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Emanuele Grimaldi, International Chamber of Shipping chairman, invites ports on a journey towards decarbonized supply chains



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EDITOR'S COMMENT



INES NASTALI Editor

Slipping the net

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STEPHEN COUSINS Freelance journalist

As a journalist, I've become something of an expert in cosmic-ray tomography in recent months, having explored the technology, which is used to non-destructively investigate structures and buildings, in articles for different publications. Its use for container scanning was new to me, but I quickly realized the benefits over systems currently in use, which if fully realized pending further R&D, could transform security in ports in terms of scanning speed, accuracy and safety.



uring the last week of June, the IMO announced that the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships (HKC) will enter into force in 2025 following the accession of two big influencers: Liberia as a flag state with

much of the world's tonnage, and Bangladesh as a flag state that is a key recycling hub. While this is a major step towards safer ship recycling,

with the convention mandating a hazardous materials inventory for ships, it shows how the long delay between the adoption of a regulation - 14 years, in the case of the 2009-adpoted HKC - and it entering into force, might render it less impactful as developments taking place in the meantime are not always reflected.

Experts have warned of contradicting stipulations with a different UN regulation: an amendment to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal. "It prohibits the export of a ship to the countries most often associated with ship recycling - India, Pakistan and Bangladesh. Export there from OECD/EU countries is prohibited under the Ban Amendment that has been in force since December 2019," James M Turner of Ouadrant Chambers explains.

This is regardless of the ship's flag state. On the other hand, the export of ships flying European flags is banned to those countries via the EU's Ship Recycling Regulation, which mirrors the HKC with an inventory list but doesn't allow ships to be sent to yards in Bangladesh or India, even if they might adhere to the HKC stipulations.

A potential regulatory conflict could ensue, with ship owners possibly slipping the net among the manifold rules. The European Commission has found that 91% of ship owners circumvented an older version of their waste shipment regulation by not declaring that a ship will be scrapped.

While the HKC only tangentially pertains to ports, where scrapyards might be located nearby and hazardous spillages could occur, there is a yet-to-be ratified convention related to the threat of noxious materials and ports. The International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, 1996 (HNS Convention) is one of two IMO conventions that have yet to gain sufficient support.

According to the longstanding chair of the IAPH Legal Committee, Frans Van Zoelen, this instrument would be vital for ports to be compensated for damages - and also in the context of offering places of refuge following a ship incident and the assurance that ports can claim damages from ship owners following the pollution of the port area.

However, a long time has passed since 1996, and since the amended HNS Protocol of 2010. Ports are expected to handle far more trade pertaining to future energy sources, such as ammonia, hydrogen, or methanol, that come with new handling precautions. It is therefore vital to know that ports can rely on compensation after an incident.

Given the uncertainties around what this trade will look like, it might - carelessly - not be at a priority for member states to ratify the HNS Convention, but in the name of safe maritime operations, it should be.

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BENCY MATHEW Freelance journalist

While the information available at the start appeared sketchy, insights from my reliable industry sources helped me shape a story that goes deeper into this developing subject from the Indian industry context. Maersk were exceptionally forthcoming on what I sought to know and this proactive approach added considerable value to the content. The research work was arduous, but it was one of the most enriching experiences in my nearly two-decade maritime reporting journey.



FRANK LENNOX-MILLARD Freelance journalist

The history of hydrography is a fascinating subject full of insights into the inner workings of the human mind looking for better methods to understand the ocean and its floor. In the past, the expansion of global trade and war were responsible for many of the developments in hydrography, but more recently concerns around climate change, aquaculture, and consolidation of a safer, energy efficient, and interconnected world through technology have also been spurs.

IN CONVERSATION WITH EMANUELE GRIMALDI

Charting a joint course

The time is now: July sees the maritime community come together at the IMO to agree on a regulatory path for concrete emission-reduction measures. Emanuele Grimaldi, chairman of the International Chamber of Shipping, and Patrick Verhoeven, managing director of the IAPH, discuss their organizations' united decarbonization journey

INES NASTALI

Т

he first week of July has been a highly anticipated one in the maritime calendar: the 80th session of the IMO's Marine Environment Protection Committee (MEPC80) is meeting in London and the UN body's member

states are tasked to adopt a strategy to reduce maritime emissions in the decades to come.

This time of year also marks 12 months for Emanuele Grimaldi, CEO of Grimaldi Lines, as chairman of the International Chamber of Shipping (ICS), which makes for a good time to review recent efforts to decarbonize the maritime supply chain in ports and in shipping.

"Ports and shipowners already have a symbiotic relationship and together will be integral to achieving decarbonization goals for the entire world. Ships are expected to transport approximately 50% of the new green fuels that other sectors will be using to decarbonize, and it is ports that will help to facilitate the trade of these green fuels, for example through refueling hubs for maritime transport," Emanuele told *P&H*.

This is something the IAPH pays close attention to. "The transition to a zero-carbon energy landscape has profound implications for the business model of ports and shipping, not unsimilar to how containerization transformed our industry in the 1960s," said Patrick Verhoeven, managing

director of the IAPH. "This goes far beyond the fueling of ships, with new energy trade lanes emerging, connecting production centers of renewable energy in the Southern Hemisphere with consumption areas elsewhere. It means we'll need massive investments to create both new greenfield infrastructure and adapt existing fossil-based infrastructure in exporting and importing ports."

These new fuels are part of the IMO strategy to reduce emissions in 2050 by 50% of the 2008 baseline data.

However, the fourth IMO Greenhouse Gas Study published in 2020 warned that without further action, CO_2 emissions from international shipping are projected to be 90%–130% of those 2008 levels by 2050 for a range of plausible long-term economic and energy scenarios.

The industry is thus hard-pressed to find technological as well as regulatory measures to bring maritime transport in alignment with the Paris climate goal of limiting global warming to well below 2°C and pursuing efforts to limit it to 1.5°C of pre-industrial times.

Ahead of the member states coming together at the IMO, the UN Conference on Trade and Development (UNCTAD) reviewed the proposed measures



IN CONVERSATION WITH EMANUELE GRIMALDI



that will be discussed during the weeklong meeting.

A favored one has been suggested by the ICS: an economic measure where CO_2 emissions are being taxed per ton to bridge the price gap between zero-carbon fuels and conventional fuels and that contributes to a research-and-development fund for alternative fuels and their infrastructure.

The suggestion – per se – is being

favored by different stakeholders. Especially by ports, as two-thirds of new infrastructure investments to accommodate alternative fuels will have to be made on land.

However, the details of financing and the level of contribution per member state still need to be ironed out. The UNCTAD review states that the solution could indeed be an "IMO fund to help expedite the transition to zero-carbon emissions without any direct financial cost to states and with minimal administrative burden. The proposed levy-based economic measure is therefore considered to be a cost-effective measure, which will help facilitate successful delivery of the 2050 levels of ambition set out in the initial IMO strategy."

At the same time, it suggests "that programs to be supported by the proposed IMO fund could be designed to identify mechanisms for reducing the cost of transportation to least developed countries and small island developing states, and other geographically remote locations."

For the fund to be successful, it needs political will, Emanuele said. "ICS continues to call on industry stakeholders to speak to their own government contacts ahead of MEPC80 so that member states are fully aware of what is required for the industry to move forward. Getting something in place as soon as possible will reduce the investment risk, which is crucial to making tangible change," the ICS chairman voices a call to action.

Then, "a system could be up and running as early as 2024 if IMO member states give the green light at MEPC80. MEPC80 will set the ambition but without measures, it will not be possible to achieve the goals. This is why we need governments to not only set the goal but also provide the tools to enable the goal to be achieved," he continued.

For him, a successful outcome of MEPC80 would be a clear direction for IMO member states with increased ambition to achieve net-zero carbon emissions by 2050.

The IAPH supports the increased ambition and the need to have a combination of technical and economic measures to help achieve this goal.

"OPS facilities will not be me stranded it is assets" the

PATRICK VERHOEVEN

"Although we remain neutral as regards to the type of market-based measure that will be adopted, we believe it is an essential instrument to facilitate a just and equitable transition through the collection and strategic allocation of the generated revenues to port-related investments for low- and zero-carbon fuels, in developing countries in particular," said Patrick.

Financial call

Part two of ICS's regulatory decarbonization trajectory is a joint proposal submitted together with the IAPH to the IMO – also to be discussed at MEPC80 in July – on onshore power supply (OPS).

Uptake of this technology is being hindered as some ports argue there are not enough ships using it to make it a viable investment – costs on the port side vary from a quarter million to several million dollars – while some shipowners say there are not enough ports offering onshore power with equal expected costs for ships.

"It is a chicken-and-egg situation," Emanuele confirmed. "The submission that we have co-sponsored with IAPH, Cruise Lines International Association and INTERFERRY aims to address this uncertainty from both the port and the ship side." The proposed collection of data regarding the accurate power consumption by ships while berthed in ports is aimed to help these ports decide on both the investment needed in the appropriate OPS infrastructure and the expected added demands on the regional power grid. "Our submission also calls for part of the revenue generated by the economic measure to be adopted by the IMO as part of the basket of mid-term GHG reduction measures to be utilized to support and incentivize investments in OPS infrastructure in ports and on-board ships," Emanuele said.

Patrick explained that "successful cases of OPS almost all involve public financing of infrastructure, at least partially, and regulation for ports, terminals and vessels, making both the provision and the use of OPS mandatory."

He also knows why the adoption otherwise is slow. "A major reason why OPS is not deployed on a much larger scale yet is that there are doubts about whether OPS is a future-proof choice." These doubts are based on the thought that climate policy will lead to emissions-free ships, with which OPS infrastructure will become less and less utilized and rapidly depreciates. "A recent study by CE Delft, however, found that there are several reasons, which make it unlikely that OPS facilities become stranded assets." He added that "cost advantages and the potential to address other pollutants are among those reasons." This is crucial as "the study confirms that, in all scenarios of decarbonization of shipping, a significant share of maritime fuels will still be fossil-based by 2040. That is why we consider OPS to be a viable long-term solution for ships at berth offering significant air pollutants, noise and GHG emission reductions".

Even though OPS might not be a widely supported practice, there are regional requirements for OPS like the ones in China, Europe, and the West Coast of the US. "It is therefore important to address any incomplete technical standardization issues with these installations, which the submission also calls upon the IMO to undertake," said Emanuele. Indeed, in California onshore power has been regulated since 2014 while the European Union wants ports to offer connections in 2030.

