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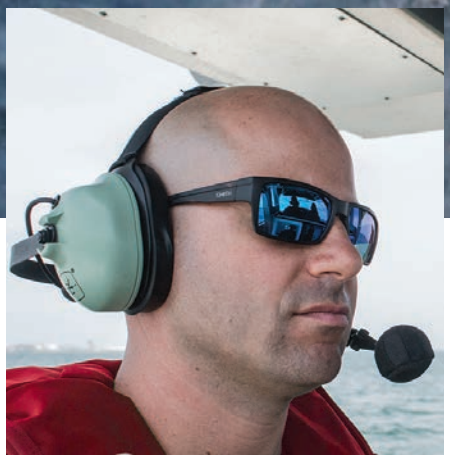

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Photo On the Cover & This Page: Pieter Van Oord, CEO, Van Oord. Source - Van Oord

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After nearly 30 years interviewing ship owner executives globally, it's impossible to pick one as standing out head and shoulders above the rest. But in discussing with a friend my recent interview with **Pieter Van Oord, CEO, Van Oord** I said: *"When their name is on the door and they're privately held, they're my favorite."*

Van Oord is the Dutch dredging and offshore energy powerhouse with a history spanning more than 150 years. This was the first time that I personally had the opportunity to go one-on-one with Pieter Van Oord, and what I found was a forthright executive that is a treasure trove of insight and information on the many markets they serve, including the fast-growing offshore wind sector. There are many things that stand out in our interview, starting with the fact that he freely and easily discussed the difficulties encountered on a pair of offshore wind projects that directly led to a loss for the company in 2021. But in true Dutch engineering spirit, an engineered solution was found, and Van Oord is extremely bullish on the offshore wind sector moving forward, not that it doesn't come with a number of challenges to face and hurdles to leap. He took the decision to order a mammoth new Wind Turbine Installation Vessels (WTIV), the world's largest, capable of installing 25MW turbines. When he said that this ship is designed for the "next, next generation" of offshore wind, he wasn't kidding, as current projections have turbines that size coming into the market around 2035. The new ship will be dual fuel, designed to run on methanol when it enters the fleet in 2024. When prodded to project how the decarb trend will reshape the maritime industry in the coming years, he was blunt: "I expect in the next decades a massive wave of investments in all sorts of new vessels" premised on the need to cut emissions. The Van Oord cover story interview starts on page 34, and you can watch the full video interview @ **bit.ly/3GVjQGJ.**

Dovetailing nicely with our Van Oord story are two additional features; the first a profile of the U.S. offshore wind segment prospects by **Philip Lewis**, director of research, Intelatus; and the second a look inside the port logistics of moving these massive pieces of equipment by **Elaine Maslin**. In the former, Lewis said the U.S. market could see 60GW of offshore wind capacity installed by 2035; optimism driven by a pair of Outer Continental Shelf (OCS) projects representing about 940MW capacity now reaching the final investment decision. Phil's story starts on page 28. The latter story from Elaine takes us inside the Siemens Gamesa blade manufacturing facility in Hull, UK. As has been well-recorded, the size of offshore wind turbines is growing exponentially, and with that comes a commensurate logistics difficulty in moving these bits and piece from manufacture hall to port to ship to installation. As Elaine reports, when the Hull facility opened it was producing 75-m long blades, while today it is eying blades up to 115m long. Her full report starts on page 30.

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U.S.A.

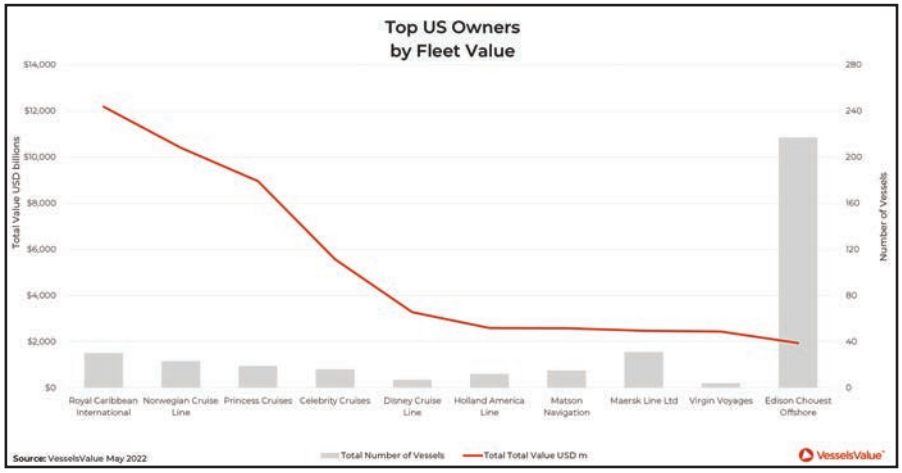
With a fleet dominated by cruise ships (in value) and OSVs (in numbers), the U.S. market has weathered an 'interesting' few years. But the space is worth a watch, as a potential influx of newbuilds to service the growing offshore wind market is projected.

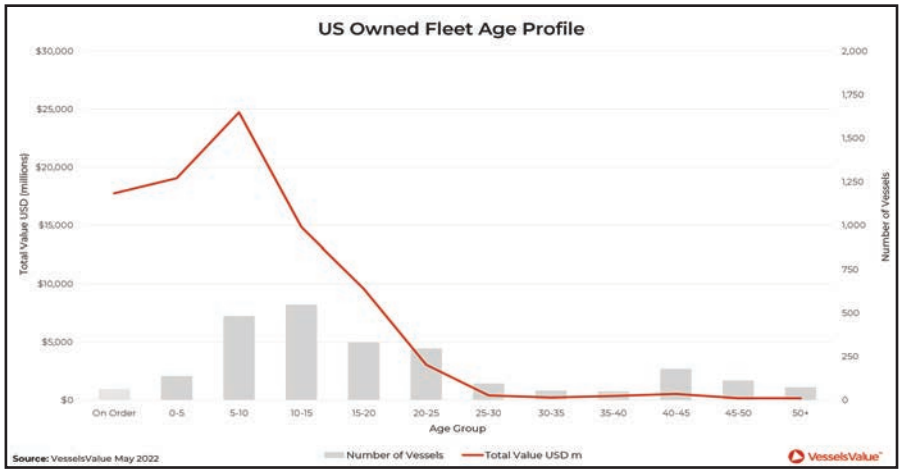
U.S. Shipowner Second Hand Purchase History

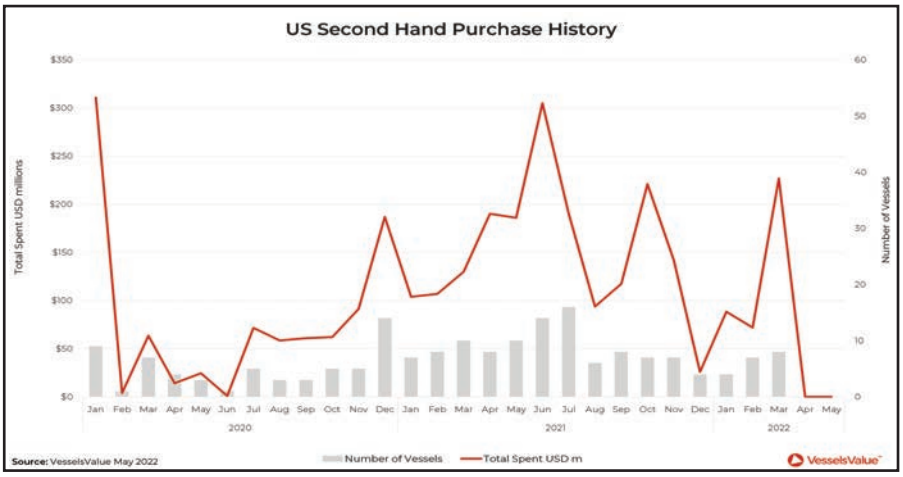
	Sale Date	# of Vessels	USD m
2020	Jan	9	310.78
	Feb	1	4.00
	Mar	7	63.45
	Apr	4	14.15
	May	3	24.53
	Jun	1	0.95
	Jul	5	71.58
	Aug	3	58.46
	Sep	3	60.86
	Oct	5	62.01
	Nov	5	91.22
	Dec	14	186.89
2021	Jan	7	103.88
	Feb	8	106.88
	Mar	10	129.84
	Apr	8	190.10
	May	10	185.93
	Jun	14	304.93
	Jul	16	190.48
	Aug	6	93.77
	Sep	8	117.41
	Oct	7	220.93
	Nov	7	141.91
	Dec	4	25.85
2022	Jan	4	88.42
	Feb	7	72.00
	Mar	8	226.82
	Apr	0.00	0.00
	May	0.00	0.00
	Grand Total	**184**	**3,148.03**

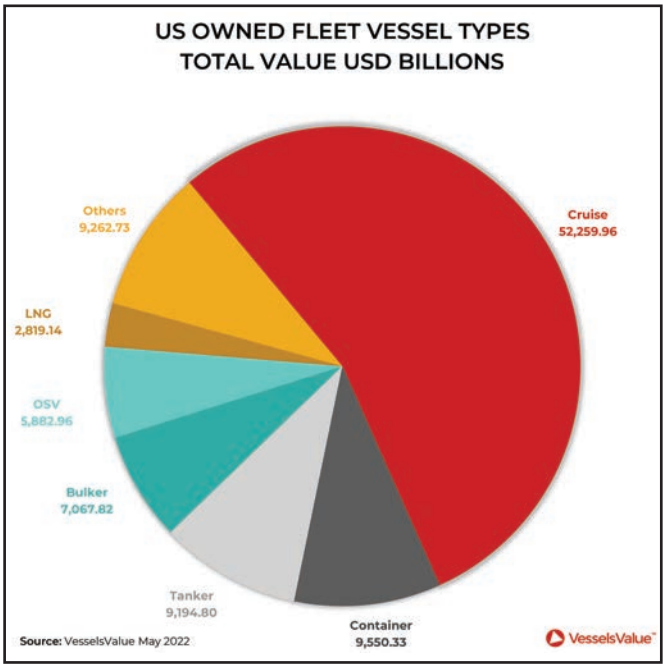
U.S. Shipowner Second Hand Sales History

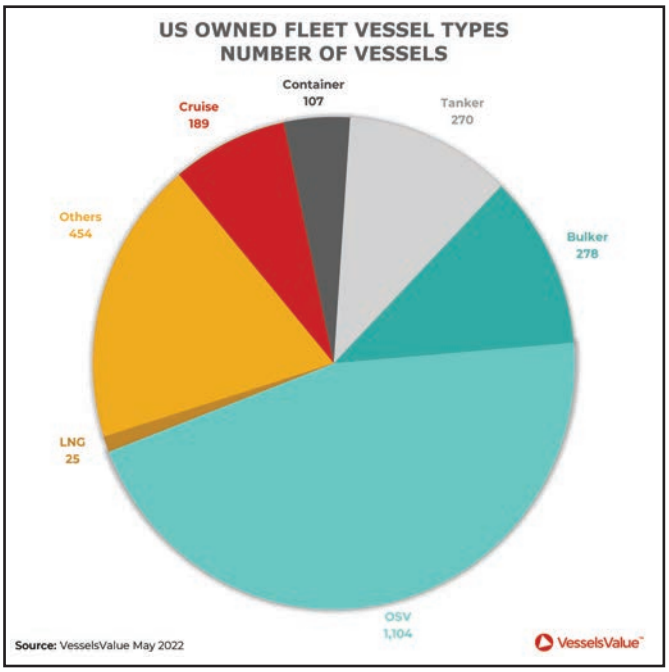
	Sale Date	# of Vessels	USD m
2020	Jan	14	313.37
	Feb	16	128.93
	Mar	4	163.73
	Apr	13	96.92
	May	11	83.89
	Jun	8	41.44
	Jul	13	143.12
	Aug	11	175.98
	Sep	19	354.95
	Oct	10	174.66
	Nov	27	231.47
	Dec	19	178.92
2021	Jan	13	181.28
	Feb	13	146.77
	Mar	19	184.88
	Apr	13	260.45
	May	10	72.98
	Jun	6	29.77
	Jul	14	172.93
	Aug	9	229.33
	Sep	13	452.42
	Oct	26	882.87
	Nov	14	365.50
	Dec	17	369.31
2022	Jan	18	554.84
	Feb	15	359.86
	Mar	12	359.82
	Apr	9	297.06
	May	1	70.00
	Grand Total	**387**	**7,077.45**











Tip #36

e-Learning Media Fundamentals

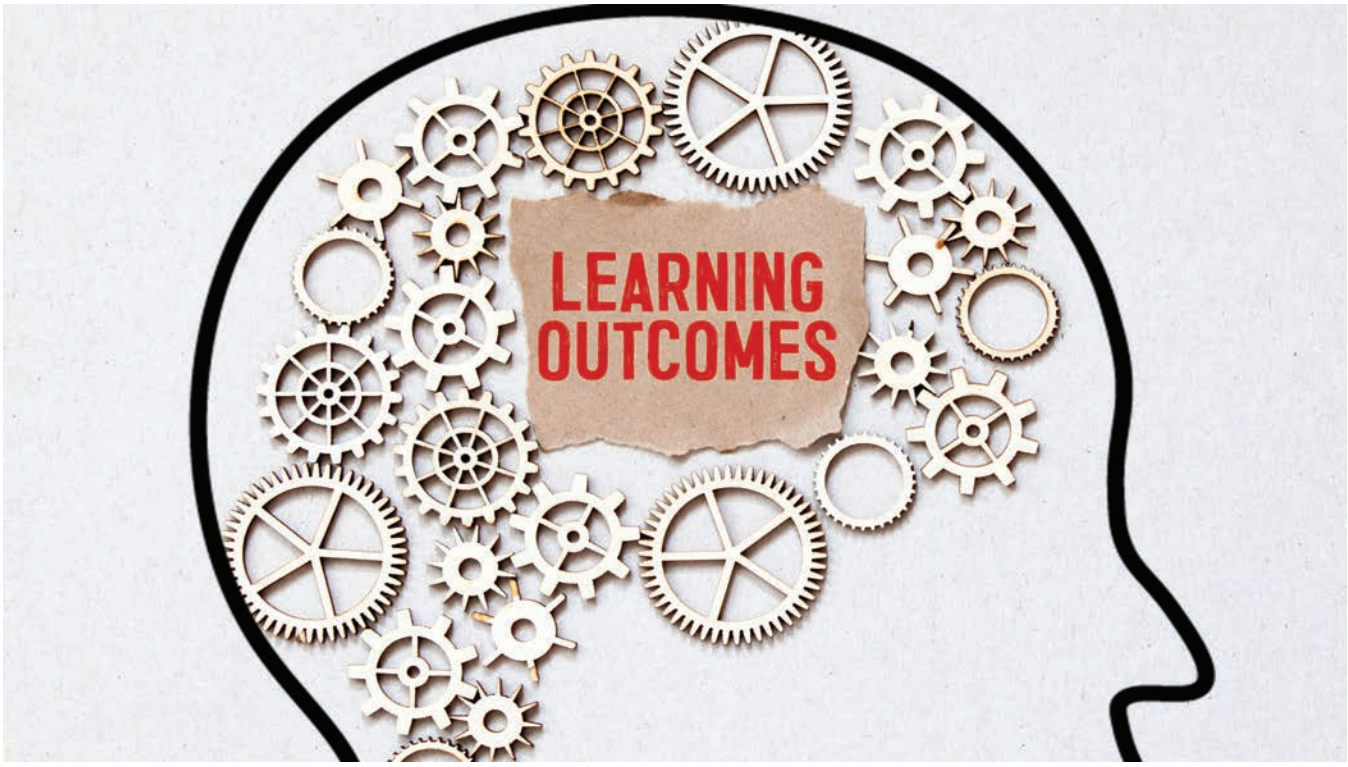
Text & Images

In the previous editions of *Training Tips for Ships*, we introduced the topic of choosing the most appropriate media for our eLearning goals. In the end, it comes down to choosing the right tool for the job at hand. Are we hoping to help trainees assimilate knowledge? Understand a concept? Learn to perform a task? Or be able to reason and make decisions?

Once we have categorized the goals as discussed in the previous edition of Training Tips for Ships, the choice of media becomes intuitive - in fact, almost obvious. Regardless, let's cover some of the strengths and limitations of the various media types here.

Although we will discuss advanced media types in the next edition, this article covers the powerful but often maligned or overlooked fundamental media types: text and images. Let's begin with text. Text is a very "dense" medium and therefore can convey complex and deep information, if written well. Therefore, as a way of conveying facts or explaining concepts, text is often an excellent choice. While text is excellent at conveying knowledge, it is much less effective at teaching a skill or the ability to reason. Before abandoning text as a choice when skills or the ability to reason is the primary goal, remember that there are very few competencies that do not have some knowledge as a core, foundational requirement. All skills and reasoning have a basis in factual knowledge. As such, while textual descriptions are not always sufficient on their own, they are almost always a valuable component of a multimedia learning approach for any competency.

Another enormous and often overlooked quality of text is that the cost of creating, maintaining, and updating tex-



tual descriptions is comparatively very low. Therefore, where textual media does the job, it is wise to use it.

Images, like text, are powerful when it comes to conveying information. They can also be helpful in explaining concepts - especially in conjunction with text. Imagery can also be helpful in training simple skills. The choice of which (text or imagery) to use depends on the kind of information being taught. For example, if our goal is to provide a trainee with the ability to recognize an object or to find components of that object (a button for example), then, as they say, "a picture is worth a thousand words". Annotated images can be especially powerful in efficiently conveying certain types of information.

