beaufort Sea and the U.S. Coast Guard has recently ordered the company's HNFE-5000 davit systems for one of its polar security cutters.

Vestdavit Technical Director Helge Gravdal said the company's experience with previous deliveries enables it to determine the correct specifications for a davit based on the client's operational requirement.

"Clients such as navies may have very specific requirements, such as the need to deploy a craft rapidly at speed in a high sea state, and this influences the design of davit we deliver. So dialogue with the end-user is very important to us," Gravdal said.

Vestdavit is also taking a technological lead with, for example, development of davits using electrical rather than hydraulic power and Gravdal believes there will be more hybrid systems in future.

It is now taking a further step forward beyond traditional davit systems with its innovative MissionEase solution that facilitates deployment of multiple craft from a single 'garage' inside a vessel using an automated track system.

One such system is already in operation on a crew-change vessel and another designed for 13 boats is now being installed on the Nexans Aurora subsea cable laying vessel under construction at Norway's Ulstein shipyard, marking the first commercial contract.

Goodall believes this will pave the way for future such installations of MissionEase on naval vessels and that the system also has potential for the expeditionary cruise market.

Tech Files

Innovative products, technologies and concepts

Liebherr

Sail Power: World's Largest Slewing Drive Unit

As the maritime industry grapples with the technology and technique to meet increasingly strict emission mandates, eConowind is working to deliver an innovative wind sail system. In step with the development, Liebherr delivered what is currently the largest worm-driven slewing drive units in the world for the sailing system by eConowind. Inspired by Jacques-Yves Cousteau, eConowind develops an innovative sailing system that is intended to revolutionize commercial shipping. Up to 40 meters high, futuristic metal sails serve as propulsion support for cargo ships. The world's largest slewing drive units turn these huge sails. Using wind power in this way, it is estimated that fuel costs in shipping can be reduced by up to 20%.

Liebherr slewing drive units are self-contained systems consisting of a drive and a bearing unit. This makes the components particularly resistant to extreme environmental influences, such as salt water or dust. Special sealing systems and surface coatings also add to the high resistance of the large components and make them ideal for use at sea. The massive, worm-driven components from Liebherr measure 1.720 mm in diameter each and weigh together over 1.4 tonnes.

LRUSV for the Marines

Metal Shark was selected to develop and implement the Long Range Unmanned Surface Vessel (LRUSV) System for the United States Marine Corps. Metal Shark has enlisted autonomous technology developer Spatial Integrated Systems (SIS), recently acquired by Huntington Ingalls Industries, to provide the autonomy solution for the LRUSV system. Under an "Other Transaction Authority" (OTA) Agreement with Marine Corps Systems Command, Metal Shark will design, build, test, and implement the vessels and will handle the integration of the autonomy system and an advanced Command and Control (C2) software suite.

In addition to the autonomous LRUSV, Metal Shark will also produce manned support vessels for the LRUSV system utilizing its 40 Defiant military patrol craft platform, which the builder is currently producing to create the U.S. Navy's new "40 PB" patrol boat fleet.

Metal Shark

Elbit tapped to supply USVs

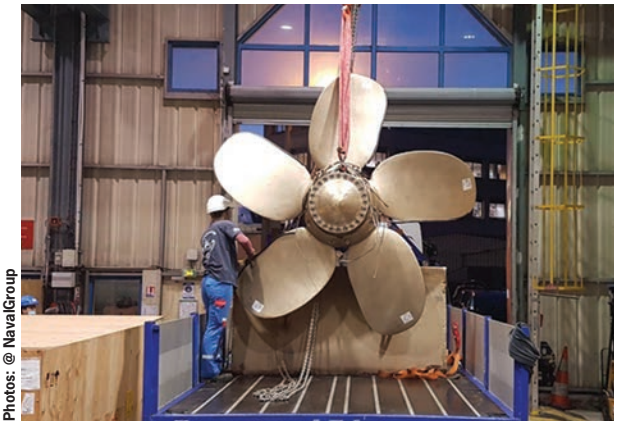
Elbit Systems

Elbit Systems won a contract to supply Seagull Unmanned Surface Vehicles (USVs) to an Asia-Pacific Navy. Under the contract, Elbit Systems will provide Seagull USV systems that are specifically configured to perform Mine Counter Measures (MCM) missions while facilitating the option to add technology modules needed for Anti-Submarine Warfare. The Seagull USVs to be supplied will integrate Side-Scan and Forward-Looking sonars, Mine Identification and Destruction Remotely Operated Vehicles. The USVs also will be equipped with the Company's autonomous suite, Combat Management System and Satellite Communication capability.

