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Harbours review

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Safety Section

Promoting safety innovation at TOC Europe 2023

Photo: TOC Europe

The second instalment of **Safety Village** this June from 13th to 15th in Rotterdam – a unique initiative of **TT Club** and the **International Cargo Handling Coordination Association** – again set up a venue for workshops and panel sessions, providing opportunities for companies to showcase their innovative safety devices, processes, and services. Five two-hour-long, specially convened panel sessions, spread through three days, gave all aspects of safety in cargo handling an airing with the goal of advancing the cause of a more secure and sustainable environment for the goods and equipment featured in global trade. Click **here** to read the event's summary.

Preparing seafarers for decarbonisation & digitalisation

DNV has prepared ***The Future of Seafarers 2030: A Decade of Transformation*** report (commissioned by the **Singapore Maritime Foundation**), in which the classification society addresses the massive changes facing the shipping world, including new seafarer training and upskilling programmes to ensure operational safety. The study examines the implications of decarbonisation and digitalisation on workforce preparedness in the current decade. "New fuels and propulsion technologies, the growing importance of IT on board, ship-to-shore integration, and the emergence of shore control centres come with new challenges and opportunities for ship crews," DNV wrote in a press release. The class has also prepared **a slideshow summary** of the study into the future of seafarers.

Increasing European ports' vigilance against drug smuggling

TT Club and its partners from **BSI Screen** are drawing the port industry's attention to the exponential growth in contraband drugs entering Europe. In April-May 2023 alone, reports included finding cocaine in containers of fruit going through the Port of Antwerp; in Rotterdam, narcotics were discovered in reefers carrying melons from Panama; ecstasy with a value of 1.5m was intercepted in a truck at Calais, while 133kg of marijuana and hashish at the Port of Motril in southern Spain (brought in from North Africa); and news came of smuggling gangs with links to Brazil operating in Lisbon and Oporto. "These are just fragments of the evidence that we have of the crucial role ports are playing in the illicit drug trade across Western Europe," comments **Mike Yarwood**, Managing Director Loss Prevention at TT Club. **Erica Bressner**, BSI's European Analyst, adds, "Increasing awareness, particularly the role of European ports in drug smuggling, is crucial to restricting this trade, especially as indications show that smuggling at ports may be increasing for certain key narcotics, like cocaine. Europol has reported record-setting seizures of cocaine every year since 2017, particularly in seaports […]." She furthers, "In response, European port authorities have worked to implement additional security measures to combat this trade and its concurrent violence. However, the control of the criminal syndicates is such that they have the ability to adapt their smuggling routes to evade authorities. This includes a diversification of smuggling routes to target non-traditional ports of entry where security measures are less intensive." TT Club points out that criminals dispose of a sizeable toolbox of levers: from bribing transport & logistics workers, customs officials and police officers through threatening port workers and their families (often online and through social media) to online hacking to then set upon unsuspecting trucks drivers to steal the cargo unit with the contraband. Yarwood outlines one strategy, "Employee vetting and training both in terms of motivating them to be vigilant and loyal but also in terms of maintaining secure processes of documentation and online communication." He also advises, "Identifying the more common origin points of contraband cargo, such as South America and North Africa, and 'rogue' consignees and unexpected delivery points will help." A new 70-strong security corps was established in Antwerp, an increased number of CCTV surveillance cameras and drones got deployed in Rotterdam, and a specialist anti-drug trafficking police unit in the Netherlands was set up. "We are dealing with global crime syndicates. Efforts to combat their activities will be akin to squeezing a half-inflated balloon, we may constrict them in one or two ports, but they will find ways to exploit others. We urge all in our industry to be aware of the possibilities of drug importation and to take all steps they can to restrict this illicit trade," advocates Yarwood.

MACN has two new members

TT Club has joined the **Maritime Anti-Corruption Network** (**MACN**) – an over 180-member-strong global business network working towards the vision of a maritime industry free of corruption that enables fair trade to benefit society at large – in a move to underline further the mutual insurer's commitment to making the industry safer and more secure. "TT Club has long been aware of the issues surrounding corruption in the maritime transport industry. The insurer is dedicated to ensuring these corrupting effects on the overall integrity of freight transport worldwide are minimised, if not eradicated," the only non-P&I insurer to be part of MACN underscored in a press brief. TT Club will work with MACN in implementing its anti-corruption principles by raising awareness of corruption issues and promoting best practices to combat its effects. The insurer will also help the Network promote its drive for collective action with the aim of creating a more sustainable operating environment through anonymous reporting and data analysis. Moreover, through its experience and knowledge of shore-side operations, TT Club will widen the scope of MACN efforts to combat corruption beyond its current maritime focus. **Mark Argentieri**, TT Club's COO, commented, "At TT, we have aligned our ESG strategy with the UN Global Compact and its Sustainable Development Goals, becoming a signatory to the UN Principles for Sustainable Insurance (UN PSI) late last year. In now joining MACN, we are taking a further step in focusing on the issues that are most relevant to our Members, and where the Club is able to have a positive impact, cooperating with international institutions that are dedicated to ensuring increased transparency in maritime transactions and enhanced procedural integrity." The Helsinki-headquartered **ESL Shipping** has also subscribed to MACN. "Membership in MACN provides us additional tools to support our seafarers when they visit areas where the risk for bribery and corruption is high. Thanks to their large database, we will have a better understanding of what kind of issues might be expected in a certain port," explained **Kirsi Ylärinne**, the company's Operations & Environmental Director. **Mikko Rausti**, Sea Personnel, Quality & Safety Director at ESL Shipping, added, "When our vessel is to call a port where the crew is expected to face a risk of facilitation payments or other attempts of fraud or corruption, our safety function goes through the best practices according to internal and MACN guidelines with Master. Together they ensure that direct contact lines and procedures are established for each port call."

NCB Hazcheck-WWF anti-illegal wildlife trade co-op

The company specialising in cargo screening has teamed up with the **World Wildlife Fund** (**WWF**) to tackle the pervasive issue of illegal wildlife trade to "[…] safeguard endangered species and protect global biodiversity for generations to come," the two said in a press release. By developing an industry source for historical data from past seizures that can be integrated into a container line's internal cargo screening solution, or an industry tool such as **NCB**'s flagship software, Hazcheck Detect, WWF aims to enhance the screening efficiency of bookings and shipments. This data-driven approach will enable the detection system to accurately identify potential illegal wildlife shipments, bolstering the detection capabilities of carriers and contributing to the fight against illicit wildlife trade. "The current system and practice of cargo screening are not enough, and the shipping and maritime container industries need a shared technology solution to effectively screen shipments. And this is what the partnership aims to accomplish," underlined **Nicole Wong**, CEO of WWF Hong Kong.

Tangible benefits from applying modern safety tech

During a recent webinar, the **International Cargo Handling Coordination Association** (**ICHCA**) and its partners stressed the need to keep the wheels of innovation spinning to provide transport workers with ever-increasing workplace safety. According to ICHCA, there have been over 350 shore-based fatalities, including 349 port workers and 20 truckers globally, since 2000. **Richard Steele**, the Association's CEO, urged in this context, "The key thing that industry can do is to agree on common good practice and then act as champions, role modelling those good values and creating the expectation of standards across the industry." Safety and sustainability advisors from **Rombit** explained that technology in a driver's cab that constantly reminds workers to perform their tasks safely could significantly reduce accidents (by as much as 80%). Maintenance, energy and repair costs were reduced by around $5,000/vehicle/year from such innovations as the real-time digital coach. The company's CEO, **Evert Bulcke**, commented, "To be successful, you need training and procedures, supported by continuous training and alerting through digital tools." Another estimation, this time from the **US Occupational Safety and Health Administration**, says that around 70% of all lift and crane accidents could be prevented through training and the application of digital tools. Steele also agreed with **Steve Biggs**, Senior Assistant for the **International Transport Workers' Federation**, that changes to work practices must be agreed with staff, getting their 'buy-in,' as only then could new technological fixes and innovations in work practices be successfully applied. In a follow-up press release, ICHCA stressed that "safety rules need to be reiterated constantly, but that must be combined with visible and felt health and safety leadership from management to the shop floor. All of which can then be supplemented by tech that produces data and can monitor safety performance. In its continued campaign to encourage such innovation, ICHCA will once more launch the annual **TT Club Innovation in Safety Awards** on September 4th this year."

Password? Password

NordPass has conducted **research** according to which transport and logistics sector employees use very poor passwords to secure business accounts. The top three include the company's name, "password," and "123456." The researchers shared in a press release, "The world's wealthiest companies' employees love passwords that directly reference or hint at the name of a specific company. The full company name, the company's email domain, part of the company's name, an abbreviation of the company name, and the company product or subsidiary name are common sources of inspiration. These passwords comprise over half of the transportation and logistics list." **Jonas Karklys**, NordPass' CEO, commented, "On one hand, it is a paradox that the wealthiest companies on the planet with financial resources to invest in cybersecurity fall into the poor password trap. On the other hand, it is only natural because internet users have deep-rooted unhealthy password habits. This research once again proves that we should all speed up in transitioning to alternative online authentication solutions." According to **IBM**'s ***Cost of a Data Breach Report 2023***, stolen or compromised credentials remained the most common cause of a data breach in companies in 2022, accounting for 19%. To stay on the safe side, NordPass recommends ensuring company passwords are strong by creating random combinations of at least 20 upper- and lower-case letters, numbers, and special characters; enabling multi-factor authentication or single sign-on; critically evaluating whom to grant account credentials; and deploying a password manager/vault.

UCIRC – revised

Bureau International des Containers (**BIC**), the **International Chamber of Shipping** (**ICS**), and the **World Shipping Council** (**WSC**) have joined forces to update the **Unified Container Inspection & Repair Criteria** (**UCIRC**), which now includes inspection criteria for container depots and other container handover facilities to address pest contamination on and in containers. "Just as any major structural deficiencies must be repaired, any pest contaminants must be taken care of prior to the dispatch of the empty container to the shipper. The revised UCIRC make this clear and also expressly reference the recently updated **Prevention of Pest Contamination of Containers: Joint Industry Guidelines for Cleaning of Containers** by BIC, COA [Container Owners Association], IICL [the Institute of International Container Lessors] and WSC. The two publications in tandem demonstrate the commitment of the container shipping industry to play a proactive role in minimizing pest contamination via the sea container pathway," BIC, ICS, and WSC said in a press release.

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'Navigating the future: safety first!'

It will be the **International Maritime Organization**'s (IMO) 2024 World Maritime Theme, as its Secretary-General **Kitack Lim** proposed at the 129th meeting of the IMO Council. "This theme would allow us to focus on the full rangae of safety regulatory implications arising from new and adapted technologies and the introduction of alternative fuels, including measures to reduce GHG [greenhouse gas] emissions from ships as IMO strives to ensure the safety and efficiency of shipping are maintained, and potentially improved so that the flow of seaborne international trade continues to be smooth and efficient," he underscored. The Organization shared in a press release that it's working on several safety issues, such as the goal-based Code for Maritime Autonomous Surface Ships (MASS Code) or the assessment of safety risks that come with the introduction of new technologies and alternative fuels, likewise the development of regulatory measures to address and mitigate those risks. Next year also marks the 50th anniversary of adopting the International Convention for the Safety of Life at Sea.

Harbour masters add weight to a group seeking action on crucial safety issues

The **International Harbour Masters Association** (IHMA) has signed a memorandum of understanding, joining the **Cargo Incident Notification System** (CINS), the C**onfidential Human Factors Incident Reporting Programme** (CHIRP), the **Container Owners Association** (COA), the **International Cargo Handling Coordination Association** (ICHCA), and the **Ship Message Design Group** (SMDG) in their joint work on improving safety during the global transport and handling of goods that have the potential to cause injury to the workforce and/or damage to the environment. Thanks to the MoU, the industry bodies will be better able to coordinate data and share research and best practices across global cargo supply chains to further develop awareness throughout the freight industry amongst operators, regulators, and policymakers as to practical and effective measures to improve safety. "It is a first-class addition to have the IHMA on-side because harbour masters play a crucial role in both maritime safety and the ship-shore interface. Their leadership on navigational safety, along with an essential contribution to wider operational safety, security and environmental protection, puts them at the crossroads of the activities that the MoU partners are seeking to continuously improve," **Richard Steele**, CEO of ICHCA, said while welcoming IHMA to the initiative.

The CTU Code – surveyed

The Polytechnic University of Turin carried out a **study** into the Code of Practice for Packing of Cargo Transport Units (**CTU Code**; jointly published by the **International Maritime Organisation**, the **International Labour Organization**, and the **United Nations Economic Commission for Europe**) and its application by shippers and forwarders. According to the research, the benefits of adhering to the CTU Code include improved safety, reputation, and supply chain coordination; decreased cargo damage, environmental impact, and operational inefficiencies; those using the CTU Code incurred no extra costs in employees, contractors, or vehicles; any increase in loading and waiting times were typically offset by CTU Code-related efficiencies overall; annual costs and penalties reduced from 670k pre-implementation of the Code to 13k post-implementation; and extra costs as a percentage of revenue reduced from 37% to 10%. Authors of the study also underlined that the "[…] use of the CTU Code provides an increase in safety with a drastic reduction of loading accidents and damage to goods, as well as important benefits in terms of costs, improved efficiency, corporate image and reduced environmental impact." Commenting on the results, **Richard Steele**, CEO of the **International Cargo Handling Coordination Association**, said, "As far as we are aware, this is the first example of publicly available empirical evidence about the use of the CTU Code made by forwarders, shippers and others responsible for safe packing. Notwithstanding the regional focus of this particular survey, we believe the results to be genuinely encouraging. They show that good operational management, efficiency and safety are partners, not opposites." The **Cargo Integrity Group**, gathering seven industry bodies dedicated to container safety, published a **Quick Guide** to the CTU Code to facilitate a greater understanding and broader use of a lengthy and complex document. The Guide includes an editable and saveable checklist of actions and responsibilities for the guidance of those packing cargo in containers.

TT Club introduces Risk Bytes

The international freight transport and cargo handling insurer released the first of a series of advice documents designed to provide a snapshot of the risks associated with day-to-day operating dangers that may not be recognised or, if they are, not sufficiently covered by the relevant insurance policies. Risk Bytes are aimed at simplifying complex risk issues by providing easily digestible information and guidance. **The first publication tackles good neighbour agreements**, outlining provisions that should be made in a formalised written contract, clarifying where the risk and liability rests during the operation of any shared asset and allowing thorough due diligence to be carried out before the agreement is signed. While TT Club applauds equipment-sharing agreements as an efficient use of resources, the organisation also flags potential liability issues if appropriate insurance coverage is not in place. "Sharing infrequently used equipment gives greater flexibility in operations and has significant cost savings. Usually reciprocal arrangements, they are not always formally outlined in well-defined contracts," TT Club noted in a press release. **Mike Yarwood**, the insurer's Managing Director, Loss Prevention, underlined in this regard, "In such circumstances, the casual nature of the arrangement, though often workable and agreeable to both parties, can lead to potential risks where liability and responsibility in the unfortunate event of an incident or breakdown may not be clear." He furthered, "[The primary risk is] in the event of the equipment or machine being lost or damaged during the period of the loan leading to financial exposure for the owner. In addition, this might severely impact business operations and cancel out any benefit gained from the arrangement, and severely damage years of a good working relationship with the neighbour." Yarwood additionally underscored that through Risk Bytes on good neighbour agreements, TT Club is also "[…] offering advice on adequate staff training, health and safety provision and include a readily recognised case study of a typical asset sharing operation."

