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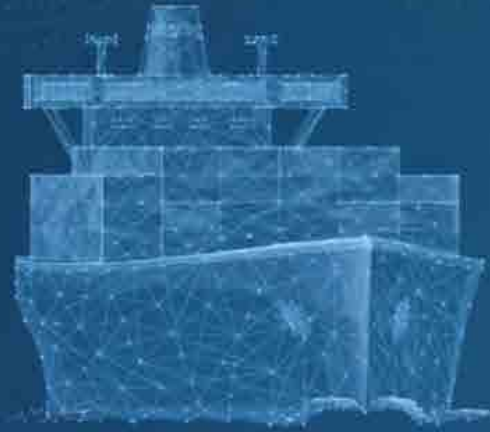
Denizcilik Haber Merkezi

INTERNATIONAL

**SPECIAL ISSUE:
MARITIME EDUCATION**

Maritime Trainer

CEO Capt. Özgür Alemdağ:
“Those who fail to train the
seafarers of tomorrow will
have no say in the future of
the maritime industry.”



Prof. Dr. Adnan Parlak:

“In the era of decarbonization,
the key to competitiveness lies
in educating engineers who can
think analytically.”

Maritime Psychology Association

Specialist Psychological
Counselor Fatma Nur Yalçinkaya:
“Technology protects a ship;
the human mind safeguards its
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From Our Editor



Strong Education, Strong Maritime Industry, Strong Future

When people think of the maritime industry, they usually picture ships, ports, shipyards, and large-scale operations. Yet the true strength of this industry lies in its people. Captains on the bridge, engineers in the engine room, port personnel, shipyard workers, and the seafarers of tomorrow—they are the ones who drive the industry forward and shape its future.

For this reason, maritime education is far more than a process of earning a diploma. It is about understanding the sea, embracing responsibility, developing discipline, working as part of a team, making sound decisions, and committing to lifelong learning. What begins in the classroom matures through experience at sea, in the field, and throughout a professional career. True competence emerges when academic knowledge is combined with practical experience, international standards, and a culture of continuous improvement. Maritime education not only provides professional knowledge but also cultivates attentiveness, sound judgment under demanding conditions, and a strong sense of responsibility. Maritime is a profession that demands character as much as knowledge, and discipline as much as experience.

The future of the maritime industry depends not only on the size of fleets or advances in technology. The real competitive advantage lies in a highly qualified workforce capable of adapting to change. Safe, high-quality, and sustainable shipping can only be achieved through well-educated professionals. Today's students will become tomorrow's captains, engineers, deck officers, technicians, and industry leaders. Investing in the quality of maritime education is, therefore, one of the most valuable investments we can make in the future of our industry.

Türkiye possesses a strong maritime heritage and remarkable potential. Maritime faculties, vocational high schools, training centers, shipyards, ports, and industry organizations form

Haydar ÖZDEN

the foundation of this ecosystem. To unlock its full potential, however, closer cooperation between educational institutions and the maritime sector is essential. Young people should experience the industry not only through textbooks but also through hands-on learning, while the industry must provide greater opportunities for their enthusiasm, curiosity, and professional development. The future of maritime depends on successfully combining today's experience with tomorrow's talent.

Maritime education is also a matter of culture. Nurturing young professionals who respect their profession, continuously improve themselves, remain open to learning, and embrace responsibility is a shared mission of educational institutions, public authorities, private companies, civil society organizations, and the maritime media.

In this special issue, Deniz Gündem examines maritime education as one of the defining pillars of our industry's future. We extend our sincere thanks to Özgür Alemdağ, CEO of Maritime Trainer, who served as the editorial advisor for this issue, as well as to his team and to all the industry professionals who generously contributed their knowledge and experience.

The seas will change. Technology will continue to evolve. Ships will continue to evolve. Yet one fundamental truth will remain unchanged: it is well-trained people who will always carry the maritime industry into the future. Strong education will remain the maritime industry's most reliable compass—today, tomorrow, and for generations to come.

Haydar Özden

Type of Publication

Digital Monthly

The Concessionaire

Gülşen ÖZDEN

Editor-In-Chief

Haydar ÖZDEN

European Representative

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Erensoy ARICAN

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News & Events

From Türkiye, Around the World, Events...



Industry Knowledge

Naval Architect and Author Sinan Kavala argues that true competitiveness in the shipbuilding industry can only be achieved through institutionalized knowledge and experience, and that AI-powered organizational knowledge systems will shape the future of the industry.



Ange: Gökçe Şengezer

Accurate information is not just an advantage in maritime—it is the foundation of safety. In the digital age, access to information is easier than ever, but finding reliable information has become more challenging. That is why trusted sources and accurate terminology remain essential in maritime education.



Feature: Maritime Education

In this special feature, prepared with the guidance of Capt. Özgür Alemdağ, Founder and CEO of Maritime Trainer, we explore the new approaches to maritime education that are shaping the seafarers of tomorrow through insights from leading figures across the industry.



Maritime Psychology

Fatma Nur Yalçınkaya, President of the Maritime Psychology Association, emphasizes that managing the psychological challenges faced by seafarers is a critical priority for operational safety and the protection of the human element.



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Türkiye İş Bankası and the Chamber of Shipping Sign Financing Cooperation Agreement



Türkiye İş Bankası and the Chamber of Shipping (İMEAK DTO) have signed a cooperation agreement aimed at improving the maritime sector's access to finance. Under the agreement, Chamber members will benefit from preferential financing packages, as well as banking products and services tailored to the needs of the maritime industry.

Speaking at the signing ceremony, Sezgin Yılmaz, Deputy General Manager of Türkiye İş Bankası, highlighted the strategic importance of the maritime sector to Türkiye's economy and foreign trade. He stated that the Bank will continue to provide financing solutions that support the sustainable growth of the industry and contribute to its long-term development.

Tamer Kiran, Chairman of the Chamber of Shipping (İMEAK DTO), said that the agreement will enable members to access financing more easily and under more favourable conditions. He noted that improving access to financing for investments, working capital and fleet renewal would make a significant contribution to the competitiveness of Türkiye's maritime industry.

In addition to preferential financing options, the cooperation will provide Chamber members with preferential banking products and a range of financial solutions tailored to the sector's needs. The agreement is expected to support the sustainable growth of the Turkish maritime industry while helping companies meet their financing needs under more favourable conditions.



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Arkas Bunker and DB Tarımsal Enerji Bring Maritime Industry Leaders Together at Biofuel Summit



At a time when international regulations aimed at reducing carbon emissions are gaining momentum, Arkas Bunker and DB Tarımsal Enerji brought together representatives from across the maritime industry at the seminar titled “Biofuels in Shipping: Sustainability, Technical Compatibility, Operational Experience and Future Perspectives,” held in Istanbul. The event focused on the growing role of low-carbon fuels in maritime transport and highlighted how an integrated model combining certified domestic biofuel production with practical bunkering expertise can support the industry’s green transition.

Speaking at the seminar, Seçkin Gül, General Manager of Arkas Bunker, stated that biofuel is no longer a solution for the future but a solution for today. He revealed that, over the past two years, the company has completed more than 60 biofuel bunkering operations for 32 different vessel types, supplying over 15,000 tonnes of biofuel and avoiding approximately 14,500 tonnes of CO₂ emissions. Gül emphasized that biofuel is fully compatible with existing vessel infrastructure, technically viable, and a practical solution for complying with emerging environmental regulations.

Selçuk Borovalı, Chairman of the Board of DB Tarımsal Enerji, underlined that biofuel production creates an integrated value chain extending beyond shipping into waste management, agriculture, energy, and industry. He explained that the company’s İzmir

facility has been transformed into an integrated bio-refinery, where all feedstocks are converted into value-added products, while the remaining residues are utilized for biogas production to generate renewable energy.

The seminar also highlighted that international carbon regulations are reshaping the maritime sector far beyond environmental compliance. Participants emphasized that these regulations directly influence freight costs, export competitiveness, access to financing, and supply chain security. They also agreed that the transition to low-carbon fuels presents a significant opportunity for Türkiye to strengthen its ambition of becoming a regional bunkering hub.





DTO Kocaeli Issues Global Trade Warning: “India-EU Trade Deal Could Weaken the Competitiveness of Turkish Industry”



Speaking at the June Assembly Meeting of the Kocaeli Branch of the Chamber of Shipping (İMEAK DTO), Branch Chairman Vedat Doğusel warned that rising protectionist policies in global trade, together with the Free Trade Agreement (FTA) currently being negotiated between the European Union and India, could pose significant risks for Türkiye. He stated that, should the agreement enter into force, Indian goods could gain access to the Turkish market by benefiting from lower customs duties, potentially weakening the competitiveness of domestic manufacturers.

Doğusel also stressed that, despite Türkiye's participation in the EU-Türkiye Customs Union, the country has no say in the European Union's free trade agreement negotiations, a situation that remains a structural challenge. “When a country signs a trade ag-



reement with the European Union, it can also gain access to the Turkish market under preferential tariff arrangements. This could undermine our competitiveness,” he said, adding that the modernisation of the Customs Union is therefore of critical importance.

In addition to global trade developments, environmental issues and maritime safety were also high on the meeting's agenda. Doğusel described the ongoing seabed sludge removal project in the Gulf of İzmit as a strategic investment for the region's environmental future. He also paid tribute to the seafarers who lost their lives in the attack on the Turkish-linked Victress in the Black Sea, noting that security risks to maritime transport continue to grow.