Tech Files

Innovative products, technologies and concepts

NAVY: 3D Printed Prop for French Minehunter



Photos: @ NavalGroup

Naval Group manufactured this new-generation propeller now mounted on a tripartite minehunter, thanks to a metal 3D printing process. With its 2.5-meter span supported by five 200-kg blades, the equipment left the workshops of the Naval Group site of Nantes-Indret in October 2020 for the site of Brest in order to be mounted on the propeller shaft. As part of its major technical stop, the assembly was transferred to the submarine base to be mounted on the intermediate shaft of the Andromède in November. Sea trials were then performed successfully at the end of December.

"Today, we witness a world first," said Emmanuel Chol, Director of the Nantes-Indret site. "It is the largest metal 3D-printed thruster ever to have been manufactured and the first propeller resulting from this technology, embarked on board a military ship and manufactured for use beyond just sea trials." Naval Group worked together Bureau Véritas throughout the process to present its technical justification file in order to allow the SSF (Fleet Support Services) and the DGA (French Defence Procurement Agency) to authorize the trial of the blades produced on a military ship in normal operating conditions. The blades received certification from Bureau Véritas. This propeller is a first step. A new development phase will begin, aimed at revamping the detailed design of other parts so that they benefit from 3D printing.

'Plug and Play' ECDIS

Raytheon Anschütz launched a new ECDIS in January 2021, the NX Compact, which is a preconfigured system of a 24-inch panel-pc and the ECDIS NX software that is designed to make installation and operation easier and safer. Optimized for ECDIS retrofits, the panel-pc is equipped with interfaces for Ethernet and IEC 61161-1 (NMEA). With a software installation wizard and selectable standard configurations for newbuilding and retrofit installations, the operating system and the ECDIS software install semi-automatically, requiring the ship-specific parameter input only. The ECDIS NX software supports intuitive interaction patters such as touch or drag and drop. A maximized chart display contributes to better situation awareness. By making all mandatory functions available at a single touch or through wizard-guided workflows, ECDIS NX is designed simplify the daily tasks and use cases of navigators.

Raytheon Anschütz

VLSFO + Older Engines = Maintenance Challenges

As shipowners mull the pros and cons associated with new fuels to meet tightening emissions rules, Chevron Marine is finding that some ship owners that switched older engines to very low-sulfur fuel oil (VLSFO) are reporting build-up of red deposits on piston crowns and top edges, sometimes combined with red iron burrs in scavenge ports. The deposits are associated with abnormal liner wear since the fuel switch, particularly on older two-stroke marine engines.

"While newer ships do not have a problem using these fuels, engines already closer to an overhaul did struggle sometimes. Cylinder units that could have run for another six months or a year on HFO did not survive the tougher conditions with the new fuels," said Luc Verbeeke, Senior Engineer, Chevron Marine Lubricants.

Chevron used a four-step laboratory analysis to narrow down likely causes. The deposits were found to include a compound of materials including harmless detergent additive residue and iron oxide. The detergent residue was determined not to be a source of wear as the deposits were only found in single cylinders rather than across the engine.

The fuels associated with the red deposit and scuffing incidences were also analyzed. Chevron found that the VLSFO blends involved showed differences from others in two fuel characteristics, typically a lower calculated carbon aromaticity index (CCAI) and high estimated cetane number (ECN).

Although VLSFO has been found to offer a typically higher energy value content than heavy fuel oil (HFO), and therefore can offer value for money, its combustion engine density properties can result in harsher operating conditions and more stress on the engine components.