Sailing together

This is not the first time the ICS and IAPH have been cooperating and it will certainly not be the last. "Many of our challenges are mutual and can only be overcome by working together. The ICS and IAPH enjoy a strong collaborative relationship, evidenced through our partnership on the clean energy marine hubs. We look forward to forging ahead with our work on the hubs and accelerating the production and uptake of green fuels for the benefit of the entire world," said Emanuele.

The initiative has the backing of five governments – the UAE, Panama, Norway, Uruguay, and Canada – and of the International Renewable Energy Agency and the Global Center for Maritime Decarbonization. The clean energy marine hubs will be formally launched at the 14th Clean Energy Ministerial in Goa in July. Emanuele is hopeful. "We are on an upward trajectory to achieve our goals."

The coordinated efforts between governments and industry across the energy-maritime value chain are also hoped to be great opportunities for port authorities. "Countries failing to take first mover advantage in establishing a clean marine energy export or import hub are likely to lose out to regional rivals who do attract the investment and knowhow. This can also become a potential energy security risk," said Patrick. "It will be the role of shipping and the ports that serve them to become the enablers of the energy transition by offering capacity to transport what is expected to be 50% of all global

"We cannot work in silos anymore"

EMANUELE GRIMALDI

zero-carbon fuels. For candidate countries this presents a golden opportunity to develop the hub concept as catalysts of economic growth and prosperity for their citizens."

Emanuele agreed. "Over the past few years, I have noticed an increase in collaboration within the shipping industry but also between shipping and other players in the energy value chain. Shipping along with its stakeholders recognize that to decarbonize, we cannot work in silos anymore. Decarbonization is a global challenge bigger than any one industry or government so achieving our goals requires joined up thinking on a global scale."

Joining the club

Although the MEPC80 meeting is the big one in the maritime calendar, later this year, in November and December, the UN has invited the world to come to Dubai and discuss the impact of climate change on a global level.

Traditionally, shipping as one of the main trade transport facilitators will be present for the week-long talks, too.

"At COP28, we are hosting a major gathering on 10 December supported by the UAE's Minister of Energy and Infrastructure. We are working with IAPH to ensure the outcomes of the World Ports Conference, which I look forward to attending in Abu Dhabi, will feed into the discussions during COP28," said Emanuele.

"We are delighted that Emanuele will be joining IMO secretary-general Kitack Lim,

our president captain Subramaniam, and other leaders at the World Ports Conference in Abu Dhabi for a discussion on what shipping and ports can deliver to COP28," Patrick responded. "It is a strong signal to the global business community and regulators that shipping and ports stand together, not just when it comes to decarbonizing the maritime sector, but also in facilitating the transport and distribution of zero-carbon fuels."

Emanuele would like to see IAPH member ports at COP28 and extends another save-the-date to mark in the maritime decarbonization calendar. "COP28 will be a significant moment for our industry, and I look forward to sharing more details in due course. The events we are planning will provide a significant opportunity for the entire maritime sector to showcase what is already under way and to bring stakeholders together to set a course for a decarbonized sector. I look forward to seeing many of the IAPH members in Dubai on 10 December," the ICS chairman concluded.



PERSPECTIVE PORTS AND THE IMO

Connecting the world

I n an uncertain decade in which shipping is dealing with geopolitical and economic challenges, supply chains have kept pace and continue to run in spite of the challenges, with ports at the beating heart of the global supply chain.

Prior to becoming secretary-general of the IMO in 2016, my maritime career led me through seafaring and maritime administrations to Busan Port Authority, where I held the position of president.

So, naturally, one of my goals in my current role at the IMO has been to bring prominence to the work of ports and their importance to the IMO discussions.

However, already in 1965, the Facilitation Convention (FAL) was adopted to ensure a secure and efficient maritime transportation system: to cut red tape at the ship-port interface; and IAPH has been holding consultative status at IMO since not long after, in 1967. I have been keen to shine a spotlight on the existing cooperation between ports and ships and to boost those connections. The safety of the 12 billion metric tons of cargo being moved by sea annually simply cannot be guaranteed without the cooperation of ports – and they are critical to shipping's decarbonization and digitalization voyage in this pivotal era.

Digitalization and automation

On 1 January 2024, the FAL Convention will see its latest evolution, making it mandatory for ports in member states to operate maritime single windows (MSWs) to electronically exchange information.

During the past few years in the quest for greater sustainability, decarbonization, digitalization and automation have been greatly enhanced in shipping. The IMO's work on trade facilitation has evolved alongside the trade that it facilitates.

For example, by introducing the mandatory electronic data exchange to increase digitalization of processes for port stays and departures and streamline procedures. It is certainly true that the urgent need to reduce human contact caused by the COVID-19 pandemic became an unexpected driver toward digitalization.

The FAL Convention has put in place the regulatory structure for this push toward modernizing the port call process, but it is clear this digital transition is not happening at the same pace in the developed and developing worlds. Recent informative events organized with IAPH and BIMCO have therefore targeted representatives of national authorities to ensure the MSW is fully embedded in national knowledge.

Digitalizing and automating procedures from a ship's arrival in port through to its departure, and potentially including its cargo's onward land journey, streamlines processes for the port itself through sharing data just once. This also supports resilience in the global supply chain of goods.

The IMO Compendium on Facilitation and Electronic Business aims to do this. It is a reference model, which aims to harmonize semantics and format for all information in





ABOUT THE AUTHOR

KITACK LIM is the secretarygeneral of the IMO. Before he took up this position, Lim was the president of the Busan Port Authority in South Korea.

the maritime domain relevant to the IMO. The compendium ensures that stakeholders' different IT systems can exchange common data, as well as supporting harmonization of MSWs, port call optimization and facilitating the development of green and digital corridors.

Collaboration with the World Customs Organization, the United Nations Economic Commission for Europe, the International Standards Organization and now with the International Hydrographic Organization ensures full alignment across the supply chain.

The time to accomplish this transformation is imminent. IMO is committed to supporting all member states to find tangible solutions to enable their compliance under FAL. IMO has been supporting this process with donors, for instance through the provision of technical assistance to small island developing states in designing an MSW and through the Single Window for Facilitation of Trade project, an initiative of Singapore facilitated by the IMO.

As the January 2024 deadline draws closer, it is clear that there are tangible benefits from sharing collective expertise to accelerate digitalization across the global maritime industry.

The decarbonization journey

Ports also play a vital role in the decarbonization of maritime.

The initial IMO Greenhouse Gas Strategy, adopted in 2018, already identified the need to further optimize the logistics chain and its planning, including ports, as a candidate short-term measure.

The Marine Environment Protection Committee (MEPC) resolution [MEPC.323(74)] was consequently adopted in 2019 to encourage voluntary cooperation between the port and shipping sectors to contribute to reducing GHG emissions from ships.

That resolution was updated in 2022 [MEPC.366(79)], to reference a call to facilitate voluntary cooperation through the whole value chain, including ports, to create favorable conditions to reduce GHG emissions from ships through shipping routes and maritime hubs.

I am also pleased to acknowledge IAPH's role as a strategic partner in IMO's GreenVoyage2050 Project, particularly in developing practical guides such as the Port Emissions Toolkit, covering assessment of port emissions and development of port emissions reduction strategies.

In other IMO projects, ports in least-developed countries and small island developing states are being supported to utilize these tools and implement the findings.

National action plans to decarbonize maritime must therefore include ports – it is the buy-in from port side that will undoubtedly make maritime decarbonization a reality. With IAPH involvement in IMO meetings and through national delegations bringing in experts on the port side, IMO member states can ensure that they fully take on board the port-side element as IMO pushes ahead with its decarbonization strategy.

Just in time to support energy efficiency Finally, in just-in-time (JIT) operations efficient digital visibility across port operations and the ongoing mission to decarbonize international shipping come together. It is well known in the context of supply chain management – yet some may be unaware that there are still some contractual barriers, which mean that ships may arrive at a port on time, yet wait at anchor to berth, burning fuel in the process. The Global Industry Alliance supports low-carbon shipping as part of the IMO-Norway GreenVoyage2050 project, working to address those barriers and promote the JIT arrival concept.

Conclusion

Shipping is undergoing substantial change on its decarbonization and digitalization voyage while seaborne trade has been and is growing, ports will therefore need to adapt and change.

Ultimately, shipping and ports are essential to the world and must be at the forefront of change as we strive for a more sustainable and greener maritime future.

FEATURE CARGO SCANNING

Coming through

The unique properties of tiny particles from space might be the secret to faster, safer and more accurate container scanning

STEPHEN COUSINS



hipping containers are a key enabler for global trade, but difficulties scrutinizing the cargoes they contain with sufficient speed and accuracy has created a health, safety, and security nightmare with serious consequences for vessels, maritime workers and the wider population.

The malpractice of cargo misdeclaration or nondeclaration, whereby authorities are not properly notified of the presence of dangerous or hazardous cargoes inside boxes, has led to an increasing number of containership fires in recent years.

According to the Allianz Safety & Shipping Review 2023, fire was the second most frequent cause of vessel loss over the past year, with the misdeclaration of cargo, plus the increasing use of larger vessels, amplifying the consequences.

Mark Smith, loss prevention executive at NorthStandard P&I Club said to *P&H*, "Even smaller fires detected at an early stage have the potential to spread and cause loss of life and severe damage. If one container on board a ship is undeclared or misdeclared, there may be others that contribute to massive expansion of the fire, which is not easy to control by the ship's crew and fire-fighting equipment alone."

The high throughput of containers is a constant struggle for ports trying to check for the presence of narcotics and to maintain biosecurity controls. In addition, the way nuclear and radioactive materials are secured inside boxes precludes straightforward inspection and remains reliant on time-consuming and impractical manual checks.

Keen to find solutions to these challenges, scientists and maritime collaborators have spearheaded a wave of research and development (R&D).

Pictured: The system at Haifa Port fires muons through a container from above and below to generate a 3D picture of the container's contents. Photo: Lingacom





Muon versus x-ray scanning of trucks



For example, into cutting edge container scanners that harness tiny particles from space, known as cosmic ray muons. Muons are tiny, short-lived and highly energetic subatomic particles produced when cosmic rays interact with the atmosphere.

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These offer an intriguing alternative to x-rays or gamma rays, which have certain drawbacks and can pose a health risk to operators and nearby port workers. Their ability to pass through matter decreases based on its density — different materials absorb or scatter them in different ways — which can be monitored and displayed in 2D or 3D to give an accurate picture of the material's appearance and properties.

