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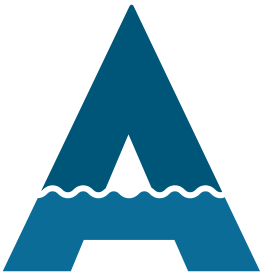





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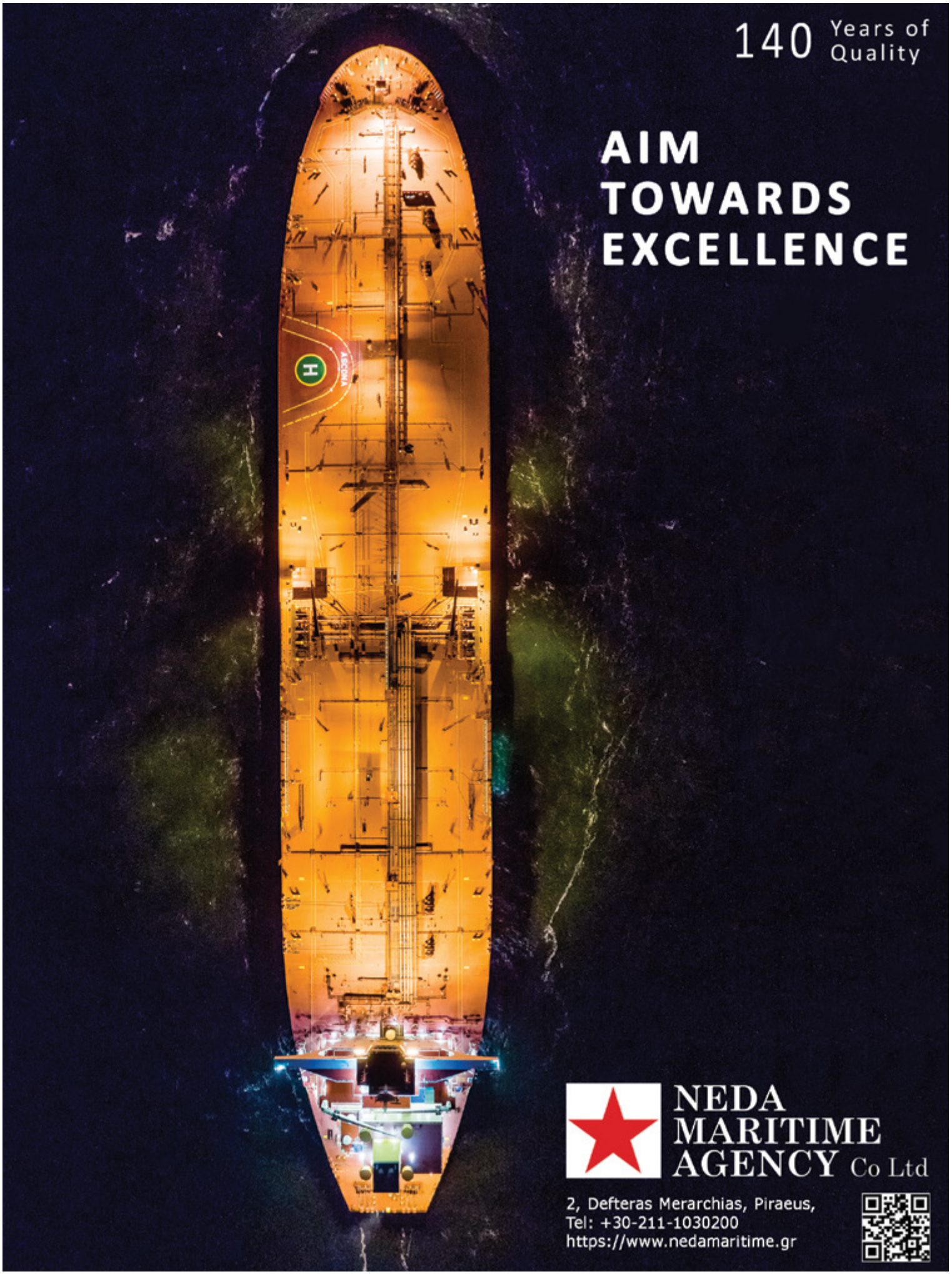
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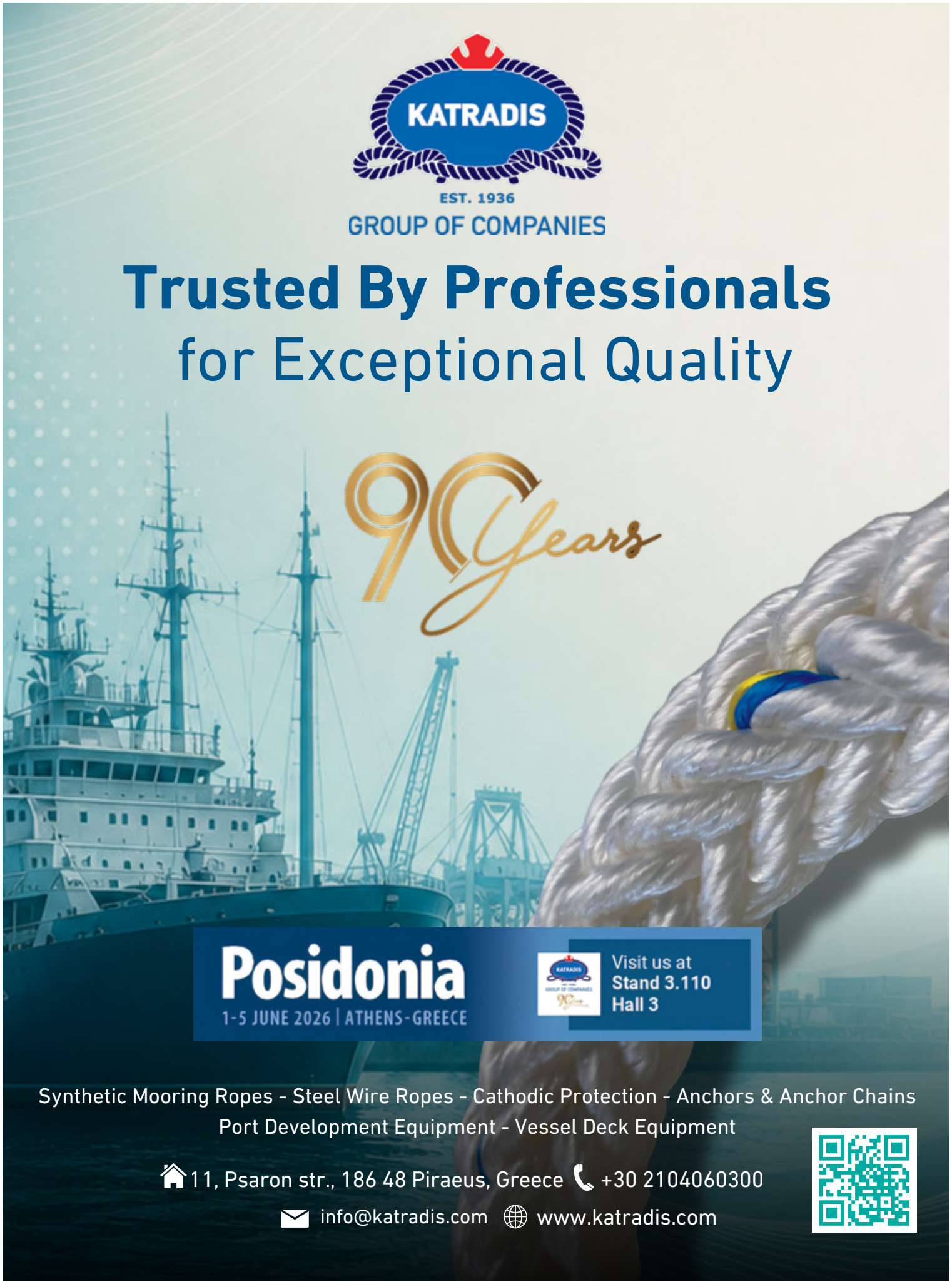
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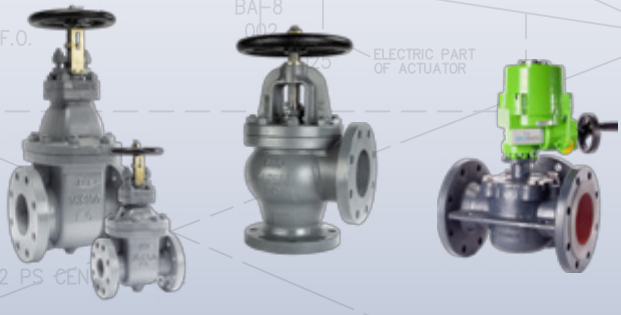
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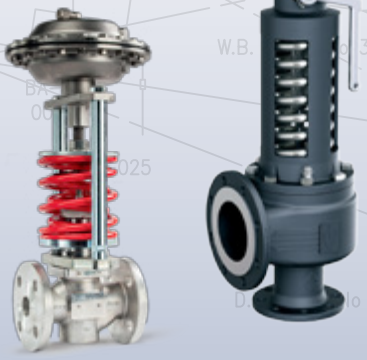
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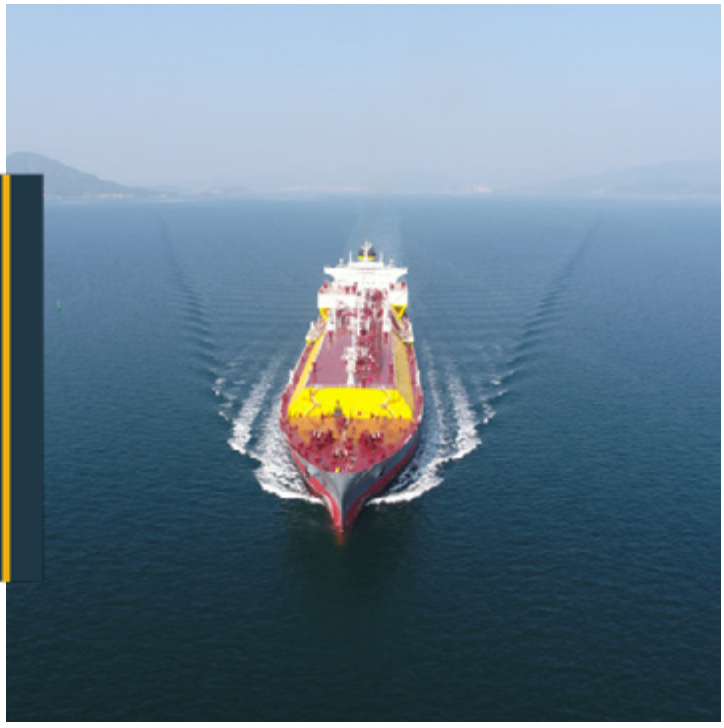
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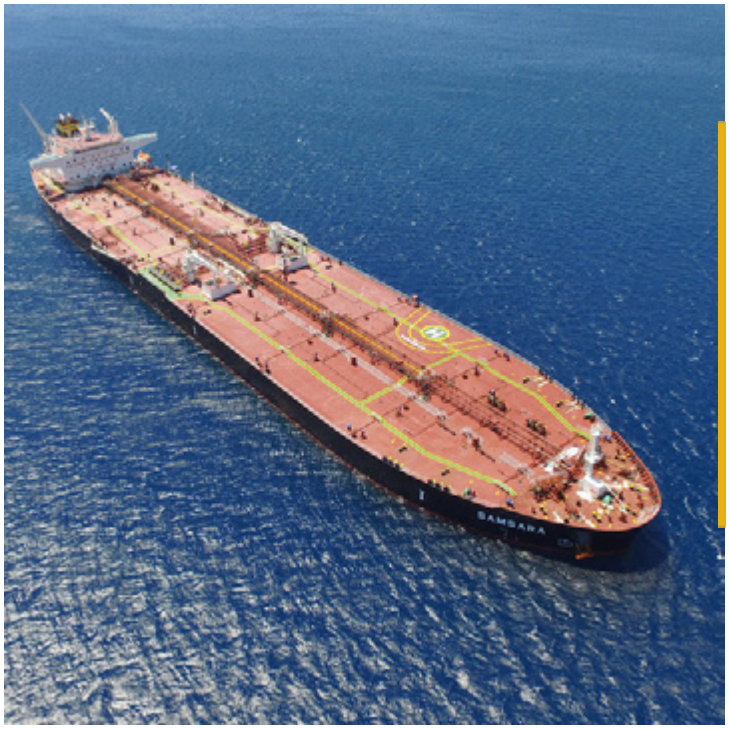


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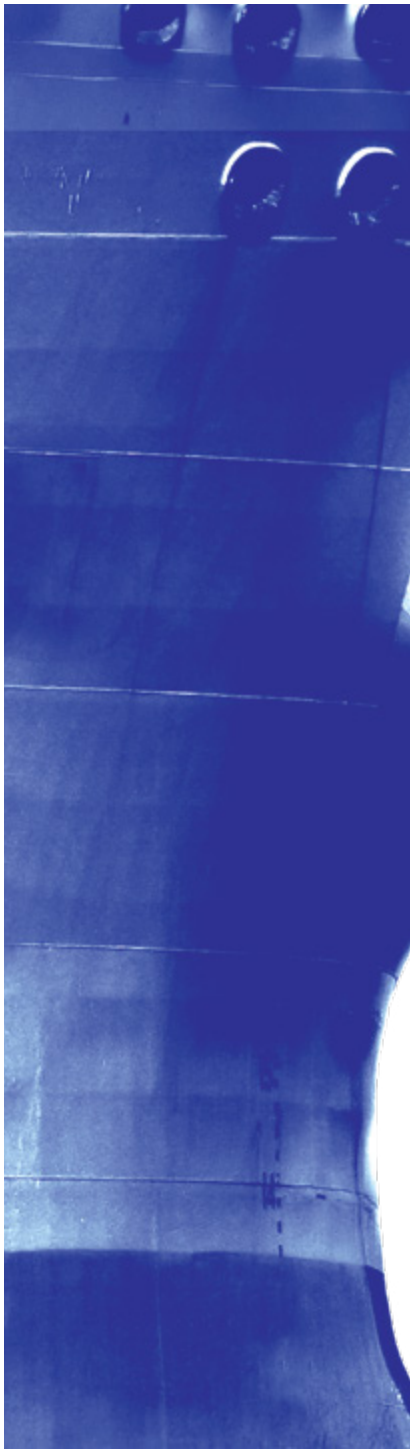
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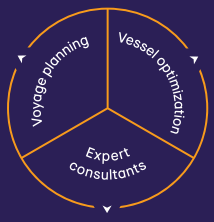


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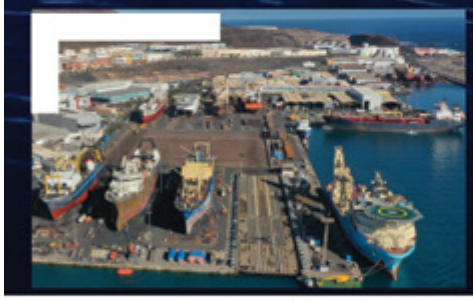
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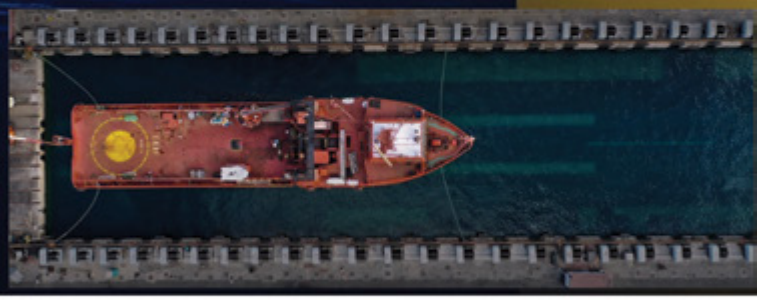
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Editorial

As May unfolds, the global maritime community turns its collective gaze toward Athens. We are standing on the threshold of Posidonia 2026, the industry's most prestigious gathering, held at the very heart of global ship management. For decades, this biennial exhibition has served as the industry's pulse, and this year reflects a sector that is both transforming and resilient.

The festive atmosphere of this year's Posidonia is tempered by the gravity of our times. The exhibition takes place amidst significant geopolitical uncertainty, fuelled by the ongoing developments in the Middle East and shifting dynamics in global trade. Under this prism, Posidonia has evolved into much more than a showcase of maritime services; it has become a high-level economic and business forum where heads of state, diplomats, and entrepreneurs converge to shape the "day after'' for global shipping, navigating a complex web of security challenges and regional instabilities that demand strategic foresight.

In this special edition of *Naftika Chronika*, we have sought to mirror this high-level dialogue. Within these pages, representatives of the global shipping industry's major social partners and institutional leaders "meet" to discuss the multifaceted challenges facing our sector. From the mounting weight of regulatory pressures to the absolute necessity of maintaining the seamless flow of global trade, their insights offer a comprehensive roadmap for the turbulent waters ahead, providing clarity in an era of unprecedented transition.

Parallel to geopolitical shifts, the industry is undergoing a profound technological revolution. Taking this into account, our May "Smart Shipping" feature focuses on the transformative power of digitalisation and Artificial Intelligence (AI). We analyse how AI is no longer a futuristic concept or distant ambition, but a practical, integrated tool that enhances fleet efficiency. Crucially, these digital solutions serve as a vital catalyst for decarbonisation, providing the data-driven precision needed to substantially reduce the environmental footprint of vessels and meet the stringent "green" mandates of the regulatory framework.

Yet, amidst the talk of algorithms and geopolitics, the industry's greatest asset remains its people. As this year marks the 20th anniversary of the Maritime Labour Convention (MLC, 2006), this issue delves into the critical topics of crew safety and seafarer wellbeing. In an increasingly automated world, protecting those at the frontline — the men and women who keep the world moving — is not just a regulatory obligation; it is the moral foundation upon which the future of sustainable shipping must be built.

Naftika Chronika's editorial team is certain that this year's Posidonia Exhibition will be another momentous celebration for international shipping, bringing together maritime professionals from across the seven seas. Beyond the vibrant exchange of ideas at the Metropolitan Expo, the debates within this issue reaffirm that, despite the scale of the challenges, the spirit of collaboration within our community remains as strong as ever.

Giannis Theodoropoulos



Seafarers must be at the heart of all our decision-making

In an era of geopolitical tension, regulatory fragmentation, and accelerating decarbonisation, the shipping industry faces mounting pressures. However, one priority remains constant: seafarers must be at the centre of every decision. In this interview, Emanuele Grimaldi speaks about protecting those who keep global trade moving and steering the sector through a period of profound change.

An interview with **Emanuele Grimaldi**, Chairman of the International Chamber of Shipping (ICS)

In your recent speech on the future of shipping, you highlighted the need for global cooperation among governments, industry, and energy providers to keep trade open while advancing decarbonisation. In today's fragmented geopolitical and regulatory environment, how realistic is that vision — and what are the biggest obstacles that still need to be overcome?

It is safe to say that our industry is entering a significant period marked by regulatory uncertainty, geopolitical instability, and the realities of the energy transition. The most unsettling challenge today is the current geopolitical environment and conflicts in key regions, which have had operational impacts on major trade routes, particularly through increased voyage times, higher insurance premiums, navigational risks and, most importantly, risks to seafarers' safety and wellbeing.

Shipping will, however, forge forward, as it always has. What needs to happen now, as we confront these challenges, is to continue working with governments, industry, energy providers, and seafarers. Only through collaboration and strategic partnerships will we overcome these challenging times while keeping global trade moving and advancing the energy transition.

The growth of the so-called "shadow fleet" operating outside international rules is creating serious safety, environmental, and reputational risks for global shipping. What additional measures should governments, flag States, and international organisations take to tackle this problem and protect both seafarers and the marine environment?

It is critical that our industry operates at the highest standards of safe, high-quality shipping. The current shift toward a more fragmented trading world risks undermining the global framework that has served international trade so well for decades. Fragmentation of markets and of the rules-based system threatens to reduce efficiency and increase costs, ultimately harming both the industry

Seafarers are indeed operating in increasingly demanding conditions, often in areas affected by conflict or instability, and their safety and welfare must remain a central consideration in policy and operational decision-making. Without our seafarers, we have no industry.

and consumers worldwide. The rise of the so-called "dark" or "parallel" fleet is an example of this fragmentation: ships operating outside the rules-based order undermine safety and environmental standards and weaken the transparency on which the global maritime and trade system depends.

The ICS is committed to working with governments and international organisations to ensure that shipping remains a rules-based, transparent, and safe sector, while ensuring that the fundamental principles of freedom of navigation and innocent passage are respected and maintained. This framework has enabled global trade to flourish for decades; therefore, we must protect it.



As seafarers face increased responsibilities, higher stress levels, and greater exposure to risk, how can the industry ensure that crew welfare and safety are not sacrificed amid economic and geopolitical uncertainty?

Seafarers are indeed operating in increasingly demanding conditions, often in areas affected by conflict or instability, and their safety and welfare must remain a central consideration in policy and operational decision-making. Without our seafarers, we have no industry.

Equally important is ensuring that seafarers are not unfairly targeted by authorities for incidents or activities beyond their control. When detained, seafarers must have access to proper legal process and be treated with dignity and fairness.

Seafarers must also feel safe while working at sea. The recent and ongoing focus at the International Maritime Organization (IMO) on improving the implementation of international standards on crucial issues such as harassment, bullying, and sexual assault is something the ICS strongly supports and urges the entire industry to prioritise.

Equally essential is the full and effective implementation of the Maritime Labour Convention (MLC), which remains the cornerstone of seafarers' rights, ensuring decent working conditions, fair treatment, and protection for those who keep global trade moving.

During recent global crises, seafarers proved how essential they are to the global economy. Why do you think they are still often overlooked in political decision-making, and how can this be changed?

Seafarers must be at the heart of all our decision-making, as their wellbeing and safety are vital to maintaining a healthy industry. They are the lifeblood of global trade, and the time for viewing them as commodities is over. We need to change this mindset through collaboration with governments, employers, and unions to build an industry that puts people first and creates an environment where they will want to work.

We must ensure that decent working and living conditions for seafarers are implemented as set out in the MLC, while also creating careers that offer growth oppor-

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tunities and accommodate changes in life circumstances and taking up roles onshore. I am pleased to say that the ICS works closely with the International Labour Organization (ILO), the International Transport Workers' Federation (ITF), and other regulatory and representative bodies to create better regulations. Significant work is already underway to strengthen protections and opportunities for seafarers, but more still needs to be done.

Rerouting ships around conflict zones increases fuel consumption and emissions. How does the ICS view the trade-off between security and the shipping industry's climate commitments?

The industry is committed to achieving net-zero greenhouse gas emissions by or close to 2050, in line with the IMO strategy; however, seafarer safety must always be the priority. The recent geopolitical conflict in the Strait of Hormuz and the surrounding region has been deeply concerning. At the ICS, we call on all States to take the essential measures to ensure the safety of the seafarers caught up in this crisis. Freedom of navigation is critical to global trade, and seafarers should always be able to do their job freely and safely.

Over the past five years, the industry has faced significant challenges, yet shipping has, time and time again, proven its resilience. Global trade continues, shipowners remain committed to investing in energy-efficient technologies to support decarbonisation goals, and, amid these heightened geopolitical tensions, we strongly urge all vessels operating in conflict regions to conduct thorough risk assessments and maintain heightened vigilance in accordance with the latest BMP (Best Management Practices) Maritime Security guidelines.

The Clean Energy Marine Hubs initiative aims to turn decarbonisation from a concept into reality by focusing on ports, infrastructure, and fuel supply networks. How is it progressing in practice, and what early results or commitments are you seeing from ports and governments so far?

I am pleased to note that the Clean Energy Marine Hubs (CEM-HUBS) initiative continues to gain momentum, with the governments of China and Malta joining last year. This brings the total number of participating governments to nine, including the UAE, Norway, Canada, Panama, Uruguay, Brazil, and Greece. What makes this initiative distinctive is that it looks beyond the immediate needs of shipping while ensuring that the sector is not overlooked in the wider energy transition.

The CEM-HUBS initiative aims to accelerate the deployment of infrastructure and de-risk the investment required to ensure that the whole world can access low-carbon fuels near ports for maritime transport and use. It brings together shipowners, fuel producers, port authorities, governments, and financial institutions, enabling the pooling of expertise, risk sharing, and the alignment of regulatory decisions. These strategic partnerships are key to developing scalable and cost-effective green-fuel supply chains, as well as the necessary infrastructure to support their uptake and turn maritime decarbonisation from ambition into a practical reality.















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Contributing to society: Beneficence (*εὐποιία*) as a core human moral duty

Greek shipping is not merely one of the strongest pillars of the national economy; it is also a living bearer of values, tradition, continuity and accumulated experience across generations. In the person of Evangelos El. Angelakos, this enduring maritime journey finds one of its authentic contemporary expressions.

Drawing on decades of experience in international shipping and close professional engagement with the shipbuilding industries of Japan and China, Angelakos reflects on the evolution of the global maritime landscape, the distinctive characteristics of Asian business cultures, and the strategic lessons Greece might draw from them.

At the same time, he speaks with unusual frankness about the importance of history and tradition as guiding principles in both business and public life. He underscores the moral obligation of every citizen to contribute meaningfully to society, while emphasising the importance of civic duty, public responsibility, meritocracy and personal example. He also points to what he sees as the Greek state's long-standing failure to recognise and strategically leverage the global stature and influence of Greek shipping for the broader national interest.

An interview with **Evangelos El. Angelakos**, Honorary Chairman of Angelakos (Hellas) S.A., Honorary Commodore of the Hellenic Navy and Honorary Dean of Shipping and Naval Engineering at Chongqing Jiaotong University,

conducted by Spilios Varelas

You have been active for many years in the shipbuilding markets of Japan and China and have witnessed their remarkable development first-hand. How would you describe the journey of these nations toward shipbuilding excellence, and what, in your view, distinguishes their business cultures?

Japan has a long and distinguished shipbuilding tradition. Following the devastation of the Second World War, however, the country's industrial base was virtually destroyed. Yet by the early 1950s, Japanese shipyards had already begun their recovery, assisted in part by orders placed by Greek shipowners. The same was true of Germany, whose shipyards also benefited from Greek confidence during the difficult post-war years. Later, during the 1960s, South Korea's shipyards likewise attracted the interest of Greek shipping companies. China, by contrast, was at that time significantly behind in both technology and industrial capability. The turning point came after President Richard Nixon's historic visit to China in 1972 and, more decisively, with Deng Xiaoping's "opening-up" reforms beginning in 1978. From that point onward, China embarked upon a transformation of historic proportions.

What is particularly noteworthy is that, despite internal political differences, the Chinese leadership ultimately united behind a common national objective. That unity of purpose produced what can only be described as a modern miracle. I mention this because it inevitably invites comparison with Greece. In our country, we do not agree on long-term national priorities. We do not share a collective vision regarding where Greece should stand globally

Credit: Valantis Kordatsakis

I have always regarded business not merely as a commercial activity, but also as a means to foster communication and exchange ideas between peoples and civilisations.

and amongst the champions, in twenty, thirty or forty years' time — in education, defence, healthcare, demographic policy or economic development. Where is such a vision, such a plan that will unite the people behind it? I, for one, have not seen it.

China, however, defined long-term strategic goals and pursued them consistently and methodically. Greece is equally capable of achieving great things. This is not romanticism or utopian thinking. Hellenism possesses both the talent and the human capital to excel internationally, as demonstrated by the global success of Greek shipping. If it can be done on the seas, it can be done on land, too.

Culturally, Japan and China differ considerably despite sharing certain historical roots. The Japanese are exceptionally disciplined, methodical and reliable. If a Japanese counterpart gives his word, one may trust that commitment. They may initially disagree with your approach, but if persuaded by sound reasoning, they will carefully implement what has been agreed.

The Chinese operate differently. They are generally less receptive to external opinions. Nevertheless, our company's experience with China has been highly positive because we have always approached discussions with preparation, seriousness and informed arguments. In my experience, there are no problems that cannot ultimately be resolved through constructive cooperation.

Today, China commands a dominant share of the global newbuilding market for commercial vessels. We recently placed an order for eight ships with a Sino-Japanese group and have already taken delivery of six. Japan continues to possess tremendous expertise, but China has advanced rapidly, and a few of its shipyards are steadily narrowing the gap. A similar process occurred earlier in South Korea, where shipyards initially lacked technical know-how but gradually acquired world-class capabilities.

Beyond its industrial rise, China possesses immense cultural depth. During your long engagement with the country, have you identified points of connection between Greek and Chinese civilisation?

China consists of fifty-six ethnic groups, yet despite its diversity, I believe the Chinese share certain characteristics with us Greeks. They, too, are heirs to an ancient civilisation; they value hospitality, they possess a strong commercial instinct, and they place great importance on the family as an institution. There is also profound respect in China for Greece and its civilisation.

The Chinese name for Greece is "Xi-La" — pronounced "Shi-La" — while China itself is called Zhong-Guo, meaning the "Central Kingdom". In some southern dialects, Greece is pronounced "Hi-La", which may well derive from the word "Hellas". Whether the connection is linguistic or symbolic, the affinity is striking.

Compared with the Japanese, I find the Chinese more outward-looking and approachable, in a way that resembles Mediterranean societies such as our own. The Japanese, by contrast, tend to be more reserved and formal. Also, women in China hold a significant role in the workplace and in business, a thing I have not observed in Japan.

Historically, the links between Greece and China stretch back centuries. In Hellenistic times, there were commercial exchanges between the two civilisations, while Greek artistic influence extended eastward through Greco-Buddhist art into India, China, Korea and Japan. Later, Byzantium maintained intermittent diplomatic and commercial relations with China.

Claudius Ptolemy, the great Greek Alexandrian geographer and mathematician of the second century AD, referred in his Geography to regions corresponding to present-day China, distinguishing between "Serica" in the north and "Sinae" in the south. His work shaped geographical understanding for centuries and guided explorers, including Christopher Columbus, from late antiquity through the early 16th century. It was the equivalent of today's... Google Maps!

In the 17th century AD, it was a Greek scholar and diplomat, Nicolas Spatharis, who was the first European to explore

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China from the north, i.e. Siberia, and to reach imperial Beijing.

My own relationship with China deepened further through a cultural initiative connected to the 2008 Beijing Olympic Games. Inspired by the ancient Greek tradition of composing odes in honour of major events, I believed Beijing — as the representative of another great civilisation — deserved such a tribute. Until then, Athens alone had received this distinction, when two distinguished Oxford classicists composed in ancient Greek an "Ode to Athens": first for the inaugural modern Olympic Games in 1896, and again for the 2004 Athens Olympics. It would also be a gift from Oinousses, the distinguished maritime island where I was Mayor, to China in gratitude for dedicating the year 2008 to the cultural heritage of Greece. Inspired then by the tradition of Pindar, I commissioned the distinguished scholar and historian Sarantos Kargakos to compose an Ode to Beijing in ancient Greek. The ode conveyed messages of peace, hope, virtue, sportsmanship, universal brotherhood and the symbolic bridging of East and West. Today, after being presented at numerous events and receiving several distinctions, the Ode has been translated into over thirty languages and has found its permanent home, its "Ithaca", at the Olympic Museum in Beijing, thanks to the initiative of Assistant Professor Vasilis Trigkas of Tsinghua University. I regard this not only as a cultural contribution but also as a gesture of friendship from Greece to China. For all the reasons above, I believe Greece should substantially deepen its diplomatic and cultural engagement with China. Frankly speaking, I consider it extraordinary that in a country of 1.4 billion people — a country that holds Greece in exceptionally high esteem — our embassy in Beijing still lacks a Cultural Attaché. In my view, this represents an extremely serious strategic omission, because culture remains Greece's most powerful international asset. This is our "nuclear arsenal".

You place great emphasis on history and tradition, something reflected even in the names of your vessels. In an era often described as suffering from a crisis of values, what lessons do history and tradition offer today?

I have always regarded business not merely as a commercial activity, but also as a means to foster communicationand exchange ideas between peoples and civilisations. Travel, especially to foreign lands, is therefore both "to trade and to observe".

This philosophy is reflected in the names chosen by our owners for the ships operated by us. During the naming ceremonies, we present short historical reflections explaining the story behind each name and its significance. Ships such as "Magna Graecia", "Europa Graeca", "Socrates Graecia", "Aristoteles Graecia", "Aeschylus Graecia", "Sophocles Graecia", and "Euripides Graecia" are intended to highlight the enduring global influence of Greek civilisation.

Classical and humanistic education profoundly shaped my outlook. In many respects, it also guided my business conduct. I never believed in advancing at the expense of others, nor do I regard money as the sole measure of success. Money is useful. Economic development is essential. However, money per se, or personal glorification, has never been my objective. Certain principles are non-negotiable. The values instilled in me by my parents and teachers became guiding stars throughout my life. Ironically, perhaps, they also contributed to my professional success. At times, however, those same principles may have restrained purely commercial self-interest. But at the end of the day, I can sleep in peace knowing that I have done my civic duty and executed my public responsibility.

Ultimately, the essential question is this: What is the purpose of life? Is it solely the accumulation of wealth? I do not believe so. Whatever contribution I may have made to society — often at considerable personal cost and on certain occasions, even at the risk of my own and my family's life — was undertaken not in pursuit of recognition, but out of conviction, conscience and a sense of duty.

Your contribution to Oinousses has been substantial and enduring. How do you view the role of a shipowner in relation to social responsibility?

Contributing to society is the duty of every citizen and every human being. All of us can — and should — offer something, whether large or small, to



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the broader community. We cannot focus exclusively on ourselves and our personal interests.

Naturally, we have obligations toward our families and those close to us. But we also have obligations toward our fellow citizens and our country. This principle applies especially to those who possess greater influence or resources, because with power comes responsibility. Beneficence (*εὐποιία*) is not optional. It is both a moral duty and an expression of nobility of character.

Guided by these principles, I served as Mayor of Oinousses for sixteen consecutive years. I did so with passion, dedication and a clear sense of purpose, often at considerable cost to my business, my personal life and my extended family. In my absence from the company, my sons undertook the load to run it successfully.

When I entered public service, I did so with a vision and a plan. Having already gained significant international business experience, I believed I possessed the practical knowledge necessary to contribute effectively. Public office should never become a field for fatal amateur experimentation at the expense of citizens. My guiding principle was simple: *to give, not to get.* I started all the infrastructure works on the island and many more. I promoted educational and cultural activities and strived to change the mentality of the community. I governed according to the principles of integrity and meritocracy. Looking back today, I take satisfaction not so much in the completion of the projects as in the gradual change of mentality among younger generations. That, above all, is my greatest reward.

Despite Greek shipping's global leadership, there remains a perception that its success is disconnected from the Greek state and public life. How should the State better leverage the strengths of Greek shipping?

Although the Greek state does not engage with shipping as strategically as it should, Greek shipping wins and brings to Greece what I would call an "Olympic gold medal" every single day, together with the admiration of the world.

Behind this achievement stands the Greek shipowner, the "quiet champion", operating not within the confines of a small domestic economy, but within the intensely competitive global marketplace and its giants. Greek shipping has conquered the oceans not through force, but through hard work, entrepreneurship, competence and perseverance.

This naturally raises an important question: why the Greek state does not use the expertise, international networks, and strategic insight of its shipping community? If the state really wanted to utilise it, it would find the ways and means to do it.

I also believe that, after concluding their professional careers, Greek shipowners should devote a few years to actively participating in public life and governance. Their practical experience, their effectiveness, their meritocratic mentality and international outlook would benefit the country enormously.

Of course, the philanthropic contributions of Greek shipowners are both great and admirable. I take my hat off to every one of them. Bravo! Yet there is a difference between making donations and personally assuming responsibility in public affairs. Engaged cit-

izenship, leading by example, has far greater long-term value for society.

While Greek shipping dominates internationally, the Greek registry continues to lag behind competing flags. Why has the Greek flag struggled to maintain competitiveness?

Ideally, every Greek-owned vessel should sail under the Greek flag, and Greek shipowners do want to. That would benefit both the country's prestige and its economy.

Why does this not happen? The answer lies primarily with the state itself. Greek-owned shipping operates globally. It functions within an intensely competitive international environment, where efficiency and responsiveness are essential. Unfortunately, the Greek registry continues to impose bureaucratic constraints that make operations unnecessarily difficult.

By contrast, registries such as Cyprus provide a continuous, twenty-four-hour, highly efficient service. The great majority of the ships under our management sail under the Cypriot flag for precisely these practical reasons.

During my years in the City of London, where we were initially based for some decades, our agency's vessels flew mainly the Greek flag. Eventually, however, bureaucratic obstacles forced our owners to reconsider. The solutions are often remarkably simple, yet the consequences of bureaucratic inefficiency are significant: Greece and its people lose jobs, influence and revenue.

What principles should guide a family-owned shipping company in order to ensure long-term success and continuity across generations? And how do you view diversification into sectors such as yachting?

A family-owned company must be led by committed, hardworking and hands-on leadership, guided by the vision and healthy foundations laid by its founders. At the same time, however, it must constantly adapt to changing circumstances and anticipate future challenges as far as possible. A successful company should never rest on its laurels. It must be prepared to take risks, but calculated ones, without overextending itself.



As for diversification, I am neither in favour of nor opposed to it. If diversification can be pursued successfully, then naturally it may benefit both the company and society. Diversification for the sake of diversification is meaningless to me, and it might be dangerous.

What matters most is loving — or coming to love — what one does. This applies equally to shipping and to every other profession. If work is viewed merely as an obligation, neither personal fulfilment and creativity, nor excellence can emerge.

I remember an incident in Japan that left a lasting impression on me. We were visiting a shipyard to take delivery of one of our newbuildings when I observed three workers paving a large public square. One of them repeatedly checked the alignment between the stone slabs with his fingers, rejecting even the slightest imperfection.

No one was supervising him. No one else would ever have noticed the difference. Yet he approached his work as a creator, as an artist approaches a masterpiece. He possessed immense pride in his work. In his own mind, he was another Praxiteles, another Michelangelo, another El Greco. In his eyes, he was building the Parthenon. I still hope and pray that he is well, wherever he may be.

That moment encapsulated for me the true meaning of dedication, craftsmanship, and self-pride in work. Of course, not every Japanese worker is like that. Yet I believe that every form of work contains within it an element of creation. When individuals create something through their own effort, discipline, sweat and toil, they derive profound satisfaction from it.

As far as yachting is concerned, it is an entirely different field from commercial shipping. In yachting, one is not dealing with cargoes, but directly with people. It is a far more delicate and service-oriented sector, requiring different skills, sensitivities and operational abilities.

Here again, we encounter the same structural problem regarding the Greek flag. The majority of yachts owned by Greek interests do not sail under the Greek registry. One only needs to walk through the marinas of Greece to observe this reality. Bureaucracy and impractical regulations deprive the Greek state of substantial revenue while simultaneously limiting employment opportunities for young Greeks.

I remain convinced that contemporary Hellenism possesses both the talent and the human capital to become a leading global force within a few decades. World-leader Greek shipping already demonstrates this reality. In mathematics, one might call this a constructive proof of existence.



The Ode to Beijing. This artwork was created by the Chinese calligrapher Rui Ming Yang and is at the Olympic Museum in Beijing.

Olympic Games "Beijing 2008"
The Ode to Beijing in Ancient Greek

Ὠδὴ στὸ Πεκῖνο

Ὀλυμπιὰς δᾴς,
τοῦ οἰκουμένῃ τῇ πάσῃ χεῦαι εἰρηναῖον τὸ φάος
ἐς γαῖαν Σηρικὴν ἔμολες τήμερον, ἣν οὐχ ἵκετο
Ἰάσων, Ἀργοῦς ναυβάτης,
οὐδὲ Λαερτιάδης, κλεινὸς Ὀδυσσεύς,

οὐδ' ἀήσσητος Ἀλέξανδρος κραταιότατος πάντων ἀγὸς
ὁ καὶ Μέγας ἐν ὑστέρῳ κληθείς.

Ὦ Πεκίνου πτόλι, αἰωνία τε καὶ πολυκλεὲς τουτὶ φάος ὀλυμπικὸν δέξαι καὶ ὀμφαλὸς γενοῦ ἀμφικτυονίας καινῆς πανταχοῖ πεταννύσης εἰρηναῖον τὸ φάος ἐλπίδων τ᾽ αὖ φάρος
πονούντων, πεινώντων, ταλάνων.

Φλὸξ αὐτὴ φρυκτωρίας δίκην
ἐν γᾶς πέρασιν ᾱ̓ξασα ἐν σταδίῳ τῷ τῷδε φωταγωγεῖ
ὑποθήκην τε νεότητι δίδωσιν
ἀγνῶς ἐν ἀθλήμασιν ἔχειν ἀγωνίζεσθαί τε
οὐκ ἀγῶνα χρημάτων ἀλλὰ κοτίνου, ἐλαίας κλώνου εἰκόνος τε ἀρετᾶς καὶ εἰρήνης
ἐν γᾷ τῇ πάσῃ.

Olympic Games "Beijing 2008"
The Ode to Beijing in English

Ode to Beijing

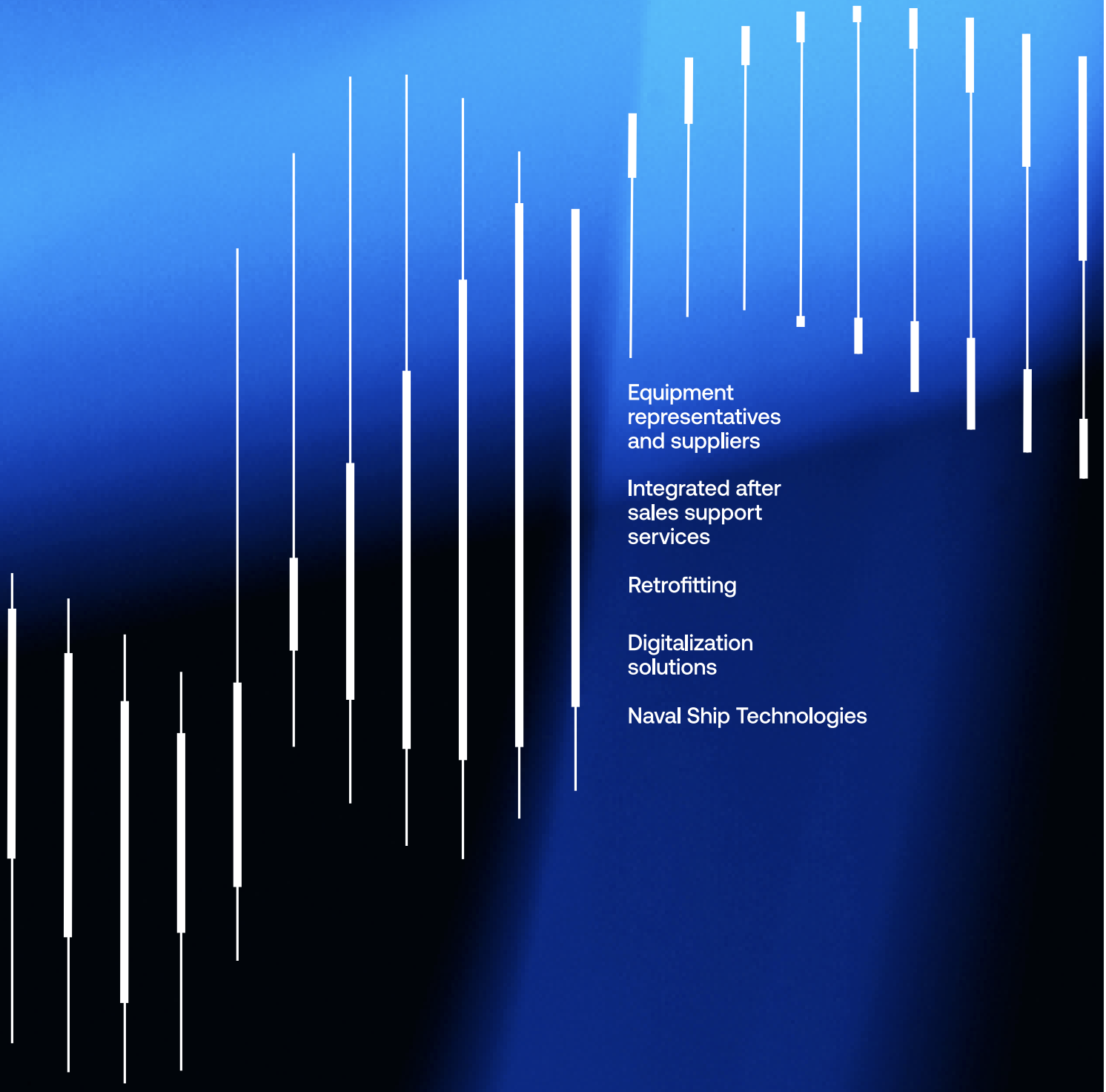
Olympic torch,
to shed your light of peace over the whole world,
today you have arrived in the land of China,
a land Jason, sailing on the Argo,
did not reach, nor did the son of Laertes,
legendary Odysseus,
nor the invincible Alexander, most powerful leader of all,
who was called Great in later times.

Beijing, city eternal and renowned, receive this Olympic light
and become the navel
of a new Delphic community spreading the light of peace throughout the world
and become a lighthouse of hope
for those who struggle, those in hunger,
those who suffer.

This flame burning here has darted like a beacon light
over the extreme ends of the earth,
and sheds its light on this stadium,
passing on the message to the young
to strive in these contests with purity
and to compete not for the sake of gain,
but to vie for the olive branch,
the symbol of true excellence and peace
throughout the world.

(Translation: Prof. Diskin Clay, Prof. James Diggle, Evangelos El. Angelakos)

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Shipping operates globally and therefore requires globally agreed-upon rules

In this era of geopolitical instability and mounting regulatory complexity, the Chairman of INTERCARGO explains how the organisation amplifies the dry bulk sector's voice at the IMO while providing hands-on support via technical committees, panels, and working groups, so that members can navigate sanctions, regional rules, and the energy transition with pragmatic, operationally grounded solutions.

John A. Xylas,
Chairman of INTERCARGO,

talks to Giannis Theodoropoulos

How does INTERCARGO support its members in addressing today's key challenges, including geopolitical tensions and increasing regulatory complexity?

INTERCARGO's role is to ensure that the voice of the dry bulk sector is clearly heard at the international level while providing practical support to our members as they navigate an increasingly complex technical and operational environment.

Today's challenges — geopolitical instability, sanctions regimes, regional regulatory initiatives, and the energy transition — require coordinated industry engagement.

INTERCARGO actively represents the interests of global quality dry bulk shipowners at the International Maritime Organization (IMO) and is in dialogue with regulators, helping to ensure that new regulations are pragmatic, globally applicable, and mindful of operational realities.

INTERCARGO represents the interests of owners from around the world operating more than 4,500 bulk carriers, accounting for over a 40% share of the world's dry bulk fleet capacity. This broad representation allows us to bring real operational experience to the regulatory debate and strengthens our ability to advocate for workable solutions.

At the same time, we support our members through an active structure of committees, panels, and working groups that meet regularly to address emerging technical, operational, and regulatory challenges. Key examples include the work carried out through our Quality Panel, which focuses on safety and operational standards in response to the growing challenges associated with vetting regimes, and our Ship-to-Ship Transfer Working Group, which has just published the first international Guidelines for StS operations. Through these forums, members share experiences and best practices and develop common positions that help improve safety, compliance, and operational efficiency across the sector.

The dry bulk sector has maintained a solid safety record over the past few years. To what extent do you believe digitalisation and AI tools will contribute to further improvements in safety and compliance, and what do you see as the main barriers to a more widespread adoption of advanced digital tools across the industry?

The dry bulk sector has made significant progress in safety over the years, and



this progress is clearly documented in INTERCARGO's Bulk Carrier Casualty Report 2025, which highlights the continued reduction in vessel losses and improved safety performance across the sector. This progress reflects the industry's ongoing commitment to higher standards in vessel design, cargo-handling practices, crew training, and operational management.

Digitalisation and emerging technologies, including artificial intelligence, have the potential to further enhance these improvements. Data-driven tools can assist with predictive maintenance, voyage optimisation, cargo monitoring, crew training, and risk management, while digital platforms can simplify regulatory reporting and improve operational transparency.

That said, industry-wide adoption still faces challenges. Shipping remains a fragmented sector, where many small and medium-sized operators must carefully evaluate investment costs. Key issues include system standardisation, data governance, cybersecurity concerns, and the practicalities of onboard implementation. Technology should ultimately support seafarers and operators by making shipping safer and more efficient — not by adding unnecessary complexity. The recent expansion of INTERCARGO's Associate membership over the past year, through reaching out to many physical and digital innovator companies in the maritime sector, is directly aligned with these strategic goals.

Shipping has faced significant crises in recent years that have directly affected seafarers. What lessons has the sector learned regarding crew welfare, and what message would you like to convey to governments and regulators?

The past few years have reinforced a fundamental truth: shipping cannot function without seafarers. They are the backbone of global trade, ensuring that essential commodities continue to move around the world even during times of crisis.

INTERCARGO has repeatedly highlighted this through public statements and interventions, stressing that seafarers must be recognised, respected, and protected. As we have stated on several occasions, "seafarers are key workers who must never again be placed in situations where their basic rights, mobility, and welfare are compromised".

The crew change crisis during the pandemic demonstrated how fragile the system can become when governments fail to coordinate. Seafarers faced contract extensions, mobility restrictions, and significant mental and physical strain.

More recently, the deteriorating security situation in parts of the Gulf region has once again highlighted the risks faced by seafarers who continue to operate in volatile environments to keep global trade moving. INTERCARGO has reminded members that the safety and wellbeing of crews must remain the overriding priority when operating in high-risk areas, and that seafarers should never be exposed to unacceptable danger as a consequence of geopolitical tensions.

Going forward, governments must ensure that seafarers are treated as essential workers, that crew changes can take place without unnecessary obstacles, and that seafarers are protected from unfair criminalisation and undue risk when employed on law-abiding merchant vessels trading in international waters. Ensuring their welfare, safety, and dignity is not only a moral responsibility but also essential for the resilience and reliability of global supply chains.



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To what extent does EU regional legislation affect the competitiveness of small and medium-sized companies, which are the backbone of European shipping?

Shipping is a global industry, and its regulatory framework must reflect that reality. Measures introduced at a regional level, such as those developed within the EU, create fragmentation and distort the level playing field on which international shipping depends.

European shipping, and particularly the dry bulk sector, is largely composed of small and medium-sized companies. These operators form the backbone of the industry, yet they are often the most affected by complex and overlapping regulatory requirements.

INTERCARGO has consistently maintained that environmental and operational regulations for shipping should be developed and implemented solely at the global level through the IMO. Regional measures risk imposing disproportionate administrative burdens and additional costs while creating uncertainty for operators trading worldwide.

Once global regulations are agreed upon at the IMO, we believe that regional regimes should be withdrawn or aligned accordingly to restore regulatory clarity and maintain a level playing field for the global fleet.

How concerned is INTERCARGO about the risk of fragmented regulation instead of a single global framework under the IMO?

The risk of regulatory fragmentation is one of the most serious challenges facing the shipping industry today.

Shipping operates globally and therefore requires a unified regulatory framework. The IMO provides the appropriate platform for developing such regulations. However, it is essential that the process remains focused on practical, technically sound solutions.

Unfortunately, within the IMO structure, the Marine Environment Protection Committee (MEPC) often reflects broader political tensions among governments beyond the purely maritime world. On the other hand, bodies such as the Maritime Safety Committee (MSC) have traditionally benefited from strong input from engineers, technical experts, and industry practitioners, which aligns more closely with the IMO's DNA. Maintaining a balance between political ambition and technical realism is crucial.

INTERCARGO has consistently maintained that environmental and operational regulations for shipping should be developed and implemented solely at the global level through the IMO. Regional measures risk imposing disproportionate administrative burdens and additional costs while creating uncertainty for operators trading worldwide.

Governments should put aside political positioning and focus on developing realistic, affordable, and scalable solutions that can be implemented across the global fleet. Shipping's energy transition is an enormous challenge that will only succeed if regulatory frameworks are grounded in technical feasibility and economic sustainability.

Dry bulk vessels carry over 50% of global trade; therefore, the sector's specific challenges should not be ignored.

How is INTERCARGO working alongside other international maritime organisations to help drive and shape the future direction of the shipping industry?

Collaboration across the maritime industry is essential, particularly as the sector faces the dual challenge of regulatory transformation and the pressure to transition to new fuels and technologies.

INTERCARGO actively participates in the Round Table of international shipping associations, working with other key industry players to coordinate their positions and engage constructively with governments and regulators at the IMO. Through this platform, the industry is able to present unified views on key issues affecting global shipping.

At the same time, INTERCARGO maintains close cooperation with a wide range of regional and national shipping organisations, including the Union of Greek Shipowners (UGS), as well as other maritime stakeholders. This broader dialogue helps ensure that the operational realities of the dry bulk sector are reflected in policy discussions.

By combining global engagement with strong industry-wide cooperation, INTERCARGO seeks to contribute constructively to shaping a regulatory environment that safeguards safety, protects seafarers, and enables shipping to continue supporting global trade.

The recent launch of our Advisory Associate membership, engaging global P&I Clubs, Flag Administrations, and Classification Societies, is very much in line with these strategic goals.

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Regulations should target the evaders, not make things harder for those already acting responsibly

In an era marked by geopolitical uncertainty, accelerating decarbonisation efforts, and growing concerns over maritime safety, the global tanker industry is entering a decisive phase of change.
In his interview, Rolf Westfal-Larsen Jr. shares his insights on the evolving shipping landscape, highlighting the need for smarter regulation, stronger global coordination, and a pragmatic approach to the energy transition. INTERTANKO's Chairman addresses the risks shaping the industry today and outlines what must be done to ensure safety, transparency, and sustainability in the years ahead.

Rolf Westfal-Larsen Jr.,
Chairman of INTERTANKO,

in discussion with Giannis Theodoropoulos

How has the rise of the so-called "shadow fleet" affected market transparency and safety standards?

The shadow fleet is a genuine safety threat, and we are very clear and concerned about that. These are vessels operating without credible liability insurance and outside the normal inspection and vetting systems that the rest of us submit to as a matter of course. There is no SIRE, no P&I Club with teeth (i.e., real enforcement capacity), and no effective flag State oversight. When one of these ships has an incident, the consequences fall on coastal States, the environment, seafarers, and the reputation of the entire tanker industry.

What concerns us particularly is how poorly designed sanctions regulations have created the conditions for the shadow fleet to thrive. When the rules are complex and inconsistent across the US, EU and UK, the quality fleet carries a disproportionate compliance burden, while shadow operators exploit the gaps. That is the wrong way around. The regulations should target the evaders, not make things harder for those already acting responsibly.

Our position is straightforward: we need a clear delineation between the quality fleet and the shadow fleet, and that requires sanctions frameworks that identify and target the individuals, ships, and networks actually behind these operations. States are getting better at this — the seizure of shadow-fleet vessels is an effective deterrent — and we support such escalated enforcement when exercised within the bounds of international law.

We have also been working on this at the IMO level for some time, going back to issues around fraudulent ship registration. And we have recently updated our guidance on GNSS jamming and spoofing, which is closely connected. Shadow

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fleet vessels are among the actors that benefit from the degraded navigational environment created by such interference.

To what extent are geopolitical instability and heightened security risks affecting the attractiveness of the seafaring profession, and could this further exacerbate the existing global shortage of qualified officers?

The security situation across multiple regions — the Red Sea, the Middle East Gulf, and the Strait of Hormuz — has placed seafarers under sustained and genuinely serious pressure. There have been more than 150 attacks in the Red Sea since November 2023. People have died. Ships have been lost. And crews are transiting areas where there are, frankly, no effective defences against certain weapons systems currently available on board civilian vessels.

What I can say with certainty is that seafarer welfare has become one of INTERTANKO's most urgent operational concerns. In the current Hormuz/Gulf situation, we have been pressing governments hard on three things: repatriation and welfare, safety of navigation, and coordinated international security support. Seafarers need to be treated as key workers — they must not be stranded, they need to have access to provisions and welfare services, and the fatigue and psychological pressures on crews transiting these waters have to be factored into operational decision-making rather than overlooked.

Now, as to whether this is making the profession less attractive to younger people or compounding the existing shortage of qualified officers — that is a fair and important question. We have identified a significant pool of young people who wish to, but cannot, gain the required statutory seatime. Through our seafarers' initiative, we are working with OCIMF and others to increase the availability of seatime to help fill this shortfall. We fervently hope that the current situation in the Middle East Gulf is temporary, and we remain confident that seagoing careers offer a fantastic opportunity for a young person to work in a true meritocracy.

Do you believe regulatory timelines are advancing faster than both technological maturity and the necessary global infrastructure required to support alternative fuels at scale?

This is something we feel strongly about. You can set ambitious targets, and we support ambition, but the regulatory architecture has to reflect the technological and energy availability, including the infrastructure readiness. This has been illustrated in one of our submissions to MEPC84, using available global energy data. It highlights the magnitude of renewable electricity required to produce zero-carbon fuels such as e-ammonia or e-methanol at the scale needed by international shipping. Replacing the current marine fuel demand would require substantial quantities of renewable energy, raising important questions regarding energy availability, global competition for renewable resources, and the pace at which zero-carbon fuel supply chains can realistically develop.

What we have been consistently advocating is the importance of a multi-layered approach to decarbonisation. That means supporting the full portfolio of transitional pathways — energy-saving devices, wind-assisted propulsion, LNG, sustainable biofuels, Bio-LNG, shore power, carbon capture, and zero-carbon fuels — not mandating a narrow set of solutions before the fuels, certification schemes, and bunkering infrastructure exist at scale. The industry has already reduced net CO_2 emissions by 29% compared to 2008. We are one percentage point away from the 2030 ambition, seven years early. That is not an industry dragging its feet — that is an industry delivering.

The European Union is moving ahead with regional measures such as FuelEU Maritime and the inclusion of shipping in the EU Emissions Trading System. Is INTERTANKO concerned about the risk of fragmented regulation instead of a single global framework under the IMO?

That is one of our deepest concerns, and we have been consistently saying so. Shipping is a global industry. A


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tanker does not pick up cargo in one regulatory universe and delivers it in another — it operates across jurisdictions continuously, and it needs a single, coherent set of rules to operate against. When you have FuelEU Maritime and the EU ETS sitting alongside each other, potentially diverging from whatever framework eventually emerges from the IMO, you create an unpredictable environment with a heavy administrative burden and a confused overall signal to the market.

That said, I want to be careful here. We are not dismissing the EU's ambitions; it would be great to see some of the funds generated funnelled back into maritime decarbonisation, and we are actively engaging with the European Commission. But our strong preference — and our advocacy at every leve — is for the IMO to deliver a global framework, avoiding regulatory fragmentation and enabling long-term investment in decarbonisation solutions. Regional measures are, independent of the region, at best a fallback and at worst a competitive distortion.

How do you assess the implementation of SIRE 2.0 so far? Do you believe it is achieving its objective of enhancing safety and transparency without creating disproportionate operational or administrative burdens for compliant tanker operators?

From an industry perspective, the implementation of SIRE 2.0 represents a significant, largely positive step toward strengthening the tanker sector's overall safety and transparency framework. The shift to a more risk-based, behaviour-focused, and evidence-driven inspection model marks a substantial evolution in how operational performance is evaluated. Based on the evidence available to us, the early outcomes indicate that the programme is broadly achieving its objectives of enhancing safety and transparency. At the same time, the additional operational demands, particularly during the transition period, have not created a disproportionate burden for compliant operators.

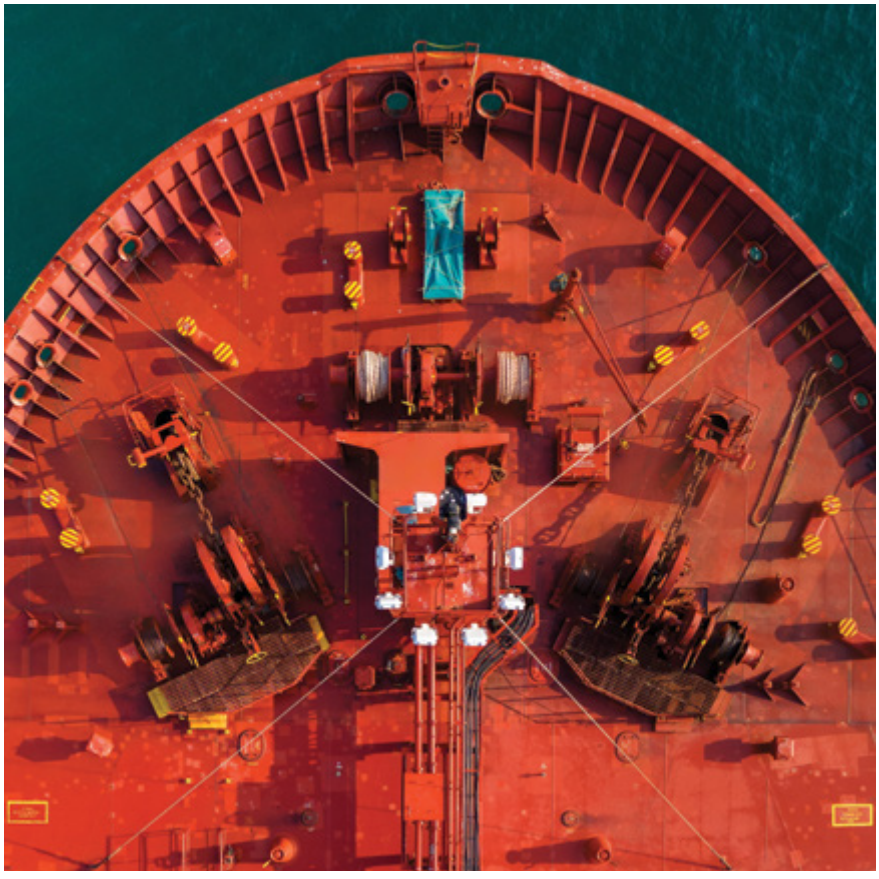
One of the most important advancements is SIRE 2.0's departure from the limitations of the VIQ 7 regime. VIQ 7 focused heavily on hardware and documentation, without adequately assessing how procedures were applied in practice or why errors occurred. SIRE 2.0 closes this gap by embedding Human Factors into the inspection process, examining behaviours, situational awareness, communication, workload, and safety culture. This results in a more holistic assessment that captures the interaction between people, processes, and equipment, rather than treating compliance as a checklist exercise.

We track SIRE 2.0 performance closely through our benchmarking tool, and the data shows that our members are engaging with the system seriously and consistently improving their performance against it. The average number of negative observations per inspection is declining. In contrast, the number of positive observations — an important addition under SIRE 2.0 and one that was not meaningfully captured by its predecessor — is rising. This matters because a system that only records deficiencies provides an incomplete picture of operational performance.

In 2025, 108 member companies uploaded more than 7,200 reports covering over 3,000 ships. The average number of negative observations per inspection decreased from 6.33 at launch in late 2024 to 5.24 across 2025. At the same time, positive observations increased, offering a more balanced and accurate view of onboard performance. This is particularly significant, as a system focused solely on deficiencies cannot reflect operational reality.

Performance on core questions, especially those linked to the most significant onboard risks, has been particularly encouraging, with negative observations decreasing by approximately 35–40% over the year. That represents a meaningful improvement in a relatively brief period and suggests that operators are not only engaging with the system but improving against it.

In terms of safety enhancement, the integration of Human Factors and the use of structured, real-time documentation have created a more comprehensive and accurate picture of a vessel's operational readiness and onboard safety culture. This has improved both the depth




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and consistency of inspections, shifting the focus from procedural compliance toward demonstrable operational excellence.

Transparency has also improved meaningfully. Increased use of photographic evidence, more standardised observation formats, and clearer criteria for risk identification provide operators with more actionable insights and reduce variability across inspectors and regions. This creates a more level playing field and supports more effective risk management across fleets.

SIRE 2.0 is fundamentally well aligned to recognise and differentiate high-performing operators. The model highlights good practice, and companies that invest in training, competence assurance, and continuous improvement are well positioned to demonstrate their performance under the updated framework.

That said, the programme introduces greater complexity. The inspection process is more detailed, requires deeper crew engagement, and places higher expectations on both shipboard and shore-based teams. The volume of data entry, documentation, and evidence generation remains significant, and the administrative burden has not yet reached a fully stable or sustainable balance. While this is partly inherent in a more rigorous, evidence-based system, further development of integration tools, digital interfaces, and optimised data-exchange mechanisms will be important for improving efficiency without diluting safety.

Looking ahead, enhanced digital integration, particularly through API-based data exchange, offers a clear opportunity to streamline workflows and reduce administrative effort, helping to offset some of the additional demands introduced by the new regime. We continue to channel structured feedback through industry forums, including vetting committees and SIRE focus groups, to ensure that genuinely onerous requirements for compliant operators are addressed constructively.

In summary, SIRE 2.0 is moving the industry in the right direction. It delivers meaningful improvements in safety insight, inspection quality, and transparency, while providing a more accurate, risk-aligned assessment of tanker operations. With continued refinement and a focus on administrative simplification, the framework is well positioned to fully realise its intended benefits for both operators and charterers.

Shipping is the infrastructure on which the global economy runs. Around 80% of world trade moves by sea, and the tanker sector is what keeps the lights on — quite literally — across much of the world. When the Strait of Hormuz comes under pressure, that is not an abstract geopolitical event; it is a direct threat to the energy security of importing nations across Asia and beyond.

What message would you like to convey to governments and regulatory bodies regarding the strategic role of shipping in ensuring global energy security, economic stability, and a realistic transition to a low-carbon future?

Shipping is the infrastructure that underpins the global economy. Around 80% of world trade moves by sea, and the tanker sector is what keeps the lights on — quite literally — across much of the world. When the Strait of Hormuz comes under pressure, that is not an abstract geopolitical event; it is a direct threat to the energy security of importing nations across Asia and beyond. INTERTANKO wants to see — and is publicly calling for — governments to coordinate their responses to ensure the safety and welfare of seafarers in the region.

What we need from governments is a recognition of that strategic reality, and a regulatory approach that reflects it. We need longterm solutions that are coherent, global, and workable. We need investment in infrastructure to enable the energy transition: bunkering networks, certification systems, and fuel supply chains. And we need the seafarers who make all of this possible to be treated with the seriousness their role demands — as key workers, as professionals operating under increasing pressure, as people whose welfare is never a secondary consideration.

The tanker industry is playing its part in the transition to a lowcarbon future. Our members are investing, trialling new technologies, and navigating the transitional pathways. But we need a level playing field, a single global framework from the IMO, and governments that understand that shipping is part of the solution.

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Traditional family-owned shipping companies have long been the foundation of the shipping industry and will, hopefully, remain so

In an industry defined by its intensely cyclical nature, the Andreadis family's long tradition offers a vantage point on the evolution of global shipping. Now spanning five generations, the company's trajectory reflects a broader sectoral shift: moving from the aggressive growth strategies of earlier eras toward a strategic focus on risk management, continuity, and longevity. In his exclusive interview, Paul Andreadis discusses the traditional Greek "hands-on" approach in contrast to the rise of third-party management, the looming global shortage of qualified crew, and why Athens remains the world's most dynamic and sophisticated shipping hub. The interview highlights the social contribution of the Greek shipping community, which is uniquely positioned to respond rapidly to national emergencies, while also addressing the reasons why the Greek registry faces challenges in maintaining its competitiveness.

An interview with **Paul Andreadis**, Managing Director of Commercial Shipping & Trading Company Ltd.,

conducted by Panagiotis Korakas

With the Andreadis family having a long tradition in the shipping industry, how has this legacy influenced the direction and decision-making of your firm over the years? How do you navigate between tradition and path dependence and the need to adapt and evolve?

The family has been involved in commercial shipping for five generations now, which I believe has a bearing on the company's culture and the way it approaches strategic decision-making. While earlier generations tend to adopt a more aggressive approach to growth, it is natural for priorities to shift towards more conservatism as organisations mature over time. A greater emphasis is then placed on risk management to ensure continuity and longevity. Having said that, sustained growth always remains essential, and companies must continually adapt and evolve to maintain their commercial viability. In this regard, history has many lessons to teach us, as a comprehensive understanding of the global economy and a recognition of the sector's intensely cyclical nature remain ever relevant.

Several representatives of the Greek shipping community continue to follow the approach of previous generations by choosing to stay out of the spotlight and keeping a low public profile. Do you believe this stance is still appropriate in an era that increasingly calls for openness and outward engagement?

Openness and engagement are clearly fundamental to any commercial trade that involves multiple parties. Building

Credit: Maria Eirini Moschona



and maintaining strong, enduring relationships is of paramount importance in shipping. In our part of the ecosystem, this relationship-building often occurs within the industry, away from public attention. While shipping ultimately benefits all end consumers, the nature of its operations does not require public mass marketing (as is the case with consumer goods, for example). Counterparties in this sector are relatively limited and industry-specific. As a result, many shipping companies may appear discreet and out of the public spotlight.

In a period marked by heightened challenges and the growing dominance of large-scale players in the shipping industry, can family-owned companies endure?

Traditional family-owned shipping companies have long been the foundation of the shipping industry and will, hopefully, remain so. It is, however, becoming increasingly challenging for smaller firms to compete with larger players, particularly with respect to pricing. Nevertheless, I believe that if smaller companies adopt a different approach and treat their involvement in shipping more as a platform for investing in an asset class (in the vein of multi-asset family offices), rather than operating in a rigid corporate manner, they may be able to remain competitive despite the disadvantages associated with economies of scale. Family-run operations also tend to be more agile, with smaller and more adaptable teams that can respond quickly to changing circumstances and make decisions efficiently, without the delays that often arise from multiple hierarchical layers.

We are witnessing an increased presence of major third-party ship management companies in Piraeus. In your view, is this altering the hands-on approach that we have traditionally associated with Greek shipowners?

Third-party ship management is a modern evolution in the shipping industry, which I believe serves a valuable role. Over time, a growing array of options has become available to shipping investors, allowing them to participate according to their interests and preferred operational methods. More traditional operators can opt for a hands-on approach, while those less interested in the intricacies of day-to-day ship operations may choose to hand over management to a third party. This naturally leads to some loss of control, but it offers the advantage of convenience for those who wish to only focus on the financial aspects of an investment. Furthermore, third-party managers make the asset class accessible to investors from non-shipping sectors. This opening to a wider market ultimately benefits the industry by attracting additional capital, which in turn supports job creation, stimulates related sectors, and influences asset value appreciation.

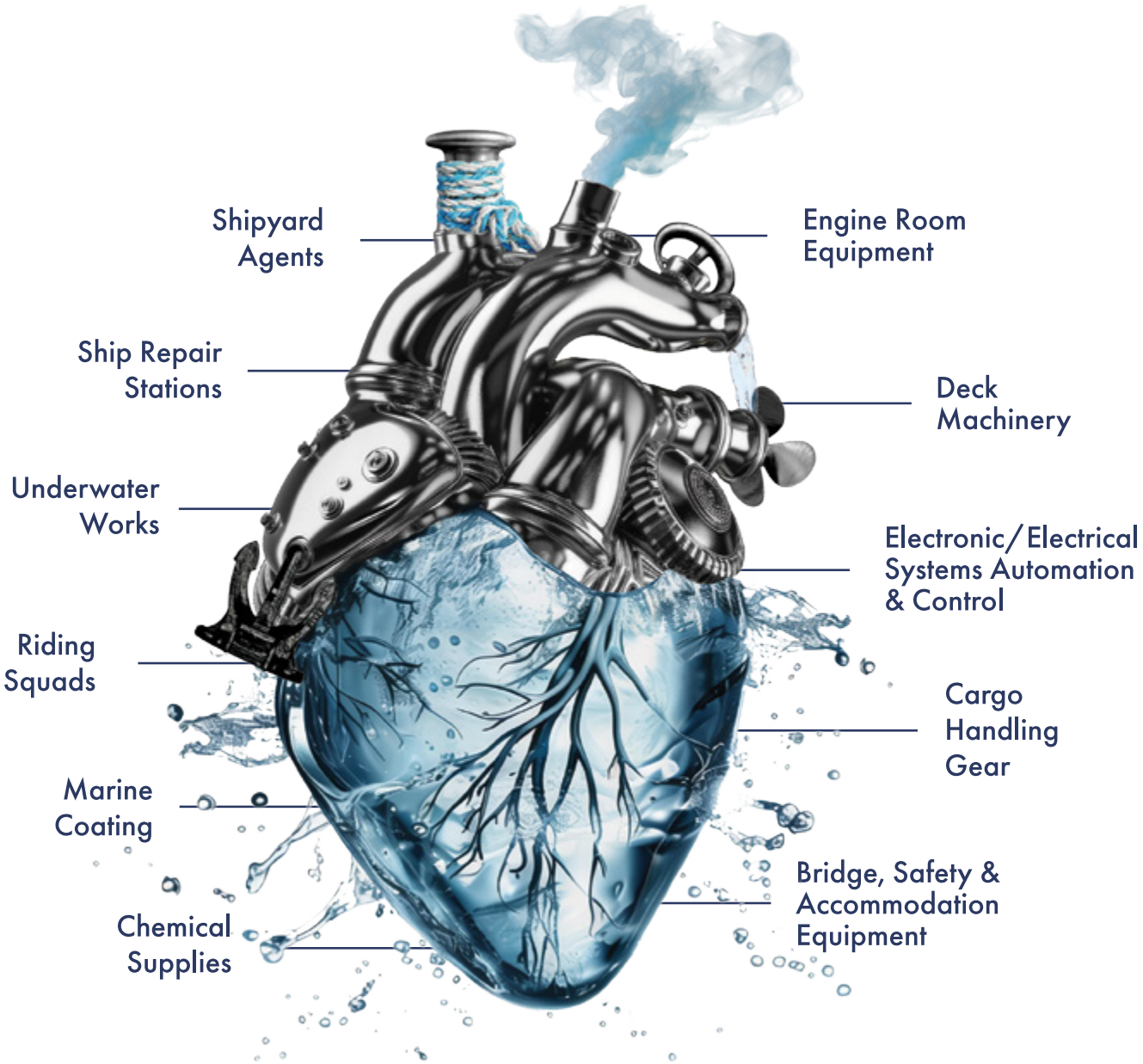
How do the demands of charterers, port authorities, and the ever-growing regulatory requirements impact smaller ship management companies?