Chevron Marine

Above: Piston with scuffing and deposits.

Chevron Marine

Below: An example of the red deposits analyzed at Chevron laboratories.

Tech Files

Innovative products, technologies and concepts

ABB

Azipod Makes its Bulk Carrier Debut

China's Chengxi Shipyard delivered the first of two self-unloading transshipment newbuilds outfitted with Azipod propulsion. The delivery saw two 1.9-MW Azipod units installed on each of the 21,500-DWT transshipment bulkers for Germany's largest bulk carrier owner, as part of a package of electric, digital and connected solutions from ABB. The scope of supply also included diesel-electric power plant, drive systems complete with two bow thruster motors, power management systems for propulsion and cargo handling, as well as a 50/60-Hz connectors to draw on zero emission shore power when in port.

"This was Chengxi Shipyard's first time installing Azipod technology, and the process went remarkably smoothly," said Jiafa Jiang, Vice General Manager of Chenxi Shipyard (Yangzhou) Co., Ltd.

Controlling a fleet of around 700 ships, around 95% of Oldendorff's owned fleet is comprised of 'eco' newbuilds delivered since 2014, which are specifically designed for low fuel consumption and reduced carbon footprint. And since its forthcoming vessels will be tasked with transferring cargo from oceangoing ships in deep water for delivery to a port with restricted draft and space, maneuverability is also a vital consideration.

Leveraging AI for Ship Info

DeepSea Technologies launched Cassandra Light, a hardware-free AI-driven platform designed to deliver accurate vessel performance insights using only noon data, enabling charterers and shipowners to gain visibility and transparency on vessel performance across their whole fleet. Cassandra Light monitors and visualizes CO2 emissions and notifies users of fuel over-consumption, representing a key tool in charterers' and shipowners' efforts to reduce the environmental impact of their fleets in line with the wider goal of decarbonisation, and helping drive a significant reduction in fuel spend.

The platform also provides AI-based performance insights to present an at-a-glance overview of key vessel metrics in one place. This includes alerts that detect performance anomalies and critical events that might need further investigation. Cassandra Light provides instant full fleet monitoring and assessment.

DeepSea Technologies

ZF Debuts AT 80 Thruster Range

ZF launched its new ZF AT 80 thruster model range, available as a 360-degree steerable thruster and as a retractable propulsion system, or as a bow thruster, effectively broadening its appeal amon ship owners, shipbuilders and naval architects. With a power output of 1,380 to 1,585 kW, the propulsion system covers the range between the tried and tested ZF 6000 and ZF 7000 models. The new hydrodynamically optimized shape of the underwater housing is designed to reduce drag and improve cavitation behavior. The propulsion system's efficiency is higher, thanks to the low oil fill quantity, which simultaneously reduces CO2 emissions. Leakages are detected early with a future-oriented, double-chamber sealing system. This prevents both – mineral oil leaking into waterways and/or water getting into the transmission. In combination with a resistance-optimized nozzle, the achievable speed is improved – a feature particularly useful for passenger ships, such as ferries. A PTO with a maximum torque of 560 Nm can also be provided upon request.

ZF

Kongsberg

KDI: Remote, Sim-based DP Learning

Kongsberg Digital (KDI) and The Nautical Institute announced an approved remote simulation solution for Dynamic Positioning (DP) Induction Courses. This has been developed by KDI to support training centers worldwide during the COVID-19 pandemic lockdowns, and has now been approved by The Nautical Institute.

Since the start of the pandemic, Kongsberg has been ramping up the delivery of cloud-based eLearning and remote training solutions to support education and training institutes and meet the challenges imposed by the impossibility of carrying out tuition in a physical classroom situation. The latest addition to its cloud-based simulation training solutions is a remote DP simulation application, which enables instructors to continue providing their students with mandatory DP simulation-based education through remote access to Kongsberg cutting-edge K-Sim DP technology.