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The 7th Bosphorus Shipbrokers' Dinner Held in Istanbul 2,500 Maritime Professionals Gathered at One of the Industry's Leading Networking Events



Leading figures from the global maritime industry gathered in Istanbul for the 7th Bosphorus Shipbrokers Dinner, organized by the Turkish Shipbrokers' Association (GBD). Following months of preparation, the event brought together key players in international maritime trade, with geopolitical developments, international cooperation, and the ambition of strengthening the global position of Turkish shipbrokers emerging as the evening's central themes.

Recognized as one of the maritime industry's leading networking events, the 7th Bosphorus Shipbrokers Dinner welcomed maritime professionals from around the world to Istanbul. Hosted by the Turkish Shipbrokers' Association, the event once again served as an important platform for strengthening international cooperation and business relations across the global shipping community.

Opening the event, Onur Türkeş, Chairman of the Board of the Turkish Shipbrokers' Association, emphasized the importance of solidarity and collective action within the maritime industry. Noting that Turkish shipbrokers have been steadily expanding their presence in international markets, Türkeş said one of the association's primary goals is to establish Turkish shipbrokers as globally recognized brands.



“Our primary goal is to establish Turkish shipbrokers as globally recognized brands. Through this unity, we will continue representing our country at the highest level of international maritime trade,” Türkeş said.

Vice Chairman Serhan Özcan, Secretary General Murat Hilkin and the association's board members played a leading role throughout the months-long preparation process, with teamwork highlighted as a key factor behind the event's success.

Geopolitical developments affecting global shipping were another major topic of the evening. Tamer Kıran, Chairman of the Board of the İMEAK Chamber of Shipping, highlighted the impact of rising geopolitical tensions on the maritime industry. He stressed that peace, stability and international cooperation at both regional and global levels remain essential for the sustainable growth of global shipping.

Among the distinguished guests was Üsküdar Mayor Sinem Dedetaş, who is also well known for her professional background in the maritime sector.

Public sector support was also reflected during the event. In a video message, Ünal Baylan, Director General of Maritime Affairs at the Ministry of Transport and Infrastructure, congratulated the Turkish Shipbrokers' Association and reaffirmed the government's continued support for the maritime industry. The organizers also thanked all contributors, especially the Honorary Sponsor, the İMEAK



Chamber of Shipping, together with the Platinum, Gold, Silver, Bronze and Digital Media sponsors.

Bringing the international maritime community together in Istanbul once again, the 7th Bosphorus Shipbrokers Dinner concluded with a live performance by renowned Turkish musician Ayhan Sici-moğlu, providing a memorable finale to one of the maritime industry's leading networking events.





Maritime Security Report Raises Alarm: Four Cargo Ships on Türkiye Routes and Three Tankers off Its Coast Targeted

A maritime security report has revealed that the growing military activity in the Black Sea is beginning to directly affect Türkiye's maritime trade. According to a report published by Palaemon Maritime covering the period from 24 to 31 May, four cargo vessels operating on Türkiye-bound routes and three tankers off the Turkish coast were targeted by unmanned aerial, surface and underwater systems within the span of a single week. During the same period, a total of 15 maritime security incidents were recorded across the Black Sea, the Gulf of Aden, the Gulf of Finland, the Gulf of Guinea, the Gulf of Oman, and the Strait of Hormuz.

The report states that most of the attacks in the Black Sea involved unmanned aerial vehicles (UAVs), unmanned surface vessels (USVs), unmanned underwater vehicles (UUVs), and drifting sea mines. Russian drones and unmanned underwater vehicles reportedly struck four foreign cargo vessels operating on Türkiye-bound routes, as well as a vessel in the Port of Odesa. Ukrainian forces, meanwhile, were also reported to have targeted a vessel and a Russian oil storage facility in Berdyansk, in addition to three shadow fleet tankers off the Turkish coast, using drones. Elsewhere, a tanker suffered severe damage following an explosion off the coast of Muscat, while in the Gulf of Finland two magnetic mines attached to a Liberia-flagged gas carrier were successfully neutralised before they could pose a threat.

Beyond military threats, the report also highlights the continued risks posed by piracy and sabotage. A pirate attack on a merchant vessel in the Gulf of Aden was thwarted following the intervention of the Indian Navy, while an armed skiff approaching a tanker off the coast of Yemen was driven away after the crew implemented onboard security measures. Off the coast of Côte d'Ivoire, an offshore supply vessel at anchor was targeted by robbers, once again drawing attention to security risks in port and anchorage areas.

Experts recommend that vessels operating in the Black Sea and the Strait of Hormuz maintain continuous surveillance against unmanned aerial vehicles (UAVs), unmanned surface vessels (USVs), and drifting sea mines. They also advise regular hull inspections while anchored in high-risk areas, close coordination with the relevant military authorities before transiting the Strait of Hormuz, and the deployment of armed security teams together with active anti-piracy deterrent systems for vessels operating in the Gulf of Aden. Seafarers are further urged to monitor local and international navigational warnings continuously throughout their voyages.



Koç, Ciner and Bayegan Place Major Vessel Orders: Combined Ship Orders Approach USD 2 Billion

Rising uncertainty in global energy markets and growing concerns over supply security have accelerated maritime investments by leading Turkish companies. Koç Holding, Ciner Group, and Bayegan have placed a series of orders with South Korea's HD Hyundai shipyards for Very Large Gas Carriers (VLGCs) and Very Large Ammonia Carriers (VLACs). The combined value of the three groups' investments is approaching USD 2 billion.

The largest investment of the year came from Ciner Group. After placing initial orders for four VLGCs in April, the company followed up with an order for six dual-fuel VLACs in May. The investment, covering a total of ten vessels, is valued at approximately USD 1.2 billion, with deliveries scheduled to be completed by the end of 2029.

BGN, a subsidiary of Bayegan, also expanded its newbuilding programme by adding two more VLGCs to the four vessels ordered in March. The total investment for the six dual-fuel VLGCs, each with a cargo tank capacity of 93,000 cbm, is estimated at around USD 700 million. With the latest orders, the company's gas carrier fleet is expected to grow to 19 vessels.

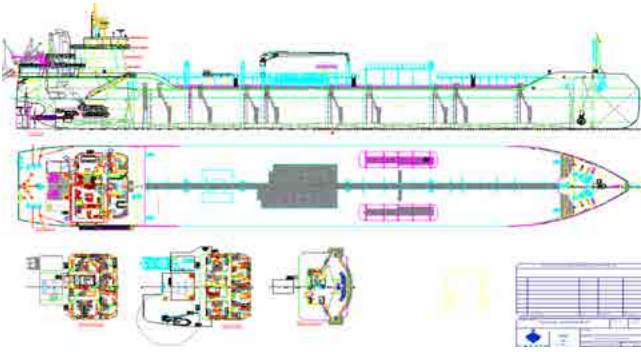
Meanwhile, Aygaz, a subsidiary of Koç Holding, placed an order for two Panamax-class LPG carriers with an investment of approximately USD 240 million. The vessels, each with a cargo tank capacity of around 90,000 cbm, are scheduled to join the fleet in the fourth quarter of 2028 and the second quarter of 2029, respectively.







Norden-Designed Chemical Tanker Bumın Enters Commercial Service



Bumın, a chemical tanker for which Norden Ship Design House, one of Türkiye's leading ship design companies, provided detailed engineering, has officially entered commercial service following the completion of its construction. Designed with a strong focus on fuel efficiency and environmental performance, the vessel has now commenced commercial operations.

Developed to meet the evolving demands of modern shipping, Bumın was designed with particular emphasis on fuel efficiency, operational performance, and environmental responsibility. The vessel's entry into service is regarded as another example of the growing competitiveness of Turkish naval architecture and marine engineering in the international shipbuilding market.

Özer Kaymak, Chief Executive Officer of Norden Ship Design House, expressed his pride in seeing the vessel delivered and congratulated the design and production teams whose efforts contributed to the successful completion of the project. He also wished Bumın safe voyages and a long, successful operational life on the world's seas.

Based in Tuzla, Norden Ship Design House has further strengthened its brand in international markets with the delivery of Bumın. The company continues to represent Türkiye's shipbuilding industry on the global stage by providing design services across a broad portfolio that includes bulk carriers, advanced tankers, specialised workboats, and floating docks.



SolarDuck and MARIN Secure €3.2 Million Grant: A New Era for Offshore Energy

Dutch floating solar company SolarDuck and MARIN (Maritime Research Institute Netherlands) have secured a €3.2 million grant under the Steady Seas research programme, which aims to provide continuous, low-carbon energy to offshore subsea infrastructure. The funding, awarded by the Netherlands Enterprise Agency (RVO), will support the development of the Offshore Floating Power Hub (OFPH), an innovative platform designed for offshore energy applications.

The OFPH platform is intended to provide electricity, communications, and other essential services to offshore oil and gas facilities, Carbon Capture and Storage (CCS) projects, and ocean monitoring systems located far from shore. By reducing reliance on long subsea power cables and diesel generators, the project aims to lower carbon emissions while improving operational efficiency and reducing operating costs.