In all three respects, smaller ship management companies are being affected, perhaps disproportionately, compared to larger companies. Charterers are increasingly imposing their own vetting requirements on ships, leading to increased costs. RightShip approval, for example, has now almost become a necessity. Clearly, the intention behind such measures is to improve safety and efficiency.

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The ever-growing global fleet is exacerbating the shortage of qualified crew. In my view, the root of the problem lies in the perception among the younger generations that life at sea is demanding and uncomfortable.

However, it can be argued that the way these vetting procedures are being implemented is at times inconsistent. Individual ports have also introduced their own rules and regulations, further increasing the operational burden. At the same time, EU emissions regulations have introduced the need for carbon trading, adding an extra layer of complexity. On the whole, all additional regulatory requirements tend to drive up costs, which are always harder for smaller companies to absorb.

Following the unprecedented floods in Thessaly, the UGS managed to raise over €50 million for the restoration of the affected areas through its "Agios Nikolaos" aid programme. As a participant in this initiative, how important do you believe collective efforts are in responding effectively to such crises and to the broader needs of Greek society?

I believe that the Greek shipping community is in a privileged position, being able to respond relatively quickly to unexpected emergencies. This is true of the community as a whole, which can play a significant role in helping to fill financing gaps in the national budget, often under strain in Greece. One has to consider that both the political system — across parties — as well as the wider public, are strongly supportive of shipping; so it can only be appropriate and justified to reciprocate.

Industry experts have underlined that global shipping will face a substantial shortage of qualified officers and crew in the coming years. What actions should be taken by companies, industry bodies, and policymakers to counter this challenge?

Indeed, the ever-growing global fleet is exacerbating the shortage of qualified crew. In my view, the root of the problem lies in the perception among the younger generations that a life at sea is demanding and uncomfortable. Examining and addressing factors that are discouraging people from seamanship, by implementing measures such as shorter shifts, improved communications with shore, higher pay, or better benefits, may help alleviate the situation.

Another approach to tackling this problem would be to increase the level of automation on ships. Technological advancements are already reducing the number of crew members required on vessels compared to the past, but there is still a long way to go. It may not be entirely unrealistic to imagine that, at some point in the future, vessels could become fully automated and autonomous, eliminating the need for crew altogether.

How do you assess Athens as a shipping hub, considering your experience living in major international maritime centres abroad?

In my experience, Athens is a leading global shipping hub for a variety of reasons. The shipping industry in Greece, including both primary operators and supporting companies within the broader ecosystem, represents one of the country's most influential and important sectors. In contrast, other countries with thriving shipping communities often have numerous major industries, which lessens the relative importance of shipping within their economies. In Greece, however, the prominence of shipping attracts a substantial workforce to the industry and related fields, further reinforcing the sector's strength. Whereas in other countries young talent may aspire to careers in technology or finance, in Greece, the corresponding industry to go into is shipping. All of this makes Athens one of the most important shipping hubs in the world, and probably the most dynamic and sophisticated one in relation to the size of its population.

Why do you believe there is a certain degree of reluctance toward placing trust in the Greek registry?

I think there are a few reasons behind the reluctance towards the use of the Greek registry. First and foremost is the issue of cost, which is naturally a major consideration for shipping companies. The Greek flag requires an increased number of Greek nationals to be employed as officers and crew, and they usually command higher salaries compared to other nationalities. As previously mentioned, there is also the practical difficulty of sourcing suitable Greek crew due to their limited availability. In addition, there is a perception that opting for the Greek flag may leave companies vulnerable to increased tax burden for their Greek-registered ships compared to those registered under open registries. Moreover, in today's volatile world of shifting geopolitics, flying the flag of an EU State could potentially restrict and complicate trade to certain regions. In general, open registers are considered to offer greater flexibility and efficiency.

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In his exclusive interview, Phrixos Papachristidis discusses the evolution of shipping leadership through the lens of heritage, empowerment, and operational excellence. Drawing inspiration from the intellectual legacy of his grandfather, a respected contributor to *Naftika Chronika*, he explores how traditional Greek shipping values have been transformed into a modern, collaborative corporate culture.
As the industry navigates the contemporary challenge of crew shortage, the CEO of the Hellespont Group analyses the company's long-term commitment to crew retention. Finally, he outlines the advantages Athens and Hamburg offer as maritime centres and how the two ecosystems complement each other.

Phrixos Papachristidis,
Chief Executive Officer
of the Hellespont Group,

interviewed by Spilios Varelas

Your grandfather was a frequent contributor to *Naftika Chronika*. How has his intellectual legacy influenced your own approach to shipping and leadership at Hellespont?

Although I never met my grandfather, his presence has always been part of the environment I grew up in. People who worked with him described a man who deeply respected seafarers, valued perseverance, and saw shipping as a cultural continuum rather than a transactional business. Those stories shaped my understanding of what leadership in this industry should look like.

At the same time, his business model was very different from what Hellespont is today. He operated in an era in which one man made the decisions, and the organisation followed. We have evolved into something fundamentally more collaborative. Today, every colleague — ashore and on board — is expected to have a voice. We believe that safe, reliable, and efficient operations come from empowered people who feel safe, valued, and trusted to speak up. In that sense, the legacy I inherited is not a blueprint but a reminder: respect for people is timeless, even as the structures around them evolve.

Do you see continuity between the values of traditional Greek shipowning families and the demands of today's highly institutionalised shipping environment?

There is a strong continuity, even if the context has changed. Traditional Greek shipping was built on resilience, calculated opportunism, and a flat organisational structure in which people had direct access to decision-makers. Those qualities remain essential today, especially in a world where agility and clarity matter more than ever.

What has changed is the profile of the people entering the industry. Over the last couple of generations, younger family members have come in with strong academic backgrounds — often with degrees tailored specifically to shipping, finance, engineering, or law. The only "unicorn", as my cousin jokingly put it, is the person who combines a master mariner or chief engineer background with an MBA; a rare combination that is not likely to be seen again and one that reflects the direction in which the industry has moved. My other cousin's rise to master mariner in our fleet and his taking command of our vessels were inspirational.

Credit: Caroline Bleicken

At Hellespont, we try to honour both traditions. We maintain a flat structure and encourage people to speak up, challenge assumptions, and take responsibility. At the same time, we operate with the governance, transparency, and discipline that modern technical management requires. The common thread is empowerment: creating an environment where people feel safe, respected, and able to contribute meaningfully.

The Hellespont Group has developed a strong presence in third party ship management. Do you believe third party management is becoming more attractive due to regulatory complexity and ESG pressures?

Yes — but the reasons run deeper than compliance. A growing share of the world fleet is owned by non shipping investors who view technical management as a cost centre. They want managers who can protect their assets, provide timely and transparent reporting, and stay ahead of increasingly complex regulations.

But beyond that, owners want stability. They want peace of mind. They want to know that the people operating their vessels — ashore and at sea — are dedicated to their vessels, competent, supported, accessible, and aligned on safety and long-term value creation. Third-party management becomes attractive when it offers not just regulatory expertise but a culture of consistent care and empowerment. At Hellespont, we invest heavily in our people because we know that safe, reliable, and efficient operations depend on them. When people feel valued and trusted, they deliver better outcomes — that is the true return on our assets.

Hellespont has chosen Hamburg as the centre of its ship management activities. What were the strategic considerations behind this decision, and how does Hamburg's maritime ecosystem complement or differ from that of Athens?

Our presence in Hamburg was the result of deep, committed involvement in the German KG market, and over time, it evolved as the company grew and diversified. Hamburg and Athens are both established maritime hubs, each with its own strengths.

We see the future seafarer as someone who can lead teams, navigate hybrid human–machine environments, and maintain calm, structured decision-making under pressure. These are skills that can be taught, but they must also be supported by a culture that empowers people, values their judgment, and gives them the confidence to grow.

Athens connects us to the Greek shipping tradition, to commercial and technical networks, and to the culture that has shaped our values. Hamburg, on the other hand, which is home to some of the largest shipping companies in the world, offers opportunities not just for the development of our business but also for access to financial and labour markets.

Both cities attract highly skilled professionals and offer a quality of life that helps retain them. The two cities complement each other: both offer heritage, global networks, technical depth, and institutional strength. In ship management, access to these resources provides invaluable stability. We do not see them in competition — together, they form a balanced foundation for safe, reliable, and efficient operations.

The global shortage of skilled seafarers is becoming a pressing issue. How serious is this challenge from your perspective? How does Hellespont approach crew retention and training in an era of increasing regulatory and technological demands?

The shortage of skilled seafarers is one of the most serious structural challenges facing our industry. The demands placed on crews have increased dramatically — from regulatory compliance to digital systems to environmental requirements — yet the global talent pipeline has not kept pace. Younger generations have more career options than ever, so the life of a seafarer, with its long periods away from home, is not always an easy sell, despite the high salaries.

For us, the response begins with a simple conviction: people are our most important asset, and retention is far more valuable than recruitment. When seafarers stay, safety improves, operational consistency increases, and the onboard culture becomes stronger and more resilient. Retention is not a cost; it is a form of value creation.

It starts and ends with the seafarer, and our approach is built on three pillars: respect and psychological safety, by creating an environment where seafarers feel safe, valued, and heard, with empowerment at the core so they can raise concerns, ask questions, and contribute ideas without fear of blame;

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continuous training and leadership development, recognising that modern seafarers need not only technical competence but also communication, leadership, and the ability to manage complexity as the industry moves through digitalisation and decarbonisation; and stability and long-term relationships, as we aim to build careers rather than fill vacancies, offering clear progression paths, transparent expectations, and consistent support on board and ashore so that our people can see a future with us.

But the global shortage of skilled seafarers is not a new challenge for shipowners and ship managers. That is why, as early as 1988, we invested in and partnered with Manship, our own manning agency in the Philippines, giving Hellespont full control over the recruitment, training, and evaluation of its crews. Moreover, in 2016, this partnership led to the creation of our own training centre, the Manship Maritime Training Center (MMTC), which further strengthened our ability to focus on the quality and development of our seafarer pool. These steps have solidified our commitment to providing high-quality ship management services to our clients. The shortage will not disappear overnight, but companies that treat their people with respect, invest in their growth, and build a culture of empowerment will be the ones best placed to navigate this challenge. For us, this is not just an operational priority; it is part of the legacy we aim to build.

How must the profile of the modern seafarer evolve as decarbonisation and digitalisation accelerate across the industry?

This question is often framed in overly simplistic terms, but the reality is more nuanced. The modern seafarer will certainly need strong technical skills, but the real differentiators will be leadership, communication, and the ability to manage complexity. As vessels become more digitally integrated and as environmental regulations tighten, the human element becomes even more important. We see the future seafarer as someone who can lead teams, navigate hybrid human–machine environments, and maintain calm, structured decision-making under pressure. These are skills that can be taught, but they must also be supported by a culture that empowers people, values their judgment, and gives them the confidence to grow. Our training philosophy reflects this shift: we focus not only on technical proficiency but also on interpersonal skills, resilience, and psychological safety.

How do you define modern maritime leadership, and in what ways must today's leaders differ from those of previous generations?

Modern leadership begins with a simple principle: people come first, performance follows. In an environment shaped by regulatory complexity, capital market scrutiny, and the energy transition, leaders must create clarity, stability, and trust. They must be accessible, transparent, and willing to listen — not because it is fashionable, but because it is essential for safety and long term value creation.

Previous generations often led through instinct and personal authority. Today, we must combine that intuition with data, governance, and a commitment to empowering our people. Leadership is no longer about control; it is about enabling others to succeed. When people feel safe, valued, and trusted, they perform at their best — and that is how we build a legacy of reliability and long-term value.



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Redrawing the global trade map: Shipping in the wake of Middle East volatility

The maritime industry currently finds itself at a critical crossroads, balancing immediate geopolitical shocks with the long-term necessity of a green transition. In this interview with *Naftika Chronika*, Andrea Olivi discusses the profound shifts reshaping global trade flows in the wake of the Middle East crisis.
Beyond the immediate crisis, he talks about the evolving regulatory landscape, contrasting the EU's ambitious decarbonisation frameworks with global standards. Furthermore, Olivi analyses how digitalisation enhances fleet efficiency without replacing physical logistics, while outlining a pragmatic path for alternative fuels within a sustainable and profitable strategy.

Andrea Olivi,
Global Head of Shipping at Trafigura,

discusses with Giannis Theodoropoulos

How is the Middle East crisis reshaping global trade flows, and what structural impact do you see this having on freight markets in the medium term?

The de facto blockade of the Strait of Hormuz is likely to have a major impact on global trade flows across all energy products. In the spot market, Asian refiners are sourcing crude oil from the Atlantic Basin as a replacement for the shortage in Arabian Gulf supply. At the same time, they are holding onto barrels of refined products they would have otherwise shipped to the West, leaving Europe vulnerable to shortages if the situation persists.

Stepping back, there are several developments to watch for. First, a major restocking of strategic petroleum reserves (SPRs) and other commercial storage is likely to occur at the end of the conflict. This should boost overall export demand compared with our previous forecasts. Second, Asian refiners will possibly try to diversify their supply sources, which is likely to support longer shipping routes as they seek a broader mix of crude sources from around the world. Investment in new infrastructure that bypasses the Strait of Hormuz is also to be expected, likely expanding the capacity of the East-West pipeline in Saudi Arabia, as well as any pipelines to Fujairah.

The scale of damage to energy infrastructure in the Middle East is likely to be significant, and some of the subsequent disruption will take months to unwind. Once there is a return to normal transits, this is likely to support stronger market conditions in the second half of the year. On the bunkering side, there is clearly a severe product shortage in Asia, which is already having an impact on the shipping industry. The relaxation of sanctions has helped increase the availability of HSFO and VLSFO, but if transits remain at these levels through early summer, we will see stored supplies in some parts of the world, forcing demand destruction. This will start with non-essential fuel users — such as lower-value shipping routes — cutting back, but will eventually extend into more core segments of the market.



Another consequence of the conflict is its impact on pricing indices. Whether it comes to freight, oil, gas, or other niche products, the pricing of innumerable physical and derivative contracts across the industry is based on transactions in the Middle East. Thus, the lack of price signals since late February has been hugely disruptive for physical traders, refiners, and shipping companies.

The decisions of the Baltic Exchange and S&P Global Energy Platts have had a particularly significant impact on the tanker market, with each taking different approaches to assessing certain Arabian Gulf–adjacent routes.

To ensure a healthy marketplace going forward, pricing agencies will need to revise their methodologies and engage in meaningful industry consultation. Without new frameworks, it will be difficult to restore pre-conflict levels of market confidence.

How is digitalisation transforming chartering, vessel tracking, and supply chain transparency?

Digitalisation has been a subject of intense debate for many years, and one we have looked at very closely as we run a large and complex shipping business, managing around 500 vessels at any point in time. Any small, consistent, and measurable savings in costs add up very quickly across a platform of our size. This gives us a strong incentive to invest in better tools to monitor and improve our performance.

Last year, we announced a strategic alliance with ZeroNorth for voyage optimisation software. We have also established partnerships across emissions tracking and trading, chartering, analytics, and a range of middle- and back-office functions.

However, the war in the Middle East is a clear reminder that shipping is first and foremost a logistics business that operates in the real world. No amount of digitalisation can replace the core skills and infrastructure needed to transport goods globally.

In your view, what is the EU's role in accelerating shipping decarbonisation compared to global frameworks like the IMO's? Do you see EU regulations as a catalyst for innovation or as a source of market distortion globally?

Many people view the EU decarbonisation targets as more ambitious than the IMO's, largely due to the adoption of FuelEU Maritime. While these regulations place real demands on business resources and compliance costs — and do have a tangible impact on decarbonisation — their effect on pricing and the broader market has remained limited. FuelEU Maritime has enabled some companies to invest in greener projects in Europe. However, these initiatives remain narrow in scope when considered within the global context.

How do you balance sustainability goals with commercial pressures in shipping?

Trafigura has always been pragmatic about its decarbonisation goals, with a view to achieving them in a sustainable and profitable way, while staying at the forefront of technical innovation. Decarbonisation has typically taken a back seat during periods of extreme market stress and disruption, including the COVID-19 pandemic, the Russia-Ukraine war, the Bab el Mandeb crisis, and now the Iranian conflict, but the focus will return to long-term decarbonisation goals once the current crisis ends.

What is the role of alternative marine fuels going forward, and how do options like biofuels and ammonia fit into Trafigura's long-term decarbonisation strategy?

The use of alternative fuels will continue to grow as production gradually increases and the necessary economies of scale are reached to enable their profitable and large-volume supply. The sheer complexity and volatility of the market in recent years have dampened enthusiasm around their use, particularly in the tramp shipping segment, where schedules are inherently less predictable. However, industry leaders are still keen to explore new technologies and find new solutions to address climate challenges collectively.

We already use and supply biofuels, particularly through TFG Marine, our bunker procurement platform, and we are expanding the footprint of our physical trading activities across all lower-carbon products in anticipation of future growth.

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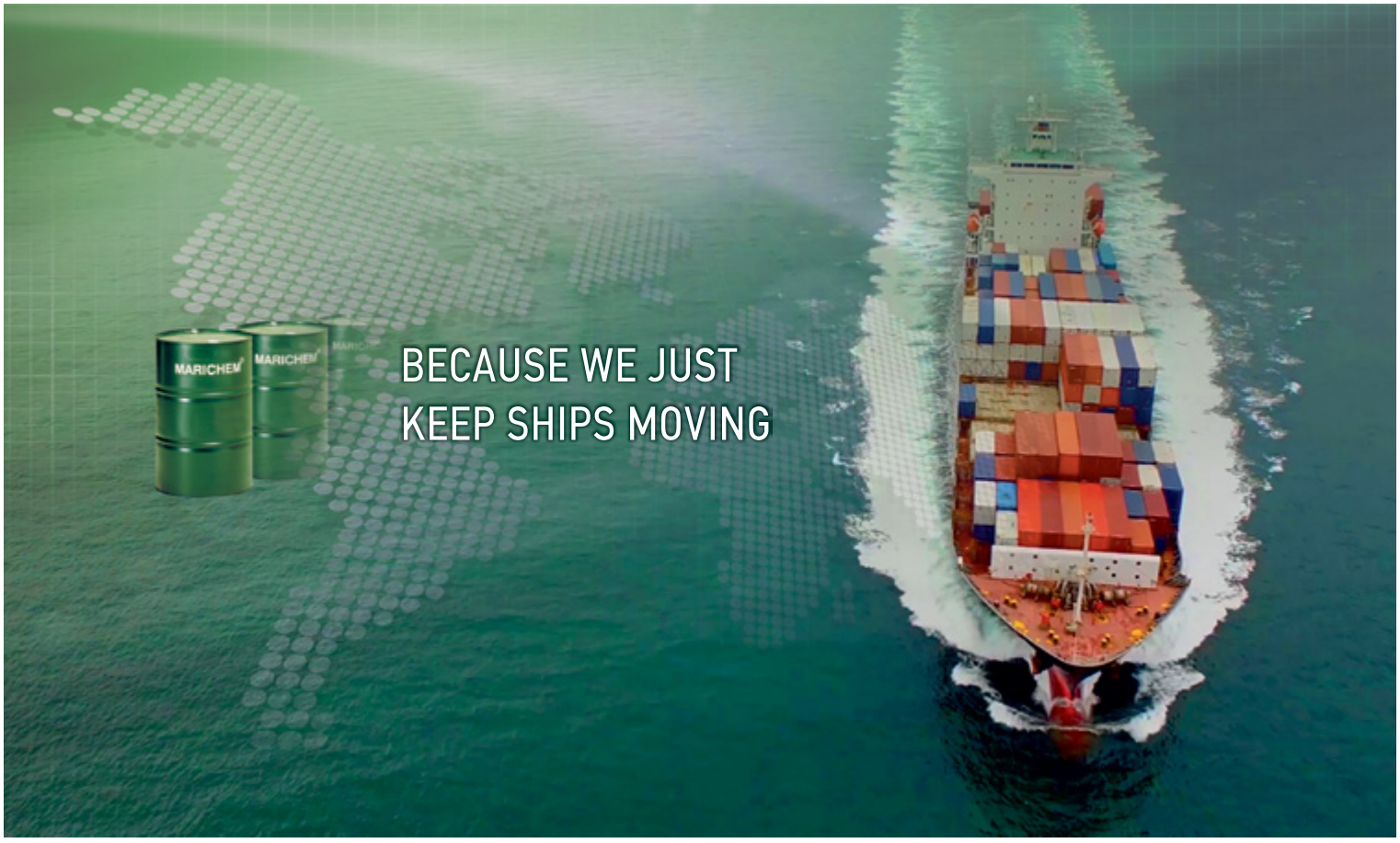


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Greece and the Republic of Korea are both peninsular nations whose destinies are shaped by the sea

In this exclusive interview with *Naftika Chronika*, the Ambassador of the Republic of Korea to Greece reflects on the historical foundations of Greco-Korean relations and the shared characteristics that connect these leading maritime nations, enabling them to build a strong and mutually beneficial economic alliance. H.E. Ju-Seaong Lim also expands on the vision of the "golden trilateral triangle", outlining the increasing opportunities for collaboration in shipbuilding, technology, and innovation.

H.E. Mr Ju-Seong Lim,
Ambassador
of the Republic of Korea to Greece,

interviewed by Spilios Varelas

As Posidonia 2026 once again solidifies Athens as a global maritime hub, the industry stands at a critical juncture. Given that Greece and the Republic of Korea represent two indispensable pillars of the maritime world – the leading shipowning nation and the premier shipbuilding power – how do you perceive the weight of our shared responsibility in guiding the industry toward a new era of technological and environmental excellence?

Greece and the Republic of Korea occupy unique and complementary positions on the world map. As I often say, we share deep "koina" (i.e., commonalities); we are both peninsular nations whose destinies are shaped by the sea. With our combined leadership comes a responsibility to define global standards. Today, we face a "triple transition": decarbonisation, AI-driven digitalisation, and energy security. South Korea contributes its high-tech know-how in smart ships and green fuels, while Greece provides its unparalleled market insight. By deepening this cooperation, we do not just follow the future — we build it.

The relationship between the Greek shipping community and South Korean shipyards has evolved far beyond mere commercial transactions, becoming a profound strategic alliance. How would you define this unique bond of trust that has been strengthened over the decades?

The friendship between South Korea and Greece was "written in blood" during the Korean War, and that sacred bond has been the foundation of five decades of commercial excellence. Above all, Greek shipowners are the most vital and cherished partners of the South Korean shipbuilding industry.

Ever since Greek shipowners became South Korea's very first customers in the early 1970s, our relationship has been built on a foundation of profound trust. South Korean shipyards have repaid this loyalty by strictly adhering to the principles of "on time, on demand, and on budget". However, this success is not South Korea's alone; it is the result of a shared journey. Greek shipowners and their engineers — the most discerning in the world — have worked tirelessly

We are moving toward an "investment-induced" alliance, in which South Korean investment extends well beyond traditional shipbuilding. A core pillar of this vision is the "golden trilateral triangle", i.e., an initiative that combines South Korean technology, the Greek market, and US finance.

alongside South Korean shipbuilders to co-create some of the world's finest vessels. This collaboration is so deep that major South Korean shipyards maintain distinct technical specifications tailored specifically to the requirements of leading Greek shipping companies. These bespoke standards have now become a global benchmark for maritime excellence.

Our strategic partnership has evolved into a robust two-way street. Building on our deep maritime cooperation, South Korea has now become the largest market in Asia for Greek export companies. We have moved beyond the traditional builder-buyer dynamic to form a powerful economic alliance in which South Korea serves as the premier gateway for Greek goods into the Asian market, with even greater potential for the future.

A journey that began with a single order in the 1970s has transformed us into "technical soulmates". Today, while we build some of the world's best ships together, South Korea has also emerged as the primary destination for Greek exports in Asia, further cementing a bond that is truly mutual.

Beyond the shipyard, where do you see the most promising opportunities for South Korean investment within the Greek maritime cluster and the broader economy?

We are moving toward an "investment-induced" alliance, in which South Korean investment extends far beyond traditional shipbuilding. A core pillar of this vision is the "Golden Trilateral Triangle" — an initiative that combines South Korean technology, the Greek market, and US finance. By connecting Korean expertise with Greek industrial centres, we can co-produce ships and rolling stock right here in Greece.

In this spirit of expansion, I hope to see a deeper synergy between the Greek maritime cluster and the city of Busan, which is currently being developed as a "Global Maritime Hub City". Just as Piraeus is the gateway to Europe, Busan's focus on maritime finance and smart logistics can allow it to serve as a "mirror" hub for Greece in Asia.

Furthermore, we are looking toward nuclear innovation. SMR-powered ships (Small Modular Reactors) represent a groundbreaking field, where South Korean R&D can meet Greek operational expertise to redefine maritime propulsion. Beyond the sea, building on the success of South Korean firms — exemplified by LG CNS's digital ticketing project for the Athens Metro — we see potential in areas such as AI-based water management and e-Gov solutions to support the digital upgrade of Greek public services.

Both Greece and the Republic of Korea are located at geostrategic crossroads within their respective regions. In this context, how do you perceive the role of the two nations in safeguarding global stability and upholding the international law of the sea?

South Korea and Greece share deep geographical and historical commonalities that shape our perspectives on international stability. Both are peninsular, sea-oriented nations that have survived foreign invasions and external pressures to preserve their distinct cultural identities. These shared experiences have fostered a profound sensitivity to issues of sovereignty and a rules-based international order.

Today, as we both navigate complex regional environments, our commitment to the United Nations Convention on the Law of the Sea (UNCLOS) serves as the shared foundation for our maritime policies. Beyond regional issues, our nations act as natural partners on the multilateral stage, including within the UN, where we work together to promote international stability. Our cooperation in the defence industry, including the potential co-pro-


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A general view during the christening ceremony of the cruise ferry "Panstar Miracle" at Daesun Shipbuilding and Engineering Co. shipyard in Busan, South Korea, 09 April 2025.

Credit: EPA/YONHAP SOUTH KOREA OUT

duction of naval vessels, is a practical extension of this shared commitment to peace through principled diplomacy and the upholding of international norms.

The profound contribution of Greek soldiers during the Korean War remains the bedrock of our friendship. How is this historical legacy reflected in modern diplomatic and people-to-people relations today?

As previously stated, our bilateral relationship is rooted in a "friendship written in blood". The participation of the 10,000 Greek heroes during the Korean War constitutes the moral anchor of my mission. South Koreans have never forgotten the courage shown on battlefields like Hill 381, in which the Greek forces were revered and earned the nickname of "Spartans of the East".

This legacy is preserved through active, daily remembrance. The monuments in Yeoju, South Korea and in Papagos, Greece, stand as twin symbols of this enduring bond. Every year on 25 June, we hold a solemn commemorative ceremony in Papagos to honour this shared history. In 2025, this relationship reached a significant milestone with the formal sister-city agreement between Papagos and Yeoju, institutionalising our connection at the local government level.

Today, this friendship is also being carried forward through a vibrant educational exchange for the next generation. Schools in South Korea and Greece often organise video conferences where students engage in profound comparative case studies of the Korean War and the Greek Civil War. By fostering these intellectual ties among our youth, we ensure that the "friendship written in blood" is renewed and transformed into a partnership among our future leaders, based on shared prosperity and mutual understanding.

On a personal note, what is the legacy you wish to leave behind regarding Greco-Korean relations by the conclusion of your mission in Greece?

I want to see the "golden triangle" become a living reality. My goal is to move beyond selling ships to co-producing them. By the end of my tenure, I hope to see the Greek shipyards thriving with South Korean technology and Greek craftsmanship, supported by strategic US backing. Overall, I want to leave behind a legacy of institutional trust, where our maritime and defence pillars operate as a single engine for growth.

Lastly, as the global shipping elite gathers in Athens for Posidonia, what message would you like to convey regarding South Korea's long-term commitment to remaining the most reliable and innovative partner for Greek shipowners?

My message is: South Korea is doubling down on our partnership. We are integrating our national maritime capital, Busan, with the global shipping market. Busan is now home to the Ministry of Oceans and Fisheries and is pioneering the Northern Sea Route (Arctic) pilot programme starting in 2026. At Posidonia, our 5th Korean-Hellenic Maritime Cooperation Forum will invite Greek shipowners to be part of this new era. In a volatile world, South Korea offers the stability of 50 years of friendship and the cutting edge of a global maritime city.

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A sustainable future for the maritime industry depends on a sustainable workforce

At a time of profound transformation for the maritime industry — driven by decarbonisation, digitalisation, and the growing need for a more sustainable and inclusive workforce — the role of education and research has never been more critical. Professor Maximo Q. Mejia Jr. offers insights into how academia is shaping the future of shipping, the challenges and opportunities brought by the next generation of professionals, and his vision for a more resilient, innovative, and human-centred industry. The interview also highlights how the intersection of policy, education, and industry can act as a catalyst for a truly sustainable maritime future.

Professor Maximo Q. Mejia Jr.
President
of the World Maritime University,

talks to Giannis Theodoropoulos

How does academic research contribute to the green and digital transition of shipping?

The World Maritime University's academic research is exceptional for the practical role it plays in informing both policy and industry practice. WMU research has been presented at several International Maritime Organization (IMO) meetings, including those supporting the green and digital transition of shipping.

The University is actively engaged in maritime decarbonisation research, examining how the industry can move toward low- and (net) zero-carbon design and operations. This includes research on alternative fuels, energy efficiency, and the development of effective regulatory frameworks. By providing evidence-based insights, these efforts support IMO decision-making and benefit Member States and the industry as a whole.

The University is also actively engaged in important research regarding the digital transition, exploring how automation, data-driven systems, and increasingly connected ships and ports are reshaping maritime operations. The research considers practical implications, such as efficiency, safety, system integration, and cybersecurity.

A key advantage of WMU is its unique position at the intersection of academia, industry, and governance, which facilitates research that is both relevant and applicable in real-world contexts. The knowledge generated is shared internationally and directly integrated into WMU's educational programmes, from professional development courses to MSc and PhD studies.

Ultimately, our academic research is advancing technological progress and facilitating evidence-based policy-making, while also supporting the development of the future workforce and systems needed to build a sustainable, efficient, and resilient maritime sector.

What progress has the shipping industry made regarding equality and inclusion, and what specific initiatives is the WMU undertaking in this direction?

While there is a growing recognition across the maritime sector that a diverse and inclusive workforce is essential for longterm sustainability, significant gaps remain both at sea and ashore. Stronger policy frameworks and an increasing number of initiatives to support women entering the industry are important improvements; however, they will require sustained, coordinated efforts to achieve notable, lasting change.

At WMU, gender diversity and inclusiveness are integrated across our education, research, and capacity development efforts. We are particularly proud of the tangible progress reflected in our student body. With donor support, female representation at WMU has risen from just 3% in 1983 to a gender-parity record in our Class of 2026 Malmö MSc intake, and our two MSc specialisations in China have likewise achieved gender parity in recent years.

We are also advancing opportunities for women in the maritime sector through professional development and partnerships. For example, WMU is playing an integral role in delivering the IMO–Republic of Korea SMART-C Women Project, which focuses on specialised training to open pathways to broader career opportunities and foster a more balanced, diverse workforce. Under the SMART-C Women Project, WMU is contributing to the development of Master Plans for pilot countries, helping to ensure longterm, sustainable impact. An example of partnership-driven training is the IMO/WMU/WISTA Gender-Inclusive Leadership in Maritime training course (formerly the Women's Leadership and Empowerment course), which supports capacity development and leadership. In addition, throughout 2026, WMU is undertaking an IMO consultancy for a regional scoping exercise on gender equality policies.

WMU research further advances gender diversity by understanding the structural barriers within the industry, thereby informing more effective policy responses. The Lloyd's Register Foundation Deep Dive on Seafarer Sustainability report, based on WMU research, highlights a clear pathway to reach a target of 25% female seafarers by 2050 and includes specific steps ranging from STEM awareness for girls to targeted scholarships and robust gender-equality policies.

We are also exceptionally proud of Professor Momoko Kitada, recipient of the 2026 IMO Gender Equality Award. Her leadership in gender and diversity initiatives effectively bridges academia, policy, and practice — translating research into tangible outcomes. Her work on gender inclusiveness has inspired and informed our efforts at WMU, as well as those of countless individuals worldwide who are advancing gender equality in their own administrations and institutions.

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Generation Z exhibits distinct characteristics that academic research is increasingly focusing on. Do you believe the shipping industry is adequately taking these traits into account? What is the role of universities in highlighting these characteristics and ultimately ensuring a smooth transition for young professionals into the shipping industry?

A sustainable future for the maritime industry depends on a sustainable workforce. An article in the most recent issue of the WMU Journal of Maritime Affairs highlights the disconnect between the traditional seafaring model and Gen Z values. They are the first truly "digital-native" generation to enter the maritime professions, and several of their key values — including connectivity, purpose, work–life balance, and inclusivity — are areas where the industry is making progress but has still much more work to do. Interestingly, the values just mentioned align with where research is telling us the industry needs to be headed, not only for Gen Z but also for the wellbeing of a sustainable maritime workforce overall. A new WMU report — "In Search of a Sea-Life Balance in an Adverse Environment: Understanding Seafarers' Life, Work and Turnover" — reveals that excessive workloads and the lack of shore leave are driving a "retention crisis", with nearly half of surveyed seafarers reporting that they are considering leaving the industry.

Addressing "technostress" and identifying career pathways that allow for more fluid transitions between sea and shore are central to retaining the current workforce and attracting Gen Z to maritime careers. To attract and retain talent, wellbeing must be treated with the same rigour applied to technical safety standards. For Gen Z, high-quality connectivity is a non-negotiable standard linked to wellbeing; decarbonisation is an imperative that affects the future of humanity and all life on Earth; work–life balance with fair pay and benefits is essential; and inclusivity is expected.



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CAPABILITY

International Registries, Inc. and its affiliates (IRI) provide administrative and technical support to the Republic of the Marshall Islands (RMI) Maritime and Corporate Registries. Recognizing the specialized needs of the shipping and financial services industries across a broad commercial and economic spectrum, the RMI Registry's fleet reached nearly 208 million quality gross tons with 6,211 vessels at the end of March 2026. As of 31 March 2026, the RMI fleet had 1,541 vessels weighing 67.1 million gross tons that are of Greek interest. That is 24.8% of the total vessels and 32.3% of the total gross tons of the RMI fleet.

Piraeus, one of the largest offices in IRI's network of 28 worldwide offices, is a full-service office with the resources and capability to register a vessel, including those under construction; record a mortgage or financing charter; form a business entity; issue seafarer documentation; and provide fleet operations and technical support. The Piraeus office also includes members of the RMI's International Maritime Organization (IMO) delegation, ensuring that the voices of regional owners and operators of RMI-flagged vessels are heard at IMO meetings. The success of the RMI Registry is due to its highly qualified team members, often experts in their fields, with experience at sea and ashore, who focus on quality, service, and continual improvement.

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2. IRI's ISO 9001:2015 certification ensures consistency among its network of 28 worldwide offices for registration and ongoing technical and operational support.
3. Decentralized operations provide customers with 24-hour worldwide service.
4. The RMI Maritime Administrator (the "Administrator") has authorized the major Classification Societies to act on its behalf, while maintaining its own technical team responsible for oversight of delegated functions, simplifying matters for owners/operators.
5. The RMI maintains an excellent port State control (PSC) record and is the only of the world's three largest registries to achieve the United States Coast Guard's (USCG's) QUALSHIP 21 status for 21 consecutive years as of this period. The RMI anticipates 22 consecutive years upon publication of the USCG's 2025 Annual PSC Report. Furthermore, the RMI is also on the White Lists of both the Paris and Tokyo Memorandums of Understanding.

   This prestigious PSC record is achieved through the Registry's pre-registration vetting and assessment process, continuous monitoring of the fleet, and complimentary technical support to all RMI-flagged vessels.
6. The RMI maintains an active delegation at the IMO. This delegation plays a role in shaping future regulations, allowing the RMI to proactively manage the implementation of new requirements and provide relevant advice to owners/operators and other industry stakeholders.
7. The Administrator has experience with all major vessel types.

CONTROLLING COSTS

The Administrator is very conscious of maintaining competitive fees and avoids duplication of costs by providing full authorization to the International Association of Classification Societies members acting on behalf of the RMI.

Some cost benefits are as follows:

1. the RMI does not restrict the nationality of seafarers serving on RMI-flagged vessels. This allows operators the flexibility to choose the most appropriate seafarers and officers;
2. fees for seafarer documentation are competitive with the current market rates;
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At WMU, our unique connection to the International Maritime Organization (IMO) means our research insights have the potential to influence policy. In addition to sharing our research results with the wider maritime industry through formal reports, the knowledge gained informs our curricula, future research priorities, and capacity-development work. We actively integrate technical knowledge with human-centred soft skills — such as leadership and teamwork — which are essential for a modern, "human-centric" maritime workplace.

Ultimately, attracting Gen Z to maritime professions relies on the industry providing the wellbeing and sustainability focus, and academia providing the knowledge and education to equip graduates with the expertise to lead effectively. This alignment will shape resilient maritime professionals who can thrive in a technologically advanced industry where the human element remains at the forefront.

How would you describe your vision for the future of the World Maritime University?

My vision for the World Maritime University includes building on the strengths of our education, advancing stakeholder engagement, and achieving financial sustainability. As a graduate of the World Maritime University, I understand firsthand the transformative power of a WMU education, both professionally and personally. Being immersed in such an international environment and learning from and alongside maritime professionals from around the world broadens and shapes perspectives in an extraordinary way, which, in turn, benefits and strengthens our industry. It is essential that WMU continues to provide top-tier maritime and oceans education to professionals who will carry that knowledge home and implement it at local, regional, national, and international levels, ultimately strengthening the maritime sector as a whole.

WMU's relationship with the IMO, as our parent institution, is unparalleled by any other university, and our impact on the global maritime industry is significant. We are not simply preparing maritime professionals to work in the industry; we are preparing them to shape it. The international perspectives, networks, and cross-cultural understanding our students gain are central to that effort as they take on leadership roles and build a sustainable future for our industry.

It is also essential that WMU continues to support the needs of the maritime community. Expanding our activities across education, research, professional development, and partnerships is key to providing relevant engagement and support for a rapidly evolving industry. A wide range of industry stakeholders play a central role in identifying needs and opportunities for collaboration as we work together to develop practical solutions to current challenges. Building on these efforts requires financial sustainability, which means growing the University's Endowment Fund and broadening our revenue streams through expanded involvement in research projects, consultancy work, outreach programmes, and closer cooperation with industry.



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In what ways can shipping companies improve workforce reskilling and upskilling to adapt to the ever-changing shipping landscape?

As the industry undergoes significant transformation driven by decarbonisation, digitalisation, and increasingly complex regulatory frameworks, the skills required of maritime professionals must evolve accordingly. Therefore, shipping companies need an integrated and forward-looking approach to reskilling and upskilling.

Technical competence will always remain fundamental and must be complemented by a solid understanding of emerging technologies. Decarbonisation of shipping, for example, requires knowledge of alternative fuels such as ammonia, hydrogen, and methanol, alongside expertise in safety, energy efficiency, and environmental protection. Digitalisation is also reshaping operations across ships and ports, making digital literacy essential for managing automated systems, interpreting data, and mitigating cyber risks.

Increased automation and technology do not replace the human element, which remains critical for judgment, coordination, and decision-making under pressure. Equally important are the so-called soft skills — the ability to communicate effectively, lead diverse teams, and work collaboratively.

For shipping companies, reskilling and upskilling their workforce means investing in a broader culture of lifelong learning that combines both technical and human competencies. This should be complemented by work environments that encourage mentorship, knowledge-sharing, and adaptability. In short, technology and the human element are parallel, mutually reinforcing priorities for ensuring safe, efficient, and sustainable maritime operations.

WMU is committed to providing the lifelong learning opportunities and knowledge the industry requires, offering customised professional development programmes for maritime professionals worldwide, and strengthening the industry's capacity to adapt.

What advice would you give to young professionals entering the maritime industry?

A career in the maritime industry provides a unique opportunity to facilitate global trade in a rapidly evolving sector. It is an exciting and challenging time as the industry tackles decarbonisation, embraces technological advancements, and works to ensure the sustainable use of ocean resources.

A new generation of professionals will excel by building a strong foundation in technical competence while also developing the ability to work across cultures, sectors, and areas of expertise. There is a wide range of opportunities, from roles that are operational in nature to those shaping policy, innovation, and international cooperation. Adaptability will be the key to success and will require a commitment to lifelong learning as new technologies and regulatory frameworks emerge.

It is also important to understand the broader responsibility that comes with maritime careers. Professionals in this field play a critical role in ensuring safety at sea, protecting the marine environment, and supporting the efficient movement of global trade.

My advice to young professionals is to approach the industry with curiosity and a clear sense of purpose. Those who remain open to learning, are willing to collaborate, and are mindful of the wider impact of their work will be well positioned to contribute to a sustainable and forward-looking maritime sector.

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Protecting the sea means protecting our future

The maritime sector is undergoing rapid transformation, shaped by geopolitical uncertainty, technological change, and rising expectations for safety, sustainability, and resilience. In this context, the EMSA plays a central role in supporting Member States and EU institutions with expertise, operational services, and maritime situational awareness. In this interview, Maja Markovčić Kostelac reflects on the Agency's evolving mission, the importance of human capital, and the opportunities that a career in the maritime domain continues to offer to young professionals.

Maja Markovčić Kostelac,
Executive Director
of the European Maritime Safety Agency
(EMSA),

in discussion with
Giannis Theodoropoulos

How has the EMSA assisted EU Member States in expanding their capacity to monitor Russia's so-called "dark fleet"?

In times of crisis, such as the COVID-19 pandemic and the Russian aggression against Ukraine, the EMSA has demonstrated its strategic role in providing maritime situational awareness by utilising existing intelligence and surveillance capabilities.

The so-called "dark fleet" poses significant risks to the environment, safety, and security. Through our tools, we have been providing regular and targeted analyses and reports to the European Commission and the EU Member States; by fusing inputs from multiple surveillance sources — such as AIS data, GNSS interference monitoring, and operational reports from EU bodies — we have been helping authorities detect suspicious vessel behaviour more effectively. This includes activities commonly associated with "dark fleet" operations, such as Ship-to-Ship transfers.

Our targeted reports also support the implementation of sanctions against the Russian Federation in the maritime domain. These tools include, for example, tracking Russian-flagged and false-flagged vessels and monitoring the importation of prohibited coal, oil, and liquefied gas cargoes. Should a potential sanctions-circumvention movement of a vessel be detected, the EMSA provides a real-time notification to the Member State authorities responsible for sanctions enforcement.

Finally, as foreseen in the Agency's new mandate, which entered into force at the beginning of 2026, we are establishing a 24/7 centre to provide maritime situational awareness and analytical data to the European Commission, competent national authorities, and relevant Union bodies. These additional capabilities will ensure the EU is better equipped to manage maritime crises.

In an increasingly complex maritime domain, the EMSA remains committed to supporting the European Union and



its Member States with timely, reliable, and actionable intelligence — strengthening our collective ability to safeguard security, protect the environment, and uphold the integrity of EU policies at sea.

What role does the EMSA play in supporting national administrations, industry, and maritime stakeholders in the sustainable transition of shipping?

Our role is threefold: we offer technical and scientific assistance to the European Commission and EU Member States, facilitate capacity building, and provide implementation support for EU and international maritime legislation, tools, and operational services.

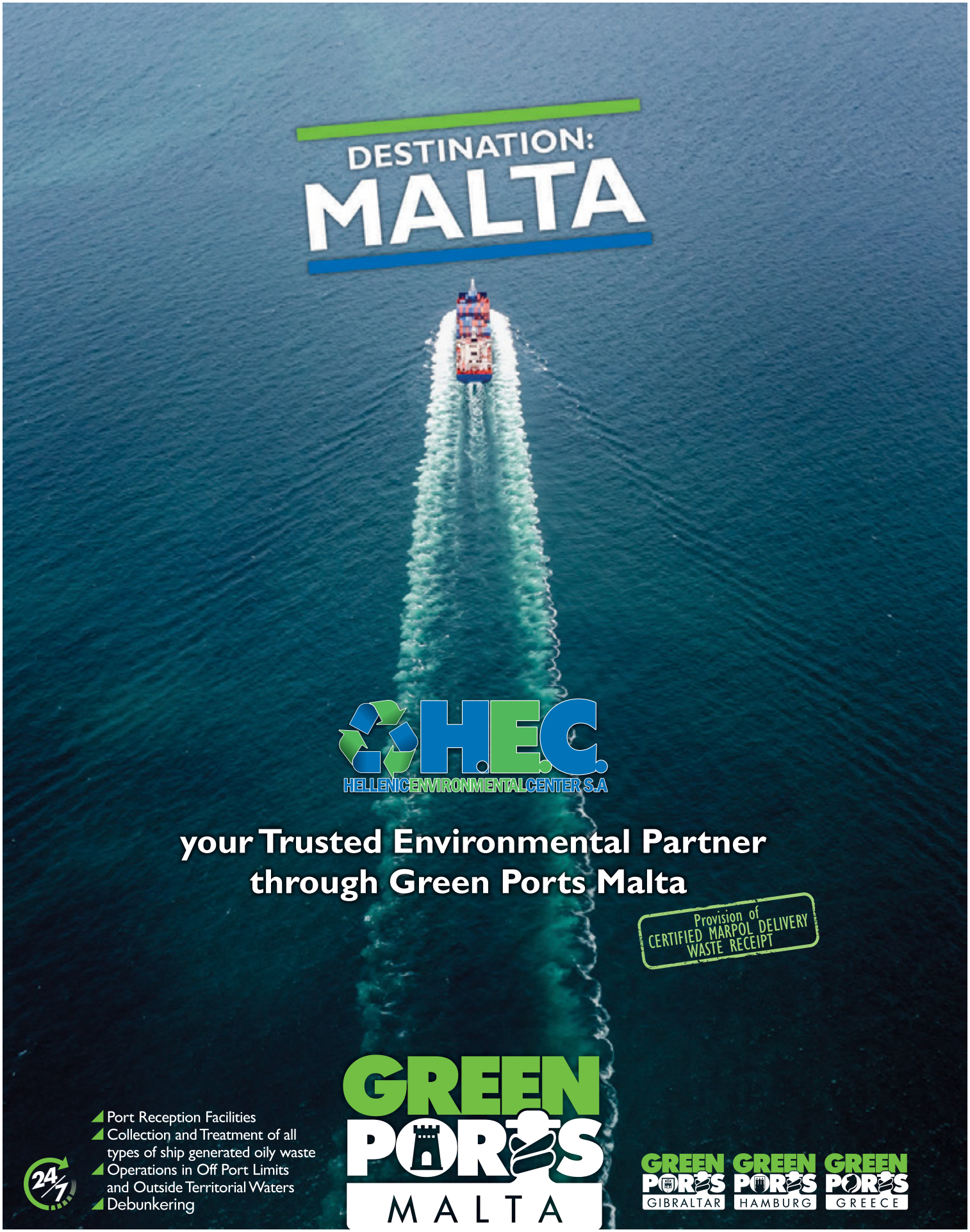
We act, first, as a knowledge hub, developing studies, technical guidance, and analyses; second, as a facilitator, supporting the exchange of best practices and lessons learned and building capacity; and third, as a service provider, offering tools and IT systems and operational assets such as a pollution-response toolbox and remotely piloted aircraft systems (RPAS).

Alternative fuels will play a key role in the sustainable transition of shipping. That is why, for some years, the EMSA has been examining the potential of different alternative fuels and power supplies for shipping, the latest of which are two studies on onboard carbon capture technologies and hull air lubrication systems, adding to our research on biofuels, ammonia, hydrogen, wind-assisted propulsion, synthetic fuels, or even exploring the potential of nuclear power for shipping. In parallel, we are carrying out studies into the safety aspects of various alternative fuels to support maritime stakeholders in the sustainable transition. To date, we have finalised a series on ammonia, another on hydrogen, and a series on the safe bunkering of biofuels. We have also published guidance for port authorities and national administrations on shore-side electricity and guidance on battery energy storage systems, as well as research on the transport of alternatively fuelled vehicles on board Ro-Ro ships.

Underpinning the sustainable transition is, of course, the human element in shipping, as new technologies and fuels will require new skills for current and future seafarers. As a result, we have produced our TRAINALTER study, which focuses on identifying specific competences for seafarers on ships using alternative fuels and energy systems, and which we hope will support the revision of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW).

Finally, with a new study called MARCOMPASS, we are also examining how the green and digital transition of shipping will impact the competent authorities in the Member States, which will need to accompany the process by implementing and enforcing the relevant legislation.

In the EU, the extension of the EU Emissions Trading System (EU ETS) to maritime transport and the provisions of the FuelEU Maritime Regulation are fundamental pillars for the green transition of shipping. The EMSA hosts the digital solution THETIS-MRV, which is annually used by approximately 3,600 companies, responsible for more than 12,600 ships calling EU ports, as well as by 23 accredited, independent conformity-



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Together with Frontex and EFCA, we are actively involved in the European cooperation on coast guard functions, the framework that supports more than 175 national authorities responsible for 11 coast guard functions. Here, we promote dialogue and cooperation across functions; we seek synergies and collaboration across borders.

assessment bodies and 25 administering authorities.

Since 2024, important milestones have already materialised, and the results so far are encouraging. For example, the first year of implementation of the EU ETS for maritime transport saw extremely high compliance from the sector, with 99% of the required allowances surrendered and an economic value of around 2.5 billion euros.

The green transition of shipping will also impact the Agency's pollution-response toolbox — the portfolio of contracted oil-spill-response vessels we maintain around the EU coastline, as well as our equipment-assistance-service stockpiles, all aimed at complementing existing national resources. We have started the process of future-proofing this toolbox and are studying response options for alternative fuels. Our first such study, on biodiesel-bunker fuel blends as marine pollutants, has already been published, and others are in the planning stage.

Underpinning all these activities is our flagship report, which supports decision-makers by providing a unique insight into the green transition of shipping. Our European Maritime Transport Environmental Report, produced in collaboration with the European Environment Agency, provides a factual analysis of the environmental pressures exerted by maritime transport across a wide range of indicators, including greenhouse gas emissions, air emissions, underwater noise, biodiversity, pollution, and marine litter.

How are emerging technologies like AI and big data transforming maritime safety management? What digital initiatives is the EMSA currently undertaking to improve maritime monitoring across EU seas?

Machine learning and artificial intelligence are important tools for intensive data work. The EMSA hosts many tools and gathers a large amount of data. Every day, millions of maritime data points from radar for oil-pollution detection to terrestrial and satellite vessel-position data for traffic monitoring, satellite optical imagery, drones, and met-ocean data are collected and processed to produce and deliver tailor-made services to users with different operational requirements and to feed our integrated maritime situational picture. We are therefore looking into new capabilities that use machine learning and algorithms to categorise and correlate incoming information, helping operators identify the events most relevant to their daily work. In parallel, we plan to phase in the use of AI to process very large volumes of data and transform them into meaningful information.

We are also looking into technological developments to upgrade our satellite-based and Earth Observation services, assessing emerging satellite sensors, new space-based communication solutions, and additional RPAS configurations to be integrated into future operational services. We will therefore continue to improve our maritime monitoring, as an essential tool at the disposal of the EU and the competent authorities in the face of evolving challenges and increasing unpredictability.

How does the EMSA collaborate with national coast guard authorities to improve maritime safety?

Maritime safety is the core business of our Agency, and it is also embedded in our name. We collaborate daily with the national coast guard authorities in many ways, including activities related to their responsibilities as Flag States, Port States, and Coastal States. We support the implementation and enforcement of relevant EU legislation through tools, guidance, and capacity-building. We offer a platform to exchange lessons learned and best practices. We provide operational services that deliver the maritime situational picture, a pollution-response toolbox, Earth Observation services, RPAS services, and underwater drones. We focus on the human element and promote a human-centred safety culture for Europe. We work on the safety dimension of alternative fuels and on MASS. Our European Maritime Safety Report (EMSAFE) is a reference document for national authorities, providing a factual analysis of the maritime safety landscape in the European Union.

Together with Frontex and EFCA, we are actively involved in the European cooperation on coast guard functions, the framework that supports more than 175 national authorities responsible for 11 coast guard functions. Here, we promote dialogue and cooperation

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across functions; we seek synergies and collaboration across borders. One such collaboration activity is the Multi-purpose Maritime Operations (MMOs) concept. These are joint maritime missions involving multiple Member States that aim to enhance maritime situational awareness, enforce regulations, protect the marine environment, build capacity, and improve cross-border cooperation among participating Member States. In 2026, four planned MMOs involve 13 countries across Europe.

What message would you give to the younger generation about the importance of maritime safety, and how can young professionals become more involved in shaping the future of safer and more sustainable shipping through organisations like the EMSA?

Maritime safety is not an abstract concept. It is about people's lives, the health of our oceans, and the backbone of global trade. Protecting the sea means protecting our future.

Shipping offers a sea of opportunities for the younger generation. Although it is often an industry that remains "invisible" to non-specialist audiences, it has a real impact on our daily lives. In moments of crisis, everybody recognises how essential it is — as we saw during the COVID-19 pandemic and, more recently, in the crisis affecting the Strait of Hormuz.

Embracing a career in the maritime sector means the opportunity to make a difference. Whether you are a technical professional, a lawyer, or an analyst, you can apply your knowledge in a sector that is dynamic and forward-looking.

Our Agency is a micro-world where different profiles can fit well. The success of our traineeship programme among young graduates confirms that many young, motivated professionals see the maritime sector as a promising career pathway.

This diversity of talent and perspectives is essential to keeping the maritime sector innovative, resilient, and well-equipped to meet the challenges it faces. It is this human capital that will continue to drive its evolution in the years to come.

What priorities will guide the EMSA's strategy in the coming years?

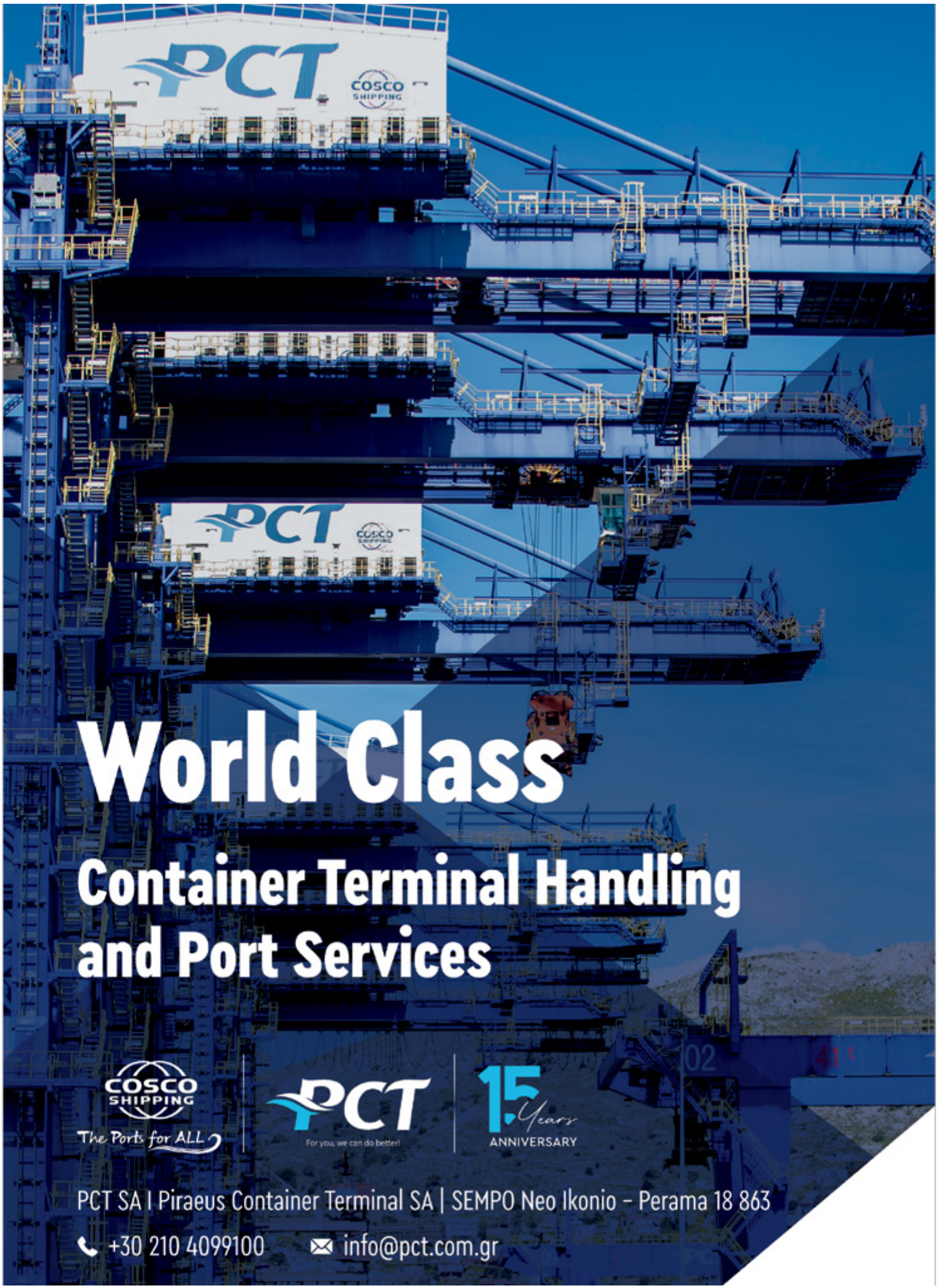
The priorities shaping the future direction of the EMSA are closely aligned with the EU's broader policy framework — particularly the EU Maritime Security Strategy, the EU Industrial Maritime Strategy, and the EU Ports Strategy.

Our mandate has recently been revised to reflect the evolving context of shipping and the Agency's role as a technical body alongside the European Commission and the EU Member States, as well as a multi-domain maritime capability hub. In this capacity, we integrate maritime safety, environmental sustainability, decarbonisation, maritime security and cybersecurity, maritime surveillance, and maritime crises, as well as digitalisation and simplification, into a single, coherent system.

The challenges arising from the current geopolitical context will make the maritime situational awareness provided by the EMSA increasingly crucial for supporting decision-makers in what is likely to remain an unpredictable environment.

In a more complex risk landscape and an evolving regulatory framework, the Agency will step up its efforts to support safer, smarter, and greener shipping, acting as a facilitator, knowledge hub, and service provider.

Looking ahead, the EMSA will continue to adapt, innovate, and strengthen its role to ensure that Europe's maritime domain remains secure, sustainable, resilient, and competitive in addressing future challenges.


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Change is a constant in freight and commodity markets

In his interview with *Naftika Chronika*, the CEO of Ardmore Shipping discusses how the company is navigating a period defined by structural change, geopolitical volatility, and accelerating technological transformation across the maritime sector. Gernot Ruppelt highlights the growing role of digitalisation and artificial intelligence in driving operational efficiency, alongside the importance of seafarer wellbeing, safety standards, and responsible industry practices in an increasingly complex global shipping environment.

Gernot Ruppelt,
Chief Executive Officer
of Ardmore Shipping,

in discussion with Spilios Varelas

Ardmore has refrained from placing newbuilding orders, maintaining a fleet with an average age of 9.8 years. However, shipyard slots are rapidly depleting, and second-hand MR2 values are now approaching newbuild parity. Have you determined a specific entry point for ordering next-generation vessels, or does the fleet's current age profile provide the flexibility to wait until the alternative fuels landscape becomes clearer?

Decisiveness and patience are not mutually exclusive. Our track record speaks to our ability to identify opportunities that offer a strong strategic fit and clear value, and to act on them when the timing is right. We recently did exactly that by acquiring three modern, fuel-efficient vessels in the second-hand market at what we consider very attractive prices. At the same time, we have sold our last non-eco vessels at strong prices in recent years. The fleet we operate today is modern, highly fuel-efficient, and well positioned, providing us with genuine optionality in both timing and sources of deal flow.

In terms of alternative fuels, legislation remains fragmented at best, and the availability of truly green fuels at scale with a credible economic rationale remains limited. Committing significant capital to dual-fuel capability is therefore a tough case to make, and it also carries real opportunity cost. Deploying those same funds into enhancing the efficiency of vessels already in operation can deliver measurable returns (in some cases 30-40% or more), while simultaneously cutting emissions and strengthening financial performance. That is a more compelling trade-off.

Profound volatility has been observed in the clean products market due to geopolitical disruptions. To what extent do you consider the current profitability to be purely event-driven? In the event of a full restoration of Suez Canal transit routes, what strategy will Ardmore implement to sustain its momentum?

It would be too simplistic to attribute the strength of this market purely to geopolitical disruption. There are multiple layers at work, and it is important to understand them individually.



At the foundation lies structural demand growth: demand for refined oil products continues to rise, grade complexity is increasing, and refinery dislocation — with large, export-oriented refineries in the East serving Western consumer markets — is a long-term, durable feature of our trade. These are not event-driven phenomena; they represent a fundamental reshaping of how energy products move around the world.

The second layer is arbitrage and trade flexibility. While geopolitical disruption is one catalyst, factors such as weather, seasonal demand shifts, and supply imbalances all create opportunities for well-positioned operators with a truly global commercial platform. At Ardmore, we actively trade through our in-house platform across multiple geographies, combining successive cargoes in the most profitable way.

Change is a constant in freight and commodity markets. Even if specific geopolitical tensions were to ease tomorrow, the underlying structural dynamics (i.e., refinery dislocation, trade complexity, and an ageing global fleet) remain firmly in place. The normalisation of any single trade route would reshape some flows, but it would not reverse the fundamental supply-demand picture we see today. Our diversified spot trading model, complemented by selective high-quality time charters with top-tier counterparties, is designed precisely to perform across a wide range of scenarios.

You recently completed an extensive drydocking programme covering nearly half of your fleet. This appears to be a clear move to maximise revenue days at a time when MR2 spot rates are approaching the $30,000 mark. Is this "all-in" strategy on the spot market your response to the prevailing geopolitical uncertainty?

Maintaining the highest quality fleet and maximising operational readiness are always priorities, regardless of market conditions. The timing has, of course, been fortuitous. Currently, 82% of our fleet operates in the spot market, reflecting our conviction in the underlying fundamentals and our ability to capture upside through active trading. At the same time, we have been deliberate about layering in a portfolio of high-quality time charters at attractive fixed rates, for multi-year periods with first-class counterparties.

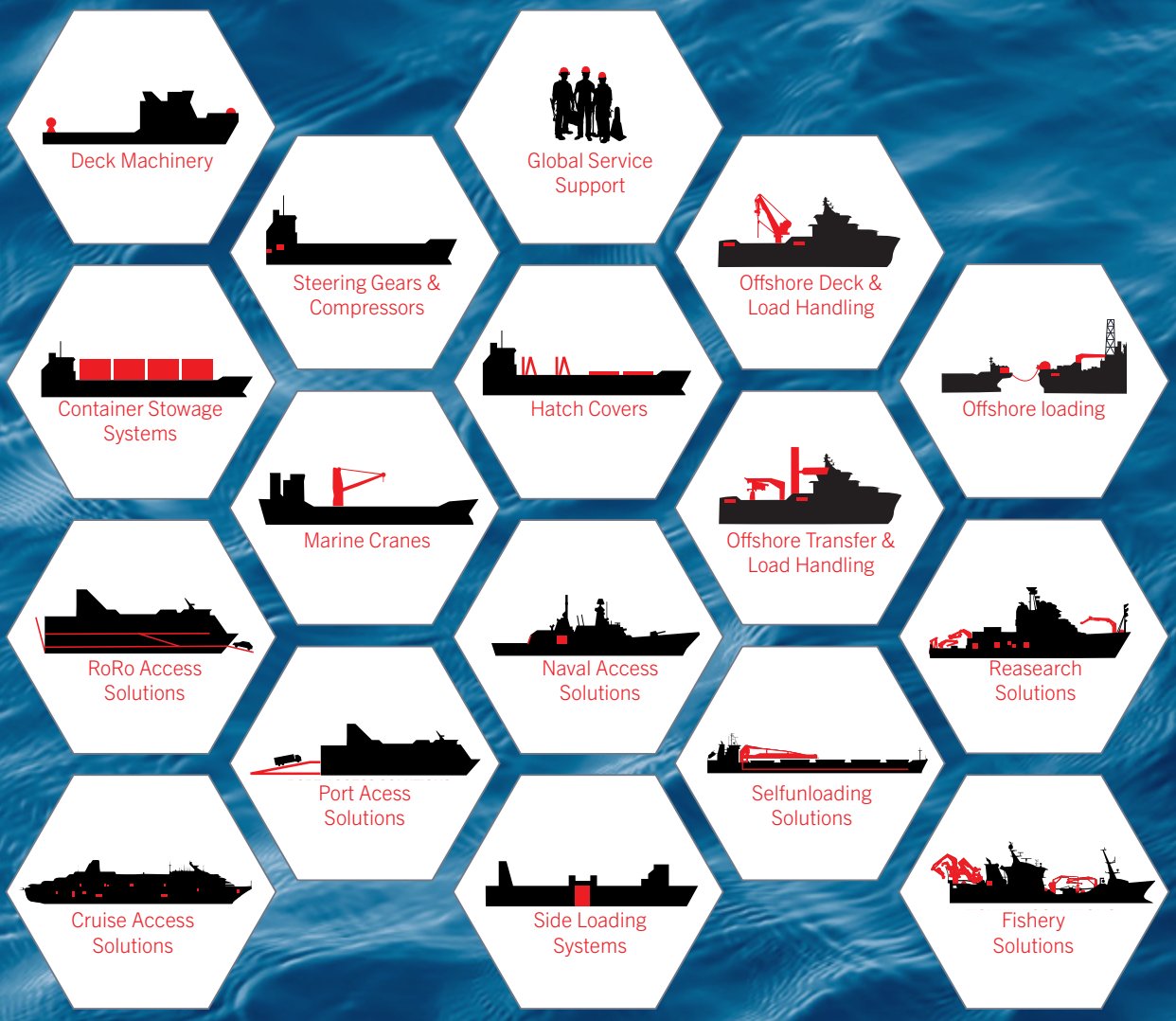
Our robust balance sheet, low breakeven levels, and commercial platform, which has the agility to move quickly when opportunities arise, provide us both resilience and optionality in all market environments.

Artificial Intelligence is now firmly embedded in daily operations. How do you envision this technology enhancing operational efficiency across the sector, and conversely, what are the primary challenges emerging from its integration?

Our approach to AI, as with all innovation, is purposeful and pervasive: it spans everything from onboard fuel management and voyage optimisation to shoreside business processes and commercial decision-making. These are not pilots or experiments confined to a lab; they are live, deployed tools generating real financial returns. In some cases, we have documented returns exceeding 100% on individual technology projects.

When considering how companies position themselves within the AI landscape, there are broadly three options: you can be a developer of technology, an investor in it, or an adopter. At Ardmore, we are the latter: a decisive, cost-effective, and agile adopter. We move quickly, integrate intelligently, and measure outcomes rigorously. The strongest results consistently

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Our seafarers are at the core of everything we do. So, the question of how we create a respectful, safe, healthy, and genuinely attractive working environment on board is not a peripheral HR consideration; it is an essential business priority.

come from the combination of hardware, software, and the human element.
Of course, the challenges are real and should not be underestimated. Data quality and organisational change management are probably the two most significant ones. AI is only as good as the information it receives, and the shipping industry has historically not been the most consistent in data capture and standardisation. The other challenge is cultural: technology adoption requires trust in new tools and the willingness to adapt workflows, which in turn demands deliberate effort and leadership across all levels of a business.

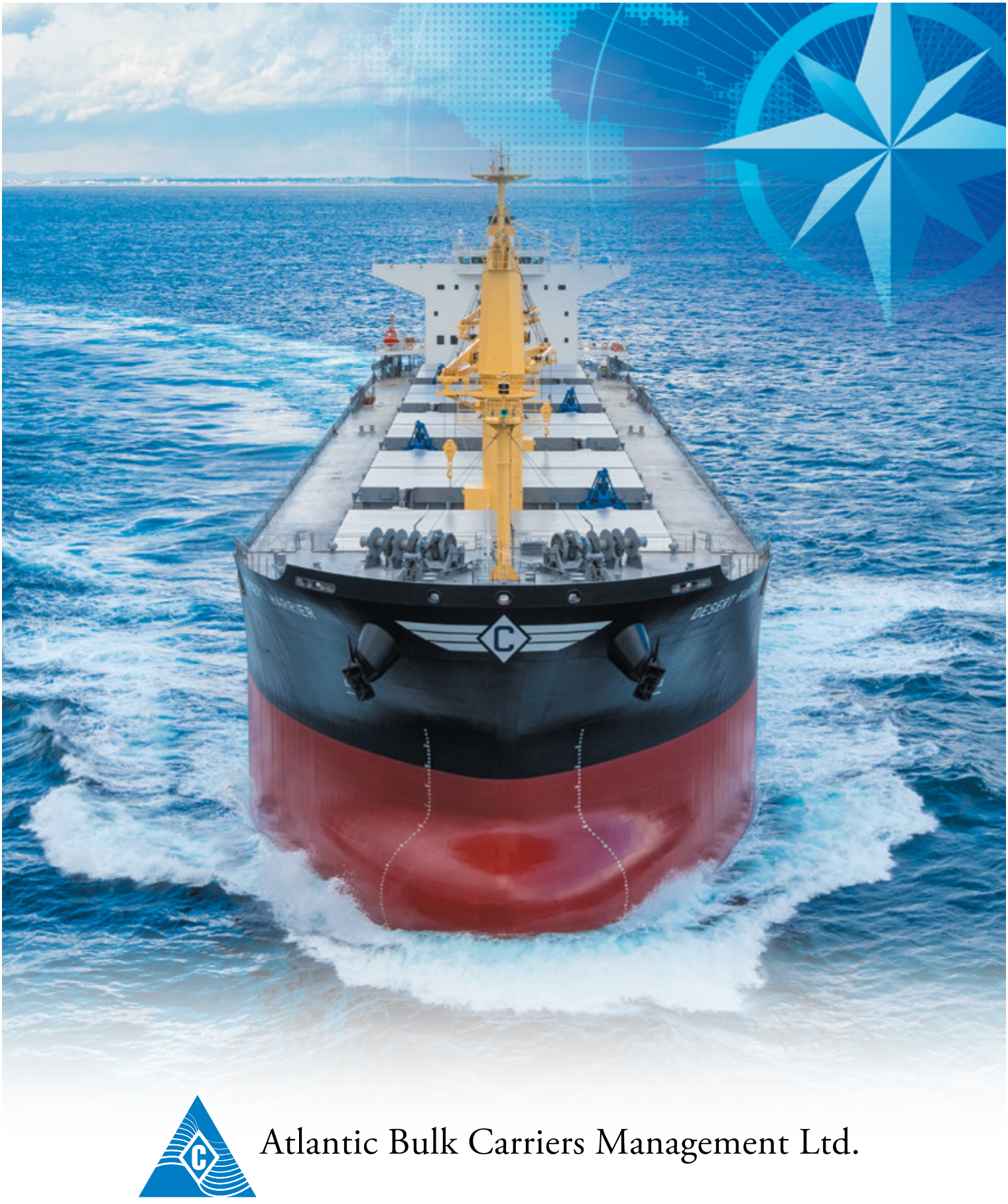
Ardmore is among the pioneers in introducing onboard hydroponics. Beyond its ecological footprint, to what extent do such wellbeing initiatives influence a seafarer's decision to join Ardmore rather than a competitor?

Our seafarers are at the core of everything we do. So, the question of how we create a respectful, safe, healthy, and genuinely attractive working environment on board is not a peripheral HR consideration; it is an essential business priority.
Fresh food grown on board is, in some ways, a simple idea. But simple ideas can have a profound effect on daily quality of life when you are at sea for months at a time, thousands of miles away from home. Hydroponics is only one example of how we aim to be forward-thinking about the seafarer experience. It reflects a broader organisational philosophy: that the wellbeing and motivation of our crew is inseparable from the performance of the business.
It is also important to keep in mind that reputation as an employer of choice compounds over time. We are not competing on wages alone; we are competing on the quality of the environment provided onboard our vessels, the respect we show to our colleagues, and the sense that Ardmore is a company genuinely invested in the people who work for it. That is a clear differentiator, and one we are proud of.

How does the rise of the so-called "shadow fleet" impact the industry's reputation and overall safety, encompassing seafarers, cargo, and the marine environment?

The so-called shadow fleet — now estimated at around 30% of the global tanker fleet — operates in a space that is opaque, poorly regulated, and, in our view, genuinely dangerous. We have witnessed recent and stark examples of what happens when these vessels fail: risk to human life, environmental damage, and cargo losses that could have been prevented.
The notion that, if geopolitical conditions shift, these ships could simply transition back into mainstream, quality trades is an illusion. Many of them are old, poorly maintained, owned by entities unlikely to meet established vetting standards, and operated outside the expectations of our customers and the wider public. The economics of shadow trading have sustained their activity; remove that, and much of it has nowhere to go.
For operators like Ardmore, who have built our reputation on best-in-class corporate governance, rigorous safety standards, and a strong execution track record, this is both a reputational and a competitive matter. We are, and intend to remain, unambiguously on the right side of that line, which is beneficial for our seafarers, the environment, and the long-term credibility of our industry.


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On

The freight market is being reshaped amid uncertainty

Global shipping markets entered the second quarter of 2026 facing the consequences of the escalating conflict in the Middle East, which is reshaping conditions across all sectors. Throughout 2026, outcomes will be shaped by the duration of the conflict, the pace of oil supply recovery, and how markets adapt to fundamentally altered trade routes. How these dynamics unfold will have direct consequences for utilisation, earnings, and asset values across the fleet.