As a response to the COVID-19 situation, the NI has reviewed and approved the use of KONGSBERG's cloud-based remote DP simulators, equivalent with the NI Class C DP simulators required for the DP Induction courses. By temporarily approving remote simulation training, The Nautical Institute is helping the industry to maintain mandatory DP skills through the pandemic crisis. The remote training solution is valid until April 1, 2021, with the option to further extend approval depending on the coronavirus situation.

SturdiSignal Nav Lights

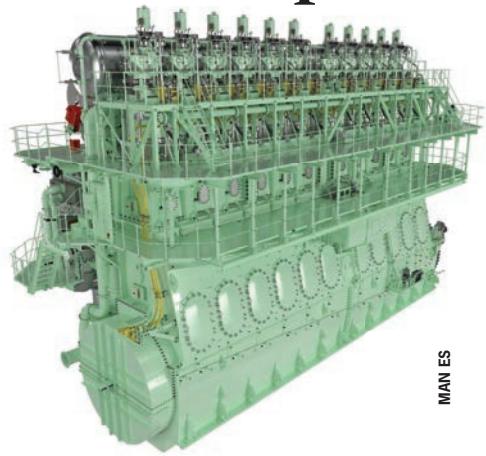
Phoenix Lighting introduced the SturdiSignal Series of navigation lights, a modular and serviceable LED navigation light. The design is built to allow for tool-less repair in minutes, without any electrical work, to eliminate maintenance calls and reduce overall vessel operation costs. With a spare LED module kept onboard for field repairs, a vessel can always remain safe and compliant. These navigation lights are designed to provide safe and reliable illumination for up to six nautical miles, for any vessel over 20m in length. The IP67 rated design will withstand moisture intrusion. The SturdiSignal can be used to replace existing navigation lights or specified into the design of a new vessel along with an alarm panel. They are compliant with COLREGS, ABS, UL1104, Coast Guard regulations and are manufactured in the U.S.

The SturdiSignal features a double head autonomous option that automatically alternates LED heads to double the lifespan of a light and automatically switch to an alternate head if one fails or falls below required visibility. Marine operators can tailor Phoenix's navigation lights to their specific needs.

Phoenix Lighting

ME-GI's for Ultra Large Containerships

MAN Energy Solutions won an order for six MAN B&W 11G95ME-GI Mk10.5 main engines in connection with the building of six ultra-large, 23,500+-teu container vessels for Hapag-Lloyd. The engines will be built in Korea and will offer the option of operating on LNG or conventional fuel, meeting Tier III emission standards through SCR. The first engine delivery is scheduled for May 2022. Korean shipyard, Daewoo Shipbuilding & Marine Engineering, will build the vessels with delivery expected from April through December 2023. The newbuildings will be deployed on the Europe – Far East routes as part of THE Alliance. The engines will operate on LNG, but have sufficient tank capacity to operate alternatively on conventional fuel. "These newbuildings will be fitted with mature ME-GI technology that continues to accumulate references across multiple segments," said Bjarne Foldager, SVP and Head of Two-Stroke Business at MAN Energy Solutions.



MAN ES

In the Shipyard

New vessels, contracts and designs

Austal

Austal Volta is fully electric.

Photos Courtesy Meyer Turku/Costa

Costa Toscana was floated out at Meyer Turku

Austal's 450 PAX Fully Electric Ferry

Austal Australia launched the VOLTA series of electric-powered high speed ferry solutions, with the introduction of the Passenger Express 46V, a fully electric-powered 46m catamaran ferry design. The VOLTA series is distinct in the burgeoning market for electric vessels as it offers a completely integrated design, construction and support solution - including on-shore charging infrastructure and in-service support programs for operators. The series combines a light-weight, low-resistance hull forms, specifically designed, tested and optimised for electric-power propulsion, with the latest in lithium ion batteries. In develoment for the past two years, the first of class Passenger Express 46V is a high speed passenger ferry, designed to provide an environmentally friendly, economical vessel for metropolitan, inland waterway commuter ferry services. Boasting a capacity of up to 450 passengers, a maximum speed of 25 knots and fast charging capability, with a range of over 175 nautical miles per day, the Passenger Express 46V highlights the real advantages of the VOLTA design technology.