The research programme will build on the experience gained through SolarDuck's Merganser project in the North Sea. SolarDuck will lead the platform design and system integration, while MARIN will carry out hydrodynamic analyses, wave response analyses, and structural integrity and endurance testing to validate the platform's performance under offshore operating conditions. Following the research phase, the technology is expected to be prepared for commercial deployment, with Joint Industry Projects (JIPs) planned in collaboration with global industry stakeholders.





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Yalova Exports Reach Record High: Exports Surge 146% in the First Five Months to Exceed USD 725 Million

Yalova recorded a record export performance during the first five months of 2026, with total exports increasing by 146.3% compared with the same period last year. The value of exports rose from USD 294.7 million to USD 725.8 million, while the highest monthly export figure was recorded in April, reaching USD 275.5 million.

The ship, yacht and services sector once again served as the main driver of export growth. During the first five months of the year, the sector recorded exports of USD 664.7 million, accounting for the vast majority of Yalova's total exports. It was followed by the steel sector with USD 26.6 million, and the chemicals and chemical products sector with USD 10.1 million.

Other sectors generating more than USD 1 million in exports included ready-to-wear and apparel (USD 6.9 million), mining (USD 5.2 million), machinery and components (USD 2.4 million), ornamental plants (USD 2.3 million), ferrous and non-ferrous metals (USD 2.2 million), electrical and electronic equipment (USD 1.6 million), and the HVAC industry (USD 1.6 million).

The latest figures once again highlight the decisive role played by Yalova's shipyards and shipbuilding industry in the province's economy and export growth.



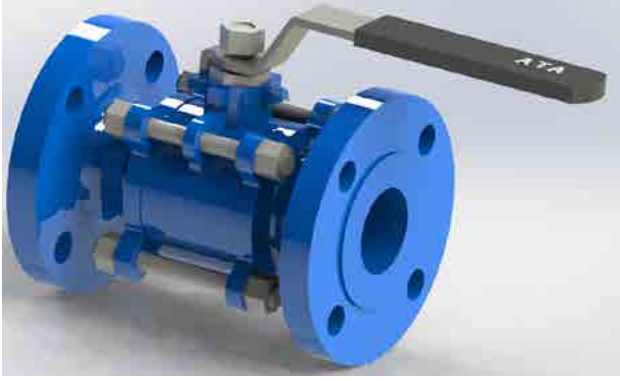
New Opportunity for Shipyard Investment in Zonguldak: 42,897-Square-Metre State-Owned Site Opened to Investors

According to a notice published in the Official Gazette on 24 June 2026, the Ministry of Transport and Infrastructure has invited applications for the allocation of a 42,897-square-metre state-owned site in Kilimli, Zonguldak, for the development of a new shipyard. The property, located behind the main breakwater of the Kilimli Fishing Harbour, is open to applications from individuals and private legal entities. Applications, together with the required documentation, must be submitted to the Ministry in sealed envelopes within 30 days of the publication date.

The successful applicant will be authorised to establish shipyard-related facilities on the site. However, before construction can begin, all environmental permits and other statutory approvals must be obtained during the preliminary authorisation process to be conducted by the Ministry of Environment, Urbanisation and Climate Change. The investor will also be required to obtain a construction permit and commence work within one year of the site handover, while the project must be completed in accordance with the approved project schedule within two years.

Following approval of the allocation process, the successful investor may be granted a usufruct right or right of use over the state-owned property for a period of up to 30 years. Applications will be evaluated by a commission established by the Ministry based on technical and financial criteria. The planned investment is expected to strengthen shipyard capacity in the Black Sea region, stimulate the regional economy, and create new employment opportunities.





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Marport and CMA CGM Strengthen Partnership as FEMEX Service Begins Regular Calls

The partnership between Marport and CMA CGM has entered a new phase as the FEMEX service, operating between Northern Europe and Türkiye, has begun making regular calls at Marport. Under the new operational arrangement, operations previously handled at another terminal have been consolidated at Marport, bringing CMA CGM's activities in Ambarlı together at a single terminal.

The FEMEX service is a key container shipping service connecting Northern European ports with Türkiye's Marmara and Aegean regions. It links major European ports—including Southampton, Antwerp, Hamburg and Rotterdam—with the Turkish ports of Ambarlı (Istanbul), Gebze, Gemlik and Aliğa. Through its regular port calls, the service is designed to provide reliable schedules, consistent transit times and greater operational efficiency.

Supported by Marport's advanced terminal infrastructure and high container handling capacity, the new operating model is expected to enhance CMA CGM's service quality in Türkiye, improve vessel operations and deliver faster, more effective solutions for customers. The initiative is also expected to strengthen Türkiye's position within regional logistics networks while supporting the country's international trade flows.

The concentration of CMA CGM's terminal operations at Marport is regarded as an important part of the company's growth strategy in Türkiye. With the FEMEX service now making regular calls at the terminal, the partnership aims to provide a more reliable, efficient and sustainable service network for both import and export cargoes.



Gemak Completes FPU Modules for the Sakarya Gas Field

Gemak Group of Companies has completed the module fabrication works it undertook for the Osman Gazi Floating Production Unit (FPU) as part of the Sakarya Gas Field Phase 2 development project, supporting Türkiye's goal of strengthening its energy independence. The project commenced in November 2025 and was completed in July 2026. The modules will be deployed at the Sakarya Gas Field in the Black Sea, approximately 170 kilometres offshore in 2,150 metres of water, where they will process natural gas before it is transported ashore from the 405 billion cubic metre reserve discovered in 2020.

The FPU systems will perform a range of critical offshore processing functions, including receiving production fluids from subsea wells, separating oil, gas and water, processing natural gas, treating produced water and transferring processed products. The project involved approximately 2,100 tonnes of steel fabrication, with manufacturing carried out through the integrated production capabilities of Gemak Altınova Shipyard and the Neta Boru Çelik Factory. Steel fabrication and outfitting works were completed in accordance with DNV-OS-C401 standards, while surface preparation and coating applications complied with ISO 8501-1 and SSPC SP-10 specifications.

One of the project's notable engineering achievements was the digital integration established between the Tekla modelling system and the NC-controlled pipe cutting machine for full-penetration pipe welding applications. This synchronisation enhanced both production accuracy and efficiency. The completed modules were transported and shipped using Gemak's self-propelled modular transporters (SPMTs) together with the M/V Neta, enabling the entire process—from fabrication to logistics—to be carried out entirely using the Group's in-house resources.

The Osman Gazi FPU modules will be deployed as part of the Sakarya Gas Field Phase 2 development programme led by the Turkish Petroleum Corporation (TPAO) and are expected to help increase Türkiye's natural gas production capacity. Through its expertise in shipbuilding, heavy industry, steel construction and offshore engineering, Gemak Group of Companies continues to play a key role in Türkiye's strategic energy projects.

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The Azra C Case Deepens: Experts Issue Critical Warning: Around 15 More Ships in the Region Pose Similar Risks

Following the plight of the Indian crew aboard the Azra C, which has been at the centre of public attention for months off the coast of Zeytinburnu, Istanbul, a statement drawing attention across the maritime community has been issued. Mediator and Attorney Arif Sinan Ünlü stressed that the incident is not merely a humanitarian issue affecting seafarers, but also a serious threat to maritime safety. According to Ünlü, approximately 15 other foreign-flagged vessels in the region face risks similar to those of the Azra C as a result of financial and legal difficulties.

According to the statement, contrary to the public perception that the seafarers had been “abandoned to their fate,” the local Harbour Master’s Office, relevant public authorities, the Consulate General of India, DAD-DER, and the International Transport Workers’ Federation (ITF) have been working in coordination throughout the process. Of the 12 Indian crew members on board, eight have been safely repatriated, while one seafarer requiring medical treatment was transferred to hospital. The remaining four crew members continue to receive regular supplies of food, drinking water, and other essential necessities.

However, experts warned that the vessel’s fuel reserves have fallen to a critical level and that the number of crew members remaining on board has dropped below the minimum safe manning requirement, posing a serious threat to navigational safety and the safety of life at sea. Ünlü emphasized that resolving abandoned vessel cases is not solely Türkiye’s responsibility, noting that Flag States, shipowners, insurers, and diplomatic missions must also take an active role in the process. He added that in many such cases, shipowners become insolvent and Flag States fail to assume sufficient responsibility, leaving Turkish authorities and non-governmental organizations to shoulder most of the burden.

The statement also included an important warning for seafarers. Before joining a vessel, they should assess not only salary levels and contractual terms, but also the vessel’s age, technical condition, flag, and the shipowner’s track record. The 50-year-old Azra C serves as an important lesson for the maritime industry in preventing similar incidents in the future.



Tamer Kiran Announces He Will Not Seek Re-election: Race for the İMEAK Chamber of Shipping Presidency Officially Begins

The June Assembly Meeting of the Chamber of Shipping (İMEAK DTO) featured several major announcements ahead of the Chamber’s upcoming elections. Chairman Tamer Kiran announced that he will not seek a third term in the elections scheduled for October, while the first two candidates officially entered the race for the presidency.

Reflecting on his eight years in office, Kiran said his decision was guided by the principles of institutional continuity and sustainability. Emphasising that no position is permanent, he stated that strong institutions remain strong when leadership is passed on at the right time. Kiran also announced his support for the current Vice Chairman, Recep Düzgit, in the upcoming election. During the meeting, Recep Düzgit and Assembly Member Şadan Kaptanoğlu officially declared their candidacies for the Presidency of the Chamber of Shipping.