Tankers

According to Veson Nautical's base-case scenario, oil flows from the Middle East are expected to begin recovering as summer approaches. Some increase in shipments from the Atlantic Basin toward Asia is projected, providing support to tanker markets, though these flows will not replace lost Middle East volumes. In the longer term, demand growth centred east of Suez and continued production growth west of Suez and the MEG will require greater tanker capacity. Conversely, a prolonged conflict represents a material downside risk, as a sustained 20–25% reduction in global seaborne oil trade would weigh on fleet utilisation.

Bulkers

The dry bulk sector recorded a strong first quarter, defying its typical seasonal softness. Roughly 3% of bulker trade transits the Strait of Hormuz, with 1.4% of the global fleet currently trapped inside. That said, structural demand shifts offer more durable support. A notable example is the Simandou iron ore project in Guinea, which is introducing longer trade routes for iron ore to China, boosting tonne-mile demand. At the same time, supply growth is forecast at 3.3% per year. Handysize,



the seafront

This month's top news from naftikachronika.gr

Edited by: Giannis Theodoropoulos

Supramax, and Panamax deliveries are skewed to the near term, while most Capesize deliveries are due in 2027 and 2028. With demand projected to grow at approximately 2.7% per year over 2026–2029, the faster pace of supply growth is likely to place progressive downward pressure on freight rates toward the back end of the outlook period. In the short term, however, the market outlook remains positive, supported by the Middle East crisis, Red Sea diversions, and longer-haul routing.

Containers

Container earnings were broadly stable in the first quarter of 2026, averaging a 0.5% increase across all vessel sizes compared with the final quarter of 2025. With no near-term return to Red Sea transits expected, vessels continue to divert via the Cape of Good Hope, sustaining elevated TEU-mile demand. TEU-mile demand growth is projected at 1.4% in 2026, before recovering to an average of approximately 4% annually between 2027 and 2029. However, vessel supply growth is expected to outpace demand throughout the forecast period, with average freight rates forecast to decline by c.25.2% across all vessel sizes. In 2026, tight vessel availability and continued Red Sea diversion are expected to keep rates broadly stable before downward pressure intensifies as supply growth increases.

Global order book hits 17-year high amid record crude tanker contracting

By the end of the first quarter of 2026, the global shipping order book hit a 17-year high, reaching 191 million Compensated Gross Tonnes (CGT). This is equivalent to 17% of the global fleet, the highest ratio since 2011. The order book has been boosted by higher newbuilding contracting throughout the 2020s and most recently by the highest quarterly crude tanker contracting in history, according to BIMCO.

During the first quarter of 2026, newbuilding contracting rose by 40% y/y to 17.6 million Compensated Gross Tonnes (CGT), driven by a tripling of new tanker orders and a rebound in LNG tanker contracting. Overall, tankers have accounted for 32% of total contracting, the highest share since the second quarter of 2017. Despite this significant yearly increase, newbuilding contracting has decreased by 17% q/q, amid an easing in dry bulk orders. Bulker contracting spiked during the last quarter of 2025, largely due to increased orders for Capesize vessels.

"So far during the 2020s, newbuilding contracting has been 47% higher than the average during the 2010s, driven by stronger market conditions in the larger sectors, an overall larger fleet and an increased need for fleet renewal. This has contributed to an increase in newbuilding prices and longer lead times at shipyards, with 57% of contracting so far this year expected to be delivered after 2028", says Filipe Gouveia, BIMCO's Shipping Analysis Manager.

Some shipping sectors now have relatively large order books. The orderbook-to-fleet ratio has risen to 22% for crude tankers, 19% for product tankers, 37% for containers, and 40% for LNGs. For crude and product tankers, these newbuildings are expected to support fleet renewal, as 21% and 17% of the respective fleets are now over 20 years old — the age at which recycling is typically considered. By contrast, only 4% of the container fleet and 8% of the LNG fleet are over 25 years old, although these segments are expected to see higher demand growth.

Chinese shipyards remained the dominant choice for shipowners, accounting for 70% of contracting in the first quarter of 2026. Korean yards captured a fur-

ther 20%, supported by stronger LNG tanker ordering. In contrast, contracting at Japanese yards fell 83% y/y to just 1% of new orders, the lowest share since at least 1996, reflecting limited capacity, long lead times, and reduced competitiveness.

"In the medium term, the already swelling order books across several large shipping sectors could contribute to a slowdown in newbuilding contracting. Long lead times at shipyards and high newbuilding prices, combined with high market uncertainty concerning the Red Sea and the Strait of Hormuz sailings and alternative fuel availability, could also negatively affect contracting", stated Gouveia.

EU expands maritime sanctions in 20th package against Russia

On 23 April, the European Council adopted a far-reaching 20th package of restrictive measures comprising 120 further individual listings — the biggest package of listings in two years — alongside stern, multi-layered economic sanctions, targeting key sectors that fuel Russia's war of aggression against Ukraine.

The package includes the basis for a future maritime services ban on Russian crude oil and petroleum products. It will be implemented in full coordination and consultation with the G7 and the Price Cap Coalition, which includes G7 members and other participating countries.

The 20th package introduces a comprehensive set of 36 designations encompassing both the upstream and downstream segments of the Russian energy sector, including the exploration, extraction, refining, and transportation of oil. This package strategically targets emerging players which have recently increased their export market share. Revenues from Russian oil exports are further curbed through listings focusing on the shadow fleet ecosystem, including entities operating in third countries, as well as a significant maritime insurer. An additional 46 vessels are now subject to a port access ban and a ban on the provision of a broad range of services related to maritime transport, bringing the total number of designated vessels to 632. These measures target non-EU tankers that are part of the shadow fleet, which circumvent the oil price cap mechanism, support Russia's energy sector, and transport military equipment for Russia or stolen Ukrainian grain.

The 20th package also introduces mandatory due diligence checks for the sale of tankers, thereby making it more difficult for Russia to expand its shadow fleet, and bans the provision of maintenance and other services for Russian liquefied natural gas (LNG) tankers and ice breakers. Furthermore, as of January 2027, it will be illegal to provide LNG terminal services to Russian entities or entities owned or controlled by Russian nationals or operators. Lastly, the package bans transactions with two Russian ports, Murmansk and Tuapse, as well as with the oil terminal at the port of Karimun in Indonesia, which are used to circumvent the oil price cap.

During the first quarter of 2026, newbuilding contracting rose by 40% y/y to 17.6 million CGT, driven by a tripling of new tanker orders and a rebound in LNG tanker contracting.

India's accelerating industrialisation drives demand for bulk carriers

India continues to demonstrate strong economic resilience despite a softer global outlook and rising macroeconomic uncertainties. According to OECD estimates, GDP growth is expected to moderate from 7.6% in fiscal year 2025–26 to 6.1% in fiscal year 2026–27, mainly due to inflationary pressures, energy disruptions, and currency depreciation. Nevertheless, India is set to remain the fastest-growing G20 economy, supported by robust domestic demand, rapid urbanisation, and sustained public infrastructure investment.

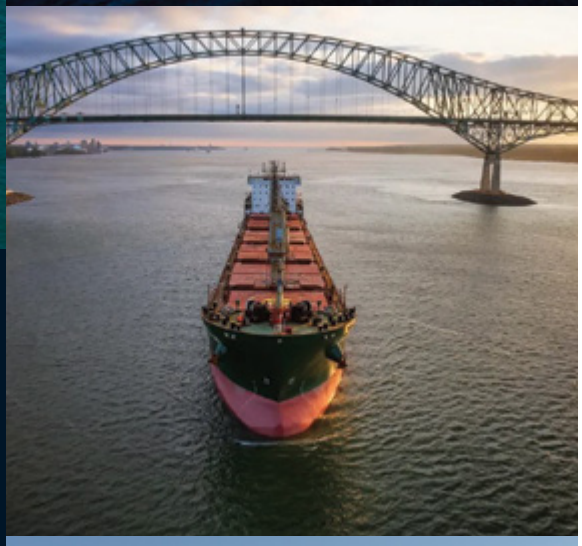
A recent analysis by Intermodal highlights that government policy remains a key growth driver, with the Union Budget 2026–27 allocating approximately $147bn to infrastructure development across railways, highways, urban projects, and technology networks. This has reinforced industrial momentum, with manufacturing and infrastructure output continuing to expand.

Steel demand is a central pillar of this growth story. Industrial production has shown steady improvement, while steel output has reached record levels, sup-

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ported by strong consumption from infrastructure projects such as the expansion of the railway network. State-owned producers, including the Steel Authority of India Limited (SAIL), have reported historically high production and sales, which reflect strong underlying demand conditions.

However, the analysis emphasises India's structural dependence on imported raw materials. Around 90% of coking coal requirements are met through imports, while steel production remains heavily reliant on the blast furnace route, keeping both coking coal and iron ore essential to industrial growth. As a result, seaborne trade flows are expected to increase significantly.

Coking coal imports are projected to rise by around 10% in 2026, reaching approximately 87 million tonnes, with Australia and Russia as key suppliers and potential growth in US exports. Iron ore imports are also expected to increase, driven by rising steel production and quality constraints in domestic supply, with Brazil playing a leading role.

Overall, Intermodal's analysis concludes that India's accelerating industrialisation and infrastructure expansion will continue to drive strong demand for seaborne bulk commodities. This trend is expected to support increased tonne-mile demand for Capesize, Kamsarmax, and Ultramax vessels, reinforcing India's growing importance in global dry bulk trade flows.

IMO approves new guidelines on ship registration

The International Maritime Organization's Legal Committee has approved a new set of guidelines to improve transparency and due diligence in ship registration, as well as to prevent fraudulent registrations and the misuse of flags.

The guidelines help close a key regulatory gap for the maritime industry, given that there is currently no binding international framework to regulate ship registration.

The newly approved Guidelines will assist both new and existing flag State ship registries by providing practical measures to strengthen verification and due diligence, ensure accurate ownership records, and improve oversight of registration procedures.

Closing the 113th session of the Legal Committee held in London from 13 to 17 April, the IMO Secretary-General, Mr Arsenio Dominguez, stated, "This is a welcome step towards ensuring due diligence in ship registration systems for the benefit of safety, protection of the marine environment, and the wellbeing of seafarers, essential for the safety and security of international shipping. The Guidelines will also aid in eliminating cases of fraudulent registration".

The Legal Committee noted that the number of ships flying a false flag has increased since the previous session in 2025, with 529 ships falsely flying the flag of a country in the past year. Nearly 40 Member States had seen cases of their flags being fraudulently used by criminal groups without their knowledge or consent.

The Guidelines focus on:

- Legislation governance and control on who can perform the registration of ships
- Procedures for quality assurance in ship registration

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Panama Canal meets rising demand

The Panama Canal recorded an increase in transits and tonnage during the first half of fiscal year 2026, along with greater demand for its reservation system, reflecting the evolving dynamics of international maritime trade.

These developments were shared during a market update hosted by Anna Milne, Managing Director of Emerging Markets Corporate Research at Bank of America Merrill Lynch. The virtual briefing featured Panama Canal Administrator Dr Ricaurte Vásquez Morales, Deputy Administrator and Chief Sustainability Officer Ilya Espino de Marotta, and Vice President of Finance Víctor Vial. Together, they presented the results for the first half of fiscal year 2026 and provided updates on port development initiatives, a gas pipeline, a logistics corridor, and the Río Indio project.

"Amid all the geopolitical complexities in the world today, the shifts and various factors affecting international trade, the Panama Canal remains open and reliable. With water levels currently at optimal levels, we are accommodating an ever-growing volume of traffic", noted Administrator Ricaurte Vásquez Morales.

During the first half of fiscal year 2026 (October 2025 through March 2026), the Panama Canal recorded 6,288 transits, an increase of 224 transits y/y. Over the same period, 254 million PC/UMS (Panama Canal Universal Measurement System) tonnes moved through the waterway, which translates to approximately 5% more than the 243 million tonnes recorded in the same period of the prior fiscal year.

Regarding the uptick in reservations and the results of certain slot auctions, which are part of the services offered by the Panama Canal, Vice President of Finance Víctor Vial clarified that while some vessels have paid over $1 million at auction, these figures reflect only temporary conditions driven by heightened demand.

The Panama Canal offers the maritime industry several advance reservation mechanisms for scheduling transits, including the Long-Term Slot Allocation (LoTSA) programme and a dedicated booking system for Liquefied Natural Gas (LNG) vessels. All vessels are required to hold a reservation before transiting.

For vessels that do not book in advance, the canal offers options such as last-minute reservations and an auction mechanism, with three to five slots made available through auction each day.

According to Vial, the average auction price before the Middle East conflict ranged between $135,000 and $140,000. Following the outbreak of the conflict, that average climbed to approximately $385,000 between March and April.

Vial also noted that since the majority of vessels book their transits in advance, there is no queue, which provides greater certainty for users. Auctions are conducted using specific time slots already built into the Panama Canal's schedule, with no impact on vessels holding confirmed reservations or on the established transit order.

Japanese shipyards "sold out" through 2029

Japanese shipyards are operating at full capacity, as according to data from the Japan Ship Exporters' Association (JSEA), there are no available shipbuilding slots until 2029.

This practically means that shipyards in Japan have secured orders for the next three and a half years. Based on JSEA data, in terms of GT, 73% of the orders secured by Japanese shipyards relate to bulk carriers, 17% to containerships, and 10% to gas carriers and other tankers. Furthermore, their share of global shipbuilding orders last year (in GT terms) stood at 9%, compared to 19.6% for South Korea and 66% for China.

In recent years, the competitiveness of Japanese shipyards has indeed been significantly affected, prompting the domestic industry to implement revitalisation measures. In this context, mergers and consolidations have taken

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CO2TIME 2026 is the first time charter party designed specifically for the carriage of liquefied CO_2. While firmly focused on the emerging CO_2 trade, the form has been drafted with sufficient flexibility to allow its use for other liquefied gases, such as LPG.

place in the recent period. In addition, in order to remain competitive and avoid being sidelined by rivals, Japan's shipbuilding industry is seeking to focus on the quality of newbuildings rather than quantity. Through a strong emphasis on high-quality design, maximum energy efficiency, automation, and reduced carbon emissions, Japanese shipyards aim to maintain their leadership in specialised market segments, where quality carries greater value than price.

NYK Group welcomes its first female LNG carrier captain

A Taiwan-based NYK Group ship-management company, NiMiC Ship Management Co., Ltd. (NiMiC), has appointed Louise Lin (Lin Yi-chun) as captain of the "Taitar No.4", a NiMiC-managed LNG carrier, with Lin having already assumed her duties. This milestone marks the first time a woman has been named captain of an LNG carrier within the NYK Group.

Lin began her maritime career at NiMiC as a deck cadet in 2011, and advanced to full-time service as a third officer on an LNG carrier managed by NiMiC in 2015. Since then, she has continually honed her expertise and excelled in various roles, encompassing safe navigation and cargo operations, and management.

Looking ahead, the NYK Group will continue to engage in crew development across various regions. By establishing and expanding training programmes, the Group aims to advance the development of local shipping industries and foster environments where diverse talents can thrive.

"Attaining the rank of captain has long been an aspiration of mine, and now it has become a reality. This achievement is not something I accomplished alone; I am deeply grateful for the unwavering support and encouragement I have received from my family, the company, and seafarers I have sailed with throughout this challenging journey. This moment represents an important milestone for local LNG seafarers and marks encouraging progress for women in the maritime industry. It's a promising beginning, and I am fully dedicated to continuing the effort to achieve a safer, more supportive, and truly inclusive working environment for everyone who works at sea or works for the sea", commented Lin.

BIMCO publishes time charter party targeting the emerging CO_2 trade

BIMCO's Documentary Committee has adopted a new time charter party, which has been developed specifically for the maritime transport of liquefied carbon dioxide (LCO_2). The form, CO2TIME 2026, responds to the rapid development of carbon capture, utilisation and storage (CCUS) projects, and the need for a standardised contractual framework for maritime transport.

CO2TIME 2026 is the first time a charter party has been designed specifically for the carriage of liquefied CO_2. While firmly focused on the emerging CO_2 trade, the form has been drafted with sufficient flexibility to allow its use for other liquefied gases too, such as LPG.

"CO_2 transport is a developing trade with a unique risk profile, but at the same time, it is closely connected to already established gas shipping practices. CO2TIME 2026 has been designed to bridge this gap by providing a familiar time charter structure while addressing the specific technical, operational, and regulatory challenges associated with CO_2 carriage", says Deputy Secretary General & Director of Contractual Affairs at BIMCO, Stinne Taiger Ivø.

A key objective of the drafting committee was to build on familiar concepts from the gas tanker sector.

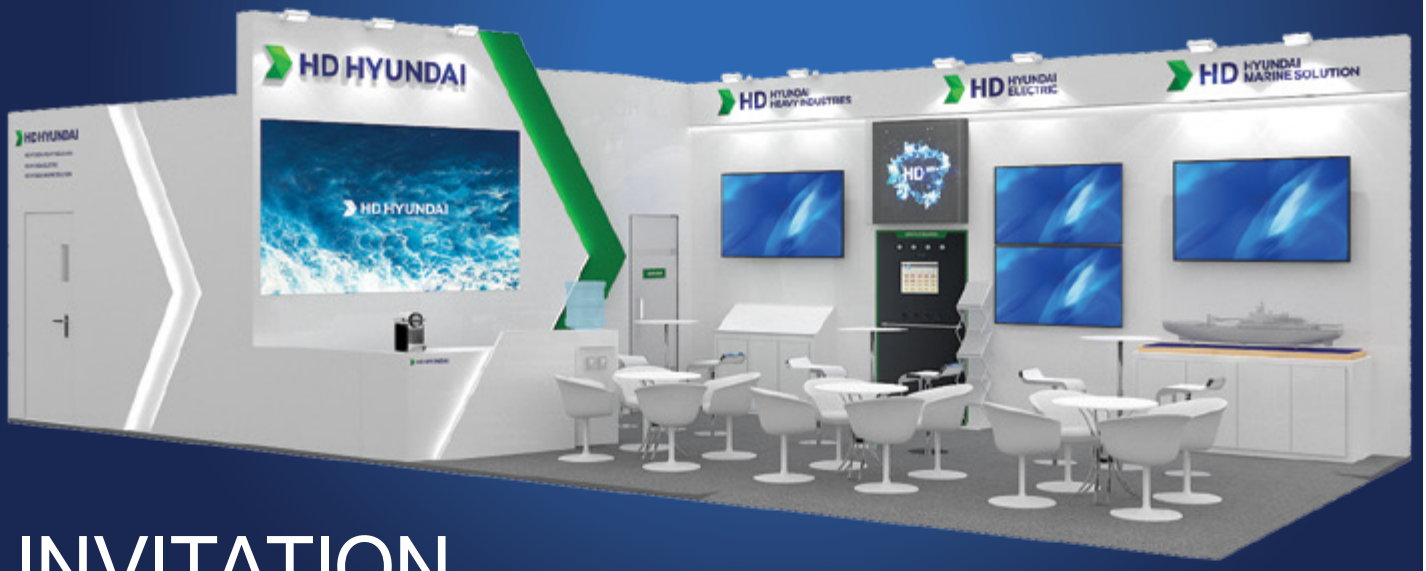
"By retaining well-established time charter principles and adapting them to the specific characteristics of CO_2 transport, CO2TIME 2026 aims to reduce contractual uncertainty and support owners, charterers, financiers and project developers entering this market", says Nicholas Fell, Chair of BIMCO's Documentary Committee.

The charter party includes a range of provisions reflecting the operational realities of CO_2 transport. Liabilities and costs are also allocated by reference to the party controlling the relevant operational decision, providing a practical framework for day-to-day operations.

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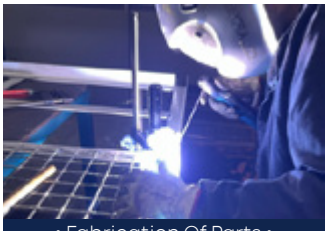
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International

News from the seas of the world

Shipping entrepreneurship developments

MSC transfers ownership to next generation of Aponte family

Mediterranean Shipping Company (MSC) announced that a transfer of ownership took place during the last quarter of 2025 from its founder, Captain Gianluigi Aponte, to his son and daughter, Diego and Alexa Aponte, both of whom are Italian nationals brought up in Switzerland and are currently residents of the country.

This transition marks a significant milestone in the Geneva-based company's history, as Diego Aponte, Group President, and Alexa Aponte, Group Chief Financial Officer, have demonstrated leadership and vision, achieving remarkable results within their respective roles and across the business. The move ensures the continued stability and growth of the MSC Group of companies under the stewardship of the next generation.

Captain Gianluigi Aponte, founder of MSC Mediterranean Shipping Company S.A. and Chairman of the Group, commented: "I am incredibly proud of this historic moment. Passing ownership to my children is not only a reflection of their dedication and achievements, but also a continuation of our family's centuries-long maritime heritage. With Diego and Alexa at the helm, I am confident that our Group will continue to thrive and honour our family's legacy of innovation, resilience, and unwavering commitment to the sea".



waters

Edited by: Spilios Varelas



Wallenius Lines becomes sole owner of Wallenius SOL

Wallenius Lines has entered into an agreement to acquire SOL Group's shares in Wallenius SOL, thereby becoming the sole owner of the company. The new ownership structure creates long-term stability, clarity, and continuity for the continued development of Wallenius SOL as an enabler of sustainable, sea-based infrastructure in Northern Europe.

Wallenius SOL plays a central role in building and maintaining logistical and industrial infrastructure in the Gulf of Bothnia, the Baltic Sea, and the North Sea. Through efficient and reliable maritime transport solutions, the company creates the conditions for long-term partnerships among customers, suppliers, and industries in northern Sweden and Finland, mainland Europe, and the British Isles. The operations have evolved with a clear industrial focus and a pioneering approach in demanding and strategically important environments.

"Becoming the sole owner gives us the opportunity to take a holistic approach to the continued development of Wallenius SOL. The company is an important enabler for industry, infrastructure, and societal preparedness, and the new ownership structure provides stability, clarity and long-term perspective for the organisation, customers and partners alike", said Erik Nøklebye, CEO of Wallenius Lines.

"We are proud of the development Wallenius SOL has achieved during our joint ownership. Together with Wallenius Lines, we have helped build a strong industrial player in the Gulf of Bothnia, and we leave with full confidence in the company's continued journey and long-term development", stated Tommy Kalin, CEO of SOL Group.

"For Wallenius SOL, this means a clear ownership structure and long-term conditions to continue developing the business in line with our plan. We will maintain our focus on customers, partnerships along the value chain, and our role as an industrial pioneer within sustainable maritime infrastructure in Northern Europe", reported Elvir Dzanic, CEO of Wallenius SOL.

The transaction does not entail any changes to Wallenius SOL's operational activities, strategic direction, or offering. The company will continue to be run by the same management and organisation and will proceed according to its long-term plan, Blueprint 2030.

CMA CGM acquires Fattal Group

CMA CGM Group and the shareholders of Fattal Group have entered into an agreement for the acquisition of 100% of Fattal Group by CMA CGM and its affiliates. Completion of the transaction is subject to regulatory approvals and is expected in the third quarter of 2026.

"This acquisition represents a key milestone in our ambition to become a global leader in end-to-end logistics and supply chain solutions. By integrating Fattal's strong distribution platform, we are expanding our capabilities downstream, closer to end markets and consumers. Together, we will leverage our combined strengths to drive growth, deepen our presence in fast-growing MENA markets, and deliver greater value to our customers and partners. This transaction also reflects our continued confidence in Lebanon and our commitment to supporting its long-term development", said Rodolphe Saadé, Chairman and CEO of CMA CGM Group.

"After 130 years of continued stewardship, the Fattal shareholders have made the decision to entrust the future of the Fattal Group to CMA CGM Group as they are confident that it will continue to build on the success of the Group and stay true to its mission to add value and ensure the long-term strength and success of the Group, its people, its suppliers and the communities it serves", stated Caroline Fattal, Chairwoman of the Fattal Group.

AD Ports Group to explore investment and development opportunities in the Port of Constanța

AD Ports Group signed a framework agreement with the National Company Maritime Ports Administration SA, the administrator of the Port of Constanța in Romania, to explore strategic invest-

ment and development opportunities in the Black Sea's largest port.

The agreement establishes a platform for collaboration across areas of mutual interest, including greenfield and brownfield port development, deployment of advanced digital solutions, and the advancement of sustainability-driven initiatives centred on renewable energy adoption, efficient waste management, and emissions reduction, reinforcing long-term resilience and responsible growth.

Captain Mohamed Juma Al Shamisi, Managing Director and Group CEO of AD Ports Group, said: "This agreement provides a framework for dialogue and cooperation with the Port of Constanța, one of the most strategically significant maritime hubs in the Black Sea region. Guided by the vision of our wise leadership in the UAE, we look forward to exploring opportunities that further strengthen the Group's presence along the Middle Corridor, while supporting our Romanian partners in unlocking sustainable economic growth through enhanced connectivity and trade".

Located at the eastern edge of Europe, the Port of Constanța is a major trade gateway on the Black Sea and one of Europe's largest ports. In 2025, it handled 88 million tonnes of liquid, dry, and general cargo, as well as approximately 1 million TEUs of container traffic.

Positioned at the mouth of the Danube–Black Sea Canal, the port provides a vital maritime link between the Black Sea shipping routes and inland waterways serving Eastern and Central Europe. As a fully integrated multimodal hub connecting sea, rail, road, and river networks, Constanța plays a pivotal role in facilitating regional and international trade, including significant volumes of agricultural products such as grains and cereals from Eastern Europe and Central Asia.

Over the past four years, AD Ports Group has made strategic investments across Central Asia and Pakistan to help reactivate the Middle Corridor, a commercially viable, lower-impact trade route connecting China and Europe along the historic Silk Road.

Navigator Gas to exit the Unigas Pool

Navigator Holdings Ltd. ("Navigator Gas" or the "Company") recently announced that in 14 April 2026, it signed a non-binding letter of intent with Bernhard Schulte (Singapore) Holdings Pte. Ltd. ("Bernhard Schulte") and Sloman Neptun Schiffahrts-Aktiengesellschaft ("Sloman Neptun" and, together with Bern-hard Schulte, the "Buyers"), for the sale by the Company to the Buyers of eight gas carriers as well as the Company's shareholding in the Unigas International B.V. joint venture (the "Unigas Pool"), which currently commercially manages the Vessels, for an aggregate purchase price of approximately $183 million.

Upon completion of the proposed transaction, Navigator Gas will fully exit the Unigas Pool, which will continue to operate with the remaining existing partners, Sloman Neptun and Bernhard Schulte.



"K" Line acquires full ownership of "K" Line Wind Service

Kawasaki Kisen Kaisha, Ltd. ("K" Line) and its wholly owned subsidiary, Kawasaki Kinkai Kisen Kaisha, Ltd. (Kawasaki Kinkai Kisen), announced that "K" Line has acquired all the shares of "K" Line Wind Service, Ltd. (KWS) held by Kawasaki Kinkai Kisen, making it a wholly owned subsidiary of "K" Line. Previously, the two companies operated KWS as a joint venture.

Overview of KWS

KWS was established in 2021 as a joint venture between "K" Line and Kawasaki Kinkai Kisen. With the expected growth in offshore wind power generation, KWS is engaged in the offshore wind support vessel business, including work vessels and geotechnical survey vessels.

Purpose of acquisition of full ownership

The objective of the acquisition is to accelerate decision-making and achieve more integrated business operations to facilitate KWS's business growth and enhance the corporate value of the "K" LINE Group as a whole.

Date of acquisition: 31 March 2026

Kawasaki Kinkai Kisen, together with Offshore Operation Co., Ltd., will continue to support KWS's businesses as part of the "K" Line Group.

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Geopolitics

UK and France to lead defensive mission in Strait of Hormuz

On Friday, 17 April, France and the United Kingdom convened 51 countries for an international summit on the Strait of Hormuz. The meeting underscored the international community's determination to support freedom of navigation, uphold international law, and safeguard global economic stability and energy security.

Strong support was expressed for a comprehensive diplomatic settlement to the conflict through negotiations, emphasising that diplomacy must prevail.

The UK, France, and their partners are set to draw on collective diplomatic, economic, and military capabilities to support freedom of navigation through the Strait of Hormuz.

Firstly, participants called for the unconditional, unrestricted, and immediate reopening of the Strait of Hormuz. The right of transit passage without restrictions or tolls was highlighted as a cornerstone of international trade. The announcement that the Strait will reopen was welcomed, with emphasis on the need for this reopening to be sustained over time. Disruptions to global energy security, supply chains, and economic and financial stability were deemed unacceptable, particularly given their impact on the most vulnerable communities worldwide. A commitment was also made to coordinate economic responses and avoid protectionist measures.

Secondly, support was reaffirmed for the essential work of the International Maritime Organization (IMO) in ensuring the safety of seafarers and vessels. Continued cooperation with the shipping industry was pledged to facilitate the resumption of operations as soon as conditions allow, including engagement with operators, insurers, and industry bodies.

Thirdly, France and the UK confirmed the establishment of an independent and strictly defensive multinational mission aimed at protecting merchant vessels, reassuring commercial shipping operators, and conducting mine-clearance operations once conditions permit, following a sustainable ceasefire agreement. The mission will operate strictly within a defensive mandate, in full compliance with international law, and in consultation with relevant states. Appreciation was expressed to the nations that have indicated their readiness to contribute, whether through military assets, logistical support, financial assistance, or political backing. All countries with an interest in the free flow of global trade were encouraged to support the initiative.

France and the UK will jointly advance this effort, including coordinating military planning with contributing nations. The UK will host the next leaders' meeting in this format.



Credit: EPA/MICHEL EULER / POOL MAXPPP OUT

UN Security Council extends sanctions regime on Libya until August 2027

The UN Security Council renewed the mandate of the Panel of Experts tasked with monitoring the implementation of sanctions on Libya until 15 August 2027, and extended the authorisation for Member States to take measures against the illicit export of petroleum from the country until 1 August 2027.

The sanctions regime was established in early 2011, when protests erupted in Libya against the Government of Muammar Qadhafi amid widespread popular uprisings across the Middle East and North Africa. In response to the violent repression by Libyan authorities against demonstrators, the Council adopted Resolution 1970 (2011), laying the legal and institutional foundation for restrictive measures.

Building on this framework, the Council took further action by unanimously adopting Resolution 2819 (2026) (to be issued as document S/RES/2819(2026)). Acting under Chapter VII of the UN Charter, it decided to extend until 1 August 2027 the authorisations and the measures in resolution 2146 (2014), as amended by paragraph 2 of Resolutions 2441 (2018) and 2509 (2020).

These include the authorisation for Member States to inspect on the high seas vessels designated by the 1970 Libya Sanctions Committee as being involved in the illicit export of petroleum from the country, and for the Committee to impose measures on such vessels, including denial of port entry, prohibition of servicing and related financial transactions, and the return of illicit cargoes to Libya.



IYKYK

Blue economy

Blue economy sees a surge in investment and growing investor interest

Favourable winds are propelling the blue economy: investment is gaining momentum, dedicated funds are increasing, and more investors are turning their attention to ocean-related opportunities.

The European Commission's "BlueInvest Investor Report 2026: The Next Wave of Blue Growth" highlights the early stages of what could become a much larger wave of capital flowing into the sector.

More funds, more interest

One of the clearest signs of this trend is the growth in dedicated "blue funds" — investment funds focused specifically on ocean-related sectors such as aquaculture, marine energy, and ocean technology. These funds are no longer isolated players. They are part of a broader investment scene that includes venture capital firms, private equity investors, and corporate-backed funds.

In total, the report identifies 159 private funds active in the blue economy in the EU. Approximately €3 billion comes from funds fully dedicated to the sector, while around €11 billion in private capital comes from investors with partial exposure. This shows that interest in ocean-related opportunities is spreading beyond niche specialists, with more general investors now recognising the potential in these sectors.

Who is investing?

Venture capital firms are leading this movement, accounting for the majority of investors in this area. Many of these firms are not exclusively focused on ocean-related activities but are increasingly backing startups working on water, climate, and sustainable technologies. This indicates that the blue economy is becoming part of a wider investment theme rather than a standalone category. At the same time, larger investors are starting to engage. Private equity funds and corporate investors are showing growing interest, particularly in areas linked to infrastructure, energy, and decarbonisation. However, the report notes that later-stage funding is still relatively limited, which can make it harder for companies to scale up.

Challenges remain

Despite this progress, the blue economy remains underfunded compared to its potential. It combines strong economic opportunities with clear environmental benefits, yet many investors still don't know enough about it or how to get involved.

To help investors navigate these opportunities, the report features in-depth analyses of key blue economy sectors: aquaculture, fisheries, blue biotechnology, blue renewable energy, blue tech, ocean observation, shipping, ports, and water management. Each section presents current trends, market developments, and business opportunities, while showcasing innovative companies from the BlueInvest project pipeline.

Overall, the picture is one of growing momentum

More funds are entering the space, more capital is becoming available, and investors' interest is clearly rising. While challenges remain — especially in scaling companies and attracting later-stage funding — the direction of travel is clear. The blue economy is no longer seen as a niche; it is becoming a serious investment theme with the potential to deliver both financial returns and long-term sustainability impact.

The first offshore wind development in South America

Petrobras has selected Fugro to deliver a geotechnical site investigation for the Rio de Janeiro Offshore Wind Pilot Project, the first offshore wind development in South America to advance under a formal environmental licensing process. The 18 MW pilot marks an essential step in energy diversification as countries in the region begin to establish regulated pathways for the responsible development of offshore wind.

Working within a nearshore study area off São João da Barra, Fugro will acquire the GEO-data needed to inform safe and efficient design. Activities include soil sampling, in situ testing, and laboratory analysis across four coastal and shallow-water locations, along with onshore investigations to support cable landfall and routing. Field operations and analysis will begin in April and continue through the third quarter of 2026, with final reporting scheduled for 2027.

The project stands to benefit from Fugro's work on early-stage offshore wind developments in emerging markets worldwide, ranging from initial pilot studies to full site characterisation. For this effort, Fugro's Brazil-based teams will lead delivery, pairing nearshore operations from the Rio das Ostras hub with laboratory analysis at the Pinhais facility. This combination of local insight and global experience will help ensure consistent, decision-ready data for Petrobras.

73% of the world's ocean-protected areas are polluted by sewage

A new study by the Wildlife Conservation Society (WCS) and the University of Queensland, published in Ocean & Coastal Management, has found that nearly three-quarters of the world's marine protected areas (MPAs) are polluted by sewage. In ocean regions of greatest importance for coral reefs and



tropical marine life, the situation is even more difficult, with 87% to 92% of protected areas affected and pollution levels typically tenfold higher than in surrounding unprotected waters.

Wastewater — the used water from homes and businesses that flows through sewage systems into rivers and the ocean — carries nutrients, pathogens, and chemicals that damage important coral reef and seagrass ecosystems and harm coastal wildlife. Previous studies have linked wastewater pollution to coral reef decline around the world, harmful algae blooms, and even Alzheimer's-like brain disease in dolphins. The consequences for people are just as serious: polluted drinking water is estimated to cause up to 1.4 million deaths a year from diseases like cholera and typhoid fever, as well as economic losses of up to $12 billion.

The findings arrive at a critical moment for global ocean conservation. World leaders have committed to protecting 30% of the ocean by 2030, a goal known as "30 by 30". But this study suggests the push to protect more ocean area may be missing a fundamental problem: protected areas cannot do their job if pollution keeps flowing in.

"What we found was striking", said David E. Carrasco Rivera, lead author and PhD candidate at the University of Queensland. "Using global pollution data, we mapped wastewater exposure across thousands of protected areas and compared it to unprotected waters nearby. In region after region, the areas set aside for conservation were receiving more pollution than the areas with no protection at all".

The researchers analysed pollution exposure across 16,491 marine protected areas worldwide, focusing closely on 1,855 protected areas within 50 kilometres of the coast in six tropical regions: Australasia and Melanesia, Mesoamerica and the Caribbean, the Coral Triangle, East Africa, the Indian Ocean, and the Middle East and North Africa. They used a geospatial model to measure how much nitrogen from sewage was reaching each protected area, then compared those levels to nearby unprotected waters.

"Even a perfectly managed marine protected area will fail to achieve benefits for conservation and for people if wastewater keeps flowing in from upstream", according to Dr Amelia Wenger, WCS Global Water Pollution Lead. "You cannot put up a barrier inside a protected area to stop pollution from coming in. The solution must be implemented on land, upstream, and be part of how governments plan and fund ocean protection. At present, it is not".

The study calls on governments and conservation planners to account for sewage and other land-based pollution when designing marine protected areas and when measuring whether those protections are working. The researchers point to the Global Biodiversity Framework, the international agreement that sets the "30 by 30" goal across 23 interconnected targets, and warn that Target 3, the area protection goal, cannot succeed without also delivering on other targets for land and sea use planning (Target 1), restoration (Target 2), and pollution reduction (Target 7).

Passenger shipping

The “Vision” of a battery-electric cruise ship

At Seatrade Cruise Global in Miami, USA, the MEYER WERFT Group presented Project “Vision”, the world’s first 100% battery-electric cruise ship with a size of more than 80,000 GT. The concept study demonstrates how sustainable innovations can redefine the future of the cruise industry.

“We asked ourselves how we can use innovation to reduce CO_2 and contribute to decarbonisation — not in 50 years, but much sooner. We enable a reduction in greenhouse gas emissions of up to 95%”, explained Tim Krug from the MEYER WERFT Concept Development Group. Every year, MEYER WERFT presents an entirely new and innovative concept at Seatrade Cruise Global, the world’s largest industry trade show, underlining its position as a technological leader.

Johannes Bade, responsible at MEYER WERFT for the development programme behind “Vision”, adds: “With battery-electric cruise ships, we offer a competitive product that relies on existing technologies. We are opening up entirely new opportunities for our customers to operate sustainably and profitably in the long term”. Project “Vision” is 275 metres long, accommodates 1,856 passengers, and has a size of around 82,000 GT.

With the battery system, a large portion of typical European cruise routes can be covered, for example, the route from Barcelona to Civitavecchia near Rome. By 2030, around 100 ports across Europe will offer the required charging infrastructure. Upon request, the ships can also be built as hybrids with small generators, enabling, for example, transatlantic crossings.

Project “Vision” also introduces new architectural approaches to cruise ship design: the vertical shaft running through the ship for exhaust treatment, and the funnel, which usually occupies parts of the sun deck, can be eliminated. This enables an entirely new sun deck design with unobstructed views. The “Vision” concept study is designed as an all-weather ship and includes fully glazed, weather-protected areas. For example, the traditional aqua park has been arranged as an indoor area at the stern, making it usable year-round.

Another major advantage of the fully battery-electric power system and the elimination of main engines is that onboard comfort is significantly improved, with even lower engine noises and vibrations on the “Vision”.

Credit: MEYER WERFT Group



MSC Group’s Cruise Division introduces Sandy Cay: A new luxury private island retreat in the Bahamas

MSC Group’s Cruise Division introduced Sandy Cay — a new luxury private island destination located adjacent to the Ocean Cay MSC Marine Reserve in the

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Credit: Port of Marseille Fos

Bahamas, due to open in 2028. Designed for MSC Cruises and Explora Journeys' guests, the new island further elevates the company's vision of delivering truly unique and authentic travel experiences.
Conceived as an intimate complement to Ocean Cay, Sandy Cay offers a more secluded, elemental escape — inviting guests into a quieter, deeply immersive connection with the ocean's natural rhythms and the spirit of the Bahamas.
Pristine aragonite sands — among the purest and brightest in the world — give Sandy Cay its name and its character, shaping an island defined by serenity.
The island has been carefully conceived to offer a more intimate yet elevated and immersive experience. It remains true to the ethos that defines Ocean Cay, connecting guests to nature and the ocean's natural beauty.
Located within the same crystal-clear Bahamian waters as the Ocean Cay MSC Marine Reserve, Sandy Cay will complement the company's existing private island destination, offering a new dimension of discovery, serenity, and escape.
Guests of MSC Cruises and Explora Journeys will have the first opportunity to experience Sandy Cay in 2028.

The Port of Marseille-Fos launches shore-side electrical connections for cruise ships

In the presence of Philippe Tabarot, Minister for Transport of France, the Port of Marseille-Fos showcased its facilities capable of accommodating three large cruise ships simultaneously — an outstanding feat of technical prowess in Europe.
Following a testing phase that began in late 2025, Marseille-Fos will be one of the very first ports in Europe and the Mediterranean until 2026 capable of delivering such performance, with its total electrical capacity reaching 108 MW. Rolled out as part of the of the "Onshore Power Supply for Ships — Smoke-Free Port Call" initiative, this major technical breakthrough now enables the simultaneous provision of 60 Hz connections for up to three large cruise ships, each with energy requirements of up to 16 MW — equivalent to the consumption of a town of 13,000 inhabitants — thereby allowing them to turn off their combustion engines for the entire duration of their port call.
Thanks to photovoltaic power stations installed on several port sheds and warehouses, and the French electricity distribution system operator ENEDIS, the electricity supplied by the Port of Marseille-Fos is 100% renewable.

New report finds LNG remains cruise shipping's most deployable decarbonisation option

Lloyd's Register (LR) has published the latest report in its award-winning Fuel for Thought research series, examining the role of liquefied natural gas (LNG) in the cruise sector.
Launched on Tuesday, 14 April at Seatrade Cruise, "Fuel for Thought: LNG for Cruise" offers a detailed, evidence-based assessment of how LNG is already delivering improved air quality and emissions performance. The report underpins how further gains can be achieved through advances in engine technology, methane abatement, cleaner fuel supply and emerging pathways such as bio-LNG and synthetic methane.
The report shows that LNG is now the most widely adopted alternative fuel in the cruise sector, both in the in-service fleet and within the orderbook. This reflects the need for solutions that are available at scale, supported by global bunkering infrastructure and compatible with existing safety and regulatory frameworks.
The report examines the full lifecycle performance of LNG, including well-to-wake emissions, regulatory treatment under IMO and EU regimes, and the economic implications of emerging compliance mechanisms such as the IMO Net Zero Framework and FuelEU Maritime.
It makes clear that addressing methane slip is critical to LNG's long-term credentials and highlights the progress already being made through improved engine designs, onboard abatement technologies, and verification approaches.
The analysis also underlines the importance of recognising upstream improvements in LNG production and supply. Certification of lower-emissions LNG and the scaling up of bio-LNG offer the potential to achieve a significant reduction in greenhouse gas intensity, but only if regulatory frameworks evolve to reflect real-world performance and encourage investment across the value chain.

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MSC Group Cruise Division: Driving sustainable, year-round growth in global and Greek cruise tourism

The Cruise Division of MSC Group, headquartered in Geneva, is a global leader in cruise tourism, operating through two distinct brands that cover both premium and luxury segments.



by **Pierfrancesco Vago**,
Executive Chairman
of MSC Group's Cruise Division



MSC Cruises, the world's third-largest cruise line and market leader in Europe, operates a fleet of 23 modern ships offering itineraries across five continents, visiting over 100 countries and more than 300 destinations. Complementing this, Explora Journeys, launched in 2023, represents the Group's entry into the luxury segment, with a growing fleet set to reach six ships by 2028, delivering refined and immersive ocean experiences.

The Mediterranean lies at the heart of MSC Group's cruise strategy, with Greece playing a pivotal role as both a leading destination and a strategic homeporting hub. The company continues to deepen its presence in the region through expanded deployment, diversified itineraries, and strong partnerships with national and local stakeholders.

As highlighted by Pierfrancesco Vago, Executive Chairman of MSC Group's Cruise Division:

"Greece is at the heart of our operations, serving both as a key destination and a

strategic hub for homeporting. We continue to invest in supporting responsible and sustainable tourism development. We have expanded our itineraries beyond traditional destinations to include Thessaloniki, Kavala, Volos, and Syros, offering travelers authentic experiences while ensuring more balanced tourism benefits. Reaching nearly 500 port calls in 2026 across more than 20 Greek ports by MSC Cruises and Explora Journeys, our consistent year-round presence reflects our ongoing commitment to the country's tourism and economic development."

Extending the tourism season & year-round presence

A cornerstone of MSC's strategy is the extension of the tourism season in Greece. The successful implementation of the winter cruise program for 2025–2026 demonstrated Greece's viability as a year-round cruise destination. During the period November 2025 to March 2026, the ships MSC Lirica and MSC Sinfonia operated more than 40 weekly itineraries with homeporting in Piraeus, establishing it as a key winter hub in the Eastern Mediterranean.

This program resulted in approximately 85 cruise calls across Greek ports, including around 40 homeport calls in Piraeus, 20 in Corfu, and additional visits to Heraklion, Rhodes, Katakolo, and Chania (Souda), ensuring geographic dispersion of tourism activity. With a weekly capacity of approximately 4,300 passengers, the winter season generated an estimated 365,500 visits to Greek destinations, attracting travelers from 15 international markets.



This year-round activity supports local economies, strengthens employment, and maintains infrastructure and services during low-demand periods, proving that cruising can be a strategic tool to combat seasonality and reposition Greece as an all-season destination.

Investment in fleet & infrastructure

MSC Group's investment strategy is built on continuous fleet expansion and destination development. The company is advancing the growth of Explora Journeys, targeting six luxury ships by 2028, while also expanding its World Class fleet and planning a new generation of ships from 2030, focusing on innovation, design, and enhanced passenger experience. At the same time, MSC collaborates with destinations to improve port infrastructure and visitor management, ensuring sustainable growth.

Sustainability as a core priority

Sustainability is central to MSC Group's Cruise Division strategy, guided by a clear decarbonization roadmap. This includes investment in energy-efficient ship design, optimization of operational performance, and the development of low- and net-zero carbon fuels.

A key example is MSC World Europa, one of the company's LNG-powered vessels, capable of reducing CO_2 emissions by up to 25% while virtually eliminating sulphur oxides, nitrogen oxides, and particulate emissions. The ship is also equipped with shore power connectivity, allowing near-zero emissions while docked.

A balanced growth model

Through its dual-brand approach, MSC Group combines scale and accessibility with luxury and exclusivity, addressing the evolving needs of global travelers. Its strong commitment to sustainability, investment, and year-round destination development—particularly in Greece—positions the company at the forefront of the cruise industry.

By expanding beyond traditional destinations, supporting local communities, and promoting balanced tourism flows, MSC Cruises and Explora Journeys are actively shaping a more resilient, inclusive, and sustainable future for global cruise tourism.

EU-Mercosur

The hidden gem of the Greek shipping clause





by **Dr Anna Bredima**,
Consultant on International / EU maritime affairs

It never rains but it pours ... Farmers' demonstrations in Greece and France, five Member States which did not accept the EU-Mercosur agreement in Council, and then its postponement in the European Parliament and the involvement of the European Court of Justice.

Last but not least , the EU decided the signature and provisional application of Mercosur on 1 May 2026. Irrespective of these developments, it is worth focusing on its maritime implications, particularly for Greece.

The upheaval over the "sacred cow" of the agreement's agricultural implications has diverted attention from its beneficial implications for the EU maritime sector, both liner and bulk tramp. The agreement opens EU access to a market of 271 million consumers and provides mutual commitments to the liberalisation of maritime transport on a commercial basis. The Mercosur countries had, par excellence, protectionist shipping legislation, and it took 25 years of negotiations for them to accept liberalisation. The Mercosur cargoes will be carried by sea. Who will be transporting them? European shipping, and preeminently Greek shipping. Greek shipping requires open trades to survive, since it is a cross-trader. The agreement covers a wide range of cargoes, from cars, machinery, and finished products to bulk commodities and rare earths.

But where is the hidden gem, particularly for Greek shipping, in the EU-Mercosur agreement? It lies in Article 2(g) bis of Chapter XXX, which includes the so-called "Greek shipping clause" among its beneficiaries. Among the beneficiaries (natural persons and legal entities of the EU and Mercosur), the clause — inspired by the Greek shipping registration system (Article 5 of the Code of Greek Public Maritime Law, Legislative Decree 187/1973) — provides that: "maritime companies established outside the EU or Mercosur but controlled by nationals of an EU Mem-

Agreement



ber State or Mercosur will also be beneficiaries if their ships are registered in an EU Member State or Mercosur according to its legislation and fly the flag of an EU Member State or Mercosur".

This clause is included in a series of EU bilateral trade agreements with third countries (e.g., China, Japan, Canada, South Korea, Indonesia). It derives from Regulation 4055/1986 (Article 2, paragraph 1) on the freedom to provide maritime transport services (OJ L 378, 31.12.1986, pp. 1–3), where Greece had the foresight to include its system among the beneficiaries at a time when it was least expected.

It is particularly gratifying for me, as I paved the way for this development in my capacity as co-rapporteur of the European Economic and Social Committee's opinion on the 1986 maritime policy package of Regulations. Historically speaking, this was the first legislative package of the EU and included Regulations 4055/1986, 4056/1986, 4057/1986, and 4058/1986.

The EESC produced a substantiated opinion on the package in a series of meetings in Copenhagen and Piraeus, due to the nationalities of the two rapporteurs, Knud Mols Sørensen, high priest of the International Transport Workers' Federation (ITF), and myself, in my capacity as Director of International and European Affairs at the Union of Greek Shipowners. We were assisted by Professor John Tzoannos and Mrs Belinda Pyle, who served as experts to the rapporteurs.

Characteristically, it is mentioned in the opinion on the Regulation "on freedom to provide maritime transport services" (OJC 212, 23/8/1985, pp 2-21): "The EESC therefore recommends that the Regulation should also refer to the nationality of the service provided, i.e., to the flag. Article 1(1) should therefore be amended by adding at the end "or of vessels flying the flag of a member state". Since non-EU companies owned the bulk of the Greek flag fleet, it was not covered by the proposed criterion of a company of a Member State. As co-rapporteur, I thought it expedient to propose an alternative criterion: the flag of a Member State. The Greek Ministry of Maritime Affairs and Insular Policy promoted the EESC proposal. It was taken into account by the Council in the final text of Regulation 4055/1986 (under the British Presidency). Indeed, the Regulation "takes a photo" of the Greek ship registration system reproduced in the beneficiaries of the Mercosur agreement: EU-flagged ships owned by non-EU companies, majority-controlled by EU nationals.

In addition to its evident economic advantages, the Greek shipping clause in the EU-Mercosur agreement also recognises the geopolitical importance of Greek shipping and of Greece for the EU. The agreement should also be viewed in this light, and one can only hope that it disentangles itself from the remaining obstacles and finally enters into force.

Greek shipping in an era of contested thalassocracy



by **Vasilis Trigkas***

Admiral Isoroku Yamamoto, the commander of Japan's Combined Fleet, was not a strategic intellectual whose views were taken lightly in the Empire of the Rising Sun. Having studied at Harvard University and served as Japan's Naval Attaché in Washington, Yamamoto had a clear grasp of the gap in naval capabilities between the United States and Japan. This gap was not simply reflected in the size of their respective fleets but, more importantly, in their national industrial capacity.

The United States, with a GDP six times that of Japan and, crucially, with all its major resources located and protected within its vast continental territory, could, if necessary, increase its naval output to a level Japan could not match. With Japan's energy and production resources running out in the early 1940s, Yamamoto — although aware of the material gap with the United States — nevertheless advised a surprise attack on the American fleet anchored at Pearl Harbour. The decision bore the character of a grim paradox: an act born less of self-confidence than of necessity. Japan was, in a sense, "committing suicide by fear of death". The initial strike, executed with remarkable precision, achieved a fleeting tactical brilliance; however, it served even more decisively to awaken the very industrial giant that Yamamoto had long feared. The US mobilisation of shipbuilding and manufacturing was beyond what Japan, constrained by its structural limits, could replicate.

Fraught with deep concern that day, which, according to President Franklin D. Roosevelt, was "a day that would live in infamy", the United States, in 1942, scrambled to build 22 aircraft carriers. In contrast, Japan was capable of building only three. Over the four years of the war in the Pacific, the United States produced more than thirteen times as much steel as Japan. Japan decisively lost the naval war at Midway; Admiral Chester Nimitz's island-hopping strategy created a vast maritime logistical network to sustain American far-flung naval projection and gradually tighten the noose around Japan. The atomic bombings of Hiroshima and Nagasaki were, in this sense, the coup de grâce to an already decisive Japanese naval defeat.

America's naval primacy in the Second World War did not emerge out of thin air. Since the dawn of the twentieth century, the US had possessed the industrial capacity to surpass any other state in shipbuilding. In 1907–1909, Theodore Roosevelt demonstrated American naval power by dispatching the so-called "Great White Fleet" on a circumnavigation of the globe, calling at major foreign ports to convey a clear message: that the United States was, if not yet the foremost, then certainly among the world's preeminent naval powers.

American dominance of the oceans continued unabated after the Second World War as Washington sought to contain the Soviet Union. The US fleet — larger than the rest of the world's navies combined — could project force across the rimland, i.e., the coastal zones of Eurasia, thereby consolidating American political influence over economically and resource-rich regions, notably Western Europe and the Persian Gulf. The key instrument of this "rimland control" was the aircraft carrier, whose aviation capabilities enabled the projection of devastating force deep into the interior. Even in the recent war against Iran, 70% of US destructive power sprung from carrier aviation and sea-launched cruise missiles.

It is not a stretch to argue that, for the past 100 years, the United States has been the world's sole thalassocracy. However, Chinese analysts maintain that we are living in an era of unprecedented change unseen in a century. Among

them is the possibility that we may be approaching the twilight of American naval supremacy, as China has achieved something equally unprecedented: it has surpassed the United States in two of the three components of sea power — actual capacity and incremental capacity. Its navy is now larger and, more importantly, its capacity to increase naval production outpaces that of the United States by two orders of magnitude. In this sense, in terms of both existing and potential naval power, China today bears some resemblance to the United States in 1942, while the United States risks occupying a position not unlike Japan's at that same moment, i.e., being technologically sophisticated and operationally formidable, yet constrained by a more limited productive capacity to regenerate maritime power at scale. The analogy, however, should not be overstretched. Unlike Japan, the United States retains abundant natural resources, advantages in naval technology, and, most importantly, a global alliance network with significant shipbuilding capabilities. The emerging asymmetry, therefore, is not one of comprehensive inferiority but of differential industrial depth, an imbalance between the two leading naval powers that may prove decisive over time if left unaddressed.



China currently produces more steel than the rest of the world combined. For every carrier, tanker, LNG vessel, or container ship the United States can build in a given period, China can produce more than 200 in the same period. In 2025, Chinese shipyards controlled 65% of global shipbuilding. While commercial output does not translate directly into naval production, the economies of scale embedded in China's shipyards could, if required, be redirected toward naval build-up with considerable effect.

It is only in the third element of naval power, that is, naval logistics, and in particular the network of overseas bases, that China continues to lag significantly behind the United States. Here, the American position remains dominant, with more than 50 major naval bases and hundreds of supporting installations across the globe. By contrast, China's overseas footprint is far smaller, with one naval base allegedly in Cambodia and a dual-use port in Djibouti. Naval bases remain indispensable to sustained global naval projection, as fleets depend upon reliable systems of resupply and maintenance. Without such bases, China's naval power remains handicapped within its first island chain.

The consequential strategic question for China is when its leadership will decide to to build a global network of naval bases to extend the reach of its already formidable navy beyond the littoral waters of the first island chain. To be sure, current Chinese naval doctrine is focused on the Taiwan question, ensuring that China's overwhelming firepower nearshore will decisively prevent any secession. Yet, China's need for global naval power projection is driven less by prestige than by calculation: China must increasingly secure its overseas economic interests at a time when the United States appears intent on rolling-back China's access to resource-rich regions (see Venezuela and the Western Hemisphere) and key arteries of connectivity, not least the maritime chokepoints (see the recent case of Panama). And while China can, for the moment, secure crucial energy and food resources from Russia, it has massive economic interests beyond continental Eurasia — interests vulnerable to US coercion and maritime interdiction.

As the United States and China enter what may be described as a "New Cold War", one in which neither side can decisively defeat the other through direct conflict owing to the constraints of nuclear deterrence, the navy assumes renewed centrality as an instrument of political power. It possesses both inducive and coercive qualities. By protecting sea lanes and supporting partners, a naval power can offer reassurance and rewards, thereby attracting allies; in its more coercive form, i.e., "gunboat diplo-



Greek Prime Minister Kyriakos Mitsotakis (R) and Chinese President Xi Jinping (L) visit the cargo terminal of Chinese company COSCO in the port of Piraeus, Greece, 11 November 2019.

Credit: EPA/ORESTIS PANAGIOTOU

macy", naval presence can be used to extract concessions.

The United States has historically demonstrated considerable skill in both dimensions. China, mindful of its own experience as a victim of gunboat diplomacy during the "century of humiliation", has rightfully been reluctant to embrace the coercive variant. Yet it may find it increasingly necessary to cultivate global naval power as a means of both deterrence and inducement to discourage American efforts to revise the economic status quo in regions where China has invested heavily and to encourage sustained bilateral engagement from states along the rimland.

It is in this latter dimension, namely, inducement, that the economic foundations of a thalassocratic power become particularly significant. Surplus capital, usually generated through maritime commerce, enables sustained investment in infrastructure that enhances connectivity and economic welfare. Over the past fifteen years, China has emerged as a leading investor in maritime and transport infrastructure. The port of Piraeus in Greece is a particularly illustrative example as COSCO's investment has transformed it from a relatively underutilised facility into one of the European Union's principal commercial ports.

Our Nobel Laureate in Literature, Odysseas Elytis, once wrote that "If you deconstruct Greece, in the end an olive tree, a grapevine, and a boat will remain. That is, with as much, you reconstruct her". Greece is a peninsula surrounded by the sea, and this geographical position has not only shaped its civilizational character as an open and cosmopolitan beacon, but also its geopolitical instincts. In the great power conflicts of the modern era, Greece has consistently aligned with the thalassocratic coalition. In the First World War, it joined the Entente Cordiale, though not without external prompting, as the Anglo-French bombardment of Piraeus served as a stark reminder that Imperial Germany could not project naval power in its defence. In the Second World War, despite certain ideological affinities with the Axis, Greece aligned without hesitation with Britain. During the Cold War, it anchored itself firmly within the Anglo-American-led order by joining NATO.

This strategic certainty of a rimland state aligning with the dominant maritime power may, however, be approaching its limits. As China rises to challenge American command of the seas, the foundations of this long-standing pattern may gradually erode. The pace of such change will depend, above all, on Beijing's decision to develop a network of naval bases beyond the first island chain. This evolution will not be immediate; it may unfold over a decade or two. Yet, once realised, it would mark a fundamental shift in the geopolitical and geoeconomic environment within which rimland states, such as Greece, have long operated.

Such a transformation will bear directly on Greece's formidable shipping sector, which constitutes the very lifeblood of the global economy. The Greek maritime fleet operates globally but depends on a stable maritime order. When a thalassocracy faces no peer competitor, the choice for shipowners is relatively straightforward: their vessels operate under the security umbrella of the dominant naval power. In an era of contested seas, however, that clarity fades.

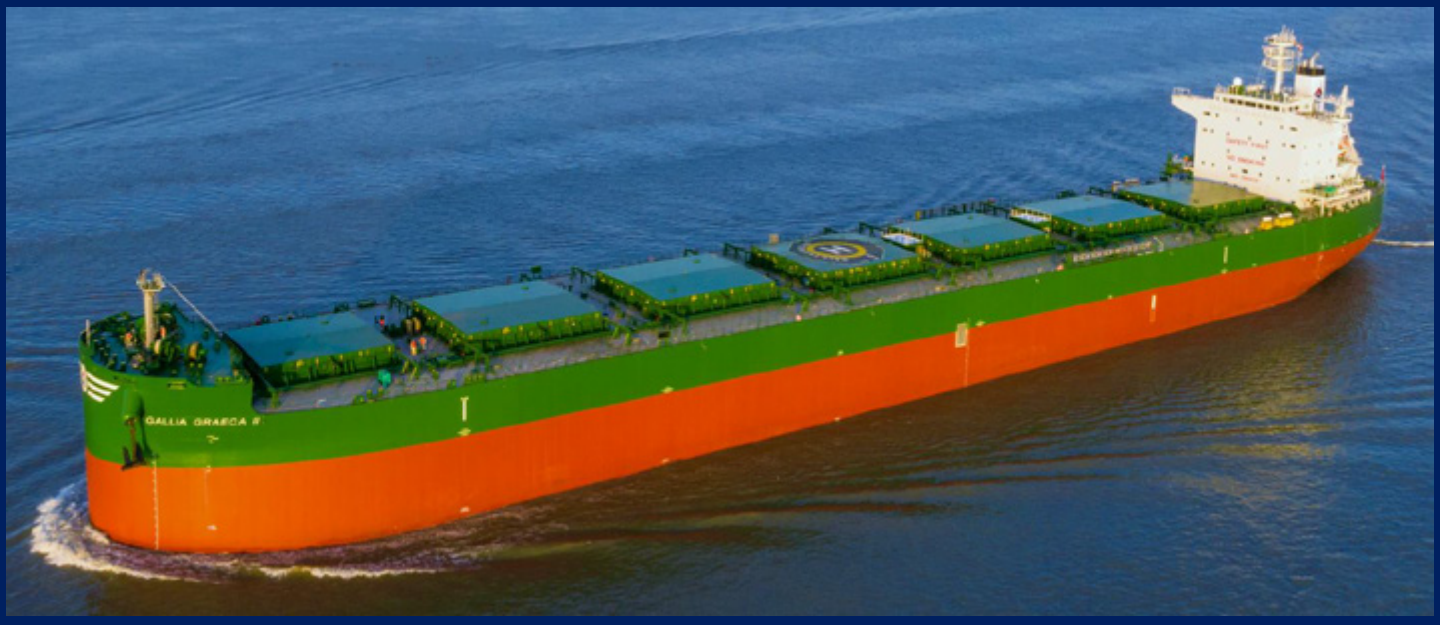
Although it will take time for China to develop the necessary logistical architecture (namely, overseas naval bases) and project naval power geopolitically on a large scale, geoeconomic Sino-American antagonism has already begun. From the US Section 301 investigation seeking to impose costs on Chinese-built ships regardless of ownership to efforts to undermine COSCO's investment in Piraeus, and the more acute prospect of merchant fleets being involved in logistical roles during crises or blockades, it is clear that the emerging state of competitive maritime dominance is reshaping long-standing assumptions. The competition, particularly in the geoeconomic domain, is imminent and intensifying, with senior US officials declaring that "ships are the new chips".

In this nascent era of a contested thalassocracy, the maritime community must cultivate geoeconomic and geopolitical intelligence to build sufficient strategic foresight and stay ahead of the geopolitical curve, balancing efficiency with resilience. Above all, it must do what it knows best: demonstrate to all major powers that unrestricted maritime connectivity and commerce advance the welfare of all and enhance prosperity and security. That end, however, can only be reached if China and the United States channel their rivalry into constructive competition for excellence, rather than mutual attrition, and resist reducing rimland states to pieces on a geoeconomic chessboard.

*Vasilis Trigkas is an economist and assistant professor of global affairs jointly appointed at Schwarzman College and the Department of International Relations, Tsinghua University. He is a member of the Council for International Relations, Greece.

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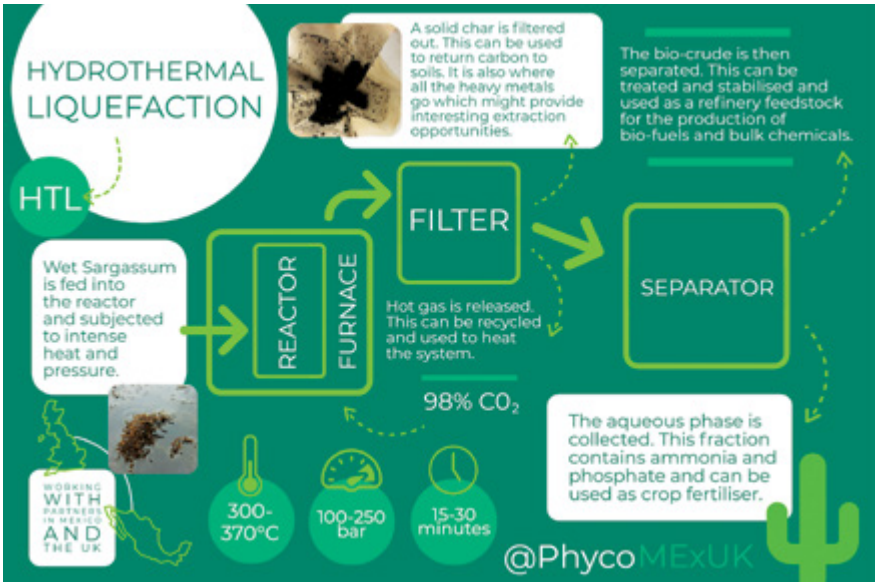
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Emerging marine biofuels from HTL and pyrolysis

Maritec Naias
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Opportunities and current limitations

The transition toward low-carbon shipping has led to increased research activity around alternative fuels that can integrate with existing marine systems. Among these, fuels derived from Hydrothermal Liquefaction (HTL) and pyrolysis have attracted growing attention in recent literature as potential candidates for future marine applications.





HTL & pyrolysis processes

HTL is a thermochemical process that converts wet biomass - such as sewage sludge, food waste, and algae - into a crude-like liquid (bio-crude) under high temperature and pressure in aqueous conditions (typically 250–375°C and 10–25 MPa). A key advantage highlighted in recent studies is the ability of HTL to process high-moisture feedstocks without prior drying, improving overall energy efficiency. The resulting product exhibits a calorific value of approx. 30–37 MJ/kg, which is lower than that of conventional marine fuels. In parallel, pyrolysis processes convert dry biomass (e.g. lignocellulosic residues and wood waste) into bio-oil through thermal decomposition (typically at 400–600°C) in the absence of oxygen. While pyrolysis oils are widely studied, their direct use in marine engines remains limited due to their chemical characteristics, including high oxygen content, acidity, and chemical instability.

The diagram above illustrates a typical hydrothermal liquefaction process.

Assessing the realities and opportunities ahead

From a fuel perspective, both HTL-derived bio-crude and pyrolysis oil exhibit properties that differentiate them from conventional marine fuels. Elevated levels of oxygen and nitrogen, along with elevated sulfur and ash content in certain feedstocks, as well as variability depending on feedstock and process conditions, can affect combustion behavior, storage stability, and emissions profiles. As a result, most studies converge on the need for upgrading processes, such as hydrotreatment, to improve fuel quality and compatibility.

Despite these challenges, the potential relevance of these fuels to the maritime sector is linked to two main factors. First, their production pathways are based on widely available waste streams, aligning with circular economy principles. Second, after appropriate upgrading, they may offer partial compatibility with existing marine engines, reducing the need for extensive infrastructure changes.

However, current literature also emphasises several limitations that must be addressed before large-scale deployment. Both HTL and pyrolysis fuels are still primarily at pilot or demonstration scale, with limited commercial availability. In addition, their physicochemical variability introduces challenges in standardisation, handling, and long-term storage. The table below presents a comparison of the physical properties. A critical consideration for marine applications is the absence of fully established fuel standards. In practice, when a fuel does not conform to existing marine specifications, a structured evaluation pathway is required. This typically includes detailed fuel characterisation (e.g. viscosity, density and elemental composition), pre-treatment or upgrading steps, blending with conventional fuels, and engine compatibility testing. Engagement with engine manufacturers and classification bodies is also essential at an early stage, allowing operators to evaluate fuel suitability, identify potential risks, and define mitigation strategies before any onboard or sea trial implementation.

From an analytical perspective, these emerging fuels introduce additional complexity in fuel testing and quality control. Their non-conventional composition requires extended analytical methodologies (e.g. Gas Chromatography–Mass Spectrometry) compared to standard marine fuels, particularly in relation to stability, contaminant levels, and combustion-related properties. This highlights the role of specialised laboratories in supporting both research and early-stage adoption.

In conclusion, fuels derived from HTL and pyrolysis represent potential future options within the broader portfolio of marine energy solutions. Current research suggests that they could contribute to greenhouse gas (GHG) emission reduction strategies, particularly when derived from waste biomass. However, significant technical, economic, and regulatory challenges remain. Continued investigation, including detailed fuel analysis and performance evaluation, will be essential in determining their role in the evolving marine fuel landscape.

Maritec-Naias will be present at Posidonia 2026 at Hall 3, Stand 3.254. Don't miss our seminar, "Marine Biofuels in Practice: Regulation, Risks & Claims, and Reality", on Wednesday, June 3rd at 12:45 PM in Seminar Room 2B (Hall 2), where industry experts will share practical insights of marine biofuels.

Fuel type	Very low sulfur fuels (VLSFOs)	Heavy fuel oil (HFOs)	Diesel	Biodiesel (FAME)	HVO	Upgraded HTL Marine Biofuel
Density @ 15°C	840 - 1010	930 - 1010	820 - 890	860 - 900	811.8	820 - 900
Viscosity @ 40°C/50°C	20 - 380	278.7	2.0 - 6.0	3.5 – 5	2.82	2.0 - 15
Cetane number	-	-	40-50	>51	76.3	-
Estimated Cetane number	32.2	18.8	-	-	-	-
Carbon content (%)	86	86	85 - 87	76 - 78	84.5	70 - 80
Oxygen content (%)	-	-	0	10.0 - 12.0	-	5.0 - 20.0
Heating value (MJ/Kg)	40 - 42	39 - 40	42 - 43	37 - 39	44	40 - 43

To learn more about Maritec-Naias visit **www.maritec-naias.com**

INTERCARGO: Promoting safe & efficient STS operations through collaboration and knowledge sharing



As ships grow significantly in size, port infrastructure remains limited, and bulk cargo trade continues to increase, Ship-to-Ship (StS) operations in the dry bulk sector are no longer occasional. However, unlike the tanker industry, where STS operations have followed established standards and guidelines for decades, the bulk carrier sector has yet to establish a clear, shared method for performing STS operations safely and efficiently.

Meanwhile, recent developments in critical maritime routes, such as the conflicts in the Strait of Hormuz, are intensifying the search for alternative supply chains, promoting solutions that involve transshipments between bulk carriers. It is, therefore, even more imperative for all stakeholders to adopt more structured, safe, efficient, and mutually acceptable procedures.

In this context, INTERCARGO undertook the initiative to draft and publish the first "Ship-to-Ship Transfer Guidelines for Bulk Carriers", aiming to fill this gap by providing practical guidance for safe and efficient lightering and transloading operations. This new publication, which contributes to the development of the first international guidelines for STS transshipments in the dry bulk sector, was developed with the support of DYNAMARINe and was officially presented on 31 March 2026, at a special event held at the Angelicoussis Group Auditorium.

During the event, the complexity of STS operations was highlighted: the involvement of multiple parties, regional variations, as well as dynamic factors such as weather conditions, draft, and visibility, which directly influence the risk profile of these operations.

The event brought together representatives from ship management companies, insurance organisations and P&I Clubs, charterers, and service providers, who exchanged views and experiences, highlighting the significance of the new publication in addressing a growing operational need: the safe and efficient execution of STS operations in the dry bulk shipping sector.

The session opened with remarks from INTERCARGO Chairman Mr John A. Xylas, who stated that "until now, the bulk carrier sector did not have a ded-



L-R: John A. Xylas, Panagiotis Korakas, Capt. Stamatis Dimitrakis, Onnik Chatsikian, Capt. Georgios Kyrkorianos, Dr Alexandros Glykas, Dimitris Monioudis, Tom Fitchew, Kostas Petrakis, Jacob Damgaard, Capt. Panagiotis Nikiteas, Capt. Mehmet Emin Atalay

icated industry reference specifically addressing STS operations. This comprehensive guide is designed to support safe, efficient, and well-managed STS operations for bulk carriers. It reflects the collective knowledge and the operational experience of many professionals who contributed to its development. Their contribution demonstrates how the industry can work together to improve safety standards and operational practices.

INTERCARGO represents owners operating more than 4,500 bulk carriers worldwide. One of our core priorities is to promote safe and responsible operations across the global dry bulk fleet. Initiatives such as this guide form part of our broader commitment.

Safety has always been at the heart of our industry. Over the years, significant progress has been made through improved ship design, operational procedures, and better training. However, safety is never static; it requires continuous learning, adaptation, and a willingness to share knowledge openly. This guide is intended to support exactly that objective. It is a practical tool that operators, masters, crews, and technical managers can use to better understand the challenges associated with STS operations and to apply best practices in their day-to-day work".

Subsequently, the Chairman of INTERCARGO's Technical Committee, Mr Dimitris Monioudis, delivered a detailed presentation, pointing out that "shifts in cargo flows, particularly towards regions such as Africa, where port infrastructure is still under development, make a clear guidance framework imperative. The events of recent years clearly demonstrate this necessity".

Capt. Georgios Kyrkorianos, Commercial Representative and Regional ESG & Quality Assurance Manager at NYK Group, stressed that "safety in STS operations starts with the information shared between the involved parties. Shippers play a key role in this process, as the quality and timing of the information determine the quality and timing of the operation. When information is late or incomplete, risks increase and delays follow. Looking ahead, with the Simandou iron ore project coming on stream, we can expect more STS activity in West Africa. This makes early and complete information from shippers even more critical for planning safe operations".

On behalf of DYNAMARINe, CEO Dr Alexandros Glykas described the event as "a particularly significant milestone for STS operations worldwide and for INTERCARGO", noting that the new publication is the result of a coordinated effort by the shipping community. As



Recent developments in critical maritime routes, such as the conflicts in the Strait of Hormuz, are intensifying the search for alternative supply chains, promoting solutions that involve transshipments between bulk carriers. It is, therefore, even more imperative for all stakeholders to adopt more structured, safe, efficient, and mutually acceptable procedures.

he stated, "the new guidelines provide a comprehensive framework for the safe conduct of STS operations between bulk carriers, and there is no longer any excuse for practices that do not meet the required standards". The message is clear: all STS operations must be conducted in accordance with INTERCARGO's best practices, and all vessels involved must comply with the framework outlined in the new guide.

Jacob Damgaard, Divisional Director and Head of Loss Prevention at the Britannia P&I Club, emphasised that "the existence of a unified framework is critical not only for safety but also from a commercial standpoint, as it creates a common point of reference for the industry and strengthens the position of companies". As he noted, "this effort is not the end, but the beginning of a broader process to enhance safety and consistency in the industry".