Prinicipal Particulars – Passenger Express 46V

Length, o.a.	46 meters
Beam	12.3 meters
Draft	< 2 meters
Propulsion	2 x Full electric, permanent magnet motors
Batteries	Full redundancy with 2 Lithium battery banks
Minimum battery life	7 years
Passengers	400 to 450
Bicycles	10
Crew	3
Operating speed	20 knots
Maximum speed	25+ knots
Max. range per day	>175 nm per day with 20% reserve

LNG-Powered Costa Toscana Floated Out

The LNG powered, 185,000 GT, cruise ship Costa Toscana was floated out to the outfitting pier at Meyer Turku shipyard last month. Costa Toscana is a sister ship to Costa Smeralda, delivered from Turku in 2019. The ship is powered by liquefied natural gas (LNG) and has been designed with a circular economy concept. The use of LNG will eliminate all sulfur dioxide emissions and almost all particular matter emissions (95-100% reduction), while also significantly lowering emissions of nitrogen oxides (direct reduction of 85%) and CO 2 (up to 20%). The ship also has an intelligent energy efficiency system, and 100 % of the ship's recycling materials (such as plastic, paper, glass and aluminum) will be carried out of the ship and recycled.

Costa Toscana facts

Delivery	2021
Flag	Italy
Length	337m
Width	42 m
Draft max	approx. 8.8m
Gross Tonnage	185,000
Passenger cabins	2663
Total passengers	approx. 6730
Balcony cabin ratio	62,6%
Total crew	1646
Service speed	17knots
No. of main engines	4

Metal Shark Fireboats for Miami-Dade

Designed by Metal Shark and built to Lloyds Registry standard, the welded-aluminum monohull pilothouse fireboats FB-21 and FB-73 were acquired to boost Miami-Dade Fire & Rescue's (MDFR) maritime firefighting capability. The new

Metal Shark

Metal Shark Delivers Fireboats for Miami-Dade.

SCF Group

PAO Sovcomflot took delivery of a new LNG Carrier.

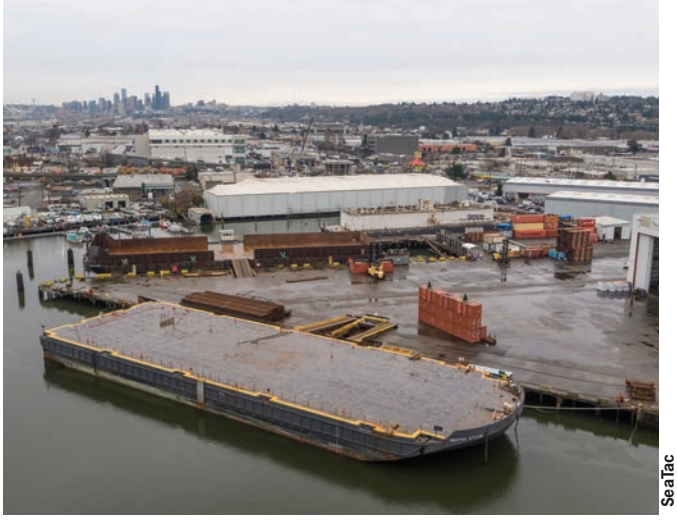
55 x 17.5-ft. Metal Shark fireboats feature an innovative pilothouse that uses Metal Shark's signature "pillarless glass" with reverse-raked windshield, helping to reduce blind spots. The fireboats are powered by twin V8, 16-liter, 1,200-horsepower MAN D2862 LE456 inboard diesel engines coupled to Marine Jet Power (MJP) 350X waterjets via ZF500 transmissions, and reach a top speed in excess of 44 knots. The fireboats deliver a flow rate in excess of 8,500 GPM, with twin Darley ZFE 3000 self-priming fire pumps driven via PTO from the main engines. Each pump draws from its own dedicated in-hull sea chest, feeding a central manifold with crossover capability, which in turn supplies the entire system.