Addressing developments affecting the maritime sector, Kiran welcomed the resumption of commercial vessel traffic through the Strait of Hormuz following the temporary agreement reached between the United States and Iran. At the same time, he described the attacks on Turkish-flagged merchant vessels in the Black Sea as deeply concerning and said that diplomatic efforts to safeguard the security of Turkish seafarers are ongoing.

Turning to regulatory issues, Kiran stated that the Ship Agencies Regulation, which entered into force in May, has imposed additional personnel requirements on Class B ship agencies, imposing additional costs on the sector. He announced that the Chamber has submitted a request to the Ministry of Transport and Infrastructure seeking revisions to the relevant provisions. He also noted that problems related to customs summary declaration procedures have been resolved and announced the signing of a new credit cooperation agreement aimed at improving the sector’s access to finance.

Kiran further stated that the Chamber’s financial position had strengthened considerably during his tenure. He revealed that the Chamber’s budget had increased from TRY 97 million in 2018 to approximately TRY 1.7 billion, while the Chamber’s USD 10 million debt and Piri Reis University’s USD 60 million financial liabilities that existed when his administration took office had been fully settled. At the end of the meeting, the winners of the “Seafaring Nation, Seafaring Country” Project Competition were announced. The awards will be presented during the 5th Türkiye Maritime Summit on 3 July.

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When knowledge is lost, it is not only a project that disappears. Years of effort, hard-earned experience, and the most valuable asset capable of shaping the future can vanish with it. The true strength of Türkiye's shipbuilding industry lies not merely in the vessels it builds, but in its ability to preserve and transfer its collective knowledge to future generations.



Sinan KAVALA
Consultant | Naval Architect

Over the past three decades, Türkiye's shipbuilding industry has undergone a remarkable transformation. Shipyards that once specialized in a limited range of vessel types are now delivering technologically advanced, high-value vessels to customers around the world. The industry has also established internationally recognized capabilities in naval shipbuilding, yacht construction, and repair and maintenance services.

Taken as a whole, the sector has accumulated an extraordinary body of knowledge and experience.

None of these achievements came easily. Behind every successful project were long working hours, technical challenges, delivery pressures, economic crises, unforeseen setbacks, failures, and, above all, people who repeatedly found the determination to move forward despite them.

Today, we possess substantial expertise gained through projects incorporating technologies that, in some cases, were being implemented for the first time. These projects required millions of man-hours and involved the contributions of thousands of professionals across the supply chain. The knowledge accumulated through such efforts represents one of the industry's most valuable assets.

The Real Value of Experience

The question is: how effectively are we preserving the knowledge and experience acquired through

such tremendous effort and investment?

Despite advances in technology, improvements in education, and the growth of our workforce, one of the industry's most persistent challenges remains the shortage of qualified personnel. Perhaps even more significant is our limited ability to institutionalize and transfer the knowledge accumulated over decades to future generations.

In the early 2000s, Turkish shipyards secured a significant share of the global chemical tanker market. During that period, shipyards, engineering companies, design offices, and marine equipment manufacturers acquired invaluable expertise. The global financial crisis of 2008, however, resulted in the loss of part of this accumulated know-how. In the years that followed, new capabilities emerged through the construction of offshore support vessels, electric ferries, fishing vessels, tugboats, mega yachts, and a wide range of naval projects that attracted international attention. Yet global economic and political fluctuations have repeatedly disrupted continuity, causing valuable expertise to be lost along the way. What concerns me is that the value we manage to pass on to future generations does not always reflect the effort invested in acquiring it. Too often, experience gained during a project disappears when the project itself comes to an end. Yet the true strength of any industry lies not only in its ability to create knowledge, but in its ability to retain it.

Projects End, Experience Should Not

Why is knowledge transfer so difficult? The answer extends far beyond the absence of systems or procedures. By the nature of our business, once a project is completed, attention quickly shifts to the next challenge. Documentation plans, root-cause analy-

"The true value of a ship is not measured only by the day it is launched. The true value is the knowledge and experience gained throughout the project being able to be transferred to future generations. The industry's sustainable power is built with institutionalized experience."

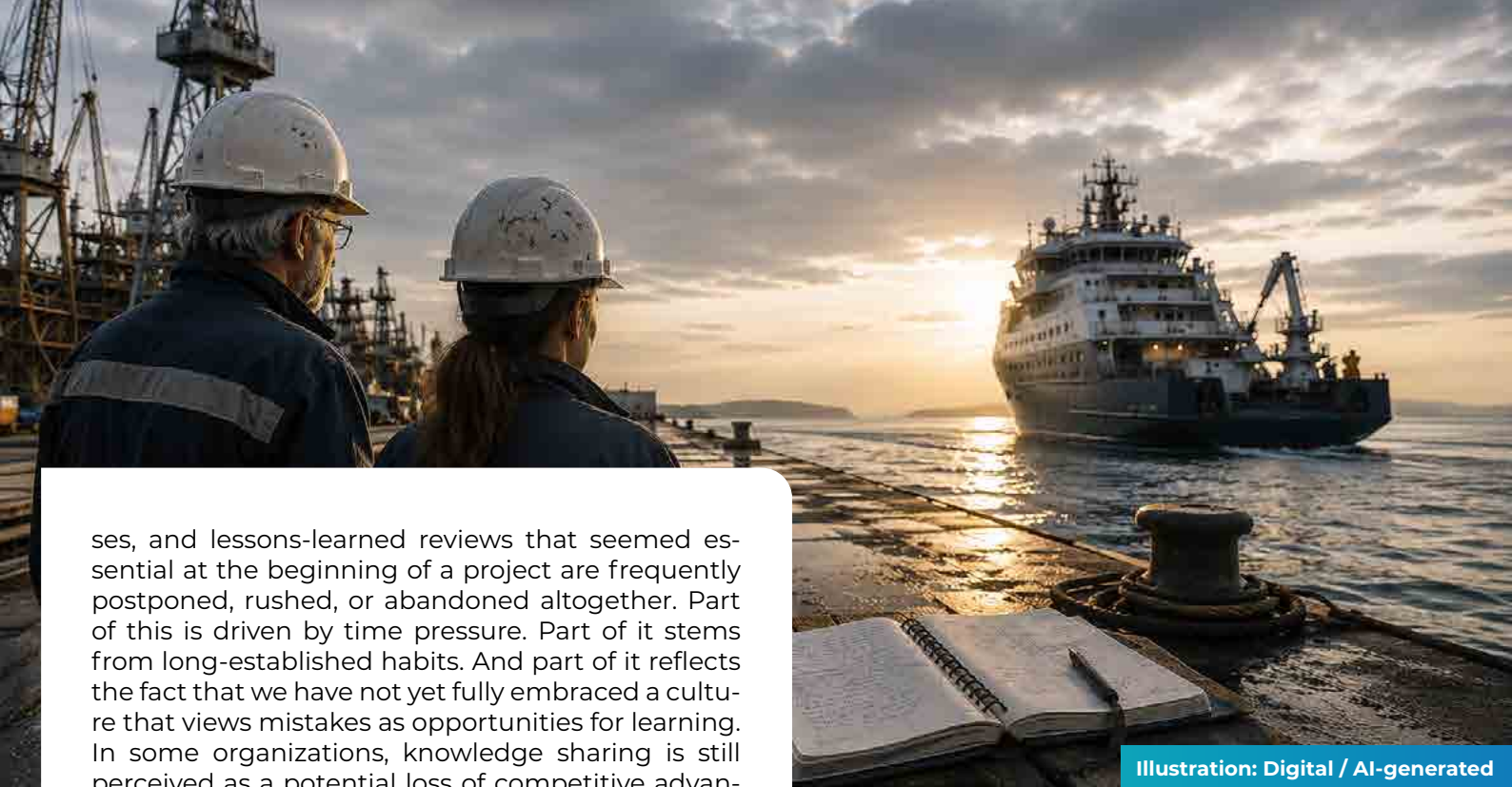


Illustration: Digital / AI-generated

ses, and lessons-learned reviews that seemed essential at the beginning of a project are frequently postponed, rushed, or abandoned altogether. Part of this is driven by time pressure. Part of it stems from long-established habits. And part of it reflects the fact that we have not yet fully embraced a culture that views mistakes as opportunities for learning. In some organizations, knowledge sharing is still perceived as a potential loss of competitive advantage. I believe the era when knowledge derived its value from secrecy is long behind us. Today, knowledge becomes more valuable when it is shared. Its true worth emerges when it is understood, discussed, challenged, and transformed into lessons that others can build upon.

When a vessel is delivered, we are not simply handing over a finished product. We are also concluding a process that has generated hundreds of technical decisions, resolved numerous complex problems, and produced countless lessons. These lessons extend far beyond engineering. Valuable insights emerge in finance, legal affairs, procurement, project management, occupational health and safety, and countless other disciplines involved throughout the project lifecycle. The vessel may leave the quay, but the knowledge and experience it leaves behind are the industry's most valuable assets.

Experience That Is Never Recorded

Consider the engineer who identifies a critical improvement during the design stage. Consider the chief engineer who notices a seemingly minor issue during sea trials. Consider the project manager who develops an innovative solution during a crisis, the skilled craftsman who accumulates practical expertise over decades, or the shipyard team that extracts important lessons from a complex project.