Representatives of Chartworld Shipping Corporation, Kostas Petrakis, Director of HSQE, and Onnik Chatsikian, DPA, stated that "the guidelines introduce safety, uniformity, and clarity to dry bulk STS operations, strengthening risk management while providing a clear framework at the legal and insurance levels".

Finally, representatives of Maran Dry Management Inc., Capt. Stamatis Dimitrakis, Operations Manager, and Capt. Panagiotis Nikiteas, DPA, CSO and HSQE Manager, emphasised that "knowledge and information are power, which is why this publication is of particular importance. The new STS guidelines are essential in promoting operational consistency and reducing the risk of disruption. They demonstrate that the dry bulk sector is capable of self-regulation, while serving as a benchmark that will contribute to substantial improvements throughout the value chain".

Also particularly noteworthy were the remarks offered by Capt. Mehmet Emin Atalay of Oldendorff Carriers and Tom Fitchew of Fendercare Marine, who emphasised the value and significant contribution this publication is expected to make to the operation of dry bulk carriers.

The discussion was moderated by Mr Panagiotis Korakas, Executive Director of Isalos.net and Head of Cultural Heritage at *Naftika Chronika*.

By convening stakeholders from across the maritime value chain, INTERCARGO aims to support a more integrated approach to STS transfers, with wider engagement expected as the industry works towards greater consistency in how these operations are carried out.

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Maritime industry

Initiatives of the maritime community for the benefit of Greek society

Stavros Niarchos Foundation: Another donation for Greek healthcare

On Wednesday, 22 April, the "Attikon" University General Hospital in Athens held a blessing ceremony for the new building complex being added to its campus through a grant from the Stavros Niarchos Foundation (SNF), as part of its Global Health Initiative (GHI). During the event, the Co-President of the Stavros Niarchos Foundation, Andreas C. Dracopoulos, delivered a speech, while Adonis Georgiadis, Minister of Health, Gerasimos Siasos, Rector of the University of Athens, Spyridon Apostolopoulos, Director of the "Attikon" University Genral Hospital, and Dr Panagiotis Koulouvaris, Assistant Professor at NKUA, also gave remarks.

The new building complex will include accommodation for on-call medical staff, addressing a long-standing structural shortcoming of the hospital, which was built without provision for staff rest facilities, resulting in doctors having to use patient beds during their shifts. The construction of a specialised building will immediately free up already-equipped rooms for inpatient care, thereby enhancing the hospital's overall capacity to serve patients while also improving working conditions for medical and nursing staff. The building complex will also house a coordination centre for the Mobile Medical Units (MMUs), implemented by Regeneration & Progress in collaboration with AEMY S.A. (Health Units S.A.), under the scientific supervision of the First Orthopaedic Clinic of the National and Kapodistrian University of Athens (NKUA), and created at the initiative of, and supported in full by, SNF. It will also house the Centre for Therapeutic Exercise, as well as the SNF Complex Joint Reconstruction Centre.

The new buildings are expected to be completed and handed over to the Greek state in 2027. The grant for their construction is part of SNF's Global Health Initiative (GHI). With a total budget exceeding one billion dollars, the GHI includes more than 100 grants in Greece and abroad, such as the design, construction, and outfitting of three new, state-of-the-art hospitals in Komotini, Thessaloniki, and Sparta, the procurement of critical equipment such as air ambulances for the National Center of Emergency Care (EKAV), mental health initiatives, training programmes for health care providers, and a broad framework of international partnerships to promote innovation and the exchange of expertise and best practices.

The Minister of Health, Adonis Georgiadis, stated:

"I am very happy to be here today. If I start talking about the donations of the Stavros Niarchos Foundation to the National Health System, night will fall, and I will surely have forgotten many. It is impossible to easily grasp the scope of the interventions, both in terms of geographic coverage and depth, in every healthcare institution in the country – from psychiatric facilities, mobile health units, and ICU renovations to almost anything one could imagine. I would truly like to thank Mr Andreas Dracopoulos for his swiftness, effectiveness, and above all, his humanity.

The National Health System has several great benefactors, and I thank them all. – even the smallest donor, for example, the lady from Patras who donated an ambulance to the National Centre of Emergency Care (EKAV) from her own income. Across this entire spectrum of major benefactors, the Stavros Niarchos Foundation is undoubtedly the national champion. The three hospitals we are set to receive within the next 12 months alone will completely change the country's healthcare map.

The project we are inaugurating here today is a very important one. The "Attikon" University General Hospital is one of the flagship institutions of the National Health System. It was originally designed to serve 80,000 people per year, but in reality it serves 200,000. Its needs are therefore substantial. That is why it is now one of the few hospitals where, unfortunately, there are patients still being treated on stretchers.

To resolve this issue, the Ministry of Health has implemented an ambitious plan, of which today's project – the construction site we are inaugurating – is a crucial part. First of all, we will build dormitories for doctors and provide our on-call doctors with humane working conditions. Doctors are hardworking

benevolence

Edited by: Panagiotis Korakas



Credit: Ministry of Health

people; they deserve dignity in their work, and it is our responsibility to provide it. We thank the Stavros Niarchos Foundation for making this possible through today's project.

Secondly, by relocating the doctors to the building we will construct, we will free up 52 beds in the main hospital, which will be added to the internal medicine clinic. This means 52 fewer stretchers and, therefore, 52 fewer people suffering hardship during each on-call shift".

The President of the Stavros Niarchos Foundation, Mr Andreas Dracopoulos, stated:

"All of us at the Stavros Niarchos Foundation are particularly proud to support the construction of three new hospitals in Komotini, Thessaloniki, and Sparta, which will be an invaluable addition and significant reinforcement to Greece's National Health System. However, it is hospitals such as the "Attikon" University General Hospital that serve as the flagships of our national healthcare system and have remained at the forefront of patient care for decades, often under adverse conditions, earning the trust of the public over time.

We would like to express our heartfelt thanks to the nursing, medical, and administrative staff, as well as the cleaning personnel, for their dedication. Their tireless efforts have made the "Attikon" an integral and invaluable pillar of the National Health System, and we are delighted to have the opportunity to support their work once again".

HELMEPA: The scholarship programme for the academic year 2026–2027

The Hellenic Marine Environment Protection Association (HELMEPA) recently announced its scholarships for the 2026-2027 academic year, for full-time Master's level (postgraduate) studies of one or up to two years' duration, with physical attendance, at Universities in Greece, other Member States of the European Union, the United Kingdom, and Switzerland.

The scholarship amount is €7,500 for postgraduate studies in Greece and €15,000 for postgraduate studies abroad, regardless of the official duration of the studies.

HELMEPA's scholarship programme aims to support the development of highly qualified professionals with prospects for employment in Greece, with



strong academic foundations in the fields of Shipping, Environment, Environmental Education, and Education for Sustainable Development, or Naval Architecture and Marine Engineering, while also rewarding academic excellence and providing financial support to students with greater economic need.

The following scholarships are awarded:

For postgraduate studies in Shipping:

- In memory of George P. Livanos, founder of HELMEPA.
- In memory of Athina I. Martinou, donated by the Athina I. Martinou Foundation.
- In memory of Nikolaos S. Apostolopoulos. The scholarship is generously donated by the family of the deceased. Priority will be given to studies related to Maritime Law and Marine Insurance.

For postgraduate programmes in Environmental Studies:

- In memory of Captain Vassilis C. Constantakopoulos, HELMEPA's Honorary Chairman.
- In memory of Vassos Hajioannou. The scholarship is generously donated by the family of the deceased.

For postgraduate programmes in Environmental Education and Education for Sustainable Development, or Naval Architecture and Marine Engineering:

- In memory of Stavros Daifas. The scholarship is generously sponsored by his daughter, Ms Irene S. Daifas, Member of the Board of Directors of HELMEPA.

The requirements for the applicants are that they must be up to 32 years old, have completed their studies at a Greek higher education institution, College, or Merchant Marine Academy, with a degree grade of 7.5/10 or above, and have secured a letter of acceptance to a full-time postgraduate programme of one or up to two years' duration.

Interested applicants must submit their application electronically, along with the required supporting documents, by 24 May 2026.

For further information, interested applicants may contact HELMEPA's New Generation Manager, Dimitris Kazas, at dkazas@helmepa.gr, or call +30 210 9343088.

Aikaterini Laskaridis Foundation: A multidisciplinary educational mission in Kalymnos

The Aikaterini Laskaridis Foundation inaugurated its new cycle of regional Educational Missions for 2026, aiming to disseminate knowledge and enhance the educational experience of students and teachers throughout Greece.

From 19 to 23 April 2026, a multidisciplinary programme of activities for primary and secondary education students was held in Kalymnos, in cooperation with the local educational community.

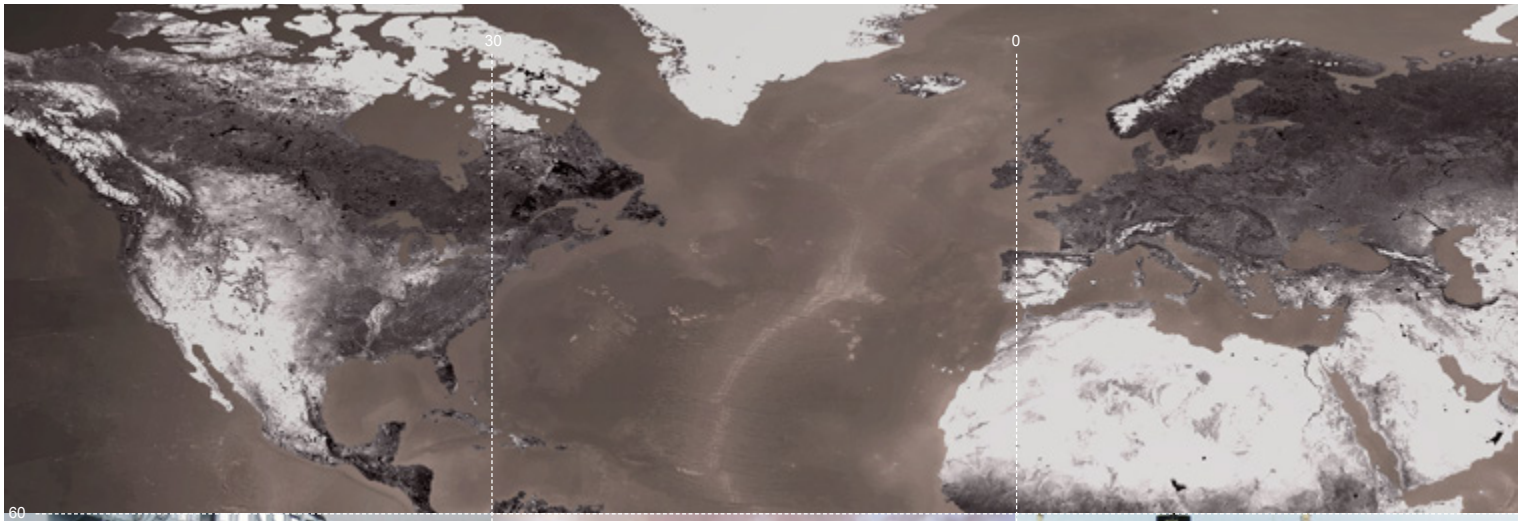
The activities covered a broad range of fields, from artificial intelligence and programming to art, rhetoric, and creative expression, cultivating skills essential for the modern learning environment.

Specifically, the following educational programmes were implemented:

- Responsible Artificial Intelligence for children – Instructor: Dr Michalis Feidakis, Lecturer at the Department of Electrical and Electronics Engineering, University of West Attica.
- Robotics and programming: First steps into technology – Instructor: Antonios-Periklis Michalopoulos (MSc), Software Developer, Researcher
- Art history & artists: Mystery in the museum – The case of Konstantinos Volanakis – Instructor: Venia Pastaka, Art Historian
- Debate workshop – Instructor: Melina Sidiropoulou, Journalist, Author
- "Shall I tell you a story?": How our expressive means inspire story creation through painting – Instructor: Panos Kougias, Actor, Director
- "Storm chasers read in a privileged hiding place" – Instructor: Dikaios Chatziplis, Writer, Educator

The Foundation's ten-member team visited 37 schools, including the schools of Telendos and Pserimos, the Evening Gymnasium with High School Classes, the Evening Vocational Senior High School (EPALE), and the Laboratory of Special Vocational Education (E.E.E.E.K.), which delivers educational programmes to 2,870 students, confirming the strong impact and the need for similar initiatives in Greece's regional areas.

This initiative is part of the strategic plan of the Aikaterini Laskaridis Foundation to promote equal access to knowledge, bringing modern themes and educational tools to every student.





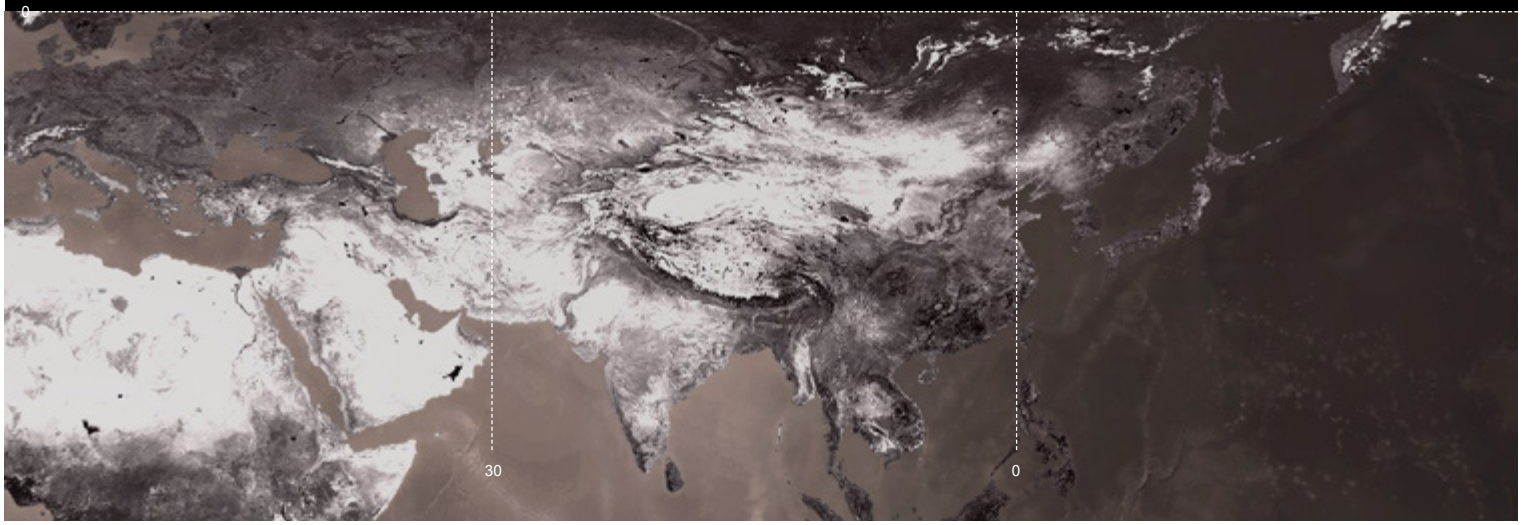




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Panama:

Leading the future of autonomous navigation

At a time when the maritime industry is undergoing one of its most profound transformations, Panama continues to reaffirm its position as a global leader in innovation, safety, and regulatory excellence. As the world's largest ship registry, Panama is not merely adapting to the emergence of Maritime Autonomous Surface Ships (MASS); it is actively shaping the future of autonomous navigation.

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The evolution toward autonomous shipping represents a defining moment for global maritime transport. Advances in digitalization, artificial intelligence, and remote operations are redefining how vessels are operated, monitored, and managed. In this rapidly changing environment, Panama has embraced a forward-looking strategy that combines technological adoption with a robust and flexible regulatory framework, ensuring that innovation is matched by responsibility.

A landmark moment in this journey occurred in September 2019, when the Panama Ship Registry supported one of the world's first Maritime Autonomous Surface Ships trials. The roll-on/roll-off vessel IRIS LEADER, operated by Nippon Yusen Kabushiki Kaisha (NYK), completed a voyage under autonomous navigation systems in accordance with the guidelines of the International Maritime Organization (IMO). This achievement underscored Panama's proactive role in enabling real-world applications of emerging technologies while maintaining the highest standards of safety and compliance. This milestone was not an isolated initiative, but rather part of a broader vision. Panama recognizes that the future of shipping lies in a balanced integration of human expertise and advanced technological systems. Autonomous navigation is not intended to replace the human element, but to enhance it—creating a safer, more efficient, and more sustainable maritime environment. By supporting hybrid operational models that combine onboard crews with shore-based control systems, Panama ensures continuity, reliability, and operational excellence.

Another successful sea trial comes from SM Korealine Co., part of SM Group's maritime division, whose subsidiary Korealine LNG received Panama flag approval in 2023-2024, for the autonomous operation of its bunkering vessel, SM Jeju LNG 2. The vessel completed autonomous navigation trials on the Tongyeong–Jeju route using technology developed by Samsung Heavy Industries and duly approved by an IACS, marking a step toward wider adoption in commercial shipping.

The strength of the Panama registry lies in its ability to evolve. Its regulatory framework is designed to accommodate innovation while preserving the fundamental principles of maritime law. Through a functional and inclusive interpretation of what constitutes a vessel, Panama is well-positioned to incorporate autonomous ships within its registry, regardless of the degree of human intervention involved. This adaptability provides clarity and confidence to shipowners, operators, and investors navigating the transition toward automation.

At the same time, Panama remains firmly aligned with the pillars established by the International Maritime Organization: safety of life at sea, environmental protection, and operational integrity. The introduction of MASS technologies is being approached with a structured and phased methodology, ensuring that each step forward is supported by rigorous testing, compliance mechanisms, and international cooperation. This commitment reinforces Panama's reputation as a registry that prioritizes both innovation and responsibility.

Beyond regulatory leadership, Panama is investing in the future of maritime human capital. The rise of autonomous systems is redefining traditional roles within the industry, giving rise to new professions such as remote operators, data analysts, and shore-based engineers. Panama is actively supporting this transition by promoting the development of specialized expertise and fostering a modern workforce capable of managing advanced maritime technologies. In doing so, the registry not only adapts to change but drives it.

The global nature of shipping requires collaboration, and Panama continues to work closely with international partners, classification societies, and technology providers to advance the adoption of autonomous navigation. By facilitating cooperation across jurisdictions and encouraging the exchange of knowledge and best practices, Panama strengthens the collective ability of the maritime community to address the challenges and opportunities of digital transformation.

In an industry where trust, reliability, and efficiency are paramount, Panama offers a stable and forward-thinking platform for shipowners worldwide. Its commitment to innovation is matched by its dedication to maintaining a transparent, efficient, and service-oriented registry. This combination of scale, expertise, and adaptability positions Panama as the flag of choice for the next generation of vessels.

Looking ahead, the path toward fully autonomous shipping will continue to evolve. Regulatory frameworks are expected to mature in the coming years, with the International Maritime Organization working toward the implementation of comprehensive MASS regulations. Throughout this process, Panama remains at the forefront, actively contributing to the development of policies that will define the future of the industry.

Panama's vision is clear: to lead the maritime sector into a new era where technology and human expertise work in harmony to deliver safer, smarter, and more sustainable shipping. By embracing innovation while upholding the highest standards of governance and safety, Panama is not only responding to change — it is setting the course.

As the maritime world navigates the complexities of autonomy, Panama stands as a trusted partner and a global benchmark, demonstrating that progress and responsibility can move forward together.



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smart shipping

Challenges and opportunities ahead



The shipping industry is entering a defining phase of transformation, where digitalisation, artificial intelligence, and advanced analytics are no longer optional tools but strategic priorities. As global shipping faces mounting pressure to improve efficiency, reduce emissions, and enhance transparency, the adoption of smart technologies is rapidly reshaping both operations at sea and decision-making on shore.

In this special feature on "Smart shipping, executives from leading ship management companies and classification societies share their insights on how innovation is influencing fleet competitiveness, cost structures, and ESG performance. At the same time, the industry must confront critical questions around data transparency, the expectations of charterers and cargo owners, and the growing exposure to cyber risks as vessels become more connected and software-driven.

From the practical application of data analytics in optimising fuel consumption and reducing CO_2 emissions, to the evolving roles of seafarers and shore-based teams, the feature highlights both the opportunities and the challenges of this transition.



In the long run, the most successful organisations will be those combining technology with stronger human capability

Konstantinos Vlachos explores how digitalisation and AI are reshaping fleet competitiveness across freight rates, operating costs, and ESG performance. He examines the evolving role of seafarers and shore-based teams, the growing expectations for transparency from charterers and cargo owners, and the rising importance of cyber resilience, as well as the long-term shift toward integrated, intelligent ship-shore ecosystems that will define the next decade of smart shipping.



Opinions expressed by
Konstantinos Vlachos,
Chief Technical Operations Officer
at Castor Ships

How are digitalisation and AI currently influencing your fleet's competitiveness in terms of freight rates, operating costs, and ESG performance?

Digitalisation and AI are gradually becoming competitive differentiators across all three areas. On freight rates, the benefit is not always direct in the sense of "AI producing higher rates", but it does improve the quality of commercial decisions.

Digitalisation and AI are now directly linked to voyage economics. ERP platforms for weather and voyage optimisation enable continuous tuning of speed and routing based on sea state, congestion, and contractual constraints, trimming bunker consumption and carbon-cost exposure while still meeting ETAs. Better voyage planning, more accurate performance monitoring, and faster access to operational data also help owners present vessels more credibly to charterers and respond more effectively to market opportunities.

In practice, the latest platforms report typical fuel and CO_2 savings in the mid-single digits per voyage, with even greater gains on weather-sensitive lanes. These improvements flow directly into TCE performance and, under the EU ETS regime, translate into lower allowance requirements. In a competitive market, transparency and reliability often support stronger commercial positioning.

On operating costs, the impact is becoming increasingly tangible. Digital tools allow closer monitoring of machinery condition, hull and propeller performance, and more effective troubleshooting, reducing the time required to diagnose and correct technical issues. This improves planning, reduces inefficiencies, supports better maintenance timing, and helps avoid unnecessary cost escalation. Even small gains in fuel efficiency, off-hire prevention, and maintenance optimisation become very meaningful when multiplied across an entire fleet.

From an ESG perspective, digitalisation and AI support are now essential. They enable emissions monitoring, regulatory compliance, and evidence-based decision-making on decarbonisation measures. In practice, they help shipowners move from broad ambition to measurable performance. Fleets that use data intelligently are better positioned to improve CII ratings, support compliance with the EU ETS and FuelEU, and demonstrate progress to charterers, financiers, and other stakeholders.

To what extent do data analytics and predictive models contribute to the reduction of fuel consumption and CO_2 emissions on a day-to-day basis?

They already contribute in a meaningful way, particularly when applied consistently and linked to strong operational discipline.

Day-to-day fuel consumption is influenced by a combination of speed, weather routing, trim, draft, engine load profile, hull condition, auxiliary loads, and port-related delays. Data analytics help operators understand these variables in real time and identify when performance deviates from expectations.

Continuous voyage optimisation and weather routing, supported by AI-based engines, can recalibrate route and speed every few hours, typically securing mid-single-digit fuel savings per voyage, with double-digit improvements occasionally achieved on certain trades.

Predictive models are especially valuable because they allow teams to move from reactive management to proactive optimisation. Instead of only explaining why consumption increased after the fact, they can indicate where efficiency is likely to deteriorate and where corrective action is needed. This may relate to voyage planning, engine settings, hull fouling trends, or maintenance scheduling. AI models trained on high-frequency operational data can detect performance drift — such as fouling or trim inefficiencies — and recommend small, persistent adjustments that compound into lower daily fuel consumption and improved CII performance.

As vessels become more connected and systems generate increasing volumes of information, crews are expected to interpret alerts, validate data, and operate increasingly sophisticated equipment.
The human element remains central because onboard operations still require judgment, prioritisation, and practical experience.

That said, the real value does not come from the model alone. The benefit materialises when analytics are integrated into daily operational decisions both onboard and ashore. In my view, the combination of accurate data, experienced interpretation, and disciplined follow-up is what produces measurable reductions in fuel consumption and CO_2 emissions. AI enhances this process, but operational judgment remains critical.

How is the role of seafarers and shore-based teams evolving with the introduction of AI, remote operations, and smart vessels?

The role is evolving from manual reporting and fragmented monitoring toward more informed, decision-oriented work.

For seafarers, this does not mean they become less important; in fact, their role becomes even more critical. As vessels become more connected and systems generate increasing volumes of information, crews are expected to interpret alerts, validate data, and operate increasingly sophisticated equipment. The human element remains central because onboard operations still require judgment, prioritisation, and practical experience.

For shore-based teams, digitalisation is changing the pace and quality of decision-making. Technical, operational, HSQE, and commercial departments now have access to more timely and detailed information, enabling earlier and more effective intervention. The focus is gradually shifting from managing events to anticipating them.



Automation is also shifting work from manual watch-standing toward decision-centred oversight. However, the human element remains responsible regardless of the level of autonomy. This supports a gradual "human-in-the-loop" transition rather than replacing people.

In the long run, the most successful organisations will not be those that replace people with AI, but those that combine technology with stronger human capability. Training, cross-functional understanding, and clear accountability will become even more important. Smart shipping will require smarter collaboration between ship and shore.

Are charterers and cargo owners advocating data transparency and digital performance reporting strongly enough?

Progress is real, but uneven. On the positive side, BIMCO's CII clauses require owners and charterers to collaborate on data sharing and voyage instructions that are consistent with CII compliance. At the same time, the Sea Cargo Charter has prompted many cargo interests to measure and publicly disclose their climate alignment, creating a growing expectation for verified per-voyage emissions data.

The overall direction is clearly toward greater transparency. Some charterers and cargo owners are placing much stronger emphasis on emissions data, voyage efficiency, and verified performance reporting, particularly those with strong ESG commitments or exposure to investor and customer scrutiny. For them, transparency is no longer optional.

However, the market is not yet fully aligned. In many cases, a gap remains between the desire for detailed reporting and the willingness to standardise expectations, share responsibilities, or reward performance. Owners are often asked to provide increasingly granular operational data, but the commercial framework does not always fully recognise the value of operational efficiency and transparency.

Going forward, stronger collaboration will be needed. If the industry aims to improve environmental performance and operational efficiency, owners, charterers, and cargo interests will need a more consistent approach to data quality, reporting standards, and performance incentives. Broader adoption of common data models and independent verification is still required to make "like-for-like" comparisons routine.



Has cyber risk become a serious threat to fleet safety and business continuity as ships become increasingly connected and software-driven? To what extent is the industry truly prepared to protect itself against these threats?

Cyber risk has unquestionably become a serious threat to both fleet safety and business continuity.

As vessels become more connected, the potential consequences of a cyber incident extend beyond office systems and administrative disruption. They can affect communications, navigation support, cargo operations, maintenance

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I do not believe the future of shipping lies in removing the human element but rather in equipping people with better tools and greater operational visibility. The companies that successfully combine operational experience with intelligent digital systems will achieve the strongest and most sustainable competitive advantage.

systems, and the overall integrity of ship-shore interaction. In a highly connected operating environment, cyber resilience has become an integral component of overall operational resilience.
The industry has made notable progress in recent years: awareness has increased, regulatory expectations have become clearer, and many companies have introduced cyber procedures, crew training, access controls, and incident response frameworks.
The regulatory and standards response has also accelerated. The IMO updated its Guidelines on Maritime Cyber Risk Management (MSC-FAL.1/Circ.3/Rev.3) and embedded cyber risk into the ISM Code through Resolution MSC.428(98), requiring cyber risks to be addressed within Safety Management Systems. IACS has also placed "safe digital transformation" on its agenda and issued cyber-resilience recommendations.
Nevertheless, preparedness across the industry remains uneven. While guidance is becoming increasingly clear, maturity levels still vary across fleets, supply chains, and training programmes. Some organisations treat cyber risk as a core operational and safety issue, while others continue to approach it primarily as an IT matter.
Cybersecurity must be embedded across vessel operations, procurement decisions, software management, crew awareness, and leadership oversight. Technology alone will not solve the issue; preparedness depends on strong governance, discipline, and continuous training. Ultimately, cyber risk must be treated as a core safety and business continuity issue rather than a mere IT concern.

Looking ten years ahead, which element of smart shipping do you believe will be the most transformative and why?

The most transformative element will be the integration of intelligent decision-support across the full ship-shore ecosystem.
In other words, it is not about a single isolated technology, but rather about the ability to integrate vessel performance, voyage planning, maintenance, emissions management, safety management, and commercial decision-making into a single, continuous, data-driven operating model.
This will be transformative because shipping has traditionally operated with fragmented information flows and delayed feedback loops. When these systems become integrated, owners will be able to make better decisions faster, reduce inefficiencies, improve safety, strengthen compliance, and deploy capital more effectively.
Such integration will also support more credible decarbonisation pathways because efficiency improvements will be measured and managed under real operating conditions.
I do not believe the future of shipping lies in removing the human element but rather in equipping people with better tools and greater operational visibility. The companies that successfully combine operational experience with intelligent digital systems will achieve the strongest and most sustainable competitive advantage.
For me, smart shipping is ultimately not about technology for its own sake. It is about using technology in a practical, disciplined way to make fleets safer, more efficient, more transparent, and better prepared to meet the commercial and environmental demands ahead.

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The evolution toward smart shipping does not reduce the importance of maritime professionals; it elevates it

Capt. Nestor Grigoropoulos highlights that smart shipping is driven not by autonomy but by the powerful combination of digital tools and human expertise. He stresses that AI enhances efficiency, transparency, and decision-making, while the industry's real progress depends on skilled professionals, aligned regulations, and realistic pathways for decarbonisation.



Opinions expressed by
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How are digitalisation and AI currently influencing your fleet's competitiveness in terms of freight rates, operating costs, and ESG performance?

Digitalisation and AI influence competitiveness primarily by enhancing operational control rather than altering the structural forces that determine freight rates. Market pricing remains externally driven, but technology improves a fleet's performance within that environment. By strengthening cost visibility and reducing operational uncertainty, digital systems contribute to sustained commercial resilience.

From an operating cost perspective, AI-supported analytics allow continuous examination of fuel consumption behaviour, machinery efficiency, and voyage performance under dynamic conditions. Instead of relying on retrospective reporting, operators can intervene in real time, thus shortening response cycles, reducing inefficiencies before they compound, and supporting more accurate budgeting. Over time, this translates into greater cost stability, which is particularly valuable during volatile market cycles.

In terms of ESG performance, digitalisation enables structured, traceable environmental reporting. Emissions monitoring, performance benchmarking, and automated data aggregation strengthen the credibility of disclosures. However, ESG competitiveness is also shaped by the regulatory framework in which vessels operate. When regulatory regimes diverge across jurisdictions, compliance costs increase and strategic planning becomes more complex. Technology can enhance transparency and efficiency, but it cannot neutralise regulatory inconsistency. Sustainable competitiveness, therefore, requires both intelligent operational systems and coherent global regulatory alignment.

To what extent do data analytics and predictive models contribute to the reduction of fuel consumption and CO_2 emissions on a day-to-day basis?

Data analytics contribute to daily emissions reduction through precision and repeatability. Predictive models assist in determining optimal speed settings under varying weather patterns, identifying performance drifts in propulsion systems, and refining voyage planning to minimise unnecessary consumption. These decisions are made continuously and influence fuel consumption on every leg of a voyage.

The key impact of analytics lies in reducing operational deviation. Even minor discrepancies between planned and actual performance accumulate over time. By identifying these deviations early, analytics prevent small inefficiencies from becoming systemic losses. This disciplined optimisation process delivers measurable improvements across fleets without requiring major capital interventions.

However, day-to-day optimisation operates within technological limits. While analytics refine performance within current propulsion frameworks, the broader decarbonisation trajectory depends on fuel transition pathways. The limited availability of scalable alternative fuels presents practical constraints. When regulatory expectations outpace fuel supply readiness, operational optimisation alone cannot bridge the gap. In such circumstances, financial compliance mechanisms risk becoming economic pressure points rather than catalysts for innovation. Sustainable emissions reduction requires alignment between regulatory ambition and technological feasibility.

How is the role of seafarers and shore-based teams evolving with the introduction of AI, remote operations, and smart vessels?

The integration of AI, remote monitoring, and smart vessel technologies is fundamentally reshaping operational roles by shifting the emphasis from manual execution toward analytical supervision and decision validation. Seafarers are increasingly operating within data-rich



environments where systems provide recommendations based on predictive models, performance analytics, and real-time situational inputs. As a result, the role of the modern officer is evolving toward interpreting data outputs, assessing system reliability, and maintaining operational awareness while managing automated processes.

This transformation places significant importance on structured upskilling and reskilling initiatives. Traditional seamanship remains the foundation of safe operations, but it must now be complemented by digital competence, systems understanding, and the ability to critically evaluate algorithmic outputs. Training programmes must therefore evolve beyond procedural instruction and focus on the development of analytical thinking, data literacy, and the capacity to recognise when automated guidance may not fully reflect operational reality. Continuous professional development will become essential to ensure that technological advancement strengthens rather than undermines human expertise.

For shore-based teams, remote operations and real-time data access are creating a more integrated operational environment. Technical managers, performance analysts, and safety departments are increasingly involved in proactive oversight, allowing earlier identification of risk trends and supporting informed decision-making during voyages. This collaborative model enhances fleet consistency and operational learning across vessels. However, the expansion of remote capabilities requires clear governance frameworks to maintain accountability and avoid ambiguity in decision-making authority. The Master's role remains central, and effective digital integration depends on preserving clear lines of command while enabling informed support from shore.

Ultimately, the evolution toward smart shipping does not reduce the importance of maritime professionals; it elevates it. The industry's success will depend on investing in people through targeted upskilling and reskilling strategies that ensure technological innovation is matched by human competence and confidence.

The integration of AI, remote monitoring, and smart vessel technologies is fundamentally reshaping operational roles by shifting the emphasis from manual execution toward analytical supervision and decision validation.

Are charterers and cargo owners advocating data transparency and digital performance reporting strongly enough?

Charterers and cargo owners are increasingly advocating transparency, particularly regarding environmental performance and operational efficiency. Data-driven reporting enables stakeholders to assess risk exposure, alignment with compliance requirements, and supply chain sustainability with greater confidence. This trend has accelerated as ESG considerations become embedded in financing and procurement strategies. However, the implementation of transparency frameworks is not yet fully harmonised. Divergent regional requirements and differing data methodologies can generate compliance complexity. When reporting standards lack global alignment, they may introduce additional administrative layers that do not necessarily improve performance outcomes.

A further consideration is the economic structure of certain regulatory mechanisms linked to transparency. Where financial penalties or market-based schemes are imposed without global consistency, they may function as implicit economic transfers rather than performance incentives. This can affect commercial balance across trading routes and fleet segments. Effective transparency should therefore be embedded within globally coordinated regulatory systems that promote accountability without distorting competitiveness.

Has cyber risk become a serious threat to fleet safety and business continuity as ships become increasingly connected and software-driven? To what extent is the industry truly prepared to protect itself against these threats?

Cyber risk has become inseparable from operational safety as vessel systems integrate navigation, engineering, and communication platforms into interconnected digital architectures. A cyber incident today could potentially disrupt navigational integrity, interfere with cargo management, or interrupt commercial operations.

Industry awareness has advanced significantly, and cybersecurity is increasingly

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incorporated into safety management systems. However, preparedness levels vary depending on fleet age, technological integration, and organisational maturity. The coexistence of modern digital systems with legacy components introduces complexity that requires careful management.

Effective preparedness depends on layered defence strategies, clear governance protocols, and continuous awareness training. Cybersecurity cannot rely solely on technical safeguards; it must be embedded into daily operational culture. As digitalisation expands, maintaining system resilience and recovery capability becomes as important as preventing intrusion.

Looking ten years ahead, which element of smart shipping do you believe will be the most transformative and why?

Over the next decade, the most transformative element of smart shipping will be the emergence of truly integrated decision-support ecosystems — platforms that synthesise operational, environmental, and risk data into coherent, real-time insights that meaningfully inform human decision-making.

These systems will go beyond automation of reporting. Their real value lies in structuring complexity, translating performance trends, metocean data, compliance requirements, and safety indicators into clear, actionable guidance. The competitive advantage will therefore belong to organisations that embed these tools into disciplined operational processes, ensuring consistency of execution rather than fragmented digital adoption.

In evaluating the future of smart shipping, it is essential to distinguish between incremental progress and aspirational narratives.

The IMO's framework for Maritime Autonomous Surface Ships (MASS) confirms that autonomy evolves in stages, from decision-support systems (Degree 1) to fully autonomous vessels (Degree 4). Today, commercial shipping remains firmly within Degree 1, where technology enhances, but does not replace, human control. Early developments toward Degree 2 exist, but remain limited in scope and operational maturity, while higher degrees of autonomy are not yet aligned with current regulatory or commercial realities.

This position is further reflected in fleet investment decisions. With more than 700 vessels on order under Greek ownership alone, the industry continues to invest capital in conventionally crewed ships. These vessels increasingly incorporate advanced digital systems, but their design philosophy remains centred on human oversight, demonstrating that the industry's trajectory is not toward removing the human element, but toward strengthening it through better tools.

Looking ahead, the pace and direction of transformation will be influenced by factors beyond digital capability. The limited availability of alternative fuels and the lack of globally harmonised regulation introduce practical constraints that shape investment decisions. In such an environment, systems that enhance operational efficiency and support compliance across varying regulatory regimes will deliver more immediate value than standalone advances in autonomy.

The defining feature of the next phase of smart shipping will therefore be integration, not only of data, but of technology within a stable operational and regulatory framework. The combination of advanced digital support with experienced human judgment will remain central to safe and efficient maritime operations, enabling the industry to navigate increasing complexity with clarity and control.

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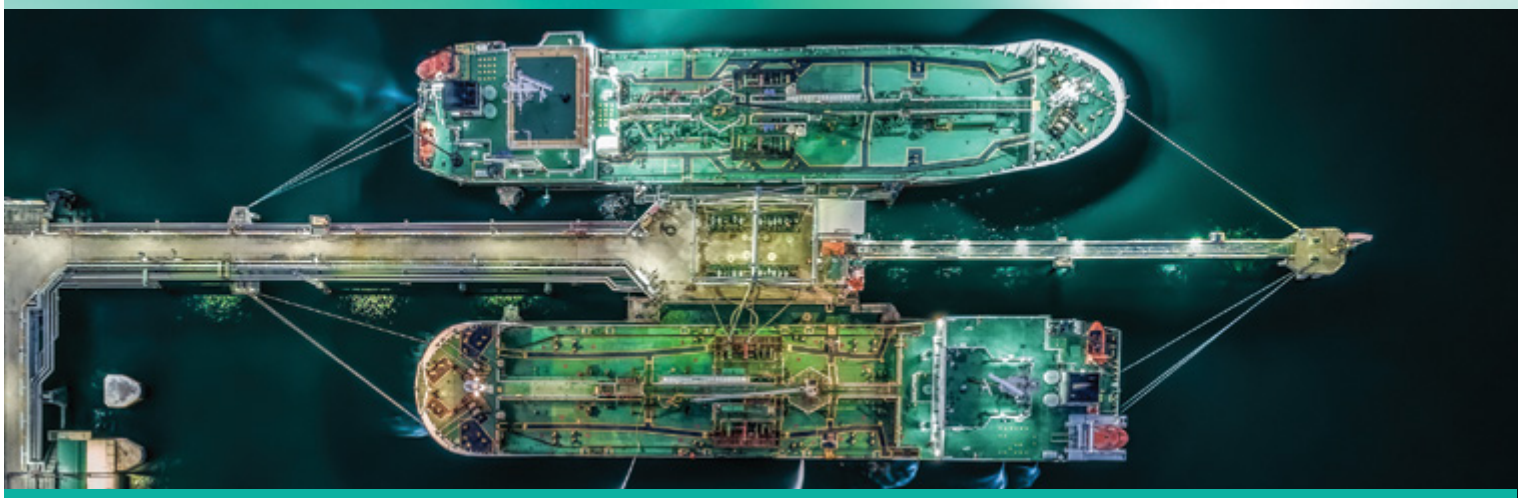
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The maritime industry is moving toward greater transparency and more robust digital performance reporting

Maria Tsompanoglou reflects on the evolving dynamics of the Greek shipping sector, examining how operational demands, regulatory pressures, and shifting labour-market expectations are reshaping the profession. Drawing on her long experience across technical and managerial roles, she offers a grounded perspective on the skills, structures, and cultural shifts required to sustain competitiveness in an increasingly complex maritime environment.



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How are digitalisation and AI currently influencing your fleet's competitiveness in terms of freight rates, operating costs, and ESG performance?

The maritime shipping sector is entering a particularly challenging phase. Between volatile freight markets, rising operating costs, and increasingly strict ESG requirements, it is clear that traditional ways of operating are no longer enough, which is exactly why digitalisation and AI are not just relevant but are quickly becoming essential.

These technologies are fundamentally reshaping how companies think about operations and competitiveness. Tools like predictive analytics and real-time monitoring are no longer optional add-ons; they are actively enabling smarter, faster, and more informed decision-making. From what I can see, areas like predictive maintenance and route optimisation are already delivering tangible benefits, such as reduced fuel consumption and less downtime, which directly strengthen fleet performance.

What stands out is how real-time data and advanced analytics allow for continuous diagnostics and early fault detection. This kind of responsiveness creates opportunities for dynamic optimisation that were not possible before. Similarly, advanced forecasting models seem to give companies a stronger advantage in navigating market volatility, a long-standing challenge in this industry.

However, the transition is not as straightforward as it may seem. There are still significant barriers that cannot be overlooked. High investment costs, fragmented regulations, and persistent data-sharing issues make large-scale adoption difficult. On top of that, the shortage of a skilled workforce is one of the most critical constraints.

There are also deeper, longer-term uncertainties that raise important questions. For instance, we still do not fully understand how digitalisation and AI will impact fleet competitiveness across different operational contexts, or how human interaction with increasingly intelligent systems will evolve over

time. Other issues, like the high cost of advanced AI models, resistance to organisational change, ethical considerations, and the need for robust data governance, add further complexity.
Ultimately, education and training are becoming central to addressing many of these challenges. A more multidisciplinary approach is essential if the industry wants to remain competitive in this new environment.
At the same time, more targeted policy support, continued investment in infrastructure, and greater standardisation of digital solutions will be essential to enable broader and more effective adoption of digital and AI-driven tools. Standardisation is particularly critical, yet it is not discussed enough and is often overlooked. Without standardisation, even the most advanced solutions may ultimately fall short of delivering real value.

To what extent do data analytics and predictive models contribute to the reduction of fuel consumption and CO_2 emissions on a day-to-day basis?

Data analytics and predictive models are already making a meaningful difference in reducing daily fuel consumption and CO_2 emissions. What makes them so valuable is their ability to support more accurate decision-making, enable real-time monitoring, and improve fuel management in ways that were previously impossible. I find hybrid models particularly interesting; by combining physics-based approaches with machine learning, they appear to strike a strong balance between accuracy and interpretability. Even with relatively limited datasets, these models can deliver highly reliable predictions, which is quite impressive. At the same time, they offer operational flexibility that enables continuous, real-time adjustments.
However, it is important not to overlook what these systems depend on. Their effectiveness is closely tied to the quality and integration of data coming from multiple sources. Without well-structured and reliable datasets, even the most advanced models will struggle to deliver consistent results. In my view, their full potential remains somewhat constrained by ongoing challenges in organisational alignment, technical implementation, and data governance.
Recent developments seem to reinforce the importance of hybrid approaches. Integrating domain-specific knowledge, such as hydrodynamics or engine-performance models, with machine learning is, I believe, one of the most promising directions forward. These models not only achieve very high levels of accuracy but also remain understandable, which is critical for real-world applications and trust.
I see data fusion, AI, and real-time monitoring systems as key enablers of both operational efficiency and emission reduction. However, significant barriers remain to be addressed. Organisational integration is often more complex than anticipated, and issues around data governance and cybersecurity continue to raise legitimate concerns.



How is the role of seafarers and shore-based teams evolving with the introduction of AI, remote operations, and smart vessels?

The role of seafarers is undergoing a significant transformation. What was once largely based on manual, hands-on operations is now shifting toward responsibilities that rely on remote monitoring, decision-making, and the management of increasingly complex digital systems. This shift demands a very different skill set, one that is far more cognitive, technical, and systems-oriented than before.

At the same time, shore-based teams are taking on a much more active and influential role. They are no longer just providing support; they are becoming central to supervision and decision-making processes, often relying on AI technologies to optimise vessel performance and maintenance. This highlights that the transformation is not purely technological; it is human-centred. It requires not only new tools but also new ways of working, new organisational structures, and updated regulatory frameworks to ensure operations remain safe, efficient, and sustainable. Both seafarers and shore-based personnel are now expected to adapt continuously. Continuous learning is no longer optional; it is an ongoing requirement.

This transition is not without its challenges. Issues such as cybersecurity, human factors, and increasing mental workload are becoming more prominent and are still not being addressed as thoroughly as they should be. There is a clear need for training systems and regulations to evolve in step with these changes.

From my perspective, one of the biggest gaps lies in our understanding of human factors in remote operations. Areas such as mental health, fatigue, and ergonomic design are critical yet remain comparatively under-researched. Risks, including loss of expertise, boredom, and mental overload, could significantly affect safety and efficiency if left unaddressed. Therefore, stronger integration between shipboard and shore-based teams is essential, as multi-functional teams and better digital platforms could substantially improve coordination and communication, which are becoming increasingly complex in this new operating environment.

On the regulatory side, existing frameworks are inadequate to meet the demands of AI-enabled and remote operations. There is a real need for updated regulations, especially in areas such as watchkeeping and fatigue management, to reflect this new reality.

I find hybrid training approaches particularly promising. Combining simulation-based learning with real-time remote operations could help bridge the gap between onboard experience and shore-based oversight. This kind of training can play a key role in improving situational awareness, strengthening human-machine coordination, and enabling faster, more effective decision-making, especially in critical situations.

Are charterers and cargo owners advocating data transparency and digital performance reporting strongly enough?

Charterers and cargo owners are increasingly pushing for greater data transparency and more advanced digital performance reporting, driven by both regulatory requirements and day-to-day operational needs. We are seeing a steady shift toward digital record-keeping, real-time data access, and the integration of digital platforms for operational and environmental reporting.

Regulatory, commercial, and sustainability pressures are all contributing to a growing demand for real-time data sharing, greater operational visibility, and increased environmental accountability. As a result, we see digital transformation gradually reshaping traditional shipping practices and opening the door to new ways of working with our charterers and ensuring compliance.

While many challenges remain, it is clear that technological progress and regulatory developments are advancing, particularly in the tanker segment, where stakeholders are already calling for uniform, scalable, and flexible systems. The bulk carrier segment is gradually moving in the same direction.

The demand for real-time data is highest where commercial and regulatory pressures align. In these cases, digital platforms play a key role in closing data gaps and enabling more consistent, efficient information-sharing.

From my perspective, several elements are key enablers to the digital transition: strong leadership, the right organisational culture, proper training, clear regulatory incentives, and effective collaboration through digital platforms. Existing regulatory frameworks such as IMO EEDI, SEEMP, EEXI, and CII, along with financial incentives, are already proving effective in encouraging wider adoption of digital reporting.

Overall, the direction is clear: the maritime industry is moving toward greater transparency and more robust digital performance reporting. But we see that the strength of this move varies across regions and sectors. In areas with more developed digital infrastructure and stricter regulations, such as Europe and the Americas, expectations around transparency and the pace of digital adoption tend to be higher.

Has cyber risk become a serious threat to fleet safety and business continuity as ships become increasingly connected and software-driven? To what extent is the industry truly prepared to protect itself against these threats?

Undoubtedly, it is a serious threat. Ships' increasing connectivity has expanded their exposure to cyber risks. What was once a relatively contained operational environment is now far more open, making unauthorised access, data breaches, and system disruptions not only possible but increasingly probable. These threats are no longer abstract; they have very real implications for fleet safety and business continuity, with the potential for serious operational and financial consequences if not properly addressed.

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Looking ten years ahead, I believe the most transformative element of smart shipping will be the shift toward autonomous operations. We are already seeing early forms of this transition, from semi-automated cargo-handling systems to advanced navigation-support tools, such as AI-driven collision avoidance and augmented-reality interfaces.

face grows, which is one of the most concerning developments. Unauthorised access to these systems could compromise critical operations and sensitive data. Even more troubling is that the impact of a cyber incident can extend well beyond technical disruption, potentially affecting the safety of life at sea, environmental protection, and the financial stability of shipping companies. Moreover, the human element remains one of the most vulnerable areas, as gaps in training and awareness among mariners continue to play a significant role in successful cyberattacks. While measures such as mandatory training, regular system updates, and clear reporting procedures are often recommended, their implementation remains inconsistent across the industry.

Given the growing complexity and sophistication of cyber threats, a multi-layered defence approach is essential. It should combine technical solutions, procedural safeguards, and strong attention to human factors. The use of advanced hardware and AI-driven software, for example, can greatly enhance the detection of navigation system attacks. However, in practice, the widespread adoption of these technologies is still limited.

While there have been important technological and regulatory advances, the industry's overall preparedness remains uneven. Inconsistent adoption of best practices, gaps in training, and varying levels of risk management maturity hinder progress.

In my view, effective risk mitigation relies on integrating technical controls, standardised protocols, continuous monitoring, and alignment with international regulatory requirements, with strong organisational preparedness built on both technology and human awareness.

Looking ten years ahead, which element of smart shipping do you believe will be the most transformative and why?

Looking ten years ahead, I believe the most transformative element of smart shipping will be the shift toward autonomous operations. We are already seeing early forms of this transition, from semi-automated cargo-handling systems to advanced navigation-support tools, such as AI-driven collision avoidance and augmented-reality interfaces. These technologies are enhancing situational awareness and reducing human error, but they also signal a much deeper structural change.

In my view, what makes autonomy truly transformative is not just the automation itself, but the convergence it represents. Automation brings together digitalisation, connectivity, energy efficiency, and safety into a single, integrated ecosystem. In this context, maritime communication networks will play a critical role, enabling real-time data exchange, remote operations, and seamless coordination between ship and shore.

Over the next decade, we are likely to see these technologies mature and integrate more fully, with autonomous shipping emerging at the centre of this evolution. This shift has the potential to deliver substantial improvements in operational efficiency, safety, and environmental performance. At the same time, it introduces complex challenges, particularly in terms of investment, regulatory adaptation, and the evolving role of the human operator.

The success of this transformation will depend on three key factors. First, technological integration — ensuring that systems are not only advanced but also interoperable and reliable. Second, regulatory evolution, including the development of international standards and clear liability frameworks. And third, a strong focus on human factors, through investment in training, effective human-machine interfaces, and organisational adaptation.

Ultimately, autonomy will not replace the human element but redefine it. In my opinion, the extent to which the industry manages this transition will determine how transformative these technologies truly become.

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The effective and smooth integration of AI applications across vessel and shore operations is the most transformative element of smart shipping

Iasonas Zacharioudakis views AI as the next phase in shipping's digital transformation, emphasising that data analytics and predictive modelling offer substantial potential to enhance overall vessel operational performance.



Opinions expressed by
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How are digitalisation and AI currently influencing your fleet's competitiveness in terms of freight rates, operating costs, and ESG performance?

Capabilities for improving fleet competitiveness have evolved progressively from limited data availability to large-scale data collection and are now moving toward the early phase of AI-assisted utilisation.

Digitalisation in shipping has become both operationally and financially feasible and has already delivered measurable gains by leveraging the growing availability of data. Automated data acquisition, digital platforms, and large-scale data-driven process visualisation have improved operational control and shifted the focus from manual data gathering to deeper data evaluation and more data-driven actions.

Using a simple example, digitalisation directly supports operating costs by enabling continuous measurement and tracking of fuel consumption, as well as the early detection of deviations that trigger data-driven actions. The same logic applies to emissions, as effort is no longer concentrated on collecting environmental data but on continuously and reliably tracking emissions drift, supporting exposure forecasting, and strengthening the vessel's overall ESG performance.

When such performance data are also transparent, properly documented, unbiased, and reliably shared, fleet competitiveness is further supported. This structured approach to data management strengthens the owner's credibility in commercial discussions with charterers and, indirectly, supports freight rates.

Among other things, AI constitutes the next stage in large-scale data utilisation, aiming to boost a vessel's competitiveness. The scale and frequency of data now exceed what humans can efficiently

analyse. That is where AI enters the scene — not to replace digitalisation, but to enhance the processing of large datasets, the identification of patterns, and the support of data-driven corrective actions. In this way, operational control is further strengthened, thereby improving competitiveness.

In a nutshell, digitalisation has already established a more efficient operational model, while AI is emerging as the next layer of enhancement, contributing to and supporting fleet competitiveness in terms of cost discipline, sustainability performance, and market positioning.

To what extent do data analytics and predictive models contribute to the reduction of fuel consumption and CO_2 emissions on a day-to-day basis?

Data analytics and predictive models can contribute to reducing fuel consumption and CO_2 on a day-to-day basis. Still, the extent of their impact depends on the quality, volume, and completeness of the underlying data.

These tools transform collected operational data into structured insight. For instance, by enabling earlier detection of fuel consumption deviations and suboptimal operating patterns, they shorten response time and support corrective, data-driven actions, such as scheduling hull and propeller cleaning and fine-tuning of main engine operation. In this way, they strengthen monitoring benefits and contribute to more efficient daily operations.

However, building on the same data foundation, it must be recognised that while the industry can now collect massive volumes of data, volume alone is only a necessary precondition for improvement. The validity of analytics depends not only on the availability and quality of large-scale data, but also on the capture of all critical process parameters. Large data volumes may still be insufficient if specific parameters of the under-examination process are not measured or are incomplete. In such cases, outputs remain indicative rather than fully reliable for decisive corrective action.

Essentially, data analytics and predictive models hold significant potential



to support overall vessel operational performance, including daily fuel efficiency and CO_2 emissions reduction. Yet their full value depends on continuous improvement in data integrity and the availability of all critical parameters required for reliable analysis.

How is the role of seafarers and shore-based teams evolving with the introduction of AI, remote operations, and smart vessels?

AI tools, remote access systems, and smart vessel technologies currently serve as supporting tools rather than replacements for human experience and judgment. They are indeed reshaping the way seafarers and shore personnel work. AI and digitalisation are reducing first-level tasks such as routine data collection, cleaning, and visualisation, which allows seafarers and shore-based teams to devote more time to evaluating information and making sound decisions, rather than spending time extracting and organising data. We are witnessing a clear shift in their role, from manual processing toward data evaluation and a more decision-making approach based on readily available, large-scale information.

Remote access systems add another important dimension that gradually reshapes crew and ashore roles. Systems allow office personnel and Makers' experts to connect remotely to the vessel, view operational parameters, assess equipment performance, and support the crew in troubleshooting. This improves response time, builds more confidence, and enhances the traditional handling of technical issues, eventually making it more efficient and reliable.

In brief, the role of seafarers and shore-based teams is evolving toward greater emphasis on evaluation and informed decision-making rather than on

> Essentially, data analytics and predictive models hold significant potential to support overall vessel operational performance, including daily fuel efficiency and CO_2 emissions reduction. Yet their full value depends on continuous improvement in data integrity and the availability of all critical parameters required for reliable analysis.

hands-on tasks, as AI, remote systems, and smart vessel technologies become more deeply integrated into the sector.

Are charterers and cargo owners advocating data transparency and digital performance reporting strongly enough?

There is a clear and growing push from charterers and cargo owners for greater data integrity and structured digital performance reporting. This trend is increasingly linked to the need for cost control and regulatory exposure, both of which rely on accurate, transparent, and well-documented operational data.

Fuel consumption is a key component of operating expenditure (OpEx) and therefore represents a shared focal point for charterers and owners. While it is not the only cost element, it remains one of the most significant and measurable drivers of operational efficiency, and charterers are increasingly advocating its clear visibility.

In this context, data transparency, figure accuracy, and tamper-proof reporting are no longer optional but integral to commercial alignment and regulatory accountability in modern shipping, and are strongly supported by both cargo owners and charterers.

Has cyber risk become a serious threat to fleet safety and business continuity as ships become increasingly connected and software-driven? To what extent is the industry truly prepared to protect itself against these threats?

As vessels become more connected and software dependent, cyber risks have become a real operational concern, affecting safety and business continuity and requiring specific actions.

The industry has indeed taken steps to mitigate dangers. The International Maritime Organization (IMO) requires cyber risk management to be addressed within the Safety Management System. In parallel, classification societies have introduced cybersecurity notations to standardise the protection of onboard IT and OT systems. These initiatives demonstrate that cybersecurity is now receiving increased attention across the shipping industry and that the transition is clearly in focus.

At the same time, as the shipping industry enters a new phase of digital connectivity, it is natural that cybersecurity requirements attract increased attention and active discussion among owners, shipyards and vendors. All industry players are exploring and evaluating how to implement these new IMO/Classification Societies/IEEE standards effectively and in a financially sustainable way, while remaining operationally aligned with real onboard environments. This attitude should not be viewed as a barrier but as constructive, valuable feedback that supports further improvement and fine-tuning.

Overall, there are clear indications of progress, with structured measures being introduced. Ongoing brainstorming on their practical application among all interested parties will be key to fully supporting the industry through this transition.

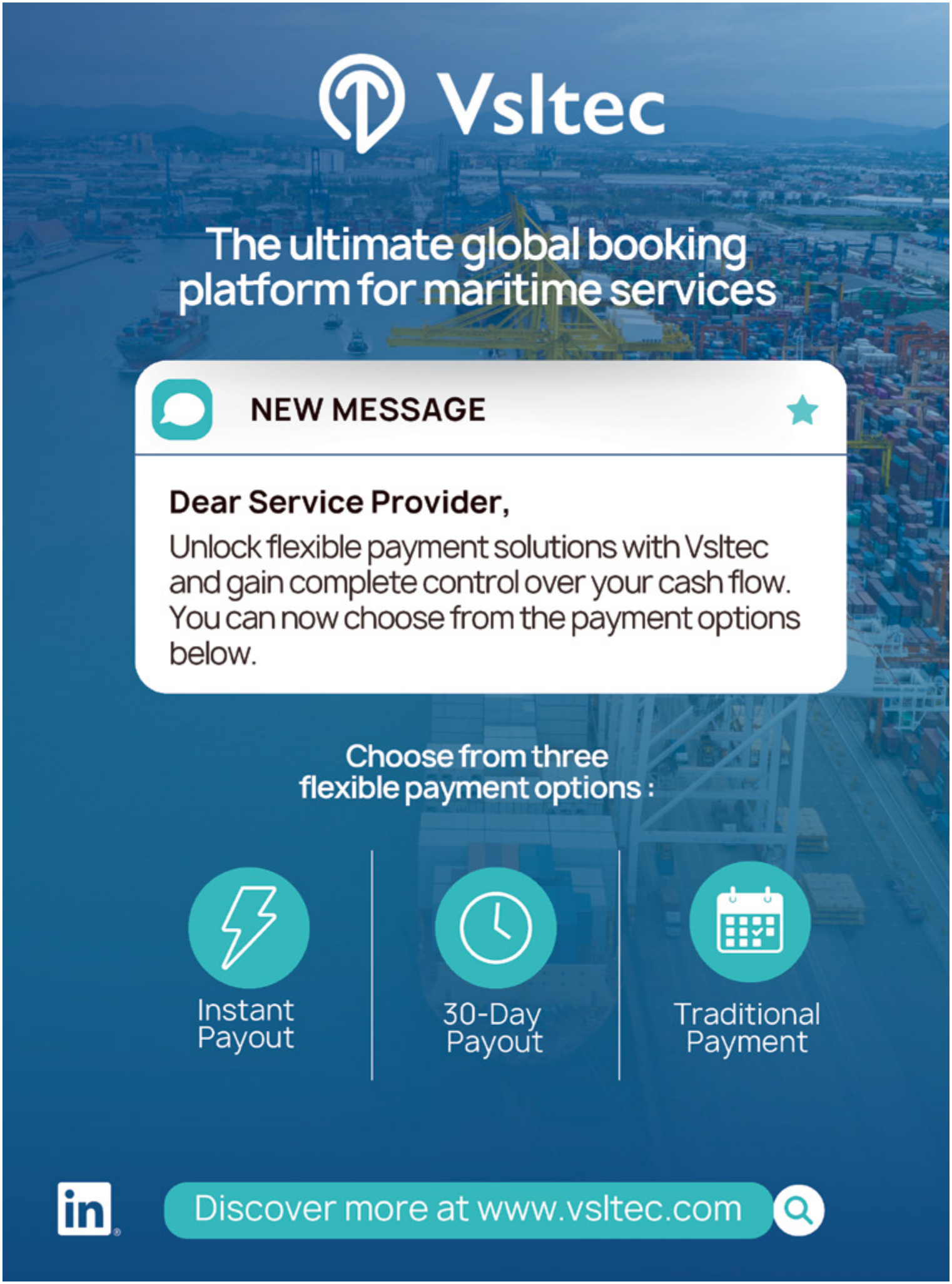
Looking ten years ahead, which element of smart shipping do you believe will be the most transformative and why?

Over the next decade, the most transformative — and at the same time most challenging — element of smart shipping will likely be the effective and smooth integration of AI applications into both vessel and shore operations.

AI technology is advancing rapidly. Technical limitations related to data integrity or algorithm maturity are expected to improve over time, while hardware constraints such as processing power, energy demand, and storage capacity are being progressively addressed across industries. Yet the decisive factor will not be the pace of technological development, but how AI is practically applied by crew and shore-based personnel without introducing operational disruption.

The real transformation, therefore, lies not in the technology itself but in the way seafarers and shore teams incorporate AI into daily decision-making. AI should function as a support tool, capable of surfacing relevant information, visualising complex data, and proposing potential solutions. It should not become the final decision-maker. Human judgement must remain central, with professional expertise strengthened rather than replaced. Otherwise, vessel performance and safety could be compromised, with unpredictable consequences.

Ultimately, what will define the next decade is not AI capability alone, but the industry's ability to integrate technology and human judgment in a balanced way, ensuring that innovation enhances efficiency and safety while utilising human experience and sense of responsibility.


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Navigating the digital frontier: How AI and smart technologies are reshaping global shipping

Global shipping is undergoing its most profound transformation in generations. Digitalisation, AI, and rising ESG expectations are reshaping every dimension of the industry, demanding a new level of operational excellence and transparency from shipowners and managers worldwide.
For Danaos, this transformation is not a reaction to external pressure; it is the result of a deliberate, long-term vision. More than a decade ago, the company foresaw the need for a digital infrastructure capable of collecting and producing high-velocity, high-integrity data. The goal was not simply to digitise existing processes, but to lay the foundations for what was coming: the AI era and the age of data-driven decision-making. Moreover, it is encouraging to see the broader industry moving in the same direction. For those who have invested early and consistently, the results speak for themselves. Today, as AI moves from concept to operational reality and emissions regulations tighten across the maritime world, Danaos is not catching up — it is already there.



Opinions expressed by
Dr Stamatis Arkoulis,
Digital Transformation Manager
at Danaos Shipping

How are digitalisation and AI currently influencing your fleet's competitiveness in terms of operating costs and ESG performance?

Digitalisation has already had a tangible and measurable impact on both Danaos's operating costs and ESG performance — and AI is the next frontier Danaos is actively moving towards.
In terms of operating costs, a decade of systematic digitisation has delivered a level of visibility and control that translates directly into efficiency gains across the entire organisation. Through continuous monitoring of emissions, energy consumption, and vessel performance, technical teams are empowered to make more informed decisions about fuel management, maintenance planning, and equipment health. But the impact reaches well beyond the technical department. In crewing, digitisation has transformed how Danaos plans and manages its seafarers — from smarter rotation scheduling and skills matching to improved communication and welfare monitoring — reducing costs while strengthening retention. In operations, streamlined voyage planning and faster regulatory-compliance reporting have compressed timelines and significantly reduced the administrative overhead that once absorbed considerable resources across the business. These are not marginal improvements — they are structural changes to how Danaos runs its operations.



On the ESG front, the progress has been significant. In 2024, Danaos achieved a 51.4% reduction in CO_2 emissions intensity compared to the 2008 IMO baseline, surpassing its 2030 environmental target six years ahead of schedule. In 2025, an S&P Global ESG Score of 63 placed us among the top 3% of the industry in environmental performance — a reflection of digital tools and data transparency working hand in hand with a genuine company-wide commitment to sustainability at every level.

As for AI, Danaos approaches this frontier with both enthusiasm and pragmatism. The journey is underway, exploring possibilities, testing concepts, and building the frameworks that will allow AI to be harnessed in a way that is responsible, effective, and genuinely value-adding. The foundation is solid: years of high-quality, high-integrity operational data that will give AI the substance it needs to deliver meaningful results when the time is right.

To what extent do data analytics and predictive models contribute to the reduction of fuel consumption and CO_2 emissions on a day-to-day basis?

Data analytics and emissions monitoring are no longer back-office functions at Danaos; they are embedded into the rhythm of daily operations. A continuous, fleet-wide view of vessel performance and fuel consumption allows teams to make smarter decisions, faster, and with far greater confidence than was possible even a few years ago. Critically, teams can also run alternative scenarios and assess projected outcomes, thus enabling better, more informed choices rather than relying solely on experience and intuition.

The impact is felt across the entire operational cycle — from how Danaos plans and schedules dry dockings and hull maintenance to how it evaluates and develops alternative fuels such as EU-certified biofuels. Decisions that were once based solely on judgment are

increasingly data-driven, and the results in terms of emissions reduction are both meaningful and measurable.

What makes this progress sustainable is not any single tool or initiative but the culture and discipline behind them. Danaos's ISO 50001 energy management framework, in place for more than a decade, ensures that performance data are not simply collected — it is consistently analysed and acted upon across the organisation. That combination of technology, process, and people is what turns data analytics from a reporting exercise into a genuine, lasting driver of performance.

How is the role of seafarers and shore-based teams evolving with the introduction of AI, remote operations, and smart vessels?

The evolution of the human role in shipping is one of the most important and exciting dimensions of digital transformation. People are the cornerstone — without them, even the most sophisticated technology outcomes have little to say.

Danaos firmly believes that digitalisation should serve its people. For Danaos seafarers, the ambition is to grow from skilled operators into orchestrators of data-rich environments — more analytically capable, more digitally fluent, and more closely connected to the shore team. Danaos continuously invests in supporting and upskilling its crews, ensuring they are not simply adapting to new technologies but are genuinely empowered and enriched by them. A seafarer who exploits valuable data is not only safer and more effective, but also more confident and fulfilled in their role.

Crew welfare is equally central to this vision. Improved connectivity means seafarers are better supported and more meaningfully connected, both to their families ashore and to the office team that stands behind them. Digital tools have also allowed Danaos to approach crew scheduling and rotation planning with far greater sensitivity — reducing fatigue, improving predictability, and enabling the composition of crew lists with complementary skills and experience, so that every vessel has not just qualified individuals on board, but a cohesive, well-matched team.

The evolution of the human role in shipping is one of the most important and exciting dimensions of digital transformation. People are the cornerstone — without them, even the most sophisticated technology outcomes have little to say.

Ashore, the transformation is equally significant and still unfolding. Automation and digital productivity tools are progressively changing the nature of work for shore-based teams. The administrative burden that once consumed a large portion of the workday has already been substantially reduced — and with AI-powered productivity tools now available to all staff, the ambition is to go further still. Freed from repetitive, low-value tasks, people can redirect their energy and expertise toward higher-order thinking: anticipating problems before they arise, engaging more deeply with technical challenges, and building the proactive, trust-based relationships with crew members, partners, and charterers that no automated system can replicate. In that sense, digitalisation is not making Danaos shore teams smaller — it is making them sharper.

Are charterers advocating data transparency and digital performance reporting strongly enough?

Data transparency and performance reporting are becoming increasingly important to charterers, and Danaos has been building the infrastructure to meet that expectation for some time now.

Danaos's approach to charterer engagement is grounded in digitally enabled transparency. Customers are provided with access to ship-specific performance and emissions data through secure, timely digital channels — from daily operational data covering most of the fleet, to per-minute sensory vessel performance data that offers an unprecedented level of operational visibility. Monthly emissions and compliance reporting — including EU ETS, FuelEU Maritime, CII ratings, and GHG data — is shared with a growing portion of charterers, and Danaos is progressively expanding API-based real-time data exchange that integrates directly into clients' own systems. Today, nearly a third of Danaos clients are engaged in ongoing emissions and performance data exchange.

This is not simply about compliance. When data is shared proactively with charterers, Danaos helps them meet their ESG targets and regulatory obligations while deepening the trust and collaboration that underpin long-term

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partnerships. Transparency, in Danaos's view, is not just a reporting obligation, but a commercial and relational asset.

The broader market is moving in this direction, driven by regulatory developments such as FuelEU Maritime and the EU ETS, and Danaos welcomes this momentum. The more the industry embraces data transparency as a shared standard, the better the outcomes for all stakeholders — charterers, operators, and the environment alike. Danaos's commitment is to continue raising its own bar and to be a reliable, transparent partner for charterers who choose to make this journey together.

Has cyber risk become a serious threat to fleet safety and business continuity as ships become increasingly connected and software-driven? To what extent is the industry truly prepared to protect itself against these threats?

Cyber risk is real and present and demands the same rigour that Danaos applies to physical security. Cybersecurity is treated not just as an IT concern but as a safety-critical issue, because in an era of connected ships and software-based operations, a breach on board can carry serious consequences.

Danaos's approach is comprehensive and multi-layered. A dedicated cybersecurity policy sets clear standards across the entire organisation (on board and ashore), with governance led at the highest level and day-to-day execution managed by specialised teams. This means a unified defence framework built on prevention, detection, response, and recovery — encompassing regular risk assessments, vulnerability scans and penetration testing, a Cybersecurity Incident Response Plan, and business continuity planning covering redundant infrastructure and disaster recovery. External specialists and auditors independently validate defences on an ongoing basis, while continuous awareness training ensures the human layer of security remains as robust as the technical one. Notably, no cybersecurity or data privacy breaches have been recorded across the organisation to date.

As for the industry's overall preparedness, progress is being made, but it remains uneven. Awareness has grown, particularly following several high-profile incidents that exposed the vulnerabilities of connected maritime operations. The regulatory framework is moving in the right direction. However, implementation across the industry remains inconsistent, and the gap between the most prepared operators and the rest represents a genuine systemic risk.

Looking ten years ahead, which element of smart shipping do you believe will be the most transformative and why?

Looking ten years ahead, the most transformative development in smart shipping will be the emergence of fully integrated fleet intelligence — a state in which every vessel, system, and data stream across a fleet works together as one, rather than as a collection of separate, siloed assets.

The real power of this integration goes beyond operational efficiency. When data from technical management, operations, crew, commercial, and compliance functions converges into a single, unified intelligence layer, AI gains something it cannot have today — a truly holistic view of the organisation. Moreover, with that holistic view comes a fundamentally different quality of decision-making: safer, more targeted, and genuinely cross-departmental. A maintenance signal informs a commercial decision. A crew wellbeing indicator shapes a voyage plan. Regulatory obligations are balanced seamlessly against operational priorities. This is the kind of joined-up organisational intelligence that creates real competitive advantage — and real value for charterers, shareholders, and partners alike.

For Danaos, this is not an abstract ambition. It is the natural next step in a journey that began over a decade ago and one being pursued with both conviction and pragmatism. The foundations, i.e., the data, the systems, and the culture, are already in place. And, ultimately, what drives Danaos is not the technology itself, but what it means for the people at the heart of this industry. Smarter, more integrated intelligence means safer vessels, better supported seafarers, and shore teams empowered to do their best work. That is the future we are working towards — and the progress made so far gives us genuine reason for optimism.







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As ships become more connected and software-driven, cyber risk is a tangible business risk

As vessels become more connected and software-driven, the operational and commercial implications of cyber risk are becoming impossible to ignore. The CFO of Seanergy Maritime Holdings Corp. discusses how digitalisation, AI, and rising transparency expectations are reshaping competitiveness, safety, and day-to-day execution across modern fleets.



Opinions expressed by
Stavros Gyftakis,
CFO of Seanergy Maritime Holdings Corp.

How are digitalisation and AI currently influencing your fleet's competitiveness in terms of freight rates, operating costs, and ESG performance?

Digitalisation and AI are increasingly shaping fleets' competitiveness by improving decision quality, documentation, and consistency — factors that matter in today's market even when they do not directly translate into higher spot rates. Commercially, the advantage lies primarily in credibility: when a fleet can demonstrate stable operational execution, clear evidence trails, and well-structured emissions documentation, it becomes easier to respond to tender requirements, support charterers' reporting needs, and reduce the scope for avoidable performance or documentation disputes. The commercial value is therefore often reflected in smoother fixtures, stronger relationships, and less friction across the voyage lifecycle.

Regarding operating costs, the benefits are more immediate. Continuous monitoring and structured analytics reduce time spent on repetitive troubleshooting, shorten the path from detection to corrective action, and help prevent minor deviations from escalating into costly off-hire risks or inefficient operating modes. Where appropriate, AI-supported guidance can also standardise routine responses to recurring technical and compliance queries, allowing onboard and shore-based teams to focus on higher-impact matters.

For ESG, digitalisation strengthens both substance and assurance. Stronger data controls, audit-ready records, and consistent management-system execution support more reliable reporting and earlier identification of gaps. The essential condition is that governance, data integrity, cybersecurity, and human accountability remain embedded throughout.

To what extent do data analytics and predictive models contribute to the reduction of fuel consumption and CO_2 emissions on a day-to-day basis?

Day-to-day reductions in fuel consumption and CO_2 emissions are typically the result of disciplined execution rather than a single "silver-bullet" model. Analytics contribute by making operational reality measurable and comparable. Validated data, consistent segmentation of operational states (at sea/port/anchor/manoeuvring), and stable baselines allow teams to detect deviations early and focus attention where it has prac-

tical value. When an issue is identified, whether it is a reporting gap, a sensor inconsistency, or genuine performance deterioration, the response is targeted: operational adjustments (speed management, trim practice, voyage-planning discipline, port efficiency) or technical follow-up (maintenance prioritisation, calibration checks, investigation of primary consumers' consumption).