Photo: TT Club

The WSC Whale Chart


Photo: Canva

The **World Shipping Council** (**WSC**) launched a navigational aid called the **WSC Whale Chart**, the first worldwide mapping of all mandatory and voluntary governmental measures to reduce harm to whales from ships. "With the WSC Whale Chart, seafarers will, for the first time, have a comprehensive global resource offering critical navigational coordinates and concise graphics to identify routing measures and areas subject to static speed restrictions designed to protect whales and other cetaceans. We hope that by compiling this unique navigational aid, keeping it updated and making it available for free to all navigators, we can help reduce ship strikes and safeguard endangered whale populations across the globe," highlighted **John Butler**, President & CEO of the WSC.

PCC Intermodal connects Poland and Italy

After trialling the route in July 2023, the Gdynia-based company decided to kick off a rail container service (incl. bulk, tank & reefer) between its terminal in Gliwice and the Padova Interporto Terminal this August. PCC Intermodal is prepared to offer up to five weekly round trips for train sets comprised of around 20 wagon platforms, including 60, 80, and 90 ft. Traction will be provided by Captrain Poland and Captrain Italy, with PCC Intermodal supplying the wagons.

Malungsfors added to Green Cargo's network

As of the coming December, the terminal in west-central Sweden will be part of the country's state rail haulier's chain of loading points, connected to Gothenburg with three weekly round trips. The inclusion results from an agreement between Fiskarhedens Trävaru, a privately-owned sawmill in northwest Dalarna (375k m³/year) and the operator of the Malungsfors terminal, Green Cargo, and the Gothenburg-based logistics company Träfraktkontoret (handling some 75k TEUs/year of forest product exports). Earlier, Fiskarhedens Trävaru had one per week connection with Gothenburg, while the new deal already includes the possibility of upgrading the timetable to five weekly runs (intermodal as well as wagon loads). "This agreement is beneficial not only for Fiskarheden but for all companies across the region since they will be able to shift their shipments from road to climate-smart rail, which means stronger export and import opportunities for the region," underlined Joakim Limberg, Marketing Manager at Fiskarhedens.

New ro-ro company to traffic between Poland and Sweden

Wallenius and Greencarrier have set up a new shipping line, Lakeway Link, that will connect the Swedish ports of Södertälje and Västerås with the Polish Gdynia and Gdańsk. The twice-a-week service, intended to kick off at the end of this year, will be operated with Mälarmax vessels for carrying wheeled cargo, including high & heavy. "Lakeway Link will open the waterway between important logistics points in Europe that previously could not be reached efficiently by sea. This is positive from a sustainability point of view as it reduces emissions while contributing to more efficient flows and decreased heavy traffic on the roads," Fredrik Hermansson, CEO of Greencarrier Liner Agency Sweden, said. Göran Söderdahl, Global Senior Commercial Manager at Wallenius Marine, added, "Lakeway Link will strengthen the development of Swedish shipping. We will design and build new vessels based on the latest technology, contributing to more sustainable logistics in both the Baltic Sea and our inland waterways, where Lake Mälaren plays a major role. The ships will be designed to handle different types of cargo as well as socially beneficial missions, such as sea rescue."

Hupac links Poland and the Netherlands

As of 2 May 2023, the company's trains are shuttling two times per week between Hupac's terminal in Warsaw and CLdN's facility in the Port of Rotterdam (from which direct sea connections to Ireland, Portugal, and the UK are available).

Norrköping added to MSC's Baltic Loop 11…

The Swedish port is now part of the sea container service that connects the region's Tallinn, Norrköping, Lübeck and Åhus with Antwerp. "We are very proud about this. It is good for our customers choosing to ship containers to & from the Port of Norrköping. It provides additional opportunities to reach overseas markets as well as new short-sea options from Lübeck and Tallinn," said Magnus Grimhed, the port's Marketing & Sales Manager.

Photo: Port of Norrköping

… while Halmstad added to the Belgium-Denmark loop

The Swedish seaport (part of the Port of Halland) is, as of 1 June 2023, included in the weekly sea container service of MSC that also calls to Antwerp and Copenhagen. The inaugural berthing was carried out by the 161 by 25 m *MSC SUEDEROOG* F, offering 1,368 TEUs of capacity. According to the port authority, the addition has the potential to up Halmstad's yearly container traffic by as much as 25%. The service is expected to carry household, electronic and fast-moving consumer goods, as well as recycled materials and forest products


Photo: Port of Halland

New Lithuania-Poland rail service

The Lithuanian LTG Cargo and its Polish chapter LTG Cargo Poland had been testing (on-demand basis) the Kaunas-Sławków route for the first half of this year; as of 15 June 2023, the intermodal connection, with a stopover in Pruszków at METRANS' terminal, became a regular twice-a-week one.

Stena Line takes over the ferry & ro-ro terminal in Ventspils

For an undisclosed sum, the Swedish shipping line has acquired the operations of the facility in question in the Latvian seaport (the acquisition is subject to authority approval for competition compliance). "The Baltic Sea is a major growth region for Stena Line, and our investment in Ventspils shows how committed we are to developing our business with Latvia. With this strategic move, we have secured a long-term position in an essential part of our European network, and I am looking forward to working with our customers and partners to continue expanding in the region," commented Niclas Mårtensson, Stena Line's CEO. The sister ships *Stena Baltica* and *Stena Scandia*, each offering room for 970 passengers and 2,875 lane metres for freight, serve the Ventspils-Nynäshamn crossing.

Stena Line discontinues its Hanko-Norvik ferry service…

The crossing remained operational until 20 October 2023, after which the service's ro-paxes *Urd* and *Stena Gothica* (each offering room for 186 passengers and 1,598 lane metres for cargo) had to find new employment (either redeployed within Stena Line's network or chartered out). "Due to the development of the current geopolitical situation, the previous volumes have been reduced, and services on the market have become saturated. As a result, the demand from Stena Lines trade customers on the route has not developed as expected," the Swedish shipping company wrote in a press release. Stena Line also says that the Finnish government's decision to grant an exemption from the European Union Emissions Trading System from 1 January 2024 for vessels trading via the Åland Islands will also create an uneven commercial landscape with a clear advantage for that trade lane. The Hanko-Norvik route was launched at the beginning of 2022.

… and Fjord Line terminates its Norway-Sweden crossing

As of 29 October 2023, the Norwegian shipping line no longer sails between Sandefjord and Strömstad. The service has been operated since 2014 using the *Oslofjord* ferry (room for 1,770 passengers and 720 lane metres for freight). The company intends to dispose of the ro-pax. Fjord Line said in a press release that it'll focus on its crossings between Denmark and Norway: Hirtshals-Stavanger-Bergen and Hirtshals-Kristiansand. In effect, Color Line's *Color Hybrid* (2,000 pax/760 lm) has remained the only one on the Sandefjord-Strömstad route.

New Denmark-Germany rail link

Samskip has launched a new combined service for unitised freight between its terminal in Duisburg and Padborg. Traction for the thrice-a-week 40-unit capacity connection is taken care of by TX Logistik. At the same time, the company has put in motion three other services linking the Samskip Terminal Duisburg: to Padua (four/week) and Verona (3/w) in Italy and with the French Macon (4/w). "At a time of heightening driver shortages across Europe's road haulage sector, the new rail service additions build reliable, efficient and sustainable rail service capacity along four major European routes, each connecting Duisburg direct with leading regional centres for unitised freight," Samskip underlined in a press release. Samskip shared that its eight 720m-long tracks facility in Duisburg handles up to 250k units/year.

Malmö added to X-Press Feeders' GSX service

The Swedish part of Copenhagen Malmö Port has been included in the weekly feeder loop that connects Hamburg and Bremerhaven with Malmö, Åhus, and Södertälje. The Germany Sweden Express (GSX) is served by the 101 by 18 m, 509 TEU-capacity *Anna G*.

Finnlines takes delivery of the first Superstar

After just over two years of construction, the company took hold of *Finnsirius*, the first 235.6 by 33.3 m ferry in a series of two. The 1 A Super ice class ro-pax, offering room for 1,100 passengers and 5,200 lane metres for cargo, will start plying across the Naantali-Långnäs-Kapellskär crossing this September. Her sister ship, *Finncanopus*, is expected for delivery before year-end. The two feature several emission-reduction technologies: air lubrication, battery systems, scrubbers, and waste heat recovery. They will also take advantage of the automooring technology and draw power from onshore power supply facilities. *Finnsirius* and *Finncanopus* are also equipped with ballast water treatment systems. "Finnlines' Green Newbuilding Programme [€500m in total] has been a massive investment which will benefit our freight customers and private passengers. These hybrid ro-pax vessels are not only the largest in the company's fleet so far, but they transport cargo in a more sustainable manner. For example, the vessels have been equipped with enormous high-powered battery banks and onshore power supply in order to have zero emissions while at port. In addition, port operations will also be more efficient with auto-mooring," highlighted Tom Pippingsköld, President & CEO of Finnlines.

Photo: Finnlines

ForSea becomes Öresundslinjen

Following the takeover by Molslinjen, the ferry line operating the Helsingborg-Helsingør service has been further integrated within the group. The ferry Tycho Brahe, which returned on the route on 4 October 2023 after a planned docking, is the first to fly the new livery: logo, colours, and interior. Öresundslinjen joins the group's Alslinjen, Bornholmslinjen, Fanølinjen, Langelandslinjen, Molslinjen, and Samsølinjen. ForSea got its name in 2018 after a change from HH Ferries.

Finnsirius enters traffic…

Finnlines' newest flagship ferry of the Superstar class has started sailing between Naantali and Kapellskär via the Åland Islands' Långnäs. The ro-pax, offering room for 1,100 passengers and 5,200 lane metres for cargo, replaced *Europalink* (554/4,215). *Finnsirius*' sister ship, *Finncanopus*, will substitute *Europalink*'s sibling, *Finnswan*, next year. The 235.6 by 33.3 m 1A Super ice class new-builds feature several emission-reduction technologies, such as air lubrication, batteries, scrubbers, and waste heat recovery. They also have ballast water treatment plants. *Finnsirius* and *Finncanopus* will also take advantage of auto-mooring and draw power from the shore while berthed (thanks to the multi-million investments made by the ports in Naantali and Kapellskär).

Photo: Przemysław Myszka

… while *Europalink* is back in the southern Baltic

The 2007-launched 218 by 30.5m ferry, with room for 554 passengers and 4,215 lane metres for wheeled cargo, has returned to serving its maiden route between Malmö and Travemünde. *Europalink* joins *Finnfellow* (452/2,200), *Finnpartner* (274/3,052) and *Finntrader* (274/3,052) on Finnlines' Germany-Sweden link. In addition to the move, the ferry was moved from Finnish to the Swedish ship registry.

Victoria I – back in the Baltic

Tallink & Silja Line's ferry, providing accommodation services in Scotland from July 2022 to August 2023, is sailing between Helsinki and Tallinn again. The vessel departs from Tallinn at 12:30, arriving in Helsinki at 16:00. The return leg starts at 18:35 and ends at 22:00. The ro-pax offers room for 2,500 passengers and 1,030 lane metres for cargo. The reintroduction of *Victoria I* restores the company's daily departures between the two seaports to the pre-pandemic level of 14. "Passenger numbers on the Tallinn-Helsinki route have shown steady growth, and customer demand is there for the cruise product to return, so I am pleased that we are able to meet that demand," Paavo Nõgene, CEO of Tallink Grupp, commented.

Photo: Tallink Grupp/Marko Stampehl

Tanker cold ironing in Gävle

On 16 November 2023, Terntank's *Tern Fors* drew electricity from the shore, marking a new milestone for the development of onshore power supply (OPS) in seaports (as apart from Gävle, only the Port of Long Beach at BP Terminal's Pier T offers OPS, 8.0MW at 6.6kV, for tankers). The tanker was connected for over three hours, consuming 1,424kWh, and it used the electricity to run its unloading equipment (the vessel is equipped with battery packs, ensuring no blackout will occur if the OPS connection is lost). To enable safe cold ironing, the containerised OPS unit on the quay was overpressurised with air so that no gases could enter it, while the connecting room on board the tanker was filled with nitrogen to keep the oxygen level below 5% to prevent any sparks from leading to explosion. Terntank and the Port of Gävle already 'plugged in' *Tern Fors* in February 2023 but with no electricity transfer. Gävle also partakes in the Green Cable project, led by the Port of Gothenburg, which is tasked with devising a global standard for tanker cold ironing in hazardous environments.

Helsinki's new smart check-in gate system

With the help of Visy, the Finnish seaport has put in place a solution that weighs, measures, and photographs passenger cars & trucks at the West and Katajanokka harbours. The system – consisting of scanner-based preliminary vehicle identification points, automatic barriers, and display panels guiding drivers to the right lane – identifies the vehicles using a camera and automatically verifies their permits when they approach the check-in area. All vehicles are measured, while lorries are also weighed and have their condition recorded. The Port of Helsinki has received EU financial support for implementing the project, with the funds used for planning, placing the infrastructure, developing the system, and procuring & installing the required hardware.

Maersk's first methanol feeder – christened

The 172m-long container ship of 2,136 TEUs capacity got the name *Laura Maersk* from her godmother Ursula von der Leyen, the EU Commission President, in Copenhagen. The feeder is the first in an overall 25-big order of container carriers able to run on methanol, the last of which will be delivered in 2027. *Laura Maersk* and the others will help Maersk reach its 2040 zero greenhouse gas emission target. The company plans to transport at least a quarter of its ocean cargo using green fuels by 2030. Maersk has also invested in e-methanol production capacity in Spain, some 2.0mt/year. *Laura Maersk* serves the Rotterdam-London-Felixstowe-Gothenburg-Aarhus rotation.

Photo: Maersk

Kokkola's new STS

The Finnish seaport has received a gantry for handling containers to be deployed at Silverstone Port. The ship-to-shore (STS) crane has been purchased from the BCT Baltic Container Terminal Gdynia for an undisclosed sum. The new equipment will help the Port of Kokkola handle more containers and in a faster manner (8,802 TEUs went through its quays over January-September 2023, +13.2% year-on-year, according to statistics from the Finnish Ports Association). "We have had loyal container transport customers since 2009 from, among other things, the KIP [Kokkola Industrial Park] area, industry in central Finland and the retail trade. There is now a sharp increase in container traffic in the Port of Kokkola, and we have received strong feedback and several requests from customers to increase our container handling capacity. At the same time, the size of container ships is increasing all the time, which the 17-container-row crane suits perfectly. This crane investment is our answer to our customers' needs, and it also improves our service to our partners," commented Torbjörn Witting, the Port of Kokkola's Managing Director..

Port of Hirtshals' new tugboat

Having arrived in early autumn, with its crew undergoing training exercises, *Sibba* began assisting the ferry traffic served by the Danish seaport at the beginning of November 2023. "The new tugboat was chosen precisely because it can operate in the sometimes intense wind conditions in Hirtshals. In addition, we are enhancing safety for existing and future customers, partly because the new tugboat has a bollard pull, which is the number of tonnes a tugboat can pull in a standstill, of over 30 tonnes, which is more than twice as much as the old one," highlighted Robert Hansen, Master Mariner and Fleet Manager at Port of Hirtshals. The port's former tugboat, built in 1979, was handed over to her new Danish owner on 1 December 2023. "*Tybring* is of good size and is therefore relevant for many different purposes, and we have received quite a few inquiries from serious buyers. We are very pleased that a purchase agreement has now been reached, which means that the tugboat will have a new lease on life," commented Hansen. The 18.7 by 9.2 metres, azimuth stern drive-type Sibba was built in 2019 by Sanmar Shipyards from Türkiye. The construction of the tugboat was based on Robert Allan's RAscal 1800 design. The ship has two Caterpillar C32 main engines, each producing 970kW at 1,800 revolutions/minute to achieve a bollard pull of 32t and a speed ahead of 12 knots.