Other types of imagery such as graphs and diagrams can be used to visualize complex information or processes. These still fall into the "knowledge transfer" category of learning goals, but for the right kind of information they can be incredibly effective.

Keep in mind that images can almost never be used alone. At the very least, they require textual descriptions to guide the trainee in terms of what is being taught, and what to look for on the image. And finally, like text most forms of imagery are relatively inexpensive to maintain and update.

Each media choice has its own strengths and limitations. I wish to stress that it is not necessarily the case that a more expensive or more sophisticated media is better for all learning applications. And as discussed in the previous article, combining media types (especially text with some other media type) will almost always yield better educational results than any one media alone. The bottom line is this: use the media that will do the job, keeping in mind that whatever choice you make, you'll need to not only create it, but also maintain and update it.

The next edition of *Training Tips for Ships* moves on to some of the more sophisticated media types. Until then, sail safely and stay healthy!

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Crude Oil Export Tax Jettisoned by Courts

As recently as February 2022, Russia exported more crude oil than any other country except Saudi Arabia. That same month, the United States was the fourth-largest exporter of crude oil. With the ever-increasing sanctions against Russia, crude oil exporters in the United States are racing to fill the supply gap. However, a novel decision rendered by a federal appeals court regarding how crude oil exports are taxed under the Oil Pollution Act of 1990 may have a significant impact on those exporters' net profits.

The Act

As a result of the infamous 1989 Exxon Valdez oil spill, Congress enacted the Oil Pollution Act of 1990. The Act created the Oil Spill Liability Trust Fund, which is administered by the U.S. Coast Guard's National Pollution Funds Center to fund responses to oil spills and threatened spills. The primary expenditures of the fund are state access for removal actions, payments to government trustees to administer natural resource damage assessments and restorations, payment of claims for uncompensated removal costs and damages (made when the party responsible for the spill is unknown or cannot pay for the response), and research and development. The fund pays for containment, cleanup, and damages from spills or threatened spills up to $1 billion (or the balance of the fund, whichever is less) for any single incident.

Except for the years between 1994-2006 and 2019, the fund's primary source of revenue has been a five-to-nine-cents-per-barrel fee (amount depending on year) on imported, domestic, and exported oil. Other sources of revenue to the fund are fines and penalties, cost recovery from parties responsible for spills, and interest. Between 2007 and 2018, the fund's total excise tax receipts (from domestic, imported, and exported crude oil) were $5.67 billion, while other receipts totaled $3.77 billion ($2.13 billion from fines and penalties, $1.28 billion from cost recoveries, and $362 million from interest). In 2021, the United States imported an average of 6.11 million barrels per day of crude oil while exporting an average of 2.90 million barrels per day.

The Lawsuit and Decision

Between 2014 and 2017, Trafigura Trading LLC exported approximately 50 million barrels of crude oil from the United States. Trafigura remitted over $4 million to the Internal Revenue Service for these exports, as required under 26 U.S.C. section 4611(b), a provision of the Internal Revenue Code that corresponds with the Oil Pollution Act of 1990. After its request for a refund was denied by the IRS, Trafigura filed suit to challenge the constitutionality of the tax and for a refund of the funds it paid to the IRS. The trial court ruled in Trafigura's favor, finding the tax unconstitutional and granting a refund to Trafigura.

The United States appealed the trial court's decision to the United States Court of Appeals for the Fifth Circuit, which has jurisdiction over Texas, Louisiana, and Mississippi. On March 24, 2022, after a lengthy history about the United States Constitutional Convention of 1787 and Alexander Hamilton's involvement therein, a three-judge panel of the Fifth Circuit held that the United States' tax on crude oil exports is unconstitutional and, therefore, unenforceable. In affirming the trial court's ruling, the Fifth Circuit held that the provision functions as a "tax" rather than a "user fee," and is therefore unconstitutional in violation of the Export Clause of the United States Constitution. The Export Clause states: "No Tax or Duty shall be laid on Articles exported from any State." Because of this Fifth Circuit opinion, Trafigura is entitled to

collect a refund of the more than $4 million it paid to the IRS unless the United States appeals the case to the United States Supreme Court, the Court takes the appeal, and the Court reverses the Fifth Circuit's decision.

Future Impact

Because the Fifth Circuit's opinion is so new, it is difficult to determine what its future impact will be. The United States has until June 22, 2022 to appeal the Fifth Circuit's decision. It may opt not to file an appeal because this decision is not binding in future cases – as it currently stands, trial courts are not obligated to follow it, nor are other panels of the Fifth Circuit. This is because the decision is a plurality: out of the three-judge panel, one judge authored the opinion, another judge concurred (agreeing with the holding of the authoring judge, but for different reasons than in the primary opinion), and the third judge dissented (arguing that the tax is constitutional). Therefore, the opinion is restricted in application only to that specific dispute between Trafigura and the IRS. However, the IRS may opt to appeal the case to the Supreme Court because other crude oil exporters will claim refunds from the IRS for significant amounts of crude oil export taxes paid and, if those refund requests are denied, the inevitable resulting litigation would leave the IRS in the same position it is in now.

Another solution to the likely dearth of Oil Spill Liability Trust Fund revenue in the wake of this decision would be legislative intervention. Congress could repeal the statute and replace it with a tax that could not run afoul of the Export Clause, such as, for example, doubling the import tax on crude oil for the benefit of the fund. Such a measure would have the effect of subsidizing the export side of the industry, which may enable it to expand exports in wake of the sanctions against Russian crude oil.

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Cargo Fires: A Burning Issue for Shipping

Commercial insurer Allianz Global Corporate & Specialty just released its latest Safety & Shipping Review, an annual analysis of shipping losses and accidents worldwide. The 2022 report reveals that the maritime sector continues its long-term positive safety trend over the past year with 54 total losses of vessels reported globally, compared with 65 a year earlier. This represents a 57% decline over 10 years (127 in 2012); while during the early 1990s the global fleet was losing 200+ vessels a year.

The 2021 loss total is made more impressive by the fact that there are an estimated 130,000 ships in the global fleet today, compared with some 80,000 30 years ago. Such progress reflects the increased focus on safety measures over time through training and safety programs, improved ship design, technology and regulation.

However, the industry is not without its challenges. Russia's invasion of Ukraine, costly issues involving larger vessels, crew and port congestion and managing decarbonization targets, means there is no room for complacency.

Another growing challenge facing the shipping industry is fire on large vessels, which remains a key cause of major losses, requiring urgent action to improve vessel safety. A fire on board car carrier Felicity Age, beginning in February 2022, led to the vessel sinking in the Atlantic Ocean, along with its cargo of 4,000 vehicles. The incident occurred less than one year after a fire led to the sinking of the large container ship X-Press Pearl in May 2021 off Sri Lanka.

Catastrophic fires on large vessels typically begin with combustible cargo, which then spreads rapidly and outpaces the firefighting capabilities of the crew. The size and design of large vessels makes fire detection and fighting more challenging than traditional shipping, and once crew are forced to abandon ship, emergency response and salvage operations become more complex and expensive, and the risk of a major or total loss increases.

No let-up in container ship fire frequency

Fires on board large container ships are a top concern for marine insurers as a growing number of incidents continue to generate large losses. The Safety & Shipping Review analysis shows there have been over 70 reported fires on board container ships alone in the past five years, including incidents such as the Yantian Express (2019), and the Maersk Honam (2018), which made headlines around the world. More recently, a fire broke out on board the large container ship Zim Kingston in October 2021 after a container of dangerous goods was damaged in a storm.

There have also been many near misses. In 2021, a container of flammable products caused a large fire and explosion at Dubai's Jebel Ali port. Protection and indemnity insurer Gard estimates that there was at least one fire involving containerized cargo every two weeks in 2020.

Fires can take hold quickly and spread rapidly, yet container ship crews are relatively small in number, while detecting, locating and accessing a fire within a stack of containers is time-consuming. Fire-fighting equipment currently required under the International Convention for the Safety of Life at Sea (SOLAS) means crew face considerable risks when tackling a container fire, and are often unable to do so successfully.

Reducing the risk of fire on board large container ships will require a combination of regulatory action and industry initiatives, and there are encouraging signs that these are underway. Following proposals by insurers, ship owners' associations and the flag states of Germany and Bahamas, the International Maritime Organization's (IMO's) Maritime Safety Committee agreed last year to amend SOLAS with the aim of enhancing fire detection and fighting capabilities on new container ships. Although the review was held up by Covid-19, the amendments are expected to enter into force on January 1, 2028.

However, with the regulatory changes some years away, the emphasis will be on the shipping industry to tackle the issue in the short term. We now have ships that are almost too large for the crew to fight fires effectively. There needs to be an urgent review of fire detection and fighting protections and equipment on board large container ships.

Cargo mis-declaration at heart of problem

Addressing a root cause for fires on board container ships is key to solving the problem.

A number of blazes at sea in recent years have been traced

back to combustible or mis-declared cargos in containers, including batteries, charcoal and chemicals such as calcium hypochlorite, an ingredient in cleaning products.

In March 2022, the US Coast Guard (USCG) issued a safety alert about the risk posed by lithium batteries following two separate container fires caused by mis-declared cargo. The first, saw a shipping container waiting to be loaded onto a container ship bound for China catch fire. According to the USCG, the bills of lading indicated that the container was carrying 'synthetic resins' when, in fact, it held used lithium-ion batteries.

In a similar incident in August 2021, a container full of discarded lithium batteries caught fire while being transported by road to the Port of Virginia, where it was due to be loaded onto a container ship. The cargo was mis-declared as 'computer parts'. These incidents would have been potentially "catastrophic" had the containers caught fire after being loaded aboard the container ships, the USCG said.

It is estimated that around 10% of all containers loaded on board ships contain declared dangerous cargo. However, around 5% of containers shipped consists of undeclared dangerous goods — either due to administrative error or being deliberately mis-declared. For example, this would equate to 1,000 teu or more of undeclared dangerous cargo on board a 24,000 teu ultra-large container vessel.

In 2019, the International Union of Marine Insurance (IUMI) and other stakeholders co-sponsored a submission to the International Maritime Organization (IMO) Sub Committee on Carriage of Cargoes and Containers proposing a comprehensive review of the International Maritime Dangerous Goods Code (IMDG Code), which defined and classified dangerous goods, as well as procedures for declaration. At present, some of those commodities are not considered dangerous and do not need to be declared as such by the shipper to the carrier.

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Khanna

Captain Rahul Khanna is Global Head of Marine Risk Consulting at Allianz Global Corporate & Specialty. He served more than 14 years on board merchant ships in all ranks, including Master of large oil tankers.

To read the full Allianz Safety & Shipping Review 2022, please visit: **https://www.agcs.allianz.com/news-and-insights/reports/shipping-safety.html**

CyNav for Ports & Terminals

WTW has launched CyNav for Ports and Terminals, a cyber solution specifically designed to help address the escalating cyber risks faced by owners and operators in this strategically vital sector of the global maritime supply chain.

The release of CyNav for Ports and Terminals is a direct response to growing calls from operators for a bespoke product that addresses the specific risks faced by their high-value asset class and closes the gaps found in the standard cyber policies of today's insurance market.

Due to the outsized role its practitioners play in supporting the global economy, the maritime logistics sector is increasingly a target for extortion, hacktivists and state-sponsored networks of cyber criminals. Cyber-attacks on maritime transport assets rose 400% in 2020.

Since then, the number of cyber-attacks on global maritime infrastructure have continued to escalate, especially in the first quarter this year (2022); in the port sector, there were recent attacks on a cross-section of strategic facilities, from marine oil terminals in Western Europe to container ports in South Asia and South Africa.

As port operators navigate their way through the Fourth Industrial Revolution, their assets are becoming increasingly reliant on connectivity and new technologies, especially those that automate communications and operations. Third-party services providers are now routinely connecting to port systems to support and monitor the performance of their products.

While this has provided unprecedented levels of operational transparency and efficiency throughout the ports' value chains, it has also significantly raised the risk of network intrusions. As connectivity builds between partners, each connection point offers cyber criminals another gateway to mission-critical systems and commercially sensitive or private data.

Theft of the latter potentially opens the operators of inadequately protected systems to signifi-cant fines under legislation such as the EU's General Data Protection Regulation; a failure to adequately protect personal data could see a company anywhere in the world fined up to the equivalent of 4% of its global revenue, provided the data breached was the property of EU citizens.

A specific area of vulnerability for port operators – and a new focus of activity from cyber criminals – is the connections to the operational technologies that control activities such as vessel berthing, port traffic, cargo handling and ancillary equipment such as gantry and ship-to-shore cranes.

Awareness campaigns about the vulnerability of transport-related IT access points has helped to strengthen those systems. For example, there has been some progress in securing maritime IT systems from third-party intrusion: in general, the adoption of defensive software products such as privilege access management controls, multi-factor authentication firmware and endpoint detection and response solutions is better protecting system-entry points.

But the ports sector's operational technology is less well defended, according to digital security experts, who say attacks through those systems can still provide access to the IT systems, and are less likely to be covered by standard cyber policies.

To help close some of the gaps in standard policies, CyNav for Ports and Terminals focuses on helping to transfer the risks of nominated business interruptions to provide a wider cover. It was designed to be customised and to address risks specific to the operators of ports and terminals, including:

- Losses from business interruptions
- Business interruption losses from vulnerabilities in the IT supply chain
- Property damages
- Crisis management expenses
- Property damage liability
- Wrongful delivery of cargo
- Regulatory actions (where insurable)

The launch CyNav for Ports and Terminals comes about a year after WTW brought CyNav for Shipowners to market. Both were created in direct response to industry requests for more comprehensive and customized cover from the growing maritime cyber threat.

The Author

Abraham

Ben Abraham is Head of Marine at Willis Towers Watson. He has more than 28 years of maritime insurance industry experience.

IGP

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OFFSHORE WIND MARKET INTELLIGENCE PACKAGE

2022 U.S. Offshore Wind Outlook and Market Forecast

The monthly report and database contains all of the latest developments and information on the projects that will lead the U.S. to deploy 30 GW of offshore wind by 2030 and 110 GW by 2050. The report contains insights to support component manufacturers, shipyards, vessel owners and operators, service providers, ports and terminal operators, public agencies and financial institutions amongst others to better understand the opportunities and challenges presented by this growing segment.

Get all the information you need to access this growing multi-billion dollar market today!

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Permanent Magnets:
May the Force be with You

*Forward-thinking owners who want to optimize energy efficiency and outrun ever-stricter environmental regulations need future-proof propulsion solutions that are versatile and reliable. Direct-drive electric propulsion based on permanent magnet (PM) technology ticks all the boxes, says **Jussi Puranen** of Yaskawa Environmental Energy / The Switch.*

I am convinced that direct-drive electric propulsion will replace conventional diesel-mechanical systems as the premium solution for energy-efficient ships within 10 years.

Given looming new regulations including EEXI and CII, and Phase 3 of EEDI, many existing ships will need to be retrofitted to improve performance. Ships with low EEXI scores may struggle commercially as the market becomes more choosey, while poor performance in the CII will also put vessels at a competitive disadvantage. Owners will need to take remedial action.

Leading the pack

Direct-drive electric propulsion based on permanent magnet technology is, in my view, the premium solution to meet these challenges. The system does not require gearing and is significantly more reliable versus conventional geared installations. Everyone knows replacing a dodgy gearbox on any vessel is a huge task.

The 'permanent' in PM means the magnetic field created requires no current to be fed into the rotating unit, making the technology very efficient. Rotation speed of the motor is around 100 rpm instead of 1,000 or 1,500 rpm. PM motors are also much simpler in construction than conventional synchronous motors. Only minor maintenance such as checking seals and cooling fans is required, prolonging motor life and reducing operating costs.

Integration flexibility

PM motors have already been successfully applied to direct-drive electric propulsion in ships both with single and twin screws. The system can be used both with fixed pitch and controllable pitch propellers, and in the future could also be possible for podded propulsion. Power capacity suits any size of vessel. The latest-generation machines can provide up to 12MW to 15MW on one shaft line, but two in tandem doubles the power. The same tandem solution on twin shaft lines can give up to

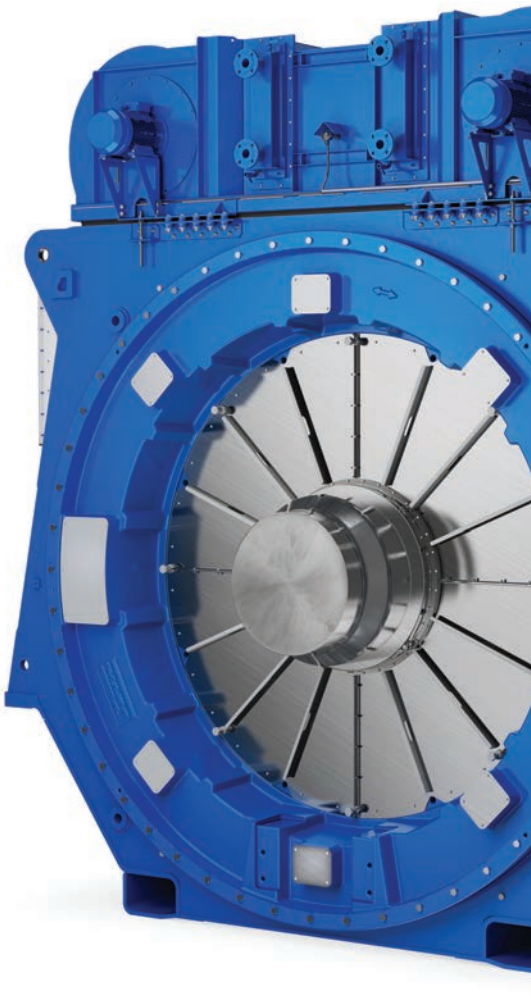


Photo courtesy Yaskawa Environmental Energy / The Switch

50MW of power, suitable for the largest vessels. With electrical propulsion, you also have full torque available starting from zero speed – versus conventional combustion engines that have no torque at close to zero speed. That is perfect for powerful icebreakers, for example, needing to bash through ice ridges from a standing start.