Predictive elements add value when they improve prioritisation and timing. Trend-based alerts can highlight emerging patterns such as a gradual shift in the power-to-speed relationship, abnormal auxiliary-consumption behaviour, or recurring operational profiles associated with inefficiency. Earlier visibility supports earlier intervention, where most of the emissions benefits lie.

Equally important, we avoid overstating precision. Shipping operations are influenced by weather, routing, draft, and port constraints, so robust outcomes depend on transparent assumptions, comparable-condition filtering, and a clear link from analytics to actions that crews and superintendents can realistically implement.

How is the role of seafarers and shore-based teams evolving with the introduction of AI, remote operations, and smart vessels?

Shipping has always relied on the professionalism and judgement of its people. The introduction of AI and smart-vessel technologies is helping seafarers and shore-based teams uphold safety standards with greater consistency, while also improving efficiency and reinforcing best practices in daily execution.

On board, intelligent systems enhance everyday safety by improving visibility into navigation, machinery, and compliance parameters. Clear operational insight helps officers maintain safe boundaries and identify small deviations at an early stage. Acting before minor variations escalate preserves safety margins, supports stable watchkeeping, and promotes disciplined engine operation. When risks are observed earlier, decisions are calmer, more structured, and better documented.

Immediate access to procedures, historical guidance, and technical knowledge further strengthens execution. Crews can apply company standards consistently across shifts and voyages, reducing variability and avoiding repetitive clarification. This structured approach not only protects safety but also improves efficiency, as operations remain controlled and predictable.

The same applies ashore. Greater transparency enables shore teams to support vessels proactively rather than reactively. Communication becomes more focused and efficient, reducing back-and-forth exchanges and strengthening coordination. Structured information flow allows earlier risk identification and more effective collaboration between ship and shore, reinforcing high safety standards and consistent operational practices.

Shipping has always relied on the professionalism and judgement of its people. The introduction of AI and smart-vessel technologies is helping seafarers and shore-based teams uphold safety standards with greater consistency, while also improving efficiency and reinforcing best practices in daily execution.

Are charterers and cargo owners advocating data transparency and digital performance reporting strongly enough?

Demand for transparency is clearly growing, but the level of advocacy varies across counterparties and trades. Many charterers and cargo interests now request emissions-related information and performance reporting, particularly when they face their own disclosure requirements and stakeholder expectations. However, the industry has not yet reached a shared view of what "good transparency" looks like in practice, particularly regarding common definitions, verification approaches, and consistent expectations for data structure, quality, and comparability.





A practical challenge is aligning expectations with the commercial frameworks. Data requests can be extensive, while contractual frameworks do not always reflect the investment required for measurement, assurance, and robust reporting controls. Transparency also benefits from trust and shared content. Owners and charterers must be confident that shared information will be interpreted fairly, recognising that outcomes can be influenced by routing, weather, draft, and port constraints, and that not all variables sit within the vessel's control.

Advocacy becomes truly effective when it is coupled with agreed methodologies, credible verification, and balanced contractual mechanisms that allocate responsibility proportionately. Progress is being made, but it is broader alignment, standardised data expectations, clearer assurance practices, and commercially realistic incentives that will determine whether transparency becomes a consistent driver of improved performance and decarbonisation.

Has cyber risk become a serious threat to fleet safety and business continuity as ships become increasingly connected and software-driven? To what extent is the industry truly prepared to protect itself against these threats?

As ships become more connected and software-driven, cyber risk becomes a tangible business risk that can affect fleet reliability, schedules, reputation, and, in certain scenarios, safety. Even limited disruption to IT or onboard systems can quickly translate into operational and commercial consequences. Cybersecurity is therefore embedded in overall operational effectiveness and supported by strong technical expertise throughout the organisation.

While industry awareness has increased, preparedness remains uneven, and threats continue to evolve — increasingly sophisticated and often AI-enabled. At Seanergy, cyber-risk management is addressed through a structured, layered strategy that combines recognised security standards, risk assessment, business-continuity planning, regular exercises, cyber insurance as part of risk transfer, and continuous crew and shore-based awareness. This integrated approach ensures that digital advancement strengthens performance and resilience while safeguarding safety and business continuity.

Looking ten years ahead, which element of smart shipping do you believe will be the most transformative and why?

Over the next ten years, the most valuable AI contribution in shipping will be a practical safety-compliance co-pilot that helps crews navigate the growing volume of procedures, permits, checklists, and regulatory requirements more efficiently, without increasing workload. Shipping is a highly regulated sector, and there is increasing focus on clear procedures and reliable evidence of compliance. AI can support this by turning compliance into consistent execution.

On board, AI will support safety by converting complex requirements into timely, situation-specific guidance. During pilotage, manoeuvring, heavy-weather preparation, critical maintenance, and cargo-related operations, it can surface the right operational limits, the right steps, and the right documentation prompts based on the vessel's actual condition and specific characteristics. On the bridge, it can combine traffic, route intent, visibility, and weather into clearer risk signals that strengthen watchkeeping discipline without adding to alarm fatigue. The same logic extends to deck and engine-room activity, where intelligent monitoring can detect hazardous patterns early and support safer work planning, isolations, and handovers.

A major benefit is the audit-ready evidence generated organically during operations, reducing the time otherwise spent reconstructing events after the fact. As execution becomes steadier and more controlled, fuel performance improves through fewer unstable operating points, stronger speed discipline, lower auxiliary peaks, and earlier detection of hull or machinery-related penalties.


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Technology isn’t replacing seafarers; it’s empowering their decisions

Global shipping is undergoing its most profound transformation in generations. Digitalisation, AI, and rising ESG expectations are reshaping every dimension of the industry, demanding a new level of operational excellence and transparency from shipowners and managers worldwide. Theodoros Tserpelis discusses how digitalisation, AI, and data-driven decision-making are reshaping fleet operations, enhancing competitiveness, strengthening ESG performance, and redefining the role of seafarers in the era of smart shipping.



Opinions expressed by
Theodoros Tserpelis,
Digital Transformation Planning Manager
at TMS Group

How are digitalisation and AI currently influencing your fleet's competitiveness in terms of freight rates, operating costs, and ESG performance?

Digitalisation and AI have moved from pilot initiatives to production use for the TMS Group, and are increasingly reshaping and improving the way we manage and operate our fleet.

From a commercial perspective, digital solutions support voyage evaluation at the decision-making stage and route optimisation during execution, improving employment decisions upfront while also enhancing fuel efficiency during the voyage. Operationally, new technologies enable practices such as condition-based maintenance, helping to reduce avoidable OpEx through earlier and more targeted interventions.

From an ESG perspective, emissions and energy KPIs are embedded directly into daily operations, supporting improved CII trajectories, regulatory compliance, and more transparent and consistent sustainability reporting for charterers.

To what extent do data analytics and predictive models contribute to the reduction of fuel consumption and CO_2 emissions on a day-to-day basis?

Data analytics contribute through layered, continuous optimisation. High-frequency sensor data collected on board is continuously monitored, providing detailed visibility into vessel and machinery performance. Beyond real-time monitoring, this data is also used to create digital twin models and run simulations that help analyse performance trends, assess operational scenarios, and support more informed day-to-day decisions on fuel efficiency and emissions. Weather- and safety-constrained voyage optimisation delivers measurable fuel savings, while hull and propeller performance analytics guide optimal cleaning

intervals. The optimisation of the engine and auxiliary load further reduces inefficiencies.

Cumulatively, these interventions typically deliver single-digit percentage reductions in fuel consumption and CO_2 emissions on an annualised basis, depending on the trade, the vessel's profile, and data quality, while maintaining safety and commercial commitments.

How is the role of seafarers and shore-based teams evolving with the introduction of AI, remote operations, and smart vessels?

The role of seafarers is evolving towards augmented decision-making rather than automation-led replacement. This means that officers maintain their full authority but are supported by data-driven tools that enhance decision-making by reducing cognitive load and improving situational awareness.

Shore-based teams are increasingly focusing on exception management and scenario planning, using shared operational views of vessels to provide more targeted support. This shift requires stronger data literacy, systems thinking, and cyber awareness across both onboard and shore-based roles.

Are charterers and cargo owners advocating data transparency and digital performance reporting strongly enough?

Momentum towards data transparency is clearly increasing, particularly among major charterers that have made strong ESG commitments. However, expectations, data standards, and technical maturity vary across the market.

We support standardised data sharing that improves safety, compliance, and performance, while respecting data governance, operational sensitivity, and the privacy of the crew.

Has cyber risk become a serious threat to fleet safety and business continuity as ships become increasingly connected and software-driven? To what extent is the industry truly prepared to protect itself against these threats?

Cyber risk is now an important operational and business concern. Increased connectivity and the growing integration of IT and OT systems expand the attack surface, making cyber resilience critical to fleet safety and business continuity.

Effective risk management requires a defence-in-depth strategy, secure vendor ecosystems, continuous monitoring, and strong people awareness. While industry preparedness has improved, capability levels remain uneven, particularly in relation to legacy systems and incident response.

Looking ten years ahead, which element of smart shipping do you believe will be the most transformative and why?

The most transformative element will be trusted, interoperable data ecosystems rather than any single technology. Standardised, high-quality data enables continuous optimisation and supports more informed operational, technical and commercial decisions. Such ecosystems will allow shipping companies to make better-informed decisions that balance operational safety, commercial performance, and decarbonisation requirements.



Vessels are becoming increasingly instrumented & software-driven

Lars Laugen shares his perspective on how digitalisation is reshaping competitiveness, efficiency, and resilience across a large global fleet. He discusses the practical impact of digital tools and AI on fuel optimisation and emissions reduction, the evolving relationship between seafarers and shore-based teams, and the growing importance of cyber security in an increasingly connected maritime ecosystem.



Opinions expressed by
Lars Laugen,
Chief Digital Transformation Officer
at OSM Thome

How are digitalisation and AI currently influencing your fleet's competitiveness in terms of freight rates, operating costs, and ESG performance?

Freight rates remain market-driven, so digitalisation does not directly influence pricing. Its real impact is on operating costs and ESG performance, which is where we focus our efforts.

Fuel optimisation is a priority, as fuel represents both the largest cost component and the primary driver of emissions. We also focus on system integration, ensuring data flows across crewing, technical management, performance, and finance without being repeatedly re-entered. On the AI front, we take a practical approach by applying it to areas such as PSC risk assessment, procurement patterns, crew planning, and the automation of repetitive, low-value tasks.

To what extent do data analytics and predictive models contribute to the reduction of fuel consumption and CO_2 emissions on a day-to-day basis?

They contribute significantly, but only when built on a strong data foundation, which is often underestimated.

With real-time sensor data, we move beyond traditional noon reports to achieve live visibility on hull and propeller performance, trim, weather routing, and auxiliary load. Day-to-day improvements come from a series of small, informed decisions, such as adjusting speed to meet ETA requirements, optimising trim, scheduling hull cleaning, and managing generator loads.

Predictive models build on this by forecasting fuel consumption per voyage and identifying anomalies early. While each individual gain may be incremental, the cumulative impact across a fleet is meaningful.

How is the role of seafarers and shore-based teams evolving with the introduction of AI, remote operations, and smart vessels?

Vessels are becoming increasingly instrumented and software-driven, which requires crews to develop stronger digital capabilities and adapt how they work. The skill profile is evolving, with greater emphasis on cyber awareness, data lit-

eracy, and confidence in using decision support tools, alongside traditional seamanship.

On shore, the shift is more pronounced. With real-time data available, superintendents are moving from reactive troubleshooting to proactive oversight, enabling one person to support more vessels effectively.

Importantly, AI is not being used to replace human judgment in safety-critical decisions. Instead, it is used to reduce friction, allowing experienced professionals to focus on what truly matters.

Are charterers and cargo owners advocating data transparency and digital performance reporting strongly enough?

Progress is uneven. Energy majors and some large owners have been pushing data transparency for years, setting higher expectations and gradually moving the industry forward. However, many charterers still rely on PDF-based noon reports and trust-based reporting, despite having the leverage to demand more.

The real shift will occur when transparency becomes commercially relevant rather than a compliance exercise. Once verified, performance data directly influences charter terms, financing, or insurance premiums, and thus demand will accelerate.

Has cyber risk become a serious threat to fleet safety and business continuity as ships become increasingly connected and software-driven? To what extent is the industry truly prepared to protect itself against these threats?

Cyber risk is now a significant operational concern. The attack surface has expanded with satellite connectivity, IoT sensors, ECDIS updates, remote support systems, and third-party software on board. A successful breach could impact navigation, propulsion, or cargo operations, or simply restrict access to essential data.

Industry preparedness is improving, but vulnerabilities remain, particularly among older vessels with legacy systems that were never designed for network connectivity. Overall, the industry is better positioned than it was five years ago, but continued focus and investment are necessary.

Looking ten years ahead, which element of smart shipping do you believe will be the most transformative and why?

Today, the same data is reported, re-entered, and reformatted multiple times across stakeholders such as vessels, managers, owners, charterers, classification societies, and authorities. This duplication creates inefficiencies and increases the risk of errors.

Over the next decade, this will change. AI agents integrated directly into operational systems will take over much of the repetitive shore-based work, including reporting, reconciliations, follow-ups, document handling, procurement, and travel coordination.

As a result, organisations will become leaner but more specialised. Stakeholders will be able to access the data they need directly from connected systems, rather than relying on manual reporting from crews or managers. Thus, efficiency, accuracy, and decision-making across the value chain will be improved.



AI remains most effective when paired with marine engineering and human expertise

Spyridon Zolotas explains how digital class strengthens overall safety and compliance through more proactive, evidence-based oversight, while reshaping inspections through real-time data and risk-based approaches. He also explores the evolving role of surveyors and the importance of combining AI capabilities with human expertise in an increasingly digital maritime landscape.



Opinions expressed by
Spyridon Zolotas,
South Europe Marine Vice President
at RINA

How is the concept of "digital class" changing the way ships are surveyed, certified, and monitored compared to traditional class models?

Digital class represents a fundamental evolution from periodic, manual inspections to a continuous, data-driven verification model. Modern ships generate vast streams of operational, environmental and machinery data, enabling classification societies to assess the vessel's actual condition at any moment rather than rely exclusively on calendar-driven checks. This approach aligns with the industry's transition toward hyperconnected operations, in which intelligent platforms aggregate information across the ship's ecosystem to support real-time decision making. By integrating digital twins, remote surveys and predictive analytics, digital class improves transparency, optimises maintenance planning, and minimises operational disruption. Ultimately, it strengthens overall safety and compliance through more proactive, evidence-based oversight.

At RINA, the SERTICA platform supports the digital-class ecosystem by consolidating data from sensors, electronic logbooks, and fleet management tools into a unified digital environment. Through modules such as SERTICA Maintenance, HSQE, SERTICA Performance, SERTICA Vessel Reporting System (VRS), and SERTICA Logbook, operators gain real-time monitoring capabilities, automated data validation, and advanced analytics for machinery health. The platform's ability to gather, validate, and analyse operational data, combined with configurable dashboards, alerts, geofencing, and predictive tools, enhances the accuracy and reliability of the information that classification societies use for remote verification, continuous compliance, and condition-based assessment. This results in fewer disruptions, better-targeted physical surveys and a more transparent, data-driven certification process aligned with the future of digital class.

How is AI being used to predict structural, machinery, or safety risks before they turn into incidents, and how reliable are these models today?

AI can enhance maritime safety by analysing sensor outputs, historical failure patterns, weather data, and operational behaviour to detect early indicators of structural fatigue, machinery degradation, or emerging safety hazards. Predictive maintenance models will increasingly help prevent breakdowns, extend asset life, and reduce downtime by identifying anomalies well before conventional methods would capture them. However, AI remains most effective when paired with marine engineering and human expertise, particularly because explainability and governance are essential for trust. Today's models are robust enough to support everyday operational decisions, but expert validation remains central to safe adoption across the fleet.

To what extent will real-time ship data affect physical inspections in terms of ensuring compliance with safety and environmental regulations?

Real-time data will not eliminate physical inspections, but it will redefine their purpose. Continuous monitoring allows surveyors to verify compliance and technical performance remotely, reducing reliance on rigid survey windows and shifting attention toward targeted, risk-based interventions. This mirrors the industry's broader shift from siloed processes to a more integrated, system-wide approach to safety and regulatory obligations. With high-quality data streams feeding digital platforms, classification societies can confirm the health of machinery, structural integrity, or environmental performance without always requiring physical attendance. In-person inspections will remain essential for critical components and damage assessment, yet overall frequency and duration can decrease, improving efficiency and reducing operational disruption. RINA supports this transition by enabling continuous environmental compliance and helping shipping companies meet current regulatory obliga-

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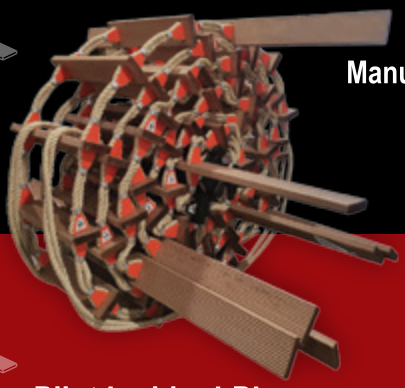
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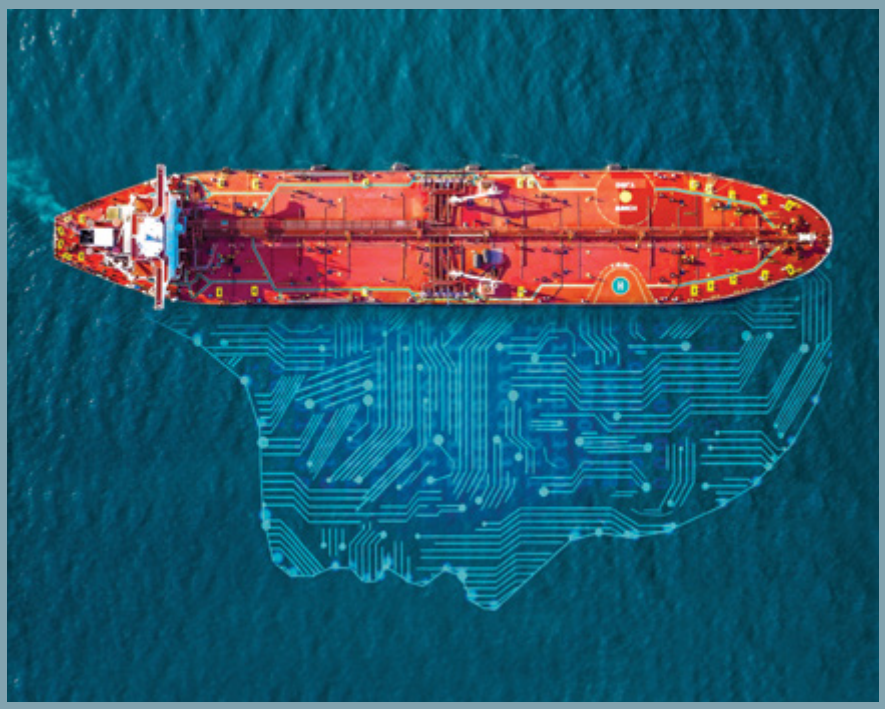
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tions while preparing for future ones. Its SERTICA Vessel Reporting System (VRS) provides structured, validated, and regulation-aligned reporting, ensuring data consistency and helping shipowners stay ahead of evolving frameworks such as MRV, DCS, ETS, CII, and other decarbonisation-related requirements.

As vessels become increasingly connected and software-driven, how is cyber risk being incorporated into class guides and risk assessments?

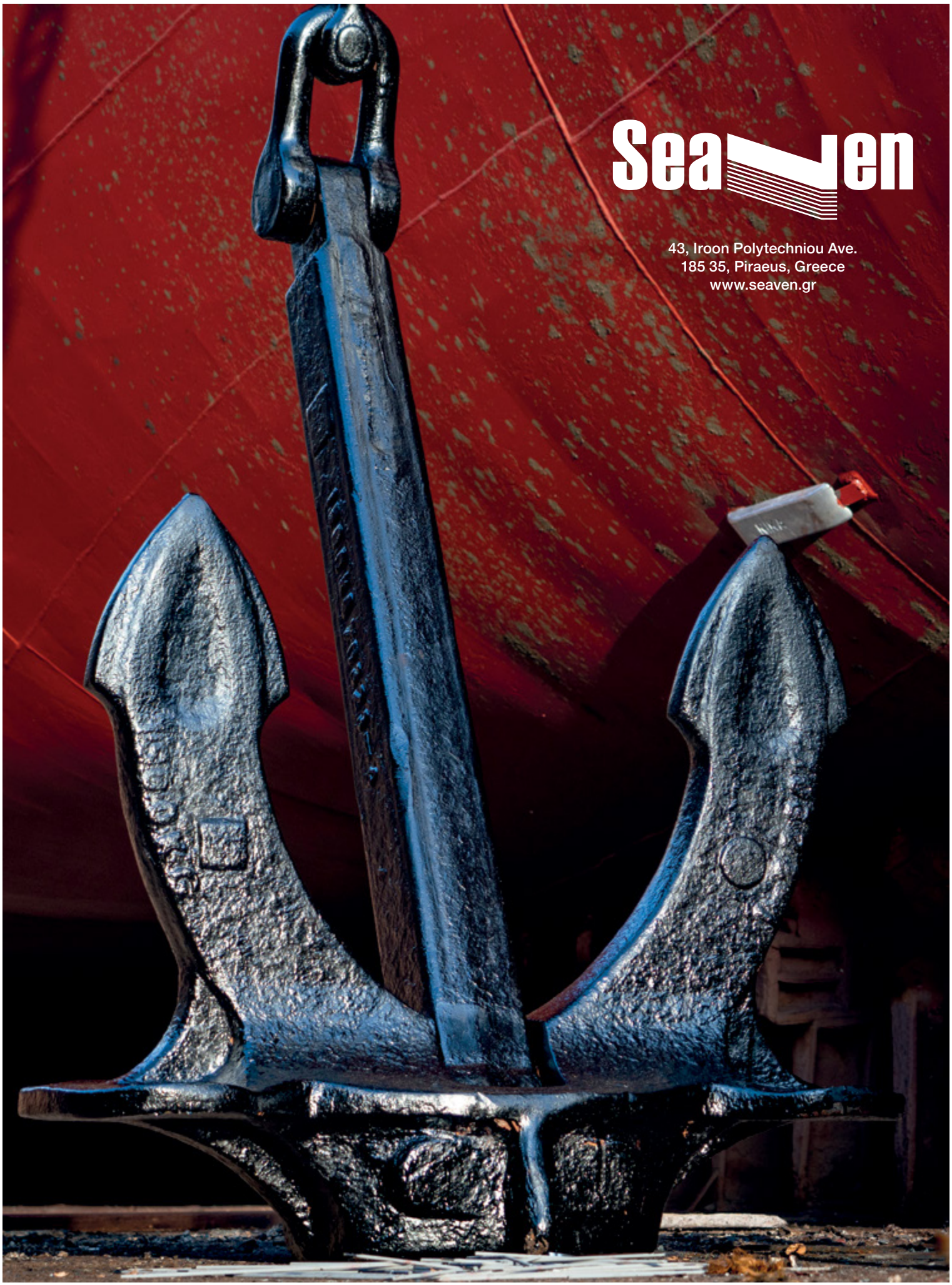
As vessels become more software-driven and interconnected, cyber risk is now directly embedded within class rules rather than treated as an optional add-on. Classification societies assess both the technological safeguards and the organisational readiness needed to manage cyber threats, extending requirements into the Safety Management System and integrating guidelines such as those developed by IACS and IMO. RINA's approach combines vulnerability assessments, penetration testing, and real-time threat-monitoring technologies, ensuring that cyber resilience is treated as a safety-critical function. This reflects the regulatory focus highlighted in current AI and digitalisation frameworks, where cybersecurity, data integrity, and system transparency are essential prerequisites for safe maritime automation.

What is currently the biggest regulatory or safety barrier to large-scale autonomous and remotely operated vessels?

The primary barrier is the absence of fully harmonised international regulations that can certify autonomous functions to the same safety assurance level expected for crewed vessels. MASS (Maritime Autonomous Surface Ships) development is advancing quickly; however, key issues, such as human oversight, liability, equivalence to existing SOLAS, COLREGs and STCW requirements, sensor validation, and redundancy standards, remain under active discussion. Projects advancing autonomy, such as those mapping regulatory gaps and preparing frameworks for higher levels of autonomy, illustrate how technological readiness is outpacing regulation. Until global rules evolve to define responsibility, approval methodologies, and governance for AI-supported decision-making, large-scale deployment of autonomous ships will remain constrained.

How is the role of the traditional surveyor changing as classification societies are moving toward digitalisation?

Digitalisation is transforming the surveyor from a primarily physical inspector into a hybrid technical assessor who validates both the vessel and the digital evidence supporting its condition. With AI-enabled decision support, integrated data platforms and remote-survey capabilities, surveyors can focus on interpreting insights rather than collecting them manually. Their responsibility now includes assessing data quality, verifying the performance of automated systems, understanding cyber-safety implications and ensuring that AI-driven tools align with regulatory requirements. Far from diminishing the profession, digitalisation elevates it: the surveyor becomes essential in bridging human expertise and digital intelligence, safeguarding safety as ships become more autonomous and more complex.



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Digital class is not a departure from established principles; it is their extension

George Stefanis analyses how maritime classification is being reshaped through the integration of advanced technologies, explaining how emerging tools enhance safety, efficiency, and predictive maintenance while reinforcing — not replacing — the core principles of classification.



Opinions expressed by
George Stefanis,
M&O GMC / BSA Commercial Manager
at Bureau Veritas (BV)

How is the concept of "digital class" changing the way ships are surveyed, certified, and monitored compared to traditional class models?

Maritime classification has always evolved alongside the industry it serves. Built on robust rules, technical rigour, and independent expertise, the traditional model has safeguarded life, property, and the environment for decades. As vessels become more complex and increasingly connected, digital class represents the natural progression of this framework: reinforcing established principles through structured data, advanced tools, and intelligent systems.

At Bureau Veritas Marine & Offshore (BV), digital classification integrates 3D models and digital twins into the classification process, from design and construction through to operation. By creating a unified digital environment, continuity is strengthened between plan approval, construction surveys, and in-service inspections. Shipowners, shipyards, and class experts benefit from improved traceability, higher data quality, and enhanced collaboration across the vessels' lifecycle. This approach enhances, rather than replaces, physical attendance, ensuring that survey decisions are supported by accurate, structured, and consistent information.

How is AI being used to predict structural, machinery, or safety risks before they turn into incidents, and how reliable are these models today?

Artificial Intelligence (AI) is playing a practical and increasingly operational role in enhancing safety. Bureau Veritas' Augmented Surveyor 3D (AGS 3D) combines drone imagery, LiDAR scanning, and intelligent data processing to create a detailed 3D representation of inspected spaces. Thus, structural anomalies such as corrosion, cracks, and coating degradation can be identified and mapped directly onto the digital model, supporting thickness assessment and structural evaluation. The result is an objective, traceable, and standardised inspection record that enhances reporting quality and long-term asset monitoring.

To what extent will real-time ship data affect physical inspections in terms of ensuring compliance with safety and environmental regulations?

By enabling the remote inspection of ballast tanks and other confined spaces, AGS 3D significantly reduces human exposure to hazardous environments while improving the consistency and depth of inspection findings. The creation of a persistent digital record also allows for comparisons over time, which can help strengthen condition monitoring and survey planning. In this way, digital tools augment the surveyor's expertise and enhance safety, structural reliability, and decision-making without diminishing the central role of professional judgment. In addition, remote surveys may be carried out without a surveyor on board (when applicable and under defined procedures). Predictive maintenance

schemes based on AI and data analysis further support optimised maintenance planning, as they build on condition-based approaches within the class framework.

Beyond structural inspections, digitalisation supports a broader shift toward risk-based and data-informed methodologies. Machinery and operational data can be analysed to detect deviations or abnormal trends, contributing to earlier identification of potential issues. As data governance and validation frameworks continue to mature, confidence in predictive analytics is steadily increasing. When applied responsibly, these tools enhance proactive maintenance and contribute directly to incident prevention, reinforcing the core mission of classification.

The growing availability of real-time ship data further supports compliance and safety. Continuous monitoring of critical systems and environmental performance can complement physical inspections, as it enables a more targeted and risk-informed approach. Of course, on-site surveys remain fundamental; however, digital insights allow surveyors to focus their attention where it matters most, thereby increasing both effectiveness and efficiency.

As vessels become increasingly connected and software-driven, how is cyber risk being incorporated into class guides and risk assessments?

As vessels become more software-driven and interconnected, cyber resilience becomes inseparable from safety assurance. Cyber risk considerations are embedded within Bureau Veritas' class framework and recognise that vulnerabilities in onboard digital systems can have operational and safety consequences. Ensuring the resilience of connected systems is therefore an integral component of modern classification.

What is currently the biggest regulatory or safety barrier to large-scale autonomous and remotely operated vessels?

Looking ahead, the advancement of autonomous and remotely operated vessels will depend not only on technological capability but also on regulatory harmonisation and stakeholder confidence. The certification of automated and decision-support systems must provide the same level of assurance as traditional arrangements, and classification has a critical role to play in building that trust.

How is the role of the traditional surveyor changing as classification societies are moving toward digitalisation?

In this evolving landscape, the role of the surveyor continues to expand. Digitalisation enhances expertise by equipping professionals with richer information, advanced tools, and risk-based methodologies. By combining human judgment with digital intelligence, classification becomes more consistent, transparent and resilient.

Digital class is not a departure from established principles; it is their extension, ensuring that maritime assurance remains rigorous, relevant, and responsive in an increasingly digital world.



The role of the surveyor is not being replaced by digitalisation; it is being enhanced

George Lountzis highlights the role of AI in enhancing the industry's existing knowledge by enabling hybrid approaches that better reflect real-world vessel behaviour and reduce uncertainty in operational decision-making. He discusses how real-time ship data is reshaping inspection practices by making them more targeted and data-informed, while also outlining the key regulatory and technical challenges associated with the adoption of autonomous and remotely operated vessels.



Opinions expressed by
George Lountzis,
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How is the concept of "digital class" changing the way ships are surveyed, certified, and monitored compared to traditional class models?

"Digital class" is less a break from traditional classification and more a natural progression along the digitalisation curve the industry has been following for years. Even the so-called "traditional class" today relies heavily on digital records, onboard systems, and data streams, as these have become standard for owners and operators. It is therefore more accurate to view "digital class" as a gradient of digital integration, driven both by the digital maturity of the owner/operator and by the evolution of class and regulatory processes. For classification societies, this means continuous adaptation, which involves understanding the digital capabilities deployed on vessels in operation, developing requirement frameworks to certify these systems, and then incorporating the insights they generate into the survey process itself. At ABS, this is reflected in tools such as the "ABS Guide for Smart Functions for Marine Vessels and Offshore Units", which provides a framework to type-approve smart functions, including the underlying data and sensor infrastructure, as well as the applications that support machinery health monitoring, structural health monitoring, and broader operational decision-making.

This foundation is further strengthened by the "ABS Guidance Notes for Verification and Validation (V&V) of Models, Simulations and Digital Twins", which set out best practices for demonstrat-

ing and documenting the credibility of these solutions.

How is AI being used to predict structural, machinery, and safety risks before they turn into incidents, and how reliable are these models today?

The marine industry has a strong foundation: decades of experience in the physics that govern structural integrity, machinery performance, and safety. AI is not replacing this knowledge, but is integrating with physics-based understanding to create hybrid approaches that better reflect how assets behave in real-world operation and reduce different sources of uncertainty.

The reliability of these models is highly use-case dependent. A model that is credible for one decision may not be appropriate for another. Data quality, both in training and in operation, is critical, which is why ABS has issued the "Advisory on Data Quality for Marine and Offshore Applications – Time Series Data". Other factors, such as explainability, operational robustness, and usability also play a significant role in determining the level of trust placed in these systems.

To what extent will real-time ship data affect physical inspections in terms of ensuring compliance with safety and environmental regulations?

Real-time and near real-time ship data will not eliminate physical inspections, but they are already making them more targeted, efficient and effective, which is why ABS is actively moving in that direction. The most significant impact comes from digitally integrating operational and maintenance data into the survey process, so that compliance checks are better informed and less intrusive for the vessel.

A practical example is the ABS Preventive Maintenance Program (PMP), including the PMP-MS and PMP-DG notations, which recognise owners who digitally integrate their Computerised Maintenance Management Systems (CMMS) with ABS. By sharing maintenance records directly with the classification society, much of the review can be conducted in advance or in parallel with operations, streamlining the survey and allowing surveyors to focus on the physical verification of higher-risk areas.

ABS has also implemented a Condition-Based Program with US government clients that uses operational data, such as structural sensor readings and machinery maintenance reports, to plan availability periods and prioritise survey activities. This data-driven approach helps identify where risk is greatest and supports more transparent, collaborative survey planning between ABS and the operator.

As vessels become increasingly connected and more reliant on software and operational technology (OT), cybersecurity is being treated as a core safety consideration.

As vessels become increasingly connected and software-driven, how is cyber risk being incorporated into class guides and risk assessments?

As vessels become increasingly connected and more reliant on software and operational technology (OT), cybersecurity is being treated as a core safety consideration. At ABS, cyber risk is addressed as part of our mission to promote the safety of life, property, and the natural environment. Rather than being handled solely as an IT concern, cybersecurity is integrated into vessel design, system architecture, and lifecycle risk management.

ABS has developed a comprehensive CyberSafety framework and associated notation suite that provides guidance to shipowners, shipyards, equipment manufacturers, and software providers on how to design and operate cyber-resilient systems. Key publications include guides for "Cybersecurity Implementation for the Marine and Offshore Industries", "Software Systems Verification", "Software Provider Conformity", and "Cybersecurity for Equipment Manufacturers".

These guides support the secure design and operation of both IT and OT environments, addressing areas such as system architecture, network segmentation, secure remote access, software assurance, and lifecycle cybersecurity management for safety-critical shipboard systems.

ABS is also actively involved in the development and implementation of mandatory maritime cybersecurity requirements, including the IACS Unified Requirements E26 and E27, and engages with emerging regulatory initiatives from the International Maritime Organization (IMO) and the US Coast Guard.

To support operators of existing vessels, ABS has introduced the Cyber Resilience – Existing Vessel (CR-Ex) notation. CR-Ex provides a structured pathway for



assessing and strengthening cybersecurity on legacy vessels, aligning operational practices and system architectures with the principles established in IACS E26 and E27.

Through these efforts, ABS incorporates cybersecurity into classification in the same structured way as other safety risks, helping owners and operators demonstrate resilience as vessels become increasingly digital and connected.

What is currently the biggest regulatory or safety barrier to large-scale autonomous and remotely operated vessels?

The single largest barrier is that the global regulatory framework was built around crewed ships and is still being adapted for autonomous and remotely operated operations. Most of today's rules assume the physical presence of people on board — a crew who can see, decide, and act in real time. Reinterpreting or revising those requirements for vessels with minimal or zero crew is complex and requires broad consensus among regulators, flag States, and industry stakeholders.

Several specific challenges stand out. First, regulations and conventions, from watchkeeping and navigation to emergency response, are written with human presence at the centre. Defining how "equivalent" safety can be achieved when decisions are made by software, remote operators, or a combination of both is not straightforward.

Second, authorities will expect robust evidence that autonomous and remotely operated ships can manage both normal operations and credible failures, collision risks, loss of communications, equipment failures, cyber events, or emergency conditions at least as safely as conventional vessels.

ABS is addressing these issues through guidance such as the "ABS Requirements for Autonomous and Remote Control Functions" and other related documents, which define notations and verification methods for autonomy functions.

How is the role of the traditional surveyor changing as classification societies are moving toward digitalisation?

The role of the surveyor is not being replaced by digitalisation; it is being enhanced. Digital tools give ABS surveyors greater insight, better preparation, and safer methods, so they can apply their technical judgment more precisely to each individual asset.

Historically, class requirements evolved from broad rules applicable to all ships to approaches that took into consideration a vessel's age and type. In the digital era, the shift is toward an asset-specific view, i.e., using data to understand the unique design, operating profile, and condition of each vessel.

What remains unchanged is the essence of the ABS surveyor's mission: to apply independent technical judgment in the interest of safety, property, and the environment. Digital tools and ABS's expanding body of rules, guides, and technical publications simply provide more information and improved methods to uphold that mission in a rapidly changing industry.



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Digitalisation is rapidly evolving the role of the traditional surveyor

This interview explores how digitalisation, AI, and cyber-resilient practices are reshaping classification, with Adrianos Zaphiropoulos examining how these shifts are transforming surveys, assurance models, and the evolving role of the modern surveyor.



Opinions expressed by
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How is the concept of "digital class" changing the way ships are surveyed, certified, and monitored compared to traditional class models?

The move toward "digital class" represents a significant opportunity to transition aspects of class from a time-based, inspection-centric assurance model to a risk-based, continuous, and evidence-driven one.

Traditional class models were built around periodic physical surveys conducted at defined intervals, and continue to play an integral role in assuring the safe operation of a vessel, as they provide a snapshot of a vessel's condition at a specific moment. As digitalisation introduces an era of increasingly complex ships, tighter regulatory oversight, and heightened commercial pressure, that episodic view is no longer sufficient on its own.

Digital class expands the evidence base. By integrating real-time sensor data, remote inspection technologies, AI analytics, and digital twins, classification societies can now build a far more holistic and dynamic understanding of asset condition. For example, drones and remotely operated vehicles allow surveyors to inspect tanks, holds, and underwater structures without exposing personnel to confined spaces or hazardous environments. At the same time, AI-enabled image analysis helps identify corrosion, cracking, or deformation patterns more consistently than manual review alone.

More importantly, digital twins are transforming classification from a retrospective activity into a forward-looking assurance process. These virtual representations combine design data, operational parameters, and live sensor inputs to track how a vessel or system behaves relative to its intended performance, enabling classification to shift from "Has this met the rule at inspection?" to "Is this behaving safely and predictably over time?"

Certification itself is also changing. Digital certification platforms reduce the administrative burden, improve transparency, and allow immediate access to compliance status, while continuous data streams support more flexible survey regimes based on actual conditions rather than fixed calendars. The result is not a weaker class model, but a more robust and resilient one, aligned with how modern ships are designed, operated, and regulated.

How is AI being used to predict structural, machinery, or safety risks before they turn into incidents, and how reliable are these models today?

AI's most immediate impact in maritime safety lies in its ability to identify weak signals that humans and traditional models struggle to detect.

Modern vessels generate vast volumes

of operational data across propulsion, auxiliary machinery, hull structures, navigation, and safety systems. Historically, only a small proportion of this data was analysed due to technical and human limitations. LR research highlights that traditional empirical approaches typically process around 10% of available vessel data. In contrast, AI-driven models can analyse closer to 90% of it, unlocking patterns and correlations that were previously invisible.

In practical terms, this enables predictive maintenance models that track subtle deviations in vibration, temperature, pressure, or energy consumption and flag emerging failure modes well before they become critical. Similar approaches are used to identify abnormal operational behaviours that pose safety or compliance risks, enabling interventions to be planned rather than rushed. LR's work on data-driven condition-based maintenance demonstrates that these techniques can significantly reduce unexpected failures and narrow the cost gap between older and newer vessels over time.

However, LR is clear that AI reliability must be understood in context. These models are only as good as the data they ingest and the governance frameworks that surround them. Bias, data gaps, and poorly defined operating boundaries can all degrade performance. As a result, LR consistently positions AI as a decision-support partner, not a replacement for engineering judgement. The most reliable outcomes occur when AI outputs are combined with domain expertise, physics-based understanding, and structured assurance processes.

This is why class involvement is increasingly focused on assuring the AI itself: validating model intent, monitoring performance drift, and ensuring outputs are explainable and auditable. Initiatives such as LR's Artificial Intelligence Register formalise this approach by providing a structured framework for documenting, governing, and assuring AI systems used in safety-critical applications. Reliability today is high enough to deliver real value, but trust depends on transparency, oversight, and continuous validation.



To what extent will real-time ship data affect physical inspections in terms of ensuring compliance with safety and environmental regulations?

Real-time ship data is reshaping compliance from a retrospective exercise into a continuous assurance process, with major implications for physical inspections.

In particular, as far as environmental regulation is concerned, digital platforms now enable near-real-time monitoring of emissions, fuel consumption, and voyage profiles. Tools within LR's digital ecosystem allow operators to track compliance with regimes such as FuelEU Maritime on an ongoing basis, rather than assembling evidence after the fact. This improves accuracy, reduces crew workload, and supports earlier corrective action when deviations emerge.

From a survey perspective, this wealth of data allows for more targeted, risk-based inspections. Rather than treating all systems equally in every investigation, inspectors can focus on assets exhibiting abnormal behaviour, accelerated degradation, or regulatory risk signals. This approach has already been demonstrated through initiatives such as LR's collaboration with Latsco, which uses continuous vessel data to inform smarter, evidence-based classification decisions. The result is greater efficiency alongside stronger safety and compliance outcomes.

That said, LR is explicit that data does not eliminate the need for physical inspections. Sensors can fail, software can misinterpret conditions, and certain degradation mechanisms — particularly structural issues — still require direct human verification. The future model is therefore hybrid: continuous digital oversight combined with strategically deployed physical inspections, informed by evidence rather than driven purely by time intervals.

Substantial progress has been made on autonomy, and the IMO's work on the Maritime Autonomous Surface Ships (MASS) Code marks a significant milestone. However, the Code is intentionally goal-based and high-level, leaving open questions around how autonomy is demonstrated to be safe, predictable, and controllable in real-world operations.

In effect, real-time data enhances the credibility and effectiveness of inspections rather than replacing them.

As vessels become increasingly connected and software-driven, how is cyber risk being incorporated into class guides and risk assessments?

Cyber risk has transitioned from an IT concern to a core element of maritime safety assurance.

As ships integrate greater connectivity between operational technology (OT) and information technology (IT), the potential impact of cyber incidents extends well beyond data loss to include propulsion, navigation, and cargo operations. LR has responded by embedding cyber considerations directly into class rules, notations, and unified requirements, ensuring cyber resilience is treated as a safety issue rather than an optional add-on.

Modern class guidance focuses on layered defence, network segmentation, intrusion detection, and, critically, operational recovery. LR experts consistently emphasise that no system can be made entirely secure; therefore, resilience depends on the ability to detect anomalies early, isolate affected systems, and recover safely. AI-based anomaly detection is increasingly used to identify deviations in network behaviour, although human oversight remains essential.

Equally important is the human dimension. Many cyber incidents exploit procedural weaknesses rather than technical flaws. As a result, cyber risk assessments increasingly consider training, awareness, and operational discipline as integral components of resilience. Cyber assurance is now understood as a socio-technical challenge, blending technology, people, and process within a single risk framework.

What is currently the biggest regulatory or safety barrier to large-scale autonomous and remotely operated vessels?

The principal barrier is not technology maturity, but assurance and regulatory alignment.

Substantial progress has been made on autonomy, and the IMO's work on the Maritime Autonomous Surface Ships (MASS) Code marks a significant milestone. However, the Code is intentionally goal-based and high-level, leaving open questions around how autonomy is demonstrated to be safe, predictable, and controllable in real-world operations. Key challenges include defining Operational Design Domains, setting clear operational envelopes, and ensuring effective human oversight during abnormal situations or emergencies. Regulators and flag States need confidence not only in what autonomous systems can do, but in what they cannot do — and how they fail safely.

LR's response has been to focus on evidence-based assurance. Initiatives such as the Maritime Autonomy Assurance Testbed (MAAT) bring together simulation, live trials, and structured data collection to demonstrate compliance in a way regulators can trust. Until such frameworks are widely adopted and harmonised, large-scale commercial autonomy will remain constrained despite technological readiness.

How is the role of the traditional surveyor changing as classification societies move toward digitalisation?

What is rapidly evolving the traditional surveyor's role is digitalisation itself.

As routine inspection tasks become increasingly supported by data, remote technologies, and automation, surveyors are spending less time gathering evidence and more time interpreting, validating, and contextualising it. This includes assessing data quality, interrogating AI outputs, reviewing digital evidence from remote inspections, and making informed judgements about risk and compliance.

The skillset required is therefore broadening. Digital literacy, data interpretation, and systems thinking are becoming as important as traditional engineering expertise. At the same time, the human role becomes more critical, not less. AI can highlight anomalies, but only experienced professionals can understand their operational significance, weigh competing risks, and make accountable decisions. In this sense, digitalisation reinforces the surveyor's value as a trusted authority. By focusing human expertise where it adds the most value — complex judgement, novel technologies, and system-level assurance — classification societies strengthen their role as independent guardians of safety in an increasingly digital maritime industry.


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From periodic paperwork to “always on” assurance: How digital class is enhancing maritime safety

Enabled by connectivity, sensors, and advanced analytics, the ongoing digital transformation in maritime is redefining how ships are designed, operated, and assured throughout their lifecycle. In this article, Harald Olav Bjørdalsbakke examines the key issues shaping this transformation from a class perspective and explores their practical implications for shipowners, yards, technology providers, and regulators.



An article by
Harald Olav Bjørdalsbakke,
Principal Engineer, Program Manager - Strategic AI Development at DNV Maritime

Digital class and the new “always on” model of assurance

Moving to a more “real-time” class systematics means augmenting periodic surveys and manual checks with a continuous data stream from a vessel’s most critical systems, including navigation, propulsion, and power generation. Remote surveys and digital-evidence reviews are now standard tools, applied when appropriate. The acceptance threshold for remote methods depends on data quality, system criticality, and the clarity of the verification objective. With new capabilities such as vessel specific data models, “data ready” vessels, equipment, and systems, and interoperable data models, we can connect information from a vessel’s design and construction with its actual condition, maintenance, and operational performance. As a result, our assurance role as class shifts from being based on isolated events (the survey) to a continuous process throughout the vessel’s lifecycle.

This enables us to perform more targeted onboard inspections, ensure continuous compliance of critical systems, detect deviations in system performance earlier, and offer increased flexibility and predictability based on a vessel's actual condition. Continuous data enables risk-based and condition-based assurance, allowing owners and class to optimise inspection scope and timing. This reduces disruption while sharpening our focus on the areas that matter most. All this helps us evaluate risk and support our customers’ decision-making over the long term.

The surveyor — still the decision maker

Even with new, rich data sets streaming into class, some verifications will stay irreplaceably physical. And this means that the surveyor is still, and will remain, at the heart of DNV’s business and our role as a classification society. But the toolbox they use has expanded in the digital era. In addition, data has enabled — and will continue to enable — their perspective to expand to encompass the entire lifecycle of a vessel, engaging earlier and more

continuously with these assets across every phase of design, construction, and operations.

Surveyors are now gaining insights and information from tools such as drones, ROVs, and other technologies, which not only extend their reach and improve the quality and nature of their findings but also keep them and the onboard crews safer while on the job. Their role is also evolving, with an emphasis on diagnostics not from the tap of a hammer but from the signal in a data stream. It's about interpreting data, validating and analysing anomalies, and then using this information to make decisions and prioritise interventions based on risk. But as it has always been, human judgment remains the decisive factor.

The use of AI in predicting and monitoring ship systems

Another technology increasingly available to support class and the surveyor is AI. AI is already used to detect anomalies, classify risks, and predict failures by identifying patterns in vibration, temperature, stress, load, or control signals.

The increased volume and complexity of data available to the maritime industry have reached a point where it is challenging to leverage this wealth of information with traditional analytical methods. But AI, paired with structured data models and human expertise, can extract insights from that data at a scale and speed we have not seen before.

However, there is no doubt that AI agents still have a long way to go before they are ready to tackle the challenges of keeping shipping safe on their own. The most reliable outcomes arise when we take a hybrid approach that combines AI with physics-based methods and human engineering judgment.

Crucially, a human expert always remains in the loop. Surveyors and engineers interpret AI-generated information, validate predictions, and identify potential mitigation steps, enabling data to drive the right actions at the right time.

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Cyber risk is now a core safety consideration

It should be clear that underlying all of this is the huge rise in the digitalisation of ship systems, networking, and data exchange. Assurance today depends on trustworthy, authenticated, traceable, and tamper-evident data flows from vessel to shore to class.

However, as vessels have grown more connected and software-driven, software integrity, verifiable data handling, and cybersecurity have become fundamental parts of the safety equation. As an essential part of data-driven class verification, cyber resilience is also built around continuous action and assessment, with ongoing monitoring to ensure that key systems can detect, withstand, and recover from cyber events. At DNV, cyber risk is now explicitly built into our class guidance and risk assessments, with requirements covering governance, access control, software update processes, network segregation, incident response readiness, and more.

Data-driven verification heightens the importance of data standards

Our progress on this path to a more digitally enhanced class and industry depends on data standardisation and contextualisation. Without shared schemas, semantics, and quality benchmarks, there is a risk that data remains siloed and hard to trust. This is where standards can work as enablers: frameworks such as ISO 19848 and structured models like DNV's Vessel Information Structures (VIS) help to make data trustworthy, comparable, and meaningful across systems and for all stakeholders.

Nevertheless, context is paramount; raw data becomes actionable intelligence only when it is tied to a specific system, design intent, maintenance records, operating conditions, and risk models. If we want to use AI to take this data and generalise, explain, and expand across fleets and use cases, it needs high-quality, well contextualised data — clean "fuel" that enables reliable performance.

Digital class builds on the fundamentals of safety

This new assurance landscape doesn't change our focus on the fundamental principle of enhancing maritime safety; it enables us to deliver on this principle with greater precision and confidence. We're working to build frameworks of trust suited to the digital era — ones that not only cover steel, but digital models, AI systems, data quality, and cyber integrity, demonstrating how these can reduce risk across the whole industry. With trusted data, AI, cyber-resilient systems, and human judgment working together, our role as a class can be more targeted while encompassing a more holistic picture of the asset across its entire lifecycle, always firmly grounded in engineering and the expertise of our people.


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The reliability of AI-based models is expected to continue improving

Daiji Aihara explores how ClassNK is advancing digital class, AI-enabled risk prediction, and cyber-resilient safety frameworks, while also outlining how data, governance, and human oversight will shape the next decade of smart-ship regulation and assurance.



Opinions expressed by
Daiji Aihara,
General Manager of the Tech Expertise Centre at ClassNK

How is the concept of "digital class" changing the way ships are surveyed, certified and monitored compared to traditional class models?

The concept of "digital class" transforms the traditional model of periodic, on-site surveys into a data-driven framework that enables safety assessments based on a vessel's actual condition. By utilising sensor information and operational data, we can transition toward a more dynamic evaluation process. Furthermore, with the advances in remote technologies and robust data governance, maritime safety management is becoming significantly more efficient and technologically sophisticated.

How is AI being used to predict structural, machinery, or safety risks before they turn into incidents, and how reliable are these models today?

When applying AI to predict structural, machinery, or safety risks, it is essential to incorporate actual operational data, detailed design information, and engineering knowledge specific to each piece of equipment. From the perspective of a classification society, we are currently in the research phase, collaborating with multiple manufacturers to address these requirements.

Furthermore, by analysing the historical survey and inspection data we possess, we are conducting studies on how each vessel's operational profile influences its overall safety performance. However, given AI's inherent characteristics, particularly the risk of hallucinations, the reliability of such models remains at the research stage; therefore, we believe human verification (Human-in-the-Loop) is still indispensable.

That said, with the ongoing accumulation of operational data and the rapid advancement of AI engines, the reliability of AI-based models is expected to continue improving. In addition, we consider that establishing clear rules and frameworks for AI, particularly regarding responsibility and governance, is essential before these technologies can be put into full practical use.

To what extent will real-time ship data affect physical inspections in terms of ensuring compliance with safety and environmental regulations?

Real-time vessel data facilitates continuous monitoring of operational status and machinery health, allowing us to evaluate regulatory compliance more promptly and accurately. This constant flow of information makes it possible to identify potential issues at an earlier stage. Consequently, we believe that physical inspections will become increasingly risk-based and targeted, enhancing both the efficiency and the quality of safety management.

By utilising real-time data in IMO DCS



and EU-MRV, the verification process is also expected to: a) reduce inconsistencies found in traditional manual records such as BDNs (Bunker Delivery Notes), logbooks, and noon reports, thereby improving data accuracy; b) streamline the verification process, as real-time data lowers the workload required for data aggregation and preparation before verification; and c) strengthen the improvement cycle by enabling operators to identify and correct problematic voyage data prior to verification, which in turn reduces the number of comments during the verification stage.

As vessels become increasingly connected and software-driven, how is cyber risk being incorporated into class guides and risk assessments?

NK incorporates cyber risk as an integral element of ship safety, addressing it through UR E26/E27 design-stage requirements and through its Cyber Security Management System (CSMS) certification framework at the organisational level.

Cyber risk has evolved beyond a standalone IT concern into a safety-critical factor that can directly affect navigation, control systems, and operational reliability. Under UR E26/E27, cyber-resilience requirements are incorporated at the design stage of newbuildings, including network segmentation, local access control, and remote access control, thereby enhancing the cyber resilience of onboard systems.

In addition, NK offers its CSMS certification framework to promote structured risk assessment, defined accountability, incident-response preparedness, and continuous improvement processes within organisations.

Through these complementary approaches, cyber risk is addressed within a structured safety-management framework that reflects the increasing digitalisation of shipping.

What is currently the biggest regulatory or safety barrier to large-scale autonomous and remotely operated vessels?

There are three main regulatory and safety barriers to the large-scale deployment of autonomous and remotely operated vessels. Firstly, internationally unified legal frameworks and safety standards have not yet been established, which fundamentally hinders widespread implementation. In particular, the boundaries of responsibility remain unclear and need clarification through further international discussions.

Secondly, safety levels vary significantly depending on the Concept of Operations (ConOps), which is central to validating the Operational Design Domain (ODD) of Autonomous Navigation Systems (ANS). Furthermore, within the Operational Envelope (OE), ensuring safety depends on effective collaboration between systems and humans, with human operators expected to compensate for system limitations. Determining the appropriate allocation of tasks between humans and automation is therefore essential.

Thirdly, validating emergency response procedures is also crucial, as appropriate responses may vary substantially depending on the situation and the ConOps. Addressing these issues requires internationally unified and operationally acceptable technical guidelines.

Taken together, these issues highlight the need for harmonised regulation, clarified responsibility, robust system-human integration, and scenario-based emergency preparedness before autonomous and remotely operated vessels can be deployed at scale.

How is the role of the traditional surveyor changing as classification societies are moving toward digitalisation?

With the progress of digitalisation, the role of the traditional surveyor is expanding to encompass data-driven analysis and evaluation. This shift requires more sophisticated judgment rooted in comprehensive risk assessments. While the expertise gained through hands-on, on-site experience remains indispensable, the synergy between professional intuition and advanced digital technologies will further elevate the quality and reliability of the survey process in the years ahead.

Bridging maritime operations, research, and innovation

The global shipping industry is undergoing a profound transformation driven by digitalisation, decarbonisation, and increasing reliance on data-driven decision-making.



An article by
Nikolaos Tsoulakos,
Innovation & Technology Manager
at Laskaridis Shipping Company Ltd.

As the sector moves toward stricter environmental regulations and greater transparency in operational performance, shipping companies are increasingly exploring how data analytics and digital technologies can support more efficient and sustainable operations. Industry studies suggest that digital performance monitoring and data-driven optimisation can reduce fuel consumption by several percentage points across a vessel's operational profile, highlighting the growing importance of data-based decision-making in modern fleet management.

Within this evolving environment, several shipping organisations have begun linking day-to-day vessel operations with structured scientific research and technological innovation. Among these, Laskaridis Shipping Co. Ltd. represents an example of a company seeking to connect operational practice with knowledge creation and collaborative research. This approach reflects a broader recognition within the industry that systematic analysis of operational data can support both commercial efficiency and wider sectoral progress.

In recent years, greater emphasis has been placed across the maritime sector on the systematic use of operational data as a decision-support tool. Rather than treating research as a peripheral activity, some operators have increasingly embedded analytical processes within routine operational workflows and strategic planning. This shift reflects the growing complexity of regulatory requirements, environmental constraints, and technological systems that characterise modern shipping. By capturing and analysing vessel performance data in a structured manner, everyday ship operations can evolve into a continuous learning process that supports operational optimisation, transparency of performance, and evidence-based decision-making.

Within this broader framework, Laskaridis Shipping Co. Ltd. has established the Innovation Library of Lavinia Corporation, an initiative aimed at consolidating scientific publications, technical studies, and research outputs generated through academic collaboration and participation in international research programmes. The initiative seeks to curate and preserve research material in a structured format while supporting knowledge sharing within the maritime community. The planned public accessibility of the Innovation Library reflects a growing industry trend toward the open dissemination of knowledge on maritime innovation and sustainability.

Participation in European research and innovation initiatives

A key element of this research-oriented approach involves participation in European research and innovation initiatives, particularly those funded under Horizon Europe. In such multi-partner consortia, shipping companies often act as operational reference partners, contributing real-world operational insights that help align research objectives with the realities of commercial shipping.

These collaborative initiatives typically

address major challenges facing the maritime sector, including energy efficiency optimisation, digital twins and decision-support systems, predictive maintenance methodologies, emissions monitoring and reduction strategies, and the assessment of alternative fuels and hybrid propulsion technologies. By contributing operational experience, vessel-specific parameters, and feedback from ship management practice, industry participants help ensure that research outcomes remain practically relevant and scalable.

One particularly valuable contribution from the operational side is the provision of anonymised high-frequency operational data collected from vessels trading under real commercial conditions. Such datasets reflect the complexities of global shipping operations, including varying weather conditions, cargo patterns, routing scenarios, and operational constraints. Access to these datasets enables academic researchers to validate artificial intelligence models, machine learning algorithms, and simulation frameworks with a level of realism that is often difficult to achieve in purely theoretical settings. Operational datasets contributed through collaborative research initiatives by companies such as Laskaridis Shipping Co. Ltd. illustrate how real commercial fleet data can support the development and validation of advanced analytical models.

Collaboration with universities and research institutions

Complementing participation in European research programmes, collaborations between shipping companies and academic institutions have become increasingly common through formal Memoranda of Understanding and research partnerships. These collaborations aim to promote continuity and depth of research rather than isolated short-term studies.

Joint research activities frequently focus on topics such as ship performance analysis, weather impact modelling, digitalisation of safety and compliance processes, port state control analytics, machinery health monitoring, and decarbonisation pathways for existing fleets. Through these collaborations, academic researchers gain access to operational datasets and insights into ship management processes. At the same time, industry partners benefit from advanced analytical techniques and independent scientific evaluation of operational practices.

Such partnerships also contribute to education and capacity building. Engagement with postgraduate students and early career researchers provides opportunities to address real operational challenges while strengthening the analytical capabilities of the next generation of maritime professionals. This interaction helps bridge the traditional gap between academic research and operational practice.

> In recent years, greater emphasis has been placed across the maritime sector on the systematic use of operational data as a decision-support tool. Rather than treating research as a peripheral activity, some operators have increasingly embedded analytical processes within routine operational workflows and strategic planning.

From operational data to peer-reviewed scientific output

The increasing integration of operational data with academic research has produced a growing number of peer-reviewed publications arising from industry-academic collaboration. Studies based on operational vessel datasets have appeared in international journals and conferences covering maritime engineering, energy systems, artificial intelligence, and transport economics.





These publications address topics such as fuel consumption modelling, digital twins for operational decision-support, predictive maintenance systems, and techno-economic evaluations of alternative energy solutions. In several cases, research outcomes derived from operational datasets have received recognition through conference awards and scientific distinctions.

Beyond individual achievements, this body of work contributes to the broader maritime knowledge base and supports evidence-based discussion on digitalisation, decarbonisation, safety management, and regulatory development.

Environmental and social implications

The increasing adoption of data-informed operational strategies also carries significant environmental and social implications. Advanced analytics and continuous monitoring can help identify operational inefficiencies, optimise fuel consumption, and reduce emissions across vessel fleets. Such approaches support compliance with evolving environmental regulations while enabling proactive planning for future requirements related to carbon intensity, energy efficiency, and alternative fuels.

From a social perspective, digitalisation and data-driven decision-support tools can enhance safety awareness and operational transparency on board vessels. Predictive maintenance systems and performance-monitoring frameworks help reduce the likelihood of equipment failures and operational risks, while improved data visibility supports more informed decision-making by both onboard and shore-based personnel.

At the same time, collaboration with academic institutions contributes to knowledge transfer and professional development within the maritime sector, strengthening the human capital dimension of maritime sustainability.

Governance, data quality, and digital responsibility

The effective use of operational data requires robust governance frameworks and careful attention to data quality and confidentiality. Many shipping organisations participating in research collaborations have developed structured procedures for data collection, validation, anonymisation, and controlled sharing with external partners.

These practices allow valuable operational insights to be utilised for research purposes while protecting commercial sensitivity and ensuring compliance with cybersecurity and confidentiality requirements. The integration of high-frequency telemetry with contextual operational information from ship logs, maintenance systems, and voyage-planning tools enables more comprehensive analysis of vessel performance.

Such integrated datasets support improved modelling of the interactions among technical systems, environmental conditions, and human decision-making processes in complex maritime operations.

Strengthening the connection between industry and science

The developments described above reflect a broader shift within the maritime sector, where operational practice is increasingly intertwined with scientific research and technological experimentation. The growing collaboration between shipping companies and research institutions illustrates how operational practice can directly contribute to scientific advancement. By participating in research programmes, sharing anonymised operational data, and supporting academic collaboration, industry actors increasingly play an active role in developing new knowledge and technologies.

As regulatory requirements intensify and technological complexity continues to increase, closer cooperation between maritime operations and scientific research is likely to become even more important. The experience of companies such as Laskaridis Shipping Co. Ltd., which actively participate in collaborative research initiatives and knowledge-sharing platforms, demonstrates how operational experience and scientific analysis can reinforce each other in addressing the sector's emerging technological and environmental challenges.

In this context, industry engagement in research not only supports operational competitiveness but also contributes to the broader transition toward a more resilient, efficient, and sustainable maritime sector.

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Beyond paper: Electronic bills of lading and the limits of blockchain

Shipping is undergoing a structural shift in the way trade documentation is created, transferred, and relied upon.



An article by
John Agapitos LLB, LLM, MSc
Solicitor and Lawyer
at Agapitos, Georgiou and Partners

For generations, the industry has depended on paper-based processes to transfer rights to possession, release cargo, and evidence contractual rights. That model is now being challenged by digitalisation. Electronic bills of lading are becoming more widely accepted, and blockchain has emerged as a technology to make them more secure, reliable, and efficient.

The starting point is the bill of lading itself. In its classic form, it performs three functions: it acts as a receipt for the goods, as evidence of the contract of carriage, and, where it operates as a document of title, as a means of transferring constructive possession and the right to delivery while the goods are in transit. That final function gives the bill its commercial power: it allows the document to stand in for the goods while they are in transit and to be endorsed, traded, financed, and relied upon by banks and third parties. Any serious electronic alternative must therefore do more than digitise information; it must reproduce the bill's legal and commercial effect, especially its document-of-title function.

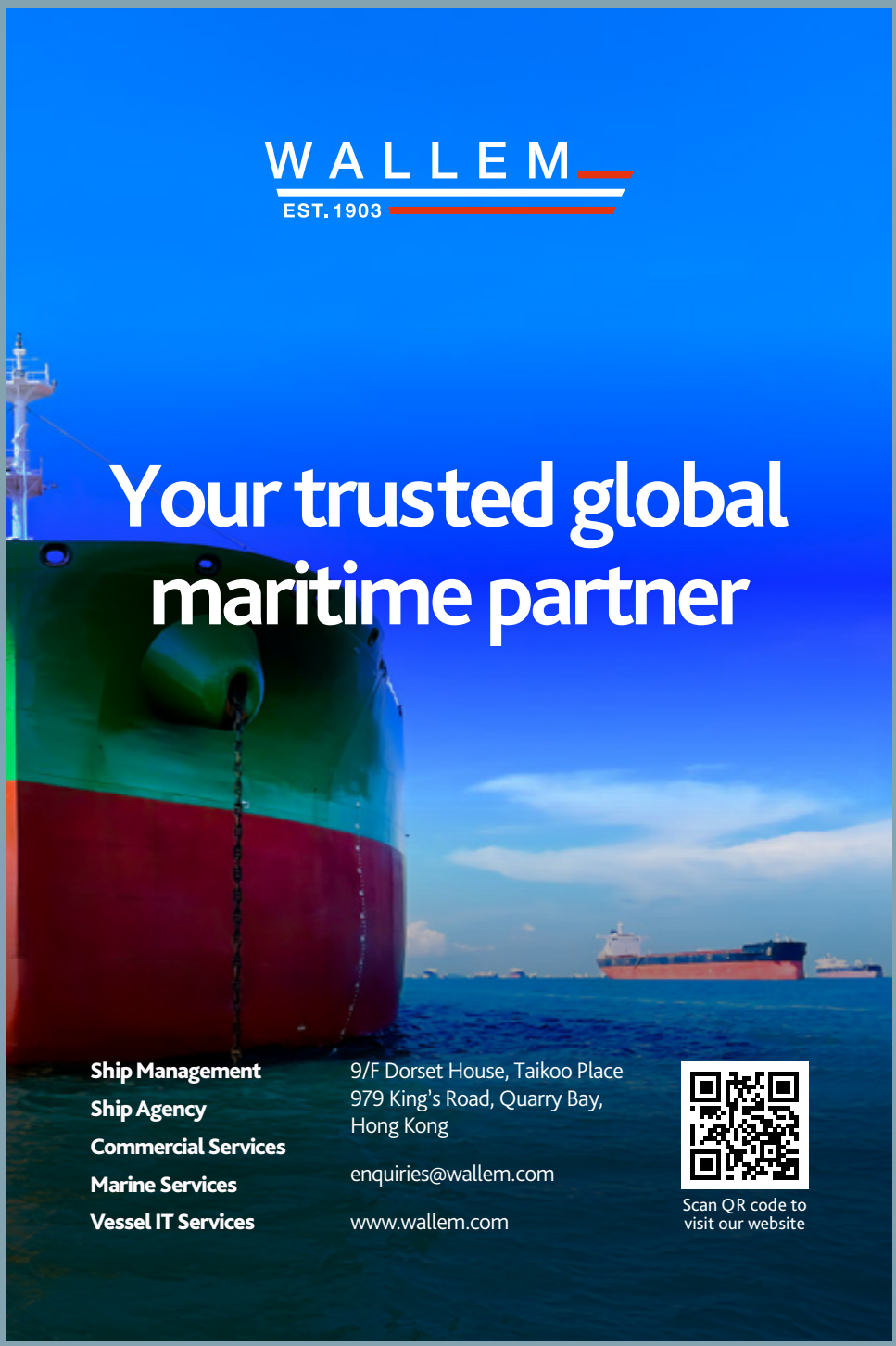
The paper bill, however, is costly, slow, and vulnerable. A late-1990s UN study estimated the global cost of processing trade paperwork at approximately USD 420 billion annually, while more recent reports have indicated that paper documentation can account for up to one-fifth of transport costs and that the bill of lading itself may account for 10–30% of total documentation costs. So long as the physical document remains the "key to the warehouse", these costs remain embedded in the system. Paper also slows trade: vessels often arrive before the original bill, causing delay, storage costs, demurrage, and reliance on letters of indemnity, which remain commercially familiar but legally risky. Paper systems also carry security risks, including forged or switched bills, human error, confusion caused by multiple originals, and delivery without surrender of the original bill. Depending on the jurisdiction, the consequences can be severe: for instance, under UK law, delivery against a forged bill is treated as misdelivery, with no defence based on good faith or innocence.

These problems explain why the industry began looking for electronic alternatives long before blockchain entered the picture. As early as the 1990s, electronic bills of lading were being used through closed, centrally administered systems. Broadly, the carrier would issue an electronic record containing the same information as a paper bill, and control over that record would be assigned to a single holder at a time via a secure message, private key, or registry entry. Transfer did not occur through physical delivery of a document but through the platform's intervention: the existing holder's control would be cancelled and reissued, or recorded in favour of the transferee, usually under a rulebook or user agreement accepted by all participants. In legal terms, these systems relied largely on contractual mechanisms to reproduce the transfer of rights and control that paper bills achieve more directly.

Those early systems were innovative but limited. They relied heavily on the carrier or platform operator's involvement, so the electronic bill could not be negotiated freely or independently in the same way as a paper bill could. Their effectiveness also depended on all parties joining the same private system and accepting the same contractual framework, which limited interoperability and made legal recognition across jurisdictions uncertain. They reduced some paper-based friction but did not eliminate reliance on intermediaries or fully resolve concerns over fraud, system failure, or legal equivalence. That is why blockchain-based models later attracted such attention.

Blockchain entered the story later, not as a synonym for the electronic bill, but as a more advanced technological answer to the same problem: how to make an electronic bill unique, trustworthy, transferable, and scalable. Broadly, blockchain is a particular type of distributed ledger technology. In a decentralised blockchain model, instead of a single central operator keeping the master record, transactions are recorded across a network of participants in linked blocks. Each block is connected to the previous one using cryptographic methods and maintained in a way that makes tampering extremely difficult to detect. In this context, a bill of lading can be represented as a unique digital token and transferred electronically, while preserving a verifiable record of who has control at each point. Many commercial electronic bill platforms remain permissioned, membership-based, or governed by platform rules, so decentralisation should not be overstated. Even so, the transfer no longer depends on couriers and physical presentation, but on digital control over a shared, verified, and hard-to-alter record.

The practical appeal is clear. Blockchain can reduce dependence on a single intermediary by distributing the record across a network, although many commercially important permissioned systems remain governed and trust-based rather than fully decentralised. It can improve traceability, create an audit trail of changes and transfers, make unauthorised tampering harder, and allow the bill to be treated as a unique digital asset rather than a copyable file. It can also reduce the risk that cargo outruns its documents, provide a clearer record of who is entitled to control the bill, and support smart-contract functionality, meaning coded mechanisms that automate actions once preset conditions are



The market has moved beyond theory, although adoption remains transitional rather than universal. A growing number of provider-operated electronic bill of lading systems have been reviewed by the International Group of P&I Clubs, and many now use blockchain technology. This indicates growing market confidence, but not yet full industry-wide adoption.

met. Blockchain is therefore best understood as an enabling technology for electronic bills of lading, not as a separate category of trade document.

The market has moved beyond theory, although adoption remains transitional rather than universal. A growing number of provider-operated electronic bill of lading systems have been reviewed by the International Group of P&I Clubs, and many now use blockchain technology. This indicates growing market confidence, but not yet full industry-wide adoption.

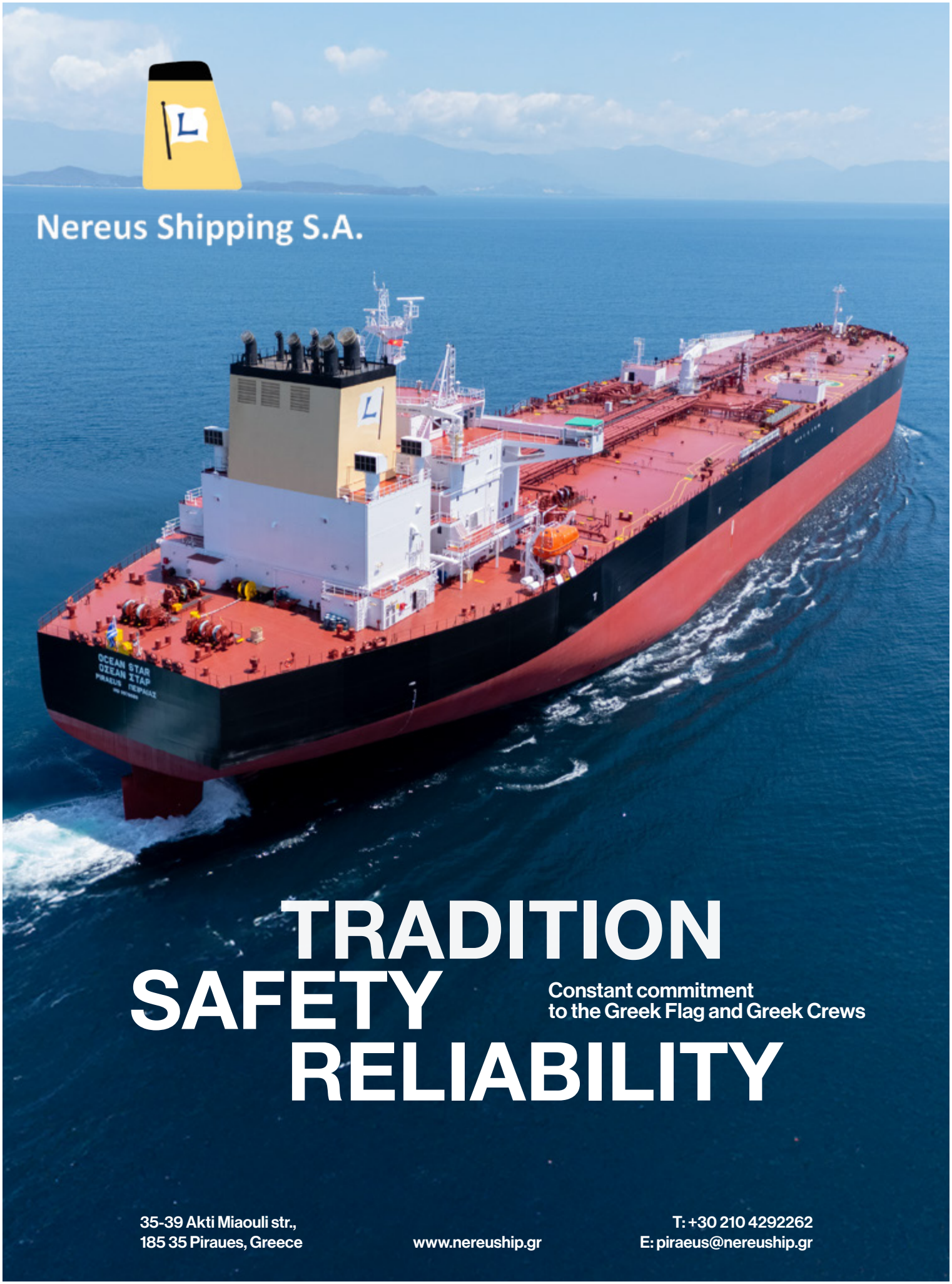
Yet blockchain is not a silver bullet. The first challenge is interoperability. Many providers use private or permissioned blockchain systems because they offer tighter access control and more predictable governance, but different platforms may not interoperate easily. Ideally, an electronic bill of lading should be capable of moving between platforms without losing its legal or commercial effect. In practice, the absence of common standards can frustrate that goal. The problem also extends beyond platforms: banks, insurers, customs authorities, and other public or quasi-public bodies must also be able to accept and process electronic trade documents. If they still require paper, digitisation creates a new bottleneck rather than removing the old one.