Andrea Giammanco, a particle physicist, expert in muon tomography and senior researcher at the Université Catholique de Louvain in Belgium said to *P&H*, "Cosmic ray tomography (CRT) is intrinsically safe because no artificial source of radiation is needed, we just exploit cosmogenic muons, a ubiquitous background radiation that's been around since the dawn of time."

He added, "In contrast, irradiating a volume with x-rays or, even worse, gamma rays, is hazardous to humans and the need to adhere to specific regulations to avoid risk to operators and bystanders, such as harbor staff, entails an extra layer of procedural complexity. What's more, humans may be hiding inside the cargo to be scanned and get accidentally irradiated."

Multiple threats

The need for faster, more efficient methods of container inspection has come to the fore in recent years as customs authorities face a huge influx of boxes but are only capable of inspecting a small fraction of them without interrupting the flow of trade.

Gillian Clark, senior executive for claims at marine insurance firm NorthStandard P&I Club said to *P&H*, "The throughput at container terminals is so great that it

is simply impossible to open or scan every container and

still maintain the benefits in terms of time and economy of container shipping."

Recent research has shown that organized crime is constantly evolving its methods to avoid detection, often stashing drugs, counterfeits and other illicit goods inside legitimate container shipments. Meanwhile, potential fires caused by misdeclaration or undeclared hazardous cargoes add to the sense of urgency.

Container screening plays a key role in tackling these issues; existing systems using x-rays and gamma rays typically do not provide enough penetrative power through some heavy materials, suffer from interference resulting in incoherent images, and emit intensive high-energy radiation that is both dangerous to humans and subject to regulations on the use of radiation sources.

Muons pass through our bodies all the time with no health consequences.

CRT is considered state-of-the-art in cargo screening and offers a potential solution to all the issues outlined above, with significant R&D activity underway in the field. Backers of CRT technology point to its ability to produce high resolution images, even in noisy or conductive environments, superior penetrating power, and use of safe, naturally occurring radiation.

Particle power

CRT in security is an emerging field and R&D projects are often under wraps with stakeholders reluctant to disclose their intellectual property or covered by restrictions.

A €7.5 million project to help the EU better secure its borders is currently developing a "lightweight, compact and smoothly transportable" scanner for use by border guards, customs and law enforcement authorities.

Partners in the Horizon 2020-funded SilentBorder project include the German Aerospace Center, the University of Sheffield, UK, Université Catholique de Louvain, Belgium, the University of Tartu in Estonia, and technology provider GScan. The system is being designed to enable the "safe and fast screening, detection and identification" of hazardous and illegal goods, including special nuclear material (SNM), contraband and hidden persons in twenty-foot equivalent containers.

The intention is to create a high-performance system that uses novel algorithms, combined with artificial intelligence to identify materials as an alternative to x-ray or gamma ray scanners that are relatively slow as scanning high thickness goods in intermodal shipping containers.

Unlike existing scanners, the device will be designed to avoid image blurring when materials are piled together and classify materials like drugs, explosives, weapons, tobacco, alcohol products and heavily shielded or masked nuclear material based on elemental composition.

A spokesperson for the SilentBorder project said to *P&H*, "Muon tomography systems are easily able to detect and identify nuclear material, even when it is shielded. They also offer the ability to fully detect and classify material composition, especially when AI algorithms are deployed. This is something, which is very challenging with existing approaches. The reconstructed image provided when using cosmic rays is also naturally 3D, since cosmic rays enter the shipping container from many different directions."

"Significantly faster" scanning times are being targeted so initial container clearance can be given in 2 to 3 minutes, depending on the contraband and its size, versus up to 30 minutes using x-ray scanners. AI will automate confirmation of contents and compliance with a customs declaration with no need for operator interpretations.

SilentBorder runs until April 2025 and is collaborating with officials from the border control authorities in two EU countries.

Pioneering work in the CRT cargo security field is also detailed in a paper published earlier this year, which highlights applications carried out by the Los Alamos National Laboratory and its spin-off technology company Decision Sciences. Its Discovery system harnesses muon tomography to, according to its website, detect security threats at both seaport and land border operations, including shielded nuclear material, contraband, or anomalies in commerce. An illustration of the system depicts a large-scale drive-through portal. Layers of aluminum drift tubes — a method for sensing muon particles — are mounted above and below a vehicle support platform and fire particles through the container to record what is going on inside.

The company says the system can penetrate through all shielding materials that block x-rays, including water, ice, steel, lead and concrete, with "unlimited viewing angles" as well as create 3D images "in as little as 30 seconds."

Terror alert

Large-scale terror attacks have highlighted complex security challenges, but if terrorists were to acquire chemical, biological, radiological, nuclear and explosive (CBRNE) materials in a dirty bomb, casualty numbers would be even higher and the devastation more widespread. Under current set-ups in ports, the sheer volume of container throughput can block the chemical signatures of CBRNE materials and containers themselves are typically made of thick steel, sealed and locked, and threat materials can be shielded inside to evade standard detectors.

Keen to tackle this conundrum, a team of scientists led by Israel-based company Lingacom, with partners Technion, Ben-Gurion University and CNB-CSIC/Yale, developed a proof-of-concept multisensor system combining CRT and other technologies to automatically scan containers for threats in port terminals.

The circa €3.5 million EU-funded research project, known as COSMIC ran between 2018 and 2021 and developed eight new types of sensors, integrated them with software and tested them in live environments in three seaports in the Netherlands, Israel and Spain.

The live trial of muon tomography sensors, used to detect shielded nuclear materials in containers, was carried out at Israel's Haifa seaport. The fixed installation was a drive-through portal for trucks carrying containers with a layer of drift tube sensors above and a layer of sensors embedded in the road below. David Yaish, CEO at Lingacom said to *P&H*, "COSMIC successfully proved that we can harness muons to inspect and detect shielded nuclear materials inside dense containers containing attenuating materials such as metals, ceramics, frozen meat etc."

He added, "The idea is not to replace x-rays, it's to provide customs with new capabilities x-rays cannot provide. Muons also enable 3D information, so you can pinpoint the location of the threat."

The COSMIC system is modular and while some of the sensors are, according to Yaish, "very close to commercial deployment" others require more development. Lingacom has had CRT sensors on the market for three years and is "continuing the commercialization process" in relation to a nuclear-sensor product.

While research and investment in the field of CRT is yielding results, it faces technical, market and other hurdles. Imaging methods based on x-rays or gamma rays can yield high-definition images almost instantaneously and the intensity of radiation can be accurately controlled, but cosmic muons arrive from the universe around us in a trickle — around 100 per second per square meter. "This is not a lot," said Giammanco. "It means that hours may be needed to form a high-definition 3D image of the interior of a cargo, which is too long in most cases." Nevertheless, he said, times could be reduced to minutes if the goal is only to find enough evidence of a threat to justify a manual inspection of the cargo.

In addition, ports' reliance on established remote-sensing methods may stymie uptake of CRT, which still needs to prove its stripes as a reliable solution for business-as-usual. The SilentBorder spokesperson said, "The key market challenge is gaining the trust of the end users. It must be fully demonstrated that the technology provides fast and reliable results for a vast range of realistic scenarios and performs better than existing methods without increased complexity for the end user."

Time will tell if cosmic-ray muons can be properly harnessed to benefit ports, or if their future instead remains among the stars.



14



Wake-up call

While advances in cargo screening methodologies move on apace, the adoption of an industry-wide standard remains elusive and lacks consistency, resulting in the dangers of nondeclaration or misdeclaration of cargo

W hat's in the box? A crucial question as maritime casualties, such as serious ship fires, and multiple lesser incidents continue to demonstrate the critical importance of correctly declaring and packing goods in containers.

It is fundamentally the responsibility of shippers to ensure that all other counterparties in the global supply chain are made aware of the exact contents of every single consignment.

TT Club's analysis of claims indicates that two-thirds of incidents related to cargo damage are caused by poor practices that occur before the container leaves the packing location. Such deficiencies result in multimillion dollar losses, including tragic container ship fires with loss of seafarers' lives.

Cargo owners, in particular, need to take responsibility to ensure these risks are mitigated. It is vital that they ensure the exact nature of cargoes and their potential dangers are well understood by their forwarding agents, other intermediaries and carriers.

It should be appreciated also that the dangers are not just restricted to the more obvious hazardous chemical cargoes, such as those used in paints, cosmetics, cleaning products, fertilizers, weedkillers and aerosols, but also to a wide variety of consumer goods.

The list is long and often surprising — barbeque charcoal, fireworks, hand sanitizer, wool, cotton, vegetable fibers and many more. In recent months, lithium-ion batteries, where volumes of shipments are growing exponentially, have become of greater concern. Owing to the heavy demand for rechargeable power for a widening range of devices, and increasing restrictions in air carriage, they are primarily moved via surface transportation.

The risks are varied, but the potential harm when things go wrong includes toxic vapors and fire of extreme heat that is difficult to extinguish.

Critically, the declaration of such batteries in an accurate way to ensure maximum safety may be difficult even for the most conscientious of shippers.

Currently, lithium-ion batteries are classified as one of four UN numbers, but may be subject to certain exemptions depending on power output and weight of lithium.

Further, all four classifications are Class 9 in the IMDG Code, "Miscellaneous dangerous substances and articles," the least hazardous ranking.

Their inclusion as Class 9 dates from a change in Class from 4.3, at the point that button batteries were being introduced. It is arguable that there is a need to review this classification, since the size and energy capacity of these batteries have altered dramatically since then — as, indeed, has the volume being carried in container ships.

In answering the question – What is in the box? – we are not just hampered by nondeclaration or misdeclaration, but also in achieving a thorough understanding of the risks presented by a correct declaration, where the inherent hazards may have advanced beyond the regulatory framework.

Closing the gaps

Through the US Inflation Reduction Act and shipping lines' investments, ports stand a chance to modernize their processes and equipment

> As an example, Royal Caribbean Group is doing this now with terminal development at Port Everglades and Port Miami.

Q: What advice can you give ports to close the gaps?

A: Ports assets are expensive to build and procure, they take a long time in planning, permitting, designing and construction. Therefore, a periodic detail planning and strategic capital improvement programming become key in incorporating lessons learnt from global ports, staying ahead of the market trends, and continuing to handle growing trends of cargo and people handling.

Ports need to also take advantage of the existing federal grants and work with public and private sectors to modernize their facilities toward a net-zero and eventually a zero-carbon operation. Attention to their ESG mandates will attract investments by public sector and uni- or multi-lateral organizations. With the projected growing container market trade projections, this could create a win-win scenario.