Fuel agnostic

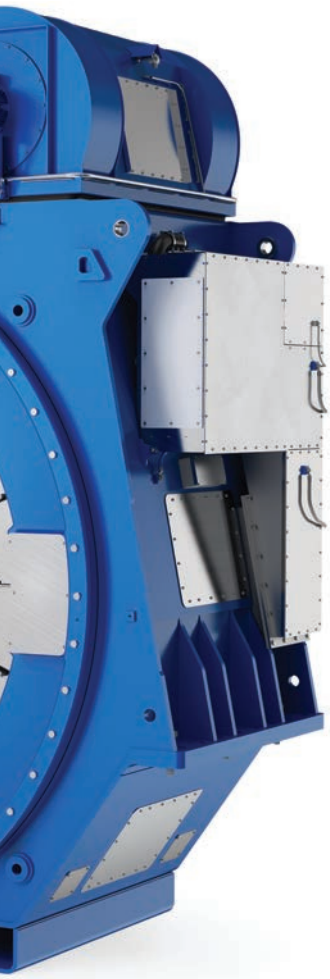
PM motors can be powered by gensets using any energy carrier, be it methanol, ammonia or hydrogen in the future, perhaps even nuclear energy from onboard thorium reactors. Batteries too, of course. Frequency converters enable precise speed control via the vessel power management system. The entire system is also more compact, which is a huge advantage, especially for retrofits with limited space.

Granted, the efficiency of PM motors depends on vessel operating profile. They are most efficient at 50¬–70% of full load, which happily matches the optimal point at which ships mostly operate today.

They also have unmatched power density and can be up to 50% lighter than conventional machines. Quiet operation and minimal vibration are further benefits.

Setting the standard

Megawatt-class PM machines also make perfect shaft generators to boost efficiency at any power and any speed. They have become commonplace for shaft generators, typically at the request of shipowners. I believe the same will happen with direct-drive electrical propulsion using PM motors, both for newbuilds and retrofit projects. A recent comparative study for a 174,000 cbm, twin-screw LNG carrier showed that installing a PM shaft generator saves an estimated $75,000 in fuel costs every year. This would be more or less the same for electrical propulsion using a PM motor. That's a pretty good base to work from.



The Author

Puranen

Jussi Puranen currently works as Head of Product Line – Electric Machines at Yaskawa Environmental Energy / The Switch, Finland. He has nearly two decades of experience in R&D and product development of electrical machines.

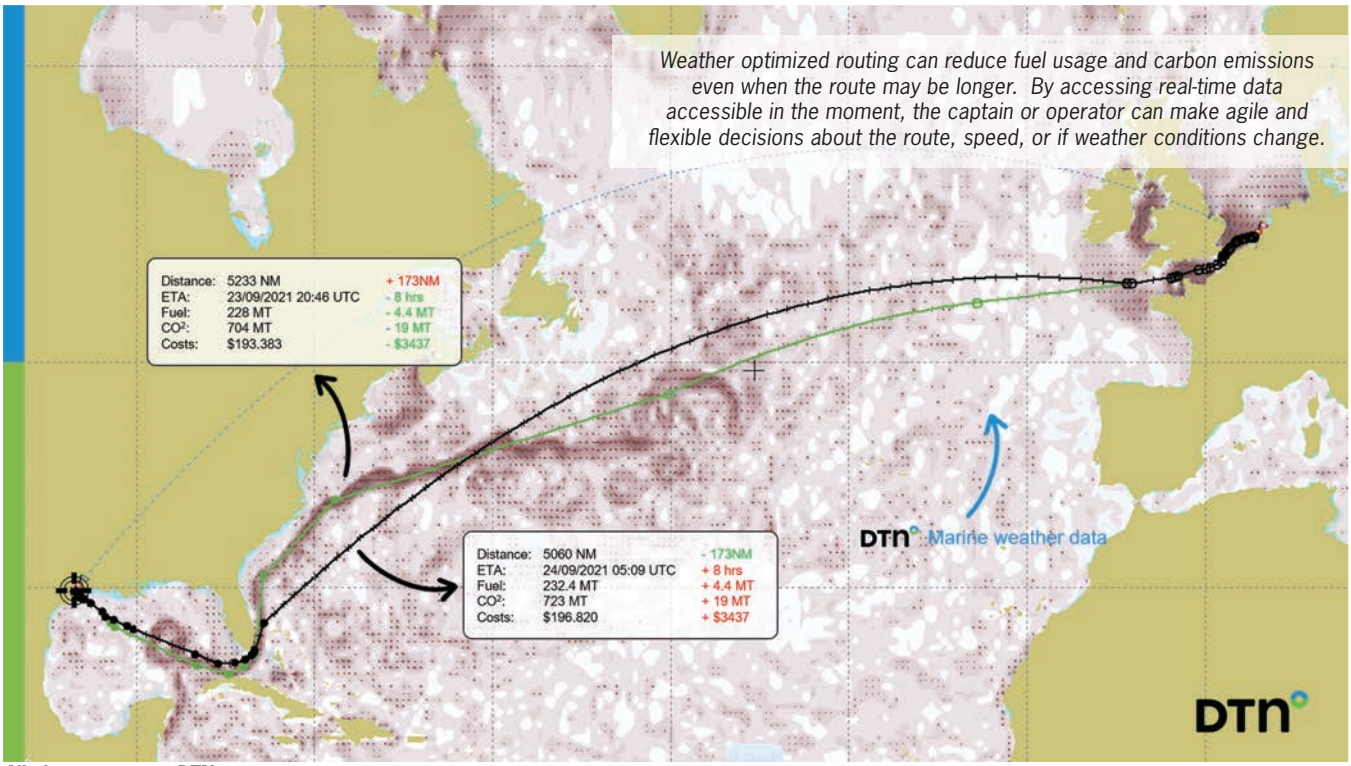
Digitalization is a Key Strategy for Decarbonization

By Renny Vandewege

Digitally transformed organizations are projected to contribute to more than half of the global gross domestic product by 2023, accounting for $53.3 trillion, and many in the maritime industry are part of that transformation. Ship owners and operators of all sizes are seeking or using digital solutions to improve vessel performance, increase crew and vessel safety, and reduce operational costs as well as environmental impact. Today the barrier to digitalization is not as focused on if there is a digital solution but if the solution makes a reliable, sustainable impact without creating additional workloads. In the boon of digital solutions, companies adopted technology that delivered specific insights, such as weather data or vessel performance. As digitalization has matured, those same companies are realizing the insights are data heavy, siloed, or require multiple solutions running in concert, but not in collaboration with each other. The next digital pivot for the marine industry is improved processing of big data and system integration.

Enriched weather data and decarbonization

A good example of this is the integration of weather intelligence for decisions around decarbonization. According to a recent study, reducing carbon emissions is a top industry pressure, not only for regulatory requirements, but also for non-regulatory requirements, such as greenhouse-gas initiatives. This suggests that the drive to reduce emissions goes beyond mandatory actions and comes from multiple sources, including a company's commitment, stakeholders, and the public. While there are many strategies to achieve decarbonization goals, using weather insights for optimal weather routing for instance can reduce greenhouse emissions up to 5 percent, depending on the type of vessel, the season, and the conditions. Applied to other data information, such as port information and vessel performance, the ability to further reduce emissions increases. When ports are full, ships idle offshore with their engines – and emissions – still running. A recent study of four major seaports found that during the "pandemic period" ship emissions



Weather optimized routing can reduce fuel usage and carbon emissions even when the route may be longer. By accessing real-time data accessible in the moment, the captain or operator can make agile and flexible decisions about the route, speed, or if weather conditions change.

All photos courtesy DTN

increased by an average of 79% across those four ports. By incorporating weather analytics into port arrival calculations and port authority information, the captain can adjust as needed, such as slow steaming which has been shown to reduce greenhouse emissions or use an alternative optimized route.

While most in the marine industry acknowledge that enriched weather data is necessary, particularly as it relates to decarbonization efforts, research has found that only one in 10 have fully integrated weather data into their operations. So, what are the barriers to adoption? One is that weather inherently is the original big data. Secondly, before the marine industry began the digitalization journey insights were difficult to access and manage.

Delivering Big Data

This challenge is apparent when looking at the magnitude of data available in weather intelligence. As computing power and atmospheric and oceanic models become more robust, so does the data. For example, a single wave forecast could be pulling data from an ensemble of atmospheric and oceanic models which produces terabytes of information. Now consider that information compounded with other data to generate hourly forecasts. Traditional systems can't handle the ingesting and processing of massive amount of data and offshore vessels couldn't manage the data load.

Today, flexible, cloud-based technologies have not only changed the way weather data is accessed, but also improved the accuracy and reliability of the data with high-performance computing which allows for faster processing of more data. Companies like DTN, a data, analytics and technology company, are using an ensemble approach and overlaying other insights, such as fuel usage and vessel performance, to deliver the insights through cloud-based APIs making it possible to access the information at any time on or offshore.

Integrated Insights

As the marine industry began the digitalization journey, companies quickly began to realize that managing multiple points of data across separate technologies actually increased workloads and made it challenging to make confident decisions based on time-sensitive information. For example, routing, weather data, and vessel performance solutions provide critical information, but users often had to log in and out of several systems and then manually overlay the insights, because of different processing and storage requirements, or incompatible technology, making it nearly impossible to couple solutions. Cloud-based solutions and flexible APIs integrated into the ship's systems help manage the large datasets and give mariners real-time information when and how they need it.

Specifically, when looking at decarbonization efforts, there are benefits to having an all-in-one solution accessible through an API, such as implementation of Just-In-Time arrival (JIT) by using weather and ETA optimized routing. Most vessels still sail consistently with charter party speed to the terminal. However, integrating weather and ETA dependent route and speed optimization and instead of fixed speed orders can reduce greenhouse gas emissions. Mariners can pass the updated weather and Requested Time of Arrival Berth (due to changes in berth or port planning, for example) to the vessel; and put standing instructions to adjust the arrival time accordingly. This would allow for seamless implementation of JIT arrivals that result in improved fuel efficiency and reduced CO2 emissions.

Another example of reducing carbon emissions through digitalization is by using weather optimized routing, vessel performance and enriched weather data to plan voyages that use less fuel even when the route is longer. By having the real-time data accessible in the moment through cloud-based platform the captain or operator can make agile and flexible decisions about the route, or the speed, if weather conditions change.

Smarter Data, Smarter Decisions

As digitalization in the maritime industry continues to evolve and cloud-based solutions and APIs make it easier to access real-time intelligence in the moment, more companies of all sizes will have ready access to integrated data at their fingertips. Many technology companies that serve the maritime industry are developing single source platforms that can accommodate multiple data sources without requiring more technology or software. Ship owners and operators can make insightful decisions with a holistic view of the environment and make course corrective actions in real-time to balance operational decisions, vessel efficiency while reducing carbon emissions.

The Author

Vandewege

Renny Vandewege, VP of Weather Operations, DTN, leads strategic direction for weather solutions across the supply chain, as well as 180+ meteorologists worldwide.

Blue Economy Opportunities for U.S. Exporters in India

The growing demand for marine technologies is generating new export possibilities for U.S. companies. To help American businesses pursue these opportunities, the Department of Commerce's International Trade Administration (ITA) is hosting Discover Global Markets: The Blue Economy, in Providence, Rhode Island, Sept. 20-22, 2022. Based at the U.S. Consulate General in Chennai, India, Commercial Specialist **Sham Shamsudeen** is leading a delegation of Indian buyers to the event. Sham is part of ITA's U.S. Commercial Service's global network of offices located in 100+ cities across the United States and in U.S. embassies and consulates in more than 75 markets. He will be joined at the export forum by U.S. businesses, foreign buyer delegations, and U.S. Commercial Service marine industry experts from 20 countries. In the below Q&A, Sham shares some insights on India marine technology opportunities, doing business in the market, and agency export resources to help.

Could you describe the delegation you are bringing to the DGM Blue Economy export forum?

The Indian delegation is likely to include distributors, buyers and port operators seeking to explore U.S. products and services to support the development of port infrastructure, ocean technology, shipbuilding, ship repair, recycling, inland waterways infrastructure, enhanced logistic efficiency, marine tourism, education, research and training.

What is attractive about the Indian market for U.S. suppliers of marine technologies?

India's maritime sector envisions an overall investment of $45 billion across ports, shipping, and inland waterways categories by 2030. India needs the state-of-the-art port and ocean technologies such as automation, data analytics, equipment and services for security, logistics, vessel tracking, oil spill detection, contingency preparedness, dredging, underwater exploration and mapping. U.S. manufacturers and suppliers pioneering innovative, green, and future ready technology products will have a leading edge in the Indian maritime sector.

Could you elaborate on marine "green" technology opportunities?

The internationally benchmarked Health, Safety and Environmental (HSE) standards have been adopted by many countries' maritime sectors. In an effort to align with these standards, eight areas have been identified to improve the safety and sustainability in India's ports and maritime bodies. Green tech opportunities include renewable energy, air quality improvement, water usage optimization, improved solid waste management, dredging material recycling, zero accident safety program, and occupational health management and centralized monitoring.

Do U.S. marine tech firms have any competitive advantages when entering India's market?

Yes. U.S. manufacturers and suppliers which pioneer innovative, green, and future ready technology products will have a leading edge in the Indian maritime sector. Presently, U.S. maritime companies do sell these products and services in India. These include equipment and solutions for port infrastructure development, feasibility studies, ocean technology, ship building, navigation and communication equipment, gears/equipment for commercial and sport fishing, and logistics and supply chain solutions.

The Indian customer appreciates quality after-sales support and associates it with good value. To ensure efficient distribution of products and timely after-sales service, it is usually more efficient to establish regional service centers with trained technicians and sufficient inventory than to partner with third-party service companies or ship items back to the United States for servicing or product repairs. These considerations are very important, especially when seeking long-term success in the value conscious and growing Indian market.

Are there good opportunities for U.S. small and medium-sized or new to market businesses?

Selling in the Indian market can be complicated and difficult for new entrants. U.S. companies, especially those new to market, often need to persuade Indian consumers to make purchases based on lifecycle costs. New to market businesses must navigate issues such as sales channels, distribution and marketing practices, pricing and labeling, and protection of intellectual property. These issues are most effectively addressed through an Indian partner or agent, and relationships with potential agents are extremely important. It is strongly recommended that U.S. companies do due diligence to ensure that potential partners are credible and reliable. The U.S.

Commercial Service can assist in identifying prospective Indian partners for U.S. businesses. Our trade experts can also provide background checks on specific foreign companies to help determine their suitability as a potential business partner.

What are some of the challenges that U.S. marine tech firms face in doing business in India?

The Government of India's 2020 procurement regulations limit global tenders to purchases over roughly $26.6 million (unless specifically authorized); the regulations also include Indian value-add content preferences. Similarly, state government organizations have put in place localization requirements for companies competing for tenders. Given India's movement toward self-reliance, we expect that local content requirements will become increasingly stringent at both the central and state government levels.

Can you give any advice or tips to U.S. businesses looking to enter India's market?

Strategic planning, due diligence, consistent follow-up, patience, and commitment are prerequisites for doing business successfully in India. The Indian market necessitates multiple marketing efforts that address differing regional opportunities, standards, languages, cultural differences, and levels of economic development. Penetrating India's markets requires careful analysis of consumer preferences, existing sales channels, and changes in distribution and marketing practices. India is a face-to-face society, and in-person meetings are typically required before formalization of work partnerships or agreements. While the pandemic has led Indian companies to work more frequently with global partners in virtual environments, it remains to be seen whether this is a permanent shift in business practices.

Why is it an advantage to have your delegation at the event?

Discover Global Markets: The Blue Economy, A New Age in Ocean Technology, Sustainability and Logistics is an ideal platform for businesses to collaborate. The Indian delegation will have the opportunity to meet with U.S. companies face-to-face through business matchmaking services and locate U.S. products and services. The delegates will also get the opportunity to dive deeper and learn about the latest industry trends, and possibly pursue site visits while in the United States.

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Commercial Specialist Sham Shamsudeen.

Photo courtesy U.S. Commercial Service

The Future of Digitalization through the eyes of "Mr. ECDIS" Tor Svanes

As shipowners struggle to determine the best means to leverage digital solutions, Tor Svanes, CEO, NAVTOR, is a treasure trove of intel and perspective, past, present and future. Svanes is an ECDIS pioneer with a long connection to the tech that sits at the center of unlocking the value of digitalization.

By Greg Trauthwein

"Maritime" is seemingly interwoven in the DNA of Norwegians, a country and its population that has thrived making a living on, under and around the seas, while simultaneously respecting the potential perils and the environment itself.

Tor Svanes, CEO of NAVTOR, is symbolic of the Norwegian grit, a bona fide ECDIS pioneer emerging from a small Norwegian town and evolving into a visionary corporate and technology leader.

With its enabling technologies, NAVTOR today sits at the crux of the digitalization and decarbonization transformation starting to sweep through maritime globally.