SCF Takes New LNG Carrier

On January 15, 2021, PAO Sovcomflot (SCF Group) took delivery of SCF Timmerman, a new 174,000-cbm LNG carrier. The same day, the vessel embarked upon her maiden commercial voyage. The carrier is operated under a long-term time charter agreement with Shell. The carrier was named after Frans Timmerman, a 17th-century Dutch merchant who served as a shipbuilding mentor to the Russian emperor Peter the Great and played an important role in creating the Russian seaborne fleet. SCF Timmerman is the third vessel in a series of 174,000-cbm new-generation Atlanticmax LNG carriers ordered by SCF Group in 2018. The lead vessel of the series, SCF La Perouse, was delivered to SCF in February 2020 and is time chartered to Total. The second vessel in the series, SCF Barents, was delivered to SCF in September 2020 and is also time chartered to Shell. Each ship is equipped with an advanced Mark III Flex cargo containment system, slow-speed dual-fuel X-DF engine, and a system that reduces nitrogen oxide emissions while the vessel sails in liquid fuel mode. In addition, all vessels of the series are among the first globally to feature a boil-off gas partial re-liquefaction system, which significantly reduces cargo losses while on long voyages or awaiting cargo operations.

SeaTac Grows Barge Capacity to Alaska

Seattle-based SeaTac Marine Services has acquired a new heavy deck cargo barge, a barge built in 2010 that can haul up to 11,000 tons and with nearly 30,000 square feet of deck space, making it one of the larger barges in the Pacific cargo trade. The 300 x 100 feet barge was purchased from Signet Marine in late 2020. Specializing in general cargo and heavy lift machinery, the Atlas will fit well into SeaTac Marine's regular shipping schedule to Anchorage and Seward. SeaTac Marine is modifying the barge to maximize cargo protection and space.



SeaTac

SeaTac Grows its Barge Capacity in Alaska.

ID, Mitigate Risk 2021

Meet the "COVID Trio"

In step with the recent release of the Allianz Risk Barometer for 2021, we visited last month with Captain Andrew Kinsey, Senior Marine Risk Consultant, Allianz Global Corporate & Specialty to discuss findings from the recent report and what it means for the year ahead.

By Greg Trauthwein

Andrew, to start, can you summarize the top three risks to businesses in 2021, aka the COVID trio?

Sure thing. The top three global business risks are business interruption, a pandemic outbreak and cyber incidents. And those are our top three global business risks, but then also the report, the barometer drills down into marine and shipping specific-related risks as well. And not unsurprising given the global trade, the top three maritime and shipping risks are pandemic outbreak, business interruption, natural catastrophe and then followed by four, which is cyber. So they mirror each other.

What changes do you expect to see to the global supply chain to help it be more resilient in the future?

Interesting question. It's really the downside of global production and supply chains; it's an interconnected world where we're working and living. Let's look at a specific segment, vehicle production, for example. Right now with global vehicle production, it's not the bulkers that we're looking at that have a shortage; it's not the steel that's the issue; it's actually the availability of microchips that is impacting vehicle production globally. Due to the interconnected nature of the supply chain, those microchips have been in such high demand for gaming consoles and for things that people are using while stuck at home: computers, laptops, tablets, gaming consoles have created tremendous demand impact. So excess production goes to the one that brings the greatest return (5G vs. automatic chips).

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What we're seeing is that certain builders have a more robust profile in their supply chain. Toyota, for example, is one, as following the 2011 it took concrete steps to make its supply chain more robust, and also to keep more inventory on hand. That increased inventory is money out of their pockets and into inventory. It's also more storage, more warehousing. However, Toyota has been able to continue production without any slowdown, because (of lessons learned in 2011).

How has COVID-19 specifically enhanced cyber risk?

Yes, it has and it's actually a multifaceted impact. One of the keys is we're working remotely. As a result, those platforms that we connect through have to be secure. In many cases they were not, and in many cases they continue not to be. And it's the challenge that you're in an interconnected world, but just by the nature of that interconnectivity, we are increasing our exposure to cyber

risks. Not only are we increasing that exposure, those avenues are being actively targeted by individuals who are looking to take advantage. It's similar to what happened when we started getting a lot of Amazon deliveries and people started getting their stuff stolen off their front porches.