Q: How do you collaborate with ports?

A: Our ports' business is built upon a deep appreciation of what matters in operating small-, medium- and big-size ports and we welcome all partnerships and cooperation in servicing the ports industry with AECOM's global reach and deep bench of multidisciplinary port professionals who are delivering all types of port projects in local markets worldwide. One thing that is critical is to make sure labor is on board and part of the discussion for any type of port efficiency efforts. AECOM can demonstrate the need for densification, automation, space optimization and offer training to union workforce, while demonstrating that jobs and productivity can work together to meet the future needs.

Q: Please give us a brief introduction of your role and how you interact with ports. A: My name is Alanna Strohecker, leader of the Global Goods Movement business at AE-COM. I lead the strategy and business development functions of AECOM's business that provides transportation solutions across the supply chain, including the company's global freight rail, ports and marine business.

AECOM has been a trusted partner to ports worldwide for more than a century, providing strategic, technical and management services to port sector clients in building port infrastructure. We deliver planning, engineering, architectural, program and construction management services to the port industry. We assist port authorities, global port terminal operators and naval clients with their strategic plans and optimization of their operations, in addition to assisting them in preparation for federal grant applications.

Q: How do you see the current state of the port infrastructure market in terms of market potential, including for bunkering and digital infrastructure?

A: The current state of the port infrastructure market is booming owing to extensive investments by the US government, shipping lines and terminal operators backed by strong profits and added visibility ports have received in serving as the key node of the global supply chain markets post-pandemic. Larger-vessel size is also dictating modification to bulkheads and ship-to-shore cranes. Electrification, cold ironing and alternative fuel bunkering requirements are also changing the infrastructure landscape of the ports.

The majority of shipping lines, cruise line clients and ports are still in the initial stages of building upon the digital infrastructure. AECOM has been working with several

ALANNA STROHECKER Senior vice president and leader of AECOM's Global Goods Movement business

Australian ports in implementing its asset management programs as well as digitizing its assets.

Q: What do ports need to do now to prepare for a changing infrastructure landscape? A: Many ports are implementing modernization and upgrade projects to be able to service an ever-growing fleet of deeper, wider and longer ships in the container, cruise, crude and LNG markets.

Ports are racing to upgrade their old infrastructure to sustain the current business and prepare for the new trends in the shipping industry with extensive focus on emissions reduction, automation of processes and equipment and preparing for rising sea level issues.

Funding for development is always a challenge but ports should be aggressive about identifying and securing grants and working with their users on public-private partnerships that have cruise and cargo lines investing with upfront funding and then making long-term commitments for using the facilities with guaranteed volumes and rate escalators.





Photo: AECOM



Since 2020, Carla Monrabal has been the president of Argentine Puerto Dock Sud Management Consortium. Time to catch up on her efforts around decarbonization, digitalization, and diversity

CHARLIE BARTLETT

here is more than one reason to be excited about Argentina's future. The World Bank estimates it could increase its GDP by 2.7% for 2030 by shifting to a low-carbon economy, and with an abundance of wind energy, Argentina is being mooted as one of the big winners in the oncoming global green energy gold rush — a prospect that has not been passed by Carla Monrabal, president of Puerto Dock Sud Management Consortium (CGPDS).

"We recognize the potential that this transition to cleaner, more sustainable energy can achieve and the need for us to take full advantage of it." Monrabal explained how the port is doing this. "We have joined the Global Ports Hydrogen Coalition, an activity developed by the Clean Energy Ministerial Hydrogen Initiative. This membership gives us the opportunity to share knowledge and collaborate with more than 40 ports and organizations internationally, with the goal of promoting the use of green hydrogen as a zero-emission alternative energy source in our port facilities and operations." In addition, the port is "part of the Consortium for the Development of the Hydrogen Economy in Argentina promoted by YPF Technology, which aims to promote collaborative work between companies, organizations and key players in the country for the national development of this energy vector."

Getting certified

While the perception of ports, particularly those handling oil and gas vessels, has not been as bastions of green thinking, the UN Sustainable Development Goals (SDG) are front-and-center in Puerto Dock Sud as the only certified port in the region. Is this a tough sell? "I wish to change the widespread perception that ports are not sustainable, which, I understand, is due to the commonly established association between these activities and negative environmental impacts," Monrabal responded. "In this sense, one of the recent actions we carried out within the administration and operations of CGPDS was the audit for the verification of the carbon footprint, in which it was verified that the tasks performed by the CGPDS were carried out in accordance with the standards of ISO 14.064." The president added, "The Port of Dock Sud, for the first time in its history, adopted a responsible and sustainable approach in its operation."

Properly quantified, the port will set about cutting down its emissions something for which there had been no particular drive in the years before Monrabal's tenure in 2020 began. "Verifying our carbon footprint as port authority gives us a clear picture of our greenhouse gas emissions and motivates us to implement additional measures to reduce them."

Digital and agile

Another measure has been to incorporate the port in the Single Window for Foreign Trade in Argentina (VUCE), intended to streamline processes,

"I wish to change

the widespread

perception that

ports are not

sustainable"

speed up response times and eliminate paperwork. "I am sure that its implementation will be very beneficial for the Port of Dock Sud because it will allow us to improve our competitiveness," said Monrabal.

"We already collaborate in the exchange of information for the development of our own systems such as, for example, the vessel turning request system called Nereo, in the case of the port, and, in the case of VUCE, in the contribution of digital infrastructure such as monitors for the modernization and expansion of the central monitoring center, the installation of the first fiber optic ring in the port area, CCTV infrastructure — intelligent cameras and domes and scales for weighing trucks transiting through the port area," she explained.

Contributing to societal development And to prove the worth of its certification for UN SDG 5, gender equality, the port is working on diversifying its workforce and interaction with the local community. Monrabal illustrates the necessary business of changing company culture to create environments where women actively seek to work. "Since my arrival at the Port of Dock Sud, I knew that one of the main objectives of my administration would be the gender issue because I understood that, as the first woman to preside a port in the province of Buenos Aires, I had to fulfill a double responsibility, to manage the port well and to do it with equity," Monrabal told *P&H*.

Prior to 2020, Puerto Dock Sud had been content to fulfill its operational brief, lacking action plans for improving efficiency and competitiveness, as well as any policies for inclusion or care for the environment. "Nor were there any links with the local community, which made the Port of Dock Sud at that time seem disconnected from its surroundings," Monrabal added.

"After taking office, together with my team, we focused on five key areas: community, infrastructure, sustainability, gender and security. Since then, we have implemented measures to improve port infrastructure, promote greater equity,

adopt sustainable practices, strengthen port security and establish a closer connection with the local community."

In one example, the training to work program operates within the municipality of Avellaneda, province of Buenos Aires, and

the Río Santiago Shipyard, with courses aimed at reducing the gap between women and men within the port — including for hands-on manual labor even today is widely thought of as men's work. Sure enough, engaging with the local community to communicate this, has had results.

But the changes have hardly been limited to the boardroom.

"Thanks to this program, one of the first graduates managed to join the construction company specialized in horizontal drilling, Mar Profundo," said Monrabal.

"Despite the fact that historically, ports have been a male-exclusive sector, the reality is that women play an irreplaceable role in societal development," she reminds readers and looks forward to guiding the port into a sustainable future.

Digging in

Decisions on investments, including implementation plans, are a subject of strategic and operational importance for ports and all current and potential service providers, port users, and stakeholders. The IAPH World Ports Tracker examines the state of port infrastructure updates currently underway **PROFESSORS THEO NOTTEBOOM AND THANOS PALLIS**

W hile the IAPH World Ports tracker regularly checks in on global throughput of ports, once a year, the survey comes with supplemental questions devoted to investments made to advance infrastructure.

The overall picture is positive: In 2022, such investments were executed as planned in four out of 10 ports (42%) and incurred only minor delays in the other four (39%) that took part in the March IAPH survey.

Considerable delays occurred in 10% of the reporting ports and a small percentage of the ports that participated in the survey (4%) canceled or shelved their existing infrastructure development or upgrade projects that they had planned to launch by the end of this year.

This percentage is similar to that of ports that succeeded in making their investments faster than anticipated (3%). The share of reporting ports that did not have any infrastructure development plans for 2022 stands at 8%.

A noteworthy observation is the global nature of these trends: the survey did not identify delays or cancellations of port investments in any particular region of the world – they happened in all five continents.

Beyond upgrades of existing infrastructure, reported investments included, among others, new container terminals – in some cases with advanced forms of automation – and investments targeting intelligent digitalized infrastructures.

In addition, reporting ports mentioned the development of investments focused on the expected increase of handling electric vehicles such as investing in constructing facilities and developing processes, namely predelivery inspecting centers for operating state-of-the-art terminals that will serve automotive and commercial vehicle trades.

Sustainable investments

The second type of investments examined were those focusing on improving the sustainability of ports. While all port investments target aspects of economic, environmental and social sustainability, some of them are being developed with sustainable operations as their explicit goal.

Certain investments include advancing sustainable ports by reducing emissions, introducing electrified equipment and vehicles, or planning onshore power supply.

The survey revealed a positive trend in world ports taking action: During 2022, most of these investments were executed as planned (50%) or were subject only to minor delays (37%). However, 10% of reporting ports said they were facing significant delays. Pinpointing to causes for these delays, some ports referred to national policies on related issues, such as uncertainty regarding governmental proposals and policies on reducing emissions or linking such policies with investment initiatives.

Capacity expansion

On a related level, the survey looked at expansion plans, which are related to investment decisions. The IAPH World Ports Tracker survey looked at the priorities of ports and the forthcoming changes in available capacity for all types of port activities.

That said, one survey question aimed to reveal particular markets that ports prioritize for expansion or upgrades to their capacity and whether the capacity expansion will become operational in the immediate future.

One in three reporting container ports (33%) said major container terminal capacity expansion or upgrades will become operational in 2023. Notably, these include ports everywhere in the world except the reporting North European ports. Similar upgrades and expansions are taking place in the breakbulk market and will be operational in 25% of the reporting ports. Such projects are reported worldwide but more frequently in Sub-Saharan Africa. Capacity upgrades or expansions are less frequent in the liquid market (11%).

Survey responses by geographical region (%)



Planned investment in ports for 2022 (% as in early March 2023)



Source: IAPH © 2023 S&P Global Market Intelligence

On the other hand, passenger ports reported fewer initiatives. Perhaps the major implications and standstill of activities experienced during the pandemic have stalled plans to expand infrastructures and capacities, at least until passenger markets – cruise or coastal shipping – see a return to new normal levels.