Photo: Port of Hirtshals

BPO Ystad Climate Declaration

The Members of the **Baltic Ports Organization** recognize the growing, negative impact climate change has had on Earth's ecosystem and the human society in the last decades. We strongly believe that combating climate change is the responsibility of all, including the businesses forming the transport, shipping and port sectors.

As representatives of the port sector in the Baltic Sea Region (BSR), we declare our readiness to put forth the best effort to reduce greenhouse gas (GHG) emissions from port activities, inspire environmental consciousness and cooperate with business partners and a wide range of stakeholders in order to protect our climate.

With the European Green Deal, and the adoption of various associated initiatives, such as the Fit for 55 package, the European Commission set the course towards a climate neutral European Union. The maritime industry is called to contribute its share to the ambitious goals laid down by the policymakers. The push towards the greening of maritime transport, both in Europe and on a global scale, further underscored by the recent approval of IMO's GHG Strategy, is one of the defining factors shaping the future of the maritime transport sector.

At the same time, recent events made clear the crucial and strategic role seaports play for Europe's economy, and the continuous efforts aimed at decarbonization and Europe's energy independence. As the gateways between road and sea transport, ports ensure the security of supply of goods and materials and fuel Europe's uninterrupted development. With sufficient support, this unique position will allow them to take an active role as enablers of change.

While we support the plan formulated by the European Commission, we also firmly believe that only through a practical and rational approach, combined with transparent dialogue between the involved parties, a carbon neutral Europe can be made a reality. The goals need to be achievable, the road to meeting the targets set clearly outlined, and the necessary financial and legislative support provided.

Over the years, the Baltic ports' achievements in the field of environmental protection and climate responsibility allowed them to develop a set of good practices positioning the Baltic Sea Region (BSR) as a role model for green transport. By embracing technologies such as on-shore power supply (OPS) systems and alternative fuels, including, among others, hydrogen, ammonia and methanol, early on, Baltic ports and their partners already started paving the way for a green future. Furthermore, numerous Members of the BPO have set their own GHG emission reduction and "zero-emission" goals, exceeding those proposed by international organizations.

Our most recent initiative – **Baltic Ports for Climate** – is aimed at the further development and construction of OPS installations in ports located in the BSR, expanding the already existing OPS network. At this point in time, OPS usage on a broader scale is hindered by the lack of uniformity between the grids and electricity networks on ships. Further standardization is necessary, and that requires cooperation.

It is clear that the tasks at hand can only be completed by working together. We declare our continuous willingness to share the experience we have gathered and cooperate with the maritime community and the policymakers with a single goal in mind – to help propel Europe into a green era characterized by responsibility, resilience and competitiveness.

September 8, 2023, Ystad, Sweden

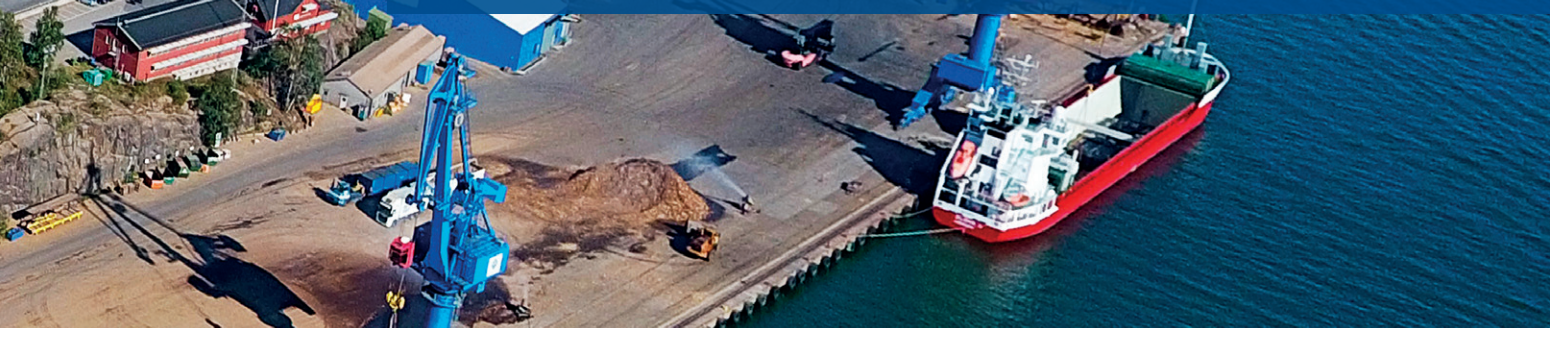
BPO BALTIC PORTS ORGANIZATION

THE ALL INCLUSIVE PORT

Location, location, location.

Let's repeat that one more time. Location. It's important for every property. And perhaps especially so for ports. Take the Port of Oxelösund for example. Draw a circle around the whole Baltic Sea and we're pretty much in the middle. Close to everything. Convenient for transports. And speaking of logistics, how about our direct access to both railway and motorway E4? And our 16,5 meter port depth, ice-free all year round? That's what we call location, and it's worth saying more than once.

The Port of Oxelösund is more than a port. We are a business partner who solves your logistical challenges and helps optimize your goods' journey, from start to finish. Our goal is to be the Baltic's leading port terminal, with Europe's best stevedoring services.



oxhamn.se

Port of Oxelösund

Photos: Pixabay

Applying AI-powered data technology to benchmark ESG performance and tackle EU ETS challenges for shipping

The new green currency

by **Steve Marshall**

Regulatory requirements and competitive pressure drive the accelerating trend towards sustainability in shipping. The ability to benchmark fleet performance against key environmental, social & corporate governance (ESG) metrics will be vital for future commercial success in an increasingly green-focused market, according to maritime data and technology firm OceanScore.

OceanScore

OceanScore is a Hamburg-based provider of sustainability data and compliance solutions with a strong maritime background. The company offers a range of ESG solutions tailored to the industry's unique needs. Click oceanscore.com to learn more.

"While many shipping companies are promoting ESG strategies to raise their profile in the market, this needs to be supported by reliable, trustworthy and transparent data that enables stakeholders to make commercial decisions based on actual fleet performance," says Albrecht Grell, Co-Managing Director of OceanScore.

He also believes that whereas price and profitability have previously been the fundamental determinants of charter awards, financing and investments, ESG data represents the new green currency that will determine value creation for shipping companies as we advance amid stricter regulations and commercial pressure.

"There are increasing demands from banks, financial institutions and investors for ESG data to inform their decision-making as well as from charterers and cargo owners, underpinned by market initiatives such as the Poseidon Principles for banks and Sea Cargo Charter for bulk ship charterers geared to decarbonising the entire supply chain of shipping," notes Grell.

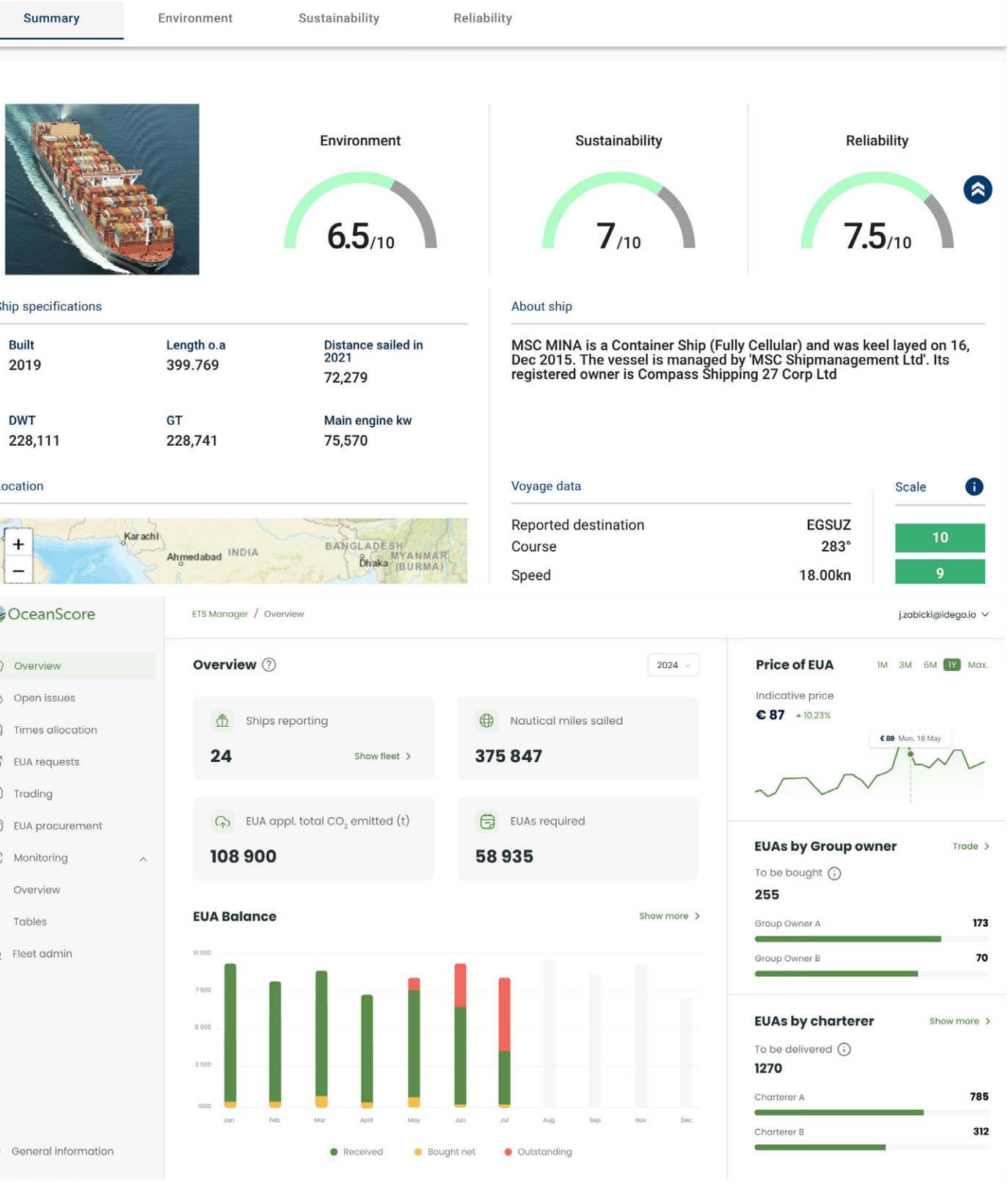
Trustworthy and transparent data

Recognising this need, the Hamburg-based OceanScore has built a digital platform that monitors the performance of the entire global fleet of 125,000 commercial vessels, enabling diverse industry stakeholders to benchmark ship operations against sustainability goals.

The artificial intelligence (AI)-powered platform uses proprietary engineering algorithms and advanced regression models to analyse data from multiple sources, including the EU's MRV (Monitoring, Reporting and Verification) and other reported vessel data.

As well as comprehensively tracking emissions (CO_2, SO_X, NO_X, and particulate matter), the platform records a further 50 ESG scores around vessel safety and reliability, environmental performance and adherence to the United Nations Sustainable Development Goals (SDGs). These include, for example, wage levels for crew and vessel safety incidents.

Grell says OceanScore is working with Scope Ratings, Europe's leading rating agency, to validate its scores independently. "This is part of the platform's transparency policy to ensure objective,



unbiased and high-quality data that can be trusted," he explains.

Therefore, its data provide a sound basis for decision-making for ship managers, cargo owners, ports, banks, investors, insurers, protection & indemnity clubs, and other stakeholders. The platform is also designed to facilitate collaboration and data-sharing among industry players, providing a single source of verified data visible to all parties for tracking vessel and ship managers' sustainability.

Higher level of accountability

Grell says a major concern for the industry is the inclusion of shipping into the

EU Emissions Trading System (EU ETS) from next year. This event will impose a higher level of emission accountability for companies extending beyond annual reporting under the existing MRV regime, with the risk of heavy financial penalties or even expulsion from EU trading in the event of non-compliance.

This means shipping companies will be required to acquire and trade so-called EU Allowances (EUAs), or carbon credits, to cover the cost of their emissions in a given year, which could leave them with huge financial liabilities given a current market price of around €90 per tonne of CO_2 emitted.

OceanScore's Co-Managing Director Ralf Garrn explains that the regulation poses issues such as how to accurately monitor emissions, how to acquire and trade EUAs, which trading platform to use, how to achieve the best price, how many EUAs should be purchased, and who should pay for carbon credits. "With the clock ticking to implementation of the EU ETS, shipping companies need to understand the practical implications and initiate efficient systems to address these issues and ensure compliance. A solid monitoring solution, properly covering the many different options to deal with the ETS regime, is a necessity given the complexities of shipping and the ETS regulation," Garrn advises.

Therefore, in a further evolution of the platform, OceanScore has launched an integrated solution that enables ship operators to both manage emission liabilities and trade carbon credits under the impending EU ETS regime for shipping.

The web-based ETS Manager is designed to manage and monitor the entire process from automatically ingesting vessel operational data, assessing the need for EUAs, allocating them to owners or stakeholders, requesting and accounting for them, and tracking open positions. The solution incorporates the advanced trading tool EUA Trader, powered by RWE Supply & Trading, to buy and sell EUAs (also available as a standalone application).

EUA Trader tracks the market price of EUAs and facilitates the buying and selling of carbon credits on the RWE Supply & Trading platform through a simple operation that is fully integrated into OceanScore's ETS management platform, with the ability to buy incremental volumes as needed and forward trading flexibility to hedge the risk of price changes.

Grell says the ETS Manager is rapidly gaining traction among European and non-European clients ahead of the three-year phased implementation of the EU ETS from 1 January 2024, with OceanScore investor Döhle Group among several pilot customers. "The industry faces a major challenge to navigate the complexity of the new regulation and mitigate financial risk due to the requirement to purchase carbon credits to cover the cost of emissions, which will reach €8 billion or more annually," he calculates.

Grell furthers, "The interplay between owners, managers and charterers creates significant complexities unique to shipping and poses potentially significant risks, especially for ship managers, if not managed properly. Excel alone will not be sufficient to maintain transparency and control of these processes." He says OceanScore's comprehensive solution, characterised by a high level of automation to reduce administrative workload and issues with wrong data entries, is geared to "simplifying complexity" for shipping companies to help them navigate the difficult path to EU ETS compliance.

"Harnessing the power of new AI-driven technology to process vast volumes of vessel data will be vital to enable shipping to meet market and regulatory challenges in the relentless green shift for decarbonisation of the industry," Grell continues. Moreover, he highlights, "OceanScore can also function as a one-stop shop for stakeholders such as ports that need to determine the emission levels of multiple vessels from different ship owners and managers or cargo owners that need to assess the carbon footprint of different fleets to ensure they remain within their sustainability targets."