Each of these examples represents knowledge that cannot easily be measured, yet carries immense value. The work undertaken within our industry involves enormous responsibility. In some cases, a single well-informed decision can prevent significant financial losses or even save lives. In others, mistakes can result in serious consequences. The lessons gained through such experiences should not remain

"The most valuable cargo is not the ship leaving the shipyard; it is the experience gained while building that ship. Knowledge grows as it is shared and becomes permanent as it is transferred. Strong industries are those that are able to protect this invisible capital."

confined to individuals, organizations, or individual projects.

They are part of a much larger asset shared by the entire industry—and indeed by the nation itself.

Major projects are completed through significant personal sacrifice, commitment, and risk. They generate economic value, create employment opportunities, and produce remarkable engineering achievements. Yet perhaps their most valuable outcome is the knowledge and experience they leave behind. That knowledge is the capital that will ultimately determine the future competitiveness of both our industry and our country.

Every lesson that is lost means future generations may be forced to repeat the same struggles and pay the same price to learn what was already known before. Unfortunately, economic downturns, organizational changes, retirements, and generational transitions often result in a significant portion of this knowledge disappearing with them.

“When knowledge is lost, not only the past is lost, but the future as well. True leaders are institutions that can manage the knowledge born from their projects as much as the projects themselves. Because sustainable success lies in the hands of those who can institutionalize learning.”

From Craftsmanship to Institutional Memory

Knowledge and experience cannot be preserved through reports, procedures, and databases alone.

A significant portion of expertise resides in lived experiences, critical decisions, and the practical solutions developed over years of work. Some lessons are documented; many are not. Yet these undocumented insights often prove to be the most valuable.

This is why the traditional master-apprentice relationship remains highly relevant, even in today’s technology-driven world.

Most professionals can trace important moments in their careers to individuals who shared their knowledge with them. Sometimes it was a master craftsman, sometimes a supervisor, and sometimes an experienced colleague working on the same project.

What was transferred was rarely limited to technical expertise. More often, it involved ways of thinking—how to approach a problem, identify risks, evaluate alternatives, and make sound decisions under pres-

sure. For this reason, mentoring deserves a far more prominent place within our industry. At the same time, mentoring should not be viewed as a one-way transfer of knowledge from senior professionals to younger generations. Today’s young professionals bring valuable expertise in digital technologies, data analytics, automation, and artificial intelligence. Perhaps the most effective model is one in which both generations learn from one another, combining experience with innovation to create a stronger and more resilient industry.

Investing in Knowledge Management

Around the world, leading engineering sectors are placing increasing emphasis on knowledge management alongside technological development. Aerospace, defence, automotive, and large-scale engineering organizations have long recognized that sustainable competitiveness depends not only on innovation but also on the ability to capture, preserve, and reuse knowledge.

Lessons-learned systems, project memory repositories, corporate knowledge banks, and digital knowledge platforms have become strategic priorities for many organizations.

The aerospace sector provides one of the most compelling examples. For decades, incidents, deviations, and operational challenges have been systematically documented. Root-cause analyses are conducted, lessons are shared across organizations, and findings are integrated into future projects.

Over time, this approach has become embedded in the industry’s culture. The reason is simple: competitive advantage is determined not only by technological capability but also by the speed at which





Illustration: Digital / AI-generated

organizations learn.

Without a strong foundation of accumulated knowledge, even the most advanced technologies cannot compensate for a slow learning process.

Artificial Intelligence and Industry Memory

The rapid development of artificial intelligence is making this discussion even more relevant.

Today, much of the conversation surrounding AI focuses on its potential to transform design processes, project planning, engineering calculations, and decision-making. There is little doubt that these technologies will improve efficiency and reshape many aspects of our work.

What interests me most, however, is a different question:

Can artificial intelligence help preserve our industry's collective memory?

The answer is both promising and challenging.

Just as previous technologies did not automatically create institutional memory, artificial intelligence will not achieve this on its own. If knowledge is not captured, documented, and structured, there is nothing for AI to learn from. Artificial intelligence cannot preserve expertise that has already been lost.

What it can do is make existing knowledge more visible, accessible, and useful than ever before. Imagine a future in which reports from previous projects, quality records, technical notes, root-cause analyses, design reviews, and project experiences are systematically organized and connected through intelligent systems. A young engineer facing a technical challenge could instantly access similar cases from the past, understand how they were resolved, and build upon solutions developed years earlier.

The potential value of such a capability is enormous.

However, the prerequisite remains unchanged: knowledge must first be captured before it can be shared, searched, or enhanced through artificial intelligence.

Capital Passed On to the Future

For this reason, our industry should focus not only on investing in new technologies but also on systematically preserving the knowledge it has already created. Universities, shipyards, professional associations, engineering organizations, and industry stakeholders can play a vital role in this effort.

Capturing the experience of experts approaching retirement, conducting oral-history initiatives, documenting major projects, and establishing AI-supported knowledge repositories could become some of the most important investments we make for the future.

Over the years, Türkiye's shipbuilding industry has built an extraordinary reservoir of knowledge, expertise, and practical experience.

Today, a new responsibility stands before us.

Our challenge is no longer simply to create knowledge, but to ensure that it endures.

Because the ships of the future will not be built solely from steel, software, advanced materials, and emerging technologies. They will also be built upon the experience, lessons, achievements, failures, and wisdom of those who came before us.

Every generation inherits knowledge from the previous one. The extent to which that knowledge is preserved and strengthened will determine how successfully the next generation can move the industry forward.

True progress begins not only when we generate new knowledge, but when we successfully preserve, share, and build upon the knowledge we already possess.

That is the invisible capital that will shape the future of our industry. ■

"Technology can provide speed, but it cannot replace experience. The true value of artificial intelligence will emerge in its ability to carry the knowledge of past generations into the future without letting it be lost. Institutional memory is the most strategic capital of an industry."

Medical Assistance

Learned in Class, Perfected in the Field

In the maritime industry, education is essential not only for seafarers but also for the professionals responsible for safeguarding their health and well-being. Medical assistance specialists manage critical operations that often have a direct impact on the lives of seafarers across the globe. But how is this profession taught? How do medical assistance specialists acquire the skills and expertise required for such a demanding role?



Gökçe ŞENGEZER
Founder

Is there a dedicated university program for those who wish to pursue a career in medical assistance?

No. Medical assistance is a multidisciplinary field that brings together healthcare expertise and operational management. However, there is currently no dedicated university department or standardized academic program specifically designed for this profession. As a result, one of the questions most frequently asked by those outside the industry is: "How do medical assistance specialists become qualified for such a demanding profession?"

Is the role of a medical assistance specialist limited to medical knowledge alone?

Absolutely not. Medical assistance is far more than a healthcare profession; it is a discipline that combines clinical knowledge with operational coordination. Accurately assessing a patient's needs, identifying the most appropriate medical facility, coordinating with physicians and hospitals, maintaining communication with insurance companies and employers, arranging international patient transfers when ne-

cessary, and overseeing every stage of the process are all integral aspects of the role. For this reason, operational management and coordination skills are every bit as important as medical expertise.

In your opinion, what is the most important factor in developing a successful medical assistance specialist?

Professionals working in this field come from a wide range of educational backgrounds. However, academic qualifications alone do not determine success. Strong communication skills, effective crisis management, sound decision-making under pressure, organizational ability, and a people-centered approach form the foundation of the profession. While technical expertise develops over time, the ability to make the right decisions at the right moment and coordinate complex operations effectively is acquired largely through hands-on experience.

What distinguishes medical assistance teams serving the maritime industry from those working in other sectors?

Medical assistance teams supporting maritime operations provide uninterrupted 24/7 assistance to seafarers around the world. Managing a medical emergency at sea requires a fundamentally different approach from coordinating healthcare services ashore. Their responsibilities range from responding to urgent onboard medical situations to organizing complex international medical evacuations. Since every case presents its own unique circumstances, professional expertise is developed primarily through real-world operational experience.

How are new members of medical assistance teams trained?

In-house training forms the cornerstone of professional development. New team members receive comprehensive instruction in case management, medical terminology, patient communication, international healthcare systems, crisis coordination, and operational procedures. This integrated approach enables theoretical knowledge and practical experience to develop simultaneously, ensuring that every team member is fully prepared before assuming operational responsibilities.



Illustration: Digital / AI-generated

When does true expertise develop?

Medical assistance may not have a dedicated academic pathway, but every case represents a new learning opportunity. True expertise is built through managing hundreds of diverse cases, accumulating practical experience, and strengthening teamwork over time. By combining technical excellence with a compassionate, human-centered approach, medical assistance professionals strive to deliver the right solutions when people need them most.

Ultimately, success in medical assistance is built upon continuous learning, strong teamwork, and an unwavering commitment to delivering meaningful value to every patient. ■

"A craft not taught in university lecture halls, but learned entirely in the field through lived experience... The behind-the-scenes of medical assistance expertise, providing the reassurance of 'We are here' in people's most desperate moments."

The Making of a Seafarer

Knowledge, Skill, and Understanding

A seafarer who learns from inaccurate information endangers not only themselves but everyone at sea. The true value of maritime education lies where knowledge, practical skills, and genuine understanding come together.



Alper GÜNÖRAL
Yacht Surveyor, CE Inspector

Knowledge

Education is a fascinating concept. It is far more than the acquisition of knowledge; it is the ability to translate knowledge into practice. According to the Turkish Language Association, education is “the direct or indirect process of helping children and young people acquire the knowledge, skills, and understanding necessary to take their place in society while developing their character, whether inside or outside formal schooling.”