Still, 15% of cruise ports plan to operate either new capacity or an upgraded version of the current levels. The number of ports progressing capacity expansion and/or upgrades in non-cruise port activities is 8%.

Land use

The final question of the third-quarter edition of the IAPH World Ports Tracker survey examined the trends in land use in ports. Growing maritime transportation, containerized or not, is increasingly integrated into complex supply chains. These supply chains demand capacity and additional space, either for accommodating cargo flows or developing logistics and distribution activities.

At the same time, ports are places where land is allocated to industrial activities, real estate, and energy production or even used for urban functions.

The survey revealed that some rather significant land-use changes are expected to unfold in 2023.

About 42% of the ports stated that they intend to

devote more land to logistics and distribution activities; this is the most frequent port land-use change to occur in 2023. The second-most frequent change is the intended expansion of land used for accommodating container shipping trades; such developments are expected to happen in 34% of the ports. One in four ports intends to expand the land available to serve bulk cargoes (22%) or other cargoes (27%).

For many ports, the shift of transported commodities drives such transitions. In others, the driving force is service providers or third parties, such as stevedore companies setting up a logistics yard. Another driver is the internal reorganization of parts of the port to increase available space for specific activities and to achieve a higher operational flexibility.

Devoting more land to energy production is another trend in ports for the foreseeable future. One-third of ports reported that more space would soon be used for non-fossil energy production, while 11% make more land available for fossil energy production.

Lastly, ports also work with stakeholders outside of the maritime industry as one in four ports plans to devote more land to non-energy-related industrial activities and one in five ports makes space for increased land use for either commercial real estate (22%) or urban functions (22%).

Ports where terminal capacity expansion or major upgrade will become operational in 2023 (% per market, as in early March 2023)



Container Urban/city function

Do you plan any major change in the land use in your port in the next 12 months?





PADDY RODGERS Director, National Maritime Museum Greenwich, UK

THE COLUMN

Casting a shadow

"The tanker

fleet will see a

return of the

bad old days

of oil spills"

T he tanker market has for many years had sanctions or regulations creating a regulatory division in the marketplace. At the turn of the millennium, the market was divided into single and double hull fleets.

Then there were sanctions against Iran and a fleet based around the ownership of the Iranian fleet, which operated in off-main market trades, or in storage. Now the market is split over those ships out of the main market and trading in oils out of floating storage

units (FSUs) to nonsanction adopting countries, primarily mainland China and India. Incidentally, this has the desired effect of reducing FSU revenues from the sale of oil as their oil is priced at a discount to move, and cheap oil is refined and sold on or used domestically to deliver windfall profits in those countries but nevertheless forming part of total oil supply.

The ships that take part in the trade are held in opaque ownership, are old and increasingly outside normal controls and regulation. Critically, these trades are dependent on port state control turning a blind eye to the condition of the fleet. It is a concern that the tanker fleet will see a return of the bad old days of oil spills and sinkings in the race to the bottom for the shadow fleet.

A divided fleet

So, two tiers of market, created not by ship specifications, design and capacity, but by individual state regulations, in this case sanctions. This is probably the future not a passing phase, because the European Union will impose stronger regulation of carbon emissions on the road to 2050. To avoid a non-compliance windfall, such as can be seen in the current windfall benefit to Chinese and Indian refiners, the European Union will introduce cross border tariffs to stop – as an example the United Kingdom becoming a transshipment point for greenwashing long-haul high-carbon emitting cargoes to be presented into Europe on a short-haul carbon net-zero trade.

> The impact for the tanker industry has been beneficial, partly because the shadow fleet cannot come back into the main market, but also the trade dislocation has increased ton miles. Russian pipelines are not used, instead oil is shipped not to close neighbors but to more distant shores, and the

supply shortfall in Europe is filled from more distant suppliers on tankers.

In the meantime, with no clear fuel solution, tankers have not been ordered and the global fleet has shrunk for the first time since 2002. The market is supported, not by oil supply and demand, but global disunity of regulation. This may be good for freight, but it is casting a giant shadow over the fight against global warming.

ABOUT THE AUTHOR

PADDY RODGERS is the director of the National Maritime Museum in Greenwich. Before taking up this role, he led tanker company Euronav for almost two decades.

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Which app you cannot live without? Outlook and WhatsApp.



UICK

What is your favourite season to travel and who do you take along? Latvian wintertime is the best for travel; I will definitely choose my family.



What is a quality you value in a business partner? Loyalty and willingness to discuss and explore new opportunities, and a good company to have a beer with.



MĀRTINŠ ZIEMANIS Deputy CEO, Freeport of Riga Chair, IAPH Legal Committee

What was your first job? My first job was a consultant in a household store – I was the best lawnmower tractor seller.



What mythical creature do you believe was real? Easter bunny; I even had a telephone number to reach it, but it turned out that that belonged to my mother's phone ...



What world record do you think you have a shot at beating? Rat run.



What secret about the universe would you most want to learn? Where our soul travels after we leave this universe.



Nº 8

If you did not work in this industry, what profession would you pursue? Global consulting – project management.



If you were to devote the rest of your life to philanthropy, what cause would you choose? Supporting people to use their potential and make the world a better place.



What is the best advice you have ever received?. Do not take advice from people you would never ask advice from. PROJECT FOCUS INDIA'S INLAND WATERWAYS

The new flow

Inland waterways transportation is seeing a frenzied pace of development in India as the government, together with industry stakeholders, attempts to reduce the trucking leg within the supply chain

BENCY MATHEW

ignificant investment and policy reforms have been made in recent years – and more are in the works – to make India's untapped inland waterway routes navigable and raise the share of river transport for the movement of freight, intracountry and across the border, in the region. Among the leading container lines serving Indian trades, Maersk has been the frontrunner to maximize the use of the improved inland waterways ecosystem as it actively pursues an integrator approach in serving customers amid constantly evolving trade dynamics.

"Inland waterways exist in several countries around the world, and Maersk does move cargo regularly on those

Pictured: Bird eye view of Kolkata city with Hooghly River and Howrah Bridge. Photo: Pabitra Chakraborty/Alamy Stock Photo







unresolved claims by multiple jurisdictions.

routes, and so do other logistics partners," Akshyat Bhatia, Maersk's head of intermodal for South Asia, said to *P&H*. "While some basic learnings can be applied from those solutions, the modus operandi is generally different in different geographies and not replicable in its entirety everywhere."

Maersk India has undertaken a string of container-on-barge pilot runs from Kolkata port, including for moving import cargo destined for the country's landlocked northeast region in a transloading fashion over Bangladeshi ports, and for cross-border export shipments to Bangladesh.

An updated inland water transit and trade protocol between New Delhi and Dhaka, a government-to-government treaty designed to facilitate coastal shipping along the Bay of Bengal, unpins Maersk's newfound shortsea desire.

Move to containers

"Traditionally, only general-purpose barges moved on the river routes between India and Bangladesh, and in 2022, Maersk became the first shipping line to carry cargo in containers," said Bhatia.

According to the Danish carrier, notwithstanding the complexities, inland waterways present significant growth potential as a trade enabler, advocating that some government incentives should help build up the use of navigable waterways as an alternative to land-based transportation. "By advancing into containerized transport on this route, we are expanding the opportunities for importers and exporters from India and Bangladesh with a faster, more reliable and safer option for their cargo," Bhatia said.

One of the customers chosen by Maersk under this cross-border market evaluation was Coca Cola Beverages Bangladesh. Soumyendu Sen Sarma, director of finance at Coca-Cola Bangladesh, struck an upbeat tone on the new shipping experience. "The speed of delivery with the new solution offered by Maersk over inland waterways is going to be extremely beneficial for us," said Sen Sarma.

"The delivery schedule of the cargo, which used to be routed through the transshipment hub and then arrive in Chittagong and further to the destination, used to be impacted severely with delays," he noted.

Adjusting the schedule

However, Maersk noted that designing and deploying container-carrying barges involves a great deal of time and that to keep itself aligned with Bangladesh's coastal policy norms, it is acquiring multipurpose barge tonnage able to transport containers and bulk shipments, along with requisite barge certifications, which are expected to be in place in the second half of this year. "Cargo movement from Kolkata to northeast India through the Indo-Bangladesh Protocol Route will not only reduce transit cost by 25% and time by two to three days, but it will also help in developing the economy of that part of India," said Kolkata port chairperson Vinit Kumar.

While not discounting the role inland waterways could play in nurturing environmentally sustainable supply chain networks, the way ahead is not as rosy as concerns, such as backhaul cargo limitations and last-mile delivery inefficiencies, make shortsea shipping interests leery of counting on this alternative sea-based solution. To mitigate such pain points, stakeholders believe a robust multimodal transport ecosystem is essential to building industry participation at some scale. Simply put, inland waterways or shortsea solutions should be designed to play a complementary role to inland modes, especially the rail leg.

"For logistics service providers, the entire ecosystem must exist from a scalability perspective," said Bhatia. "Rail-linked ports, truck and trailer infrastructure in and around the river ports, year-round navigability, timely maintenance, customs process simplification, etc., are the enablers that, along with the demand created with the help of incentives, would make it a compelling proposition to invest in."

According to Maersk's perspective, inland waterways have positive omens, particularly for customers seeking to source agricultural goods from India to Bangladesh in smaller lots as they will be able to hedge against the volatility of commodity prices as demand fluctuates.

"The importers are finding ocean carriers unreliable despite space availability, and by importing in bulk, they are missing out on the price advantage of a commodity that keeps varying month on month," the carrier said. "The product is a perfect bet for fast-moving consumer goods customers who prefer the safety of their cargo clubbed with reliability over anything else."

Maersk intends to provide a regular fortnightly barge call to Bangladesh, to start off, and enhance the frequency as it builds a critical mass of shipper customers.



Easing the paperwork

Expanding the contours of the bilateral coastal pact, New Delhi recently liberalized customs regulations to permit Bangladesh exports to be transshipped on mainline sailings calling at Nhava Sheva and Mundra, thus also trying to peel some subcontinent freight away from Sri Lanka's Colombo port and Singapore, the regional hub heavyweights.

With the opening of dedicated coastal berths within existing major harbor locations, India's so-called futuristic container terminals have also developed a stronger affinity for container-on barge service, pitching it as a more reliable, cost-efficient solution for intra-country cargo flows, vis-à-vis trucking. For example, both PSA International and Mumbai, Bharat Mumbai Container Terminals recently began using barges to transport containers from Goa to Nhava Sheva, aiming to extend its cargo reach beyond the mainstay north-western interior.