A high level of confidence

OceanScore recently gained a strong endorsement for its solution with an oversubscribed seed funding round that saw several high-profile investors commit capital for expansion of the platform, including global container shipping giant MSC as well as the Döhle Group, the Schoeller family (shareholders in Columbia Shipmanagement and Scope Ratings), TecPier, and Israel's theDOCK.

MSC's Group President Diego Aponte comments, "We have decided to leverage OceanScore to provide better visibility on the environmental and broader sustainability performance of ships in our fleet." New investor theDOCK's Nir Gartzman adds, "OceanScore's analyses are predicated on advanced data science and deep engineering expertise to provide effective decision-support tools to optimise sustainable fleet management. This gives us a high level of confidence in its solution." ■

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Baltic Transport Journal

Photo: Kaupo Kalda

Helping the winners of the future

by **Jaana Niemi**

In August 2023, Nortal, a multinational digital transformation and strategic change company that has been digitalising ports for more than 20 years, announced cooperation with MODI, an international leader from Germany in biometrical vision and entrance solutions. This partnership means a leap forward to providing a groundbreaking passenger experience across European and North American ports.

Nortal has extensive experience bringing the port, ferry, cruise and maritime cargo sectors on board the digital revolution. The Smart Port solution – the company's innovative answer to streamlined port management – blends service design, data, the Internet of Things (IoT), and automation to redefine interactions from digital environments to physical contact points in terminals.

Staying relevant and efficient

The Smart Port solution includes terminal management and gate operating systems, a digital check-in, and terminal automation components – an overall setup built and continuously developed based on market feedback and needs. Nortal has successfully implemented its solutions in more than 15 Baltic seaports.

Among many, the Smart Port system has improved efficiency and brought significant environmental savings at the Port of Tallinn: a 44% reduction in waiting times during check-in & boarding and a 95% faster pass-through rate in automated lanes (max two seconds), resulting in shorter turnaround times for ferry operators. The system also brought about a 75% reduction in terminal operational staff (check-in and marshalling); very high passenger and employee satisfaction; comprehensive real-time access to terminal data (personalised for different internal and external stakeholders); and optimal use of terminal space (e.g., serving several parallel operators and departures and the ability to add additional departures).

The results are achieved through a 'factory-like' system that automatically collects all traveller and vehicle data without stopping (including license plate numbers, vehicle weight & dimensions, and the like). The system also guides traffic through the terminal more efficiently and sustainably by using IoT-controlled automatic gates, traffic lights and screens. It also dynamically adjusts the terminal space to fit the loading requirements of the next vessel, and precisely sorts the vehicles into various loading groups as requested by the ferry operator.

"We see ports struggling with lack of efficiency, poor passenger experience, meeting sustainability goals and getting on track with the data game in our everyday work," says Kadri Haufe, Head of Smart Port Advisory at Nortal. She furthers, "Uncertain volumes development coupled with a highly competitive landscape requires ports to keep adapting to stay relevant and efficient.

Nortal

Nortal is a fast-growing, impact-driven global company and a strategic partner for governments, healthcare institutions, the maritime industry, leading businesses, and Fortune 500 companies. With a solid physical presence in North America, Europe and the Middle East, plus an international talent pool, the company can shape tailored ecosystems and future solutions that are human, data-driven, and safe. Go to nortal.com/smart-port-solution to learn more.

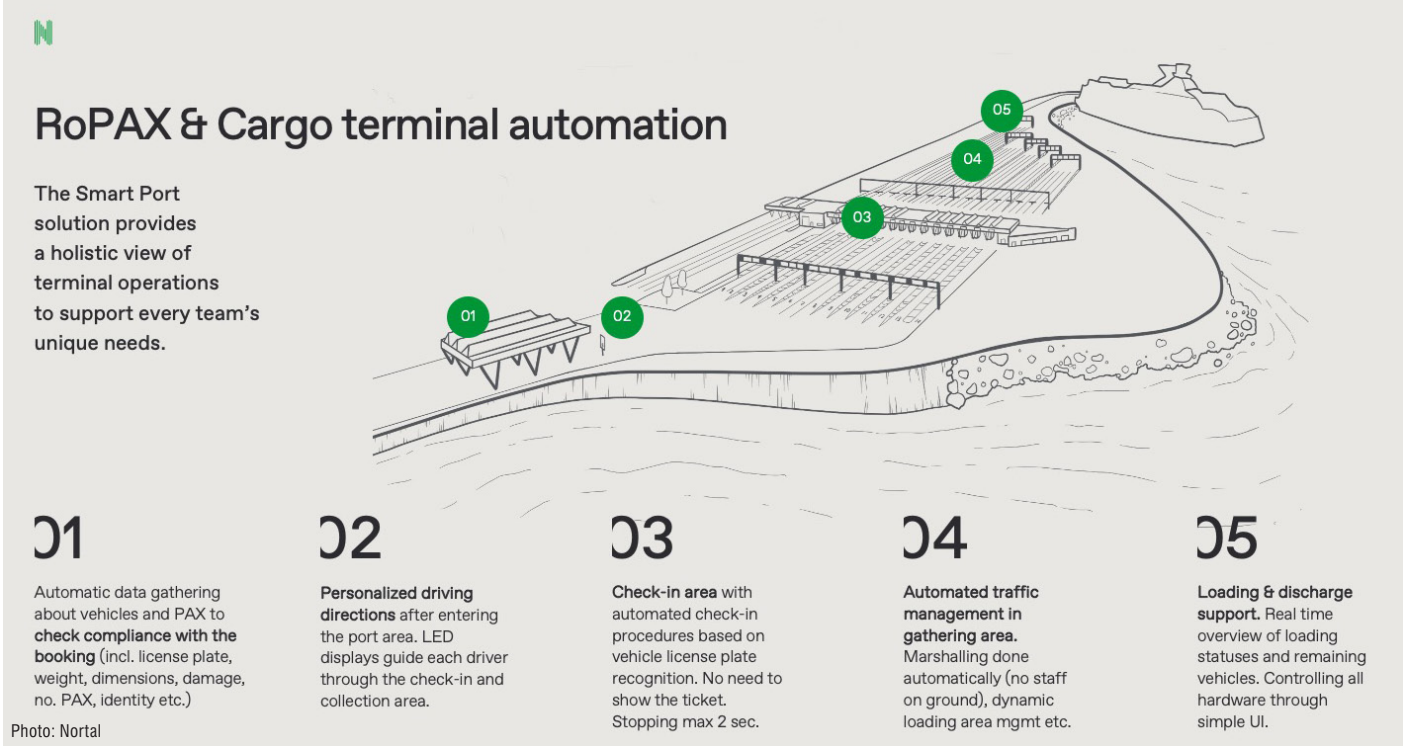

Photo: Nortal

The winners of the future will be the most efficient players."

Flowing freely

Nortal is continuously looking for opportunities to support and future-proof ports. While the company has a hardware-agnostic software solution that can easily integrate with legacy and most modern solutions, it prefers best-in-class, proven and tested technology that brings real value to the process. "Cooperating with MODI fits these principles perfectly. We aim to help ports achieve high-level efficiency, provide excellent customer experience, and meet their sustainability goals. Cooperation with MODI supports each of those elements," underlines Haufe.

MODI, Nortal's cooperation partner, has specialised in biometric systems and identity validation tools for commercial and government applications worldwide for over two decades. MODI Vision has developed a free-flow, on-the-move facial recognition with a unique, patented camera technology (currently the most innovative technology in terms of speed, resolution, and image quality). "After we introduced the Paperless Airport already years ago, MODI GmbH is now focusing strongly on the port of the future. MODI, in collaboration with Nortal, will carry out this necessary development for the maritime industry in the digital age," shares Dieter Klawunder, CEO of MODI. He also notes, "The biometric facial recognition offers several advantages, including a much more convenient boarding process for passengers. Verifying passport data and secure identification also significantly enhance security and improves flow at the border control points in the ports."

Nortal and MODI have developed an initial concept with integrated biometric facial recognition for ferry ports and cruise terminals. For passengers and drivers, this solution would first mean enrolling their biometric information (taking a selfie) and verifying their travel documents before arriving at the port, then just passing the identity verification control cameras in free flow (i.e., without stopping for verification). If the pre-enrolment is done and the passenger is recognised, there's no additional activity required for identity verification at the port – neither from passengers nor from staff. This is a revolutionary upgrade from the technology we're starting to see in bigger airports, which requires standing in a precise location and looking into a single camera.

The Nortal-MODI solution will be used for foot passengers, vehicles, and staff entrance controls. The solution will most benefit frequent travellers who can use the same enrolment over extended periods (e.g., six months). In case the individual does not have a chance to pre-enrol home or on borders with specific security standards, the option will be present in the terminal in the form of self-service kiosks.

From the technical perspective, this system involves a specialised camera, a user interface for enrolments, a matching back-end for identity verification, and integrations with the Smart Port system.

The joint offering will allow ports to provide a seamless passenger experience and achieve high efficiency by removing manual information processing for passengers and cargo. Both companies are confident that their combined product portfolio and digital concepts will establish the port of the future as highly secure, smart, and passenger-friendly. ■

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The importance of data strategy in terminal operations

Photo: Canva

Measuring what matters

by **Chad Van Derrick**, *VP, Software Product Management, Tideworks Technology*

Terminals are continually pressured to increase the efficiency of how goods are moved. As such, operators must be able to obtain and leverage insight from data quickly to make decisions that impact their business and customers. But how can this be done when terminals often lack the infrastructure and resources necessary to sort through terabytes of data, the majority of which could change several times within a day? The secret lies in creating a well-formed data strategy that can inform decision-making and ensure smooth operations across ports and the broader supply chain.

The big buzzword that comes across most frequently when I speak with customers is "optimization." "We want to optimize." "Your software should optimize our operations for us." "We want to be fully optimized within the next five years."

But what does this actually mean? What stands behind "to optimize your terminal's operations?" Because each facility operates differently, and because they are unique snowflakes per se, their definition of optimization and data strategies need to be unique.

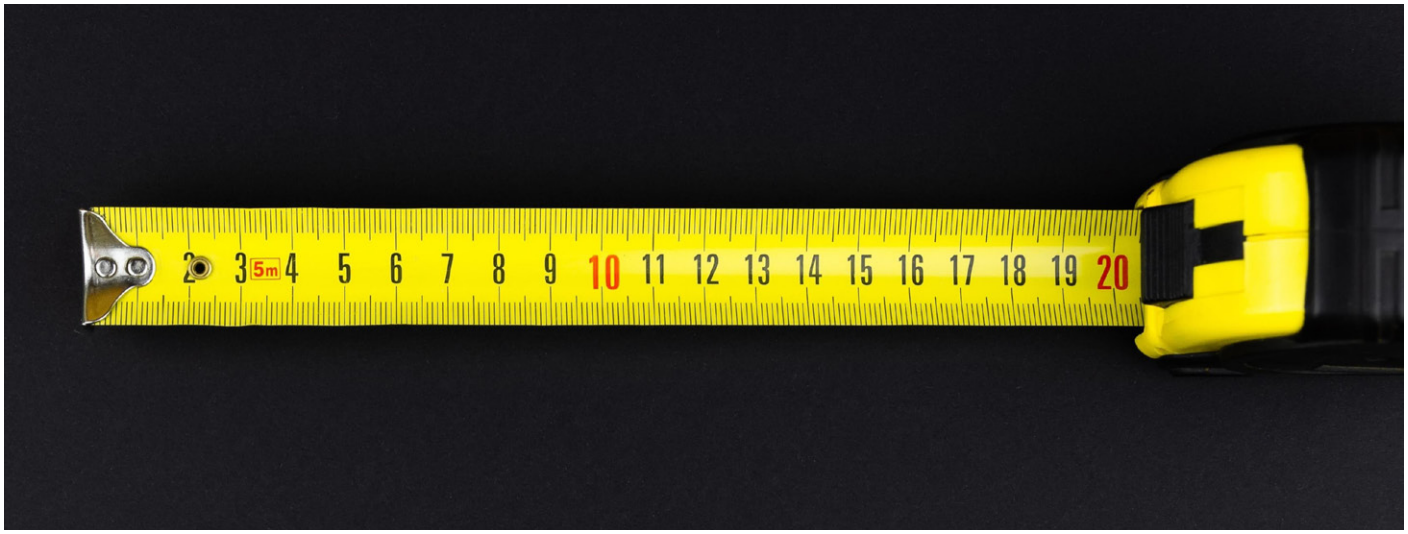
A data strategy is a framework that a terminal develops to effectively manage, use, and leverage its data assets to achieve business objectives. Some of these are tactical, like keeping gate turn times below a certain threshold, while others are strategic, such as minimizing unproductive moves to maximize margin. A good data strategy outlines business goals and offers a comprehensive roadmap for how a terminal should use and share its data across the organization and with customers and vendors.

As I write this, a copy of John Doerr's Measure What Matters is staring at me from my bookcase. In this seminal tome, he introduces the concept of Objectives and Key Results (OKRs) for setting clear and measurable objectives across the organization, providing alignment, transparency, accountability, adaptability, and perhaps most importantly, focus. A good data strategy starts here, identifying what matters, why it matters, and with what frequency decisions on that data need to be made.

The right data, at the right time, in the right place

Terminals are swimming in transactional data. This type of data records specific interactions or events, such as a gate-in, a container's location, or equipment move instructions. This information matters in the moment and can be used to guide hour-to-hour, day-to-day operations.

Compare this to master data, core information about vessels, berths, equipment, terminal layout, customers, employees, and container data like the number, owner, type, and status. Master data is pretty stable; it doesn't change frequently, compared to transactional data like a container's location, which could change daily.



There are other data types, but let's keep it simple and start there. So, the big question is whether these types of data are suitable for analytics. The assumption I see many terminals make is "yes." And with that, they start building data warehouses to gather all of the information that the terminal produces, hoping it will eventually lead to some insights.

It is a fair assumption, and companies in other industries started with this same assumption many years ago. Still, they quickly learned it was a costly, time-consuming affair that produced minimal results. Why? It ignored Doerr's advice: measure what matters.

Analytical data is structured specifically for analysis and reporting. Analytical data is what belongs in a data warehouse, and through its specific data lineage, it is the data used to compute it. Doesn't this mean all data? Absolutely not! It's only the data that matters to that specific terminal – that the terminal is using to make decisions.

The best data initiatives start simple, are time-boxed, and are tied to a specific, measurable business outcome. Resist the temptation to boil the ocean; start small and get results – fast. In this way, a terminal optimizes its operations, one OKR at a time.

The value of real-time data – and a warning about AI

A data strategy often relies on real-time data to provide accurate and timely information on events happening throughout a terminal. Real-time data becomes available as events unfold with a few seconds of minimal delay. It is a valuable measure in a data strategy because it gives insight into recent and present events and helps organizations anticipate future moves.

And there's the gazillion-dollar data strategy word: anticipate. So, let's talk about Artificial Intelligence, or AI, those two enchanting letters representing the magical black box for quick and easy optimization. Where does AI fit into a terminal's data strategy?

While AI can certainly uncover hidden insights in large data sets and apply predictive analytics and machine learning models to forecast trends and outcomes, it should be considered a piece of your strategy but in no way a substitution for it. A magic bullet is just that, magic, and without the work to identify OKRs, your various types of data and its lineage, and then applying the people, processes, and systems to govern that data, ensuring its quality and integrity, your AI initiative is sure to fail.