The second challenge is trust, confidentiality, and cyber risk. Blockchain may reduce dependence on a central operator, but it does not eliminate concerns about privacy, system integrity, or liability. Public blockchains raise obvious confidentiality concerns, while private blockchains, though more controlled, may still expose or allow others to infer commercially sensitive information about cargoes, counterparties, and trade flows. Blockchain's association with anonymity can also be unsuitable for trade, because anonymity may increase exposure to fraudulent transactions, unreliable parties, and sanctions risks. Nor is blockchain immune to hacking, malfunction, or fraud. Code can fail, platforms can malfunction, and disputes may arise over who is the rightful holder or who bears liability if a private key or electronic signature is issued to the wrong party. These risks must therefore be allocated carefully by contract. In that sense, digitalisation does not remove risk; it changes its form.

Cost is another obstacle. Electronic trade platforms, including blockchain-based platforms, are expensive to build and maintain, and providers often need substantial insurance and governance frameworks to reassure the market. Some blockchain models also entail significant energy demands, weakening the commercial and environmental case, as the system must compete not only with paper but also with non-blockchain digital alternatives. Strong technology alone is therefore not enough; commercial success also depends on market support, ease of use, and integration across the wider-trade ecosystem.

The legal dimension is just as important as the technology. The older conventions were not drafted with electronic substitutes in mind. The Hague/Hague-Visby Rules, still the most commercially important, say little about the form of the bill because their focus is the carrier's liability regime. Some argue that the wording is broad enough to include an electronic bill if it performs the same functions, but the point is unsettled and is often addressed expressly in contractual clauses. The Hamburg Rules do not resolve the issue either, despite referring to electronic signatures and other means of communication.

The Rotterdam Rules were the first serious international convention-level attempt to address electronic transport records directly. They recognise elec-


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tronic records as equivalent to paper documents where the parties' consent and reliable procedures exist for issuance, transfer, integrity, and identification of the rightful holder. Most importantly, they treat "exclusive control" over a negotiable electronic record as the functional equivalent of possession. That was a major conceptual step, but uptake and ratifications have been limited, so the Rules have not produced universal legal convergence.

More progress has come through soft law and domestic reform. The UNCITRAL Model Law on Electronic Transferable Records, adopted in 2017, proceeds on the basis of functional equivalence and technological neutrality. Its central idea is that if a reliable method can identify the electronic record, preserve its integrity, and subject it to exclusive control, that control can perform the role that possession plays in the paper world. That is what makes blockchain commercially interesting: it offers a practical way to achieve the control, integrity, and uniqueness this framework requires.

English law has now moved decisively in this direction through the Electronic Trade Documents Act 2023. Under the ETDA, an electronic trade document can have the same legal effect as its paper counterpart if it is administered through a "reliable" system. Such a system must, in substance, ensure a document's uniqueness, integrity, singular control, and transferability of control. Accordingly, the ETDA is technologically neutral: it does not require blockchain but plainly accommodates it. It was inspired by the MLETR, but it does not simply reproduce it. In particular, English law permits parties to contract out of certain non-mandatory provisions, and the ETDA adopts a broader concept of electronic trade documents than the MLETR's focus on electronic transferable records. Its requirement of a "reliable" system is also important, because the statutory factors remain guidance rather than a fully settled standard.

Singapore has taken a slightly different route with its Electronic Transactions (Amendment) Act 2021, which adopts the MLETR without an opt-out option and supplements it with domestic regulations and administrative controls, making Singapore a notable example of legal recognition supported by state-backed digital infrastructure. Broadly, the spread of MLETR-style reform indicates that legal recognition is gradually catching up, even if legal certainty continues to develop unevenly across jurisdictions.

The market, therefore, remains in transition. Paper bills of lading are inefficient, slow, insecure, and costly, while electronic bills of lading offer a broader solution to those weaknesses. Blockchain is one of the most serious technologies now being used to make that answer work at scale by improving traceability, integrity, control, and transferability, but it does not remove every obstacle. Interoperability, confidentiality, cyber exposure, cost, governance, and legal recognition all remain live issues. For shipowners, operators, traders, and financiers, the question is no longer whether paper is flawed, but whether a chosen digital system is robust, commercially acceptable, and legally reliable enough to do the job of the paper bill better. Beyond the legal framework, lawyers and advisers must understand and keep pace with the fast-evolving technology underpinning electronic bills of lading. Blockchain may not be a magic fix, but it is increasingly central to the industry's move away from paper and towards workable digital trade.



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From data

Is this the end of the dashboard era?

For the better part of a decade, the maritime industry has poured energy into a single proposition: collect more data, integrate it, and visualise it.



by **Panos Theodosopoulos**,
CEO of Metis

The reports multiplied, the dashboards got prettier, and somewhere along the way an uncomfortable truth crept in: having the data is not the same as making the right call.

That gap is now the most important problem in shipping technology. Fuel prices swing. Regulation tightens with CII, EU ETS, and FuelEU Maritime stacked on top of one another. Charterers expect transparency that did not exist five years ago. The fleet manager who once juggled three or four operational variables now balances a dozen: technical, commercial, environmental, and regulatory, often in the same morning.

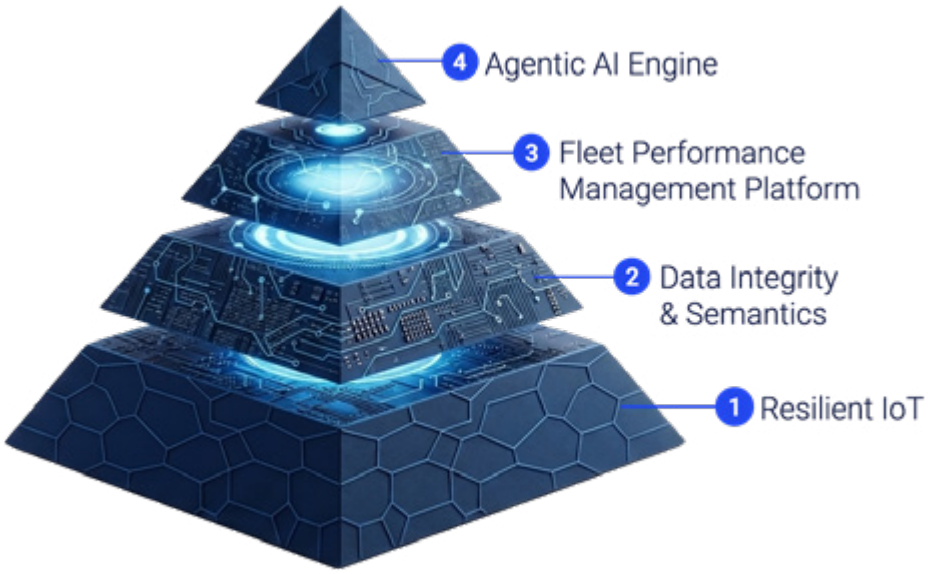
Dashboards do not solve that. They describe the world, yet do not easily navigate it. What operators need is timely, contextual guidance they can trust on a typical Tuesday morning when the wind is up, the schedule is slipping, and a decision has to be made in minutes.

There is a quiet conversation in shipping right now about AI, and it is not about capability. It is about trust. Operators have seen enough black-box recommendations to know that a confident answer is not the same as a correct one. Trust in AI-driven decision support is built upstream of the AI itself: in telemetry integrity, data validation, and contextual modelling. Skip those layers, and the recommendations on top cannot be trusted. This is exactly where Metis has focused.

The Metis platform is built on four layers: two foundational, two intelligent.

The first foundational layer is resilient IoT: telemetry that monitors itself, flags sensor and connectivity failures in real time, and self-heals where it can. The second is the Metis Data Confidence & Context Layer, where most of the trust problem in maritime AI is actually solved. Every signal is validated, cleansed, and quality-scored. Every KPI carries an explicit definition, a documented methodology, and a record of the variables and operational conditions that influence it. Bad data does not just produce bad answers; it produces confident bad answers, which are worse, and this is the layer that prevents them.

to actions



On top sit the intelligence layers. Maritime-specific analytics translate clean signals into the KPIs that matter: vessel and voyage performance, charter party compliance, machinery health, and emissions exposure. Above those, domain-specialist AI agents, hull and propulsion, machinery, voyage ops, emissions compliance, each agent carrying deep maritime knowledge and trained to reason within its discipline. A cross-functional orchestrator weighs their outputs, resolves competing priorities, and surfaces a single prioritised recommendation rather than a wall of alerts. This is not general-purpose AI pointed at shipping; it is maritime-native intelligence on a foundation that operators can see.

Consider a recent customer scenario. A bulk carrier on a long Pacific leg shows a gradual rise in main engine fuel consumption. The traditional path: a review of recent noon reports, or a month-end report and a discussion later. With Metis, the sequence collapses. The machinery agent flags the deviation in near-real time and cross-checks scavenge air pressure, turbocharger condition, exhaust gas temperature spread, and fuel quality. The hull agent rules out fouling. The orchestrator weighs the finding against the voyage agent: a mid-laden vessel, a fixed charter, and a tight redelivery window — then produces a single recommendation: “Adjust the load profile now and schedule a turbocharger and scavenge port inspection at the next port call”. A recommendation delivered with its reasoning attached, transparent end-to-end.

The role of the fleet manager is going to change, and for the better. Today, the job involves enormous triage, examining alerts, reconciling reports, and chasing data quality issues. Much of that is plumbing, not judgement. As Metis handles the plumbing, the human role moves up the stack: less time assembling the picture, more time deciding what to do.

The shift from data to actions is already underway. The question is not whether it happens. The question is whose actions you will trust.

Traditional platforms tell you what happened. Metis tells you what to do next, and why.

Sustainable maritime business begins with digital optimisation

From keeping vessels running optimally to reducing carbon costs and safeguarding supply chains, an integrated approach to digital optimisation can deliver significant benefits to ship operators, writes Cristian Corotto, President of Accelleron's Digital Division.



by **Cristian Corotto**,
President of Accelleron's Digital Division

In a rapidly changing market, the case for digital optimisation gets stronger daily. In the past year alone, we have seen supply chain shocks in the Black Sea, the Red Sea, and the Panama Canal, new carbon pricing regulations, and an increase in the incidence of machinery damage on an ageing fleet. While there can be no panacea for such a complex web of factors, there is little doubt that digital solutions can be deployed to minimise the impact of each.

At Accelleron, we go further. We believe that an integrated digital approach not only reduces the cost of supply disruption, vessel downtime, and emissions regulation but also allows operators to develop strategies to actually thrive in these challenging conditions.

That is the rationale behind our most recent digital acquisition of True North Marine in 2023. Combining Accelleron's engine, hull and propeller, and emissions optimisation capabilities with True North Marine's voyage optimisation expertise gives us a uniquely powerful digital solution that does far more than just improve operational efficiency. By adding consultancy based on our combined domain knowledge in seafaring, technical, and commercial operations, we deliver actionable insights that address shipping companies' strategic goals.

The building blocks of efficiency

There are several important steps to implementing an integrated digital strategy, but the starting point is understanding the real performance of your vessels right now. In a scenario

where many unknowns remain, focusing on what we can know is essential. Nothing should come before understanding and optimising the baseline efficiency of your vessel and fleet. This is the only way that the impact of future investments, business decisions, and operational measures can be properly assessed and deliver the most benefit.

A recent case calculation shows the outsized impact that a focus on efficiency – driven by nothing more than harnessing data to optimise ship performance – can have in a climate of growing compliance costs. With a 10% digital efficiency advantage, a 37,000 DWT chemical tanker on purely intra-EU voyages would save €72,000 in EU emissions costs (on top of the cost of fuel) in 2025. By 2030, that number rises to €183,000 a year.

Accelleron's experience shows that such gains are not just theoretical. In early 2024, Korea Marine Transport Company Ship Management (KMTC) reported that it had saved US$540,000 in fuel costs in a single year, after installing Accelleron's state-of-the-art digital engine optimisation solution on twelve Panamax vessels.

There are further benefits to taking a fleet-wide approach, beyond simply optimising engine performance on each vessel. One of India's largest private ship owners, Great Eastern Shipping Company (GESCO), saved more than US$45,000 a day per vessel, after enlisting Accelleron to digitise its previously manual fleet engine benchmarking programme. By using a digital solution, GESCO could not only track its fleet performance but also analyse individual engine data to identify specific problems faster. As a result, the pilot installation on two vessels was quickly extended to 46 more tankers and bulkers across the GESCO fleet.

Simplifying compliance

A good digital solution should not only track your fleet performance and emissions; it should also simplify compliance. Accelleron's emissions module, for example, now allows for calculation and reporting of well-to-wake (WtW) emissions. Combined with the platform's existing capabilities for tank-



There are several important steps to implementing an integrated digital strategy, but the starting point is understanding the real performance of your vessels right now. In a scenario where many unknowns remain, focusing on what we can know is essential.

to-wake emissions reporting – which is used to report on emissions for the EU ETS as well as the IMO's Data Collection System – the new WtW function enables ship operators to fully account for different types and sources of fuels. This is an essential part of any reporting solution for FuelEU Maritime, which came into effect at the start of this year. With full insight into a vessel's baseline efficiency and actual performance – particularly fuel use and emissions – operators can benefit from several other cost reduction measures that digital solutions afford. Accelleron's solution, for example, can monitor hull and propeller fouling, providing recommendations for the best time to schedule hull cleaning to reduce drag. It can also assemble and validate voyage reports, CII forecasts, and reports on emissions for a variety of regulators.

Securing the supply chain

Ensuring that vessels are running optimally is just one aspect of an efficient maritime business. The capability to plan and execute the most efficient voyages – and, based on that, organise the optimal use of the overall fleet – is equally important. And when confronting the challenges of today's fragile, just-in-time global logistics networks, it is vital.

True North Marine's voyage optimisation and weather routing capabilities help secure the supply chain for some of the world's biggest charterers. A prime example is Airbus, which has its own fleet of Ro-Ro carriers dedicated to delivering components from across Europe to assembly plants in Toulouse, France, and Alabama in the US.

But even a company as big as Airbus can't control the weather, and the volatile North Atlantic is a major potential source of production disruption. True North Marine has been working closely in the last several years with Airbus' chosen shipping partner, LD Seaplane, to ensure that vessels make it to their destinations safely and within their respective schedules. While LD addresses the transportation challenges for Airbus, we help manage some of the unavoidable risks involved.

This is about more than software. Any supply chain hinges on effective communication between parties, and True North Marine has built strong relationships with a crucial link – the ship captains – to help LD Seaplane avoid delays. That human element is crucial, even when using intelligent digital systems, whether you are avoiding weather or troubleshooting engines.

A winning combination

Accelleron's recent acquisition of True North Marine means we can combine the benefits of engine expertise, routing capabilities, and all the domain knowledge that goes into using those systems in the best way.

As an example, Accelleron's digital solutions can provide operators with an annual forecast of fuel cost and emissions for the next year based on anticipated fleet utilisation. This provides the tools operators need to plan and budget for fuel, emissions, and operating costs. With these reports, they can calculate compliance balances and penalties in advance, enabling informed decisions on EU allowance purchasing, for example, or the pooling, borrowing or banking of FuelEU Maritime surpluses.

When you layer routing expertise on top of deep insights into vessel performance, you have the basis for long-term operational, commercial, and investment planning. But to translate this into truly effective decisions, human expertise is essential. At Accelleron, this is part-and-parcel of our digital offering. We bring deep domain expertise to technical and commercial operations, keeping in close communication with our clients as they use these digital insights.

With digital solutions spanning technical and commercial operations, Accelleron combines advanced technology with expert consultancy to maximise efficiency, enhance performance, reduce emissions, and increase profitability, all in one place. A simple, comprehensive solution that delivers efficiency, financial predictability, strategic insight, and a unique vision of how an integrated digital approach can drive value for ship operators.

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Climate alignment cannot afford to drop off shipping financiers' radars

Despite regulatory delays and geopolitical headwinds, the case for transparency in maritime finance has never been stronger, argues Paul Taylor, newly appointed Chair of the Poseidon Principles.



by **Paul Taylor,**
Global Head of Maritime Industries
at Société Générale
and Chair of the Poseidon Principles
Association*

It is a turbulent time for the global shipping sector. Geopolitical tensions, supply chain security concerns, and shifting policy timelines have placed enormous pressure on organisations trying to plan for the long term. Among the most significant recent disruptions was the postponement of the International Maritime Organization's (IMO) Net-Zero Framework. This delay added a fresh layer of uncertainty to an industry already navigating complex challenges.

However, uncertainty is not the same as irrelevance. If anything, recent turbulence makes the case for credible, consistent climate alignment initiatives like the Poseidon Principles more compelling, not less.

Launched at the Marine Money Conference in 2019, the Poseidon Principles were the first sector-wide climate alignment framework in global finance. Today, 36 banks and export credit agencies report annually on the alignment of their portfolios with the IMO's decarbonisation trajectories. Together, they represent nearly three-quarters of global ship finance.

The framework has since inspired several similar initiatives across other high-emitting sectors, such as steel, aluminium, aviation, and chartering, a testament to the value of sector-specific transparency initiatives in driving systemic change.

The most recent Poseidon Principles Annual Disclosure Report, published in December 2025, offers tangible evidence that progress is being made. Even though decarbonisation pathways are becoming increasingly stringent year-on-year, climate change alignment scores improved by almost eight percentage points compared to the IMO's minimum ambition. Not only that, but signatories disclosed, on average, 95% of the eligible activities in their portfolios, compared to 93% in the previous year. These are not insignificant gains. They reflect a sector that is moving in the right direction, despite the challenges.

The reporting methodology used by Poseidon Principles signatories goes beyond what current regulations require. Whereas regulatory frameworks typically focus on tank-to-wake

carbon emissions, the Poseidon Principles measure carbon-equivalent emissions from a well-to-wake perspective. This captures the full life cycle of marine fuels, from extraction and refining through to bunkering and combustion, and accounts for additional greenhouse gases beyond CO_2. For financial institutions seeking a genuinely comprehensive view of environmental risk, this distinction matters.

Why regulatory delays do not change the need for action

A common temptation in times like these is to pause voluntary action and wait for clearer signals. This logic is understandable, but ultimately shortsighted. The IMO's 2023 GHG Strategy and its overarching goal remain in place: net-zero emissions from international shipping by or around 2050.

For lenders and investors, this means that the ships being financed today will need to meet increasingly stringent emissions requirements over the course of their operational lives. Banks will strive to finance new alternative-fuel vessels as they come on stream; still, those providing debt capital cannot move faster than those responsible for supplying the new fuels and infrastructure needed to underpin them.

The refinancing and retrofitting of existing vessels are equally important, with specialist upgrade funds now offering sale-and-leaseback structures on vessels demonstrating improved operational performance. This is where the Poseidon Principles framework adds particular value: providing signatories with the data-driven insights needed to help their clients navigate the complexity of the transition ahead.

A vessel financed in 2026 may still be on the water in 2050. The decisions made now (dual-fuel capability, technologies installed, energy efficiency, etc.) will determine whether that asset remains commercially viable as the regulatory environment tightens, whether that is later this autumn or years down the track. Ignoring climate alignment today does not reduce future exposure; it makes mitigating risks harder.

Climate-related initiatives, such as the Poseidon Principles, underscore the importance of transparent, continuous benchmarking. They provide a measurement framework that helps institutions and their clients understand where they currently stand and chart their own pathways forward. The goal is transparency and accountability, not ultimatums.



This approach reflects a hard-won lesson from the first six years of operation: ambition must be balanced with practicality. Decarbonisation takes time and requires that the right infrastructure, fuels, regulations, and technologies be available at scale. Many signatories have found that progress begins with listening to clients, shipowners, and operators to understand the real constraints and opportunities at play. Transparency creates a common language for those conversations and a shared basis for decision-making.

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The road ahead and the cost of standing still

One of the most significant recent developments within the Poseidon Principles was the launch of associate membership, approved unanimously at the Annual Meeting in May 2025. This new category enables financial institutions that provide or arrange capital for maritime activities, such as private equity firms, hedge funds, or capital markets underwriters, to formally engage with the framework, even if they are not yet in a position to report on their portfolio alignment.

Associate members can participate in working groups, use the methodology to build internal capacity and inform strategic decision-making, and access peer learning from institutions across geographies. The expectation is that, over time, those providing secured vessel finance will progress toward full signatory status. In a market where the role of alternative capital providers is growing, this pathway broadens participation without lowering the bar.

Looking further ahead, the Poseidon Principles' Future Principles Committee is actively exploring how the framework might expand to address broader sustainability metrics (such as biodiversity, crew welfare, and ship recycling) while avoiding reporting fatigue or unnecessary burdens. The principle guiding this work is that any new metric introduced must be measurable, benchmarkable, and genuinely useful to those it affects.

As the backbone of world trade, the shipping industry has a responsibility to demonstrate that its historical emissions do not define it, but by its commitment to a decarbonised future. For the financial institutions that fund the global fleet, the choice between engagement and inaction carries real consequences not just for the climate, but for the long-term resilience and competitiveness of their own portfolios. Climate alignment in shipping remains strategically essential. Through frameworks like the Poseidon Principles, the methodologies for pursuing it are robust and recognised, and the community of institutions committed to this work continues to grow. What is needed now is sustained focus and the willingness, even amid uncertainty, to stay the course.

Credit: EPA



*The Poseidon Principles constitute a global framework for responsible ship finance, integrating climate considerations into lending decisions. For more information, visit poseidonprinciples.org.

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Digital travel, human expertise: Navigating crew mobility in an era of global disruption



An interview with

George Chatzantonis, Managing Director at Antaeus Travel Group

How is crew travel changing in today's environment?

Crew travel has always been demanding: tight schedules, complex itineraries, and the need to move people globally without delay. That core pressure remains unchanged. What has changed is the environment. Crew travel is no longer driven solely by logistics; it is shaped by an increasingly volatile and unpredictable global landscape.

Geopolitical instability is now a daily reality. Conflicts in key regions, airspace closures and shifting regulations directly affect both aviation and shipping. Routes that were standard yesterday may be unavailable today. Transit times are longer, costs are more volatile and options are increasingly constrained. For crewing teams, travel planning is no longer just execution, it's risk management.

This shift has raised expectations. Crews must still reach vessels on time, but doing so has become far more complex. Visibility, speed, and adaptability are no longer advantages; they are essential.

What role do technology and AI play in managing this complexity?

Technology is reshaping how these challenges are addressed. AI and digital platforms can process vast amounts of travel data in real time, comparing fares, routes, and availability within seconds. Tasks that once took hours can now be completed almost instantly.

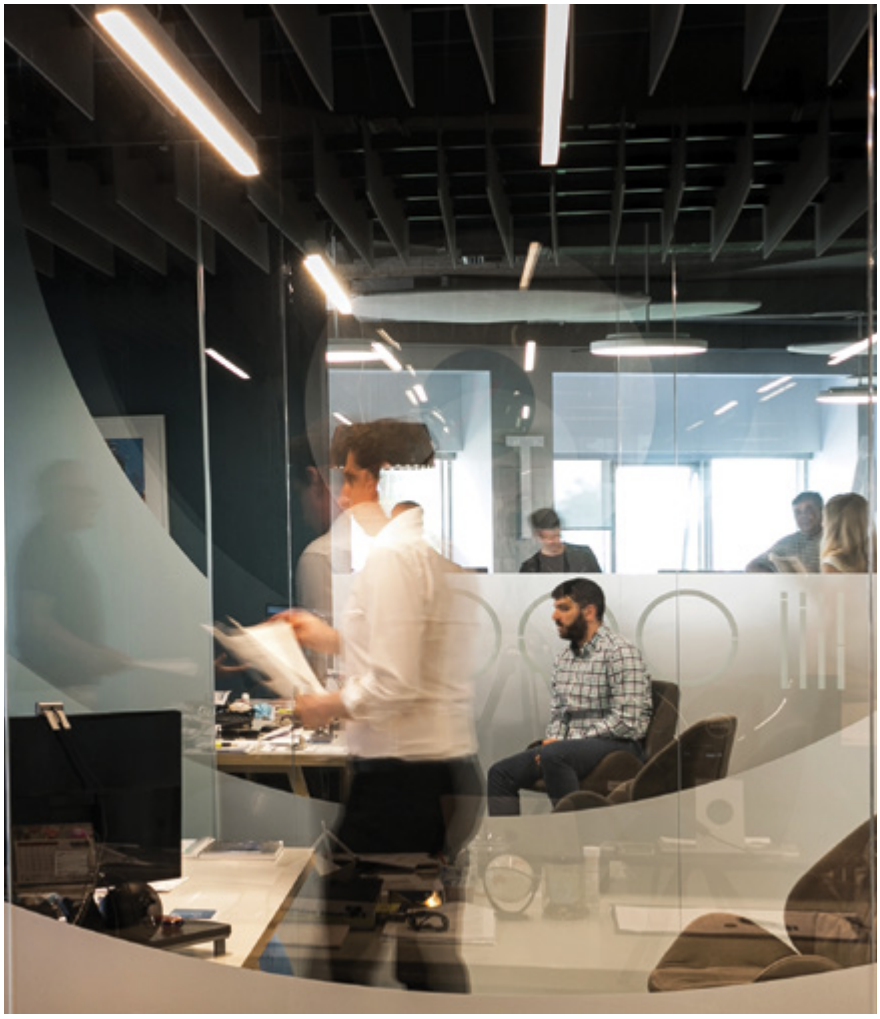
For shipping companies managing crew changes across multiple regions, this creates immediate value. Faster response times, better decision-making and improved cost control contribute to more efficient operations, but more importantly, technology brings clarity to increasingly uncertain situations.

However, technology alone does not eliminate complexity - it often exposes it. As data volumes grow, so does the need to interpret them correctly. This is especially evident in a major shift taking place within the airline industry.

How is NDC changing the way crew travel is booked?

New Distribution Capability (NDC) is transforming airline content distribution. Traditionally, fares were available through a single global system, giving travel providers equal access. That model is evolving. Airlines now offer differentiated content including. exclusive fares and bundled services through specific channels.

In practice, this means providers no longer see the same options. Access to the full range of fares depends on a travel partner's level of integration and



connectivity. For maritime operators, where travel is a major cost factor, this has direct financial implications.
At the same time, NDC adds complexity. Airlines implement it differently, and the landscape continues to evolve. Without the right systems and expertise, more data does not necessarily lead to better outcomes.

Why is human expertise still critical in such a digital environment?

Because disruption is no longer the exception, it is the norm. Geopolitical instability, changing airline distribution, and operational pressures intersect to make decision-making more complex. AI provides speed and options, but it cannot replace judgment, accountability, or experience. When flights are canceled, routes become unavailable, or urgent travel is required, solutions depend on fast, decisive action. That requires human expertise.

In crew travel, the margin for error is minimal. A failed crew change is not just an inconvenience; it can disrupt vessel schedules, impact cargo commitments and create significant commercial consequences. In those moments, access to information is not enough, what matters is knowing someone is actively managing the situation.

How should maritime companies approach crew travel move forward, and how does your new crew travel tool assist?

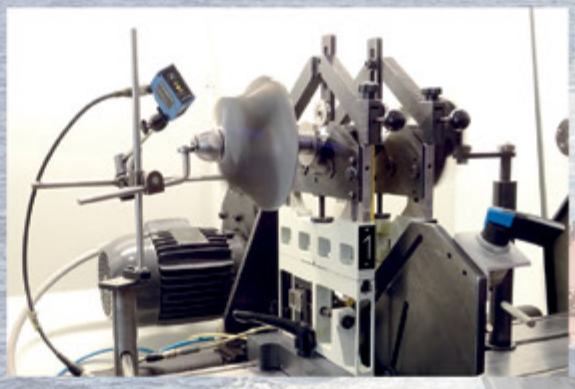
The answer is balance. Technology must be fully leveraged to provide speed, visibility and control, while experienced professionals interpret data, anticipate challenges, and respond in real time. Antaeus Travel Group, this approach has guided us for 38 years. As a family business, we emphasize relationships, reliability, and accountability, while combining that foundation with advanced technology to meet evolving industry needs.
Our platform, Synopsis, was developed to address a common challenge: fragmented information. Disconnected systems, delayed approvals, and limited cost visibility create inefficiencies where clarity is essential. **Synopsis** integrates the entire process - from requests and bookings to approvals and reporting into one platform. It enables crewing, operations, and finance teams to work with greater transparency and control, improving both efficiency and decision-making.
At the same time, technology alone is not enough. In a 24/7 industry, access to human support remains critical. That is why our platform is directly connected to our travel specialists, ensuring assistance is always available when needed.
Crew travel will continue to be shaped by both disruption and innovation. Geopolitical uncertainty is likely to persist, and global mobility systems will keep evolving. In this landscape, success will depend on combining technology with human expertise - using one to enhance the other.



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A special report on the 20th anniversary of MLC

The Maritime Labour Convention (MLC) marks twenty years as one of the most transformative regulatory frameworks in modern shipping, setting a global benchmark for seafarers' rights and working conditions. Often described as the "fourth pillar" of international maritime regulation alongside SOLAS, MARPOL and STCW, the MLC, 2006 has played a crucial role in harmonising labour standards across a highly fragmented and globalised industry.

Over the past two decades, the Convention, often referred to as the "seafarers' bill of rights" has not only improved minimum requirements for employment, accommodation, health protection and welfare, but has also strengthened enforcement through certification and inspection regimes. Yet, its true impact extends beyond compliance. In an era shaped by geopolitical instability, crewing shortages, and increasing pressure for decarbonisation and digitalisation, the human element of shipping remains more critical than ever.

As the industry reflects on twenty years of the MLC, this special feature explores its achievements, ongoing challenges, and the evolving expectations placed on shipowners, regulators, and the seafarers at the heart of global trade.



at 20

The evolving role of the MLC in protecting seafarers



by **Mark Dickinson**,
Vice-President
of the ILO Special Tripartite Committee,
Vice Chair of ITF Seafarers' Section
and Former General Secretary
of Nautilus International

The contribution of the MLC to strengthening the protection of seafarers' rights and improving their welfare

I believe it is important to spend a little bit of time reflecting on what was in place before the creation of the Maritime Labour Convention (MLC). Prior to its adoption in February 2006, there existed approximately 70 instruments (conventions and recommendations) covering various aspects of seafarers' living and working conditions at sea. Some of them dated back to the very early days of the International Labour Organization (ILO), and many had not been widely ratified.

One notable exception was the convention on minimum standards for merchant ships (C.147), which had created the basis for port state control and was, relatively speaking, well-recognised and ratified by many major maritime nations. However, the fact remained that, at the time, many of the existing conventions had either not entered into force or had become outdated and were in need of being updated.

Without going into the specifics of what was a lengthy process spanning at least a decade, the effort to consolidate these 68 instruments into a single framework convention was quite considerable. The result was the MLC, an unprecedented and comprehensive set of minimum standards covering all aspects of life and work at sea.

A dynamic was thus created, whereby it became necessary to hold a certificate verifying that both the vessel and its operator complied with these minimum standards. This, in turn, provided a strong incentive for countries to ratify the Convention, ensuring that ships under their registers would be covered by the certificate, which serves as evidence of compliance with the newly agreed minimum standards. Currently, 112 countries have ratified the Maritime Labour Convention, covering 97% of the



world fleet. When comparing the "before and after" regarding this matter within a span of just 20 years, the progress made is quite remarkable.

During the early days of the MLC, we talked about the "Seafarers' Bill of Rights" in order to emphasise its significance in the public's consciousness. Over time, the language used has slightly shifted; instead of focusing solely on seafarers' rights, we now more commonly speak of minimum standards.

On reflection, we have weathered the COVID-19 crisis, and are currently in the midst of a major conflict in the Middle East, which could escalate or de-escalate within weeks — its trajectory remains uncertain. Such developments represent significant tests for the standards provided to seafarers by the Convention. In this context, it may be appropriate to start talking again about the MLC in those heady terms that were used back in 2006: a Seafarer's Bill of Rights, with fundamental social and employment rights, including the right to a healthy and safe workplace.

It feels as though everybody is talking about shipping again, but for all the wrong reasons. It is at moments like these that one surprisingly finds out how little people truly realise about the sector's significance. Approximately 90% of all global trade is carried out by ships, and in the UK, where I'm from, that figure rises to 95%. The ignorance of the average person, politician, or regulator, who thinks goods arrive in supermarkets almost by accident, is striking.

Given the critical role of shipping in the global economy — never more so than in these moments of global conflict — it is difficult to understand how this lack of recognition for the importance of seafarers and shipping persists.

Reflecting on the past 20 years, remarkable progress has been made: moving from conventions that addressed seafarers' rights and welfare but were not widely ratified, to a situation where 97% of the world fleet is covered by minimum standards. The sheer fact that this Convention can be amended and has already been amended five times across five sessions of the Special Tripartite Committee (STC), which is responsible for keeping the Convention under review, is truly significant in the context of seafarers' social and employment rights.

Within the shipping industry, the MLC is the only convention addressing seafarers' living and working conditions that can be amended. It is enforceable and verifiable, with ships being subject to detention if standards are not met.

While the past two decades have established a baseline of minimum standards and decent work, it is important to recognise that, within the ILO framework, "decent work" extends beyond minimum requirements — it is about decent standards and fairness.

Shipowners may use the term "sustainable", and it can certainly be debated what that really means in practice; nevertheless, it is generally agreed that continuous improvement is essential on the journey from minimum standards to decent work for all seafarers, in order to properly recognise their contribution to the world and the global economy. After all, our prosperity depends on seafarers and the shipping industry as a whole. For that reason, it is difficult not to be in awe of the significance of the MLC when reflecting on its journey over the past 20 years.



Credit: EPA/RONALD WITTEK



Credit: EPA/MIKKEL BERG PEDERSEN

The role of the MLC in ensuring dignity, fair treatment, and wellbeing for seafarers across different regions and political contexts

Ensuring dignity, fair treatment, and wellbeing for seafarers across all regions of the world and in all political contexts remains the ultimate challenge we are facing. While 97% coverage across 112 countries sounds fantastic, I personally won't be satisfied until that figure reaches 100%. Realistically, achieving that within a reasonable timeframe is, of course, a significant undertaking, as some countries may never ratify the Convention.

The fact that the United States has not ratified the MLC, especially in the current context of tensions in the Middle East, remains a significant concern. Many of the Gulf states have not ratified the Convention either, thus creating geographical gaps in its global coverage. To address this gap, when it comes to Port State Control, the MLC includes a critical provision known as the "no less favourable treatment" clause. This ensures that even if a ship's flag State has not ratified the Convention, the vessel will still be inspected in accordance with ILO/MLC standards when calling at the port of a signatory country, thereby eliminating any competitive advantage some states might seek to gain through non-ratification.

But how can it be ensured that all flag States that have ratified the MLC actually implement and enforce the rights it provides? The ILO has a unique oversight structure to hold Member States accountable. Their national legislation is reviewed by the Committee of Experts on the Application of Conventions and Recommendations (CEACR) to confirm it complies with MLC standards, and a platform is available for organisations like the International Transport Workers' Federation (ITF) to lodge formal complaints to the Committee if these provisions are not being upheld. This provides a level of oversight, transparency, and accountability that can be and is used to make sure that those countries are fulfilling their obligations.

Overall, the "no less favourable treatment" principle, higher oversight, and the combined roles of flag State and port state control are all important mechanisms in upholding standards and ensuring that seafarers are treated with dignity and fairness, regardless of where they are from in the world.

Of course, there is still more to be done, as several countries have not yet ratified the Convention. Nevertheless, the ILO is actively working to educate governments, politicians, and regulators, helping them understand the necessity of protecting seafarers as key workers, as they are now being rightly recognised by governments.

Moreover, the recently agreed amendment of the MLC, set to come into force in December 2027, incorporates two sets of joint IMO-ILO guidelines (the first developed in 2006, and the latter in 2025), which address the fair treatment of seafarers following maritime incidents, accidents, or pollution events, as well as cases involving alleged crimes. Too often, seafarers are treated as though they have no rights, detained without evidence or due process, and denied the fundamental rights that any citizen would expect when involved in such circumstances.

Since these guidelines have now been incorporated into the mandatory provisions of the MLC, standards in this area will soon be significantly raised, and consequently, the obligations placed on states will increase accordingly.

Moving forward, criminalisation remains a significant challenge within the maritime industry. In my capacity in my day job at Nautilus International, the criminalisation of our members is among my primary concerns. This issue directly impacts the recruitment and retention of young talent, and it is therefore both necessary and appropriate that it be addressed.

Another major issue currently affecting our industry is the abandonment of vessels and the seafarers who work and live on board. Under the ILO MLC provisions on financial security, various stakeholders — including flag States, port states, and labour-supply states — have the obligation to ensure that seafarers are paid their wages and are repatriated, preventing situations where ships are abandoned and crews are left to fend for themselves. In practice, however, such cases often create complex, multi-jurisdictional challenges involving port and coastal states, seafarers' home countries and the flag State, while the shipowners who abandon their crews usually escape liability.

The MLC's provisions on financial security, strengthened over the past 20 years, are fundamental to ensuring dignity, fair

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The MLC standards held up remarkably well during the pandemic, and they will continue to provide a vital framework now, as we witness the ongoing conflict in the Middle East.

treatment, and wellbeing for seafarers. Drawing on the lessons learned from COVID-19, standards have also been improved in areas such as repatriation, access to shore leave, and medical care. Furthermore, greater emphasis has been placed on social connectivity to support mental health, as maintaining contact with home is particularly critical for seafarers operating in conflict-affected areas, such as the Middle East. It is no surprise that both unions and shipowners are calling for improved social connectivity, particularly through the provision of free Wi-Fi — a necessity ultimately deriving from the standards set by the MLC.

The role of the MLC in protecting seafarers in an increasingly complex geopolitical maritime environment

In recent years, the maritime industry has faced significant turbulence and insecurity due to the pandemic, the resulting cost-of-living crisis and geopolitical tensions. However, in my view, the event that clearly highlighted the importance of the MLC was not the COVID-19 pandemic itself, but the crew change crisis it triggered. During that time, seafarers' rights were ignored, with shipowners simply invoking force majeure and claiming there was nothing they could do.

There was a great deal of understanding regarding that situation, but the real trigger lay in the decision by some countries to close their borders without considering the full impact of that action. The crew change crisis was the unintended consequence of decisions made by officials who prioritised border security and public health, failing to consult transport authorities in the same way they consulted health departments. This exposed a fundamental weakness in the way many countries view the shipping industry.

By contrast, the UK's approach — and I say this with some pride — reflected its position as an island nation with a strong maritime history by maintaining shipping as part of the conversation. While the government's initial response was a broad lockdown and keeping everyone safe at home, there was a relatively quick realisation that certain industries, specifically transport (i.e., shipping, aviation, rail, and road), had to keep moving. Other countries, such as China, India, the Philippines, and Singapore, remained heavily restricted, and it took quite some time before they realised the full consequences of their decisions.

Within the ILO, there were regular meetings with the STC Officers to monitor the situation. With support from the ILO, the IMO, and WHO, it became clear that the conditions for invoking force majeure were not open-ended. Force majeure does not apply simply because repatriating a crew is difficult or costly; it applies when it is physically impossible. The moment a viable option exists — whether that involves deviating the ship, chartering special flights, or placing seafarers in isolation hotels — the claim of force majeure stops applying. Seafarers' rights cannot be waived; they are inalienable.

More recently, the war in Ukraine has had massive implications for both Russian and, most importantly in this context, Ukrainian seafarers. Given that many of these nationals are employed across the Greek fleet, this is an issue that Greek shipowners clearly recognise. It is difficult to imagine how such circumstances would have been managed without the framework provided by the MLC.

The MLC standards held up remarkably well during the pandemic, and they will continue to provide a vital framework now, as we witness the ongoing conflict in the Middle East.

If anything, the pandemic highlighted the shortcomings of the states that have ratified the Convention. It exposed, first, the failure to uphold seafarers' rights during a public health crisis and, second, the lack of coordination between port, flag, and labour-supply states. Such coordination is becoming increasingly critical given the frequency of geopolitical tensions. At the end of the day, the fundamental obligation remains the same: to protect seafarers and ensure their wellbeing through access to medical care, shore leave, social connectivity, and timely repatriation.

The challenges ahead

In my view, one of the weaknesses of the MLC is that while five sets of amendments have successfully been introduced and significant improvements have been achieved, we have essentially been "picking the low-hanging fruit". Because consensus is required to implement changes, much of the work across five sessions of the STC has been spent focusing on issues where agreement can readily reached. Meanwhile, there are some very critical matters in the "higher branches" — issues that would have a far greater impact for seafarers — but we aren't reaching for them yet because that common ground is harder to achieve.

A concrete example of such issues is fatigue. Recent research from the World Maritime University (WMU) concludes that seafarers work, on average, 75 hours per week. The researchers also found that records are often falsified to avoid vessel detention, and the entire system is manipulated to prevent non-compliance from being detected. This does not make the maritime profession attractive to young people. In major labour-supplying countries, economies are growing, and alternative career choices are emerging. As a result, the shipping industry is currently facing a recruitment and retention crisis that cannot be resolved unless we address fatigue, including crewing levels, excessive working hours, and inadequate rest hours.

Another example of this "higher-hanging fruit" is the just transition. We must ensure that both current and future seafarers possess the skills to sustain long, worthwhile careers that are futureproof against the shift to alternative fuels and the emergence of new technologies. There is still much we do not know — particularly in relation to AI — and while its full impact and potential are not yet fully grasped, the ongoing discussions around it highlight its growing significance. We must incorporate provisions into the MLC to ensure that seafarers are upskilled and reskilled at no cost to themselves, enabling them to sustain their livelihoods. Ultimately, there can be no just transition if seafarers are not placed at the centre of the conversation.

Social security protection, covering sickness, disability, and ill health, is also a vital part of this conversation. When the MLC was consolidated, seafarers' pensions (C.71, 1946) were one of only two areas that remained outside its scope (the other being C.185 on Seafarers Identity Documents, 2003). This gap must be addressed to ensure seafarers are supported not just during their working years, but also through to their retirement.

So, fatigue, just transition, and social security protection (including retirement) are amongst the critical issues that must be addressed moving forward. The MLC must evolve with greater ambition than in the past, and this will require the resolve to tackle these difficult challenges. As the ancient African saying goes, "the sweetest fruit hangs in the highest branches of the tree" — it may be harder to reach, but the reward is worth the effort. That is where our increasing focus should be.

A more ambitious approach, however, carries certain risks. Should these more complex issues be addressed, it is possible that some flag States or countries may choose to reject the amendments. This could result in the emergence of a "two-tier" MLC, whereby certain provisions are accepted by some countries but rejected by others.

Such a scenario would be a nightmare for shipowners, as the main value of the MLC for them lies in the level playing field it creates, ensuring that all shipowners play by the same rules. If that framework becomes fragmented, the shipping industry will be back to square one, struggling to bring those who resisted the changes back into alignment.

Therefore, strong social dialogue must be maintained between shipowners and the trade unions representing seafarers. This collaboration is the only way to ensure that the MLC remains a unified Convention. Personally, I remain positive that the shipping industry's issues can be resolved with sufficient commitment and ambition. Approaching governments with a unified front typically helps secure their support.

Let us remain optimistic that the challenges discussed, from fatigue and the just transition to the acquisition of digital and green skills, will all be addressed with the seriousness and diligence they require.



Twenty years of the MLC, 2006 Progress, impact, and the road ahead

This year marks two decades since the International Labour Organization constituents adopted the Maritime Labour Convention, 2006 (MLC, 2006), a landmark instrument that reshaped the global governance of seafarers' rights. From its inception, the MLC, 2006 was envisioned as a universal framework to guarantee decent working and living conditions on board and ensure a level playing field for shipowners. Twenty years on, that vision has largely become a reality. Although challenges remain, the Convention and its mechanisms have proven to be a reliable foundation for the international community in addressing them. As the maritime sector undergoes rapid transformations, the full implementation of the Convention — paired with initiatives to strengthen seafarers' welfare — is vital to safeguarding seafarers' rights and ensuring that shipping can attract and retain the skilled professionals it needs.



by **Beatriz Vacotto,**
Head of the Maritime Unit,
International Labour Standards Department,
International Labour Office.
The views expressed herein are the author's and do not necessarily represent those of the ILO.

A transformative milestone for maritime labour

The MLC, 2006 was adopted to address the complexity of more than 65 existing ILO instruments by bringing coherence and renewed ambition to global labour standards at sea.

The Convention's impact has been profound. It has become, undeniably, a universal reference point for decent work in the maritime sector. Today, 112 countries have ratified it, representing over 96% of the world's gross tonnage and including the main labour-supplying countries. This success did not happen by chance. It has been built through sustained social dialogue, multilateral cooperation, and unwavering commitment across the industry. It has been underpinned by a series of innovative features embedded in the Convention. Together, they have ensured that the MLC, 2006 delivers protection for seafarers and effectively promotes fair competition at sea.

For the close to two million seafarers, the results are tangible: improved legislation safeguarding their rights, clearer employment contracts, enhanced regulations of recruitment and placement agencies, stronger monitoring of onboard working and living conditions, and enhanced enforcement through port state control.

A living instrument for a changing industry

One of the defining strengths of the MLC, 2006 lies in its capacity to adapt. Since it entered into force, it has been periodically updated to address emerging challenges, including in relation to financial security for abandonment, death and long-term disability of seafarers, payment of seafarers' wages in cases of captivity by pirates, internet connectivity, access to medical care, and most recently, the prevention and elimination of violence and harassment

on board, the recognition of seafarers as key workers, and access to shore leave. These amendments demonstrate that international labour standards can evolve to strengthen protections and close gaps. The tripartite structure of the ILO and the proactive approach of seafarers and shipowners' organisations have been central to this evolution, ensuring that each new amendment is rooted in consensus and backed by operational experience.

Challenges that demand renewed commitment

Despite two decades of progress, significant challenges remain. Numerous countries are yet to fully harmonise their laws with the MLC, 2006 and face difficulties with practical implementation. Some regions still present low ratification levels. As a result, too many seafarers continue to face violations of their rights, including non-payment of wages, excessive working hours, criminalisation, abandonment, denial of shore leave, and fraudulent recruitment practices.

The COVID-19 pandemic exposed further vulnerabilities. Hundreds of thousands of seafarers were stranded at sea, denied repatriation, medical care, or communication with their families. Most recently, ongoing conflicts and wars have further heightened risks, severely affecting seafarers.

In response to this hardship, the international community has sent a strong signal: seafarers must be recognised as key workers. Safeguarding their lives, personal safety and wellbeing in line with the MLC, 2006 must remain a priority. As stated by the ILO Committee of Experts on the Application of Conventions and Recommendations, it is precisely in times of crisis that the protection established under this Convention assumes its full significance and must be applied most scrupulously.

Priorities for the future of seafarer welfare

The shipping industry stands at the crossroads of profound transformation. As it faces a projected shortage of seafarers, ensuring that a career at sea remains attractive — particularly for women and young people — is critical to the industry's sustainability.

Looking ahead, continued efforts are needed to raise awareness about the MLC, 2006 and strengthen its enforcement by enhancing inspection systems and complaint mechanisms. Timely technical assistance, cooperation among countries, and coordination among different national authorities are crucial.

Greater emphasis must be placed on ensuring that seafarers feel valued and respected by fostering a culture that supports both their physical and mental wellbeing — an approach already embraced by many responsible shipowners worldwide.

Addressing the issue of inadequate manning must be a priority. Minimum safe manning levels do not necessarily equate to decent manning — one that safeguards seafarers' welfare and allows full compliance with the MLC, 2006. Concerted efforts are needed to prevent and address violence and harassment on board, ensuring that all seafarers — men and women alike — feel safe at sea.

Honouring the spirit of the MLC

This anniversary is both a moment of celebration and a call for action. Shipping needs a new social contract — one grounded in social dialogue, rights, fairness, and a human-centred approach to the transformations shaping the industry. The MLC, 2006 provides the foundation for this contract, but its promise will only be realised if we place seafarers' rights as the heart of maritime discussions.

As we look to the future, let us commit to turning vision into reality, ensuring that every seafarer can work with dignity, fairness, and respect.



Credit: Crozet / ILO

Twenty years of the MLC, 2006
A milestone worth marking, but not a reason to slow down

This year marks the 20th anniversary of the adoption of the Maritime Labour Convention, 2006—a moment that transformed the landscape of maritime regulation and helped elevate seafarers' rights and protections to a global legal standard. As the "fourth pillar" of the international maritime regulatory system, alongside SOLAS, MARPOL, and STCW, the MLC consolidated dozens of fragmented labour instruments into one comprehensive framework. Its ambition was clear: establish minimum working and living standards for seafarers worldwide.



by **Nikolaos Koletsis**,
Senior Policy Officer
for Maritime Transport
at the European Transport
Workers' Federation (ETF)

As recent global disruptions — from pandemics to geopolitical tensions and supply chain shocks — have demonstrated, it is precisely during such periods that the protective framework of the MLC assumes its greatest importance. In moments when seafarers face prolonged contracts, restricted shore leave, fatigue, and uncertainty, the Convention serves as a crucial safeguard, ensuring that fundamental labour standards are not treated as optional but as essential obligations.

But as we mark two decades since its adoption, one fundamental truth must remain front and centre: The MLC is a minimum-standards treaty, i.e., a floor, not a ceiling. The Convention has made a profound difference, yet significant gaps remain, and the lived experiences of too many seafarers still fall short of what a modern, safe, and humane maritime industry should guarantee.

A Convention that changed the global landscape

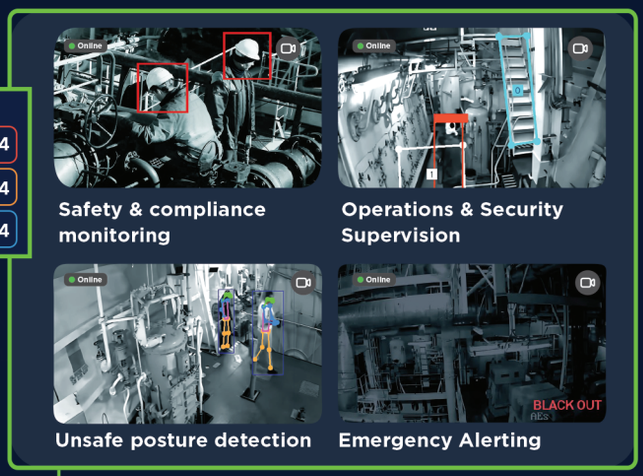
In its 20 years, the MLC has delivered clear, concrete improvements for seafarers. While implementation varies, several gains stand out:

- Recognising seafarers as key workers, marking a major step forward in seafarers' rights. This new status seeks to ensure that seafarers receive better protection, easier access to medical care and travel, and stronger support at all times.
- Improved protection for shore leave, which has long been a point of tension between security procedures and crew welfare.
- Clearer and stronger repatriation rights, preventing abandonment and ensuring seafarers are not stranded without support.
- Enhanced protection against

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criminalisation, with growing recognition of the need for fair treatment when incidents occur.
- New measures addressing bullying and sexual harassment, marking an important cultural shift within the industry.

These achievements are positive and meaningful, but they coexist with ongoing deficiencies, inconsistent enforcement, and a widening gap between the Convention's promises and the everyday realities crews report.

The enforcement challenge: Where progress still falls short

The MLC gives seafarers the right to a safe and secure workplace, yet its enforcement depends heavily on flag States, port state control (PSC), and the rigour of inspections. Too often, shortcomings in these areas weaken the Convention's impact.

Grey zones in the MLC — loosely worded or insufficiently defined provisions — create space for inconsistent interpretation. This leaves seafarers vulnerable to inadequate working conditions, excessive hours, unpaid wages, or insufficient access to welfare and medical support.

The Declaration of Maritime Labour Compliance (DMLC) is intended to serve as a basic indicator of compliance, but it cannot replace robust, detailed PSC inspections. Documentation must never become a substitute for verifying the reality on board.

From the EU vantage point, this anniversary is an opportunity to reinforce Europe's capacity to enforce the MLC effectively and consistently. The European Transport Workers' Federation (ETF) has long highlighted the untapped potential of the European Maritime Safety Agency (EMSA) to enhance MLC compliance. Specifically, the EMSA can provide standardised, advanced training for EU PSC inspectors to enable them to conduct in-depth MLC-focused inspections, particularly regarding hours of work and rest, wage payment and records, social security coverage, and other deficiencies warranting detention. It can also encourage structured cooperation among EU port state authorities through the systematic exchange of information, best practices, and emerging challenges, thereby strengthening the overall enforcement ecosystem. Finally, the ETF strongly supports the development of an EMSA guidance document to address ambiguous MLC provisions by clarifying the interpretation of vague MLC requirements, listing the most frequently detected deficiencies by flag, and outlining flag-specific documentation and certification rules. Such a document would significantly enhance the quality and consistency of MLC enforcement across the European maritime space.

If one issue most starkly exposes the limitations of the current framework, it is fatigue. Despite its inclusion in both the MLC and STCW, chronic fatigue remains pervasive in the maritime sector — and increasingly linked to severe health risks.

Fatigue: The unresolved crisis

If one issue most starkly exposes the limitations of the current framework, it is fatigue. Despite its inclusion in both the MLC and STCW, chronic fatigue remains pervasive in the maritime sector — and increasingly linked to severe health risks.

Research over recent years has drawn a direct correlation between long working hours and cardiovascular strain, heightened accident risk, and deteriorating mental health. Yet maritime rules still allow from 72 to 91/98 hours of work per week, far exceeding what international health research deems safe (<50 hours) or what the ILO defines as decent working hours (<48 hours).

Recognising this, the ETF commissioned the World Maritime University (WMU) to assess how the European Pillar of Social Rights applies to seafarers and how sea-based workers compare to land-based workers within the EU. The findings were stark: excessive working hours constitute one of the clearest and most damaging gaps in maritime labour protection.

The full WMU report titled "Charting the distinct rights of sea workers in European waters – A focus on decent working time" will be presented in Brussels on 21 May 2026.

A call for regulatory evolution

The 20th anniversary of the MLC is not just a moment to celebrate progress — it is a moment to look ahead with ambition. The ETF is calling for a review and revision of the MLC and STCW frameworks regarding rest and work hours, aiming to reduce excessive working time limits, strengthen provisions on rest, fatigue prevention, and manning levels, and ensure strong EU engagement in international reform processes. That includes active support in the ILO–IMO Joint Tripartite Working Group (JTWG) on hours of work and rest, launched following agreement at the Special Tripartite Committee of the MLC in April 2025. Effective regulation must adapt to ensure that seafarers' health, safety, and dignity are protected — not only in principle, but in day-to-day practice.

Credit: EPA/FRANCIS R. MALASIG



Looking forward: Rights on paper must become rights in practice

Twenty years after its adoption, the MLC remains one of the most significant achievements in international maritime labour regulation. It has delivered tangible progress and continues to shape the standards by which the industry operates.

On this anniversary, the European Transport Workers' Federation reaffirms a simple but powerful message: Seafarers deserve more than words on paper. They deserve structures, inspections and enforcement that guarantee their rights, protect their health, and uphold their dignity at sea. The MLC has changed the industry for the better — but its next twenty years must deliver the stronger, clearer, and more humane maritime labour regime that seafarers have always deserved.

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A new horizon: The rise of female seafarers in Greece

For centuries, the sea has been both Greece's livelihood and its legacy — a source of prosperity, resilience, and global influence.



by **Gregory Spourdalakis**,
Managing Director
of Columbia Shipmanagement Greece

Yet for much of that history, seafaring has been regarded almost exclusively as a male profession. That narrative is now changing, and Greece is increasingly at the forefront of this transformation. The implications for the global shipping community are significant.

In recent years, Greece has witnessed a notable increase in the number of women pursuing maritime careers. While women remain a clear minority, with the ratio of men to women at sea still estimated at approximately 1:3 to 1:4, the direction of travel is unmistakable. Data for the period 2020-2024 has revealed a consistently upward trend: from 1,237 women in 2020, the number of registered female seafarers in Greece rose to 2,048 in 2024, marking a total increase of 65.6% over five years.

Women are no longer entering only select or traditionally 'acceptable' roles. They are present across the full spectrum of shipboard positions: officers and ratings, engine room and deck crew, as well as senior roles such as masters and chief engineers. This breadth of participation marks a fundamental shift in how maritime careers are perceived and pursued.

Encouragingly, the change is not limited to those already at sea. Female participation in maritime universities and academies in Greece has increased significantly compared to 20 years ago, signalling a stronger and more sustainable pipeline of talent for the future — one that reflects modern society rather than outdated stereotypes. From an industry perspective, this transformation matters deeply.

Expanding women's participation is not simply about diversity for its own sake; it's about enhancing the sector's resilience and competitiveness and future-proofing an industry that underpins global trade. A more inclusive workforce brings fresh perspectives, stronger team dynamics, and a wider talent base at a time when shipping can least afford constraints.

At Columbia Group, we are witnessing this evolution firsthand. We are committed to ensuring that women not only enter maritime professions but are supported to remain and progress,

both at sea and at shore. Initiatives such as our Female Cadet Programme are focused on mentorship, career development, and inclusive workplace practices. These are all crucial factors if this momentum is to translate into long-term change.

That said, it would be disingenuous to suggest that progress comes without challenges. Diversity brings opportunity, but it also requires thoughtful operational and cultural adjustments. One practical consideration is working with a pregnant seafarer whilst at sea. A pregnancy during a typical six-month contract may necessitate additional procedures, including medical assessments, hospital visits, repatriation, leave arrangements, and recovery time. These situations are manageable, but they demand clear policies, flexibility, and close coordination between ship managers, operators, and crews.

Beyond logistics, deeply rooted social expectations continue to influence career decisions. In many families, including within Greece, traditional roles still assume that mothers remain closer to home while fathers serve as primary earners. This dynamic can make extended periods at sea more challenging for women once children are involved. These realities cannot be ignored. Supporting sustainable, long-term careers for women at sea requires acknowledging these pressures and working toward solutions that reflect real life, not idealised models.

> Expanding women's participation is not simply about diversity for its own sake; it's about enhancing the sector's resilience and competitiveness and future-proofing an industry that underpins global trade. A more inclusive workforce brings fresh perspectives, stronger team dynamics, and a wider talent base at a time when shipping can least afford constraints.

Despite these challenges, it is encouraging to see that the maritime industry is undergoing a rapid transformation, driven by decarbonisation, digitalisation, and evolving regulatory demands. These changes require adaptability, innovation, and diverse skill sets, and women are not newcomers to this future; they are integral to it.

The rise of female seafarers in Greece is not a passing trend. It is a signal that our industry can evolve while remaining true to its heritage. By embracing this change thoughtfully and pragmatically, we strengthen not only our workforce but the long-term sustainability of global shipping itself.



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Both programmes are delivered entirely in Greece, a country with a long-standing maritime tradition and the world's leading shipping community. Built on Alba's high academic standards and strong ties with leading shipping companies and organizations, the programmes combine academic rigor with real-world relevance. As a result, many students secure employment even before graduation, while on average more than 95% of Alba graduates are employed within six months.

Today, as geopolitical uncertainty, technological advancements, and regulatory changes reshape global shipping, education is no longer optional—it is essential. The industry increasingly demands professionals who can combine technical understanding with strategic thinking, adapt to constant change, and translate knowledge into effective decision-making.



More highlights of our programmes

Business relevance

Programmes are continuously updated to reflect the latest developments in shipping, from digitalization and cybersecurity to energy transition and new fuels. They are designed in consultation with the Alba Shipping Business Advisory Committee (BAC), a group of senior industry professionals, ensuring strong alignment with market needs.

Scholarships | Financial Aid Options

Financial support is available through named scholarships, including full and partial awards dedicated to shipping programmes, offered in collaboration with leading industry organizations such as the Hellenic Shipbrokers Association, the Masters and Mates Union of the Greek Merchant Marine, the International Propeller Club of Piraeus, Green Award, WISTA Hellas, and Seanergy.

Internships

Students without prior shipping experience gain hands-on exposure through Alba's extensive internship network, working with some of the most well-known shipping companies in the industry.

Field trips

Field trips in Greece and abroad, including onboard visits, provide a first-hand understanding of the sector's operations, challenges, and opportunities, helping students connect theory with practice and feel part of the industry early on.

Internationalization & recognition

Alba's shipping programmes attract students from around the world, while graduates build careers across key maritime hubs including Greece, Norway, the UK, Singapore, Dubai, Malta, and Cyprus.





Navigating learning | Where executive development meets shipping

In today's increasingly complex environment, shipping companies are investing not only in fleets and technology, but also in their people. Continuous learning, reskilling, and leadership development have become essential as the industry evolves rapidly.

Alba Executive Development works closely with organizations to design tailored programmes that empower executives with the skills needed to lead themselves, their teams and their organization through change. The focus is on business acumen, strategic thinking, adaptability and resilience—capabilities that are now central to effective leadership in global shipping.

Alba customized executive programmes in shipping management, bring together executives across functions and help build a strong learning community, while they also address cutting edge themes, such as AI and energy transitions in shipping, reflecting the sector's growing focus on technology, sustainability and alternative energy solutions.

The need for leadership-focused training continues to rise, with programmes co-designed in partnership with the Human Resources teams of the organizations. These initiatives include leadership development programmes and transferrable skills workshops, focusing on strengthening executive capabilities, underscoring the industry's shift toward people-centered development.

Beyond individual companies, Alba also collaborates with maritime industry bodies to deliver specialized programmes for their members, fostering shared learning and professional growth across the sector.

Preparing professionals for a changing industry

Shipping today requires a new type of professional—one who combines operational expertise with a broader understanding of global markets, technology, energy, and data. The ability to manage complexity, remain resilient under pressure, and continuously adapt is no longer optional; it is fundamental.

Education plays a crucial role in shaping these capabilities. More than a formal qualification, it provides the foundation for structured thinking, sound judgment, and long-term professional growth. In a sector defined by constant change, true security comes not from stability, but from the ability to adapt with knowledge and confidence.

Seeing what others miss in crew operations

Astrolabe: Maritime crew planning intelligence



In today's maritime environment, operational complexity is intensifying. Regulatory pressure, geopolitical uncertainty creates disruptions, and the pool of qualified seafarers is tightening. What was once handled through experience and manual coordination is now reaching its limits, demanding more integrated, intelligent solutions.

This shift is driving a new wave of digital transformation, focused on operational processes.

At the forefront is Intellar, a technology firm specializing in artificial intelligence (AI) and robotic process automation (RPA) designed to solve real-world business challenges.

With more than 150 projects delivered across Cyprus, Greece and Malta, Intellar has built its approach around eliminating inefficiencies in complex processes while improving accuracy, compliance and operational scalability.

Crew change management: See the crew plan you missed

A defining example of this philosophy is Astrolabe, Intellar's flagship platform for maritime crew optimization. Developed through close collaboration with industry stakeholders, it addresses one of shipping's most intricate and often underestimated challenges, crew change management.



Coordinating a single crew change requires multiple variables to align simultaneously: vessel schedules, port rotations, travel logistics, certifications and regulatory requirements. In many organizations, these elements are still managed across disconnected systems, relying heavily on manual intervention. The result is limited visibility, teams only see fragments of the picture, while critical opportunities for optimization remain hidden.

Astrolabe fundamentally changes this dynamic, the platform uses a proprietary AI engine to evaluate all constraints in parallel, uncovering scenarios that would be difficult to identify manually. By generating optimal crew change plans in real time, it creates a more structured, transparent and responsive planning environment where decisions are both faster and better informed.

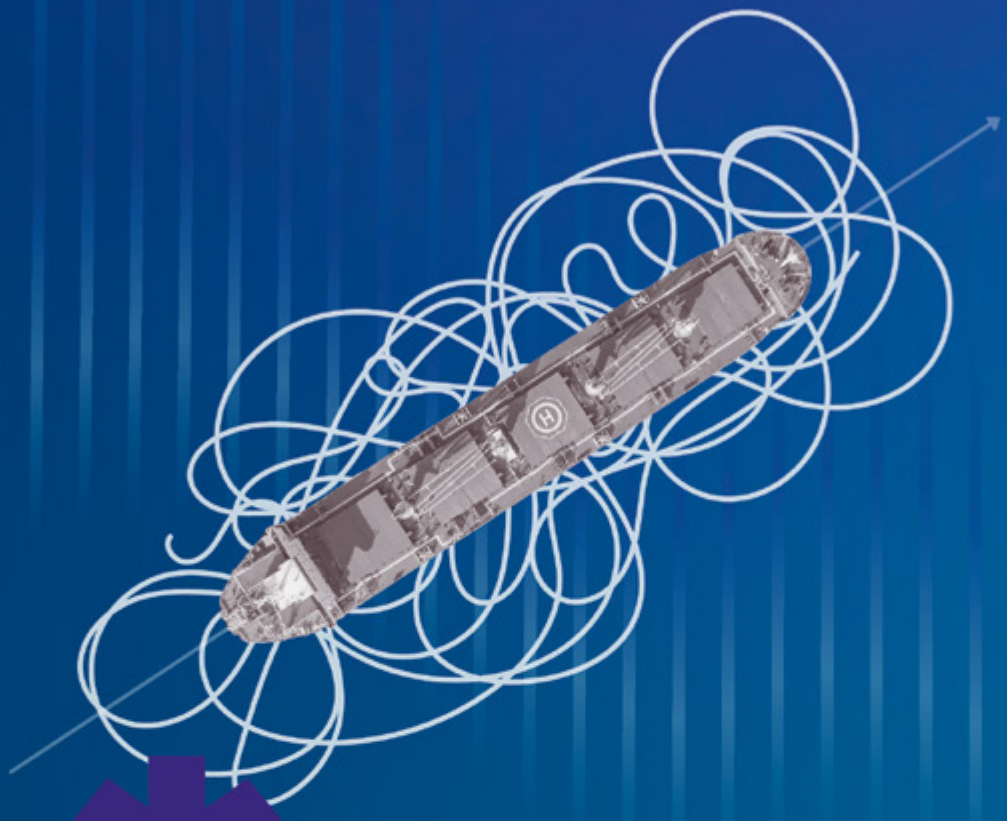
Operational impact

Early deployments indicate materially accelerated planning cycles, alongside meaningful cost efficiencies achieved through optimised routing and coordination. At the same time, automated oversight of certifications and regulatory requirements enhances compliance integrity and reduces operational exposure.

Importantly, this technological advancement is matched by a strong human focus. A dedicated mobile application equips seafarers with direct access to critical information, improving transparency, strengthening communication and fostering greater engagement throughout the crew change process.

As the maritime industry advances into a more digitally mature era, solutions such as Astrolabe signal a broader transformation, transitioning toward more intelligent and data-driven operations.

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Horizon from the bridge



Relationship between P&I insurance and war risk insurance in maritime operations

Maritime trade operates within a complex risk environment where vessels, cargo, and crews are exposed to a wide range of hazards. Among the most critical insurance mechanisms that safeguard shipowners and operators are Protection and Indemnity (P&I) insurance and war risk insurance. While these two forms of coverage are distinct in purpose and scope, they are closely interconnected in practice. Understanding their relationship is essential to appreciating how maritime risk is managed comprehensively.

Overview of P&I insurance

P&I insurance is a form of mutual insurance primarily provided by P&I Clubs. It covers third-party liabilities arising from the operation of ships. These liabilities typically include:

- Injury, illness, or death of crew and passengers
- Pollution damage
- Cargo loss or damage
- Collision liabilities not covered by hull insurance
- Wreck removal and associated costs

P&I insurance is designed to respond to liabilities incurred during the normal commercial operation of a vessel. However, such coverage is subject to exclusions, most notably those relating to war risks.

Overview of war risk insurance

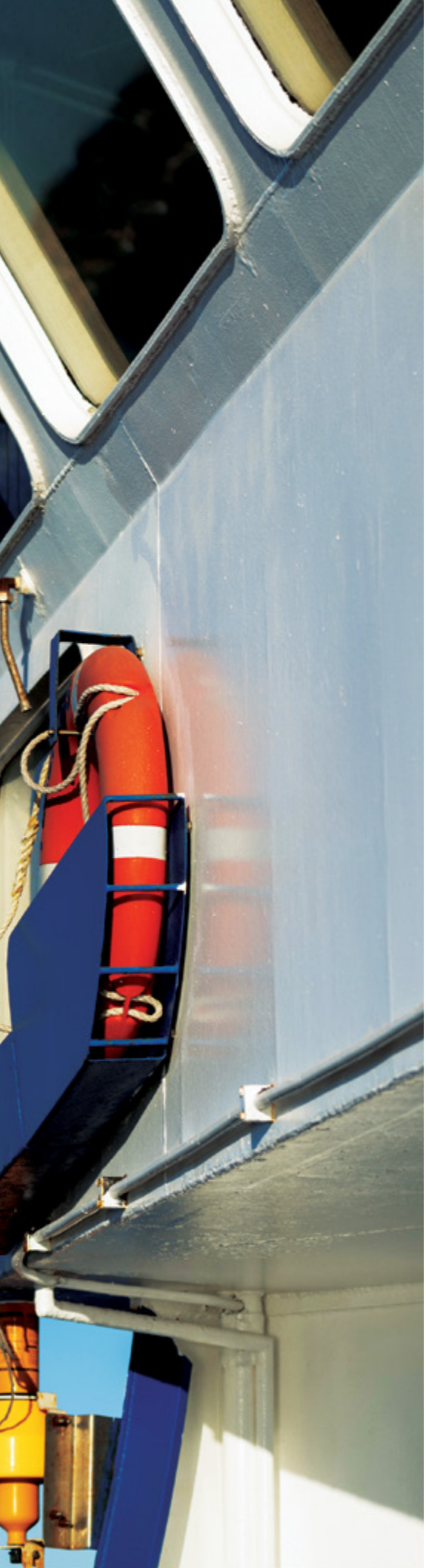
War risk insurance provides coverage for losses or damages resulting from war-related events. These may include:

- Acts of war, civil war, or rebellion
- Piracy and terrorism (depending on policy terms)
- Mines, torpedoes, and other war weapons
- Capture, seizure, or detention of vessels

War risk insurance is typically divided into two categories:

- Hull war risk (covering physical damage to the vessel)
- War P&I (covering liabilities arising from war-related incidents)

This specialised insurance exists



because standard marine insurance policies, including P&I coverage, exclude war risks due to their catastrophic and unpredictable nature.

The relationship between P&I and war risk insurance is fundamentally complementary. P&I insurance covers operational liabilities under normal conditions, while war risk insurance fills the gap when those liabilities arise from war-related events.

For example, if a vessel causes pollution during routine operations, P&I insurance would respond. However, if the same pollution incident is caused by a missile strike or an act of war, the claim would fall under war risk insurance instead.

This division ensures that shipowners are not left uninsured but also allows insurers to manage and price risks appropriately.

A key aspect of the relationship lies in the "war exclusion" clause found in P&I policies. This clause explicitly removes coverage for liabilities arising from war-related events. To address this gap, shipowners must obtain separate war risk insurance.

However, in practice, P&I Clubs often provide a limited form of war risk cover through special arrangements or extensions, sometimes referred to as "war P&I cover". This is often reinsured in the commercial market and may be subject to sub-limits and special terms.

Additionally, in high-risk areas, such as conflict zones, insurers may impose additional premiums or require specific war risk coverage as a condition for entering those regions.

The interplay between P&I and war risk insurance has significant operational implications:

- Voyage planning: Shipowners must assess whether routes pass through war-risk regions and ensure adequate coverage is in place.
- Cost management: War risk premiums can fluctuate significantly depending on geopolitical conditions.
- Claims handling: Determining whether a claim falls under P&I or war risk insurance can be complex and may involve a detailed investigation into the cause of the incident.

This dual-insurance structure requires careful coordination between insurers, brokers, and shipowners. Modern maritime risks blur the line between traditional war risks and other perils. For instance, cyberattacks may be linked to state actors, raising questions about whether they fall under war exclusions. Piracy, once considered a war risk, is sometimes treated differently depending on jurisdiction and policy wording. Hybrid conflicts and sanctions regimes further complicate the interpretation of coverage and the handling of claims. These evolving risks highlight the need for clearer definitions and closer integration between P&I and war risk frameworks.

P&I insurance and war risk insurance are two pillars of maritime risk management that function in tandem. While P&I insurance provides broad liability coverage for routine maritime operations, war risk insurance is designed to address extraordinary risks arising from conflict and geopolitical instability. Their relationship is defined by exclusion and complementarity, each covering what the other does not. For shipowners and operators, understanding this relationship is not merely theoretical; it is crucial for ensuring continuous protection in an increasingly uncertain global maritime environment.

Geopolitical crises from 1980 up to the present day, and the role of seafarers

From 1980 to the present day, geopolitical crises have continuously reshaped global trade, security, and economic stability. Wars, sanctions, regional conflicts, and maritime security threats have repeatedly disrupted key shipping routes. Despite this, global trade has never stopped. The reason lies largely in the resilience and dedication of seafarers, who continue to operate vessels under some of the most dangerous conditions on earth.

Major geopolitical crises (1980–Present)

The late Cold War and regional conflicts (1980s): The Iran–Iraq War marked one of the first major disruptions to maritime trade in the modern era. During the Tanker War, both sides targeted oil tankers in the Persian Gulf, directly threat-

ening commercial shipping. Meanwhile, the Soviet–Afghan War contributed to regional instability, affecting trade routes and global politics.