"With the new barge solution over rail and road logistics, PSA Mumbai embraces the most sustainable approach to bring down logistics costs for the cargo owners," the Singapore-based terminal operator noted.

In 2018, the Nhava Sheva port authority unveiled a barge transport policy for laden imports cleared under its much-publicized direct port delivery (DPD) scheme, an ease-of-doing-business initiative to tighten logistics costs by eliminating supply chain intermediaries and improve container dwell time metrics with cargo wheeled out directly from the dock within 48 hours of landing. Under the alternative plan, DPD containers were to be sent by barges to the nearby Mumbai port for distribution to customers from there, instead of trucking them to the city's outskirts for storage and destuffing. The port claimed this would help eliminate as many as 3,000 truck trips daily that generally occurred between Nhava Sheva, Mumbai and Bhiwandi. **Pictured:** Cargo barges transport iron ore mined in the hinterland along Mandovi River in Goa, India, to the main harbor for export. Photo: Getty Images/natbits

A typical barge could carry up to 200 containers on a single trip, and to encourage a modal shift from road to waterways, the government offers a 40% discount on normal port tariffs for coastal ship calls.

A case study released by Maersk in the past put the average cost of transporting one metric ton of cargo in India by inland waterways at 1.19 rupees (1.4 cents), versus 1.41 rupees by rail and 2.28 rupees by truck.

Making use of the potential

The Asian Development Bank, in another study, reported that despite being blessed with a vast coastline and expansive river networks, India's modal inland waterway share in domestic cargo transportation was seen significantly below the global average, at just 6%, compared with what it found to be 34% in Japan, 28% in Italy, 24% in mainland China, 17% in Brazil and 12% in the US.

To turn things around, a total of 111 fairway development projects are in various stages of implementation by the Inland Waterways Authority of India, along with more ports of call being added to the coastal shipping arrangement between India and Bangladesh.

"With seven new ports of call, in addition to the existing six on each side, the accessibility of the inland water transport mode for trade between India and Bangladesh is expected to increase and result in growth of traffic on the national waterways," India's shipping ministry said in a recent update.

All of this goes to India's heightened need to cut logistics costs. Currently, export and import costs are estimated to constitute some 14% of the nation's GDP and New Delhi wants to bring that down by at least 5% in the very near future, to catch-up with advanced economies that incur around 8%.

On that goal, in May 2018, the Indian government tweaked its cabotage rules to allow foreign-flag vessels to transport laden export-import containers for transshipment and empty containers for repositioning between Indian ports without any specific permission or license. Previously, coastal activity was a fiefdom of locally registered cargo ships because of domestic trade protectionist policies.

In recent years, New Delhi has also considered steps to extend its coastal reach to more countries in South Asia for closer regional trade ties, using the Bangladesh, India, Myanmar, Sri Lanka, Thailand, Nepal and Bhutan platform as a country-to-country partnership channel.

As India's economic outlook brightens, lately powered by rising shipper nearshoring trends, it is amply evident that inland waterways will remain a bellwether of government actions around larger trade aspirations.

Joining the integrator race, French liner CMA CGM recently rolled out a regional container service with stops at Chittagong, Colombo, Mangalore, Nhava Sheva and Mundra, on the westbound direction, and Jebel Ali and Khalifa, on the eastbound leg. On a broader note, shifting cargo away from trucks and onto barges has been a crucial part of the global shipping industry's ongoing decarbonization strategies.





LOOKOUT PORT EQUIPMENT

Fleet upgrade

A ntwerp Terminal Services (ATS) and cleantech company CMB.TECH have launched the world's first hydrogen dual-fuel straddle carrier in the Port of Antwerp, marking another move to upgrade port equipment running on alternative fuels.

The dual-fuel combustion engine, developed by CMB.TECH, runs on a mix of hydrogen and diesel. "The dual-fuel technology is able to replace 70% of diesel consumption with hydrogen on new straddle carriers, with the eventual goal of 100% hydrogen injection," CBM.TECH stated.

Francis De Ruytter, PSA International Pte. Ltd.'s regional head of sustainability for PSA Europe, Mediterranean, and the Americas, emphasized the importance of targeting straddle carriers to reach PSA's sustainability goals. "Straddle carriers are crucial in maintaining highly productive operations at our terminals, but at the same time they are responsible for approximately 90% of our direct emissions in Belgium."

The straddle carrier's performance will come under scrutiny at PSA Noordzee Terminal with a regard to improve equipment design in the runup to scaling up this kind of propulsion system, including the supply and storage of hydrogen for an entire fleet.

"This next stage is supported by PIONEERS, a project funded by the EU and coordinated by the Port of Antwerp-Bruges. It is part of the Horizon 2020 program, which supports and promotes the development of specific solutions to reduce carbon emissions in the port sector, with the aim of transforming ports into green infrastructures by 2050," CBM.TECH said.

In the UK, Peel Ports moved 45% of its plant equipment and straddle carriers to hydrotreated vegetable oil, and 29% are electric as of this year, while Associated British Ports is trialing a hydrogen-fueled tractor in its container terminal at the Port of Immingham.

The Port of Hamburg in Germany is equally trialing hydrogen-powered straddle carriers, container and reach stackers, forklifts, terminal tractors, and trucks, while the Spanish Port of Valencia sets on hydrogen fuels cells for a reach stacker and a terminal tractor.

Pictured: CMB.TECH's hydrogen-diesel dual-fuel straddle carrier in the Port of Antwerp, Belgium. Photo: CMB.TECH



PERSPECTIVE A MARITIME MARKETPLACE

Connecting port services to a digital marketplace

Ver recent decades, marketplaces have permeated nearly every facet of trade and commerce. These platforms offer considerable cost reductions and opportunities for business growth in both purchasing and selling transactions. A myriad of manual procedures, antiquated tools and inefficient information-sharing issues can be largely addressed by contemporary marketplaces.

The year 2023 heralds the global debut of one of the first maritime ports service-centric marketplaces, introduced by Awake.Al and expanding through international ports.

Maritime ports facilitate an immense volume of trade, encompassing a diverse array of physical services and goods, as well as an increasing number of digital services and content. The Awake.Al Marketplace is designed to accommodate all these types. The platform will initially focus on supporting all kinds of physical and digital services, irrespective of whether they are directly associated with a vessel's port call.

Services connected to the port call, however, are the heartbeat of the marketplace as these are repeated tens if not hundreds of times per day in a port.

Among them, piloting, towing, mooring and unmooring, cargo unloading and loading, inspections, cleaning of various kinds, waste removal, potable water delivery, electricity at berth, food provisions, crew services, and different maintenance tasks. The marketplace will also continuously expand its offerings based on user requirements.

For instance, the option to rent warehouse or office space as well as open storage areas is something that is currently under consideration.

To the marketplace

The marketplace can be accessed via web browsers, eliminating the need for any installation and offering a seamless viewing experience across devices, ranging from large monitors to smartphones.

Hosted in the cloud primarily by Amazon Web Services in Frankfurt, Germany, the platform boasts a 99.5% availability guarantee, ensuring reliable access for users.

Fintraffic, responsible for controlling and managing traffic on land, in the air, and at sea in Finland, is developing a new European maritime single window (eMSW) for the country, in accordance with the IMO requirements commencing in 2024. Awake.Al and Fintraffic have entered into a commercial agreement to integrate the marketplace with the new eMSW solution. Shipping agents, who are among the primary users of



eMSW, will be able to make service purchases directly within the new eMSW once the integration is complete. This type of eMSW integration is an approach Awake.Al aims to implement in numerous other countries.

The marketplace will then provide application programming integrations (APIs) to facilitate integration with any compatible software solution.

Marketplace integration capabilities

come in three levels of sophistication. First from the simple convenience of magic links, which can be hosted on the customer side such as the eMSW with a secure and automatic login to the marketplace.

On the second level, Awake.Al offers embedded marketplace user

interface views for customer systems. On this medium-level integration, the customer controls most of the system user interface.

Parts where the user interacts with the marketplace are embedded for the customer system and end user.

The most comprehensive integration is based on full API usage, and here the customer controls the user interface completely. All key marketplace functions and data exchange are done fully via modern APIs.

One system fit for all

Awake.Al is also developing integration with Zapier – a third-party common integration platform – that will offer two-way data exchange between the customer system and marketplace. This is initially supporting use cases where the customer system is triggered with data when some key actions are executed on the marketplace side. For example, when a new order is received, the

"A myriad of manual procedures and antiquated tools can be largely addressed by contemporary marketplaces" order status changes, a new chat message is received, a new review was created, or a new port, organization or listing was added.

There are also requests to look into integrating vessel, fleet single-window solutions as well shipping agent single-window solutions.

The main purpose for this will be to have existing marketplace integrations with some of the most used shipping stakeholder software systems.

The marketplace stands as an independent single-window solution for ports, sellers, and buyers of port and port call-related trading. In addition, it is a good match along the existing and new eMSWs and other shipping software. The flexibility of integration choices and ability to host many types of



ABOUT THE AUTHOR

SIMO SALMINEN is the vice president of product at Awake. Al. A software industry veteran, he has created software systems, been part of creating a unique small vendor marketplace in Indonesia and Philippines and worked over nine years for Nokia as software architect and technology manager.

buying and selling fits many needs of the end users.

Awake.Al is also set to participate in a new EU project focusing on multimodal transport, supported by a marketplace. This collaboration will augment the Awake.Al Marketplace by incorporating the capacity to host, monitor, and execute multimodal logistics transactions for both selling and buying. A significant emphasis will be placed on capturing the emissions of various multimodal legs and presenting this information to buyers that can then inform their buying process based on this.

The marketplace development project has been partially funded by the European Space Agency (ESA). The project is currently in its final piloting phase, with completion scheduled for July 2023, which will also mark the conclusion of the ESA project.

Start trading

The fully production-ready marketplace is set to launch in September 2023. If you are interested in participating in the piloting of the marketplace, please get in touch with Awake.Al via

@ awake.ai/marketplace

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In this charterparty dispute, the owners' claim for damages for breach of the safe port warranty after a bulk carrier grounded at the entrance to the port of Chaozhou, China.

Not unsafe

TOM MACEY-DARE KC | Barrister, Quadrant Chambers MARTIN DALBY | Partner, INCE JOSHUA THOMSON | Associate, INCE

he Panamax bulk carrier in question was chartered for a time charter trip via safe ports from Indonesia to China with bulk coal. The charterers ordered bulker to load at Muara Satui and discharge at Chaozhou.