So I refer to them as some of the digitalization dangers. Cyber is part of that digitalization, just like cloud-based things.

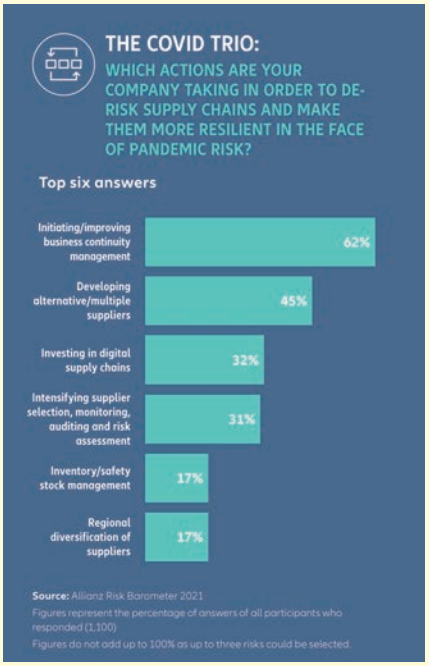
Hand in hand with the question on cyber security is growing digitalization of the supply chain in general.

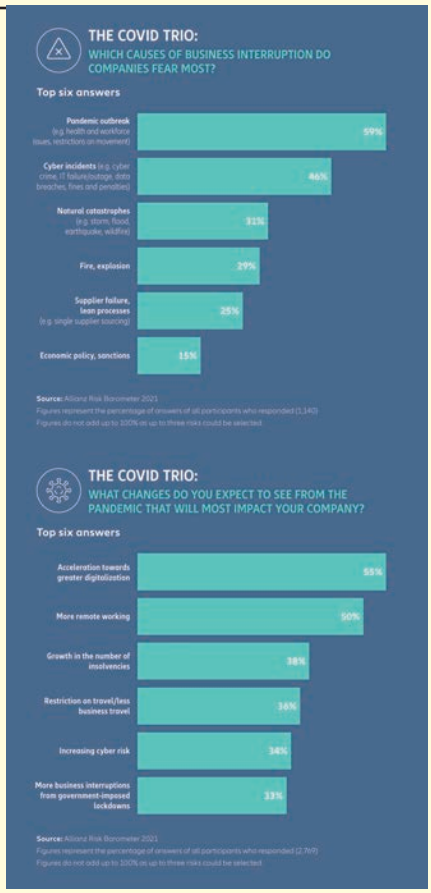
The key to the digitalization is it has to work all the time; that's the Achilles heel. So when you can't connect to the cloud it doesn't matter how much of your inventory is secure on the cloud; it's so secure you can't get to it. It's like these guys who have Bitcoin accounts and forget how to log into it. So yeah, it's really secure. It's so secure you can't touch it.

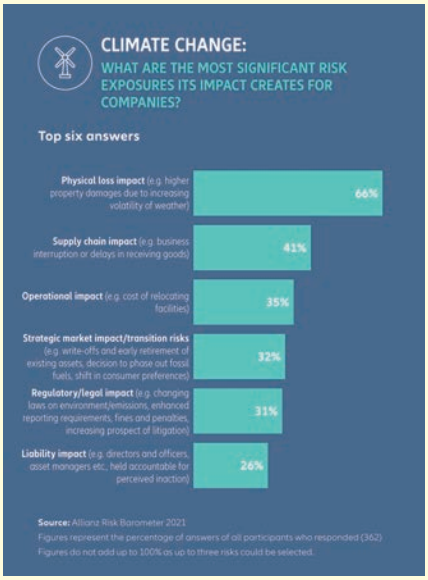
What can you leave as some salient bits of advice on what our readers can do today to help them identify, manage, and mitigate risk better in their businesses?

There's four accepted strategies for risk mitigation: acceptance, avoidance, limitation or transference. Limitation is the most common, and I equate limitation to changing course, increasing our CPA when we know if a danger is there. Transference is the business we're in here at Allianz, as the easiest method of transference is insurance. But the overall key is communication, and that's what we stress right now.