"First of all, everything is based on my love the sea," said Svanes, during his recent interview with Maritime Reporter TV in Oslo. "I've been on the sea since I was born more or less, so for me it was quite natural to try to go to sea as soon as I could."

Broad Experience

Svanes' parents would not allow young Tor to go to sea until he was age 18, so he embarked on the path as an electrician apprentice until starting his sailing career with Smedvig at 18. He sailed for two years during an interesting time for the maritime industry as more modern ships with increasingly sophisticated electronics started to become the norm rather than exception. The shipping company, with Svanes' electrician background, "took it for granted that I knew everything on the new stuff. So I made the decision: I cannot do this if I don't find out what's going on inside of those boxes."

So Svanes started in a technical school, but ended up in a Norwegian Technical University, earning a Master's degree in cybernetics.

"In a way, that was good because I was older than the other students and I had a lot of practical knowledge. Many of the things that we discussed I could picture, because I knew what it looked like in real life."

Photo courtesy NAVTOR

His love for the sea and practical knowledge from sailing combined with his technical education from university put Svanes firmly on the maritime digitalization path even before maritime itself understood where it was heading.

"I was at NorShipping 30 years ago presenting ECDIS to the king of Norway, giving him ECDIS for his Royal yacht," said Svanes. "So it has been going on for some time."

Fast forward to 11 years ago, when in January 2011 Svanes was forced out of C-Map Norway, the company under his leadership which had become one of the world's leading suppliers of electronic maps. Four years earlier, C-Map Norway had been acquired by The Boeing Company's Jeppesen Marine, but the new owners and Svanes had a different vision of the company's goals and strategy.

For Svanes, the end was a new beginning, and starting with a blank sheet, he got the room for maneuver that he needed to build a new company — NAVTOR — based on his understanding of where

"When they talk about digitalization, it's not that easy. The difficulty is to get hold of the data on the vessel, because that's what we talk about when we talk about emissions and fuel consumption. You need data from the vessel. So being the biggest player in e-navigation, it was natural for us to go into performance. **The genius part is not only making the complex simple, but making it look easy, too.**"

Tor Svanes, CEO, NAVTOR

[pictured recording his MR TV interview in Oslo earlier this year]

the future would lie for maritime navigation: the cloud-based Pay-As-You Sail concept. And with Smedvig now as a main shareholder, the company gained financial muscle it needed.

"Digitalization" *Easier Said than Done*

The word 'digitalization' has become an industry-wide buzzword, bandied about with increasing frequency and volume by a growing legion of digital solution providers. But Svanes cautions that not all solutions are cut from the same cloth.

"When they talk about digitalization, it's not that easy. The difficulty is to get hold of the data on the vessel, because that's what we talk about when we talk about emissions and fuel consumption," said Svanes. "You need data from the vessel. So being the biggest player in e-navigation, it was natural for us to go into performance" and all that it entails.

According to Svanes, the key factor that makes NAVTOR truly stand out is its complete focus on delivering an integrated solution.

"There are many companies doing performance; there are also many companies doing e-navigation. But I think it's only NAVTOR that really can in volume put this together as an integrated solution where you put in data once," said Svanes. In this regard, NAVTOR's Digital Logbook plays a central role, allowing owners to insert data in one spot, at one time, creating a repository for data and information that is being tapped throughout the ship's integrated solutions and reports.

"You only put data in once and it is used in all systems, but to do so, you have to first have an integrated solution and all of the elements that go with it."

To that end, Svanes realized that with the pace of technological evolution, it was not practical for NAVTOR to create the complete solution in house. With that, NAVTOR recently purchased two companies: "Tres Solutions, which does the performance part, and Ingenium Marine which brought in the Digital Logbooks." This effectively enabled Svanes' vision of a complete integrated solution to generate a thorough overview of what's happening on the ship.

These, and likely future acquisitions, were powered by the company evolving from a privately owned family company.

"It was a big change for us to go from a family-owned company to a private equity company, but it suddenly opened some doors for us," said Svanes. "Since we were invested in as a platform, it meant that we should also do acquisitions, and this is what we've done. With Tres and Ingenium now in the fold to 'complete our circle with integrated solutions', we probably have to do more mergers and acquisitions. Time is running fast, and we don't have time to develop everything ourselves."

Another key platform for NAVTOR is its NavStation software, a passage planning system under perpetual development and upgrade. "The latest thing we are showing now is auto routing," which takes into consideration all variables

Photo courtesy NAVTOR

about the vessel and the environment to help create the most efficient and effective route. "I think this is the most advanced auto routing in the market today," said Svanes, integrating and deploying the latest updates from artificial intelligence and marine learning, bringing it all back to the issue of sustainability. Burning less fuel means greater efficiency, profitability and less impact on the environment.

"The genius part is not only making the complex simple, but making it look easy, too."

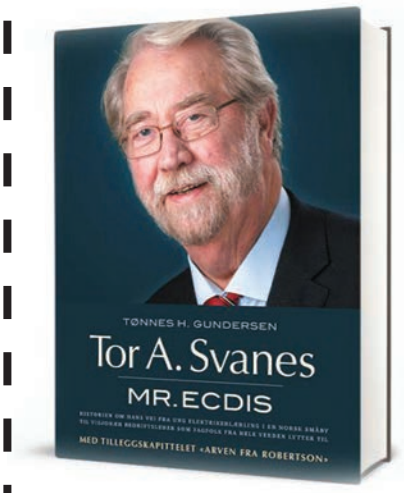
The Future

While companies like NAVTOR continue to invest in next-generation solutions, Svanes admits that many shipowners won't make the changes and investments until they are forced to by regulation.

"It is still very much regulation-driven, with performance and emission control (and all of the required reporting) driving it today," noting that the first question is usually "what is the minimum that I can do?"

Aside from efficiency and emission reduction, another driver central to NAVTOR's future is autonomous vessels, and the company has been involved in projects regarding vessel control. "To be clear, we are not in the control business, we are in the information, navigation monitoring business," said Svanes. "But we definitely will play a role as we progress toward autonomous vessels."

But he admits that the autonomous "revolution" will take a very long time, transitioning slowly at first with less people onboard before evolving to full autonomy. "We see already this happening in Norway in some local areas where they have autonomous vessels, but for international shipping it will take a long time. Remember that you have 60,000 IMO vessels sailing today, and they are going to live for another 20 to 25 years. So it's not going to happen overnight."



Get your copy of "Mr. ECDIS"

Available online for $50, the "Mr.ECDIS" book charts the unique story of NAVTOR's Tor Svanes and his role in the development of maritime e-Navigation. Written by author **Tønnes H. Gundersen**, the hardback is available in both Norwegian and English.

bit.ly/3MolSAw

US Offshore Wind Segment Showing No Signs of Slowing Down

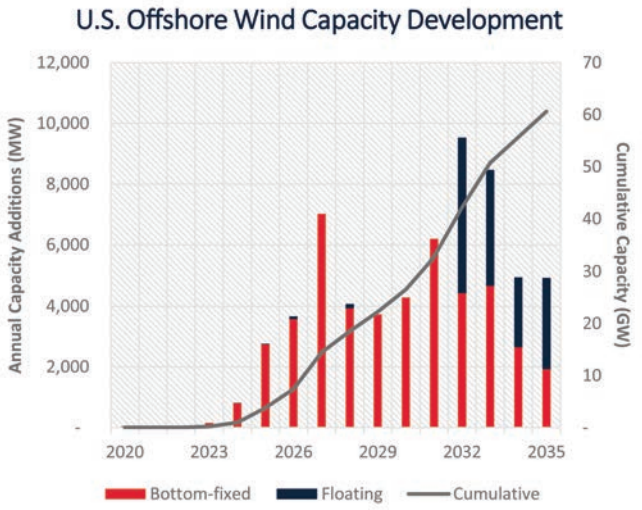
By Philip Lewis, Director of Research, Intelatus Global Partners

The U.S. offshore wind segment shows no signs of slowing on its journey to deploy 30 gigawatts (GW) of offshore wind by 2030 and 110 GW by 2050. Based on current project activity we anticipate around 60 GW of offshore wind capacity to be installed by 2035.

By 2035, we will see offshore wind turbines operating in the Atlantic and the Pacific and probably the Gulf of Mexico. We will also see an emergence of commercial scale floating wind farms around the end of the decade. Floating wind farms bring a whole range of interesting technical challenges and opportunities for the supply chains that are currently not seen with the Atlantic bottom-fixed projects.

Among foundations for the positive outlook, two major Outer Continental Shelf (OCS) projects with around 940 megawatts (MW) of capacity have reached final investment decision (FID) and have commenced onshore construction, 11 OCS developments with a potential for more than 17 GW are undergoing federal permitting review and 17.5 GW of project capacity has secured offtake commitments from states. The Bureau of Ocean Energy Management (BOEM) has completed a successful Carolina Long Bay auction and has launched the leasing process for over 4.5 GW of floating wind capacity offshore California, while further auctions are planned for the South Atlantic, the Gulf of Mexico, the Central Atlantic, Oregon and the Gulf of Maine before the end of 2024. In addition, an unsolicited request has been submitted to develop a 2 GW floating wind farm in Washington State. Meanwhile, turbine component, foundation and cable factories and Jones Act wind farm vessels are being built in the U.S., and offshore wind port development is accelerating.

Intelatus Global Partners has just released the latest in its series of market reports identifying the opportunities and challenges associated with the U.S. offshore wind industry. Our forecast accounts for projects that will install close to 70 GW of capacity in this and the next decade. The forecast capacity will require capi-



tal expenditure amounting to $205 billion to bring onstream, a recurring annual operations and maintenance spend of $7 billion once delivered, and close to $31 billion of decommissioning expenditure at the end of commercial operations:

- Two offshore wind projects have passed the FID stage, have finalized major contract commitments and have commenced onshore construction.
- An FID is expected within the next 18 months for four OCS bottom-fixed project and two demonstration projects, one of which floating wind technology.
- 16 projects are in the midterm planning stage where an FID is expected between 18 and 36 months.
- Seven projects are in the early planning stage where an FID is expected to be taken in 36-60 months.
- Another 13 areas will support close to 17 GW of future offshore wind projects and where an FID is expected after 60 months.
- There are a further 27 offshore areas at the planning stage in the Atlantic, Pacific and Gulf of Mexico that will support the longer-term U.S. ambition of deploying 110 GW of offshore wind by 2050.

Details of all U.S wind projects and developments are discussed in Intelatus Global Partners' June U.S. Offshore Wind Report. Also in the project section of the report are details for over 60 projects in the planning stage, two projects in construction, and two wind farms currently in service. The report is accompanied by an online database. Information is current as of June 1.

For more information about the U.S. Offshore Wind Market Forecast, please visit ***www.intelatus.com*** or contact Michael Kozlowski at +1 561-733-2477or Philip Lewis at +44 203-966-2492

Photo: Elaine Maslin

THE PORT LOGISTICS OF OFFSHORE WIND

Some equations just don't add up. For example, storing 500 offshore wind turbine blades at a site with only space for 400 (and that's only if you don't store the other key elements required to build a full turbine). ***Elaine Maslin visited Siemens Gamesa's blade manufacturing facility in Hull, UK, to find out more.***

Image courtesy Google Earth

Storage space is becoming a major challenge that's looming for ports involved in the fast-evolving offshore wind industry. It's already becoming a challenge for Siemens Gamesa Renewable Energy at its blade manufacturing facility in Hull, on England's east coast. Opened only in 2016, the site is already having to expand its blade production capability, to meet demand. But it's also seeing a point at which it will run out of space to store them, as projects ramp up in 2024.

The site is the largest blade manufacturing facility in the UK, producing blades for mega-projects like Hornsea Two, which will overtake Hornsea One as the world's largest offshore wind farm when it comes online this year.

Blades for the 450MW, 54-turbine Neart na Gaoithe offshore wind farm, off Scotland, are being made here, as well as for the 38-turbine Kaskasi wind farm off Germany, SeaMade off Belgium and the 900MW Greater Changhua project in Taiwan.

Blade storage challenge

Since it was opened, the manufacturing site has churned out 1700 blades, a number which can be a major challenge to handle and store at the Alexandra Dock site. This site has space for 240 blades; so long as nothing else, such as nacelles and towers, are stored on site, says Simon Muirhead, Logistics Coordinator, Siemens Gamesa Renewable Energy.

During Hornsea 2, every last bit of space at the site was used, as well as an overspill storage site, nearly 4km away (adding its own logistical challenges), at King George Dock, to allow for 180 blades, 24 nacelles and 100m-tall turbine towers to be assembled and stored, he says.

But now Siemens Gamesa is spending £186 million on a new manufacturing hall at the site and extending the existing hall, adding more than 41,000 sq. m. floor space (more than doubling the manufacturing total space). As well as increasing production capacity, this will enable the manufacturing of 108m-long blades from 2023. However, the expansion will take up a significant amount of the site's already squeezed storage space. With output set to ramp up in 2024, with expected storage requirements to reach 500, it's looking like it will be a squeeze.

Keeping up with demand

"We have to decide what we're going to do in the next 12 months and plan out to five years, but everything changes quite quickly," says John Shaw, Port of Hull Port Manager, Siemens Gamesa Renewable Energy. "Everyone is afraid to make investment early, because of (the pace of) change. But, without significant investment we will struggle with storage space for blades," says Shaw.

It's a common thread across the industry, as it continues to outpace itself, as the Ports & Vessels Conference, held in Hull in April, heard. **bit.ly/3zlqcNI**

108m blades on the horizon

Growth in activity at the Hull site since it opened has been marked, says Muirhead. When it opened, it was producing 75m-long blades. It's now churning out 81m blades, with 108m blades coming and 115m on the cards after that. Like many in the industry, it's hard to keep up.

Two vessels – Rotra Mare and Rotra Vente – converted in 2016 for the transport of blades, recently came back into service after their latest refits, in order to keep up with this growth; the Rotra Mare had to be chopped in half in order to add 11m to its length.

Blade handling

One of the biggest challenges at the port for Siemens Gamesa Renewable Energy's port and logistics team is handling the blades around the site, as it's rare that blades go straight out of the manufacturing hall and onto vessels. That means they need to be stored. When space runs out at the main site, they have to be moved to King George's Dock. This involves a huge amount of time and effort.

Moving one blade to the site takes about an hour and a half and requires seven people, five of which, including the transportation system controller, are on foot – which isn't much fun during cold, wet winter nights, says Muirhead. Road infrastructure at the port has had to be adapted to allow for these structures to be moved, which will only get more challenging as they get longer. It's like Tetris – they have to be moved and positioned in order and to the right place, to get the maximum

Photo: Elaine Maslin

storage capacity and ensure the right ones going out in the right sets when needed – all of which means taking them back nearly 4km to the main site.

"It's feast and famine," says Shaw, reflecting how projects build up, the blades lined up across the site, before they're all shipping and it's empty again. "We need large open space with good ground bringing capacity."

Blade stacking

The team is working with port owner ABP to get more space. But if that's not possible, stacking operations could have to be looked at. It's not an ideal, however, even over transporting the blades through the site. "That's cranes, people, introducing risk, and cost," says Shaw. "We could look at shipping them somewhere else, but that also adds cost."

Shaw says they're also looking at digital blade tracking capability, so it's possible to see where are, where they've moved, how often they're moved, all in a visual graphic. "With more data, we can identify more efficiencies, so we're investing in setting that up," he says.

It's a site that never sleeps. During my visit, blades for EDF Renewables UK's Neart na Gaoithe wind farm off Fife, Scotland, were being loaded out. They'll be taken to Dundee and stored again before they're taken offshore for installation. Six can be carried in the hold and another six on deck – enough for four turbines. But loading has to be in decent weather.

A global footprint

It's a growing market. As well as expanding its production facilities in Hull, Siemens Gamesa is increasing production elsewhere. It's planning its first offshore wind turbine blade facility in the US, following signing a long-term lease with the Virginia Port Authority for a site at Portsmouth Marine Terminal, Virginia. It's expected this will support Dominion Energy's 2.6 GW Coastal Virginia Offshore Wind Commercial Project.

Back in Europe, Siemens Gamesa recently brought the world's first combined offshore nacelle and blade facility into production at Le Harve. Its other main blade manufacturing facility is at Aalborg, Denmark, while nacelles are also built at Cuxhaven, Germany.

All images courtesy Van Oord

One-on-One with

PIETER VAN OORD, CEO, Van Oord

***Pieter van Oord** is candid in discussing the future growth of his storied company's activities in offshore wind with specific insights on challenging current jobs, Van Oord's recent order of a massive and groundbreaking Wind Turbine Installation Vessel, and the company's future working in the United States.*

By Greg Trauthwein

Pieter, to start, can you give a 'By the Numbers' look at your company today using the metrics of your choice?

Well, 2021 was a disappointing year for us. As we said in our annual report, it was 'a year with two faces.' We had to report a loss for the first time in a long time in our company; a loss which was created by large provisions we had to take on three projects, including two offshore wind projects. One is the Greater Changhua project in Taiwan for Ørsted. The other one is the Saint-Brieuc project in France for Iberdrola. I'll explain in detail a little bit later.

On the other side of the coin, we finished 2021 with a 4.4 billion Euro orderbook, which is a record orderbook for our company.

So (today there is some) optimism about this coming decades. We clearly see that the tipping point in our industry happened somewhere in 2021. Clients are aware that there is going to be a shortage of vessels, there's going to be a shortage of experienced contractors.