Ships entering the Port of Chaozhou are required to proceed along a buoyed approach channel and make a turn to starboard into the harbor basin. The port entry is not difficult and does not require tug assistance. Because of its laden draft, the vessel had to remain within the dredged deepwater channel, which runs along the center of the buoyed channel.

The vessel was required by SOLAS Chapter V Regulation 19 to navigate with paper charts. It also had an electronic chart system for situational awareness. During loading at Muara Satui, the master arranged for a copy of the latest UKHO chart covering Chaozhou to be brought on board. This chart was too small scale for navigation, lacked important details and was out of date.

The master did not obtain the Chinese paper chart, which is large scale and up to date. Instead, during the voyage to Chaozhou, he downloaded the latest midscale electronic chart, but lacked important details, such as the limitations of the dredged deepwater channel.

The vessel entered the port the following day with a compulsory pilot on board, and three tugs made fast to maneuver it onto the berth once inside the basin. Weather and visibility were good. The pilot was effectively conning the vessel himself: the master and deck team took no active part in the navigation.

The vessel proceeded along the approach channel without difficulty but failed to make the starboard turn successfully. It left the port edge of the buoyed channel and grounded on a charted rocky shoal patch.

The pilot was aware that the vessel was not turning quickly enough and attempted to retrieve the maneuver using engine, rudder and tug orders, but without success. The master and deck team said nothing: they did not know the limits of the navigable water for the vessel and appeared to be unaware that it was standing into danger.

The owners' allegations

It was common ground that the grounding was caused by the pilot's negligent navigation of the vessel. The owners contended that the port was unsafe, principally on the basis that the pilot was incompetent. They pointed to his failure to deploy the stern tug in indirect mode to bring the stern of the vessel around to port and its head around to starboard, amounting to incompetence, according to the test in *Papera Traders Co. Ltd. v. Hyundai Merchant Marine Co. Ltd.* (The Eurasian Dream) [2002] 1 Lloyd's Rep 719.

The tribunal rejected that contention for two reasons: indirect towage is a specialist technique, which requires regular practice by the pilot and the tugs involved. It was not a technique that was needed at Chaozhou.

There was no evidence that the pilot and tugs knew how to employ it, and no reason why they should be expected to know. If they did not know, that did not amount to a disabling lack of skill or knowledge on their part, as they had other techniques at their disposal to ensure that ships entered the Port of Chaozhou safely.

There was no other evidence that the pilot was incompetent. He had command experience with a well-known Chinese shipping company, had worked as a pilot at Chaozhou for five years before this incident, continued working as a pilot there for another five years and had not been involved in any other incidents. He demonstrated the ability to control the vessel and the tugs in other respects during this incident. He had simply failed to execute the maneuver correctly.

The tribunal concluded that this was a one-off mistake by an otherwise competent pilot, and not a defect in the setup of the port: *Kodros Shipping Corporation v. Empresa Cubana de Fletes* (The Evia)(No 2) [1982] 1 Lloyd's Rep 334. Therefore, the owners' claim for breach of the safe port warranty failed as did their supplementary claim under the implied indemnity.

The vessel is not seaworthy

The tribunal did, however, held that the vessel was unseaworthy, in breach of Article III.1, because it did not have the up-to-date Chinese paper chart on board showing the limits of the dredged deepwater channel. The master and deck team also failed to alert the pilot to his errors and attempt any action to avoid the grounding. Nevertheless, it held that the unseaworthiness was not an effective cause of the grounding.

A puzzling finding

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his decision, produced by a specialist LMAA tribunal, including two experienced master mariners, provides some useful guidance in unsafe port cases involving pilot error.

It is common in such cases for owners to allege that the pilot was incompetent and that the port was unsafe as a result. Owners will often seek to rely on the first part of

Leggatt LJ's dictum in The Star Sea [1997] 1 Lloyd's Rep 360, that it may be possible to infer incompetence from a single incident.

The present decision, however, demonstrates the importance of the second part of Leggatt LJ's dictum, that anyone can make a mistake, and a single mistake or even more than one mistake does not nec-

essarily render an individual incompetent. It may be appropriate to infer incompetence from a single incident where this is the first occasion on which the relevant aspect of the pilot's competence is tested. But where the pilot makes a mistake in a task, which he habitually performs efficiently, the tribunal is likely to conclude that this is a one-off error.

The decision also demonstrates that tribunals rightly regard a charge of professional incompetence as a grave allegation, which requires convincing evidence before it will be upheld. Additionally, it highlights that, in an unsafe port case, the competence of a pilot is to be judged by reference to the specific port that is alleged to be unsafe: if a particular skill is not required at that port, the pilot will not be condemned as incompetent if he does not possess that skill, even if other pilots at other ports employ it routinely.

Perhaps, however, the most interesting part of this case concerns the charterers' allegation that the grounding was caused by the vessel's unseaworthiness. It was

"More than one mistake does not render an individual incompetent" common ground that, if the port was unsafe and the vessel unseaworthy, and if these were both effective causes of the grounding, then the charterers would have a defense of circuity of action to the owners' claim for breach of the safe port warranty, on the basis that the owners' breach of Article III.1 caused the charterers to incur liability

to the owners for the grounding.

This means that the charterers would not need to demonstrate that the vessel's unseaworthiness was a novus actus interveniens, which severed the chain of causation between the unsafety of the port and the grounding, to avoid liability. It would be sufficient if the unseaworthiness was an effective cause of the grounding.

Ultimately, this issue was moot, as the tribunal held that the port was safe. However, the tribunal's conclusion that the unseaworthiness was not an effective cause of the grounding is somewhat puzzling, in light of its other findings.

History drops us a line

Hydrography, like anything else, has its history and lessons that can be utilized in today's maritime business FRANK LENNOX-MILLARD



t its heart and in its origins, hydrography was and is about the relationship between the sea floor and the surface at any location, revealing its anomalies, the strength and direction of ocean currents, and changes in those relationships and that between seagoing vessels and

geo-oceanographic threat. This charting of the sea and seafloor developed in importance, although surveys were undertaken for the laying of telegraph cables and the safety of waterways assessed along with existing and potential harbors, it had its origins in vessel safety.

When mariners sailed in new open and coastal waters, some idea about how the seabed was configured was of great importance. Therefore, mapping the coastline and understanding sea depth, and noting any perils that lay beneath the waves while assisting navigation and landfall were a natural consequence.

Early days

Rudimentary bathymetry dates back to ancient Egypt where depic tions – on tomb walls – were made of mariners using long slender sticks as sounding poles to determine the depth of the River Nile and its delta.

A 1,000 years later, Greek historian Herodotus wrote about a sounding just over 20 m of water at the mouth of the Nile, noting the presence of a yellow mud similar to that deposited in yearly floods, indicating something of a sophisticated observation.

The first known nautical chart was the carte Pisano, circa 1270, made in Genoa and found in Pisa, which charted the Mediterranean coastline and its harbors. Charles Brennan in his *History and Importance of Hydrography* noted that although ship's keels added

Pictured: Hydrographic service using ropeway for flow measurements in Casalecchio during 1910-20. Photo: MARKA / Alamy Stock Photo







Left: The National Maritime Museum, UK, confirmed that the instrument seen here is a sounding sextant. Right: The image shows a survey recorder annotating the echo trace roll, the UK Hydrographic Office told *P&H*. Photos: BNA Photographic / Alamy Stock Photo

stability, they also increased ship draft, thus increasing the risk of running aground. Sounding poles gave way to ropes, which gave way to a weight on a line. Herodotus mentioned lead lines deployed by hand. Markings of various kinds were attached to the lines to indicate particular depths.

Rapid growth of hydrography

The importance of hydrography in ocean-going trade became recognized by the world's leading powers quite quickly. A French hydrographic office was established in 1720 and a Danish in 1784. In 1795, the British Royal Navy appointed its first hydrographer, followed by Spain in 1797, and in 1830, the US established its own naval observatory and hydrographical office.

From the 18th century, the development of hydrography went hand in hand with international trade, exploration and the spur of the war. Nations expanded their trade base to reduce their dependence on other powers and to increase their own prosperity, and in the case of European nations, their growing imperial reach.

New trade routes and new trading partners became necessary during the war. Britain formalized its hydrographic work two years into a war with Revolutionary France and at a time of its defensive and acquisitive expansion overseas.

The UK Hydrographic Office was founded by the Order of Council in 1795 because of the "great inconvenience,

which has constantly been felt" by Royal Naval officers "from the want of sufficient information respecting the navigation of those parts of the world to which their services may be directed".

"From the outset, it was acknowledged that the Royal Navy needed charts of every sea. And, after the victory at Trafalgar 10 years later had made the high seas safer for commerce, Britain's expanding interests overseas meant that its mercantile marine also stood in urgent need of accurate charts and navigational information on a worldwide basis," wrote vice admiral Sir Archibald Day in 1967.

Across the pond, in 1807, a survey of the coast was undertaken by Ferdinand Hassler on behalf of then US president Thomas Jefferson. Hassler was keen to put theory into practice by building a geodetic triangulation network for surveys of the shoreline, as well as hydrographic surveys of coastal waters and harbors.

In 1840, British explorer Sir James Clark Ross made a bathymetric map of the Gulf of Mexico using a weighted hemp rope lowered over the side. The map showed features in the Gulf that had been unseen and unknown before then.

Matthew Fontaine Maury, professor and – from 1842 – superintendent of the US Depot of Charts and Instruments, is sometimes referred to as the Father of Oceanography. He made extensive charts of the Atlantic, Pacific and Indian oceans, as well as of the Atlantic seabed, and in 1855 published *The Physical Geography of the Sea and Its Meteorology.* Maury wrote eloquently and insightfully that whoever studies the sea "must look upon it as a part of that exquisite machinery by which the harmonies of nature are preserved".

Wired for ground

The rope method had to change though, as lines were limited in their depth and often became angled owing to drift and current, making accurate positioning difficult. Brannen said that "taking a sounding with a lead line is no good unless the position of that sounding can be plotted". Therefore, sextant and chronometer were usefully employed for manual positioning until the advent of

electronic positioning devices in the 1970s. In 1872, scientist and polymath Sir William Thomson – also known as Lord Kelvin – developed a wire line sounding machine using piano wire, which meant it became possible to measure at much greater depths than was possible using the hemp rope. He also developed a

mariners' compass and invented a tide machine. Between 1873 and 1876, the mid-Atlantic Ridge and Mariana Trench were profiled, and a bathymetric map was made of the Atlantic Ocean using over 500 plumb measurements by the HMS *Challenger* expedition. Then, in 1877, Wyville Thomson showed the extent of the mid-Atlantic Ridge in a map derived from measurements made by the *Challenger* expedition.