We have all heard the adage 'garbage in, garbage out,' and so without an effective data strategy already in place, how could you possibly trust in the results of AI? For any strategy to succeed, there must be rules and processes: cue data governance, one of the critical steps in defining your data strategy.

Creating a data strategy

Terminals can begin by following six key steps to optimize their data assets and implement a data strategy effectively.

First, organizations must have a firm understanding of their business objectives and ensure that their data strategy aligns with these goals. This alignment makes sure the organizations directly tie their data strategy in a way that aligns with how their business runs and how they interact with customers, partners, and the broader supply chain.

Second, connecting with technology providers and key decision-makers is important to understand existing philosophies. Including them in the data strategy will make sense because it will likely benefit and optimize how their solutions serve the business and its customers.

The next step involves assessing the organization's current state of the data itself and data management. This assessment entails identifying any organizational issues, such as data inconsistencies or duplications. A thorough evaluation of existing data use and management will help uncover potential challenges that might obstruct data utilization. These challenges include data silos, where valuable information is not easily shared or accessible across the organization, hindering collaboration and decision-making, and workflow challenges, where there are difficulties when designing, implementing, or optimizing the processes and steps involved in handling, transforming, and analyzing data.

Fourth, following the data assessment, organizations must create and implement data governance practices that will be utilized throughout the organization's data strategy. A data governance framework will ensure that all data is secure, compliant, and high-quality.

Fifth, the terminal's data strategy is taking shape at this point. Now, the terminal can create an implementation roadmap, defining how and when it will enhance its business strategy with data and equip its various teams with a tactical approach to managing current and future data streams and avoiding common challenges in data management.

The last step in implementing a data strategy is the assignment of ownership for each aspect of the data. This step entails designating individuals responsible for various stages of the data process, ensuring accountability, effective management and consistency throughout the data lifecycle.

Empowered

A well-structured data strategy, rooted in real-time data and clearly defined practices, empowers terminals to make informed, timely and secure decisions. A data strategy can help terminal operators use existing technology resources to address congestion and capacity changes where access to timely and standardized data is essential. With a cohesive data strategy, companies can harness the power of data to meet short- and long-term goals and adapt to evolving industry dynamics. ■

Photos: FERNRIDE

Gradual automation of container yard trucking for better performance & heightened safety

Forge ahead

by **Martin Isik**, *CCO, FERNRIDE*

Terminal operators, positioned at the critical junctions of international trade, play a pivotal role in facilitating global commerce. They work behind the scenes to ensure smooth and efficient movement of goods across continents. As the scale and complexity of global trade continue to escalate, operators are tasked with a demanding challenge: to increase efficiency, reduce downtime and ensure safety, all while maintaining robust and reliable operations.

FERNRIDE

FERNRIDE offers scalable automation solutions for yard trucking that increase productivity, promote sustainability, and improve worker safety. The company employs a human-assisted automation approach, which allows for remote takeovers of electric trucks when necessary. This ensures seamless integration and reliable operations for logistics operators. Head to www.fernride.com to discover more.

This case study article explores how HHLA tackled this challenge head-on by embracing innovation and technology, working with FERNRIDE, a company offering automation solutions for yard trucking. Therefore, FERNRIDE and HHLA TK Estonia, a subsidiary of HHLA that operates a container terminal in the Port of Tallinn's Muuga Harbour, started a project to validate and integrate the solution of FERNRIDE at the facility.

The opportunity

As global trade expands and evolves, container terminal operators must adapt and innovate. As one of Europe's largest operators, HHLA is no stranger to such demands. With vessel size increases, freight rate fluctuations, and ever-evolving customer expectations, the company has consistently demonstrated resilience in facing these challenges, focusing on maintaining efficiency, safety, and customer satisfaction.

One of the most pressing challenges HHLA had to tackle was the ever-increasing size of container carriers serving global trade. Over the past decade, the average size of these vessels has more than doubled, with mega-ships capable of carrying 20,000 TEUs becoming increasingly common. Such colossal vessels profoundly impact terminal operations because un- and loading them requires significantly more time than their smaller counterparts.

This increased berth time could lead to a domino effect on the entire operation, causing delays and congestion that ripple through the terminal and disrupt the carefully orchestrated flow of goods. The congestion doesn't only mean a few hours of setback: a ship may miss its tidal window in some ports, forcing it to wait for additional 12 hours to leave the harbour.

Balancing these escalating demands with the need to maintain safety standards and profitability is a delicate act. Terminal operators are expected to be flexible, agile, and efficient. Some see it as an opportunity to give transformative innovation a play.

The leap

HHLA strategically decided to develop an automated mixed horizontal transport system to increase efficiency and throughput. This forward-thinking approach brought them together with us, a technology company at the forefront of human-assisted autonomous trucking solutions.

FERNRIDE's automation technology will enable a single remote operator to manage up to four trucks concurrently. This is a tangible improvement from the traditional 1:1 driver-truck ratio, easing the trucker shortage issue prevalent in the logistics industry.

To validate the solution in the area of a container terminal, FERNRIDE and HHLA TK Estonia, the country's largest 'box handler,' decided to start a site project in Tallinn. As a digital-oriented terminal, HHLA TK Estonia is open to testing innovative solutions. The decision to incorporate electric, autonomous trucking into their operations was a leap towards a new era of terminal operations.

The pilot involved fitting a terminal tractor with sensors and cameras to be remote-controlled via mobile networks. Teleoperators at a computer workstation resembling a vehicle cockpit took remote control of the machinery, receiving and sending targeted commands online by controlling the gas pedal, brakes, steering wheel, and joystick.

The pilot started in early 2023 to determine the technology's operational reliability in automated container handling and to validate the technology's viability for future business opportunities. FERNRIDE's solutions were implemented seamlessly into existing processes, ensuring no interruptions or incidents occurred during the transition. This smooth integration was critical in maintaining uptime and delivering consistent customer service throughout the implementation phase.

Safety remained a non-negotiable priority for HHLA TK Estonia despite the drive for increased efficiency. FERNRIDE's technology helps in reducing the risks of on-site accidents. In the operations we managed, the accident and injury rates were remarkably maintained at 0%. This achievement underscored the impact autonomous technology could have on safety, redefining what is achievable in the industry.

Half a year later, the project partners ticked off the first phase, agreeing to proceed to the next one. With the start of the second phase, autonomous driving will be integrated into operational processes. For this purpose, an additional automated yard truck will be deployed at the terminal for container transport. The goal is to achieve a degree of autonomy of at least 80-90%.

A defining testament to FERNRIDE's success at HHLA TK Estonia was the perfect net promoter score of 10/10 awarded by the port. It is proof that FERNRIDE not only met but exceeded the goals of FERNRIDE in the project with HHLA TK

Estonia. Riia Sillave, CEO of HHLA TK Estonia, said, "The joint project with FERNRIDE enabled us to test the system directly in HHLA TK Estonia's operations. The implementation has proven itself in daily terminal operations so that the proof of concept could already be achieved at an early stage. We really enjoy working together with the FERNRIDE team, which always shows a high level of competence and professionalism. We will now continue the good cooperation with FERNRIDE and work out together how autonomous driving can work in the future. In doing so, we are pursuing the goal of making workflows at our international terminals future-oriented and sustainable."

The new benchmark

The successful project of HHLA TK Estonia and FERNRIDE is more than just a success story. It is an inspiring tale of how embracing innovation and technology can redefine the boundaries of an industry.

Adopting FERNRIDE's technology signals a significant shift in the terminal operations landscape. HHLA TK Estonia has paved the way for others in the industry by demonstrating the immense potential and benefits of autonomous trucking.

The journey of HHLA TK Estonia is a telling example of the power of innovation in addressing the modern challenges of terminal operations. It underscores the transformative potential of technology and the value of embracing change in a dynamic industry landscape. In the face of growing global trade and the escalating demands of terminal operations, HHLA has demonstrated that the solution isn't merely to increase effort but to optimise work strategies. By utilising autonomous technology, they have contributed to industry transformation and established a new benchmark for terminal operators across the globe.

This case study conveys the forward-thinking approach and determined spirit of HHLA and its subsidiary HHLA TK Estonia. As they navigate their way in the terminal operations landscape, one aspect is evident: they are not just keeping up with the industry's pace but forging ahead. ■

Photo: Pexsels

The 5G-LOGINNOV project

Transforming logistics and smart ports in Europe

by **Dr Eusebiu Catana**, *Senior Manager, ERTICO*

The EU-funded 5G-LOGINNOV project is creating new opportunities for LOGistics value chain INNOVation by harnessing the power of 5G in the ports domain. This is all thanks to an innovative framework for integrating and validating connected and automated mobility (CAM) technologies related to Industry 4.0. 5G-LOGINNOV supports the port application case by implementing 5G technological blocks. A new generation of 5G terminals for CAM, new types of Internet of Things (IoT) 5G devices, data analytics, next-generation traffic management, and emerging 5G networks are grouped to allow city ports to handle current and future capacity and traffic, increase efficiency, and manage environmental challenges.

ERTICO – ITS Europe is a public-private partnership of over 120 companies and organisations representing service providers, suppliers, the traffic and transport industry, research, public authorities, user organisations, mobile network operators, and vehicle manufacturers. Together with our partners, we develop, promote, and deploy Intelligent Transport Systems and Services (ITS) through a variety of activities, including European co-funded projects, innovation platforms, international cooperation, advocacy, and events. Our work focuses on connected & automated driving, urban mobility, clean mobility, and transport & logistics.

5G-LOGINNOV is co-funded by the European Commission, Horizon 2020 research and innovation programme under grant agreement No. 957400 (Innovation Action).

Innovation in Living Labs

As a catalyst for market opportunities built on 5G core technologies in the logistics domain, 5G-LOGINNOV is set to be a pillar of economic development and business innovation, particularly by promoting local high-tech SMEs and start-ups. The project's three Living Labs – in the European ports of Hamburg, Athens and Koper – will be the facilitators and ambassadors opening up doors for innovation in ports, covering both deep sea harbours in the mega vessel era (Hamburg, Athens) and medium-sized seaports with limited investment funds for 5G (Koper).

5G-LOGINNOV is trialling 11 clusters of use cases beyond technology readiness level 7 (system prototype demonstration in operational environment) in its three Living Labs based on 5G technological blocks, including the Management and Network Orchestration platform (MANO), Device Management Platform Ecosystem, Optimal Selection of Yard Trucks, Optimal Surveillance Cameras and Video Analytics, Automation for Ports, Port Control, Logistics and Remote Automation, Mission Critical Communications in Ports, Predictive Maintenance, Floating Truck & Emission Data, 5G GLOSA & Automated Truck Platooning (ATP), Dynamic Control Loop for Environment Sensitive Traffic Management Actions (DCET).

Trialling future reality

Strict security of the cloud infrastructure system is a crucial requirement for all ports. Smart routing of the port-related network services and applications traf-

fic directly to the port operations support systems is made possible by extending the Mobile Network Operator (MNO) infrastructure with Multi-access Edge Computing (MEC) capabilities. In addition to commercial MNO services, the private 5G mobile network with dedicated cloud infrastructure is tailored to the needs of port operations and targeted applications.

In 5G-LOGINNOV, a 5G edge processing node is implemented to support ship-to-shore (STS) crane operations. Massive 4K (uplink/downlink) live video transmissions towards the (far-)edge processing nodes serve as the input for machine learning (ML) models delivering the envisioned services. Such uplink-data-intensive applications call for enhanced capacity that cannot be served with legacy LTE networks. Hence, the Enhanced Mobile Broadband (eMBB) service of 5G technology is needed.

Making port operations safer

Low-latency transmission and eMBB capabilities of 5G are used in combination with artificial intelligence (AI) to set up a rapid alert delivery system for collision avoidance between yard trucks and people. A 4K camera is mounted on the yard truck, and a 5G modem is employed to establish cellular communication within the port. The camera is oriented to the driver's potential blind spot and transmits 4K video streams (uplink) to a GPU-enabled edge computing device in real time. An AI-enabled service deployed in the edge processing node receives and processes the video feed. If a person is detected, the driver is alerted with live annotated 4K video streams (downlink) in order to increase their situational awareness.

Frequent incidents involving boom, gantry or stack collisions, along with the presence of stevedoring personnel in port areas, generate considerable risks. To minimise the risk of serious bodily injuries, 5G-IoT devices installed in selected areas, equipped with a high-resolution camera, perform video analytics tasks locally. Using innovative ML techniques, with the help of large 4K surveillance video streams facilitated by 5G eMBB service, quick and accurate human presence detection is made possible. This use case increases safety measures in the employee workplace, opening up opportunities to optimise the use of human resources in different port operations, e.g., by reducing the patrol frequency at the risk areas.

Looking into the future

A key concern of almost any port is storing and managing bulky assets, such as spare/repair parts, especially when operating close to maximum annual capacity. In 5G-LOGINNOV, end-to-end asset performance monitoring in all phases of daily port operations is enabled by telemetry data transmitted over 5G from several data sources on board yard trucks.

The resulting predictive maintenance algorithm is used to anticipate possible breakdowns, thereby reducing downtime for repairs, increasing the service life of yard vehicles, and optimising the stock of spare parts and the overall operational efficiency. The predictive maintenance tool captures historical and recent status data for the assets in question (schedule of purchases, storage of parts, proactive maintenance), for the ML algorithm, with 5G technology providing a flexible, reliable and predictable environment to remotely keep track of the connected assets on a real-time basis.

Industrial cameras installed on operating port machinery (STS cranes) capture and transfer Ultra-High Definition (UHD) streams to the cloud-based video analytics system. Container markers are identified, and structural damage is detected by using advanced AI/ML-based video processing techniques.

To boost overall port operation, coordination with inbound external trucks is also foreseen in order to expedite container handover operations (transition of containers from external to internal trucks and vice versa), provide an estimated time of arrivals/departures, etc.

Thanks to the new advanced capabilities of 5G relating to wireless connectivity and Core Network agility, 5G-LOGINNOV ports will not only significantly optimise their operations but also minimise their environmental footprint on the city and the disturbance to the local population.

5G-LOGINNOV is already looking ahead to trialling B5G (beyond 5G) and 6G. Although they are still at an early stage of development, some B5G/6G candidate technologies – such as AI-Enabled Networks, Massive Multiple Input Multiple Output (MIMO), Dynamic Spectrum Access, Network Slicing, Edge Computing, Integrated Satellite-Terrestrial Networks, Quantum Communication, Massive IoT Connectivity, Augmented Reality (AR) and Virtual Reality (VR), Energy-Efficient Communication and Environmental Monitoring – could play a strong role in extending the impact of 5G-LOGINNOV.

Market approach

The 5G-LOGINNOV project has adopted a comprehensive market approach to ensure the effective take-up of its innovative solutions. The project emphasises collaborative business models and future common initiatives by recognising the importance of collaboration among stakeholders for advancing innovation and data sharing.

To this end, 5G-LOGINNOV has adopted a business modelling methodology called GUEST to assess stakeholder requirements, challenges, and opportunities, followed by designing specific business solutions through the Solution Canvas.

In such a way, the 5G-LOGINNOV project assumes a significant role as an innovator and incubator for start-ups in the field of 5G technology, particularly related to improving logistics and transportation operations in ports.