Obviously, Van Oord serves several sectors. Can you give a brief breakdown of revenue by market sector, with specific insights on the cumulative contribution and the future growth that you see in offshore wind, as a whole?

In 2020 we had a turnover of 630 million Euro for offshore wind, and with that the offshore wind business was, for the first time in the history of the company, the largest activity in our company, larger than dredging.

We saw a downturn in wind figures to 350 million Euros in '21. But I dare to say that this was an incidental event, associated with the operational issues we had on two projects.

So what we see in '21 was that dredging was more than 700 million (Euros), offshore wind 350 million (Euros), traditional offshore oil and gas, 200 million (Euros), and our infrastructure business in the Netherlands was about 250 million (Euros).

If you look at the future, it is obvious that our (offshore) wind business will outpace all other businesses. So, we're convinced that within wind, we're going to see double digits growth figures in the entire industry.

The question is, who is going to build all these projects? Are there sufficient contractors prepared to take on all of these risks? I don't know the answer at the moment, but we are predicting an unbalance between supply and demand during this decade.

How big is your offshore wind order book today? What is the largest projects in your pipeline? And, can you share with me the projects that you're tendering at the moment?

Our order book is about one and a half billion Euros, which is a record high order book for offshore wind. And by that, it's actually larger than the order book for our dredging business.

The largest project in our order book, for offshore wind, is the Sofia project for RWE, which is a project built in the UK. It's a massive 1.4 GW project, where we have the balance of planned for the foundations and the cables. That is the largest project in the order book.

If you ask me the projects we are tendering, I would say maybe 20 at this moment.

We are tendering now for projects in offshore wind projects in '24, '25, '26, '27, '28, even sometimes 2029. What we see is long lead times between tenders and the actual execution of the project. That is typical in offshore wind.

Usually, I would say you win a project in year one, and you execute a project in year three or year four. So, the work we're tendering for, most of it now is '25, '26. We have a pretty good order book for '22, '23, '24 already. We're tendering for only a few projects left in '24.

We recently announced that we are the preferred contractor on three large projects in Japan, which is a major step, for

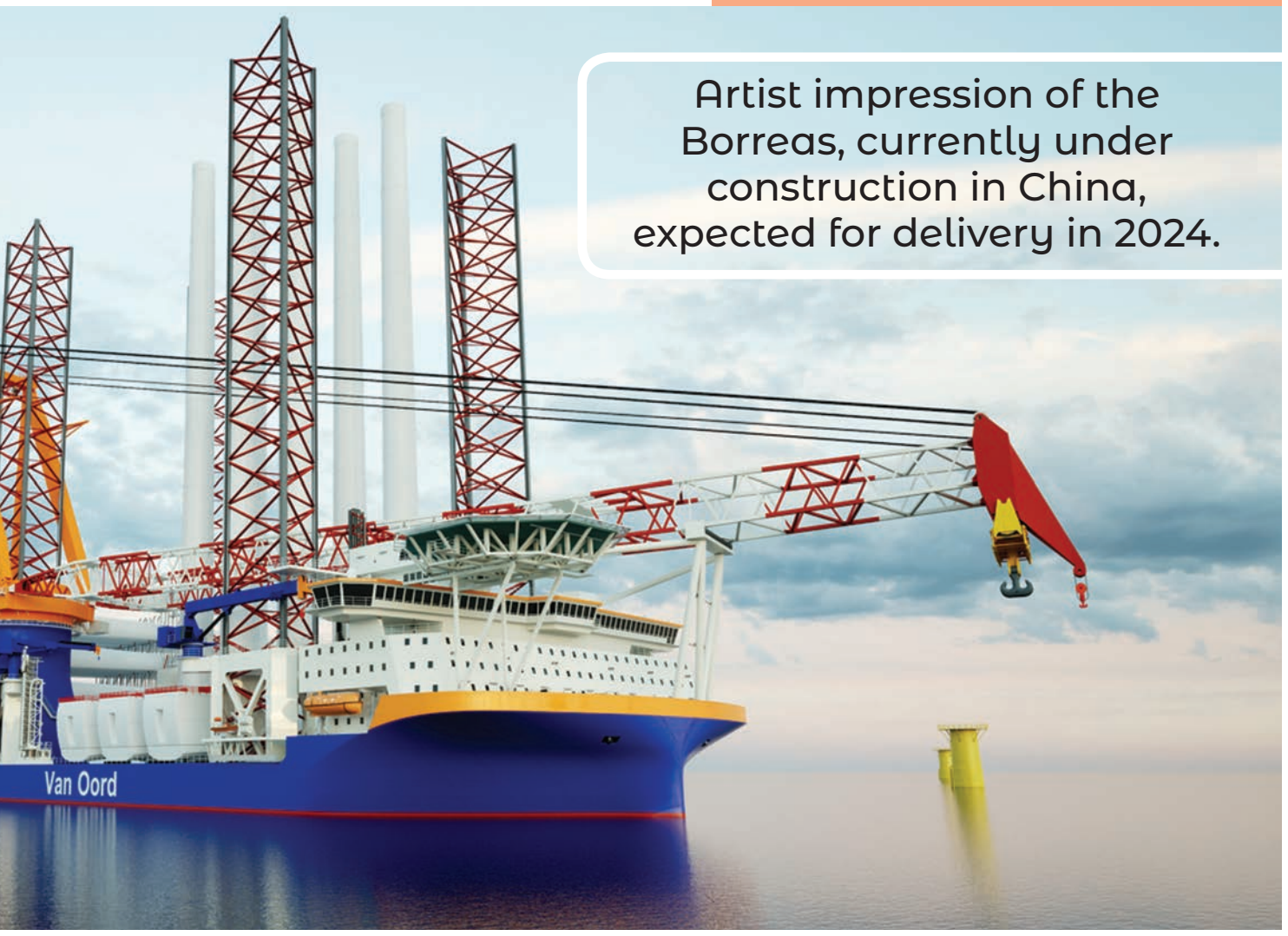
European contractors to go to Japan. These three contracts are not in our order book at the moment, but they have a value for us of more than a billion Euro. They are really large projects that will be built in '27, '28, '29 and 2030. So, there is a lead time of five years, tendering negotiations, getting your design ready, doing your engineering, doing your procurement, before you actually are going to install those projects.

Our focus is the North Sea/Europe, that is by far the largest market. Number two is the United States. We have one project in the United States at the moment, work on the South Fork project for Ørsted. Today we're tendering at least five projects in the United States. Third, we're looking at Japan.

You referenced it in our first question, but among other projects, you've been involved in the Saint-Brieuc project offshore wind offshore France. Can you talk about your role there, your innovative drilling technology that you deployed, as well as challenges faced and les-

"I expect in the next decades **a massive wave of investments** *in all sorts of new vessels."*

– Pieter van Oord, CEO, Van Oord



Artist impression of the Borreas, currently under construction in China, expected for delivery in 2024.

All images courtesy Van Oord

sons learned from this project?

I dare to say that the Saint-Brieuc project is the most complex foundation contract on an offshore wind park ever. We're looking at soil which is granite. For this particular project it is a jackets project, not a monopile. We drill three pin piles where we are going to fix the jackets. Those pin piles are drilled in holes that are, on average, 25 meters deep.

We have a very experienced drilling subcontractor, the Bauer company, from Southern Germany. They have a lot of experience with drilling, particularly in the Alps.

So as you drill in this rock, one of the challenges is to ensure that the holes do not collapse while you are drilling. You have to keep the holes open, so as you drill, you immediately save the drilling hole with a casing.

When you finalize your drill, you remove your drilling tool and insert a pin pile; a permanent pin pile which will stick a few meters out from the bottom of the sea.

You have to grout the pin pile to make it firm. So, we grout and then we retrieve the casing. When we leave, there are just three small pinnacles which stick out of the bottom.

Then the next campaign is, with a crane vessel, you place the jacket on top of the three pins sticking out of the sea bottom. It's an extremely complex (process and) project, and we encountered major issues in '21 on the project.

There was opposition by the local fishermen. We encountered soil that was even more difficult than the client had told us. So, we had to adjust the drilling tools to make it more suitable for this particular rock. We had to do a drill bit conversion. We have restarted the project in early March and – 'knock on wood' – so far things are going pretty well.

In another first, last year the Fryslan project was completed, the first time a wind farm of this size has ever been constructed by a lake. Can you discuss the challenges of working in a lake as compared to offshore North Sea?

I would say it's more difficult. The main reason for that is the logistics of bringing in those massive turbines and monopiles on a lake is quite challenging.

Second, the traditional tool to build an offshore wind project on the sea is a wind turbine insulation vessel. But here on this lake the average water depth is about 15 feet. So, the standard means were not available.

So we built a modular barge we called the 'barge soccer pitch,' because it was as big as a soccer field, and we put a massive crane on the barge

(For a project like this you need to build) bespoke equipment, which requires a lot of engineering and ingenuity.

Overall it was an extremely successful project; we finished last year, and it's been generating a lot of electricity for the province of Fryslan.

Van Oord recently ordered a vessel that will be able to install turbines of up to 25MW, turbines that don't exist today. Can you provide a rationale behind the decision to order that vessel?

Let me tell you a little bit about the history first. We built our first turbine installation vessel in 2002, a vessel called Jumping Jack, which has been sold.

In 2012, we contracted the vessel Aeolus, and it became operational in 2015. At that time, we were building turbines up to 4MW.

(At the time) we felt four megawatts was big because when we started in 2002, the average size of the turbines was two megawatts.

So between 2002 and 2014, the size (of the turbines doubled) from two megawatts to four megawatts. When we finalized our first project, which was the Gemini project, we suddenly realized that the average size of turbines had gone up to 8MW.

So we had to do a crane conversion on this vessel, installing a new Huisman crane, which made the vessel suitable for 10 to 11MW turbines.

Today, we're in the midst of building 11MW turbines. But I can tell you, the Hollandse Kust Noord (HKN) project, which we are going to build for Shell, we're going to see 14MW turbines.

So this coming winter, we're going to do another crane conversion.

This is a long introduction to the story, and it's why we believe that when you build a wind turbine installation vessel, you should actually keep in mind not the next generation turbine, but the next, next generation turbine.

We believe that somewhere around 2035 ... and this is obviously the feedback we have from the people like Siemens, Gamesa, Vestas and GE, that around 2035, we'll be working with a 20MW turbine.

So we contracted this vessel and we put on a crane, with a vision that by 2035, we would be completely ready with this vessel, to build this generation (of wind turbines which today) does not exist.

It's the largest turbine installation vessel in the world. But we really believe, if you want to invest for more than 10 years, there is no other choice.

We also noted that the giant WTIV that you're going to be building is able to run on methanol. Can you discuss how the decarbonization trend is driving decisions on the equipment that you build, own and operate?

This company has made a pledge that by 2050, in line with the Paris Agreement, we will be carbon neutral. That means that we only have 28 years to go.

Obviously the key emission within our company is the

"We believe that when you build a wind turbine installation vessel, you should actually keep in mind not the next generation turbine, **but the next, next generation turbine.**"

Pieter van Oord, CEO, Van Oord

The Aeolus, at sea.

2021 Investments

At year-end 2021, Van Oord's total committed investment program was EUR 800 million. Here are the highlights.

- **Van Oord's two new hybrid water injection dredgers (WIDs)** Maas and Mersey were put into service in the summer of 2021, replacing the first generation of WIDs.

- **Van Oord's three new LNG trailing suction hopper dredgers** are on their way. The Vox Ariane will become operational in June 2022. The Vox Apolonia will follow six months later and the Vox Alexia a further six months later. These three new dual-fuel trailing suction hopper dredgers have cleaner emissions and a significantly lower carbon footprint than conventional trailing suction hopper dredgers.

- **Van Oord's invested in a new cable-laying vessel named Calypso.** The vessel will be capable of laying AC and HVDC cables and mark the next generation of energy-efficient cable-laying vessels. It is expected to be fully operational by 2023.

- In September **2021, Van Oord also ordered a new jack-up vessel called Boreas.** The vessel will be capable of transporting and installing the next generation of 25 MW wind turbines. It will be the largest of its kind. This green vessel has been designed to operate on methanol fuel and is expected to enter the market in 2024. **The investment in the Boreas is the largest capital expenditure for a vessel in Van Oord's history.**

All images courtesy Van Oord

emission from the engines on our vessels. That means that we have to make two choices.

One, we have to choose the type of engine suitable for lower emission fuels or E-fuels. Two, we have to make a decision, with respect to choice of fuel, and the jury is still out. We don't know whether it's going to be methanol, ammonia. It could be hydrogen.

We have just finalized a series of three dredgers running on LNG. Where the footprint of LNG is much better than marine fuel, marine diesel, we see LNG as a transition fuel.

With respect to offshore wind, we see that our customers are extremely motivated to contract with contractors with a low emission solution.

For that reason we have chosen – on both vessels we're building at this moment, a new cable-laying vessel, Calypso, which we have contracted with Vard; and the Boreas (WTIV) which we have contracted with Yantai Raffles – both vessels have engine types suitable for E-fuels.

So you make an extra investment to make those vessels able to run on those E-fuels.

With respect to the Boreas, particularly, we have made a decision that we're going to make her dual fuel and suitable

Van Oord's 2021 'By the Numbers'

People in fte:	4,725 (2020: 4,369)
Number of nationalities:	83 (2020:73)
Planet, carbon footprint in tons:	487,724 (2020: 589,068)
Revenue:	EUR 1.5 billion (2020: 1.7 billion)
EBITDA:	EUR 67 million (2020: 226 million)
Net result:	EUR - 62 million (2020: 33 million)
Operational cash flow:	EUR 50 million (2020: 476 million)
Order book:	EUR 4.4 billion (2020: 3.6 billion)
Net debt:	EUR 62 million (2020: net cash 24 million)
Solvency ratio:	34.6% (2020: 41.3%)
Investment in equipment:	EUR 208 million (2020 103 million)

All images courtesy Van Oord

for methanol. Obviously, green methanol is, at the moment, only limited available. But we expect that betwee now and 2030, that a large infrastructure of green methanol will be built. We also have fuel tanks for green methanol built in the vessel.

With respect to the Calypso, we have the engines suitable for E-fuels. On this we will wait on the decision on what type of fuel we're going to use.

One other fuel I've not yet mentioned is biofuels. On our present dredgers, which have traditional engines, we carry out more and more projects with biofuels.

We have a number of people around here, in Northwest Europe now, who produce biofuels. Neste, from Finland, for example, is a big player in biofuels.

Shell Oil has just made an announcement that they're going to build here in Rotterdam, at the largest refinery, also a large biofuel factory.

In the future I would say fuel technology, on the one hand, phasing out marine diesel with the existing engines, with biofuels. On the other hand, new vessels, making them suitable for the E-fuels. Whether it be ammonia or methanol, I don't know, but I think that will be our future.

When you look ahead to the coming generation, what do you see as the greatest challenge for maritime companies of your shape and size to survive, to prosper? How are you investing today to ensure your tomorrow?

We're living in a time of transition, and you only survive when you adapt. There is a lot of uncertainty in the market (regarding the) direction we're going. But it's clear that, driven by the Paris Agreement, we have to move to carbon neutrality. That's going to change the entire industry. I think what it means, is that we have to phase out all vessels; we have to build new vessels.

What is the largest challenge? I would say it's a cultural challenge. That mindset of your people needs to change.

We cannot continue the way we have in the past. We need to build new vessels, which (today) is quite a challenge, because new build prices have gone up considerably, and you need to find a proper shipyards to build your new vessels. I expect in the next decades a massive wave of investments in all sorts of new vessels, whether it be container vessels, bulkers, tankers, dredgers, wind turbine installation vessels, which are suitable for this carbon neutral era.

Okay. Pieter, I truly appreciate your time. I look forward to following the van Oord story for another 30 years.

Well, and we're moving (more) to the United States. Follow the news. In the near future, we're going to do more announcements about the United States.

UNITED STATES COAST GUARD

U.S. Coast Guard photo courtesy of the CGC Juniper

SMALL CUTTERS PROVE THEY CAN PATROL A BIG OCEAN

By Edward Lundquist

The Coast Guard's 353-ton, 154-foot fast response cutter (WPC) is capable of deploying independently to conduct missions that include port, waterways and coastal security; fishery patrols; search and rescue; and national defense. The service plans to build 64 of them to replace the 110-foot Island class patrol boats. The FRC has a range of 2,500 miles, but the endurance of the 24 crewmembers is normally limited to about five days based on the quantity of provisions carried. Both the 110s and 154s have about the same speed and range, but the FRC has much better seakeeping qualities, which affects crew endurance.

Named after Coast Guard enlisted heroes, the FRCs are replacing the aging Island-class 110-foot patrol boats. Built by Bollinger Shipyards of Lockport, La., the Coast Guard commissioned its 48th FRC, the USCGC Pablo Valent (WPC 1148) on May 11, 2022, in St. Petersburg, Florida.

In some respects, the FRC is closer to a 210-foot medium endurance cutter (MEC) mission set than a 110-foot patrol boat (WPB) the FRCs are replacing. However, the FRCs don't have the endurance that the MECs do.

In the Coast Guard's 14th District, which covers a huge amount of the Pacific Ocean, three FRCs are based at Guam and three in Honolulu. These cutters are now conducting distant patrols that previously required larger ships.