Knowledge, skill, and understanding—these are the three fundamental pillars of maritime education. Let us explore maritime training through the lens of these essential elements.

The collective body of maritime knowledge accumulated over centuries is exceptionally broad. The international maritime lingua franca, shaped by numerous languages, the remarkable consistency found throughout historic maritime publications, and authoritative reference works such as Admiral Cem Gürdeniz’s Dictionary of Seamanship Terms have together created a rich

and enduring maritime literature.

For those who appreciate learning through reading, these publications remain invaluable sources of knowledge. Today, however, they have largely been overshadowed by digital information platforms. With the rapid rise of artificial intelligence, producing visually supported maritime content has become as simple as writing a short prompt. As a result, social media has seen an increasing number of maritime enthusiasts publishing AI-generated educational posts on a daily basis.

Unfortunately, this convenience comes at a cost.

A significant proportion of this content contains terminology that conflicts not only with the established maritime lingua franca, but also with internationally accepted seamanship terminology and fundamental nautical principles. As these inaccuracies are shared, reposted, and viewed by thousands of people, they gradually begin to be accepted as factual information.

A recent example illustrates the problem perfectly. I came across a social media post entitled “What Is the Flag Knot Used For?” Although I have deliberately chosen not to identify the source to avoid promoting it, the post is easily found online.

It claimed that the flag knot is used to join ropes of different diameters. In reality, this description is incorrect. The knot is traditionally used for securing a flag to its halyard and, in seamanship practice, for joining ropes of similar construction rather than ropes of different sizes. While this may appear to be a minor technical detail, it

“In maritime, accurate information is not merely an advantage; it is the foundation of safety. In the digital age, accessing information has become easier, yet reaching the right information is harder than ever. Every incorrectly learned concept can eventually be accepted as truth, weakening professional memory over time. Therefore, reliable sources and precise terminology are indispensable in maritime education.”

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KARTAL / ISTANBUL



Illustration: Digital / AI-generated

demonstrates how easily inaccurate information can spread throughout the digital world.

Finding reliable maritime information online is becoming increasingly difficult. On this occasion, I would also like to acknowledge Bora Erden of Captain's Sailing, one of the few content creators who consistently demonstrates exceptional care in using accurate maritime terminology.

Perhaps the saddest thought that comes to mind while writing these lines is this:

Within a year, even the facts presented in this article may be buried beneath an ever-growing flood of digital misinformation. Maritime knowledge itself risks disappearing under an expanding collection of inaccuracies. Ironically, many of us gave up countless weekends to learn these lessons properly. Even aboard a modest sailing yacht, the range of knowledge expected of a competent seafarer is remarkably wide.

Safety always comes first.

Life aboard requires an understanding of safe movement on deck, maintaining proper balance, using secure handholds, protecting both oneself and fellow crew members, and preventing man-overboard incidents. These may seem like minor details, yet each has the potential to save lives.

Beyond safety, a seafarer must possess a sound understanding of navigation and pilotage, sailing theory, the Bernoulli Principle, and sail trim. Equally important are knowledge of engine operation and routine maintenance, preparing meals on board, maintaining proper nutrition despite seasickness, responding effectively to emergencies, managing onboard waste, kee-

ping the vessel clean, orderly, and shipshape, applying traditional seamanship practices, washing clothes under limited onboard conditions, and even organising social activities that help maintain crew morale.

Ultimately, a competent seafarer must understand not only how to operate a vessel, but also how to ensure that everyone on board can live, work, and voyage together safely, efficiently, and in harmony.

Skill

In seamanship, the ultimate purpose of skill is straightforward: to ensure that a seafarer can always return safely to port, wherever they may be in the world. The sea is not our natural environment. It is constantly changing, unpredictable, and unforgiving. True success, therefore, is measured not by adventure alone, but by reaching the intended destination safely and without incident.

Nor is it only the crew that must arrive safely. Whether carrying cargo, passengers, or simply a dream, every voyage should reach its destination intact.

In seamanship, skill is born where knowledge meets experience. Knowledge can be acquired through study, but experience demands repetition, practice, and a willingness to learn from mistakes.

Knowing that turning a yacht's wheel to starboard will cause the vessel to turn to starboard is knowledge. Understanding how the yacht will respond to a given helm angle under varying wind and sea conditions is skill. Being able to apply opposite helm instinctively, at precisely the right moment, to bring the turn smoothly under control is the mature expression of that skill. The same principle applies to every aspect of seamanship discussed in the previous section.

Knowledge must first be acquired, then interna-

lised, transformed into experience, and ultimately retained in a way that allows it to be recalled instinctively whenever circumstances demand it.

Continuing with the example of a sailing yacht, a skilled sailor should be able to identify navigation marks—such as buoys, headlands, or even prominent landmarks like minarets—on a nautical chart and use them to determine the vessel's position. They should recognise whether the sails are properly trimmed and make the necessary adjustments without hesitation. They should also be capable of preparing or eating a meal while underway without spilling it despite the yacht's motion and, should something be spilled, know how to clean it up properly. Even something as simple as stepping ashore after a passage—having washed away the salt, put on a clean shirt, and arrived feeling refreshed—is part of the long chain of skills that defines an accomplished seafarer.

Yet perhaps the greatest skill of all lies beyond technique. It is the ability to continue enjoying the sea despite its challenges, responsibilities, and unpredictability. For a truly accomplished seafarer is not merely someone who knows how to handle a vessel, but someone who has learned how to live in harmony with the sea.

Understanding

Perhaps the most difficult quality to cultivate, at least in our country, is genuine understanding.

The kind of understanding I am referring to has two distinct dimensions. Unless both become an integral part of a seafarer's character, even the most enjoyable moments at sea can quickly turn into a source of frustration—not only for those on board, but also for everyone sharing the same waters.

The first dimension is the ability to internalise knowledge and transform acquired skills into lifelong habits. Those who embrace seamanship as a way of life do far more than simply enjoy being at sea. They approach training, voyages, and everyday life more safely, more efficiently, and with greater confidence. In doing so, they also make a meaningful contribution to the development of maritime culture itself.

The second dimension is embracing the etiquette of the sea as an inseparable part of everyday life.

Only a few days ago, on a calm and peaceful morning in Selimiye, I went over to a yacht lying at anchor to take a closer look. Nearby, another boat was blasting loud music while its occupants enthusiastically sang along, bringing an energy that clashed completely with the tranquillity of the morning. They seemed eager to play the part of seafarers without truly understanding what seamanship actually means.

Similar scenes are common in marinas, at anchorages, and in boatyards. High-speed motorboats throwing large wakes that disturb surrounding vessels—often followed by heated exchanges between boaters—serve as frequent reminders that seamanship is not simply about operating a boat; it is equally about learning how to coexist with others on the water.

The Seafarer's Code

Throughout my years of teaching sailing, there are several principles that I have consistently emphasised and never grown tired of explaining.

1. Never Lean Against the Lifelines

Leaning against a yacht's lifelines is one of the most dangerous habits a person can develop on board. A lifeline or its supporting stanchions can fail unexpectedly, or a sudden wave may throw someone off balance in an instant. Falling overboard remains one of the leading causes of fatalities in recreational boating and sailing accidents. Recovering a person from the water is already a demanding operation; losing sight of them altogether can become a life-threatening situation within moments.

2. Always Greet Fellow Seafarers

Just as greeting people is a sign of courtesy ashore, it is equally important at sea. Exchanging greetings with nearby vessels is more than a matter of etiquette; it is a long-standing maritime tradition that fosters mutual respect and facilitates communication whenever assistance or information may be needed.

3. Respect Light and Noise Discipline

Whether underway, alongside in a marina, or lying at anchor, unnecessary lighting and excessive noise have no place in good seamanship. Respecting

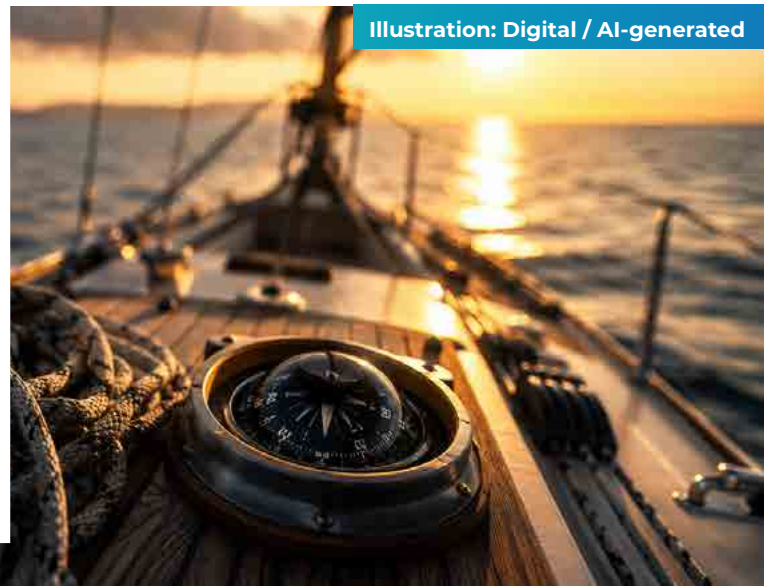


Illustration: Digital / AI-generated



Illustration: Digital / AI-generated

"The convenience of social media brings with it a serious problem: a significant portion of maritime content generated by artificial intelligence contains expressions that contradict fundamental terminology."

the peace of neighbouring vessels and minimising disturbance to marine life are fundamental responsibilities of every conscientious seafarer.