Save the World-Save the Planet

Last year, the team working on 5G and Transport & Logistics projects, such as 5G-LOGINNOV and FENIX, got ISO standard approval. Based on this standard (17748-1 Energy-based green ITS services on nomadic & mobile devices for smart city mobility applications – Part 1: General information and use cases definition), the ISO/Technical Committee 204 has decided to cover this important topic and set-up a new sub-working group (SWG) as part of its working group (WG) 17 on Nomadic Devices in ITS Systems.

This new SWG 17.2 Save the World-Save the Planet is developing a series of international standards which define energy-based green ITS services providing urban and smart city mobility applications on nomadic & mobile devices by measuring energy consumption and CO_2 emissions and providing information to users on energy capacity in the transportation sectors. This new ISO standard supports the European Green Deal. ■

The Shipnext digital shipping marketplace and transportation platform

Photo: Shipnext

Global innovation from the Baltic

by **Fitzwilliam Scott**

This spring, Shipnext – an online freight platform founded by shipping & technology entrepreneur Alexander Varvarenko, which helps the seaborne transport industry work more efficiently – was asked to contribute to a World Ocean Council documentary highlighting the people and organisations working to strengthen corporate ocean responsibility.

SHIPNEXT

Shipnext is a digital shipping marketplace and transportation platform that provides instant data and email processing, immediate cargo-to-ship matching, freight trading and contract management, digital documentation flow, freight finance, and supply chain management solutions. Go to **shipnext.com** to learn about the full range of services and tools.

For the Ventspils-born Varvarenko, the exercise provided an opportunity to reflect on his career in the shipping business. This journey has seen him launch a shipping company as well as a technology platform. After stints at Belgo Ruys in Antwerp and Flamar in Zeebrugge, Varvarenko opened his own enterprise, Varamar, in 2009 (a shipping company with offices in Houston, Hamburg, Dubai and Shanghai, Varamar is still operational today, though he is no longer involved in day-to-day management).

Performing more productive functions

In 2015, Varvarenko drew on earlier experience as a self-taught software developer and, with partners, launched the Antwerp-headquartered Shipnext in an effort to make life easier for all those in the business who are overwhelmed by the sheer volume of emails they receive. He identified many years ago that an algorithm could do a much better job of processing messages than a human – freeing up the employee to perform the far more productive function of sales and customer relationship management.

It was this efficiency that came to the fore during the filming of the World Ocean Council documentary. In the film, Varvarenko explained how Shipnext used tools such as real-time data processing and constantly-learning algorithms to tackle over 36,000 cargo and freight requests daily. He explained how the patented Shipnext system combines email handling, powered by natural language processing, machine learning and artificial intelligence, with an all-inclusive A-to-Z shipping platform. This integration enables instant freight search, freight tendering, trade facilitation, and workflow automation.

Older = greener?

Varvarenko also explained how Shipnext facilitates environmentally-friendly shipping choices. Evidence of this was the launch of an alternative emission index earlier this year: the Shipnext Voyage Emission Index (SVEI), designed in consultation with shipowners for vessels carrying break-bulk, dry bulk, and heavy & oversized shipments.

SVEI is based on individual technical parameters of the vessel, its speed,

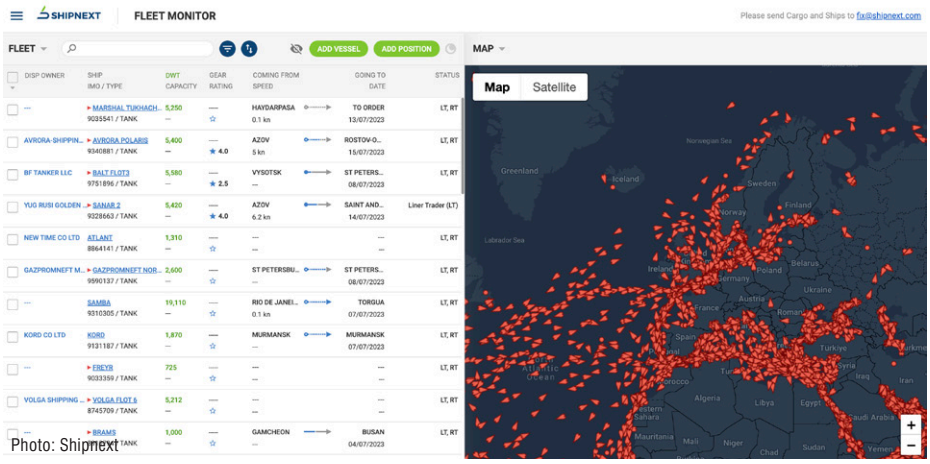


Photo: Shipnext


Alexander Varvarenko; photo: Shipnext

consumption and intake, whilst also taking into account the actual cargo quantity and the intended voyage. SVEI considers the ship's fuel consumption at sea to reflect the work of the particular vessel. In-port fuel consumption is ignored since it's comparable for most ships, and the time of loading & discharging is determined mainly by port technology, not by the technical capabilities of the vessel.

Next, the Shipnext CII (SCII) is proposed as an alternative to the International Maritime Organization's (IMO) Carbon Intensity Indicator (CII) rating, which seeks to measure the efficiency of a vessel above the gross tonnage of 5,000 and gives it a respective score from the best A to the worst E (with IMO intending to make the criteria increasingly stringent by 2030).

Carriers, including Maersk, have complained that the IMO CII fails to incentivise cargo optimisation and have called for a methodology that rewards more productive vessels. SCII has been designed to do just that. "The major problem with the existing IMO guidelines is that they do not take into consideration the cargo actually being carried on a voyage," says Varvarenko. "When you do so, the emissions profile of a given voyage changes completely."

Shipnext modelling shows how an older, higher-emitting ship, if managed properly and laden to full capacity, can prove to be the 'greener' solution vs a more modern ship that's producing more CO_2 because it is on a longer voyage.

"Right tankers for the right cargoes"

The latest innovation has been the addition of a liquid bulk functionality to the Shipnext platform, allowing it to serve a wider client base. "Shipping liquid cargo is highly specialised, and many of our customers and tanker owners requested the addition of this functionality at the platform," explains Varvarenko. "Because of the complexity, it's not common to see such facility available on digital platforms, but we want to be able to cater to the whole of the market."

Users can now add their liquid cargo to the Shipnext Trading Desk, entering key data such as the cargo's total volume in cubic metres and melting point in centigrades. Meanwhile, the Shipnext Fleet Monitor tool can be used to view tankers available to handle the shipment, as well as the tanker status and position.

Shipnext has registered the Danish-based Uni-Tankers, which has a sizeable fleet of carriers specialised in the safe handling of dangerous goods. Michael Eskling, Managing Director Marketing at Uni-Tankers, also took part in the Shipnext World Ocean Council documentary, where he detailed how the shipping business traditionally suffered from "a lack of transparency – especially when you want to locate the right tankers for the right cargoes." He added, "Working with Shipnext, we can make the market more transparent and ensure we achieve the most efficient and sustainable solution by always choosing the ship that is in the right position."

Shipnext can now better serve clients who ship a diverse range of liquid goods, including diesel, chemicals, bitumen, benzene, liquid asphalt, and waste. Owners and brokers of liquid tankers are invited to register their vessels at the platform.

Moreover, Shipnext can be used for the transportation of consumer goods, equipment & machinery, food & beverages, forest products, grains, livestock, metals & steel, minerals & rocks, organic material, and perishables & produce.

Photo: Canva

Answering the call for secure maritime-optimised email and data-transfer solutions

Evolving connectivity

by **Rob Preston**, *Senior Technical Engineer, GTMaritime*

Continuing advances in satellite connectivity at sea – especially the rise of low-Earth orbit (LEO) networks – mean that ships in service have access to higher bandwidths than ever before. For the first time, companies can truly replicate their shoreside IT set-up on board vessels at sea, implementing the same office software tools they use on land to benefit from more consistent processes and streamlined IT management. This growing number of connectivity options available to the shipping industry emphasises the need for flexible and secure email and data-transfer solutions designed specifically for maritime use.

GTMARITIME

GTMaritime is a leading provider of secure maritime data communications solutions. Since 1998, the company has been providing a range of technology solutions and services to the maritime industry that enable effective communications over satellite. GTMaritime specialises in solutions and services that help ensure vessel compliance and business operability 365 days a year, as well as keeping crew in touch with friends and family whilst at sea. Connect to **www.gtmaritime.com** to find out more.

Yet, although the enhancement of interconnectivity between vessels and shore-based operation centres is a positive development for the maritime industry, it also entails new risks to cyber security. By unifying their onboard and onshore software, shipping companies expose their vessels to the same cyber threats to which their land-based offices are subject. With digital solutions evolving rapidly and the volume of data being transferred from ship to shore soaring, the risk of a cyber-attack is also on the rise.

Another vital consideration for shipowners looking to mirror their office IT set-up on board their vessels is that the products used onshore are rarely designed with maritime deployment in mind. Where shore-based infrastructure may comfortably support their high bandwidth demands, vessel infrastructure may be pushed to its limits. Even with the increasing bandwidth available to owners, using conventional office software tools aboard a ship can impact other crucial data-dependent functions, such as crew connectivity – a significant consideration in modern shipping.

Secure & lean

Against this background, shipowners require software tools optimised for use at sea, with built-in security features and the capacity to minimise data consumption for routine business tasks, including email and file sharing. These tools should be compatible with the many network types available to shipping today; ideally, they should also be provided by technology companies familiar with the challenges faced by shipping, both in terms of working practices and the evolving threats specific to ship communications.

GTMaritime has supported ship-shore connectivity for maritime businesses since 1998, and today, its solutions can be found on board over 14,500+ ships worldwide. In developing and upgrading its products, our team works closely with its international customers to ensure their requirements and challenges are being addressed. For example, GTMailPlus is

a maritime-optimised email service whose success has been built around its ability to facilitate integration with popular office software suites, such as Exchange, Office365, and Gmail. This allows ship- and shoreside personnel to use familiar tools while benefiting from stable, secure, and bandwidth-efficient data transfers.

Meanwhile, our file and data replication service, GTReplicate, uses its proprietary secure data transfer protocol to optimise data streams between ship and shore, identifying changes in files to minimise the amount of data being transferred. As a result, even while large, data-heavy transfers are in progress, sufficient bandwidth remains available to support other tasks – with the crew still able to access online communication and entertainment services, for instance.

Better together

GTMailPlus also features an enterprise-grade security suite as standard to address the increasingly pressing issue of vessel cyber security, offering robust protection from threats, including zero-day attacks. This comprises anti-phishing, antivirus, spam management, and advanced threat protection applications. In the past six months alone, GTMaritime's solutions have protected ships against over 100k malware attacks unknown to standard antivirus services and blocked over 14m spam messages.

Reflecting GTMaritime's holistic approach to vessel security, the company offers a range of end-point protection solutions for vessels to provide scalable, intelligent, and strong protection without impacting productivity. To further enhance the company's cyber security offering, GTMaritime recently became a Focus Partner in the CrowdStrike Powered Service Provider programme, which means GTMaritime solutions can now be integrated with the CrowdStrike Falcon platform.

Provided in partnership with Crowdstrike, customers receive an end-point detection and response solution with artificial intelligence-based next-generation antivirus. This includes the ability to isolate single devices to protect the rest of the network and offers different levels of firewall protection, security operations centre, and threat hunting, along with access to 24/7 support in the event of an incident.

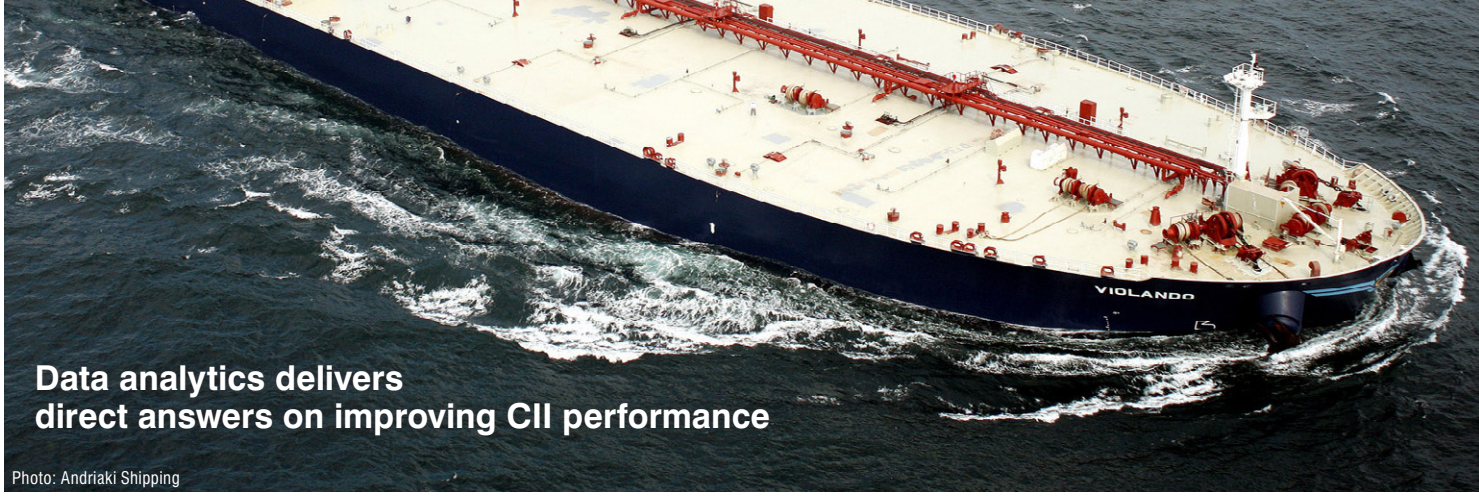
Together, GTMaritime's powerful solutions and the CrowdStrike Falcon platform provide protection from both known & unknown malware and ensure regulatory compliance as set out in the new Unified Requirements for cyber security from the International Association of Classification Societies (mandatory for classed ships and offshore installations built on or after 1 January 2024).

Maritime-optimised

Crucially in today's maritime industry, in which companies increasingly rely on more than one network to meet their operational needs, our solutions are compatible with any network type – whether based on LEO, geostationary, Wi-Fi, or LTE connectivity. They, therefore, provide secure and efficient data transfer regardless of the service – or combination of services – a shipowner uses.

Equally important is reliability. In the last year, GTMaritime software has achieved 99.98% network uptime. Backed by two European Union-based data centres and market-leading cloud-based infrastructure, it also offers high levels of redundancy and scalability.

As maritime connectivity evolves, increasing care must also be taken to ensure that vessels are not exposed to avoidable cyber threats and that crucial onboard processes are not hindered by data-hungry software designed for shore-based offices. Owners and operators would benefit from ensuring that their chosen solutions are flexible and maritime-optimised, support secure and efficient data transfers irrespective of network type, and account for the unique challenges facing ships and personnel at sea. ■



Data analytics delivers direct answers on improving CII performance

Photo: Andriaki Shipping

Overcoming scepticism

by **Fitzwilliam Scott**

Big data and artificial intelligence (AI) are often said to be reshaping the maritime industry's future, even though sceptics sometimes resist the attractions of the algorithm because they suspect a disconnect between the basis of analytics and the shipping business. A new study developed by METIS Cybertechnology with Andriaki Shipping offers a detailed analysis of the true gains to expect from the options provided to reduce ship greenhouse gas emissions (GHG-E).

METIS CYBERTECHNOLOGY

METIS Cyberspace Technology specializes in high-frequency data acquisition, and advanced performance evaluation analytics for the maritime industry. METIS combines innovative thinking, maritime business know-how and expertise in high-end technologies such as machine learning and artificial intelligence to empower shipping's digital transformation. Head to www.metis.tech to learn more.