"Our mission is different from other FRCs because we don't have a lot of ports we can pull into as we transit to our operating areas," said Lt. j.g. Joseph Fox, executive officer of USCGC Joseph Gerczak (WPC 1126), assigned to Sector Honolulu. "If an FRC back in CONUS goes north for an expeditionary operation to the Arctic, for example, they can stop along the way. When we go to Tahiti or American Samoa, there's nothing in between. We'll usually travel with a 'black

The Coast Guard Cutters Joseph Gerczak and Juniper refuel in Papeete, Tahiti, while underway during Operation Aiga, February 6, 2022. The two cutters are in the region combating illegal, unreported, and unregulated fishing and other maritime threats on the high seas throughout the Pacific.

hull' buoy tender in case we need to take on fuel at sea. But we have to be very careful with our fuel, and how we run our engines, and balance the need to have enough provisions for the trip and arrive safety with at least 20 percent fuel on board with the need to get down there so we can get to work."

The difference in distance from Honolulu to American Samoa and to Tahiti in French Polynesia is about 2000 to 3000 nautical miles, with Tahiti being further away. In 2019, Joseph Gerczak made the first unsupported transit to American Samoa as a proof of concept, and more recently to Tahiti.

"The Coast Guard is pushing the boundaries a little bit to see how far we can really go," said Lt. Joseph Blinsky, the Joseph Gerczak's commanding officer. "That's why we were the proof of concept to go to French Polynesia. We proved that it could be done unsupported."

To ensure a safe transit, the Joseph Gerczak operated with a 225-foot buoy tender (WLB) nearby in case there was a problem.

"We were the first FRC to go down there, and we arrived at a comfortable fuel level, but that's relative. We did program in a safety buffer. But there isn't much margin if there was a problem. It's definitely a matter of weather and sea state permitting and nothing going wrong. Blinsky said.

If necessary, the FRC could take on fuel from the WLB. "FRCs have refueled from tenders before. We haven't conducted a RAS with an WLB, but we have done an astern refueling with a WMSL," Blinsky said.

Normally FRCs have a five-day endurance, but the longer transit required special preparations. "Our CSs (culinary specialists) did a great job allocating and maximizing our storage," said Fox. "We had extra freezers and reefers on the bridge and out of the mezzanine deck."

The FRCs are powered by a pair of 5,800 SHP 20-cylinder MTU Series 4000 M93L diesel engines. They're called fast response cutters for a reason.

Even though FRCs have good speed—up to 28 knots--the Joseph Gerczak's Chief Engineer, MK2 Scott Sabatini, said the cutter sailed to Tahiti at about ten knots to save fuel.

"When we're going somewhere fast, we like to run at 1,800 rpm," Sabitini said. "At that speed we're burning about 500 gallons per hour and our fuel capacity is about 16,000 gallons. So, it dwindles pretty quickly. For a transit this long, we need to burn closer to 50 gallons per hour."

"Our 50 gallons-per-hour fuel consumption only works if we have both main engines running optimally at 900 rpm. We can't maintain speed and be fuel efficient on a single engine. And we can't run on just one engine at full bore, because it will exponentially burn more fuel," Blinsky said. "We base all of our calculations off of burn rate per hour, not speed."

The sea state was such that it made the transit slower, and also made a refueling at sea (RAS) a more difficult evolution. "We wanted to avoid a RAS if possible," said Blinsky.

Sabatini said that the lower speed poses some other problems for the engines. "The diesels are really designed to operate at higher RPMs. When we were going for a week to ten days at a relatively slow speed, the carbon isn't getting blown out. So, I was worried about that build up, and concerned about replacing injectors at a higher rate than normal."

FRC maintenance support is centralized, and managed from Baltimore, where parts are stored. "It can takes weeks to get to Hawaii, and longer to get to Guam, American Samoa or Tahiti," Sabatini said.

There were other considerations in planning the expeditionary patrols. Fox said personnel injuries or illnesses were a major concern. Unlike the WLBs and WMSLs, the FRCs do not have an independent duty corpsman on board, and the risk has to be considered because there was no higher level of care readily available. "If someone got hurt on one of these patrols, how are we going to get them to higher level medical care? Many of these islands don't have the level of medical care we might need. If something goes wrong, we might need a tender or a WMSL nearby with a corpsman and a sickbay."

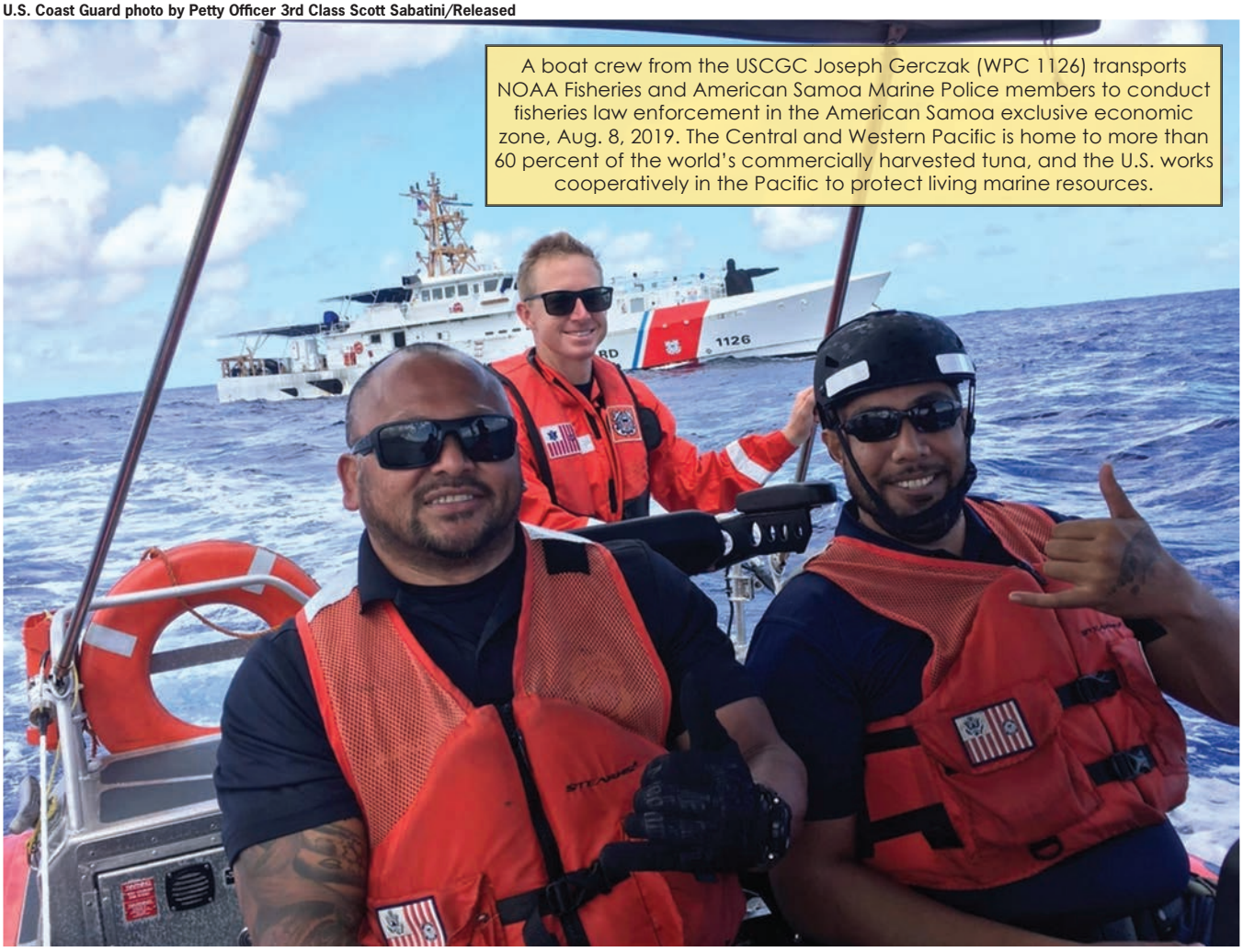
COVID made the patrols even more complicated. Crews often had to stay on board when in port. Getting repair parts and provisions to the ship more difficult and time consuming.

"We can plan these trips in detail, but each unexpected deviation from that plan comes with a set of unknowns," said Blinsky.

FRCs also patrol around Midway, Wake, French Frigate Shoals and the Northwestern Hawaiian Islands Marine National Monument, which is the largest contiguous fully protected conservation area under U.S. jurisdiction and the largest marine conservation area in the world.

"When we go downrange, we're conducting a presence mission and also helping our partners with the uniform enforcement of the Western and Central Pacific Fisheries Committee agreement, and monitoring the fishing activities in the various nations' exclusive economic zones (EEZs). COVID permitting, we can conduct inspections and ensure the fishing vessels are who they say they are, catching only what they're allowed to catch, and have the proper preventative equipment to ensure against accidental catches of sea birds and turtles," Blinsky said. "In the U.S. EEZ we have authority and jurisdiction. In other nation EEZs we'll take ship riders with us who give us that authority."

U.S. Coast Guard photo by Petty Officer 3rd Class Scott Sabatini/Released



A boat crew from the USCGC Joseph Gerczak (WPC 1126) transports NOAA Fisheries and American Samoa Marine Police members to conduct fisheries law enforcement in the American Samoa exclusive economic zone, Aug. 8, 2019. The Central and Western Pacific is home to more than 60 percent of the world's commercially harvested tuna, and the U.S. works cooperatively in the Pacific to protect living marine resources.

The crew of the Coast Guard Cutter Joseph Gerczak (WPC 1126) arrive to their new homeport of Honolulu Feb. 4, 2018, following a 42-day transit from Key West, Florida, where the cutter was delivered. The Gerczak is the second of three 154-foot Fast Response cutters to arrive to Hawaii.

U.S. Coast Guard photo by Chief Petty Officer Sara Muir/Released

Deputy Sector Commander for Sector Honolulu Cmdr. Aja Kirksey said the option of sending an FRC with a WLB together as a surface action unit (SAG) has proven to be successful. But these long deployments have risk, and we shouldn't assume that because we've done it that we should continue to do them as the norm in the future."

"As good as the FRC is, it isn't the optimal asset for this area of operations," she said. "We've been lucky because we've done really good operational planning, and we put a lot of attention on the success of this mission. But we're exceeding the design and operational intent of what this what this asset was created to do."

While the FRC and WLB make a good team, the consensus is that two FRCs together don't have the excess storage or medical support that the 225 can provide. Kirksey said a fourth FRC for Sector Honolulu would be helpful, but it's not in the Coast Guard's plans.

Kirksey said the 418-foot, 4,500-ton National Security Cutters (WMSLs) and WLBs, as well as the new 4,500-ton, 360-foot Offshore Patrol Cutters (OPCs), have better endurance and seakeeping. She's looking forward to when the OPCs starting joining the fleet in 2025.

"Not only will the OPC be better suited for the long missions, their ability to perform missions now conducted by the WMSLs (such as Bering Sea fisheries patrols) will free them up to come out here to District 14, where they are ideal for the expeditionary patrols."

But, Kirksey said, in the absence of the perfect asset, the FRCs are the right asset for the job right now. "We're making it work."

Sentinel Class Fast Response Cutters

- **Number Planned: 64**
- **Length: 154 feet**
- **Beam: 25 feet**
- **Draft: 9 feet 6 inches**
- **Displacement: 353 long tons**
- **Maximum Speed: 28+ knots**
- **Range: 2,500 nautical miles**
- **Propulsion: Two 4,300 kW (5,800 shp) MTU diesel engines**
- **Boats: Cutter Boat – Over the Horizon – Jet-drive**
- **Weapons: 1 × Mk 38 Mod 2 25 mm autocannon; 4 × crew-served Browning M2 machine guns**
- **Endurance: Five days**
- **Crew: 24 (Four officer; 20 enlisted)**

The crew of USCGC Joseph Gerczak (WPC 1126) prepare to moor at the port of Pago Pago, American Samoa, Aug. 3, 2019. They will conduct a joint fisheries patrol with NOAA Fisheries and American Samoa Marine Police members.

U.S. Coast Guard photo by Chief Petty Officer Sara Muir/Released

Inside the Scania Marine Power Platform

As the Scania USA marine business continues to grow, Dave Hughes, Sales Manager, Scania USA, shares insights on what's in store for this powertrain solution provider in 2022 and beyond.

Dave, to start, can you give us a quick overview of the Scania marine portfolio today?

The Scania Marine portfolio fills a nice niche. When people look at our competitors, they are in the horsepower range from 50 all the way up to a couple thousand horsepower. But Scania, with its core market being on-highway trucks and buses in Europe, have developed a robust, competitive and dependable solution for the maritime market. We offer two platforms, the DI13, which is an inline six cylinder, and the DI16, which is a V8 model. The DI13 is available in 250 to 900 horsepower on a propulsion engine, as well as generator or auxiliary engines from 269 KW up to 426 KW. The D16 V8 configuration is offered from 550 up to 1,150 horsepower with auxiliary applications in the 470 KW region.

Scania has been selling industrial and marine engines in the United States aggressively for more than 10 years. In that time, we've been able to place approximately 8,000 engines within the US market, of which about 10% are marine engines. One thing to consider is this doesn't include all the legacy Scania products from when Scania was selling trucks via its partnership with Mack. On a global scale, industrial and marine engine sales, engines alone are 10,000 to 12,000 units annually.

Can you give us a rundown of the primary markets that you serve with insights on the ones that you find particularly promising today?

Despite the challenging times, many of the traditional markets we've been successful in have continued to grow and be successful. For example, the Bristol Bay salmon fisheries and the Northeast lobster and shellfish industries have been very

Photo courtesy Scania

I think it's important to understand the benefits of the Scania quad engine solution. By using quad engines, we eliminate the need for those costly and complex exhaust aftertreatments, we offer more available horsepower, and should a failure occur, you're only losing 25% of your propulsion."

Dave Hughes
Sales Manager, Scania

good with many record catches recorded recently. These are two industries that Scania has been very successful in due to their power and weight ratio and historical uptime. Another industry that is experiencing rapid growth is the offshore wind market.

As it stands today, the U.S. does not have the vessels to support the rapidly growing industry. Scania has a proven track record in quad engine CTVs currently being operated in Europe and it's in a great position to support the market here in the U.S. Going back to the passenger vessel, as the market rebounds from the pandemic and the passenger counts increase, operators are looking to meet the demand of the passenger influx while modernizing their fleet. This includes the growing shift to alternative fuels, hybrid applications, something that aligned closely with one of Scania's core values to drive the shift towards a sustainable transport system.

I understand that Scania too has been making inroads into the recreation business. Can you discuss the market as you see it today with insights on any interesting recent projects?

It is an exciting time for Scania in the recreational world. Within the last two years, Scania has released its US EPA tier three compliant recreational engines. These engines are available in this 700-1,150 horsepower range and compete favorable in both the fishing and leisure applications. Being one of the most fuel-efficient engines on the market, we can provide customers not only the proven reliability of the Scania brand, but also allowing anglers to stay on fish longer, cruising the yachts longer range, while taking some of the burden out of their bank accounts. Maritimo Yachts has seen great success in selling US bound boats utilizing U.S. versions of the engines that they've been very successful throughout other parts of the world.

Another pure pleasure application that we're seeing success in is the Nordhavn vessels. They have an N68, an expedition yacht, and expedition customers demand reliability. They are

a close-knit group of owners, and if one finds a reliable drive train solution, that information is shared amongst current potential customers. Last but not least, one of the most exciting recent applications is the Mack 900, a 46-ft. Viking sport fishing vessel. Our Northeast distributor, Mack Boring & Parts, had to invest significant resources to secure this opportunity. Since the launch of the boat, it's been traveling up and down the east coast competing in sport fishing tournaments, and participating in the Viking displays at many of the winter boat shows. The attention it's getting is rather astonishing, which is due to the exceptional performance and fuel efficiency. This is a 46-ft., 40,000 pound plus sport fishing boat that tops out over 40 knots, cruises at 34 to 36 knots, all while burning less than 60 gallons per hour combined.

Dave, I know from some previous discussions that the Scania D16 is a particularly interesting unit for you today. What is it about the DI16 that makes it interesting for pairing with water jets and CTV applications?

The Scania engine's torque tends to plateau earlier in the power curve [compared to other engines in its class]. This allows the engines to operate at a slightly lower RPM while still maintaining the power required to fully use the water jets. This results in less cavitation within the jets, more reliable product, and less breakdowns within the jets, while simultaneously equating to increased fuel economy for the operators. I think it's also important to understand the benefits of the Scania quad engine solution. Many of the CTVs in our horsepower range have traditionally used larger, twin engine applications, and with the current emission requirements, this would require costly and complex exhaust aftertreatments.

By using quad engines, we eliminate the need for those aftertreatments, offer more available horsepower, and should a failure occur, you're only losing 25% of your propulsion versus 50%.

Plus, we provided greater variance in operation configurations. For example, should the need be there, you could utilize one engine, two engines, three, or all four based on the load on their operating requirements. Another major benefit, given CTVs are commonly catamaran style hulls, the quad engine solution takes up less real estate in the engine room. Not only because the footprints are smaller, but you don't have that complex and bulky aftertreatment to worry about.