Post-Cold War instability (1990s): The Gulf War disrupted oil exports and maritime operations in the Middle East. Similarly, the Yugoslav Wars affected shipping and port operations across Europe. Economic sanctions and blockades became common tools, complicating maritime logistics.

The War on Terror and Middle East conflicts (2000s): After the September 11 attacks, global shipping faced stricter security regulations. The Iraq War and the war in Afghanistan influenced energy supply chains and maritime security operations worldwide.

Piracy and maritime security threats (2000s–2010s): Somali piracy in the Gulf of Aden posed a serious threat to commercial vessels. Ships were hijacked, crews were taken hostage, and shipping lanes became high-risk zones. This period highlighted the vulnerability of maritime trade to non-state actors.

Recent conflicts (2010s–2020s): The Syrian Civil War and the Russia-Ukraine War disrupted grain, energy, and commodity flows. The Black Sea region became particularly sensitive, affecting global food security.

The 2026 Iran crisis and the Strait of Hormuz: A major recent escalation is the 2026 Strait of Hormuz crisis, which has become one of the most significant maritime disruptions in modern history. Following military strikes by the United States and Israel in February 2026, Iran retaliated by effectively closing the Strait of Hormuz — one of the world's most critical maritime chokepoints. This narrow passage normally carries around 20% of global oil and gas shipments.

The consequences were immediate and severe:

- Tanker traffic dropped dramatically, in some periods close to zero.
- Over 150 ships were forced to anchor outside the strait to avoid attacks.
- At least 16 merchant vessels were damaged, and seafarers were killed or reported missing.
- Global oil prices surged above $100 per barrel, triggering economic instability (Reuters, Guardian, New York Post).

> From the Cold War era to the present-day Iran crisis, geopolitical instability has consistently tested the resilience of global trade. The 2026 Strait of Hormuz crisis stands as one of the most severe maritime disruptions in modern history, demonstrating how fragile - and yet adaptable - the global shipping system is.

Recent developments show that:

- Iran restricted passage, allowing only selected vessels under strict conditions.
- Shipping traffic declined to as low as 5% of normal levels.
- Oil prices surged due to supply fears and geopolitical uncertainty.
- The crisis created the largest energy supply disruption since the 1970s.

Despite these extreme conditions, maritime trade did not completely stop; it adapted.

Across all these crises, maritime trade has faced recurring challenges:

- Closure or restriction of strategic chokepoints (e.g., Hormuz, Suez, Black Sea)
- Increased insurance costs and operational risks
- Sanctions limiting cargo and vessel movements
- Delays, rerouting, and supply chain disruptions
- Direct attacks on merchant vessels

Yet, global trade has continued, largely due to the maritime workforce. Seafarers are the backbone of global trade, particularly during crises.

One of the most serious risks is the threat of physical harm. In conflict zones such as the Strait of Hormuz or the Black Sea, vessels may be exposed to missile strikes, naval mines, drone attacks, or armed boarding. Unlike military personnel, seafarers are civilians, often with limited means of defence. Even with naval escorts, the unpredictability of conflict makes every transit a high-risk operation.

Operating under constant threat significantly impacts mental health. Seafarers may experience anxiety, fear, and chronic stress, particularly when navigating high-risk areas or hearing reports of attacks on nearby vessels. Long periods of uncertainty, combined with isolation at sea, can lead to burnout, depression, and reduced concentration — factors that can further increase safety risks.

Geopolitical crises often lead to port closures, rerouting, or restrictions on crew changes. As a result, seafarers may be forced to remain on board far beyond their contracted periods. This was widely observed during crises when access to





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ports became limited. Extended service increases fatigue and reduces morale, while also raising concerns over labour rights and welfare.

Sanctions, embargoes, and rapidly changing regulations create legal complexity for seafarers and ship operators. A vessel may unknowingly enter restricted waters or carry sanctioned cargo, exposing the crew to detention or legal consequences. Seafarers often have little control over such decisions but may still face the consequences, including arrest or being stranded in foreign ports.

In politically unstable or piracy-prone regions, crews face the risk of being detained by authorities or captured by armed groups. Incidents of wrongful detention or prolonged investigations can leave seafarers stuck for months or even years. Piracy, although it has been reduced in some areas, remains a serious concern in others, with crews subjected to violence, ransom situations, and inhumane conditions.

During crises, communication systems may be restricted for security reasons (e.g., AIS shutdowns or limited internet access). This isolates seafarers from both operational updates and their families. Lack of communication increases stress and reduces situational awareness, making it harder for crews to respond effectively to evolving threats.

Crisis conditions often require additional safety measures, security drills, and constant vigilance. Crews must monitor threats, adjust routes, and comply with new protocols, all while maintaining normal ship operations. This significantly increases workload and pressure, especially on bridge and engine room personnel.

In high-risk areas, access to medical assistance is often restricted. Emergency evacuations may not be possible due to security concerns, leaving crews vulnerable if injuries or illnesses occur. Even minor medical issues can become serious without proper treatment.

Ships operating in war-risk zones face increased insurance premiums, which can influence operational decisions. In some cases, shipowners may pressure crews to proceed despite the risks to avoid financial losses. Seafarers may also face uncertainty regarding compensation in the event of incidents.

Despite their critical role, seafarers often receive limited recognition compared to other essential workers. During crises, their contribution to maintaining global supply chains is rarely visible to the public. This lack of recognition can affect morale and highlights the need for stronger support systems.

From the Cold War era to the present-day Iran crisis, geopolitical instability has consistently tested the resilience of global trade. The 2026 Strait of Hormuz crisis stands as one of the most severe maritime disruptions in modern history, demonstrating how fragile — and yet adaptable — the global shipping system is.

At the heart of this resilience are seafarers. Their willingness to operate in high-risk environments ensures that the world continues to function, even in times of war and uncertainty. The challenges they face during geopolitical crises go far beyond routine maritime risks. They operate under physical danger, legal uncertainty, psychological strain, and demanding working conditions, all while ensuring that global trade continues uninterrupted. Recognising their contribution is essential — not only for fairness but also for the sustainability of global trade itself.

Risks in mooring operations

Mooring operations are among the most hazardous routine activities carried out on board ships and at port terminals. Despite being a standard part of maritime operations, mooring involves complex coordination, heavy equipment, and significant forces, all of which create a high-risk environment for crew members and dock workers.

Mooring is the process of securing a vessel to a berth, quay, buoy, or another vessel with ropes, wires, or chains. These operations are carried out during a vessel's arrival, departure, or shifting. Although they may appear straightforward, mooring operations present significant hazards that can lead to injuries or fatalities if not properly managed.

Major risks in mooring operations

1. Snap-back of mooring ropes

One of the most dangerous risks is the snap-back of mooring ropes. When a rope or wire under tension breaks, it recoils violently along its snap-back zone. Anyone standing within this zone can suffer severe or fatal injuries.

2. Crushing and pinching hazards

Crew members working near winches, bitts, and fairleads are at risk of being crushed or having their limbs caught

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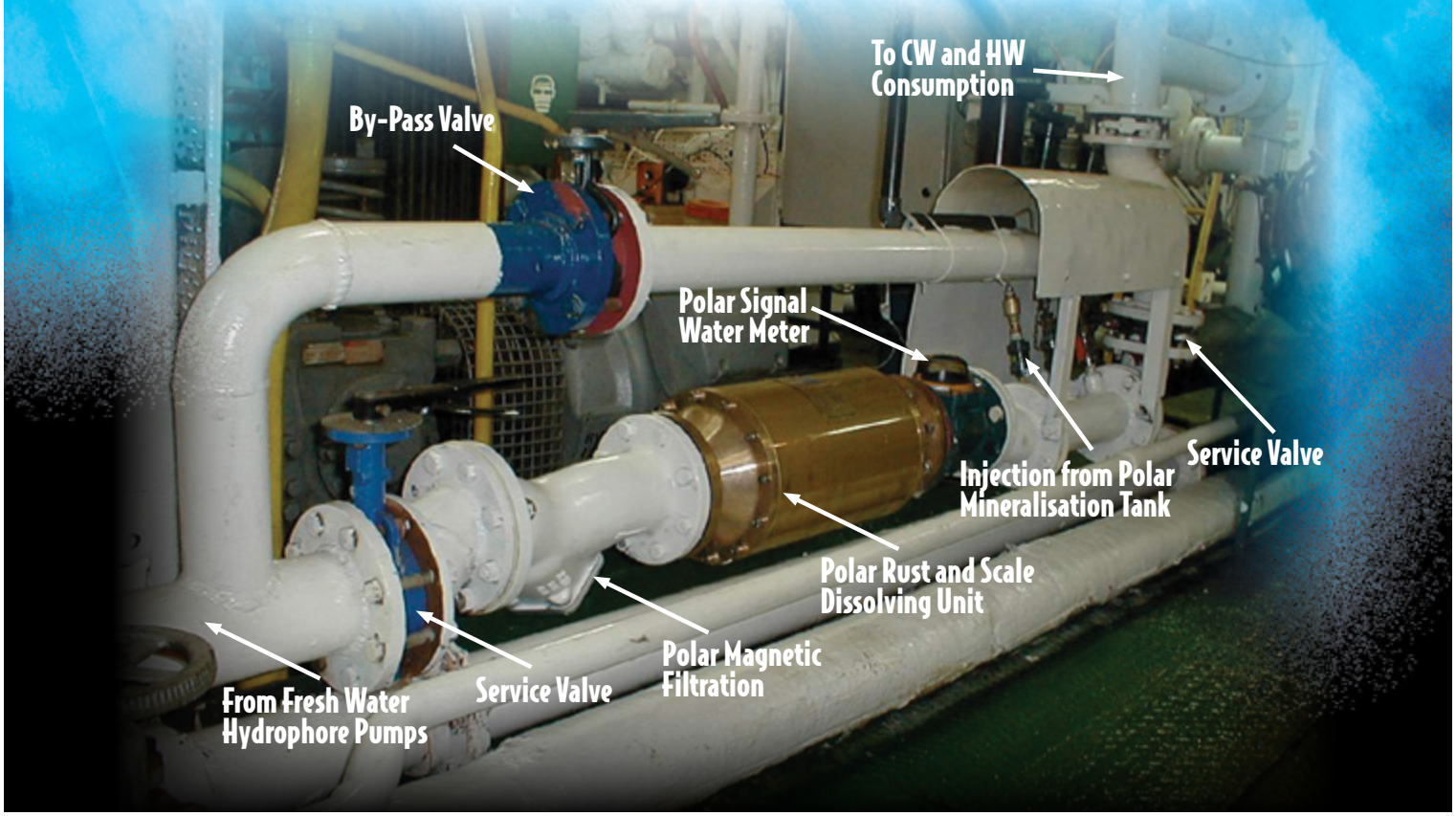
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between moving lines and fixed structures. These injuries often occur due to poor positioning or a lack of awareness.

3. Slips, trips, and falls

Decks can be wet, oily, or cluttered with equipment, increasing the likelihood of slips and falls. Sudden vessel movements during mooring can further destabilise personnel.

4. Line handling injuries

Handling heavy ropes and wires can lead to strains, sprains, and hand injuries. Improper techniques or inadequate protective equipment increase the risk.

5. Equipment failure

Failure of mooring equipment, such as winches, brakes, or ropes, can result in uncontrolled line movement, posing immediate danger to crew members.

6. Poor communication

Mooring operations require clear coordination between the bridge, deck crew, and shore personnel. Miscommunication can lead to incorrect line handling, excessive tension, or unsafe movements.

7. Weather conditions such as strong winds, currents, and poor visibility can complicate mooring operations and increase risks significantly.

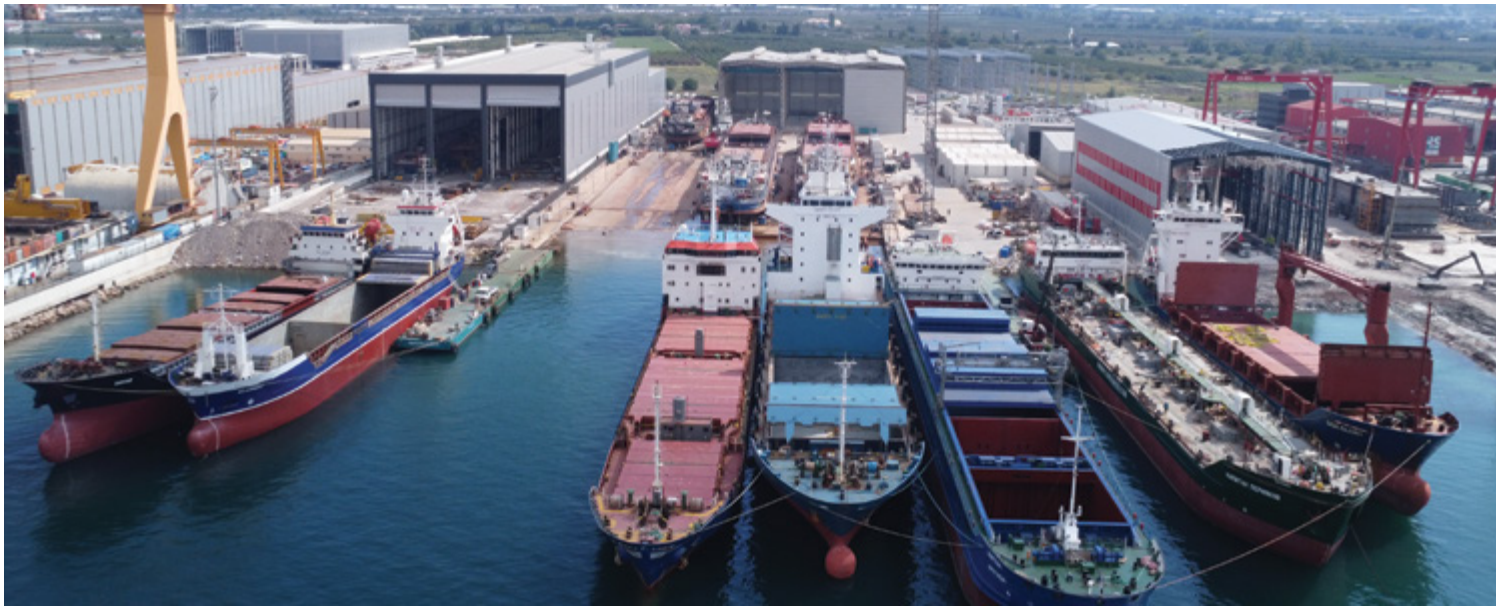
To ensure safer mooring operations, the following measures should be implemented:

- Effective training is the foundation of safe mooring operations. Crew members should undergo both theoretical and practical training covering the characteristics of mooring lines, the dangers of snap-back zones, and the proper handling of equipment. Regular drills and refresher courses are essential to ensure that safety knowledge remains current. Training should also include case studies of past incidents to help the crew understand real-life consequences and reinforce safe behaviour. In addition, new crew members must be properly familiarised with the specific mooring arrangements and equipment on board before participating in operations.
- Personal protective equipment (PPE) plays a crucial role in minimising injuries during mooring operations. Crew members should always wear appropriate PPE, including safety helmets to protect against head injuries, gloves to improve grip and prevent rope burns, and steel-toe boots to guard against crushing injuries. High-visibility clothing ensures that workers can be easily seen, particularly in low-light conditions or during night operations. However, PPE should not be regarded as a substitute for safe practices; rather, it should complement proper procedures. Regular inspection and maintenance of PPE are also necessary to ensure its effectiveness.
- Clear and effective communication is vital for coordinating mooring operations safely. Misunderstandings between the bridge team, deck crew, and shore personnel can lead to dangerous situations, such as applying excessive tension on lines or moving the vessel unexpectedly. Standardised communication protocols, including agreed terminology and hand signals, should be strictly followed. Radios and communication devices must be tested before operations begin to ensure reliability. Additionally, one person — usually the officer in charge — should be designated to give commands, reducing confusion and ensuring a clear chain of authority.
- Positioning of personnel during mooring operations is critical to preventing injuries. Crew members must be fully aware of snap-back zones and avoid standing in areas where lines under tension could recoil if they fail. Marking these zones on deck can improve awareness and help enforce safe practices. Workers should also maintain a safe distance from moving lines and equipment and avoid stepping over or standing on ropes. Maintaining proper footing and being alert to sudden movements of the vessel are equally important. Supervisors should actively monitor crew positioning throughout the operation.
- Well-maintained equipment is essential for safe mooring. All mooring equipment, including winches, brakes, rollers, bitts, and lines, should be regularly inspected for wear, corrosion, or damage. Defective equipment must be repaired or replaced immediately to prevent failure during operations. Maintenance schedules should be strictly followed, and records should be kept for accountability. In addition, mooring lines should be selected according to their suitability for the vessel and operating conditions, ensuring they can withstand expected loads



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without excessive strain.

- Proper planning significantly reduces risks associated with mooring operations. Before commencing, a thorough risk assessment should be conducted, considering factors such as weather conditions, tidal currents, berth layout, and vessel characteristics. A clear mooring plan should be developed and communicated to all crew members involved. This plan should include line arrangements, sequence of operations, and contingency measures for unexpected events. Pre-mooring briefings are highly effective in ensuring that everyone understands their roles and responsibilities.
- Fatigue is a major contributing factor to human error in mooring operations. Fatigued crew members are more likely to make mistakes, have slower reaction times, and exhibit reduced situational awareness. To mitigate this risk, ship operators must comply with work and rest regulations. Adequate manning levels should be maintained so that crew members are not overburdened. Where possible, mooring operations should be scheduled to allow sufficient rest beforehand. Promoting a culture in which crew feel comfortable reporting fatigue is also important for maintaining safety.

Mooring operations, though routine, present significant risks that require constant vigilance and proper management. Most accidents during mooring are preventable through training, communication, and adherence to safety procedures. By recognising hazards and implementing effective control measures, maritime operators can significantly reduce the risk of injury and ensure safer working conditions for all personnel involved.

IACS publishes Recommendation on Onboard Lifting Appliances following SOLAS amendments

The International Association of Classification Societies' (IACS) Recommendation on Onboard Lifting Appliances, introduced in 2026, represents a decisive advancement in maritime safety governance by establishing a unified and technically robust framework for the control, certification, and maintenance of lifting equipment on board ships.

In this context, the recommendation was developed in response to amendments adopted by the International Maritime Organization (IMO) under the SOLAS Convention, specifically regulation II-1/3-13. It clarifies the regulatory requirements and promotes consistent implementation across classification societies, shipowners, and flag administrations worldwide. Furthermore, it directly addresses the long-standing risks associated with onboard lifting operations, which have historically contributed to serious accidents, equipment failures, and loss of life.

Against this regulatory background, the recommendation establishes a comprehensive scope that clearly defines lifting appliances, associated loose gear, and their operational boundaries, thereby removing inconsistencies that previously existed in classification and compliance practices. It explicitly differentiates between new installations, which must fully comply from 1 January 2026, and existing equipment, which must meet the new standards at the first applicable renewal survey. By doing so, it creates a structured transition framework that balances safety imperatives with operational feasibility. Furthermore, it clarifies the treatment of equipment with lower Safe Working Load thresholds, ensuring that safety standards are applied proportionately without compromising risk control.

A central pillar of the recommendation is the strict enforcement of certification and documentation requirements, which are essential for verifying the integrity and safe operation of lifting appliances throughout their lifecycle. It mandates the availability and maintenance of comprehensive records, including load test certificates, thorough examination reports, manufacturer specifications, and verified Safe Working Load markings. In cases where legacy equipment lacks complete documentation, the recommendation provides alternative verification methodologies, thereby maintaining safety assurance without imposing impractical compliance burdens on older vessels. This approach strengthens regulatory accountability while recognising the practical limitations associated with an ageing global fleet.

The recommendation further strengthens inspection and testing regimes by aligning them with SOLAS requirements and enhancing their practical application. It requires initial proof load testing prior to commissioning, followed by periodic re-testing and systematic inspections at defined intervals. Emphasis is placed on continuous condition monitoring and proactive maintenance to prevent failure, rather than relying solely on reactive measures. This structured approach ensures that lifting appliances remain in a verifiable state of operational safety throughout their service life, significantly reducing the likelihood of mechanical failure during critical operations.

In addressing complex and non-standard operational scenarios, the recommendation provides detailed guidance on special cases, including dual-purpose lifting appliances, modified or retrofitted equipment, and the certification of loose gear integrated into lifting systems. By covering these scenarios comprehensively, it eliminates regulatory gaps and ensures that all forms of lifting operations onboard are subject to consistent safety oversight. This is particularly important in modern shipping, where equipment is often adapted for multiple functions and operational flexibility is essential.

The implementation of the IACS recommendation is expected to deliver substantial benefits across the maritime industry by establishing a harmonised global standard for lifting appliance safety standards. It enhances operational reliability, reduces regulatory uncertainty, and strengthens the overall safety culture within the sector. Shipowners and operators are compelled to adopt more disciplined maintenance and documentation practices, while classification societies are provided with a clear and consistent benchmark for survey and certification activities. Ultimately, the recommendation not only supports compliance with international regulations but also reinforces the industry's commitment to safeguarding human life, protecting assets, and ensuring the safe and efficient operation of ships worldwide.

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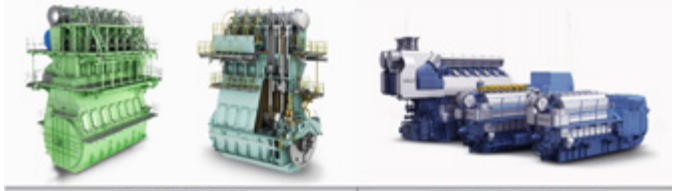
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Marine insurance in a new era of geopolitical uncertainty

Marine insurers are operating in a world that feels fundamentally different from just a few years ago. Rising geopolitical tensions and an increasingly unpredictable global landscape are introducing unfamiliar risks, pushing the industry into uncharted territory and demanding greater resilience than ever before.

The outlook remains uncertain. The ongoing conflict between Russia and Ukraine shows little sign of resolution, while escalating tensions in the Middle East continue to disrupt critical shipping routes such as the Strait of Hormuz and the Persian Gulf. These geopolitical flashpoints — alongside a range of other pressures — are reshaping risk in real time, adding complexity and volatility to an already challenging environment.

Traditionally, marine insurance has focused on physical perils such as collisions, mechanical breakdowns, and weather-related events. While these risks remain, the overall risk profile has broadened significantly. It is now increasingly influenced by geopolitical



by **Frédéric Denèfle**,
President of the International Union of Marine Insurance (IUMI)



conflict, sanctions regimes, and security threats. As a result, underwriters must look beyond maritime operations and incorporate geopolitical analysis into their risk models. War risk insurance, once considered a niche product, has become far more central and widely applied.

Catastrophic cover has long been part of the market, typically in relation to natural events such as hurricanes. Today, however, the concept is being extended to geopolitical corridors, such as the Black Sea, the Red Sea, and the Persian Gulf. Pricing, once relatively static and vessel-based, has become more dynamic. It is now often calculated per voyage, based on specific routes, with exposure reassessed each time a vessel enters a high-risk area.

This shift has significant implications for underwriting. Traditional actuarial models are increasingly supplemented by real-time geopolitical intelligence and vessel tracking. Underwriters are modelling a wide range of scenarios, including potential escalation, blockades, and sanctions. Political risk analysis, once peripheral, is now central to decision-making.

Historically, underwriting relied heavily on data such as loss history, vessel specifications, and stable, uncontested trade routes. Today, insurers must incorporate real-time intelligence, including military activity, sanctions developments, port security conditions, and advisories from governmental and defence authorities. Risk assessment has therefore become more dynamic, short-term, and responsive.

Importantly, insurers must also consider indirect consequences of geopolitical instability. Rerouting vessels to avoid conflict zones can lead to delays, longer voyages, and increased exposure to machinery breakdown, adverse weather, and crew fatigue. Cargo deterioration, spoilage, and contractual penalties for late delivery further complicate the risk landscape. These factors often raise complex coverage questions, particularly around exclusions and policy validity. As a result, insurers are becoming more closely involved in operational decisions, influencing route planning, onboard security measures, and reporting requirements.

Aggregation risk is another growing concern. Geopolitical events can lead to clustered losses — for example, multiple vessels affected within a single corridor or widespread disruption from port closures impacting numerous insured cargoes.

Inflation must also be taken into consideration, with the current situation in the Middle East driving up energy prices, which in turn impacts many areas, including the cost of losses, repairs, and replacements.

Sanctions, often a direct consequence of geopolitical conflict, are now a critical component of underwriting. Insurers must navigate increasingly complex compliance requirements, including analysing vessel ownership structures, cargo origin and destination, and trad-



Traditionally, marine insurance has focused on physical perils such as collisions, mechanical breakdowns, and weather-related events. While these risks remain, the overall risk profile has broadened significantly. It is now increasingly influenced by geopolitical conflict, sanctions regimes, and security threats.

ing histories to identify so-called "dark fleet" activity. Breaches of sanctions can result in policies being voided, while claims payments may be legally prohibited.

Beyond direct conflict, geopolitical tensions are also influencing global trade dynamics: recent tariff activity — whether imposed, threatened, or withdrawn — has contributed to market instability and policy uncertainty. Many observers believe that we are entering a "new normal" in global trade.

Tariffs have disrupted demand forecasting and inventory planning, introducing significant uncertainty into supply chains. In response, importers have increasingly stockpiled goods to secure supply and avoid anticipated tariffs, leading to unusually high cargo accumulations in certain regions and increasing exposure for underwriters. At the same time, tariffs can inflate the value of goods, requiring insurers to adjust coverage, although this may be offset by reduced trade volumes.

More broadly, protectionist policies are encouraging greater reliance on domestic production, which may reduce demand for maritime transport and, consequently, marine insurance. In higher-cost manufacturing regions, countries may seek alternative trading partners with more favourable tariff regimes, disrupting established supply chains. These evolving patterns must be understood if they are to be effectively insured.

Protectionism may also have implications for insurance markets themselves. Restrictions on cross-border financial flows or currency usage could limit where assureds can place their insurance and constrain the operations of international insurers. While such restrictions have so far been largely confined to sanctioned or embargoed nations, this could change if broader financial controls are introduced. In such scenarios, affected markets may be forced to rely more heavily on domestic insurance capacity.

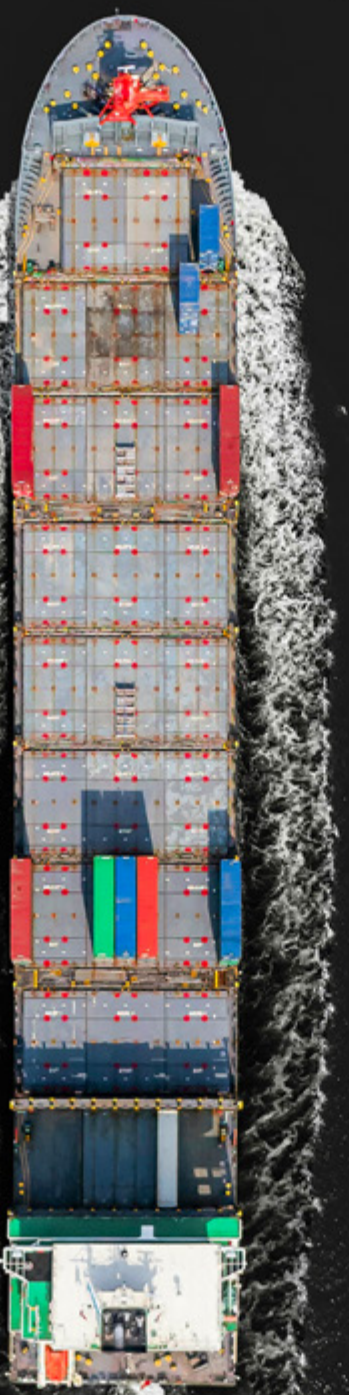
Alongside geopolitics, regulatory and sustainability pressures are driving further transformation. Although the International Maritime Organization (IMO) has delayed the implementation of new greenhouse gas measures, the transition to greener shipping continues to gather pace. Investment in alternative fuels, such as LNG and methanol, is accelerating alongside the adoption of advanced vessel technologies that improve efficiency, reduce costs, and enhance performance. Increasingly, the industry is demonstrating that sustainability and profitability can align.

Looking ahead, uncertainty remains. Will global trade continue to expand? Will investment trends remain stable? How will current conflicts evolve? How quickly will sustainability initiatives materialise? And what impact will technological advancements, including artificial intelligence, have on the sector?

While these questions are still unfolding, one point is clear: marine insurers will continue to play a critical role in global trade. Through their financial strength and technical expertise, they provide the foundation that enables the movement of goods worldwide. In an increasingly complex and uncertain environment, their role as risk absorbers and facilitators of trade remains as vital as ever.

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As geopolitical tensions escalate, particularly within the Middle East and the Strait of Hormuz, the shipping industry faces an era of unprecedented operational and contractual uncertainty. This special feature explores the critical intersection of maritime war risks, the evolving legal frameworks of charterparty clauses, and the increasing necessity for comprehensive insurance coverage. Through expert analysis, we examine how shipowners, charterers, and insurers must adapt to a reality where risk is no longer a remote contingency but a daily commercial factor that demands foresight, precise legal drafting, and proactive management.

war risks

Middle East conflict: War risk & charterparty implications

Since the end of February 2026, the conflict between the US, Israel, and Iran has created major uncertainty for the shipping industry and global trade due to the continued threats to ships transiting the Strait of Hormuz, a key passage through which an estimated 20% of global oil and gas travels. At the time of writing, there is still considerable confusion, with the situation changing on a near-daily basis, as to whether the Strait is effectively "closed" and whether vessels attempting transit may be subject to attack. Shipowners and charterers therefore face urgent questions: what contractual rights allow them to avoid risks to their vessels, crew, and cargo, and who ultimately bears the costs of safety-driven decisions?



by **Alexandra Davison**,
Head of FD&D Claims – Greece at NorthStandard

This article seeks to explain how war risk clauses in shipping charterparties operate, especially BIMCO's CONWARTIME (for time charters) and VOYWAR (for voyage charters), against the backdrop of conflict-related navigation threats, including those associated with transiting the Strait of Hormuz.

Charterparty war risk clauses typically make provisions to address risks such as blockades, piracy, terrorism, and actual or threatened war. Usually, they allow owners — in the reasonable judgment of the owner and/or master — to refuse to proceed to a nominated port if the voyage is considered dangerous and may shift certain additional costs to charterers. The most common are BIMCO's standard clauses: CONWARTIME and VOYWAR. BIMCO has long published these clauses (notably the 2013 editions) and has now issued updated 2025 versions, which are recommended for use. However, it should be noted that war risk clauses can be overridden or reshaped by other charterparty terms. For example, in the case of the "Eleni P" (Eleni Shipping Ltd v Transgrain Shipping BV [2019] EWHC 910 (Comm), [2019] 2 Lloyd's Rep. 265), a separate piracy clause narrowed rights that would otherwise have arisen under CONWARTIME. Therefore, it is crucial that charterparty contracts be read as a whole.

CONWARTIME, BIMCO's standard war risk clause for time chartering, permits owners to refuse to proceed to (or to cease proceeding to) a port if, in the reasonable judgment of the master and/or owners, the vessel, cargo, crew, or others onboard "may be exposed to war risks", whether such risks existed at the time of contracting or arise subsequently. The focus is on whether exposure may occur and whether it may be, or become, dangerous. "Reasonable judgment" relates to the soundness of the decision, and a judgment can still be "reasonable" even if not every possible enquiry has been made.

CONWARTIME requires the presence of a genuine appreciable danger, but does not require proof of how likely harm is to materialise — only that exposure may occur and may be dangerous. Owners are not required to demonstrate a material increase in risk since the time of contracting; if a port later becomes, or appears likely to become, dangerous, the vessel may depart.

CONWARTIME generally shifts additional war risk costs to the charterer,

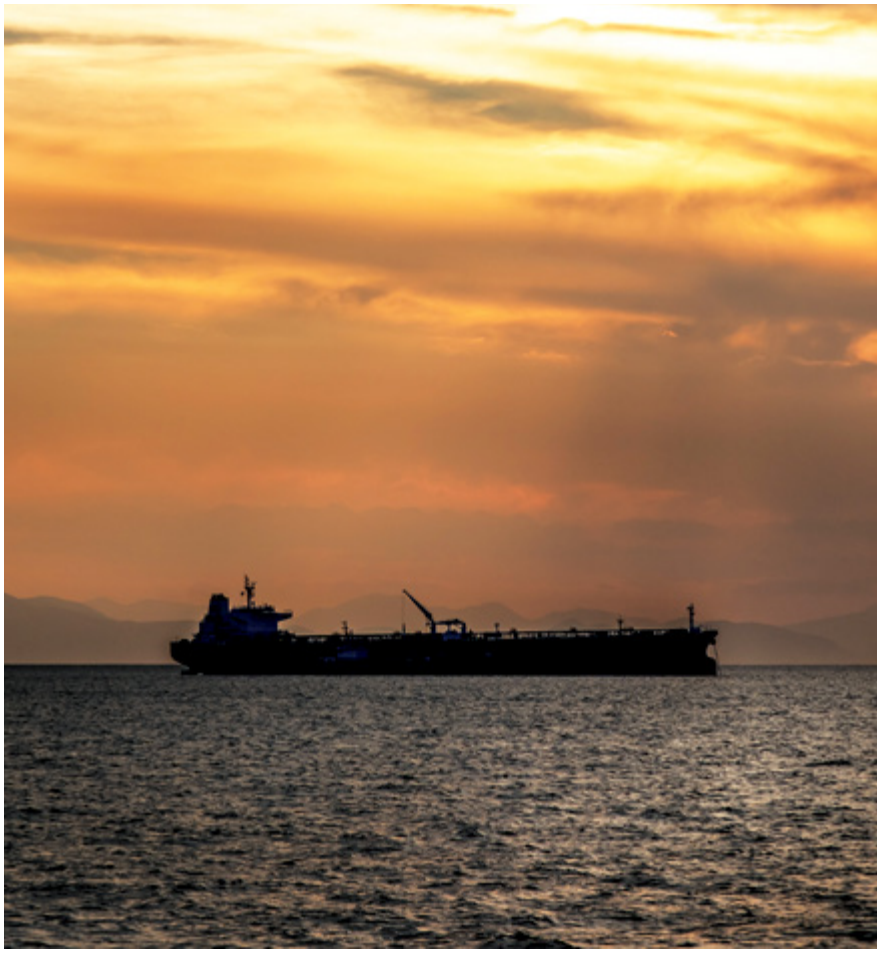
including extra premiums and crew wages or bonuses paid because of the risk. If owners decline to proceed, they must give immediate notice, after which the charterer may nominate an alternative safe port within the contractual period. If no safe nomination is made in time, owners may choose a safe port, with charterers bearing the resulting costs, risks, and expenses. Charterers must also indemnify owners against claims under Bills of Lading, Sea Waybills, or similar documents arising from actions taken pursuant to the clause.

VOYWAR, BIMCO's standard war risk clause for voyage chartering, uses the same "reasonable judgment" trigger but distinguishes between issues arising before loading and after loading has commenced. Before loading, if performance would expose the vessel to defined war risks, owners may refuse to perform or cancel. In cases where only certain contractual ports are dangerous, owners must first notify the charterer and allow time for the nomination of a substitute safe port; if such nomination fails, owners may cancel.

Once loading has commenced, VOYWAR operates much like CONWARTIME: if performance risks exposing the vessel to war risks, owners need not continue and may proceed to a safe alternative port after notifying the charterer and seeking a safe nomination. In the absence of a timely response, owners may choose the alternative port themselves. VOYWAR also permits an alternative route if part of the intended route appears to expose the vessel to war risks; in such cases, owners must notify the charterer, and freight is adjusted to reflect the deviation.

As with CONWARTIME, VOYWAR places additional premiums and costs associated with trading to dangerous areas on the charterer, until discharge is completed and, where applicable, until the vessel departs from a dangerous discharge port. Charterers must also indemnify owners against document of carriage claims resulting from actions taken under VOYWAR.

With regard to the updates to the clauses, there are some key differences between the 2013 and 2025 versions. For CONWARTIME, the 2013 revision



— influenced by the decision in the case of the "Triton Lark" (Pacific Basin IHX ltd v Bulkhandling Handymax AS (The "Triton Lark") (No.1) [2011] EWHC 2862 (Comm); [2012] 1 Lloyd's Rep. 151) — reframed the process of testing whether an area is dangerous, rather than assessing the "degree" of risk. It also confirmed — following the decision in the case of the "Paiwan Wisdom" (Taokas Navigation SA v Komrowski Bulk Shipping KG (GmbH & Co) (The "Paiwan Wisdom") [2012] 2 Lloyd's Rep. 416), and aligning with BIMCO's piracy clause — that the clause can apply even where risks existed at the start of the charter. The 2025 version largely preserves this approach while streamlining drafting, adding definitions, and enhancing transparency on insurance-related costs. It also extends the substitute port nomination period from 48 to 72 hours.

For VOYWAR, the 2013 update also adjusted the risk test, which is retained in the 2025 version. The updated wording clarifies how the clause applies before, during, and after loading, as well as after the voyage has commenced. Additionally, it updates the method for recalculating freight when an alternative route is taken, including a requirement for owners to provide supporting documents. As with CONWARTIME, VOYWAR extends the safe-port nomination period from 48 to 72 hours.

In summary, charterparties commonly include a war risk clause — often CONWARTIME or VOYWAR — allowing owners, based on reasonable judgment, to refuse to proceed to unsafe ports or to adjust performance in order to avoid danger. Owners are required to notify charterers and allow for the nomination of a safe alternative. In general, charterers bear extra costs and indemnify owners against resulting carriage claims. Finally, BIMCO's 2025 revisions focus on clarity and consistency, with practical changes including longer nomination periods and updated mechanisms for freight adjustment.

Greek owners confront the need for more suitable war risk cover

For much of the past decade, war risk insurance sat low on shipowners' priority lists. Premiums were manageable, conflict zones were broadly predictable, and arranging cover had become routine.



by **Ben McKeith**,
Senior Underwriter
at the London P&I Club

However, the escalation of tensions in the Black Sea following Russia's invasion of Ukraine, and the subsequent pressure on shipping routes through the Middle East Gulf, brought war risk back into focus.

Yet even as premiums have risen and the threat picture has grown more complex, a fundamental question is not being asked consistently enough: does the cover an owner holds actually reflect the risks their vessel faces?

That is the concern being raised by Ben McKeith, Senior Underwriter at the London P&I Club, who argues that too many shipowners and brokers remain focused on the cost of war risk cover rather than its content.

"Until recently, owners have not had a good reason to consider the scope of their war cover and, therefore, it is treated as an afterthought until it is time to renew. The recent developments in the Middle East have once again put a spotlight on why continuously assessing your war risk cover needs is so important for owners and brokers", he says.

The geography of risk is changing

The clearest evidence of this shift lies in the claims data. In the 12 months to April 2026, at least six war risk claims have been filed following incidents on vessels operating outside traditional high-risk zones.

These are not isolated events in contested waters. They are attacks linked directly to the Russia-Ukraine conflict, but occurring far from the Black Sea, in waters where owners had reason to believe that their vessels were beyond the reach of the conflict.

"We have seen incidents of limpet mines being attached to vessels, which then

explode outside of the Black Sea, most notably off the coast of Turkey, in the Mediterranean, off the coast of North Libya, and off the west coast of Africa. For some, this might mean there is a different insurer for the claim than the one that provided breach cover for the voyage within the Black Sea. It is therefore essential that the scope of both covers is considered closely, and that they dovetail to ensure that there is no risk of gaps in cover".

This is the structural problem at the heart of McKeith's warning. An owner trading near the Black Sea may hold a standard war risk policy with one insurer alongside a separate breach cover arranged specifically for any voyage into the zone itself. If those two policies are not carefully aligned, an incident occurring outside the defined breach area may fall between them. The gap is the product of two policies that were never tested against each other.

Cover outside traditional conflict zones

The instinct to reduce war risk cover when vessels are not trading in a recognised high-risk area is understandable. It is also, McKeith argues, increasingly difficult to justify:

"Some owners are choosing to have limited war risk cover because they know they're not trading in traditional high-risk areas. For example, in the Black Sea, some believe that they can skirt defined high-risk areas to avoid incidents. However, floating mines, drones, and underwater divers could still target your vessel regardless of its cargo or destination".

The threat model that underpinned war risk underwriting for most of the past 30 years was built around geography. A vessel either was or was not inside a recognised war risk zone, and its cover was arranged accordingly. What the Russia-Ukraine conflict has demonstrated is that the geography of risk is not fixed; weapons and tactics do not observe the boundaries that insurers draw on a map.

The same dynamic is present in the Middle East, where access to the Strait of Hormuz has been constrained by continuing tensions, and the threat to vessels in and around the Gulf has become more varied.

Shipowners and brokers need to ask themselves today what is actually included in their war risk cover. For many, the answer is simply a standard policy that is ticked off as part of their annual insurance premiums.

"We are seeing a similar story play out in the Middle East as geopolitical challenges continue to limit access to the Strait of Hormuz. Some shipowners know they aren't entering a high-risk area like the Black Sea or the Middle East Gulf, so they do not scrutinise their war risk cover. However, the emergence of new risks means that we are urging owners and brokers to take a closer look at their war risk cover and ensure they have adequate cover in place".

Renewal cannot be the starting point

Getting the scope right is only half the challenge; getting the timing right is the other.

War risk policies are typically reviewed at renewal, and those conversations tend to be shaped by whatever is happening in the geopolitical environment at that moment. In periods of relative calm, owners press for lower premiums and narrower cover. In times of heightened tension, they move to understand the extent of their existing coverage. As McKeith notes, neither moment is the right one for that conversation to start.

"Shipowners and brokers need to ask themselves today what is actually included in their war risk cover. For many, the answer is simply a standard policy that is ticked off as part of their annual insurance premiums".

The practical timeline also matters. War risk premiums have risen since the onset of the Russia-Ukraine conflict in 2022 and the recent deterioration in security in the Middle East, and there is little expectation of a near-term return to the conditions that preceded those events.

"The ongoing geopolitical tensions in the Middle East Gulf region mean that it is unlikely we will see a return to low premiums for war risk cover in the near future. So, while it might still be a while off until owners need to renew that cover, they need to start considering today whether their war risk cover will be adequate for the year ahead, particularly as vessels face greater exposure outside of traditional high-risk areas".

For McKeith, the underlying principle is straightforward: "That is the whole point of marine insurance; it is a check against the unexpected".

In shipping, risk cannot be eliminated; only managed, priced, and, at times, endured

Hellenic Hull Management: An analysis of the interaction between war risk cover and charterparty clauses



by **Constantine Hadjipateras**,
Claims Manager at Hellenic Hull Management

Escalating tensions across the Middle East, particularly in and around key maritime chokepoints such as the Red Sea and the Strait of Hormuz, have transformed war risk from a remote contingency into an immediate operational reality for the shipping industry. Recent attacks on commercial vessels and the growing threats posed have heightened uncertainty and forced shipowners, charterers, and insurers to reassess their risk exposure on a near-daily basis.

These developments have significant implications not only for vessel safety but also for global trade flows, freight rates, and supply chain reliability. Routes that were once considered standard are now subject to disruption, delay, or complete avoidance, often at considerable cost. In this environment, war risk is no longer confined to insurance consideration; it is now a central commercial and contractual issue that directly impacts voyage planning, cost allocation, and legal liability. As such, a clear understanding of both war risk cover and its interaction with charterparty terms is essential for all market participants navigating the current geopolitical landscape.

In the current Middle East security environment, war risk insurance has shifted from a background consideration to a central driver of commercial decision-making. Insurers are rapidly designating affected regions as high-risk or "listed areas", triggering significant additional premiums for vessels transiting through key routes. These premiums are not static and can escalate within days in response to new incidents, materially increasing voyage costs and, in some cases, rendering certain routes commercially unviable.

As one market participant observed, "there is no such thing as a strategy — we can only adapt and prepare", reflecting the reactive nature of decision-making in the current environment. At the same time, the standard seven-day notice of cancellation provisions built into war risk cover allow insurers to reassess and readjust the prices while simultaneously providing time for shipowners to seek alternative cover or make necessary operational adjustments in

response to the changing risk environment.

This volatility forces market participants to make real-time decisions on routing, pricing, and contractual exposure, often with incomplete information. In practice, war risk insurance is no longer simply a protective layer; it has become a dynamic and sometimes decisive factor shaping how and whether vessels trade in the region.

The allocation of war-related risks between shipowners and charterers is primarily governed by war clauses within charterparties, such as CONWARTIME and VOYWAR. These clauses typically grant owners the right to refuse orders to proceed to ports or areas where, in their reasonable judgment, the vessel, crew, or cargo may be exposed to war risks. In operational terms, these decisions are increasingly framed by safety considerations, with industry voices stressing that "it is a question of the risk to crew and vessel safety".

However, the interpretation of what constitutes a "reasonable" assessment of danger is often contentious, particularly in rapidly evolving conflict situations. In addition, such clauses address the allocation of additional costs arising from war risks, including insurance premiums, crew bonuses, and expenses associated with alternative routing. Disputes frequently arise where the contractual wording is unclear or where parties disagree on whether a particular area genuinely presents a sufficient level of risk. The potential for deviation, such as rerouting vessels to avoid high-risk zones, also raises questions regarding hire, freight, and delay, further complicating the contractual landscape. In practice, charterparty terms are increasingly being tested under current conditions, highlighting the importance of precise drafting and proactive risk management.

The ongoing instability in the Middle East has not only elevated war risk to the forefront of maritime operations but has also exposed the extent to which global shipping remains inherently tied to geopolitical uncertainty. What was once treated as a contingent or insurable risk has, in many respects, become a defining feature of the commercial landscape.

From an insurer's perspective, this shift is equally significant: war risk is no longer a peripheral line of cover, but a constantly recalibrated exposure, priced and reassessed in real time as events unfold. The interaction between war risk cover and charterparty provisions is therefore no longer merely technical; it reflects a broader tension between contractual certainty and the unpredictability of real-world developments.

In this environment, the allocation of risk is as much a matter of judgment and foresight as it is of drafting. Shipowners and charterers are required to look beyond the wording of clauses and consider how those provisions will operate under pressure, in circumstances that may evolve faster than contracts can anticipate.

Ultimately, the current climate serves as a reminder that risk in shipping cannot be eliminated but only managed, priced, and, at times, endured. Those best positioned to navigate this landscape will be those who recognise that legal frameworks, insurance structures, and commercial decisions must continuously adapt to a world where instability is not the exception, but the norm.



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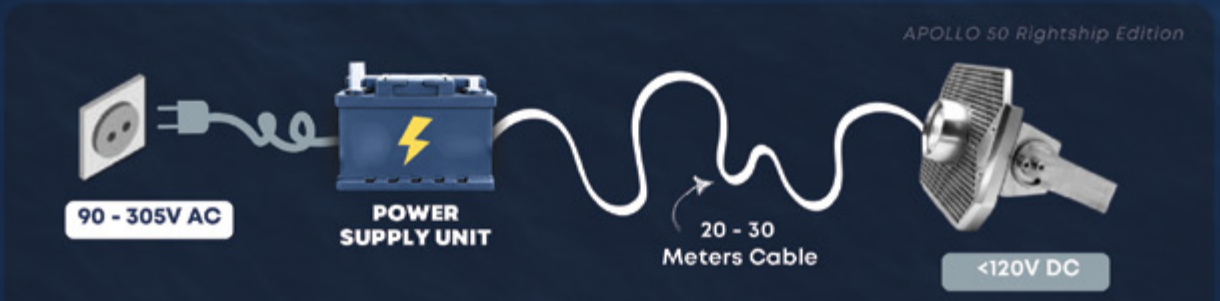
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As the maritime sector continues to navigate a period of rapid change, much of the discussion is understandably focused on what comes next.



by **Capt John Lloyd FNI**,
Chief Executive of The Nautical Institute

Progress at sea still depends on people

New fuels, digital systems, automation, greater connectivity, and artificial intelligence are all influencing how shipping operates, while regulatory expectations and commercial pressures continue to evolve alongside them.

Shipping is entering one of its most complex periods of transformation, where multiple technologies are being introduced simultaneously. But while the systems are new, the main challenge is not: ensuring that progress at sea still works for the people responsible for safety, our seafarers.

This momentum is real, and it is necessary. Shipping has always adapted and will continue to do so. Even so, amid all the conversation about transformation, some fundamentals remain unchanged. Safe shipping still depends on competent people, clear standards, and sound judgment.

At The Nautical Institute, innovation is seen as part of the industry's natural development. Maritime professionals, both at sea and ashore, have always had to work with new technologies, new procedures, and changing operational demands. What feels different now is not simply that change is happening, but the pace at which it is arriving and the extent to which multiple developments are being simultaneously introduced.

The challenge is no longer individual technologies, but the cumulative effect of multiple systems being introduced into already complex operational environments. On many ships, crews are not adjusting to one new system in isolation; they are dealing with new software, new interfaces, more reporting requirements, larger flows of data, and closer interaction with shore-based functions, often all at once. The cumulative effect of those changes deserves serious attention, particularly considering its implications for



safety, performance, and professional confidence.

This is not the first time people working in shipping have had to learn how to use technology efficiently. When automated bridge systems became more common, when the Global Maritime Distress and Safety System (GMDSS) transformed communications, and when dynamic positioning operations required new forms of technical competence, seafarers had to understand not only what the equipment could do, but where its limitations lay and how to use it safely under pressure. The sector is now in a similar phase. The tools may be more sophisticated, but the underlying challenge is familiar. Simply installing a new system is never enough; people must be able to understand it, use it properly, trust it, and know when its use requires caution rather than confidence.

That is why seafarers must remain central to the discussion. It is easy to assess a new technology in terms of its technical specifications, the efficiency gains it promises, or the volume of data it can produce. While these factors matter, they do not provide the full picture. Equally critical is how that technology works in the hands of the people expected to rely on it in real operations. Does it support sound decision-making on the bridge, in the engine room, and across the wider shipboard team? Does it reduce workload in a meaningful way, or does it introduce new distractions and pressures? Does it increase awareness and improve communication, or does it add layers of complexity that were not fully understood at the point of implementation? These are issues that directly impact operational safety.

If properly used, technology can undoubtedly be a force for improvement. It can enhance situational aware-



ness, support maintenance planning, strengthen communication, reduce repetitive administrative tasks, and help ship and shore teams operate with better information. At the same time, greater reliance on systems and increased connectivity introduce new vulnerabilities, particularly in terms of cybersecurity. These risks, although not purely technical, intersect directly with human awareness, training, and decision-making under pressure.

No system exists in a vacuum. Every new tool changes the environment in which people work, and sometimes the unintended effects are only fully felt after implementation. Workload may shift rather than reduce, cognitive demands may increase, or accountability can become less clear. Greater connectivity can bring real benefits while also creating the sense that shipboard life is becoming increasingly observed, measured, and interrupted. These are realities that leadership must understand if change is to be managed responsibly.

For that reason, I do not believe the debate should be framed as people versus technology. The real objective is to ensure that technology supports human performance and strengthens professional judgement. Seafarers assess risk in real time, interpret incomplete information, manage competing demands, and respond when conditions change or systems do not behave as expected. In many respects, the more advanced a system becomes, the more important it is to have confident maritime professionals who can display judgment in a calm and competent manner.

This has direct implications for training and standards. Minimum standards remain essential because they provide the foundation for safe practices across an international industry. But in a period of rapid change, the foundation alone is not enough. We also need a culture of continuous learning that reflects the realities of modern operations. Familiarisation must be taken seriously, not treated as a box-ticking exercise. Training must keep pace with the equipment and working practices now found on board. Professional development cannot be seen as something occasional or optional when the operating environment itself is evolving so quickly. Experience matters greatly, and there is no shortcut around the need to build competence through practice, knowledge sharing, and the exchange of experiences.

If safety is to remain the priority, seafarers' voices cannot be an afterthought in technology development; they must be considered at the starting point. For technology to deliver real benefits, it is essential to understand how it is experienced in practice by the people using it every day.

The same is true about standards. While shipping should embrace innovation, it must do so with discipline. Standards exist to protect safety, support professionalism, and provide consistency in a global sector where the consequences of poor judgment can be severe. They should evolve where necessary, but with care and with proper regard for operational realities. In maritime safety, faster change does not necessarily equate to a more efficient outcome.

Another critical issue is whose voice is heard in these conversations. There is sometimes a tendency for the perspectives of designers, vendors, managers, and regulators to dominate the conversation around innovation, while the experience of those on board is treated as something to be gathered later, if at all. That is a mistake.

If safety is to remain the priority, seafarers' voices cannot be an afterthought in technology development; they must be considered at the starting point. For technology to deliver real benefits, it is essential to understand how it is experienced in practice by the people using it every day. We need to know where it genuinely helps, where it creates friction, how it affects workload and fatigue, whether it strengthens trust and teamwork, and where unintended consequences may arise that were not apparent at the design stage.

This thinking sits behind the Seafarer Technology Engagement, Empowerment and Resilience (STEER) Project, which The Nautical Institute is taking forward with support from the Lloyd's Register Foundation. The project examines the combined impact of technology and working practices on seafarers' day-to-day work, safety, skills and welfare, with a clear emphasis on listening to seafarers.

The STEER Project moves beyond discussion. It captures the lived experiences of seafarers globally and aims to translate them into practical tools, guidance, and evidence that will inform better design, implementation, and training.



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This approach matters because there is little value in designing systems for seafarers without first understanding the realities they are dealing with. If practical outcomes are to be achieved, then training, support, and human-centred design must be informed by evidence from those actually doing the job.

This work touches on some of the most important questions now facing the sector. How do new systems and tools affect decision-making on board? How do they influence trust, awareness, and accountability? What do they mean for welfare, when connectivity brings obvious advantages but can also create new pressures? How do we prepare the next generation of seafarers not only to use digital systems, but to do so competently with confidence?

Professional bodies have a critical role to play here. The Nautical Institute's role is not only to observe these changes but to help shape the conversation by connecting experts, identifying emerging risks, and translating experience into practical guidance that supports safer operations worldwide. Its strength lies in bringing together practitioners, educators, technical specialists, and industry leaders from across the maritime world.

In periods of rapid change, that role becomes even more important. The industry needs trusted forums where experience can be shared honestly, best practices can be debated constructively, and operational insights can inform wider decisions on training, standards, and implementation. It also requires institutions that are willing to keep the seafarer's perspective clearly in view when discussions risk becoming too focused on systems rather than on what happens at sea.

This is particularly relevant to the wider industry conversation taking place this year, including at Posidonia, which brings together exactly the range of people who should be part of it: shipowners, managers, technology providers, trainers, regulators, and maritime professionals. For the Greek shipping community, with its long tradition of seamanship and its central place in world shipping, the balance between innovation and operational judgement is not a theoretical issue but a practical one, closely tied to standards, leadership, and long-term resilience. Events such as Posidonia are not only showcases for innovation, but also opportunities to challenge assumptions, test ideas against operational reality, and ensure that technological progress remains aligned with operational safety and human performance.

The maritime sector should be ambitious about the future. It should welcome technologies that can enhance safety, efficiency and environmental performance, and it should encourage innovation. At the same time, it must remain disciplined enough to ask difficult questions, introduce change at a pace people can absorb, and acknowledge unintended consequences when they arise.

The true measure of progress is not whether something is new, but whether it helps people perform their roles more safely, more effectively, and with greater confidence.

Shipping has always relied on people with skills, resilience, and judgement, and that will remain the case regardless of the systems introduced. New technologies will continue to bring benefits. However, our industry's responsibility is to ensure those benefits are realised where they matter most — not in theory, but in practice, on board ships and through the people who operate them.

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Digital payments will become the standard, not the differentiator

An interview with **Stuart I. Ostrow**,
Founder and President of ShipMoney

In an industry long defined by traditional practices, the shift toward digital transformation is reshaping the way maritime operations function. One of the most significant changes is taking place in the area of crew payments, where efficiency, transparency, and accessibility are becoming increasingly critical. In this interview, Stuart Ostrow shares insights into how ShipMoney has helped modernise financial processes for seafarers worldwide. From overcoming early challenges and building trust in a cash-reliant sector, to navigating global compliance and supporting crew welfare during times of crisis, Ostrow discusses the evolving role of digital payments and what the future holds for the maritime industry.

ShipMoney has modernised crew payments in a traditionally cash-based industry. What was the biggest challenge in driving this transformation early on?

The primary challenge was not introducing the technology but changing the mindset. Cash has been deeply embedded in maritime operations for decades, so transitioning to digital required building trust across shipowners, operators, and crews alike.

We focused on demonstrating reliability, security, and tangible benefits for both businesses and seafarers. With the administrative process simplified for operators, and crews gaining immediate access to wages along with the ability to send money home seamlessly, adoption swiftly followed.

The early phase was ultimately about building trust, being consistent, and proving that a digital approach could deliver a better and safer alternative.

Your platform now serves seafarers across more than 150 countries. How do you ensure reliability and compliance in such a globally complex financial environment?

At this scale, compliance and reliability are not optional; they are foundational. We operate within a robust global regulatory framework, ensuring full adherence to Anti-Money Laundering (AML) and Know Your Customer (KYC) regulations, as well as data security standards, while continuously adapting to evolving jurisdictional requirements.

Reliability, however, extends beyond compliance. It is about delivering a consistent experience for seafarers wherever they are in the world. Access to wages must be dependable, secure, and seamless, regardless of location or connectivity constraints.

Achieving this requires resilient infrastructure, strong trusted partnerships, and a deep understanding of the maritime operating environment.

Crew welfare appears central to your mission. How has ShipMoney evolved to support seafarers during crises like the pandemic or geopolitical disruptions?

Crew welfare has always been central to

our approach, but periods of crisis have reinforced just how critical it is.

During the pandemic and, more recently, amid geopolitical tensions, access to wages and financial stability has become even more essential for seafarers, many of whom are isolated for extended periods.

We continue to evolve our platform to ensure faster, more reliable access to funds, even in low-bandwidth environments, while also working alongside industry and welfare organisations to provide broader support. We must always keep in mind that behind every transaction is a person, often far from home, and this perspective continues to shape how we innovate.

Greece is a leading global shipping power. How important are Greek shipping companies to ShipMoney's growth strategy?

Greece remains a cornerstone of the global shipping industry, with a long-standing reputation for commercial leadership and operational excellence. For us, it's an important market, not just from a growth perspective, but also from a partnership standpoint. Greek companies tend to be forward-thinking, particularly when it comes to efficiency and long-term value, and this aligns with our focus and vision.

We see great potential in supporting Greek operators as they continue to modernise their financial operations, while also enhancing the experience for their crews. For us, building long-term, trusted relationships is what matters most.

Looking ahead, how do you see digital payments shaping the future of the maritime industry over the next 5–10 years?

Digital payments will become the standard, not the differentiator.

Over the next decade, we expect to see a continued move toward fully integrated, data-driven financial ecosystems, where payments will no longer sit in isolation but will be part of a wider operational and decision-making framework.

For finance teams, that means greater transparency, better control, and more strategic insight. For seafarers, it will mean simpler, more immediate access to their earnings and a better overall experience.

Most importantly, the shift is about moving away from legacy processes that add risk and inefficiency towards systems that are safer, more intelligent, and aligned with the realities of how global commerce operates today.

As financial complexity increases for shipping companies, how important is it to have integrated solutions for treasury, vendor payments, and crew payroll, and how does ShipMoney support this shift?

Financial complexity in shipping has definitely increased, but more importantly, it has fundamentally changed. Operators are now managing multi-currency flows, global crews, and growing regulatory demands — often across fragmented systems.

There is a clear shift towards integration. When treasury, vendor payments, and crew payroll are connected, companies gain efficiency and clarity, enabling better decision-making.

ShipMoney was built specifically for maritime, with those complexities in mind. By bringing these functions into a single platform, we help reduce operational friction and give finance teams a more controlled, transparent view of their financial ecosystem.

How are the capabilities offered by ShipMoney's platform helping shipping companies gain greater control, visibility, and efficiency across their financial operations?

For many shipping companies, the real challenge is not simply cost, but visibility. Disparate payment processes make it difficult to track the movement of funds, understand true costs, and maintain consistent control, creating inefficiencies and introducing unnecessary risks.

By consolidating payments into a single platform, operators gain real-time oversight of financial flows, reduce manual intervention, and standardise processes across their fleets. The result is stronger governance, improved accuracy, and more predictable financial outcomes.

From a treasury perspective, it also enables more effective planning and forecasting, supported by clearer and more timely data.

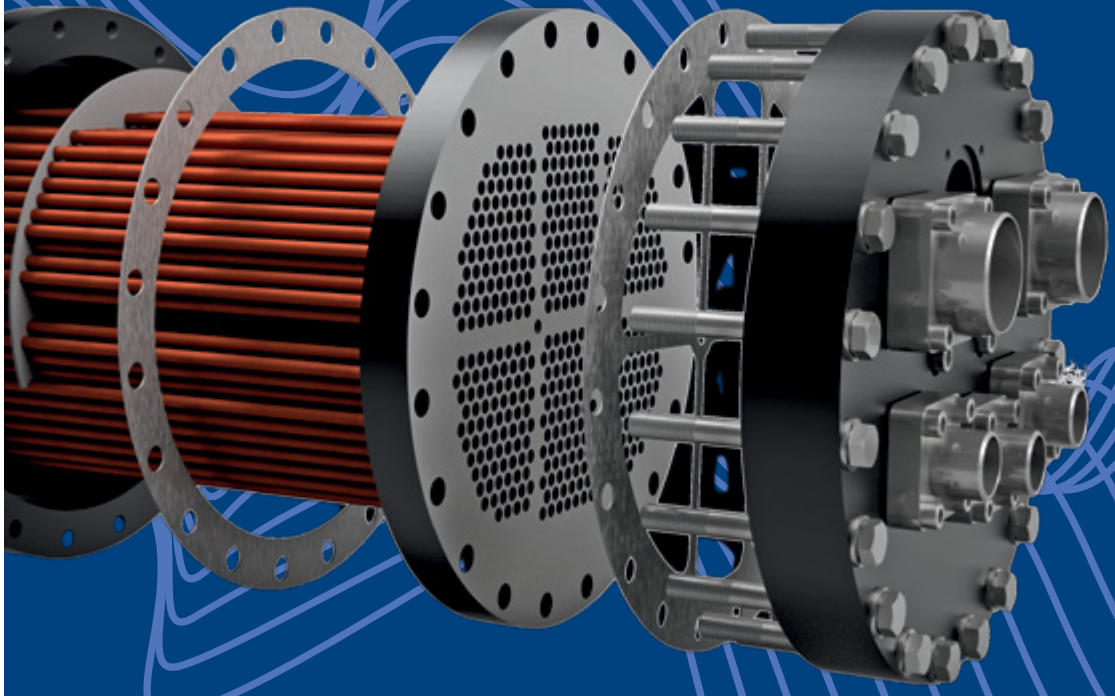


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The European Industrial Maritime Strategy
A turning point for Europe's maritime manufacturing industry

The publication of the first-ever European Industrial Maritime Strategy (EIMS) marks a decisive milestone for Europe's maritime manufacturing industry, i.e., shipyards and maritime equipment manufacturers.



by **Christophe Tytgat**,
Secretary General of SEA Europe

After years of fragmented initiatives and repeated industry calls for a dedicated European sectoral strategy, the EIMS finally provides a coherent political framework for European shipyards and maritime equipment manufacturers, as well as for European shipping. The EIMS not only meets long-standing expectations but also creates a genuine opportunity to reinforce Europe as a global leader in high-value shipbuilding and advanced maritime equipment manufacturing, while strengthening its position in the emerging markets of the Blue Economy and in strategic ship segments for Europe, such as ferries and ship retrofitting. To that end, however, the EIMS must be translated swiftly and decisively into action.

A strategy long awaited — and largely on target

The EIMS largely reflects the vision, ambition, and policy recommendations that the European maritime manufacturing industry has consistently put forward over recent years through SEA Europe — the Shipyards and Maritime Equipment Association of Europe. It also acknowledges the strategic importance of shipyards and maritime equipment manufacturers for Europe's industrial base, technological sovereignty, and resilience. Importantly, it incorporates a clear ambition to build and retrofit 10,000 sustainable and digitalised vessels by 2035 and identifies a set of maritime "lead markets", both of which are fully aligned with SEA Europe's call. By explicitly recognising these lead markets, the Strategy sends a strong signal: Europe's future competitiveness will be built on innovation, quality, sustainability, digitalisation, and systems integration.

From strategy to business: The central role of business cases and industrial roadmaps

Perhaps the most promising element of the EIMS lies in its focus on concrete business cases. Interested companies,



including shipyards and maritime equipment manufacturers, are encouraged to jointly develop structured industrial roadmaps for specific lead markets (e.g., electric ferries, next-generation cruise ships, or advanced offshore support vessels). These business cases are expected to define a clear vision and ambition, set measurable milestones, identify technological, regulatory, financial, and market barriers, and propose solutions to overcome them. This approach must create a direct bridge between industrial reality and public policy, ensuring that support measures are targeted, effective, and grounded in real business-investment projects.

The Maritime Industrial Value Chains Alliance, anticipated for the autumn of 2026, constitutes another key element of the EIMS. This governance body will provide a structured platform for industry, shipowners, Member States, financial institutions, and the European Commission to jointly assess the business cases and mobilise the necessary policy actions, funding instruments, and, where needed, regulatory adaptations.

Fair competition with third countries: No further time to waste

While the EIMS is a major step forward, its success will also depend on the European Commission's political willingness to act swiftly and decisively against unfair international competition. Unfair competition from Asia has distorted global shipbuilding markets for decades. This problem has already been recognised since the late 1980s, yet effective solutions have remained elusive.

The challenge is structural. Unlike many industrial products, ships are generally not imported into the EU customs territory, making traditional trade-defence instruments such as anti-dumping measures largely inapplicable. Past efforts to address this structural issue through international agreements or WTO litigation have failed. Meanwhile, global market concentration has intensified dramatically, with China now accounting for around 70% of the global orderbook, exerting enormous pressure on other shipbuilding nations and increasingly targeting Europe's remaining strongholds, including the cruise shipbuilding sector.

The European Industrial Maritime Strategy largely reflects the vision, ambition, and policy recommendations that the European maritime manufacturing industry has consistently put forward over recent years through SEA Europe.

Against this background, the EIMS's commitment to assessing the need for a sector-specific instrument or targeted amendments to the EU's trade-policy toolbox is welcome. Still, it must be followed by rapid and concrete action. Especially in today's geopolitical context, ensuring fair competition is no longer only an industrial issue; more than ever before, it is a matter of economic security and strategic autonomy, which will also shape the future standing of European shipping globally. Today, decisions about ordering ships cannot rely solely on price considerations.

Member States: Essential partners

Although this is a European strategy, industrial policy remains largely a Member State competence: Member States can tailor measures to their national industrial ecosystems, mobilise public investment, and support skills, infrastructure, and innovation at the local level. The use of revenues from shipping's inclusion in the EU Emissions Trading System for maritime industrial investments is a particularly relevant example. In this sense, Member States will be essential partners in the EIMS's future success. The planned high-level Maritime and Ports Board to monitor the implementation of the EIMS is therefore a positive initiative.

Competitiveness and timing: Are we late, or just in time?

A decade ago, European shipyards had largely disappeared from the political radar in Brussels. Today, the situation is fundamentally different. The EIMS enjoys clear political recognition and support at the EU level. In that sense, it has arrived at the right moment.

However, political recognition alone will not secure competitiveness. The real test will be whether the EU is willing and able to deploy concrete instruments to address structural disadvantages, particularly in relation to international competition. The Strategy opens the door to such action; walking through that door is now imperative.

Geopolitics and resilience: No time to lose

The current geopolitical environment only reinforces the urgency of implementation. Military tensions, disrupted supply chains, and growing global instability have exposed Europe's vulnerabilities. A resilient and competitive maritime sector, including the maritime manufacturing industry, is indispensable for Europe's security, energy transition, and economic sovereignty.

There is no justification for delay. On the contrary, the current context demands acceleration. Every action announced in the Strategy — industrial alliances, lead market development, skills initiatives, financing tools, and trade policy adaptations — must now be implemented with speed and determination.

Outlook: A promising but conditional future

The EIMS provides a credible pathway to unlock new business opportunities across Europe; however, success will depend on three conditions: the rapid development of concrete business cases, the swift deployment of effective policy instruments, and a willingness within the sector to cooperate across value chains and borders. _

The EIMS is not the end of the journey. It is the starting point. If Europe moves from words to action, it can secure a strong, competitive, resilient, and future-proof maritime manufacturing industry. If it hesitates, the window of opportunity may close fast.

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Wind propulsion
Scaling, standards, and sailing

The business case for wind continues to strengthen with the growth of wind-propulsion technology options in the market, declining unit costs, increasing competition, and shorter lead times for some providers as they invest in production capacity in both Europe and Asia.



by **Gavin Allwright**,
Secretary General
of the International
Windship Association (IWSA)

At the time of writing, there are over 90 large commercial vessels equipped with wind-propulsion systems, representing over 5 million DWT, of which five are 'primary wind' (i.e., 50%+ powered by wind). The remainder are 'wind-assist', meaning the system delivers a lower percentage of the total propulsive power, typically ranging from 5% to 30%. These figures are complemented by a further 10 traditionally rigged cruise vessels and around a dozen 'wind-ready' ships. These numbers are forecast to continue growing significantly year on year, with over 120 ships either on order, under construction, or publicly announced.

This growth has been driven by a number of key factors, including technological development, improved competence, economic value, and policy. The wind-propulsion systems already firmly established in the market have demonstrated the robust and reliable nature of wind solutions, generating a growing body of data and operational experience across the sector. Throughout the supply chain, there is also an expanding base of knowledge and competency — from design and material science to production, and from installation and sea-trialling to operations.

The economics of wind power have also strengthened over the past two years, especially when full fuel costs, life-cycle emissions, and policy compliance are factored in. Combining these factors with the benefits of diversifying energy supply by adding a zero-emission, zero-cost energy source that is available globally and supported by increasingly predictable forecasts in a time of uncertainty, fuel price volatility and longer shipping routes to avoid conflict areas, it becomes an attractive pathway to lower emissions, but also lower OpEx.

This accelerated growth in the number of demonstrators over the last two years led the Maritime Safety Committee (MSC) at the International Maritime Organization (IMO) in June last year to task the Sub-Committee on Ship Design and Construction (SDC 12) with developing a work plan for interim safety guidelines for ships equipped with wind-propulsion systems. SDC 12 delivered that workplan in January, with a headline deadline of approving the guidelines at MSC 116 in 2029.

The SDC 12's work on these interim safety guidelines will primarily involve collating, processing, and standardising the substantial body of work underway in the wind-propulsion sector over the last couple of years. The SDC 12 work plan highlights two key documents on which the initial work will be based: the MEPC81, INF.39 white paper, submitted by Comoros, France, Solomon Islands, and the International Windship Association (IWSA), and the European Maritime Safety Agency (EMSA) report: Potential of wind-assisted propulsion for shipping, which includes a gap analysis of the technical and safety considerations associated mainly with 'wind-assist' technologies rather than 'primary wind' designs. The Maritime Safety Committee noted that, "...Overall, the studies did not identify any major risk that cannot be resolved".

It is clear that while wind-propulsion systems, like any emerging technology, carry some degree of uncertainty or 'risk', it is important to recognise that wind propulsion itself is not 'new'. We already have a wealth of knowledge about the energy source itself and how wind power can interact and affect ship operations. The challenge today lies in applying this knowledge to the wide variety of modern ship types.

This move towards standard approaches to safety, as well as in other areas, such as technology performance verification and training, is an important and timely development. It acknowledges that wind propulsion is not a single technology but a basket of solutions that harness the wind in different ways. Each of the five main types of systems, i.e., rigid sails, rotor sails, suction sails, soft sails, and



Opening of the Sub-Committee on Ship Design and Construction (SDC), 12th Session (19-23 January 2026).

Credit: IMO/flickr

towing kites, interacts with the vessel differently. If we then factor in the size and power range of these technologies, the location of the installation on the ship, the type and size of the vessel, and, to a degree, its operational profile, the need to move towards standard criteria is well understood.

Much work has been ongoing in this area in conjunction with many of the main classification societies, with ABS, BV, CCS, ClassNK, DNV, LR, and RINA all having wind-propulsion system guidelines and a growing body of expertise in assessing these in operation.

The SDC Sub-Committee's work will cover the assessment of whether amendments are required to the Intact Stability Code (including the second-generation stability criteria), the damage-stability requirements in SOLAS Chapter II-1, the standards for ship manoeuvrability, the navigational-hazard provisions relating to obstruction of visibility, navigation lighting and radar blind spots, etc., under SOLAS Chapter V, and the International Regulations for Preventing Collisions at Sea (COLREGs).

The International Windship Association (IWSA) and its associated joint industry projects will be presenting substantive technical material and case studies to the SDC correspondence group over the coming 18 months. At the time of writing, work has also been ongoing within the Maritime Technologies Forum (MTF) to deliver a report on Guidelines for Developing and Implementing a Safety Management System for Wind-Assisted Ships, and the IMO project Green Voyage 2050 will soon release a Wind Propulsion Technologies Guide — from selection to in-service operation, which likewise addresses many of these issues.

What does this work mean for industry stakeholders looking to install, finance, and insure wind-propulsion systems, or even go further and commission or operate 'primary wind' vessels? There is increasing recognition that this technology basket is moving into the mainstream, accompanied by a steady growth in fleet orders. While the first-mover shipowners and charterers, such as Union Maritime, Maersk Tankers, Berge Bulk, Cargill, VALE MOL, K-Line, Terntank, CMES, Michelin, Mitsubishi, and LDA, to name just a few, have happily relied on technology providers, designers, and class specialists to assess safety considerations to date, it is the later adopters and the wider dissemination of these technologies that require greater certainty and a clear 'level playing field' if the wind-propulsion sector is to scale at pace.

As these later adopters position themselves to take advantage of the improving economics in wind technology, these standards will help build confidence in both the retrofit and newbuild markets. In addition, as noted earlier, there is a need to standardise approaches across the board — whether in performance-verification standards, on which IWSA, ITTC, and ISO have made a number of submissions to the IMO, or in training, where the development of interim guidelines has been included in the work plan of the IMO Sub-Committee on the Human Element, Training and Watchkeeping (HTW) at HTW 12 in February, for delivery in 2028/29, with consideration also being given to their inclusion within STCW.