The International Maritime Organization's (IMO) Carbon Intensity Indicator (CII) measures carbon intensity over time, given in grams of carbon dioxide (CO_2) emitted per cargo-carrying capacity and nautical miles travelled. The regulation rates a ship on an A-E scale, requiring continuous improvement.

Today, high-frequency data capture is invaluable for CII reporting, where traditional logs (e.g., noon reports) provide neither the quality nor volume of data to deliver comprehensive benchmarking. The two study partners have applied the power of analytics to uncover the buried relationships between ship operating parameters and IMO's CII that will help owners evaluate the options to enhance their CII performance.

Getting to the heart

Considering fast-growing data capture, higher speed connectivity, and advances in cloud computing, METIS and Andriaki Shipping use a combination of established methodology, new algorithms, and mathematical modelling to measure the impact of alternatives to improve CII scores. Doing so gets to the heart of the practical gains AI makes possible by interpreting hidden patterns and data structures and the response to those patterns available to machine learning.

Voyage performance requirements will be established by the owner (or by agreement with the charterer), but from the CII perspective, the optimum will be achieved when CO_2 emitted per cargo-carrying capacity and nautical mile is minimised. While optimised speed for minimum fuel consumption will be a central consideration, other variables include the ship's trading pattern (time in ballast and laden) and the time spent & energy used while in port. Within this framework, performance optimised for CII will, nonetheless, rely partly on the ship's ability to convert energy use into distance travelled.

In addition to analysing a ship's bunker consumption by energy produced, AI-based modelling can establish the value of different energy-saving strategies. As a first step, the METIS-Andriaki methodology evaluates the high-frequency raw data itself based on specific signal profiling, calculations from flowmeter readings, and three 'virtual sensors' that ensure the reliability of results

by learning to interpret the relationships between variables.

In a case study involving a bulk carrier of 91,373 gross tonnage (GT; 16 m-17 m

mean draft), the analysis suggests 7% could be cut from fuel consumption simply by reducing speed from 12.5 to 12 knots. The same modelling also better establishes the impact for CII of hull fouling, where drag has consequences for speed and fuel consumption but may also require a ship to reduce payload to meet its charter commitments. Again, the model would be invaluable for evaluating weather routing optimisation claims or the impact of port turnaround efficiencies on CII.

The more you know, the less you burn

Going further, METIS and Andriaki Shipping offer specific evaluations of several new energy efficiency solutions developed to save fuel, weighing up the options based on life-cycle cost. An ideal candidate for analysis using high-frequency data are waste heat recovery systems, a key technique identified by IMO for GHG-E cutting potential.

Taking a Zeolite adsorption chiller as the candidate technology, the METIS-Andriaki analysis uses a specialised software library to model an operational simulation of adsorption chillers on a very large crude carrier with a main engine of 31,640kW maximum continuous rating (MCR). Based on experimental data sampled every 15 seconds and mathematical modelling, total cooling energy for an entire year is 160,407kWh. With the respective electric power requirement at 45,831kWh, the adsorption chiller requires only 6,959kWh to operate. The net saved electric power is thus 38,872kWh, equivalent to an 8.94-tonne annual fuel saving from a single unit. With the vessel's capacity for eight modules, the CII impact could be substantial.

A second study focuses on four sister vehicle carriers of GT 36,902, each delivered in the same year, three of which underwent full hull-blasting followed by the application of silicone-based anti-fouling paints, whilst the fourth was spot blasted with conventional paint applied. Over two years of evaluation, measurements were taken every 15 seconds and resampled at 30-minute intervals. Over a range of operating profiles and weather conditions, the 'conventional' paint demanded approximately 12% more power (on average). After the analysis, the shipping company undertook hull cleaning and propeller polishing to correct the performance shortfall.

Another case study relates to the installation of an energy-saving device in the area of the propeller of a GT 84,850 oil tanker during dry-docking. The vessel undertook sea trials in both laden and ballast conditions and in good weather before and after the dock. Using an AI-based analytics approach and taking into account different main engine loads in relation to the actual speed profile, the vessel's performance after the dry-docking in terms of shaft power to speed was given as between 4% and 14% ahead of its pre-docking data.

Trim optimisation minimises ship hull resistance. Though it's a limited research field, most estimates speak of 0.5-5% in energy savings. However, the optimal trim tables employed by shipping today are usually based on calm sea states. In contrast, a dynamic system (that considers sailing speed, displacement, and actual weather state) is essential for optimisation.

In the case at hand, data from the continuous monitoring system of a 333 m-long oil tanker featuring a 31,640 kW MCR main engine was acquired over 24 months, with weather data collected from four providers and filtered, and measurements recorded with a sampling rate of one minute.

The ship's power needs could be reduced by ~3% and up to ~16% by selecting the optimal trim for certain speed and draft configurations. Further investigation into this subject is needed to obtain greater accuracy and proceed to their verification. Nonetheless, stakeholders might also note that this is an easily implemented solution that can significantly reduce CO_2 emissions. ■

Photos: RELEX Solutions

Waste no effort

by **Svante Göthe**, *Head of Sustainability, RELEX Solutions*

Food waste is a pervasive global issue with severe environmental, social, and economic consequences. At each stage of the supply chain, from production and processing to distribution and retail, substantial amounts of food are lost or wasted. The detrimental impact of this waste extends beyond the loss of valuable resources to the emission of greenhouse gases and food insecurity.

RELEX

RELEX Solutions offers a market-leading supply chain & retail planning platform through which we help retailers and consumer brands unify their planning, from demand & merchandise to supply chain & operations, for maximum customer satisfaction at the lowest operating cost. Visit www.relexsolutions.com to learn more.

However, with technological advancements and the adoption of innovative solutions like modern supply chain planning software, there is enormous potential to reduce food waste effectively. In this article, we will explore the magnitude of food waste in different parts of the supply chain and highlight how advanced planning software can be instrumental in combating this issue.

The where's & when's of food waste – and its environmental impact

Food waste occurs at various supply chain stages, leading to significant losses globally. According to the Food and Agriculture Organization (FAO) of the United Nations, approximately one-third of all food produced for human consumption is wasted, about 1.3 billion tonnes annually.

Factors such as adverse weather conditions, pests, and inadequate storage facilities contribute to crop losses, ranging from 20% to 40% in certain regions.

Inefficiencies and suboptimal processing and manufacturing practices can result in significant waste. Trimmings, by-products, and imperfectly shaped or sized produce often go unused and are discarded, contributing to overall waste.

Food loss continues to accumulate during distribution and retail operations. Inefficient inventory management, inaccurate demand forecasting, and suboptimal shelf rotation practices lead to expired products, unsold items, and overstocked shelves.

Significant food waste occurs due to improper storage, over-purchasing, and confusion over date labelling. Consumers often discard perfectly edible food, contributing to the overall loss generated throughout the supply chain.

Food waste generates substantial greenhouse gas emissions (GHG-E) and contributes to climate change. When food decomposes in landfills, it produces methane, a potent greenhouse gas. The FAO estimates that food waste accounts for approximately 8% of global GHG-E. We can effectively mitigate these emissions and their environmental impact by reducing food waste.

The hows of preventing food waste

Supply chain planning plays a vital role in combating food waste. By harnessing the power of data analytics,

machine learning, and optimisation algorithms, advanced planning software such as RELEX empowers businesses to make informed decisions, minimise inefficiencies, and reduce waste.

Our solution utilises advanced analytics to break down historical sales data, market trends, and external factors to generate precise demand forecasts for each product in every storage location. By optimising the planning process on accurate and granular demand insights, businesses can avoid overproduction, reduce stock-outs, and minimise waste.

RELEX employs sophisticated algorithms to optimise inventory levels based on demand forecasts, lead times, and service level targets. By ensuring optimal stock levels, businesses can minimise waste while meeting customer demand effectively.

We have also incorporated shelf life considerations into the planning process, enabling businesses to prioritise inventory based on expiration dates. This helps prevent outdated products from reaching store shelves, ensuring that the freshest goods are available to customers and reducing waste.

Optimising transportation and delivery routes is vital for minimising food waste in the supply chain. Advanced planning software like ours considers various factors, such as delivery windows and vehicle capacities, to plan optimised logistics operations. By optimising vehicle utilisation, businesses can minimise the risk of spoilage and reduce unnecessary emissions.

Effective collaboration and communication among stakeholders in the supply chain are also crucial for waste reduction. Advanced planning software provides a centralised platform that enables information sharing, collaborative planning, and efficient communication. Businesses can streamline operations, prevent wasteful practices, and improve overall efficiency by fostering collaboration between suppliers, producers, distributors, and retailers. The same goes for communication within companies – by having unified processes between departments with potentially conflicting interests and KPIs, such as supply chain and merchandising, waste can be reduced.

Adopting advanced planning software to reduce food waste has significant environmental benefits. By minimising food loss throughout the supply chain, we can reduce the resources, energy, and water used in producing, transporting, and disposing of wasted food. Moreover, as food waste contributes to GHG-E, such as methane from landfills, reducing waste mitigates these emissions and their impact on climate change directly.

Effectively addressing food waste requires collaborative efforts and industry-wide adoption of advanced planning software solutions. Governments, industry associations, and organisations can play a pivotal role in promoting the adoption of such technologies, providing incentives, and facilitating knowledge-sharing among stakeholders. We can create a more sustainable and efficient food supply chain by working together.

Lay waste to waste

Food loss poses a significant challenge throughout the global food system. Advanced planning software is crucial in reducing food waste across the supply chain. By effectively managing demand, optimising inventory, improving shelf-life management, and streamlining distribution & logistics, businesses can minimise waste and contribute to a more sustainable food system.

Deploying advanced planning software, coupled with collaborative efforts and industry-wide adoption, is vital to address the global challenge of food loss and build a future where waste is minimised, resources are utilised efficiently, and food security is enhanced. ■

Using 3D models is a ship designing game-changer – but what does it mean in practice?

Photo: Deltamarin

Goodbye, analogue!

by **Joonas Määttänen**, *Project Engineer, Concept Design and Project Services, Deltamarin*

The use of 3D 'digital twins' for class approval represents a milestone in the ongoing focus on applying digitalisation to increase productivity and shorten the calendar time for ship design. Designing ships in a 3D digital environment is not in itself new. We already use advanced CAD software in our everyday work, and these applications get better with every new release. However, we can't yet use the 3D models themselves for the classification approval process, where the relevant class society could review and comment on the design directly from the models.

DELTAMARIN

deltamarin is one of the leading companies in ship design and offshore engineering in the world. Services are offered from concept development and engineering to project management during shipbuilding and commissioning as well as a wide range of services for operating vessels to maintain the fleet in excellent condition or even upgrade it. The company has invested extensively in developing sustainable and cost-efficient designs both for cargo and passenger vessels. Please check www.deltamarin.com f or more info.

The traditional approval process – and this applies across the board – still requires us to supply the relevant class society with a vast amount of 2D structural drawings for every ship project. These we have to extract from the 3D models we have created, which is hugely time-consuming.

The effort that goes into them only increases as they get more intricate. For example, we recently built a detailed 3D model for the initial basic structural design of a regular-size ro-pax vessel. From this, we had to extract up to 50 separate sets of drawings, each consisting of up to 1,000 individual drawing sheets. That is quite a mountain of material!

On average, around one-third of the basic design process on each project is spent on creating, modifying, and updating such drawings, even though we do pretty much all of the actual design work in 3D. However, this is about to radically change as class societies increasingly work directly from 3D models. Our ultimate goal is to create easily maintainable 3D models covering the basic design of entire ships – essentially a digital twin for class approval.

No room for interpretation

We estimate that cutting out the laborious phase of generating and constantly updating 2D drawings will save up to 30% of the person-hours required for the basic design process, enabling faster ship deliveries. The class approval process, which is critical in terms of the ship's overall delivery schedule, could, in turn, be completed around three months faster as the class surveyors can respond much quicker to the designer's needs. Overall project lead time can be significantly reduced and productivity increased, as the 3D model can be shared directly with all project stakeholders, including the shipowner, shipyard, and equipment suppliers.

One crucial benefit of using a 3D model vs 2D drawings is that there is no room for 'interpretation' as everything is visible. The model's automatic tools can

highlight changes and show previous revisions, making it easy to track alterations and revert to an earlier version if necessary. In addition, production can continue directly from the final approved model, making handover to the shipyard easy, efficient, and free of mistakes.

Always up-to-date

The interactive model also has lifecycle benefits that drawings cannot provide. The problem with the latter is that they quickly become obsolete and unusable as the ship's structure changes, and not all drawings may even be available or accessible at a later date (some serve only one purpose, after which they are no longer needed).

In contrast, the digital twin would always be up-to-date as new changes can be done directly in the model. It would hold all important data in one place that everyone can access. Hence the benefits of the model accumulate over the ship's entire life cycle – from initial classification to later modifications or conversions/retrofits, with, for example, new propulsion systems (including wind power). The production model can simply be handed over to the project-responsible designer and/or shipyard.

As Ole Christian Astrup, Senior Principal Specialist at DNV, confirms, using 3D models "opens up for new possibilities in asset data management, which I strongly believe will drive the safety and reliability of ship design and operation. A good example would be a more efficient process for verifying rule compliance. The OCX format will help designers control and optimise their designs while enabling class societies to confirm rules compliance directly from the 3D model."

Breaking down the barriers

We are taking a leading role in this design evolution, having recently completed a section of the steel design work for an ammonia-ready Aurora Class vessel for Höegh Autoliners both in 2D and 3D, with the latter model conforming to the new Open Class 3D Exchange Format (OCX) standard. **The model was approved by DNV, which to our knowledge, is a first.**

The OCX is a standardised file format and a key enabler to replace 2D documentation requirements. The standard is owned and managed by the OCX Consortium, established in 2021, which unites all the major class societies and CAD software vendors, as well as shipyards and design houses.

The core objective is to break down barriers between different design platforms to enable the exchange of geometry and metadata between them. This will ensure that trace information is exported from the designer's application to class in a managed process that is reliable and fully transparent.

Not far off

As software development takes time, there is a bottleneck in rolling out the OCX format, not on the part of ship designers or class societies, but as 3D software suppliers work to implement it as fast as they can. They are not far off!