Larry Mayer, US Center for Coastal and Ocean Mapping director, pointed out that although the Kelvin sounding machine could be deployed quickly and easily, it still only measured one point on the sea floor.

The next stage was surveying using wiredrag, which was a means of sweeping an area with a wire stretched at a uniform depth set by weights and buoys between two vessels and dragged across the ocean between preset points. The method was improved by Nicholas Heck of the US Coast and Geodetic Survey, who expanded the channels capable of being swept to areas two or three miles across. This meant that potential hazards that had previously not been found easily using a single line, such as shipwrecks and tall outcrops, suddenly became visible.

The great oceanographic star of the first half of the 20th century was Albert Honoré Charles Grimaldi, the Prince of Monaco. Albert I was a leader in the study of the oceans and participated in several expeditions, sailing his own research yachts. In 1906, he founded the Institut Océano-graphique — Albert I, Prince of Monaco Foundation, and in 1921, he founded the International Hydrographic Bureau, which, in 1970, became the International Hydro-graphic Office.

What's that sound?

In the meantime, the *Titanic* disaster in 1912 concentrated minds on how to better locate icebergs and identify the extent of their hidden threat. However, when a method was found, it proved a lot better at observing and measuring the seafloor than any iceberg.

On July 22, 1913, Alexander Behm was granted a German patent for the invention of an echo sounding device for "measuring depths of the sea and distances and headings of ships or obstacles by means of reflected sound waves."

The outbreak of the Great War led to the use of echo-sounding in submarine detection and also the advances in technology. "The war on the oceans was an acoustic war, reflecting the changed realities of submarines and defenses against them, and the rapidly changing knowledge of the oceans opened up by acoustic instruments," said John Cloud, a geographer who works with the National Oceanic and Atmospheric Administration. Commercial applications followed. An acoustic transducer capable of detecting underwater objects by means of the transmission and reception of sound waves was developed by Reginald Fessenden of Submarine Signal Company, which fitted the Fessenden Fathometer on the M&M liner SS *Berkshire* in 1924.

A radio-acoustic ranging navigation system was invented and developed by the United States Coast and Geodetic Survey in 1924, enabling the position of a ship to be determined accurately, thus the modern science of hydrography came of age.

The establishment of a permanent international commission relating to hydrography was proposed in 1889 at a maritime conference in Washington DC, but it took a few years before it was realized.

On July 24, 1919, following the conclusion of World War I, the first International Conference of Hydrographers was staged in London with representatives from 24 nations. The intention was to devise international standards in chart production and their dissemination for the ease of exchange of hydrographic information between nations.

For all their practical use and success, single-beam echo sounders could only do so much, therefore by the 1970s multibeam echo-sounder systems were developed, increasing use and accuracy considerably.

The advent of GPS completed the circle to comprehensively understand the oceans and their floor in fine detail.

The future of exploration

Hydrography started with a narrow focus on safety of navigation, but it is now being recognized that "the data collected in support of safety of navigation, such as bathymetry and backscatter, can serve so many other purposes beyond safety of navigation, for example, habitat mapping, tsunami and storm inundation predictions, cable and pipeline surveys, and many more," said Mayer.

According to him, several lessons can be learned from the past. First, the critical importance of understanding issues of positioning — just as important as depth measurements in some cases. Second, the importance of complete documentation of surveying – now expressed as metadata – but known earlier as survey reports.

As we move further forward into the digital age, undersea bathymetric data, along with other maritime data, is becoming increasingly digitalized.

Of course, digitalization has its drawbacks given new systems entail new vulnerabilities, but for many reasons, not least environmental, the age of print needs must, albeit with some caution, give way to electronic mapping, storage and archiving.

However, we have not lost anything but the artistic beauty of early cartographers, said Mayer. "This can be replaced with stunning 3D computer images of how the seafloor really looks."

The steady evolution of the science of hydrography from its murky, muddy origins with lead line and pole progressed with wire, echo sounding, multibeam and satellite positioning, adapted not just to changing requirements but also to a worthy pioneering spirit among those who fathom the deep. •

IAPH INFO

Membership notes

We are pleased to welcome as new regular and associate members of the association:

Regular members

Port of Portland

- United States
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The shortlist of the 2023 IAPH Sustainability Awards will be published at the end of August. Let's catch up with project leader Antonis Michail on this year's entries

Q: What projects have impressed you this year? Was there a focus on certain issues?

A: What has impressed me is the record-breaking number of entries we have received. The over 85 submitted projects from ports in 30 countries constitute by far the best turnout we even had after more than 60 entries in 2021. In addition, for the first time, we had a very well-balanced sample geographically with sufficient number of projects from all regions of IAPH membership.

The number and quality of entries ensure an intense and truly global competition for this year's six awards under the World Ports Sustainability Program (WPSP) categories: infrastructure, digitalization, climate and energy, environmental care, community building, and health, safety and security.

We also had an impressive number of projects in the community building category, which clearly highlights the importance ports give to managing community relations.

We are most encouraged by this excellent turnout and grateful to all submitters who shared their splendid initiatives.

Q: Talk us through the timeline for the awards in the run-up to the World Ports Conference where the awards will be handed out?

A: The screening, processing and uploading of all eligible projects to the WPSP database have already started and will be completed by the end of June. Over the summer period, our awards jury will assess all candidate projects producing the shortlist of 18 finalists made of the top three projects per category.

The evaluation criteria include the overall project presentation, original and innovative character, vision and leadership deployed, contribution to sustainability and the UN sustainable development goals (SDGs), cooperation and engagement with stakeholders and actual measurable impact of the project to date. The final step will be as always, an open public vote over the shortlisted projects, scheduled to take place in September. The outcome of the public vote will co-determine, together with the jury evaluation, the six final winners that will then be announced during the gala dinner of the World Ports Conference in Abu Dhabi on Nov. 1.

A seventh Akiyama award, in memory of Toru Akiyama, secretary-general of the IAPH from 1967 to 1973, will go to the highest-placed IAPH Sustainability Awards runner-up from a least-developed country, a landlocked developing country, or a small island developing state.

Q: How do the submissions serve as inspiration for ports to tackle decarbonization projects?

A: The WPSP portfolio is the most comprehensive and upto-date database of port sustainability projects globally and how ports integrate SDGs into their business. The user can filter projects by SDGs applied, WPSP area of interest, and by continent and country.

Contact details are provided for all projects for people interested in following up and getting more insight information on projects. In fact, one of the main aims in setting up this database back in 2018 was to serve the principle of ports helping and inspiring other ports by sharing and exchanging practices.

Aside from the projects being communicated by IAPH to the maritime industry and beyond, these projects form the core content of our Port Endeavor sustainability training game for port and port community professionals, thus serving the principles of leading by example and inspiring piers to follow.

Q: What are WPSP's plans for the future?

A: We have recently celebrated the fifth anniversary of WPSP and had an in-depth discussion on the occasion, with our member ports during our IAPH Technical Committee Days in London, April 18–20, over the future steps for WPSP. Great ideas and options emerged that are now being evaluated as part of a dedicated IAPH membership survey, which will eventually shape the future of WPSP for the years to come.

Aside from any new developments to emerge, we will continue building on the success of the WPSP portfolio and the annual Sustainability Awards, while concentrating our efforts on capacity building through the further development and outreach of Port Endeavor.

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OCT. (17-19) British Ports Association Conference London, UK www.britishports.org.uk/events/ bpa-conference-2022 OCT. (18-20) GreenPort Congress & Cruise Lisbon, Portugal www.portstrategy.com/ greenport-cruise-and-congress

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OCTOBER-NOVEMBER (31-02) IAPH 2023 World Ports Conference

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Abu Dhabi, UAE

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THE REVIEW

From Source to Sold: Stories of Leadership in Supply Chain

PETER TIRSCHWELL

hat are the leadership qualities that enable only a handful of individuals to ascend over the course of their career into the upper echelons of the supply chain world? That enable them to build careers that build businesses, redefine categories, create value and positively influence the thinking and careers of hundreds if not thousands?

Co-written by Radu Palamariu, managing director of Alcott Global, a Singapore-based recruiting firm specializing in supply chain, which itself has redefined the recruiting space by finding an elusive nexus between people and thought leadership, and McKinsey supply chain partner Knut Alicke, the book sets out to answer these questions through brief profiles of 26 leaders.

That they rely on supply chain leaders' own words to define these qualities makes From Source to Sold: Stories of Leadership in Supply Chain an absorbing and insightful read. One that also includes quotes from the CEO of a port terminal operator.

What has made PSA International CEO Tan Chong Meng into the leader he is today, able to evolve what was once the Port Authority of Singapore into a global terminal operating business redefining itself with technology, acquisitions, and ambition as a supply chain solution provider? "You will get a lot more mileage in our career if you are propelled by your purpose – don't choose your next step because of a promotion, let the promotion come to you."

For Chong Meng that purpose includes leading on a personal level, connecting "authentically" with team members irrespective of their level, while also defining a vision, strategy, and culture that he is able to rally his organization around.

Additionally, both for Chong Meng and PSA, that meant a wholesale redefining of orientation "from primarily transshipment ports" – Singapore having largely defined the model of a successful transshipment port "to a stronger focus on origin-destination ports" while embracing sustainability as a core objective.

Indeed, a point the book explicitly makes is why, given the deep well of talent and leadership from within the ranks of supply chain, do so few supply chain leaders become CEOs. "Usually, the only kind of attention supply chain gets is negative," the authors explained. If that is the case, the supply chain upheaval wrought by the pandemic is a double-edged sword. But to them the pandemic offers a silver lining: "the often-invisible work of supply chain became a matter of both intense public interest and boardroom gratitude."

ABOUT THE AUTHORS



KNUT ALICKE is a partner at McKinsey & Company and part of the global supply chain leadership team. He is one of the global experts on the topics of operations, supply chain and risk and was ranked in the Top Three Supply Chain Influencers.



RADU PALAMARIU is the managing director of Alcott Global and global head of Supply Chain & Logistics Practice. He has worked with top Fortune 500 companies in manufacturing, logistics, transportation, supply chain management and e-commerce.

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