4. Maintain Proper VHF Radio Discipline

Marine VHF radio is not intended for casual conversation. Radio communication follows internationally recognised procedures. Transmissions should be brief, clear, and limited to operational necessity. No working channel should ever be occupied unnecessarily, and VHF Channel 16 serves exclusively as the international calling and distress channel. Once initial contact has been established, communication should immediately be transferred to an appropriate working channel.

5. Respecting the Dardanelles

There is one expression that I have never felt comfortable hearing: "We crossed the Dardanelles." I experienced the same discomfort years ago when I heard those words used in relation to the construction of the bridge spanning the strait.

For Turks, the Dardanelles is far more than an ordinary waterway. One enters from one end and exits from the other, yet, in a symbolic sense, it is never simply "crossed." It is a place of profound historical significance and sacrifice. As seafarers pass the Ç-

nakkale Martyrs' Memorial near the southern entrance to the strait, they should do so with the respect that generations of mariners have traditionally shown.

6. Keep the Boat Shipshape

Keeping a vessel clean, tidy, and well organised is not merely a matter of appearance. Good order allows equipment to be located quickly, enhances safety, promotes hygiene, and improves efficiency in every onboard operation. Above all, a well-maintained boat makes life at sea both safer and far more enjoyable.

The Importance of Training

Sailing training is far more than an activity designed to develop individual skills. It is one of the most effective ways to cultivate teamwork, leadership, communication, and collective problem-solving under real-life conditions.

Alongside individual development, group training strengthens communication among crew members. Differences of opinion are inevitable on board, yet when managed constructively, they often strengthen trust and reinforce the cohesion of the team.

No matter how skilled the helmsman may be, the safety of the voyage can be compromised if the mainsail is not hoisted at the right moment by the crew. Likewise, a Genoa trimmer may trim the sheets perfectly, but if the foot of the sail remains caught inside the lifelines, valuable aerodynamic efficiency is lost. Similarly, no matter how efficiently the foredeck team performs, the success and timing of a spinnaker hoist ultimately depend on the crew member working at the mast, whose actions determine the rhythm of the entire manoeuvre.

These examples demonstrate a fundamental truth: in sailing, individual excellence has little value unless it contributes to the performance of the team as a whole.

For this reason, sailing is much more than a recreational activity; it is a practical leadership laboratory. It teaches individuals how to communicate effectively, trust one another, make decisions under pressure, and work together toward a common objective.

Viewed from this perspective, sailing programmes deserve to be recognised as an integral part of corporate human resources, leadership development, and executive training programmes. Few learning environments demonstrate the value of teamwork, communication, and shared responsibility as effectively as a sailing yacht at sea. ■



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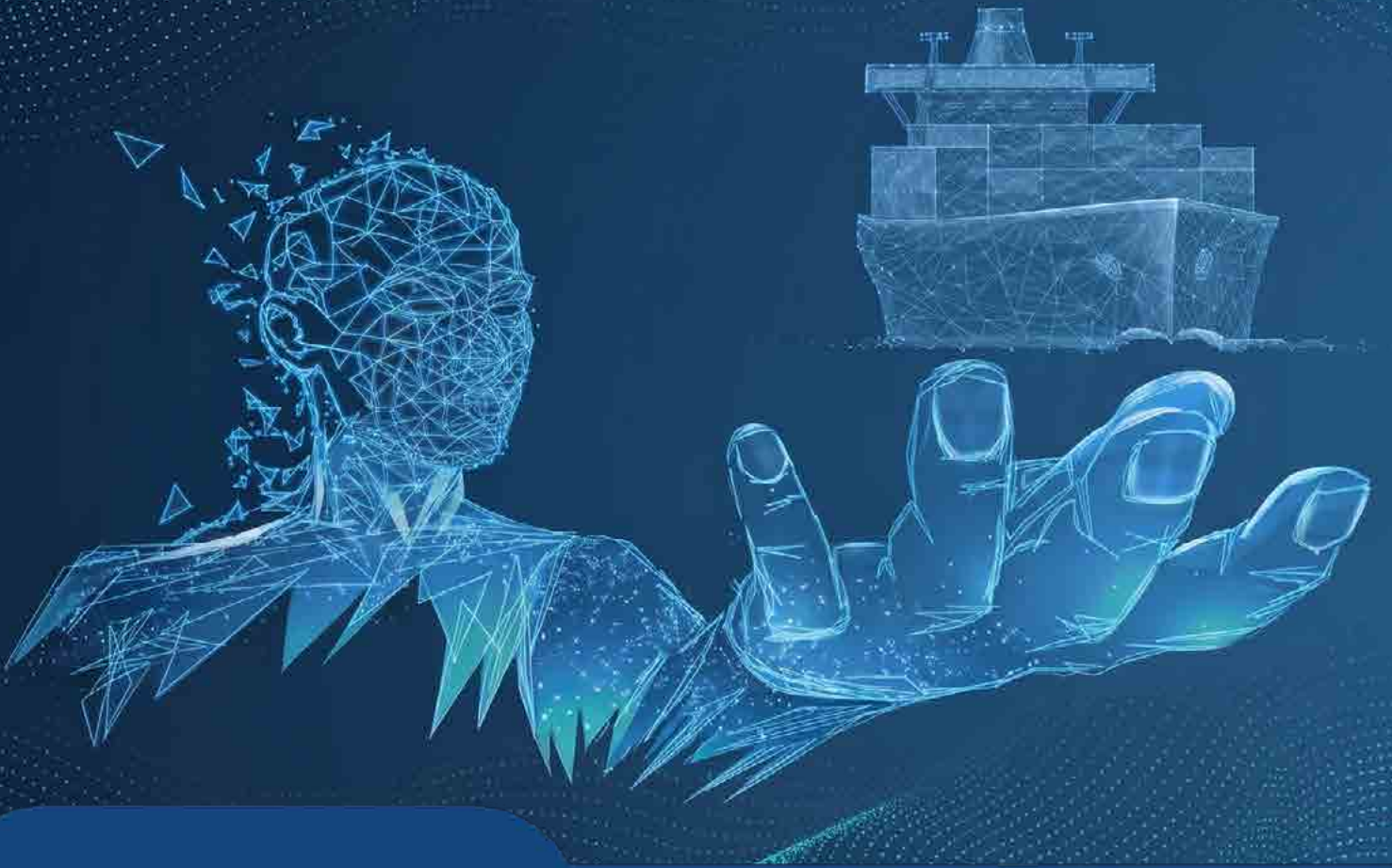


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FEATURE: MARITIME EDUCATION

Today, the maritime industry stands at the center of not only digitalization and the green transition, but also a profound transformation of its workforce. From artificial intelligence and alternative fuels to next-generation vessels and evolving international standards, this transformation demands an educational approach that goes beyond technical expertise—one that can identify, develop, and prepare the right people for the future.

In this month's feature, we explore the evolving role of maritime education and the innovative approaches shaping the industry's future workforce through the insights of leading maritime professionals. From AI-powered learning and competency management to psychological resilience, behavior-based safety culture, digital assessment systems, and Maritime 4.0, we examine the human element at the heart of a safe, sustainable, and future-ready maritime industry.

We extend our sincere appreciation to **Capt. Özgür Alemdağ, Founder and CEO of Maritime Trainer**, for his valuable knowledge, guidance, and contributions to the preparation of this feature.

We look forward to welcoming you back in our next issue as we continue exploring the evolving maritime industry together.

A New Human Model for Maritime

Building the Seafarer of Tomorrow

A global shortage of qualified officers, digitalisation, artificial intelligence and the green transition are reshaping the maritime industry. According to Maritime Trainer, the companies that will lead the future are those that can attract the right talent, develop their people and manage them through data-driven decision-making.



Capt. Özgür ALEMDAĞ
Founder & CEO

Industry reports indicate a significant global shortage of qualified officers, while ship operations are becoming increasingly complex. From Maritime Trainer's perspective, how should the industry manage this officer shortage alongside the challenge of maintaining quality? What is the formula for increasing the number of officers without compromising competence? How does Maritime Trainer support the industry in this regard?

Today, the maritime industry finds itself at the centre of one of the greatest workforce paradoxes in its history. Global workforce reports published by the International Chamber of Shipping (ICS) and BIMCO reveal that the industry is already facing a shortage of thousands of officers, with projections indicating that this gap will continue to widen in the coming years. The shortage is particularly critical in senior management positions such as Masters and Chief Engineers, where finding highly qualified personnel has become increasingly difficult.

So, how did we reach this point? The officer shortage is the result of profound sociological, psychological and geopolitical disruptions.

Pandemic Trauma and Loss of Confidence

During the COVID-19 pandemic, hundreds of thousands of seafarers remained stranded on board vessels for months, unable to return home to their families. Despite being recognised as key workers, many felt they never received the global appreciation they deserved. This experience severely damaged confidence in the profession. Many experienced officers chose early retirement or moved ashore, saying, "Never again." At the same time, countless young people who had considered a maritime career decided to pursue different paths instead.