As to the future, we are also exploring further digital developments, including using artificial intelligence to compile a database of ships that naval architects can access to study previous designs and sort them based on specific characteristics. This kind of reference set would eventually include 3D models, saving even more time. Onwards and upwards! ■

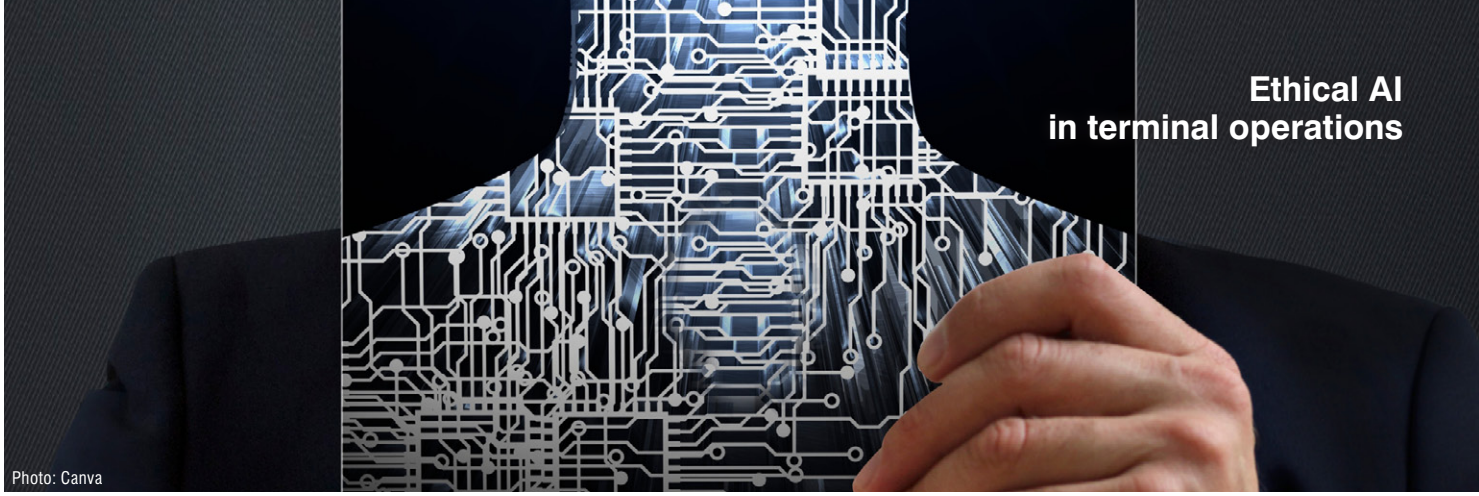


Photo: Canva

Navigating new waters

by **Dr. Jörg Herbers**, *CEO*, and **Dr.-Ing. habil. Eva Savelsberg**,
SVP Terminal and Distribution Center Logistics, INFORM

In the rapidly evolving world of terminal operations, the integration of artificial intelligence (AI) is not just a futuristic concept but a present reality. AI's transformative impact on the maritime sector is profound, reshaping the traditional paradigms of operations and setting new efficiency and innovation standards. However, this powerful technology also raises ethical questions to which INFORM has found its own answers.

INFORM develops software to optimize business processes using artificial intelligence (AI) and advanced mathematics of operations research. The company, founded in 1969 and headquartered in Aachen, promotes sustainable value creation in various industries through optimized decision-making. Its solutions are tailored to specific industry requirements and help over 1,000 customers worldwide operate more resiliently and sustainably with greater success. INFORM's systems serve a range of industries, including aviation, automotive, financial institutions, logistics, manufacturing, transportation, telecommunications, and wholesale. The company is committed to ethical AI practices, sustainable customer relations and is increasingly focusing on cloud-based solutions. Visit inform-software.com to learn more.

At INFORM, we're actively engaged in the evolving use of AI and optimization in maritime terminals. Our suite of solutions demonstrates our commitment to using AI to enhance teamwork and operational efficiency. Still, at the same time – in this era of rapid AI advancements – we see ethical considerations as paramount as well.

In this article, we'll dive deep into the current and future implications of AI in terminal operations. We'll also explore the latest trends, real-world applications, and – crucially – the vital role of ethical AI in shaping a sustainable and efficient future for the maritime industry.

As we step into 2024, we believe that next year and beyond, we will see several cross-industry developments and technological advances that can potentially change our lives. For one, we see a trend towards more natural user experiences in AI interactions, stepping away from traditional screen-centric interfaces. This shift aims for AI's seamless integration into daily operations, making complex software more accessible and intuitive.

AI is becoming a core element across industries. We anticipate generative AI to emerge as a vital co-pilot in various platforms, enhancing functionality and user interaction. The future will be collaborative and assistive, integrating AI into mainstream products and optimizing processes. Of course, AI also continues to be a pivotal force in shaping maritime terminal operations.

From facilitation to empowerment

This revolution dates back to the early 1990s with the emergence of terminal operating systems (TOS), the initial step towards digitizing terminal operations, focusing on process adherence, communication, and coordination.

But as the industry evolved, so did the need for more advanced tools. The real game-changer has been the integration of an advanced intelligence layer behind the TOS, leveraging algorithmic-based decision-making. This leap from mere facilitation to empowerment is where the true essence of AI's role in terminal operations lies. As an add-on to existing investments in IT and software infrastructure (including a TOS), AI-based optimization modules support and/or automate decision-making within a terminal to assist in reaching operational goals and excelling at moving containers profitably.

AI applications are, to give a few examples of proven use cases, enhancing storage efficiency by optimizing container yard space utilization. This reduces the need for moving items repeatedly, ensuring peak performance in storage management. By minimizing travel and equipment interference and maximizing movement strategies like double-cycling, AI is significantly improving the productivity of crane operations in various modes of operation. It is also used to maximize the efficiency of all types of horizontal transport equipment, as AI-based decision-making reduces travel distances and lowers maintenance costs.

There are also examples of artificial decision intelligence in rail applications, such as when AI tools are employed to plan outbound trainloads efficiently. These enhance slot utilization and align closely with business objectives, demonstrating AI's proficiency in complex logistical planning. Naturally, optimized scheduling can also help augment the productivity of rail cranes and yard vehicles. It offers real-time optimization, adapting dynamically to operational changes.

Additionally, machine learning is being leveraged to improve data accuracy for decision-making processes, among others, for predicting container dwell times (i.e., the period the container is expected to be stored in the yard) and completion times for container handling tasks. This use of machine learning exemplifies how AI can boost the precision and efficiency of operations in terminal environments.

As early as 2018, INFORM was conducting a machine learning assessment, which would later result in the implementation of a machine learning solution in 2020 at HHLA Container Terminal Burchardkai in the Port of Hamburg. This use case aimed to reduce container rehandling for import boxes at terminals. INFORM's AI solution predicts the dwell time and the outbound mode of transport (e.g., rail, truck, vessel) – both of which are crucial criteria for selecting an optimized container storage location within the yard that avoids unnecessary rehandles.

Guide to responsible AI

Unfortunately, as AI's capabilities advance, so does its potential for misuse, calling for heightened vigilance and a robust ethical framework to govern its applications. The proliferation of generative AI tools has, for example, inadvertently fueled a surge in phishing attacks,

as evidenced by the dramatic rise in incidents following the availability of ChatGPT.

Recent news about unauthorized deepfakes of well-known people in advertising also illustrates the growing ethical concerns surrounding malicious AI utilization. Developments such as the recently passed **EU AI Act**, **US President Biden's Executive Order on AI**, and the **G7's Hiroshima Process** demonstrate the imminent implementation of regulatory frameworks.

We believe these developments can be seen as positive if taken responsibly. Moreover, we assume responsible AI conduct is a precondition for adopting AI for successful use cases. Driven by our deep-rooted values and our over 50-year legacy in optimizing business processes through advanced technology like AI, we want to maximize AI's potential while minimizing its risks.

We would therefore like to propose an approach for the responsible design, development, and application of AI systems that we, as solution providers, have already imposed on ourselves with our Responsible AI Guidelines published in September 2023. These set forth best practices, standards, and protocols, reflecting a comprehensive approach to AI that prioritizes societal needs and individual rights.

Beneficial AI: INFORM's approach to AI prioritizes societal and user benefits, actively mitigating risks such as bias and misinformation. This principle ensures that AI systems enrich operations while avoiding negative impacts.

Human-centric AI: AI is designed to support human decision-making, not replace it. A human-centric approach emphasizes AI's role as an enhancer of human capabilities, upholding human responsibility and judgement in critical operations.

Aligned AI: AI solutions must be aligned with human and business values. We must strive for AI systems that are clear and comprehensible, providing a solid foundation for trustworthy operations.

Privacy-preserving AI: adhering to the standards of the European Union's General Data Protection Regulation and achieving ISO 27001 certifications, we prioritize data privacy and security. AI solutions must be designed to protect sensitive information, ensuring top-tier security.

Reliable AI: consistency, quality, and transparency are the hallmarks of trustworthy AI applications, especially in vital sectors.

Safe AI: safety is a critical aspect of AI algorithms. The development process must involve rigorous testing and validation to ensure that AI systems are secure and free from potential threats.

Shifting the paradigm – ethically

Integrating AI in terminal operations is not just a technological advancement but a paradigm shift that redefines efficiency, innovation, and ethical responsibility in the maritime industry. As we look to the future, the industry must continue prioritizing ethical considerations, ensuring that AI remains a force for good, driving progress while safeguarding values and principles. ■

How all vessels can cut their emissions thanks to air lubrication

Photo: Silverstream Technologies

Floating on air

by **Alistair Mackenzie**, *Chief Commercial Officer, Silverstream Technologies*

The Silverstream® System is an air lubrication technology that harnesses fluid dynamics to reduce the frictional resistance between the hull and the water, cutting average net fuel consumption and greenhouse gas emissions by 5-10%. All shipping segments can take advantage of the system, which is effective in all sea states and suitable for retrofit installations and newly built vessels. Orders for our solution grew in 2023, with proven system performance and collaboration playing an important role. Looking ahead, we see data and digitalisation as key to the broad evolution of clean technology.

SILVERSTREAM TECHNOLOGIES

The London-headquartered Silverstream Technologies is a market-leading maritime clean technology company specialising in hull air lubrication. Its Silverstream® System reduces frictional resistance between the water and the hull surface, reducing net fuel consumption and associated emissions by an average of 5-10%. The system is unique in that it is the only proven air lubrication technology that can be retrofitted in ten days or less, as well as being applicable to newbuilds. It lasts the lifetime of the ship, is complementary to and can be used in conjunction with other clean technologies, and a return on investment is typically between two and five years. Visit silverstream-tech.com for more information.

From lower fuel costs to superior Poseidon Principles-aligned funding, many factors drive clean technology adoption. Evolving industry regulations – such as the European Union's Emissions Trading System and its FuelEU Maritime Regulation, along with the International Maritime Organization's (IMO) Carbon Intensity Indicator – are only set to become more impactful in 2024 and beyond. Long story short, they are all expected to improve the commercial rationale for adopting fuel efficiency measures at the vessel and fleet levels.

At Silverstream, we have already seen an uptick in system orders in the past few years. As of December 2023, there are 183 vessels contracted to have the Silverstream® System installed across all shipping segments, with 54 in-service (our customers include, amongst other prominent industry names, Carnival, MSC, Maersk, Grimaldi, Shell, Vale, Knutsen, and ADNOC L&S). Of these, 33 are LNG carriers (LNGCs), including 13 that are already operational.

Off the back of our growing order book, we were also featured in the 2023 edition of FT 1000, a ranking recognising the top 1,000 companies in Europe based on revenue growth between 2018 and 2021. Its latest instalment placed Silverstream as the fourth fastest-growing company in Europe and the third in the UK.

Flat bottoms, spiky gains

The LNGC segment has been, in particular, putting its commercial weight behind clean technology and the Silverstream® System specifically. Most recently, in August 2023, we announced receiving ten orders for LNGC installations. Six of the undisclosed orders are for retrofit projects taking place between 2023 and 2025, and four are for newbuilds to be delivered in 2026-27.

Meanwhile, in January 2023, we signed an agreement with the CSSC Jiangnan Shipyard Group to supply the Silverstream® System for six 175,000 m^3 LNGCs, forming part of the newbuild LNGC programme being constructed for the Abu Dhabi National Oil Company.

We also signed an agreement with China Merchants Energy Shipping in January 2023 to install the Silverstream® System on four 175k m^3 LNGCs built by the Dalian Shipbuilding Industry Company (DSIC). The installations will take place over two years, with

work expected to be completed by the end of 2024 per DSIC's building schedule.

Our system is well-suited to the LNGC segment as these vessels have a large flat bottom that maximises our technology's friction-reducing capabilities. The system reduces average fuel consumption and emissions for LNGCs by 7-10% net, which typically equates to saving one megawatt of net power.

The system can also help to reduce LNG boil-off and increase delivered cargo volume or cut fuel consumption and associated emissions, depending on the operator's commercial and sustainability priorities. This is because air lubrication can enable vessels to travel at higher speeds for the same fuel consumption or cut bunker (hence emissions) without sacrificing speed.

According to research based on recent Clarksons data, the global LNGC fleet will exceed 1,000 ships by 2026. So, while the sector's investment in air lubrication has been positive, plenty of vessels will still require energy efficiency improvements if the shipping industry is to meet its emission reduction targets.

Collaboration has also been vital to propelling the uptake of our clean technology in 2023. To rise to demand from the LNGC newbuild segment, for example, we have collaborated with many shipyards and placed particular focus on the Asia-Pacific region (APAC). In Europe, we recently signed a collaboration agreement with MAN Energy Solutions, whose two-stroke engines are the preferred choice of propulsion for large oceangoing vessels, for which our Silverstream® System is especially effective due to the size and shape of their hulls. With approximately half of the world's commercial tonnage powered by MAN, the partnership will help further accelerate the adoption of our technology across the global fleet, spanning both newbuild installations and retrofits. Broadly, it will help pave the way for the cleaner, greener, and more efficient vessels needed to achieve IMO's emission reduction targets. Through this collaboration, we are pursuing the mantra that the greenest fuel is the one you do not use.

From nice- to must-have

The shipping industry increasingly recognises that clean technologies can play a central role in decarbonisation today. However, we must also keep one eye on how they will evolve and iterate to meet the needs of tomorrow and stand up to the rigours of the entire lifespan of a vessel.

Leading solutions have a proven record of emission-saving performance; it is critical to accurately calculate, measure, and report clean technologies' efficiency level and decarbonisation impact. Access to more and better performance data is now allowing for more precision when calculating and verifying the impact of technology. Essentially, monitoring and measuring performance data, likewise system health, will be an integral component of not just our solution but all clean technologies in the near future.

Clean tech manufacturers will also use data and digitalisation to raise both the floor and ceiling of fuel-saving potential. Like the intelligent systems within modern cars that tune the vehicle's engine as it drives, maritime clean technologies will learn and respond to their environment and operate in a way that ensures maximum efficiency.

Because clean technologies are deeply integrated into a vessel, there is the potential for them to identify and unlock efficiencies that others may not even know existed. In other words, they become active and intelligent solutions to maximise the performance of a ship. We can harness data from our system, alongside multiple sensors around the vessel, to gain an in-depth understanding of air lubrication technology and identify factors that could influence the ship's overall performance and allow us to tailor in-service support.

The shipping industry's increasing focus on data and the surge of digital solutions in recent years indicates a shift from viewing data as 'nice to have' to recognising it as a vital catalyst for driving industry transformation. Many shipowners and operators now acknowledge the significance of the digital journey and the potential of data. It is no longer a matter of whether the industry will embrace digitalisation and data, but rather, when and how rapidly it will do so – and whether one's ready for it.

We are transitioning from an era where data was collected and stored passively, often leading to valuable insights being overlooked or forgotten, to a phase where data is being actively leveraged to inform business decisions and strategies. This actionable data has become a driving force behind both the industry's digital transformation and its decarbonisation agenda.

A lifecycle option

The growing uptake of our air lubrication system and clean technology in 2023 makes commercial and environmental sense, and we expect increasingly impactful decarbonisation drivers to propel the uptake of efficiency solutions further in 2024. Collaboration across the clean technology value and supply chains, as well as work in critical segments such as LNGCs and regions such as APAC, have been instrumental in making an impact today.

Meanwhile, looking ahead, a focus on the evolution of clean technology via data and digitalisation is pivotal to reinforcing that these solutions represent a lifecycle option designed to last a vessel's lifespan. ■

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