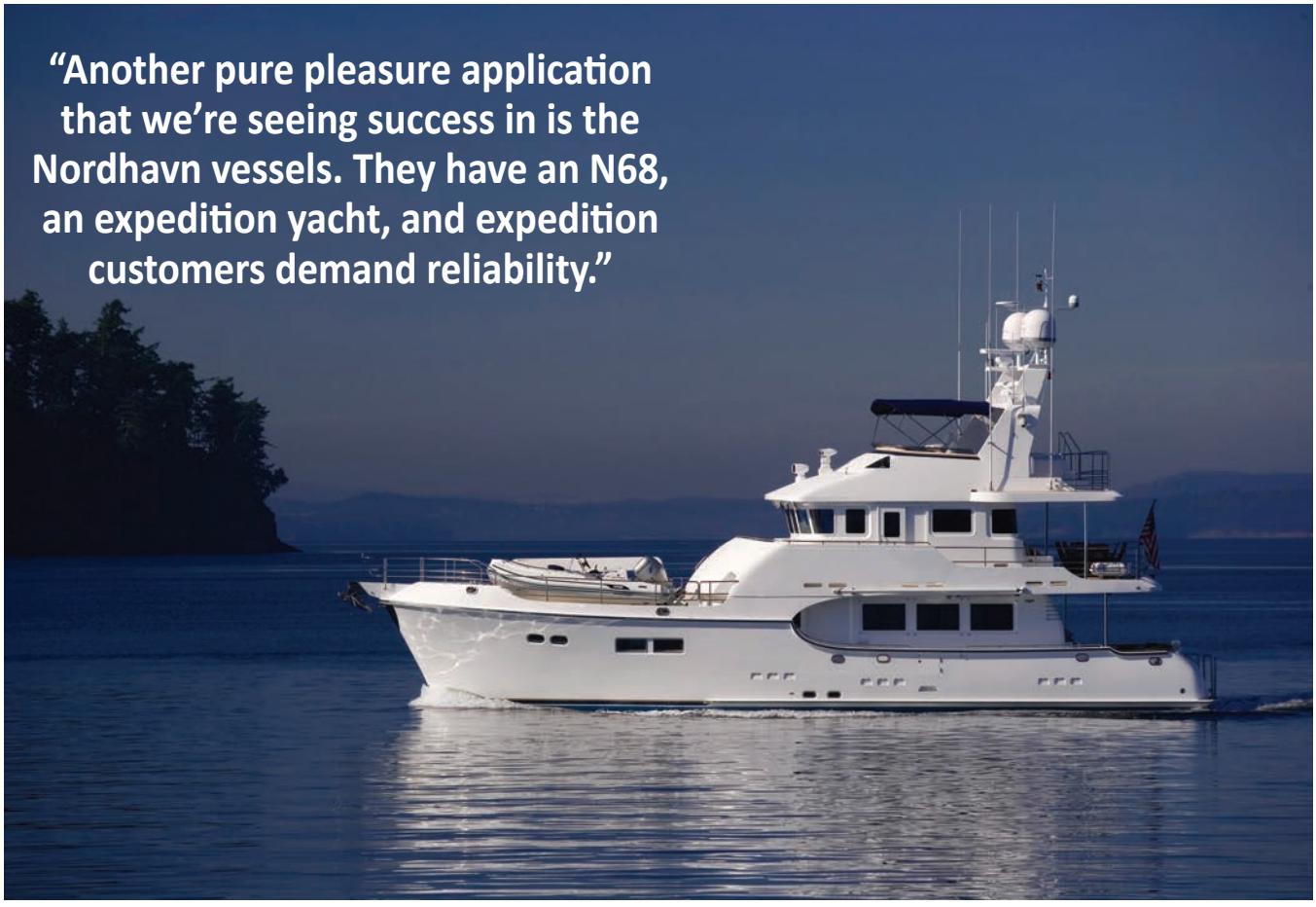


Photo courtesy Scania

Schottel Thrusters for U.S. "Scrubber Barge"

Schottel won a contract to supply rudder propellers on a self-propelled barge-based vessel stack exhaust capture and treatment system. It will be produced and operated by U.S. company Clean Air Engineering - Maritime, Inc. (CAE-M), based in San Pedro, California. The system is called the Marine Exhaust Treatment System or METS-3 and was designed by Fassmer Techincal Projects, to be built at Greenbrier Companies, Inc, Portland, Ore. Additional METS systems will be produced and operated in several other California seaports. The 26 x 13m barge will be operated by CAE-M to capture and treat stack exhaust of vessels in the Ports of Long Beach and Los Angeles, California. The main propulsion system of the barge consists of two electrically-driven Schottel RudderPropellers type SRP 150 (400 kW each) featuring propeller diameters of 1.2 metres. The SRPs will run on biodegradable oils (EALs). The scope of delivery includes the complete electrical package, which comprises electric motors, frequency drives as well as a portable control station for the Schottel MasterStick. The Schottel MasterStick is a joystick system which can control up to six propulsion units simultaneously. The thrust and the alignment of the propulsion units are controlled and distributed by a software in such a way that all translational and rotational movements required for manoeuvring the barge are executed optimally. The ship's movement can thus be controlled intuitively and comfortably in any desired directions.

Images courtesy Schottel

Brunvoll to supply for Esvagt 'green fuel' SOV

Brunvoll won a contract for a complete propulsion and maneuvering package for the new Service Operation Vessels (SOV) for Esvagt. The vessel is HAV Design 833 SOV and will be built at Cemre Shipyard, reportedly the world's first SOV able to operate on 'green fuels.' Brunvoll's delivery will be propulsion azimuth thrusters, retractable azimuth thrusters, tunnel thruster and BruCon condition monitoring system. The Brunvoll azimuth propulsion thruster family is an extension of Brunvoll thruster technology. The vessel will be equipped with Brunvoll's new Condition Monitoring System (CMS). The CMS is part of the BruCon control system family and is a layer-based platform with extensive cyber security improvements Brunvoll CMS support the new DNV class notifications for Condition Monitoring.

HAV Design

Brunvoll

Tech Files

Ride Stabilization Pitch and Roll Control

Quantum Marine Stabilizers' 5000S Control System

Stabilizer technology has advanced in recent years with the digital controls representing the greatest gains. The proprietary control technology is essentially the brains or intellect that processes data which directs the appropriate movements to the fin or rotor all starting with a roll sensor. In early 2022, Quantum launched the new 5000S control system.

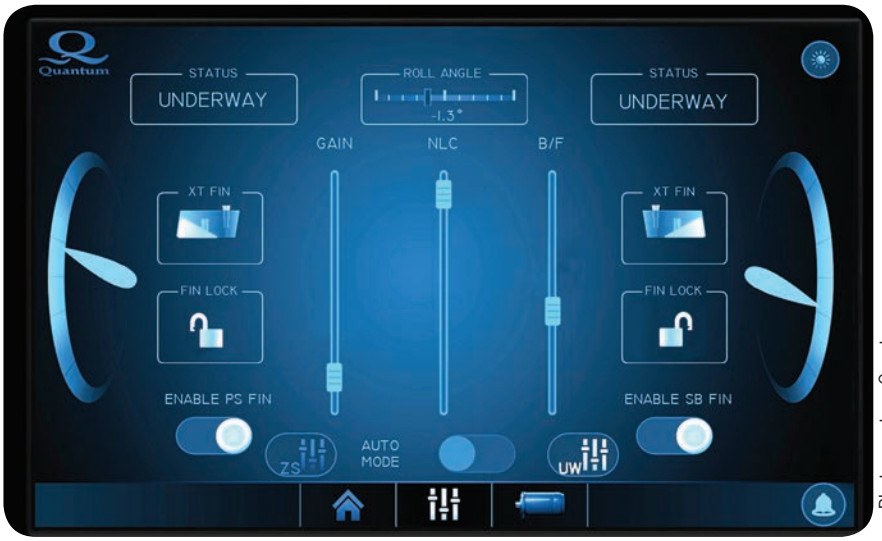


Photo courtesy Quantum

The 5000S uses a plug-in/add-on modular platform that effectively supports old, current and future control systems and algorithms, as well as the ability to execute a multitude of functions such as underway only, retractable and zero speed requirements.

It features secured remote access for prompt troubleshooting, recording capabilities that can be stored and downloaded later and a customizable glass bridge interface. As an added convenience, the 5000S can store drawings, technical data and fluid recommendations.

Humphree Stabilization Systems

Demand for stabilizers to provide a smooth ride for the high-speed vessels in Offshore Wind, Military Patrol, Fast Ferries, and Pilot Boat Commercial segments is growing exponentially year over year. Humphree transom-mounted interceptors deploy retractable vertical blades that create lift to automatically counteract the roll and pitch motions of the hull. These systems are designed and built to provide low-maintenance and reliable, 24/7/365, service regardless of wind and sea conditions. Humphree has Interceptor systems on the Atlantic Endeavor CTV, and are supplying systems to the three Senesco builds, the four Blount builds, and the St Johns, and Gulf Craft builds currently underway. Humphree is providing stabilization systems for the new class of PB 40 patrol boats being built by Metal Shark for the U.S. Navy. Also, the new class of LRUSV autonomous, unmanned, surface vessels. Recent Ferry installations include vessels for Sea Streak and San Francisco Bay. Humphree systems are specified on four new ferry builds at Mid Ship Marine. Recent Pilot boat installations include the Sabine Pilots, the Savanah Pilots, and the Maryland pilots, Humphree interceptor systems are specified on 2 new builds at Snow Boatbuilding for Savana Pilots, and Fransico Bar Pilots, a new build at Gladding Hearn for Galveston Pilots, and a new build at Breaux Bay Craft for Sabine Pilots.

Photo courtesy Humphree

The first Dual Fuel Hydrogen Work Boat Engines

The world's first dual-fuel hydrogen- and diesel-powered crew transfer vessel (CTV) is ready for service, outfitted to run the cleaner fuel that reduces up to 80% of its traditional fuel usage and associated emissions.

The 25-meter vessel, Hydrocat 48 — owned by Windcat Workboats, part of Compagnie Maritime Belge (CMB) — is based on the Windcat MK 3.5 design but lengthened to integrate adequate hydrogen storage on board. The vessel, which has been certified by Lloyd's Register and U.K. Maritime and Coastguard Agency, recently completed bunkering and sea trials in May 2022.

It is equipped with a pair of 12-cylinder IMO Tier III-certified MAN D2862 LE448 diesel engines and a selective catalytic reduction (SCR) exhaust gas aftertreatment system. Both V12 engines, which each have an output of 749 kW (1,019 hp) at 2,100 rpm, have been prepared for dual fuel operation by MAN Engines and supplemented with a hydrogen injection system by CMB's cleantech arm CMB.TECH, the first to build a hydrogen-powered passenger shuttle, Hydroville, in 2017.

"What's special about our technology is that we use a conventional diesel engine, which doesn't need to be optimized for hydrogen," said Werner Kübler, MAN Engines' head of development. "A proven V12 marine engine is thus used in which hydrogen is introduced into the charge air via an adapter and is added to the combustion cycle. The combustion process is thereby started according to the diesel principle, which requires the injection of approximately 5% of diesel fuel. The diesel fuel common rail injection parameters have been optimized here for dual fuel operation. According to CMB.TECH, the operating behavior, fuel consumption and all other characteristics correspond exactly to the MAN D2862 LE428 with the same performance. "In a form of pre-treatment, a precisely measured quantity of hydrogen is added to the charge air. This mixture of hydrogen and air is then ignited with the injected diesel fuel in the combustion chamber of the cylinders. Depending on the engine's operating point, only a very small amount of diesel fuel is needed. The diesel injection parameters are optimized in dual fuel mode to achieve the lowest emissions and the best consumption values. Therefore, in dual fuel mode, considerably less CO2 is released in the exhaust gases in circumstances where operating behavior and full load characteristics remain unchanged. In the event of problems in the hydrogen circuit or a depleted hydrogen supply, a switch back to diesel can be made at any time. This guarantees uninterrupted operation with normal reliability."

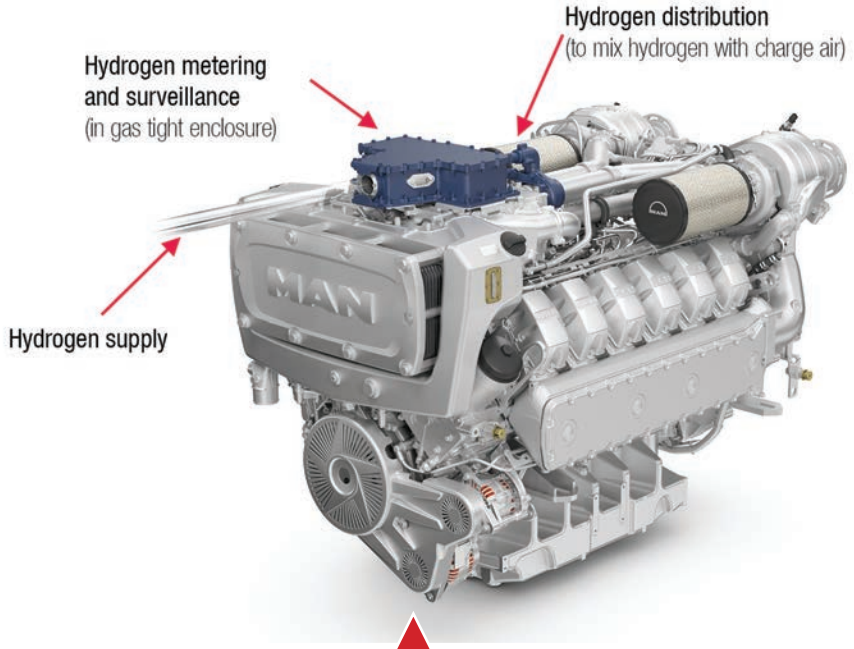


Image courtesy MAN ES

Only the hydrogen injection system (shown here in blue) has been retrofitted. The output, operating behaviour and other characteristics of the diesel engine remain unchanged.

CMB.TECH said it is working with Windcat Workboats to further optimize engine capacities and increase hydrogen usage. The companies' long-term plan is to develop the technology and infrastructure to be able to eventually use a mono-fuel option via an internal combustion engine (ICE).

To address fuel availability, CMB.TECH and Windcat have developed a hydrogen bunkering solution to use during the fuel's early phases. CMB.TECH has designed a 40-foot, 500-bar trailer for remote refueling of all various systems applying the technology currently in use. The one system can serve multiple applications, including the Hydrocat 48 CTV.

Tech Files

Innovative new Marine Solutions

Tankers to be refit with Carbon Capture Tech

Photo: Eastern Pacific Shipping

Eastern Pacific Shipping (EPS) signed a definitive agreement with Rotterdam-based Value Maritime (VM) to install carbon capture and filtering systems on MR tankers M/T Pacific Cobalt and M/T Pacific Gold, with an option to equip three more vessels. The installation of the first system is scheduled to be completed within 2022 with engineering and planning underway.

The 2020-built, 49,700 DWT sister vessels, will be fitted with VM's Filtree System – a prefabricated gas cleaning system that filters sulfur and 99% of particulate matter. The system will include a Carbon Capture Module charging a CO2 battery onboard.

The charged CO2 battery will be discharged in port and subsequently used by CO2 customers, such as greenhouses, or injected into carbon sequestration networks. The discharged battery will be returned to the vessel for CO2 recharging. This 'plug and play' approach allows vessels to capture up to 40% of CO2 emissions today, with the potential of exceeding 90% in the future.

"Carbon capture technology was missing in our existing portfolio of emission lowering solutions, which today consists primarily of alternative marine fuels," said Cyril Ducau, CEO, EPS. "We believe that carbon capture technology holds significant promise for reducing emissions for existing and future ocean-going vessels. Coupled with alternative fuels, biofuels and other solutions, carbon capture is a crucial step in accelerating the shipping industry's decarbonization efforts ahead of IMO targets."

In addition to its carbon capture capabilities, the Filtree System also removes oil residue and particulate matter from the wash water, ensuring its PH value is neutralized and contributes to reducing the acidification of seawater.

Installation onboard M/T Pacific Cobalt is expected to be completed by the end of 2022, while the installation onboard M/T Pacific Gold is scheduled to be completed by the end of Q1 2023.

Remotely Activated Towing Solution (RATS)

Remotely Activated Towing Solution (RATS) is a new safety-tech designed to enable tow lines to be established between vessels safer and faster in virtually any conditions. The RATS automation technology is designed to integrate with existing digital vessel control systems on commercial, military and autonomous vessels. The patented system integrates within a vessel, designed to provide 'push button' deployment locally/remotely without any crew needed on deck. On deployment, a rocket and ultra-floating heaving line is propelled 200+m from the stricken vessel to land in the sea. The salvage vessel safely retrieves the heaving line/rocket with a simple grapple from the water. Once heaving line is recovered, the salvage vessel can withdraw the 200+m messenger line from the speed-controlled reel, followed by 100+m of towing cable from the stricken vessel. The tow cable is then connected to the salvage vessels' main towing cable, which is then paid out to begin the tow. *RATS Marine Limited is now looking for interested parties and investment to take this project forward.* **https://ratsmarine.co.uk/**

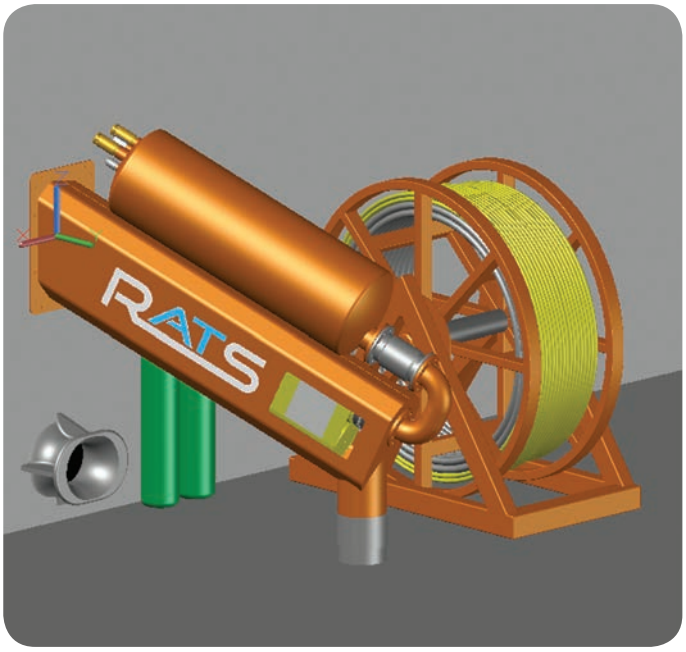


Image courtesy RATS

World's First 8th Gen Drillship Named Deepwater Atlas

Deepwater Atlas, the world's first 8th generation drillship, was named at a ceremony in Singapore in late April, shared by Transocean, the drilling contractor that owns the vessel.