This work will increasingly act as the wind beneath the wings of scalability; much has already been done to ensure the sector is not blown off course, and the next step is to shape that progress into clear, standardised guidance for the industry as a whole — may the wind be with us.

CARELL

Engineering excellence at the heart of Greece's ship repair evolution

In an industry where reliability is measured in hours and precision is measured in millimeters; longevity is perhaps the clearest indicator of trust. CARELL, with more than 70 years of continuous operation, stands today as one of the oldest family-owned ship repair businesses in Europe—a distinction that reflects not only endurance, but a sustained ability to adapt, evolve, and deliver in an increasingly demanding global maritime environment.

From its earliest days, CARELL has been shaped by a deeply rooted engineering culture and a hands-on approach to ship repair. Now in its third generation of ownership, the company continues to build on this legacy, combining traditional craftsmanship with modern project execution methodologies. Over the decades, CARELL has transitioned from a conventional repair contractor into a sophisticated technical partner, capable of managing complex repair scopes across a wide range of vessel types and operational conditions.

This evolution has taken place alongside the broader resurgence of the Greek ship repair sector. Greece, long recognized as the world's leading shipowning nation, is increasingly reclaiming its position as a competitive repair destination. CARELL has played a meaningful role in this revival, not through scale alone, but through a distinct operating philosophy that emphasizes flexibility, technical depth, and close collaboration with all stakeholders involved in a repair project.

"For over 70 years, our role has remained the same: to stand next to the shipowner and deliver with precision, flexibility, and absolute accountability"

At a time when many repair activities were concentrated in other regions, CARELL actively positioned Greece as a reliable and competitive alternative for international clients. Through persistent engagement with leading shipowners, technical managers, and operators across Northern Europe and beyond, the company helped rebuild confidence in the Greek repair offering. This outward-looking strategy not only strengthened CARELL's own market position but also contributed to the broader reintroduction of Greece into the global ship repair landscape.

Today, CARELL continues to serve a diverse international client base, acting as a trusted partner for shipowners who require both technical excellence and commercial awareness. Its deep understanding of international standards, combined with its ability to align with the operational priorities of global fleets, has established CARELL as a key reference point within the Greek repair ecosystem.

At the core of CARELL's approach lies a unique ability to operate seamlessly across multiple repair locations in Greece enabling it to tailor each project to the specific requirements of the vessel and its operators. This model allows CARELL to align its execution strategy with the strengths and infrastructure of each location, while maintaining full control over quality, planning, and delivery.

By integrating its own workforce and expertise into the broader repair ecosystem, the company contributes to a more coordinated and efficient execution process, ultimately benefiting shipowners through reduced downtime and improved predictability.



The strength of this model becomes particularly evident in complex repair projects, where coordination between multiple parties is critical. CARELL's project managers are always deployed onboard, working closely with shipyards' production teams, subcontractors, and vessel crews to ensure that all aspects of the repair are aligned. This hands-on presence enables real-time decision-making, proactive problem solving, and continuous monitoring of progress—factors that are essential in maintaining tight schedules and controlling costs.

Beyond its operational flexibility, CARELL distinguishes itself through its engineering depth. The company's capabilities span a broad spectrum of technical disciplines, including hull treatment, steel renewals, propulsion system repairs, cargo system overhauls, and advanced mechanical engineering works. In recent years, CARELL has also expanded its expertise in specialized repair techniques offering high-precision reconditioning solutions that extend the lifecycle of critical components.



A Strategic Workshop at the Center of Operations

A key pillar supporting these capabilities is CARELL's modern, company-owned workshop of approximately 2,500 square meters, strategically located to serve all major maritime and logistics hubs in the region. Positioned in close proximity to Piraeus Container Terminal (PCT), the main shipyard zones, Athens International Airport, and Piraeus Port, the workshop functions as a critical operational hub. This strategic location enables rapid mobilization of equipment, efficient handling of components, and immediate response to urgent repair requirements.

Equally important is the human element behind these operations. CARELL's teams are composed of experienced engineers, naval architects, and former seagoing professionals who bring a practical understanding of vessel operations into every project.

The strategic advantages of Greece as a repair destination further reinforce CARELL's value proposition. Located at the crossroads of major shipping routes, Greece offers a compelling balance between accessibility and efficiency. Reduced deviation distances, favorable weather conditions for extended repair seasons, and the benefits of operating within a European regulatory framework all contribute to a highly competitive environment for ship repair.

CARELL leverages these advantages by designing repair strategies that optimize both time and cost. In many cases, the savings achieved through shorter transit times, reduced fuel consumption, and minimized off-hire periods can significantly outweigh differences in nominal repair pricing. This holistic view of project economics is central to CARELL's philosophy and is increasingly appreciated by shipowners seeking to maximize operational efficiency.

A further dimension of CARELL's integrated approach is its close collaboration with Karval Shipping Agency, its in-house port and husbandry arm. This relationship enables the company to offer a fully coordinated service environment, where technical execution and port logistics are managed under a unified framework. From spare parts handling and customs clearance to crew changes and daily operational support, every aspect of a vessel's stay is carefully organized to ensure smooth and uninterrupted progress.

In a sector where fragmentation can often lead to delays and inefficiencies, this level of integration provides a clear advantage. By acting as a single point of coordination, CARELL reduces complexity, enhances communication, and allows shipowners to focus on the broader objectives of their operations.

As the maritime industry continues to evolve, driven by environmental regulations, technological advancements, and shifting market dynamics, the role of ship repair providers is becoming increasingly strategic. CARELL has positioned itself at the forefront of this transition, actively engaging in projects related to energy efficiency improvements, advanced coating systems, and the installation of energy-saving devices. Through close cooperation with equipment manufacturers and classification societies, the company ensures that its solutions are aligned with the latest industry developments and future requirements.

Ultimately, CARELL's strength lies not only in its technical capabilities, but in its ability to combine experience, flexibility, and collaboration into a coherent and effective operating model. Its long-standing presence in the industry, reinforced by over seven decades of continuous operation, provides a foundation of trust that few companies can match. At the same time, its forward-looking approach ensures that it remains relevant in a rapidly changing maritime landscape.

In the broader context of Greece's ship repair resurgence, CARELL represents a bridge between tradition and innovation. It embodies the values of craftsmanship and reliability that have defined the industry for generations, while embracing the tools, partnerships, and mindset required to meet the challenges of the future.

For shipowners and technical managers navigating an increasingly complex operational environment, CARELL offers more than a service provider— it offers a partner committed to delivering consistent, high-quality results through collaboration, engineering excellence, and a deep understanding of what truly matters at sea.

Rudder repair for the M/V “Esvagt Beta”

MarineShaft recently completed a repair of the rudder equipment for the crew change vessel M/V “Esvagt Beta” in cooperation with the involved shipyard, Kynde & Toft.



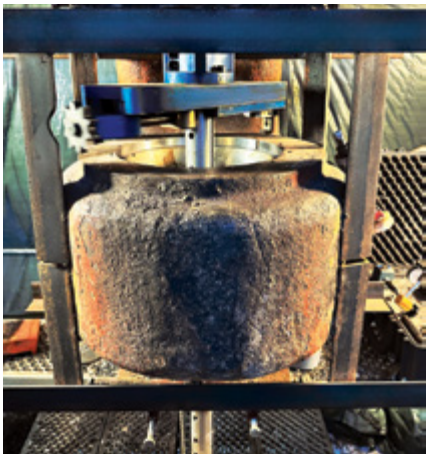
Cold straightening of rudder stock, including NDT before and after.



PMI test of rudder horn casting material to support the welding procedure. Cavitated areas were grinded and welded up.



Realign the centerline of the rudder horn by machining to oversize dimension.







Supply of bronze material for new bushing

Case/Damage:
The vessel sustained rudder damage, resulting in a bent rudder stock and misalignment of the rudder-horn pintle centerline.

Bent rudder stock
The rudder stock runout test showed a 0.5 mm deflection on the rudder stock cone, and we restored the alignment to 0.05 mm using our cold straightening method.
The rudder stock sustained no other damage, and one day in our workshop, it was returned to the shipyard.

Rudder repair in-situ
As the rudder horn pintle bearing seat was out of line, there were two repair options: Welding up inside the rudderhorn casting or machine the rudder horn pintle bearing to oversize dimension and install a new bushing.

Positive Material Identification (PMI)
To identify and verify whether the rudder horn casting was weldable material, MarineShaft conducted a PMI test. The test result was used as documentation in the repair plan presented to the classification society, in this case, BV.

Moving Rudder Horn Pintle centerline
As the rudder horn pintle bearing seat was misaligned, the repair solution was to machine it to an oversized dimension, realign the rudder horn's centerline, and install a new oversized pintle bearing bush.
The shipyard had machine capacity for the new bushing, and we supplied them with the bronze bushing material, which we had in stock for immediate delivery.
The shipyard also handled the reassembly of the rudder equipment. A case in point of successful cooperation between all parties in finding

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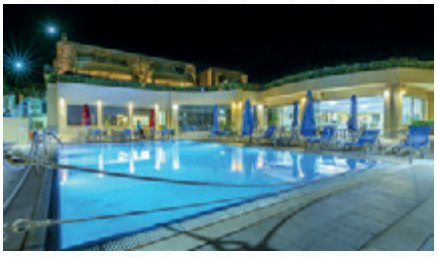
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Anemoi and NACKS Rotor Sail integration design for Ultramax segment receives AiP from Class NK

Anemoi Marine Technologies Ltd (Anemoi) and Nantong COSCO KHI Ship Engineering Co. Ltd (NACKS) have developed new wind-assisted propulsion (WAPS) integration solutions for Ultramax bulk carriers as the vessel segment prepares for rapid fleet growth. Two configurations designed to streamline installation and enhance fuel-saving potential of Rotor Sails on the 60-65,000 DWT vessels have been awarded an approval in principle (AiP) from Japanese classification society ClassNK.

The configurations fit a range common operational requirement for Ultramax vessels. Both use the latest-generation Rotor Sail from Anemoi, with a sail size

of 3.5m diameter and 24.5m in height, which is an increased area compared to Anemoi's pilot installation on an Ultramax in 2018, designed for greater fuel savings. While one arrangement features one Rotor Sail, placed on the forecastle deck, the other uses a longitudinal rail system to deploy three sails on the upper deck.

Anemoi CCO, Nick Contopoulos, said: "Ultramax vessels have been early adopters of WAPS technology, going back to Anemoi's installation on the world's first bulk carrier with Rotor Sails in 2018, the M/V "Afros", and the AiP represents an opportunity to apply all those lessons to optimise installations for maximum efficiency on our generation 3 products". Working with COSCO-owned shipbuilder, NACKS, the project enables Anemoi to strengthen its collaboration and reach within Chinese yards. According to DNV, China now accounts for more than 25% of the bulk carrier newbuilds compared to 5% just a decade ago, with NACKS and the wider COSCO group contributing significant volumes. The AiP confirms the feasibility of the integration concept designs under ClassNK's guidelines for wind-assisted propulsion systems. Factors considered under the approval include sail particulars and arrangement, foundation and supporting structures, initial trim and stability calculations, fire and safety arrangements and energy efficiency calculations under IMO's Energy Efficient Design Index (EEDI) framework.



World's first hydrogen-fuelled operation of a main engine at factory conditions for a large commercial vessel

Japan Engine Corporation (J-ENG) and Kawasaki Heavy Industries, Ltd. are jointly engaged in the Green Innovation Fund Project "Development of Marine Hydrogen Engines and MHFS" of the New Energy and Industrial Technology Development Organisation (NEDO), in cooperation with Mitsui O.S.K. Lines, Ltd., MOL Drybulk Ltd., Onomichi Dockyard Co., Ltd., and Nippon Kaiji Kyokai (ClassNK).

Within this project, J-ENG has been developing a fully Japan-made, large, low-speed, two-stroke hydrogen-fuelled engine. The world's first full-scale engine intended for installation on an actual vessel, 6UEC35LSGH, has successfully begun hydrogen co-firing operation in all cylinders. To date, the engine has achieved a hydrogen co-firing ratio of over 95% at 100% load, confirming both GHG reduction effects and stable operation. Verification testing will continue to further optimise performance under hydrogen co-firing conditions.

In recent years, the development and demonstration of hydrogen-fuelled vessels have progressed in Japan and abroad. However, most initiatives focus on short-distance, short-duration, and low-output operations — such as sightseeing boats or tugboats using compressed hydrogen — primarily for domestic coastal or port-area applications. In contrast, this project combines the high-efficiency, high-output, low-speed two-stroke hydrogen-fuelled 6UEC35LSGH engine with liquefied hydrogen fuel, thereby enabling long-distance, long-duration, and high-output operations. This represents a major technological milestone toward the practical use of large oceangoing hydrogen-fuelled merchant ships.

J-ENG has accumulated expertise through fundamental studies of hydrogen-related materials and combustion, as well as durability testing of hydrogen-fuel injection systems. The new engine has been developed based on this accumulated knowledge. Once full-scale verification is complete,

the engine is scheduled for shipment in January 2027. It will be installed as the main engine of a 17,500-DWT hydrogen-fuelled multi-purpose vessel designed and built by Onomichi Dockyard. The MHFS, a hydrogen fuel supply system for this engine, is being developed and manufactured by Kawasaki, and it will also be installed on the vessel. MOL and Onomichi Dockyard concluded a series of contracts for the construction of the vessel. In addition, through discussions among the relevant parties, agreements were reached on the specifications of various facilities required for the hydrogen-fuelled vessel, and related contracts were executed. The detailed design of the vessel is currently progressing smoothly.

The vessel is scheduled to undergo three years of demonstration operation starting in FY2028 under the operation of MOL and MOL Drybulk. Throughout the development of the engine and MHFS, as well as the design, construction, and operation of the vessel, ClassNK will conduct safety evaluations.

Strategic collaboration on the commercialisation of micronuclear solutions for global marine and shipping markets

Scorpio Tankers Inc. announced that it has entered into a strategic collaboration with AMPERA, Inc. to jointly develop and commercialise advanced micronuclear power solutions for marine, shipping and related maritime applications.

This strategic collaboration agreement aims to address the growing global demand for reliable, zero-carbon power solutions in the maritime, offshore, and port infrastructure markets.

Scorpio Tankers and AMPERA plan to develop and deploy ultra-safe, nuclear-powered maritime energy systems, including floating nuclear power barges in the near term and nuclear-powered vessels over the longer term.

NYK uses 3D technology to build new CTVs

NYK has jointly implemented a crew transfer vessel (CTV) newbuilding project that applies 3D technology as a core platform throughout the design and construction process.

This project is being carried out in collaboration with Kosaba Shipbuilding Co., Ltd. and Smert Design Co., Ltd.

From the initial design stage through to construction, a full 3D model is utilised and consistently applied. By replacing the conventional 2D approach, the project demonstrates the effectiveness of a new design and construction methodology based on 3D technology.

In designing the CTV, a full 3D model was used to examine the hull structure, equipment arrangement, and ease of operation and maintenance.

This enabled the project team to identify potential interference between structural components and equipment at an early stage, improving the accuracy of layout planning and enabling design front-loading, thereby reducing design changes and rework during construction.

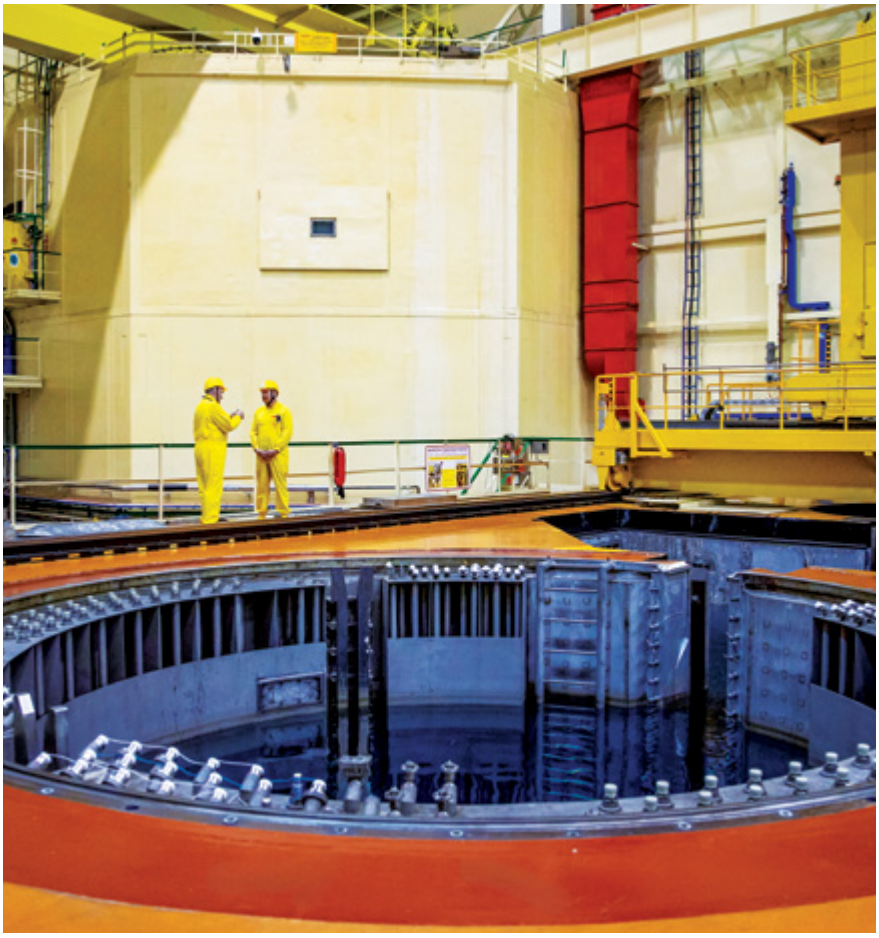
During the construction phase, the vessel was built using the design-stage 3D model. In addition, 3D scanning of the actual structure was conducted during construction to visualise deviations from the design data.

This approach enabled the identification of thermal deformation and assembly tolerances specific to aluminium twin-hull vessels (catamarans), contributing to quality verification and improvement.

The project also developed 3D digital finished drawings that centrally manage specifications, drawings, construction comments, and measurement data linked to the 3D model.

By adopting the concept of a 3DA (3D annotated) model, the project transcends conventional 3D geometric representations. In this model, each component is enriched with relevant technical data and records — ranging from specifications and construction-related notes to measurement data — which are systematically annotated and linked to individual parts of the vessel.

By using the 3D model as an entry point, users can intuitively access related equipment and documentation, which is expected to improve efficiency in vessel management operations such as inspec-



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A recent study by WinGD and Envision reveals that under moderate global regulations, green ammonia could achieve cost parity with VLSFO and LNG at current prices, even before additional subsidies or rewards associated with zero-emission fuels.

tions and maintenance after the vessel enters service.

RINA and Hanwha to promote the adoption of battery-hybrid propulsion systems

RINA has signed a Memorandum of Understanding (MoU) with Hanwha Group, through its key affiliates, Hanwha Power Systems (now Hanwha Power), Hanwha Aerospace, and Hanwha Engine, to promote the adoption of advanced battery-hybrid propulsion systems in the maritime sector, particularly in the Ro-Ro ferry segment.

The collaboration aims to accelerate the transition to low-emission vessels by leveraging innovative technologies that enable the shift from traditional internal combustion propulsion systems to advanced hybrid battery solutions, both for newbuilds and, through retrofitting, for vessels already in service. By combining the hardware expertise of the three Hanwha companies with RINA's certification know-how, the partners aim to deliver a comprehensive solution.

The partnership brings together Hanwha's advanced expertise in propulsion, energy storage, and systems integration with RINA's strong regulatory and certification know-how, fostering the development and adoption of next-generation propulsion solutions.

Hanwha Power Systems will act as the project's lead integrator, overseeing overall ship design and system interface development.

Hanwha Aerospace will enhance safety and reliability by applying aerospace energy technologies to marine ESS solutions.

RINA will play a key role in verifying and certifying the project's regulatory compliance and technical soundness for both classification and statutory certification purposes. Additionally, drawing on its extensive experience in the ferry sector, RINA will support Hanwha in analysing market trends within this specific segment.

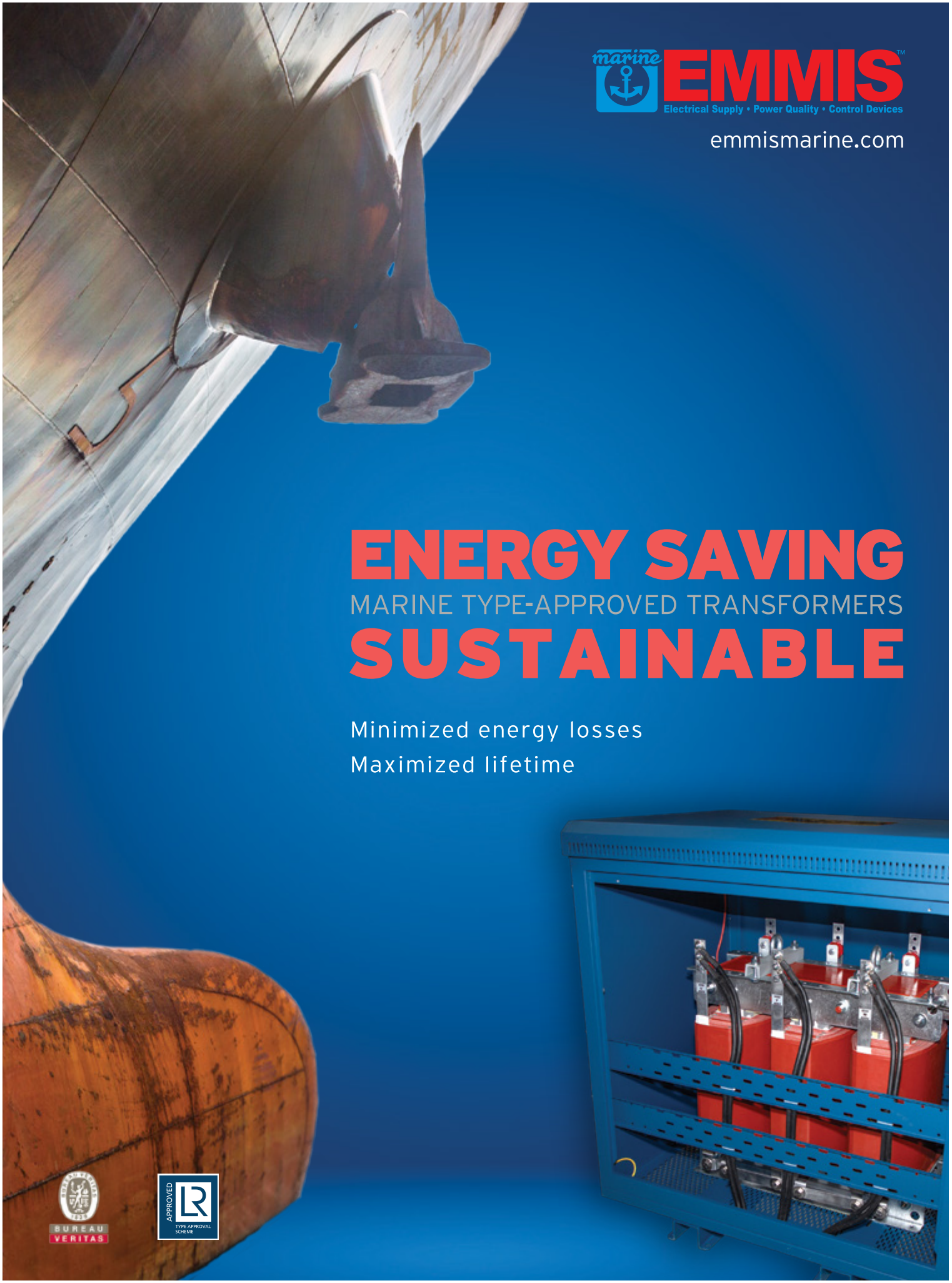
WinGD and Envision energy study shows path to green ammonia cost parity

WinGD and Envision have released a pioneering study analysing the operational costs of ships powered by renewable fuels. The findings reveal that under moderate global regulations, green ammonia could achieve cost parity with VLSFO and LNG at current prices, even before additional subsidies or rewards associated with zero-emission fuels.

The study, an operating-expense illustration of green-fuelled vessels on the container and bulk trades between China and Australia, uses verified lifecycle emissions factors and current estimated bunkering prices along China's coast. By 2050, green ammonia is projected to outperform LNG on a cost basis, with a predicted 5-6% lower lifecycle operating cost.

Fuel consumption, use of consumables for emissions abatement, and Tank-to-Wake emissions are based on the real-life performance of engines in WinGD's existing portfolio: ammoniafuelled XDFA, methanolfuelled XDFM, and LNGfuelled XDF engines. For the vessel cases studied, the data — and the corresponding illustrations — show that VLSFO and LNG are currently the most cost-competitive fuel options, with green ammonia reaching similar — and eventually lower — net costs under a global regulatory regime.

The study finds that e-LNG and green methanol may have a longer path to viability, requiring higher rewards under a global regime — although the price evolution will depend on how quickly producers can increase volumes. Further fuel candidates and power configurations will be modelled by WinGD in future studies.


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How better maintenance decisions are changing the cost equation for Greek shipping owners

For Greek shipowners managing large, mixed fleets of tankers and bulkers, maintenance decisions carry long-term consequences. These vessels are capital-intensive assets expected to trade for decades. In that environment, the real cost of maintenance is not simply parts or labour. It is the operational impact of intervening too early through unnecessary work, or too late when emerging engine issues escalate into downtime.



An interview with **Azmat Jafri**, General Manager of Marine Lubricants at Shell Marine

Modern two-stroke engines, operating under higher pressures and across dual-fuel configurations, generate more data than ever before. Yet data alone does not reduce risk. What matters is the expertise required to interpret trends correctly, align actions with OEM guidance and recommend effective intervention.

Azmat Jafri, General Manager of Marine Lubricants at Shell Marine, explains how maintenance is changing, why more data does not automatically lead to better decisions, and how owners can apply technical expertise to support long-term vessel performance.

For Greek shipowners managing long-life assets, how has the meaning of "maintenance cost" changed?

For vessels expected to operate for 20 years or more, maintenance has always been critical. But Greek shipowners are facing a fundamental shift in how they define the costs of that maintenance. Today, it is no longer just about parts, labour or planned dry dock intervals — it is about timing.

Acting too late can lead to unplanned downtime, delayed vessels and lost revenue through disrupted operations. Acting too early, however, creates its own inefficiencies through unnecessary inspections, premature component replacement and additional workload for crews.

As a result, the challenge for owners is not simply reducing maintenance spend. It is intervening at the right time, based on actual engine condition, to protect both vessel performance and commercial outcomes.

Why is getting the timing right becoming more technically difficult?

Getting maintenance timing right has become more difficult because modern marine two-stroke engines operate at higher pressures and tighter tolerances to improve combustion efficiency. This increases sensitivity to wear and operating conditions, leaving less margin for error.

At the same time, vessels are operating across a broader mix of fuels, including LNG and other dual-fuel configurations. These changing conditions influence combustion behaviour and deposit formation.

Crucially, wear no longer presents itself as a clear or immediate issue. It develops gradually, with early indicators that can be subtle and easy to misinterpret without the right context.

The variable behaviour across different fuels and operating conditions makes traditional, time-based approaches less reliable. It is why OEMs are increasingly endorsing structured cylinder condition monitoring to support more accurate, condition-based decisions.

Why is technical interpretation, not just monitoring, the real differentiator?

Monitoring provides visibility, but data on its own does not reduce risk. Without the right context, individual results can be misleading — and in some cases, lead to unnecessary intervention.

Effective interpretation requires a detailed understanding of how specific engines behave over time. Indicators of oil condition, component wear and lubrication performance only become meaningful when assessed against engine-specific baselines, operating conditions and fuel type. It is also essential to track how these indicators evolve, rather than relying on isolated data points.

This is where technical expertise becomes critical. Solutions such as Shell LubeAnalyst apply OEM-aligned frameworks and fleet benchmarking to contextualise each result, allowing vessel crews to distinguish normal variation from early signs of wear or deposit formation.

Shell's technical specialists oversee this process and ensure the testing parameters align with OEM recommendations. Dedicated advisors also provide lubricant recommendations tailored to each vessel and operating profile.

Expert technical support means turning oil analysis into clear, proportionate maintenance decisions. This involves experienced engineers applying their specialist judgement to determine when to act, and just as importantly, when not to.

How do integrated technical services support proportionate maintenance decisions?

A key challenge for owners is not simply collecting data but bringing it together in a way that supports clear decision-making. Onboard inspections, laboratory analysis and operating data are often reviewed separately. Such a scenario makes it difficult to build a consistent picture of engine condition.

Integrated technical services address this by bringing these inputs together into a single, consistent framework. Solutions such as Shell LubeMonitor combine onboard inspection data, laboratory test results and expert advisory to provide a unified view of cylinder condition.

This reduces conflicting signals and helps owners prioritise actions more effectively. It also enables more confident decisions around maintenance timing. Operators can extend intervals where appropriate while optimising feed rates and oil consumption without compromising protection.

We have seen this in our collaboration with Thenamaris LNG Inc. Through continuous monitoring with Shell LubeMonitor, they gain the information needed to intervene in a timely manner. It has helped them avoid engine cleanliness issues, extend equipment life and reduce maintenance costs.

What should Greek shipowners prioritise to ensure maintenance supports long-term competitiveness?

To remain competitive, Greek shipowners need to align their maintenance strategy with the long-term value of their vessels. This means moving away from reactive or purely time-based approaches and, instead, investing in the expertise and structured monitoring needed to support more informed decisions.

Such a move requires a more integrated approach. Product performance, diagnostic insight and technical advisory need to work together within a single framework, rather than being managed in isolation. That integration allows vessel crews to build a consistent understanding of engine condition and adapt effectively as operating conditions evolve.

Technical expertise plays a central role in this process, particularly as engines operate across a wider range of fuels. It is this expertise that allows owners to select and apply the right lubrication strategy for each engine and operating profile.

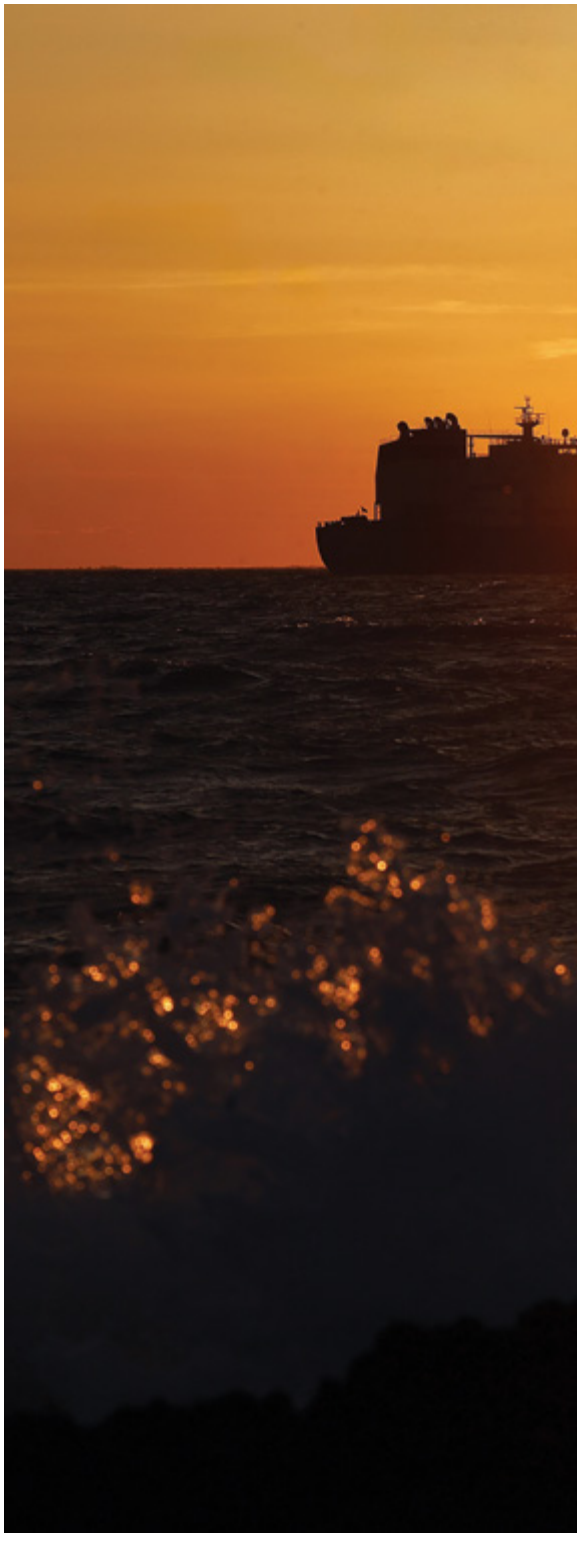
High-performance cylinder oils such as Shell Alexia 40 XC form part of that approach. Designed for compatibility across different fuel types, they provide a more stable cleanliness baseline. This helps to reduce operational complexity while supporting consistent engine performance.

With the right expert support, these products can deliver measurable results. For example, at Kiran Holding A.S. in Turkey, switching to Shell Alexia 40 XC eliminated lubricant switching, improved cleanliness by 30–40% and reduced maintenance time by 10 hours per vessel per month.

In an increasingly complex, dual-fuel operating environment, technical expertise is what allows owners to make more informed decisions, maintain long-term performance and reshape the cost equation for Greek shipping.



Energy



The cost of war: Gulf energy infrastructure faces $25 billion repair bill

War in the Middle East has triggered severe global supply disruptions in oil and gas, with reported damage and shutdowns affecting liquefied natural gas (LNG) trains, refineries, fuel terminals, and critical gas-to-liquids facilities across the region. According to Rystad Energy's estimates, energy infrastructure repair and restoration costs to date could reach at least $25 billion, based on an initial assessment of impacted facilities, and are expected to rise further. Spending is likely to be driven primarily by engineering and construction, followed by equipment and materials.

In assessing repair costs and full restoration timelines across severity tiers, one clear outlier emerges: Qatar's Ras Laffan Industrial City, where the destruction of LNG trains S4 and S6 has triggered force majeure and a 17% capacity reduction, equivalent to about 12.8 million tonnes per annum (mtpa). However, capital alone will not be sufficient to restore the facility, with a full recovery expected to take up to five years. This is because the large-frame gas turbines required to power LNG main refrigeration compressors are supplied by only three original equipment manufacturers (OEMs) globally, all of which entered 2026 with production backlogs of approximately two to four years, driven by demand from data centre electrification and coal plant retirements.

Looking beyond Qatar, neighbouring Bahrain represents another distinct disruption scenario. The Bapco Sitra Refinery was struck twice, causing confirmed damage to two crude distillation units (CDUs) and a tank farm, with force majeure declared across operations. The destruction of a newly commissioned CDU block just months after first production has eliminated novel processing capacity, delaying the revenue intended to support the recent investment. Restoring the units will likely require international contractors to be re-mobilised at conflict-inflated costs and under uncertain war-risk insurance, as the damaged assets had only recently come online.

There were also moderate to minor disruptions in other countries, including the UAE, Kuwait, Iraq, and Saudi Arabia. Across all impacted facilities, the factor that most consistently shapes recovery trajectories is the density and proximity of the domestic EPC (Engineering, Procurement, and Construction) ecosystem surrounding each asset — an often-underestimated variable in conventional damage assessments.

The speed of recovery in the region will depend on execution capacity and the timing of capital deployment as repair spending ramps up, according to Rystad Energy. Operators are likely to prioritise restoring existing fields instead

The latest developments on the energy front

& natural



Credit: EPA/GUILLAUME HORCAJUELO

of new developments, creating demand for EPC contractors and OEMs, especially those with regional experience and existing agreements with national oil companies.

IEA: Solar overtakes all energy sources in a major global first

The world's energy demand increased more slowly last year against a complex economic and geopolitical backdrop, but electricity use continued to rise much faster than overall demand, with solar PV becoming the largest contributor to growth in global energy supply for the first time, according to a new International Energy Agency (IEA) report.

The latest edition of the IEA's "Global Energy Review" provides a comprehensive global assessment of trends across the energy sector in 2025. Based on the latest data, it covers energy demand, electricity generation and use, energy technology deployment, and energy-related carbon dioxide (CO_2) emissions.

The report shows that overall global energy demand growth slowed to 1.3% in 2025, slightly below the previous decade's average of 1.4% and significantly lower than in 2024. The main reasons for this slowdown were lower global economic growth, less extreme temperatures in some regions, and rapid uptake of more efficient technologies.

At the same time, global electricity demand increased by around 3% — well over twice the rate of overall energy demand growth. Although electricity demand growth was slower than in 2024, reflecting factors such as lower cooling demand in India and Southeast Asia amid less severe heatwaves, it remained above the average of the past decade. Electricity demand growth was driven by multiple sectors

resources

Edited by: Michalis Psallis



Credit: EPA/Robin van Lonkhuijsen

across buildings and industry, and was boosted by fast-growing demand from electric vehicles and data centres.

All major fuels and technologies expanded to meet the rising demand, but at very different rates. Solar PV was the single largest contributor to growth in global energy supply in 2025, accounting for more than 25% of the increase — the first time on record that a modern renewable source has led global primary energy supply growth. Natural gas accounted for the next largest share, at 17%, reflecting its role in power generation in many countries. Overall, renewable sources and nuclear energy met nearly 60% of all growth in energy demand, and power generation from these sources exceeded total growth in electricity demand.

In the electricity sector, the additional 600 TWh of solar PV generation worldwide in 2025 marked the largest structural increase ever recorded in a single year for any electricity generation technology, contributing to a decline in coal-fired electricity generation globally. Battery storage was the fastest-growing power sector technology in 2025. The roughly 110 GW of new battery storage capacity added during the year exceeded the largest-ever annual capacity additions for natural gas. Meanwhile, over 12 GW of nuclear power reactors began construction in 2025, amid renewed momentum for nuclear projects in several regions.

Cumulative deployment of low-emissions technologies since 2019 now avoids annual fossil fuel consumption equivalent to the entire energy demand of Latin America. In the aggregate, the use of technologies such as solar PV, wind power, and heat pumps now displaces natural gas demand equivalent to half of all global annual LNG exports.

New IRENA policy advisory shows strategic role of renewables for energy security and resilience

The strategic deployment of renewables has provided enhanced resilience in the face of the current energy crisis in a number of countries, according to a new policy advisory from the International Renewable Energy Agency (IRENA).

The brief, aimed at policymakers responding to disruptions in international energy markets, suggests a set of immediate and longer-term actions to insulate countries and communities from the worst effects of the crisis, while steering economic recovery toward greater energy security and resilience.

According to the new brief, renewables are already reducing dependence on fossil fuel imports across multiple countries — from Spain and Portugal in Europe to China, India, and Pakistan in Asia. Globally, renewable power capacity continues to grow at record speed, with 692 GW added in 2025.

Furthermore, falling costs have transformed the economics of power generation. More than 85% of new renewables are now cheaper than fossil fuel alternatives. Since 2010, the cost of solar has fallen by 87%, onshore wind by 55%, and battery storage by 93%, according to IRENA.

The brief advises policymakers to:

- Facilitate the deployment of distributed renewables by leveraging cross-sector partnerships to mobilise rapid responses; provide financial and logistical support to fast-track development.
- Use public information campaigns and mandates to reduce energy demand.
- Accelerate the adoption of time-of-use tariffs to enable consumers to shift their electricity consumption to times where renewable supply on grids is high and prices are low.
- Implement fiscal measures such as grants, subsidies, or tax rebates to support electrification.
- Accelerate solar PV-battery hybrid mini-grids in off-grid and weak-grid remote areas.
- Accelerate two- and three-wheeler electrification in emerging economies; incentivise the electrification of public transport through financial and fiscal support; encourage car-pooling where appropriate.



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A new chapter for Harding Marine Services in Rotterdam



An interview with **Christopher Papachastas**, General Manager of Poseidon Group

Harding Marine Services B.V., part of Poseidon Group, has recently relocated to a new facility within the Rotterdam port area, marking an important step in the group's continued development.

According to Christopher Papachastas, General Manager of Poseidon Group, the move was driven by a simple objective: "to support higher volumes while allowing us to maintain the same level of quality and reliability our customers expect."

"Harding's previous location supported the company's operations well for many years," he explains, "but following Poseidon Group's acquisition of Harding Marine Services in 2024, the company's operations expanded, along with the need for a larger facility."

The new premises, located in Hoogvliet in the heart of the port area, cover approximately 3,850 m² and bring together under one roof fresh provisions and a wide range of dry goods, including tools, cabin stores, safety equipment and other technical items required on board.

"This combination is fundamental to the way we operate," he explains. "A vessel's requirements can range from fresh provisions to technical supplies and safety-related items, often within the same delivery window. Our aim has been to develop the Rotterdam hub so that it reflects the same capabilities as our headquarters in Piraeus," Mr. Papachastas says.



Harding Marine Services supports a broad international client base, including a significant number of shipping companies of Greek interests. "Rotterdam is one of the most important ports in the world, therefore our presence here allows us to serve companies from across the global shipping community, which is something we value greatly."

Beyond the operational improvements at Harding Marine Services, the relocation also brings another important advantage: proximity to Poseidon B.V., the other core activity of Poseidon Group in the Netherlands.

Poseidon B.V. specializes in the inspection, maintenance and certification of lifesaving and firefighting equipment of vessels, and is part of the group's wider Service Network, which operates service stations in Piraeus, Rotterdam, Limassol, Houston, Suez, Dubai, Barcelona and Algeciras,

"Having Poseidon B.V. nearby allows us to support vessels in a more complete way," Mr. Papachastas explains. "Through Harding Marine Services, we supply the vessel with the provisions and technical goods it needs to operate, while through Poseidon B.V. we ensure that its safety and firefighting equipment are properly inspected and certified."

The development of the Rotterdam hub comes at a particularly meaningful time for the group, as Poseidon celebrates 50 years of presence in the maritime industry this year. "At the end of the day," he concludes, "our objective remains unchanged: to be a dependable partner that ship operators can rely on today and in the years ahead."

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Edited by: Michalis Psalis

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COAL

Prolonged Middle East supply disruption drives thermal coal demand

Prolonged disruption to Middle East energy supplies is triggering a rebound in global thermal coal demand, as countries scramble to secure power amid constrained LNG flows through the Strait of Hormuz, according to Wood Mackenzie. “In supply shocks of this scale, coal becomes a critical fallback for energy security”, reports Sushmita Vazirani, Principal Analyst, Bulk Commodities at Wood Mackenzie. “Despite decarbonisation commitments across Asia, tightening LNG supply and elevated prices are accelerating fuel switching back to coal”. While the Strait of Hormuz remains the world’s most critical chokepoint for oil and gas, relatively little thermal coal trade passes through it directly. Major coal exporters, including Australia, Indonesia, Russia, South Africa, and Colombia, are not directly exposed to the route. However, disruptions to LNG supply are creating significant spillover effects, as higher gas prices drive fuel switching toward coal in price-sensitive markets across Asia and Europe.

Regional markets respond with fuel switching and policy shifts:
Northeast Asia: Coal-fired generation remains firm despite seasonal weakness in regional demand, supported by rising LNG prices. Taiwan is preparing to restart the 2.1 GW Hsinta coal-fired power plant, which could consume approximately 5.5 MT annually. South Korea has increased guidance for Russian coal imports, while Japan is expected to rely more on nuclear generation, including restarts such as the Kashiwazaki-Kariwa Unit 6.
China: With gas accounting for less than 3% of power generation, China remains relatively insulated and is shifting toward domestic coal supply.





Credit: EPA/Marcin Bielecki

India: Elevated LNG and petcoke prices are pushing industrial consumers back toward coal as a primary fuel source.
Europe: Countries including Italy are considering restarting coal-fired capacity, with the Amsterdam-Rotterdam-Antwerp (ARA) market particularly exposed due to its reliance on gas.

Coal continues to lose ground in US energy system

The April 2026 Short-Term Energy Outlook (STEO) of the US Energy Information Administration (EIA) indicates a continued structural decline in coal use within the US energy system, driven primarily by reduced demand in the electric power sector and competition from alternative energy sources.
Coal consumption for electricity generation is projected to fall significantly in 2026. During the first half of the year, coal use is expected to reach about 180 million short tonnes, representing a 10% decrease compared to the same period in 2025. This decline is mainly due to lower coal-fired electricity generation, as natural gas and renewable energy sources continue to gain market share.
As demand weakens, coal inventories are rising. In the first half of 2026, US power sector coal stocks are expected to rise by an average of 3 million short tonnes per month. This contrasts sharply with 2025, when inventories were declining. The buildup reflects reduced coal burn rather than increased production.
Coal production, however, remains relatively stable in the near term. Output in the first half of 2026 is forecast at approximately 260 million short tonnes, broadly in line with the previous year. For the full year, production is expected to total about 517 million short tonnes, with a modest decline later in the year as demand continues to weaken.
In the second half of 2026, coal consumption is still projected to decline by about 6% y/y, while inventories begin to decrease slightly as stockpiles are drawn down. Nevertheless, the overall trend remains downward, reflecting long-term shifts in the energy mix.
Coal's share in US electricity generation is also expected to fall, declining from 17% in 2025 to 16% in 2026 and 15% in 2027. This decline contributes to lower carbon dioxide emissions, as reduced coal use is a key factor behind the projected drop in energy-related emissions in 2026.
The outlook confirms that coal continues to lose ground within the US energy system, with declining consumption, stable-to-falling production, and shrinking importance in electricity generation.

IRON ORE-STEEL

Guinea's Simandou to become leading driver of seaborne iron ore supply growth

The emergence of Guinea's Simandou as a large-scale, high-grade iron ore supplier indicates a significant shift in the global seaborne iron ore market. According to Wood Mackenzie, this project is set to become the primary catalyst for long-term supply growth.
Wood Mackenzie expects Simandou to export around 16 million tonnes in 2026, with volumes rising progressively thereafter. However, ramp-up is likely to be uneven, with infrastructure bottlenecks and logistical complexities resulting in a phased and non-linear increase in output.
Rather than simply adding volume, Simandou is expected to displace higher-cost supply, tightening the competitive landscape and reinforcing a pronounced cost and quality hierarchy across the seaborne market. "Simandou will become the single biggest driver of seaborne supply growth over the coming decade", stated David Cachot, Research Director for iron ore at Wood Mackenzie. "But its impact goes beyond volume. These tonnes will increasingly displace higher-cost supply, reshape the cost curve and reinforce the market's shift toward higher-quality material".
For Australian producers, near-term impacts remain manageable, Wood Mackenzie remarked. The Pilbara continues to benefit from blending optionality, with lower-grade ores clearing the market efficiently when combined with higher-quality material. However, this advantage is expected to erode over time. As Simandou ramps up and demand preferences shift toward higher-quality feedstocks, competitive pressure is likely to emerge first in the lower-grade supply.



"This does not imply an abrupt displacement of Pilbara volumes", David Cachot noted. "Rather, it highlights where pressure will emerge first, as marginal tonnes become increasingly vulnerable in a more quality-sensitive market".

The competitive dynamic with Brazil is more direct. Brazilian producers, particularly Vale, compete closely with Simandou on quality, prompting a shift toward greater portfolio flexibility.

Short Range Outlook: Modest recovery expected in global steel markets

The latest Short Range Outlook (SRO) published by the World Steel Association (worldsteel) highlights a turning point for global steel demand, signalling a transition from contraction to modest growth in 2026, followed by a stronger recovery in 2027.

Global steel demand is projected to increase by 0.3% in 2026, reaching approximately 1.72 billion tonnes. This relatively subdued growth reflects ongoing structural and geopolitical challenges affecting key regions. However, a more pronounced expansion of 2.2% is expected in 2027, indicating improving market conditions and a gradual return to stability.

A major factor shaping the outlook is the evolving situation in China, the world's largest steel consumer. Steel demand in China is expected to contract by 1.5% in 2026, although this represents a moderation in the rate of decline compared to previous years. The adjustment of the country's real estate sector is approaching its lowest point, while infrastructure investment and export-driven manufacturing are expected to provide partial support. By 2027, demand in China is forecast to stabilise, marking the end of a prolonged period of downward pressure.

In contrast, India continues to demonstrate strong growth momentum and remains the fastest-growing major steel market globally. Demand in India is projected to rise by 7.4% in 2026 and accelerate further to 9.2% in 2027, driven by infrastructure expansion, industrial activity, and increasing consumption across key sectors.

Developing economies, excluding China, are expected to experience slower growth in 2026, with demand increasing by 2.5%. This deceleration is largely attributed to a sharp contraction in the Middle East due to ongoing geopolitical tensions, as well as a normalisation of demand in Southeast Asia following a period of strong expansion. Nevertheless, these regions are anticipated to regain momentum in 2027, with growth projected to exceed 5%.

EU adopts measures to protect steelmaking sector

The European Commission welcomed the political agreement reached on Monday, 13 April, between the European Parliament and Council on the measure to protect the EU steelmaking sector against global overcapacity. This is a vital step towards ensuring the long-term viability of a strategic European industry.

The new measure establishes tariff-free quotas of 18.3 million tonnes per year, with an out-of-quota duty set of 50% applied to 30 categories of steel products imported into the EU. It also introduces a Melt and Pour requirement to improve traceability and transparency of the EU steel supply chain. The measure will apply to imports from all countries, except those within the European Economic Area (EEA); however, EEA countries will still be subject to the Melt and Pour requirement. The agreed text reflects all the key elements of the Commission's proposal of 7 October 2025. According to the Commission, the measure is intended to address the negative trade-related effects of global steel overcapacity — projected to reach 721 million

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The April WASDE report indicates that world trade is projected to decline by 0.3 million tonnes to 221.9 million, as reduced exports from Ukraine, Australia, and Brazil are not fully offset by increased exports from Russia and Kazakhstan.

tonnes by 2027, more than five times the EU's annual steel consumption. It is also expected to safeguard approximately 2.5 million jobs linked to steel production and to support the EU's decarbonisation objectives.

The new measure will replace the existing EU steel safeguard, which has been in place since 2018, imposing a tariff rate quota (TRQ) system on 28 product categories, permitting duty-free imports up to a specified threshold, beyond which a 50% tariff applies.

GRAINS

WHEAT

Latest projections for wheat supply and demand

According to the United States Department of Agriculture (USDA) in its April 2026 World Agricultural Supply and Demand Estimates (WASDE) report, the 2025/26 global wheat outlook projects higher supplies, lower consumption, slightly reduced trade, and increased ending stocks. Global supplies are raised by 1.5 million tonnes to 1,103.2 million, mainly due to higher production in the EU and Russia.

The USDA further reports that global consumption for 2025/26 is lowered by 4.7 million tonnes to 820.1 million, largely reflecting reduced food, seed, and industrial use in India. Government data on India's wheat stocks for the first 11 months of the marketing year indicate that inventories are higher than previously estimated, implying lower domestic consumption.

In addition, the April WASDE report indicates that world trade is projected to decline by 0.3 million tonnes to 221.9 million, as reduced exports from Ukraine, Australia, and Brazil are not fully offset by increased exports from Russia and Kazakhstan.

Finally, the USDA notes that projected global ending stocks for 2025/26 are raised by 6.2 million tonnes to 283.1 million, which is 24 million tonnes, or 9% higher than last year. The increase in stocks is mainly attributed to India, Ukraine, the European Union, Australia, and Bangladesh.

SOYBEANS

China to reduce reliance on soybean imports

The world's largest buyer of soybeans is preparing for a decade of reduced dependence on foreign markets, according to the China Agricultural Outlook 2026-2035 report recently released by China's Ministry of Agriculture and Rural Affairs.

The China Agricultural Outlook 2026-2035 report indicates a significant shift in the country's trade strategy, projecting a steady decline in soybean imports over the next decade. It estimates that China will import 6.1% less soy in 2026 compared to the previous year, marking a sharp departure from its historical growth. This downward trajectory is expected to continue through 2035, with imports falling to approximately 82.55 million metric tonnes, which represents a 26% decrease from the 2025 peak of 111.83 million tonnes.

This reduction reflects Beijing's strategic push for food security and self-sufficiency. The government aims to increase domestic grain production to 753 million tonnes by 2035, while simultaneously reducing the livestock industry's reliance on imported soy protein for animal feed. As domestic oilseed production rises and the demand for imported meat and dairy products moderates, China's dependence on international markets is expected to decline.

This transition poses a significant challenge for major global exporters like the United States and Brazil, as they adjust to the prospect of a structural slowdown in Chinese import demand following years of sustained growth.



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Wet bulk cargoes

CRUDE OIL

IEA: Oil market outlook is highly uncertain

The International Energy Agency's (IEA) April 2026 Oil Market Report highlights a global oil market under considerable strain, driven primarily by geopolitical disruptions — particularly tensions affecting the Middle East and flows through the Strait of Hormuz. These disruptions have significantly constrained supply while simultaneously weakening demand, creating a highly volatile and fragile market environment.

A key takeaway is the sharp downward revision in global oil demand. The IEA now expects demand to decline by around 80,000 barrels per day in 2026, marking a notable shift from earlier forecasts that anticipated growth. This reversal reflects what the report describes as "demand destruction", driven by elevated prices, reduced economic activity, and supply shortages. The second quarter of 2026 is projected to see a particularly pronounced decline, representing the steepest contraction since the COVID-19 pandemic.

On the supply side, the market has tightened significantly. Disruptions to exports — especially through critical shipping routes — have reduced global availability, while production gains elsewhere have not been sufficient to compensate. As a result, the previously anticipated supply surplus has narrowed considerably, bringing the market close to balance, or potentially into deficit.

Refining activity is also under pressure. Global refinery throughput is expected to decline, reflecting both reduced crude availability and weaker product demand. Meanwhile, inventories are being drawn down rapidly, increasing concerns about energy security and price stability.

Overall, the report emphasises that the oil market outlook remains highly uncertain and heavily dependent on geopolitical developments. Even small changes in the current situation could lead to significant fluctuations in supply, demand, and prices, making the near-term trajectory of the global energy system difficult to predict.

Oil markets on edge: Geopolitical friction and rising demand fuel price surge

According to the OPEC Monthly Oil Market Report (MOMR) issued in April 2026, the global oil market is characterised by significant volatility. The OPEC Reference Basket (ORB) rose sharply in March, averaging $116.36 per barrel, driven primarily by geopolitical tensions and supply uncertainties.

Regarding demand, the report maintains a growth forecast of 1.4 mbdp for 2026. While some transitory weakness is noted in the second quarter due to geopolitical developments, overall demand remains robust, particularly in non-OECD countries such as China and India, where industrial activity and transportation needs continue to rise.

On the supply side, non-DoC liquids pro-



duction is expected to grow by 0.6 mb/d in 2026, led by the US, Brazil, and Canada. However, crude oil production among countries participating in the Declaration of Cooperation (DoC) experienced a notable decline in March. As highlighted in the April 2026 OPEC report, OECD commercial oil inventories stood at 2,826 mb in February, which is approximately 38.5 mb above the latest five-year average.

In conclusion, the market remains sensitive to geopolitical shifts, though steady demand from emerging economies provides a solid floor for consumption throughout the year.

Global seaborne crude oil shipments down 16% since start of the Iran war

Since the beginning of the Iran war, global seaborne crude oil shipments have fallen 16% compared to the first nine weeks of 2026, according to Signal Ocean data. This represents a reduction of 7.6 million barrels per day (mbdp) to 38.4 mbpd. Coincidentally, shipments during the six weeks until mid-April have likewise been 16% lower than during the same period last year, according to Niels Rasmussen, Chief Shipping Analyst at BIMCO.



Before the Iran war, the US Energy Information Administration (EIA) had estimated global oil production in 2026 at 79.9 mbpd. The 7.6 mbpd reduction in seaborne shipments means that 9.5% of the previously expected crude oil production is currently not reaching markets.

The reduction in shipments has been driven by the effective closure of the Strait of Hormuz. Since the beginning of the war, tanker transits have reduced to a trickle, while other countries have not significantly increased exports.

"In total, seaborne crude oil shipments from the Persian Gulf have fallen 12.7 mbpd during the past six weeks compared to the first nine weeks of 2026. The United Arab Emirates has managed to increase loadings from ports east of the Strait of Hormuz by 0.7 mbpd while Saudi Arabia has increased shipments from Yanbu in the Red Sea by 3.0 mbpd", states Niels Rasmussen.

Adjusting for increased shipments from ports outside the Persian Gulf, crude oil shipments from the region have fallen 9.0 mbpd compared with earlier in the year. In total, other countries have managed to increase shipments by only 1.4 mbpd during the past six weeks compared with the first nine weeks of the year.

Venezuela has increased shipments by 0.4 mbpd, while Russian Black Sea shipments are up by 0.8 mbpd. Combined, this accounts for 85% of the increased shipments from countries outside the Persian Gulf. India has been the main destination for the increased shipments from both areas.

Since the two-week ceasefire was agreed between the US and Iran, transits through the Strait of Hormuz have failed to recover significantly. The US decision to block all traffic to and from Iranian ports, except humanitarian shipments, could lead to a further reduction in transits.

"Even if the Strait of Hormuz is fully reopened, it may take a long time for crude oil and other energy shipments to return to previous volumes. According to reporting by the Financial Times, Saudi Arabia's production capacity has suffered considerable damage, while Qatar has lost almost one-fifth of its LNG output. At the same time, refinery capacity of about 2.4 mbpd is currently estimated to be offline", reports Niels Rasmussen.

$100 oil could unlock 2.1 mbdp of additional South American crude supply

A sustained $100-per-barrel oil price could unlock up to 2.1 mbdp of additional crude supply across South America by the mid-2030s, according to new analysis by Rystad Energy. The finding comes as the effective closure of the Strait of Hormuz has forced a sharp upward revision in our forecasted average 2026 oil price, from $60 Brent per barrel in January to $89 per barrel today.

At current production levels, government revenues across South America are expected to rise by approximately $43 billion this year alone relative to our base case, reinforcing hydrocarbons' central role in public finance from Brasilia to Caracas. Across the region, Petrobras stands to gain the most: revenues are set to rise by $13.1 billion under the current $89 per barrel forecast versus January's $60 per barrel baseline.

"The Middle East conflict has done more than spike oil prices — it has exposed how dangerously concentrated global supply chains are around the Strait of Hormuz. South America is now positioned as the world's most consequential source of incremental supply. The region offers scale, geologic quality, and relative political stability at exactly the moment that the world is shopping for alternatives", said Radhika Bansal, Senior Vice President, Oil and Gas Research at Rystad Energy.

Offshore developments in Brazil, Guyana, and Suriname represent the most immediate source of upside. Fast-tracking projects across these markets could deliver more than 1 million barrels of oil equivalent per day (boepd) of additional production over the next decade, backed by approximately $33 billion in incremental greenfield capex through 2035.

In Guyana, ExxonMobil is targeting up to 300,000 bpd from its Yellowtail project, which came online at an initial average production of 250,000 bpd, and Rystad Energy believes identical debottlenecking could unlock an additional 80,000 to 90,000 bpd across the Errea Wittu, Jaguar and Hammerhead fields. However, the largest upside is in earlier Final Investment Decisions (FIDs) for new projects rather than expansions of existing assets. Nevertheless, limited shipyard capacity for new Floating Production, Storage and Offloading Vessels (FPSOs) remains the binding constraint.

Under a $100-per-barrel scenario, Rystad Energy estimates Venezuela could add 910,000 bpd by 2035, with 57% coming from existing fields in the eastern and western provinces, where medium crude operating costs run as low as $7 to $8 per barrel.

Outside these three hubs, Venezuela has re-entered the global supply conversation following the January capture of President Nicolás Maduro and declining availability of medium-to-heavy sour crude from the Middle East. Under a $100-per-barrel scenario, Rystad Energy estimates Venezuela could add 910,000 bpd by 2035, with 57% coming from existing fields in the eastern and western provinces, where medium crude operating costs run as low as $7 to $8 per barrel.

ExxonMobil, whose CEO described Venezuela as "uninvestable" in January, has since deployed technical teams to assess opportunities. Shell signed preliminary agreements with Venezuelan state producer PDVSA in early March covering offshore gas and onshore exploration. All timelines remain contingent on sanctions relief and fiscal reform. The upside could be significantly higher if more players follow suit as investor confidence improves, driven by the presence of companies such as Chevron, Eni, Repsol and Shell. Increased participation in underdeveloped fields, particularly through partnerships with PDVSA, would further unlock additional production potential.

Argentina's Vaca Muerta is the region's most dynamic growth story. Crude production is forecast to reach 1 mbpd by the end of the decade, up from current production of around 600,000 bpd and 1.5 mbpd by 2035 under the standard price strip. In a high-case scenario, production could reach 1.8 million bpd, at which point the Vaca Muerta Oil Sur (VMOS) pipeline becomes the binding constraint. China is set to emerge as the primary export destination, with consistent crude shipments beginning in 2027.

LIQUEFIED NATURAL GAS (LNG)

Tightening global LNG market: The impact of Middle East disruptions

The global LNG market is facing a period of significant tightening, primarily driven by the ongoing geopolitical volatility in the Persian Gulf and disruptions affecting maritime flows through the Strait of Hormuz. According to a recent analysis

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by ING, even a swift resolution to current maritime disruptions would not immediately alleviate the supply pressures facing the market.

A critical factor in the current outlook is the status of Qatari LNG supply. ING highlights that the restart of Qatari capacity will be a time-consuming process. In addition, approximately 17% of Qatar's LNG capacity is expected to remain offline for the foreseeable future following an Iranian attack. This physical damage to infrastructure, combined with delays in the commissioning of new Qatari production capacity, has led markets in both Asia and Europe to price in a structurally tighter environment extending into 2027.

The analysis further emphasises that there are currently very few supply alternatives capable of offsetting the volumes disrupted in the Persian Gulf. While new US LNG capacity is gradually coming online, its ramp-up is not sufficient to fully compensate for the shortfall.

Consequently, the burden of balancing the market is increasingly shifting towards demand-side adjustment. This is most evident in the power generation sector:

- In Asia: Utilities are expected to rely more heavily on coal to meet energy needs.
- In Europe: Elevated gas prices are making coal-fired generation more economically competitive, even when accounting for the additional costs of carbon pricing.

The LNG market is entering a prolonged phase of scarcity. As noted by ING, the combination of geopolitical risk and infrastructure constraints in the Middle East suggests that elevated prices and supply tightness are likely to persist in global energy markets for several years.

Golden Pass LNG marks historic milestone with first LNG production

Golden Pass LNG, a joint venture between QatarEnergy and ExxonMobil, has achieved first production of LNG from Train 1 at its Sabine Pass terminal, marking a significant milestone in the project's journey to full operations. This achievement reflects years of planning, engineering, permitting, construction, start-up activities, and community collaboration.

"Today, we began producing LNG at our terminal in Sabine Pass, marking the completion of a significant effort to construct, commission, and start up the first LNG Train and the beginning of operating a world-class facility with an exceptional team", said Alex Savva, President and CEO of Golden Pass. "This remarkable step was achieved through the unwavering dedication of our employees, the commitment of our shareholders, and the strength of our partnerships".

The commencement of LNG production paves the way for Golden Pass LNG to deliver its first cargo, achieve sustained liquefaction operations, and meet its commercial and strategic objectives.

"I'm proud of our team and their tireless work to ensure we safely reached this milestone", said Jeremy Horn, Vice President of Operations for Golden Pass. "We're excited to go to work delivering Texas LNG to power the world".

The achievement also represents an important milestone for Golden Pass LNG's shareholders, underlining the project's strategic role in strengthening global energy supply and supporting long-term growth in the LNG market. Golden Pass expects to commence LNG exports to global customers in the second quarter of 2026.

GasEntec to deliver landmark Dakar LNG terminal in Senegal

GasEntec, together with its affiliates, has announced that it has entered into contracts with ELTON Logistics & Services to deliver a jetty-based LNG regasification unit (JRU) and associated onshore LNG infrastructure for the Dakar LNG terminal in Dakar, Senegal.

The new LNG terminal is expected to become a major LNG import facility in West Africa, supplying natural gas to a 300 MW combined-cycle power plant in Cap des Biches, Dakar — Senegal's largest power plant — as well as several other power plants, industrial customers, and additional end users. The project supports Senegal's continued energy transition as the country diversifies its fuel sources while enabling economic and industrial development.

The project was awarded under a mandate to address urgent national power sector requirements. GasEntec expects first gas on an expedited timeline, with full terminal operations targeted for the first half of 2027.

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Legends & milestones

Edited by: Panagiotis Korakas

Legendary shipowners and milestone events in the history of Greek shipping



Then President of the Union of Greek Shipowners (UGS), John G. Goumas, speaking at the Posidonia Forum on 9 June 1994. As per the *Naftika Chronika* July 1994 issue, the 1994 Posidonia Forum focused on the implications of the General Agreement on Tariffs and Trade (GATT) for the shipping industry.

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"Greek Line's New Liner": The ocean liner "Empress of Britain", as presented in the 15 June 1964 issue of *Naftika Chronika*. Built in 1956, the vessel was bought by Greek Line in 1964 and renamed "Queen Anna Maria". After a series of renovations, the ocean liner served the Piraeus-New York line for several years before being put into service as a cruise ship.



Snapshot taken during the launching of the converted dry bulk vessel "World Marine", which took place at the Hellenic Shipyards of Skaramangas on 31 August 1962. Owned by Stavros Niarchos, the vessel had previously been a T-2 tanker before being converted into a dry cargo vessel through the process of jumboization. This method usually involved the conversion of ageing or obsolete tankers by completely replacing their midsection with a newly constructed one, suitable for the transport of dry bulk cargo.



The tanker “Michael C. Lemos”, during its launching at the A.G. Weser shipyard in Bremen, on 30 October 1970. It had a capacity of 254,000 DWT (Photo credit: W. Winkler).

The “Marpessa” (formerly known as the “Ontario”) was a cargo vessel purchased by N. Eustathiou & Co. in May 1934. The vessel, which was built in 1919, had a capacity of 5,476 GRT and was registered under the Greek flag.





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Aviation industry

News from the aviation world

Edited by: Spilios Varelas

Concerns over jet fuel supply in the EU

On Tuesday, 14 April, the European Commission dismissed scenarios suggesting an immediate fuel shortage in the European Union, while noting that its primary concern lies with the adequacy of jet fuel supplies in the near future.

Responding to a question about publications and letters from aviation industry bodies, the Commission's spokesperson for energy, Anna-Kaisa Itkonen, stated: "There is no evidence of a fuel shortage in the EU at present, but supply issues could occur in the near future".

She explained that the EU energy coordination group, which had met a few days prior, confirmed that "crude oil supplies to the European refineries remain stable, with no need for additional stock releases at present". Nevertheless, she emphasised that "the situation regarding aviation fuel remains our primary concern at this time", noting that "the EU's refineries account for roughly 70% of the bloc's jet fuel consumption, with the remainder reliant on imports".

The spokesperson added that the European Commission has increased coordination with Member States and industry stakeholders, holding weekly meetings of oil and gas coordination groups. The aim, she said, is to maintain a comprehensive and real-time overview of stock levels, refining capacity, and alternative import routes. She stressed that "close monitoring and full situational awareness" are crucial to ensuring that the Commission can "propose or take appropriate measures if necessary".

EES launch marked by passenger disruptions, delays, and missed flights

Airports and airlines recently called on the European Commission and EU Member States to immediately introduce additional flexibility in the operation of the Schengen Entry/Exit System (EES), after its first full day of operations was marked by passenger disruptions, delays, and missed flights. For weeks, the Airports Council Inter-

Credit: EPA/OLIVIER HOSLET



national Europe (ACI EUROPE) and Airlines for Europe (A4E) have cautioned about the EES operational roll-out challenges. On its first day of full operation, those concerns appear to have materialised.

The European Commission noted that registering a traveller takes an average of 70 seconds when the EES is functioning at full capacity. However, initial reports from a number of airports and airlines across the Schengen area confirm that the mandatory registration of all third-country nationals as of 31 March, combined with the removal of the option to fully suspend the system, has resulted in:

- Passenger waiting times of two to three hours at airport border control during peak travel periods. These delays are occurring despite border authorities making extensive use of partial suspension measures, which allow biometric data not to be captured.
- Significant disruption to flight operations, with passengers missing flights and delays due to prolonged border processing times. For instance, a flight to the UK was missing 51 passengers at departure. Another flight had zero passengers on board at gate closing time, and 90 minutes later, 12 passengers had yet to reach the gate.

Olivier Jankovec, Director General of ACI EUROPE, and Ourania Georgoutsakou, Managing Director of A4E, stated: "While we will continue to closely monitor developments in the coming days, it is already evident that greater flexibility is needed immediately. Border control authorities must be allowed to fully suspend the EES when waiting times become excessive. This is essential not only in the coming weeks, but throughout the peak summer travel season. Our support for the EES and its objectives is unwavering. However, strengthening border management must not come at the expense of operational efficiency or the passenger experience. Safeguarding Europe's reputation as an accessible and well-functioning tourist and business destination is at stake, particularly as air travel is already facing significant disruption due to the ongoing situation in the Middle East".



American Airlines rules out merger with United Airlines

American Airlines Group Inc. has issued a statement addressing recent developments in the aviation sector, firmly ruling out any possibility of a merger with United Airlines.

In its statement, the company expressed appreciation for the leadership and strong support of US President Donald Trump, as well as US Transportation Secretary Sean Duffy, highlighting their ongoing commitment to strengthening what it described as the world's leading aviation industry.

However, American Airlines made it clear that it is neither engaged in nor interested in any discussions regarding a potential merger with United Airlines.

While acknowledging that broader changes in the airline market may be necessary, the company emphasised that such a merger would be detrimental to competition and harmful to consumers.

According to the statement, a merger of this kind would also be inconsistent with the Administration's approach to the industry and the fundamental principles of antitrust law.

American Airlines underlined that its priority remains the execution of its strategic objectives, aiming to secure long-term growth and maintain a strong competitive position.

The company concluded by stating that it looks forward to continuing its collaborative relationship with the Administration as efforts to strengthen the wider airline industry move forward.

Maritime numbers

17%

the global shipping orderbook-to-fleet ratio in the first quarter of 2026.

1,745

the total number of LPG carriers currently in operation worldwide.

92

the newbuilding contracts across the dry bulk and tanker segments recorded in March.

16

the maritime piracy and armed robbery incidents recorded globally in the first quarter of 2026.

22

the number of itineraries included in this year's Cyprus-Greece ferry connection.

16 million tonnes

the estimated volume of iron ore to be exported from Simandou in 2026.

961,600 TEUs

the container throughput at the Piraeus Container Terminal (PCT) in the first quarter of 2026.

38.3 million

the expected number of ocean-going passengers in 2026.

1.9 million

the number of seafarers operating the world's merchant fleet.

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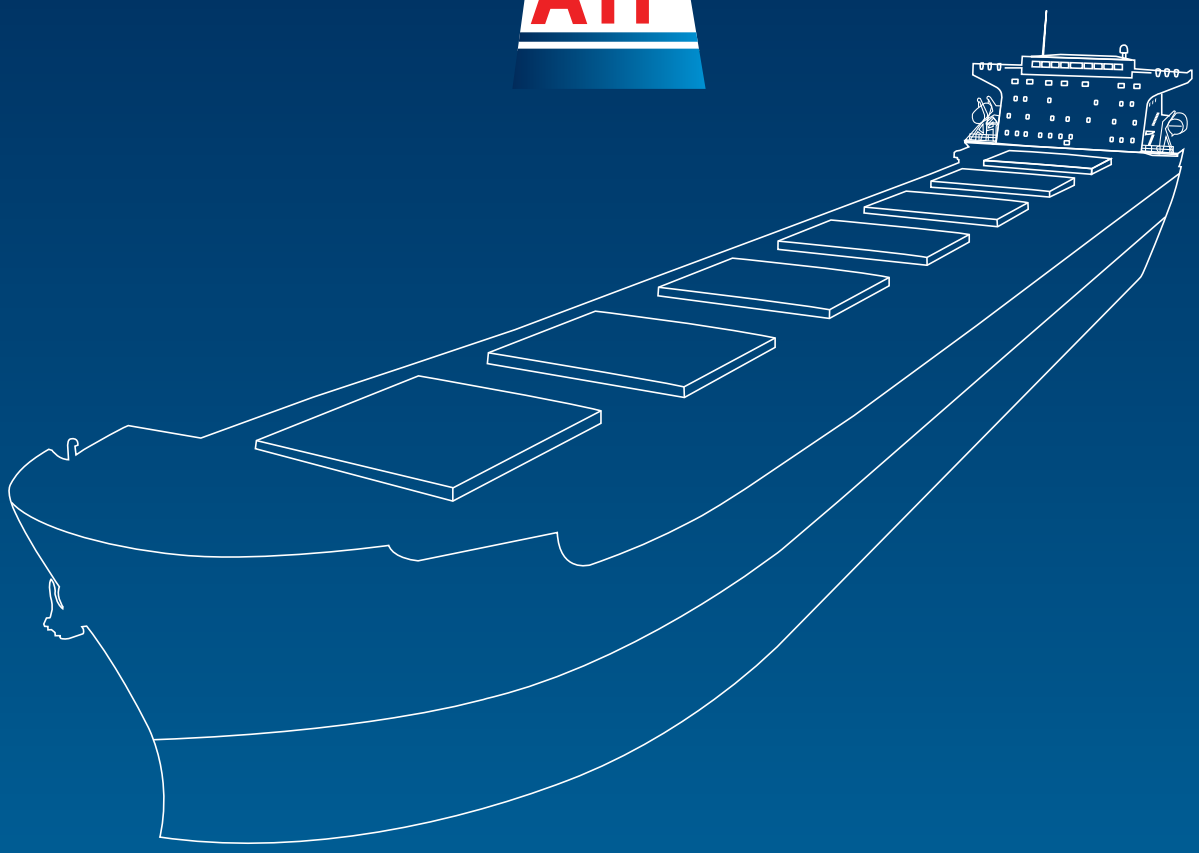
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