We are going into our 11th month of lockdown, with a lack of business travel and no face-to-face meetings. As a result, communication is getting more and more difficult because we get into this morass of constant meetings, but we're not saying enough, I feel. So it's bringing in a fresh point of view, discussing it, utilizing the assets you have to give you a new view of your risk profile. And quite honestly, that's what we do at Allianz. We are risk consultants. We look at and work with our insureds, identify their problems, and talk with them about different strategies to mitigate or limit those risks.







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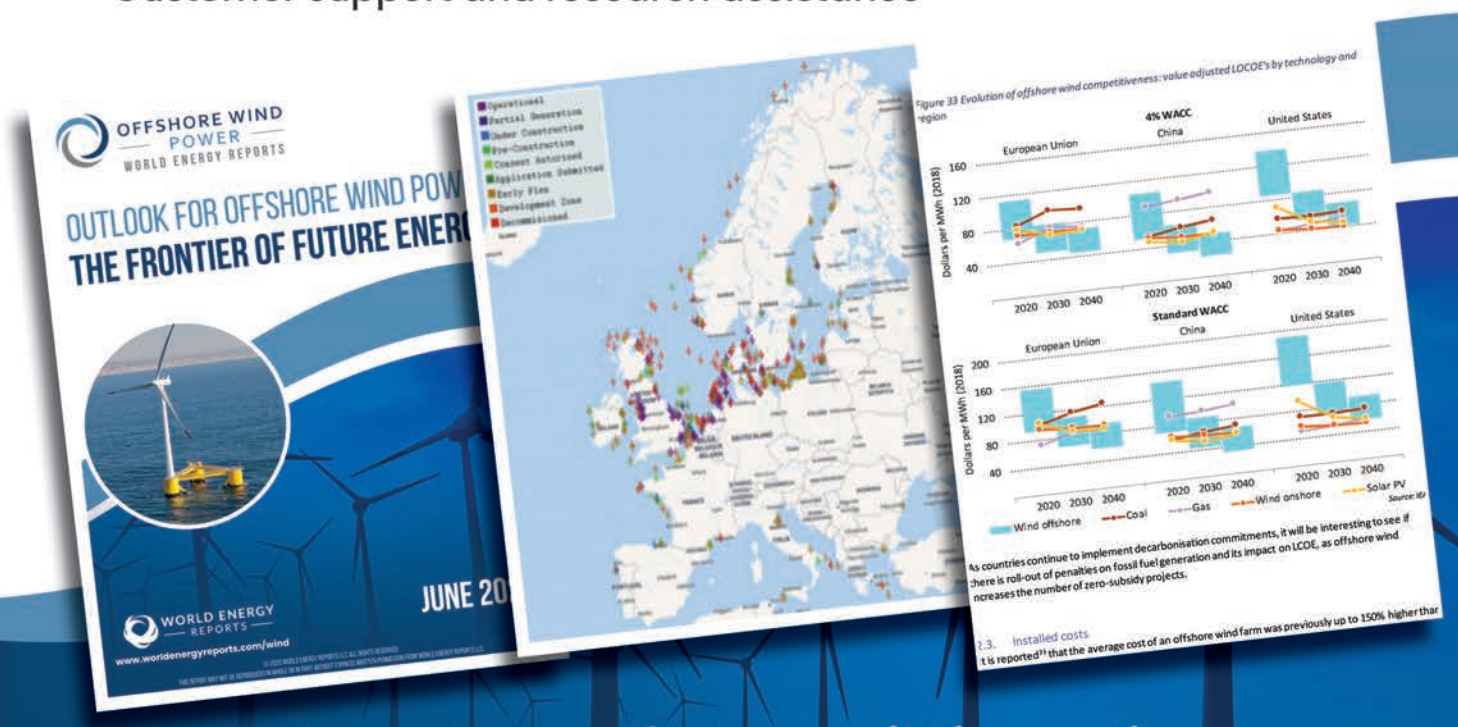

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