Deepwater Atlas and its sister-rig Deepwater Titan will be the first two 8th generation units when they enter service, and, according to Transocean, will be characterized not only by their ability to drill and complete 20,000 psi prospects, but also by their industry-leading net three-million-pound hoisting capacity.

According to Transocean's annual report information, the Atlas will be equipped with one 20,000 psi blowout preventer and one 15,000 psi blowout preventer. The Deepwater Titan will be equipped with two 20,000 psi blowout preventers.

Keelan Adamson, President & COO of Transocean, said in a video shared on social media that the rigs are so well equipped that they can reduce the time it will take to drill a deepwater well, creating an opportunity to drive the total well cost down.

Last year, the Deepwater Atlas secured a contract with Beacon Offshore Energy for drilling at the Shenandoah project in the U.S. Gulf of Mexico.

Built in Singapore by Sembcorp Marine, the drillship, which will be able to drill in water depths of up to 12,000 ft., and with a maximum drilling depth of 40,000 ft., is expected to be delivered during the second quarter, and to start drilling for Beacon in the late fourth quarter of 2022. The Deepwater Titan, which has a five-year contract with Chevron at its Anchor project in the Gulf of Mexico, is scheduled to start drilling in the first quarter of 2023.

Deepwater Atlas at sea trials (Photo: Transocean)

In the Shipyard

Latest Deliveries, Contracts and Designs

Hybrid Ferry

Västtrafik, the organization responsible for public transport in the Västra Götaland region, Sweden, has taken delivery of a fourth electric hybrid ferry powered by an EST-Floattech battery system. Built by Työvene in Finland, Eloise is a 33-m, double-ended commuter ferry designed to carry up to 298 passengers and 80 bicycles at speeds of up to 11 knots. The EST-Floattech installation is based on its flagship Green Orca 1050 High Energy Battery System which uses Lithium Polymer NMC cells.

JBattery technology continues to develop at speed, proven by battery capacity of the Eloise is 25% higher than that of its sister ship the Elvy, which was delivered in 2019. With an installed capacity of 1260 kWh, the Eloise is capable of six hours continuous electric operation. Recharging takes place using either shore power or the onboard diesel generator.

The battery room.

Images courtesy EST-Floattech

Image courtesy C-Job

New Hydrogen Ship Design

C-Job Naval Architects developed, in partnership with LH2 Europe, a new class of liquid hydrogen tanker. LH2 Europe will use the renewable electricity in Scotland to produce green hydrogen. To start, it is envisioned that the new tanker will transport the liquid hydrogen to terminals in Germany. "Hydrogen will be essential to the future of energy. LH2 Europe aims to have a full liquid hydrogen supply chain ready by 2027," said Dr. Peter Wells, CEO of LH2 Europe. "We plan to initially deliver 100 tons per day (t/d) of green hydrogen and ramp up production to 300 t/d within three years, depending on demand." The vessel is powered by hydrogen fuel cells and will be equipped with three liquid hydrogen storage tanks with total capacity of 37,500 cu. m. The tanks will have a much lower boil-off than those currently used in the maritime industry. The remaining boil-off will be used in hydrogen fuel cells, providing power to the vessel's propulsion systems, resulting in emissions of water only.

Vessel Specifications

Vessel type	Liquid Hydrogen Tanker
Length, o.a.	141.75 m
Rule length	135.75 m
Breadth	34.9 m
Depth	8.75 m
Draught design	5.8 m
Installed power	5,000 kWe
Speed	14 knots
Accommodation	14 crew
Cargo tank capacity	3 x 12,500 cu. m.

Sanmar delivers for Svitzer

Sanmar Shipyards delivered a RAmparts 2400SX class Z-drive tug to Svitzer for its operations in the Dominican Republic. Dubbed Svitzer Rivas, this is the 27th tugboat that Sanmar has delivered to Svitzer, and is based on the exclusive-to-Sanmar RAmparts 2400SX design from Robert Allan Ltd.

Measuring 24.4 x 11.5m with a molded depth of 4.38m, Svitzer Rivas is powered by a pair of Caterpillar 3516C marine diesel engines each producing 2.350 kW at 1,800 rpm driving Kongsberg US 255S FP azimuth thrusters. With this outfit, Svitzer Rivas can achieve a bollard pull ahead in excess of 80 tonnes and has a minimum free running speed of 12 knots. Deck equipment includes a DMT TW-E250kN frequency controlled electrical drive double drum towing winch with tension and length indication, constant tension. Tank capacities include 19,600 gallons of fuel oil and 2,900 gallons of fresh water.

The vessel has been constructed in accordance with ABS requirements.

Image courtesy Sanmar

Cadeler inks $345m deal for Foundation Install Ship

Cadeler signed a contract for $345m with COSCO Heavy Industries to build an F-class vessel to cater for the largest projects in the offshore industry. The contract includes an option for an additional X or F-class vessel.

The new vessel will enable Cadeler to target the growing segment of large-scale foundation installations and to offer a complete set of services within transport and installation of offshore wind farms.

"Developing our fleet is a key strategic priority to meet the increasing demand for installation capacity," said Mikkel Gleerup, CEO, Cadeler A/S.

Cadeler is currently building two X-class vessels to be delivered by COSCO Heavy Industries H2/2024 and Q1/2025. The F-class vessel will be built on specifications similar to the two X-class vessels providing substantial scale benefits.

The F-class vessel features a unique design, allowing the vessel to convert from being a foundation installation unit to a wind turbine generator (WTG) installation vessel within a short period of time. The new F-class is expected to be delivered in Q4/2025 and Cadeler is currently in discussion for a XL Monopile foundation installation contract in the North Sea, expected to commence in Q2/2026. With a deck space of 5,600 sq. m., a payload of more than 17,600 tons and main crane capacity to be disclosed at a later date, the vessels will be able to transport and install seven complete 15MW turbine sets per load or five sets of 20+ MW turbines, cutting down the number of trips needed for each project. The F-class will be able to transport up to six XL monopiles (weight 2,300-2,600mt each) per round-trip, which improves operational efficiency substantially.

	F-class	X-class
Main Crane	Larger than X-class	2,600 t @ 46 m
Hook height above deck	200m +	200m +
Variable Load	> 17,600 t	> 17,600 t
Deck space	5,600 m2	5,600 m2
Accommodation	130	130

Image courtesy Cadeler

DEME Delivers Jones Act-Compliant Feeder Solution

Belgian offshore installation firm Deme Offshore and Dutch company Barge Master, which specializes in offshore motion compensation systems, have partnered to further develop a U.S. Jones Act-compliant feeder solution for the upcoming offshore wind projects in the U.S.

Last year, DEME Offshore was selected by wind farm developer Vineyard Vind to provide the offshore transport and installation of 62 GE Haliade offshore wind turbines for the Vineyard Wind 1 project, the first large-scale offshore wind installation in the U.S. Last month DEME said it would collaborate with Barge Master to develop motion compensation technology which will be deployed in a pioneering feeder concept on the Vineyard Wind 1 project. In addition to the installation of the turbines, DEME Offshore will also handle the transportation and installation of the monopile foundations, transition pieces, offshore substation, and scour protection for the wind turbine foundations, as well as the offshore substation foundation and platform. DEME Offshore US is partnering with U.S. company Foss Maritime to develop the smart feeder barge concept "to ensure that it is fully compliant with the Jones Act." bit.ly/3NP9hXZ

Image courtesy DEME Offshore

US Coast Guard HQ

Bath Iron Works

Charles F. Krugh, Bath Iron Works

USTC/PR

Nina Østergaard Borris, CEO, USTC

Adm. Linda Fagan takes USCG Helm

Adm. Karl L. Schultz (above right) was relieved as Commandant of the U.S. Coast Guard by **Adm. Linda L. Fagan** (above left) during a military change-of-command ceremony presided over by **President Joseph R. Biden Jr.** (above center) Wednesday, June 1, 2022, at Coast Guard Headquarters in Washington, DC. Fagan assumed the duties as the 27th Commandant following her service as the 32nd Vice Commandant.

Krugh New President Bath Iron Works

General Dynamics appointed Gulfstream Aerospace executive **Charles F. Krugh** as president of General Dynamics Bath Iron Works. A U.S. Army veteran, Krugh served in a variety of aerospace manufacturing roles before joining General Dynamics in 2011 as a SVP and GM for Jet Aviation.

USTC Changes Leadership

Nina Østergaard Borris, co-owner and current COO of United Shipping and Trading Company (USTC), takes on new responsibilities in the family-owned business as CEO, succeeding her father **Torben Østergaard-Nielsen** who will take over as Chairman of the Board of Directors for USTC. **Mia Østergaard Rechnitzer**, current Head of Corporate Governance, will assume the position of Chief Governance Officer, stepping into USTC Executive Management.

Smith to lead Seaward Services

Hornblower Group announced that **Brendan Smith**, formerly VP of Engineering, NYC Ferry, has been named President of Seaward Services, Inc. Smith replaces John Keever, who has retired after 50 years in the industry.

Congressman Garbarino Visits Retlif

A globally recognized, independent EMC/EMI and environmental testing organization, Retlif Testing Laboratories welcomed New York State Congressman Andrew Garbarino to its secure facility for an escorted tour of their EMC (Electromagnetic Compatibility) and Environmental Simulation Services (ESS) laboratories. The tour was followed by a roundtable discussion in support of military contracting and defense manufacturing on Long Island, logistics and supply chain issues, and the growing employment opportunities within the contracting space.

MidAtlantic Engineering

MidAtlantic Engineering Partners (MidAtlantic), a civil, environmental, and marine engineering and surveying firm, is pleased to announce that W. Stuart Lewis, P.E. is a partner in the firm.

BMT's Hammock wins RINA's Prize

BMT said that **Lisa Hammock**, Environmental Protection and Sustainability Managing Consultant, has been awarded the David Goodrich Prize by the Royal Institution of Naval Architects (RINA). The prize, awarded annually and named after David Goodrich, a former president of RINA and one of the founders of BMT, is given for the best paper presented at the annual RINA Warships conference.

Dry Dock Conference Set for VA

The tenth International Dry Dock Conference is scheduled to take place in Virginia Beach, VA, September 22-23, 2022. The latest in this series of International Dry Dock Conferences/ Advanced Training Forums is set, with discussions and knowledge-share designed to provide advance training for those in the dry dock industry.

The conference provides an opportunity to distribute dry dock knowledge and information. The conference will include prominent speakers with presentations providing a unique opportunity to interact with conference participants. The conference will be held in person, but for those unable to travel to Virginia Beach to attend, the 2022 Dry Dock Conference/Advanced Training forum is also available via live stream Webinar. With the live stream Webinar option, you will be able to remotely tune in to watch all conference presentations, ask questions and make comments.

www.drydocktraining.com/conference.html

NYK to Invest in theDOCK's Navigator II Fund

NYK has signed an agreement to invest in "Navigator II," an investment fund managed by theDOCK, an Israeli venture capital firm specializing in maritime technology. Navigator II invests in and supports startup companies that research and develop innovative technologies in the fields of shipping, ports, and supply chains. Through Navigator II, NYK will promote open innovation with startup companies by identifying new technologies and ideas that will strengthen existing businesses and create new businesses.

Corvus to open U.S. Battery Factory

As the maritime industry increasingly moves towards propulsion solutions that help cut emissions, battery technology is increasingly taking center stage on a number of ship, boat and offshore energy installations. Leading the charge are a number of battery manufacturers globally, including Norway's Corvus Energy, which announced that the company is expanding its US operations by opening a new factory in the Port of Bellingham, Washington. The U.S.-based manufacturing facility, starting with Corvus' Orca battery, will have an annual capacity of 200 MWh of stored energy capacity, with the ability to double that capacity as demand grows, said **Geir Bjørkeli**, CEO of Corvus Energy. There are many places to set up shop, but Washington state was seen as a "natural choice for Corvus," said Bjørkeli, with its strong maritime heritage and the presence of a strong maritime cluster, the state's focus on 'green' shipping and the locale's proximity to the Corvus team domiciled in Vancouver, Canada. "We know that a U.S. presence and close collaboration with shipyards, shipowners, Washington Maritime Blue and other suppliers and service providers foster innovation across the entire industry."

Hornblower

Smith to lead Seaward Services

BMT

BMT's Hammock wins RINA's Prize

Corvus Energy

Elliot Smith, Director of real estate and properties, Port of Bellingham shaking hands with Geir Bjorkeli CEO at Corvus Energy.

S.O.S. (Save our Shipbuilding)
Germany's VSM Advises Reducing Dependence on China

As the geopolitical landscape continues to quickly transform with the Russia/Ukraine war, Europe's over-dependence on Russian energy has become painfully apparent. VSM – the German Shipbuilding and Ocean Industries Association that represents the political and commercial interests of the German maritime over a diversity of maritime market segments – issued the following statement and overview of the global shipbuilding market, highlighting how highly subsidized shipbuilding markets in China and South Korea threaten the very existence of European shipbuilding.

The German and European maritime industry is facing major challenges. Geostrategic developments and the transformation initiated by governmental climate policy are creating a gigantic need to invest in ships and maritime assets. Nevertheless, the industry finds itself confronted with low demand and uncertain future prospects.

The pandemic-induced crisis of the cruise industry has made the dramatic development of the German and European shipbuilding industry abundantly clear. Focusing on high-end markets such as cruise ships, yachts, naval vessels and other government vessels have been a successful approach to escape the distortions that have plagued the shipbuilding market for decades. European shipyards were left defenseless against the price dumping practices in conventional market segments, which have forced numerous production sites to close down. The cruise ship segment, the dominating market for Europe's shipbuilders with orders amounted to approx. 80 billion euros between 2016 to 2019 nearly completely dried up. While ship production stabilized in 2021 after an extremely weak previous year, the low order volume spells significant risks of underutilization of shipyards ahead.

The ongoing loss of substantial shipbuilding capacity is particularly worrisome in view of strongly growing requirements in Europe. In order to safeguard against the loss of strategic capabilities, existing framework conditions for the sector need to be corrected.

The maritime industry is a "freedom industry"

There is broad consensus in our soci-

Despite the record demand seen in some market segments, **Chinese shipyards are offering shipbuilding prices today which are up to 30 percent lower than 15 years ago** – although average wages in China have risen by nearly 400% within the same period.

ety that the use of Russian fossil fuels should be terminated as soon as possible. We express our respect and appreciation for the unequivocal commitment and decisive actions we have seen, especially from the Federal Ministry of Economics under Minister Habeck. The maritime industry plays a key role in the search for alternative solutions. The maritime sector connects the German economy with the world, enabling us to diversify our sourcing of energies, essential raw materials, and semi-finished products, and to reduce unhealthy dependencies. The maritime industry is a "freedom industry"!

This is why the dramatic development seen across Europe's maritime industry should sound alarm: While the global demand for new ships has doubled, orders placed in Europe have declined by another 20 percent, even compared to the extremely poor previous year.

In 2021, 85 percent of global orders went to China and Korea. Both nations' governments have been subsidizing their maritime industries massively for years. Even Japan, while maintaining a relatively high domestic demand, barely contributes 10 percent to the global order intake today. Europe's market share has dropped to less than 4 percent. At the same time, many maritime equipment suppliers report growing problems, especially in their business activities in China, a situation seen in other industries, as well. Problems include local-content requirements, discrimination, and interference by party officials.

A Dramatic Loss of Shipbuilding Capabilities

German shipyards can only accept orders based on fully cost covering prices. They can neither offer government-subsidies nor hope for the government to make up for their financial losses. Despite the record demand seen in some market segments, Chinese shipyards are offering shipbuilding prices today which are up to 30 percent lower than 15 years ago – although average wages in China have risen by nearly 400 percent within the same period. Korean shipyards which have kept up with this price competition recorded losses of $3.3 billion in 2021.

Without a fundamental change in shipbuilding policies, Europe will lose the capability to build seagoing merchant ships on any significant scale over the coming 10 years.

Already today Europe's shipping sector – and the German one disproportionately so – is highly dependent on supplies from China. German Shipowners have placed newbuilding orders worth 4 billion euros. 55 percent of them went to China and 44 percent to Korea, the G20 economy with the highest dependency on Chinese pre-manufactured products. While the shipping sector benefits significantly form state support measures, barely 1per cent of newbuilding investments remain within the EU.

Supported by European investments, China's influence on global freight transport is growing day by day

China produces 96 percent of all containers and 80 percent of all ship-to-shore cranes. China's enormous influence on the global freight transport has become evident in the context of the current disruptions due to Covid-induced port lockdowns. At the same time, China continues to expand its influence via favorable financing for newbuilding orders.

The German federal government has become aware of its painful dependence on Russian energy sources and is now taking decisive action to address this issue. VSM is calling on the federal government to learn from its past mistakes and counteract with the same determination the growing maritime dependence.

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