Geopolitical Conflicts and Security Risks

The Russia-Ukraine war significantly disrupted the supply of seafarers from two countries that together account for approximately 15% of the global maritime workforce. This challenge has been compounded by drone and missile attacks in the Red Sea, regional tensions involving Iran, and vessel seizures and security incidents in the Strait of Hormuz, turning many strategic waterways into high-risk operating areas. Working at sea is no longer perceived simply as a demanding profession—it is increasingly associated with serious physical danger and psychological pressure. Unsurprisingly, many seafarers are reluctant to serve on these routes.

Declining Interest in a Seafaring Career

For the younger generation, the romantic appeal that once surrounded life at sea has largely disappeared. Flexible working models ashore, opportunities in the digital economy, and the desire to remain connected with family and social life have significantly reduced young people's motivation to pursue maritime careers. As the quality and convenience of shore-based life continue to improve, the attractiveness of seafaring declines accordingly.

When these factors are considered together, the

The maritime industry's greatest challenge is no longer its ships, but its people. The real competition will be to develop and retain qualified officers, not simply to find them.



Illustration: Digital / AI-generated

available talent pool continues to shrink, while expectations regarding knowledge, competence and professional standards continue to rise. Ships are becoming increasingly digital, regulations more demanding, and inspections more rigorous than ever before. This leaves shipowners facing a critical strategic decision.

Many companies have begun recruiting personnel from developing countries. However, this approach also introduces operational risks when seafarers lack sufficient maritime education, corporate culture, or communication skills. Consequently, shipowners are increasingly confronted with a fundamental question:

“Should we recruit anyone simply to fill vacancies, or should we invest in long-term human resource strategies that enable us to develop, retain and grow our own talent?”

At Maritime Trainer, our answer is unequivocal. Sacrificing quality in pursuit of quantity inevitably increases the risk of marine casualties, loss of life, environmental incidents, operational failures, and even commercial consequences such as vessels becoming unacceptable to charterers.

Today, sustainable success depends on building long-term human resource strategies, establishing a strong corporate culture, investing in employer branding and public relations, attracting young ta-

Company culture does not begin on board. From day one, every seafarer should feel they are part of the company. A strong sense of belonging is the foundation of safe operations.

lent through cadet programmes, implementing effective recruitment and assessment systems, designing comprehensive onboarding processes, delivering continuously updated interactive training aligned with modern learning habits, systematically managing performance and competencies, supporting employee well-being, and investing in long-term career development.

The role of crewing departments is no longer limited to finding personnel whenever a vacancy arises. We are now entering an era in which companies that take ownership of all these areas are the ones that thrive. Organisations capable of managing every aspect of human resources through a holistic approach will be the winners of the future.

Instead of relying on traditional methods that are rapidly losing their effectiveness, companies that optimise their processes through end-to-end digital infrastructures and data analytics are creating real competitive advantage.

Successful companies do not simply recruit people; they manage human capital strategically. In the maritime industry, long-term competitive advantage comes from strong people before strong fleets.



To support this transformation, Maritime Trainer enables ship management companies to manage the entire employee lifecycle—from recruitment and onboarding to training, development and retention—through a single integrated digital platform. At the same time, our business intelligence solutions support data-driven decision-making, while seamless integration with various ERP systems helps organisations achieve significant savings in both time and operational resources.

This holistic approach enables companies not only to comply with industry standards but also to achieve stronger performance during inspections and audits.

The maritime industry has long been one of the sectors where hierarchy and the traditional master-apprentice relationship are deeply embedded. Today, however, we are working with Generation Z—a generation that has grown up in the digital world. How do you observe the cultural tensions created by this shift? How can the traditional maritime culture be aligned with the expectations, attitudes and behaviours of the new generation?

For decades, the maritime industry's rigid "I tell you, you do it" culture functioned effectively. However, this approach no longer resonates with Generation Z. Today's young officers do not accept hierarchy without question. They want to understand the reasoning behind their responsibilities, receive logical explanations, obtain regular feedback, and work in an environment where fairness and transparency are evident.

At the same time, it is important to acknowledge the other side of the picture. We also observe that some of the attitudes and behaviours traditionally regarded as essential in the maritime profession are less developed among younger generations. A sense of belonging, corporate loyalty, face-to-face communication skills, and a long-term career perspective are among the most noticeable gaps.

Perhaps the most significant challenge is the search for purpose and belonging. Young professionals want to understand how their work contributes to the global supply chain and society as a whole. Yet seafarers often remain the invisible part of that story. When

the pursuit of short-term financial gain outweighs personal and professional development, motivation can diminish just as quickly as it emerges.

This is precisely why the industry must move beyond conventional training methods. Such transformation cannot be achieved through technical education alone. It also requires a strong corporate culture, modern leadership, and learning models that reflect the expectations of today's workforce.

At Maritime Trainer, we focus on four key areas to bridge this cultural gap.

Company-Specific Onboarding and Corporate Culture

We believe this transformation should begin long before a seafarer steps aboard a vessel. That is why we design customised onboarding programmes that introduce each company's culture to new-generation seafarers in a structured and systematic manner.

Before reporting for their first assignment, seafarers become familiar with the company's safety culture, vision, values and ways of working. As a result, they board their vessel not only technically prepared but also culturally aligned with the organisation.

Strengthening Procedural Knowledge and Employee Engagement

One of the greatest challenges for younger seafarers is understanding and embracing the complexity of a company's Safety Management System (SMS).

We digitalise these processes, making them more accessible, interactive and easier to understand. As a result, seafarers learn procedures more efficiently while developing a stronger connection with their employer. This approach enhances not only knowledge levels but also employee engagement and long-term retention.

A New Approach to Mentoring and Leadership



the comprehensive transformation model we bring to the maritime industry.

The maritime industry is simultaneously facing the pressures of digitalisation and decarbonisation (the green transition). Alternative fuels such as ammonia, methanol and hydrogen, together with autonomous and smart ship technologies, are no longer future concepts—they are becoming operational realities. How should training strategies evolve to close the enormous skills gap created by this “Twin Transition”? Given the slow pace of the IMO STCW revision process, what role should agile training organisations such as Maritime Trainer play in preventing the gap between industry needs and regulatory frameworks from widening?

Today, the maritime industry is facing perhaps the greatest skills gap in its history.

On one side, digitalisation is transforming every aspect of ship operations. On the other, decarbonisation is introducing alternative fuels, energy efficiency technologies, cybersecurity, data analytics and digital operational management as essential components of modern shipping.

As a result, the level of technical knowledge and professional competence expected from today's seafarers has increased dramatically compared with only five years ago. Ships are no longer simply cargo carriers; they have become highly sophisticated, technology-driven operational centres that continuously generate and process data.

For this reason, our understanding of maritime education must fundamentally change. The objective is no longer limited to training new personnel. We must also prepare the existing workforce for the future through continuous reskilling and upskilling programmes.

The traditional mindset of “recruit the seafarer, provide basic training, and let them operate safely” is no longer sustainable. To remain competitive, today's shipowners must evolve into learning organisations where continuous development becomes part of everyday operations.

The industry cannot afford to wait for regulations to catch up. Training must address both today's operational needs and tomorrow's technologies. This is where true transformation begins.

We do not aim to eliminate the maritime industry's long-established master-apprentice tradition. On the contrary, we seek to transform it into a modern mentoring model that reflects today's workplace realities.

For this reason, we provide not only young officers but also Masters and Chief Engineers with training in next-generation leadership, communication and mentoring.

Our goal is to create psychologically safe working environments where experienced professionals can transfer their knowledge while also benefiting from the digital capabilities and questioning mindset of younger generations. In doing so, we encourage a culture of mutual learning and create opportunities for reverse mentoring as well.

Training Designed for the Learning Habits of Generation Z

If you expect Generation Z to memorise hundreds of pages of procedures, you are likely to lose their attention before the learning process even begins. Today's young professionals learn faster through visual content, engage more effectively with concise learning materials, and gain significantly greater value from interactive experiences.

That is why we design all our training content around their learning preferences. Through mobile-compatible micro-learning modules, gamified scenarios, storytelling techniques and highly interactive content, we transform learning from a compulsory task into a natural and engaging experience.

Ultimately, retaining the next generation is about far more than offering competitive salaries. Real alignment is achieved by creating a holistic learning ecosystem—one that respects employees' time, provides a clear sense of purpose, introduces corporate culture from the very beginning of the recruitment journey, and supports continuous development through technology. At Maritime Trainer, this is exactly

However, this transformation presents a significant challenge.

The IMO's STCW Convention, which forms the foundation of global maritime education, naturally evolves through international consensus among numerous member states. As a result, revision processes inevitably take considerable time. The industry, technology and climate transition, however, cannot afford to wait.

A shipowner introducing methanol- or ammonia-fuelled vessels into its fleet tomorrow cannot postpone crew preparation until future STCW amendments are adopted. Consequently, the gap between regulatory frameworks and operational realities continues to widen.

This is precisely where agile, technology-driven training organisations such as Maritime Trainer have a critical role to play.

We do not wait for regulations to catch up. Instead, we continuously analyse both current and emerging industry requirements and develop our educational solutions accordingly. To achieve this, we have built our training library upon a comprehensive, multi-layered and globally oriented approach.

Collaboration with Equipment Manufacturers and Emerging Technologies

Working closely with shipowners and ship management companies, we collaborate directly with leading equipment manufacturers around the world.

Together, we develop training programmes covering next-generation digital systems and alternative fuel technologies, combining theoretical knowledge with practical operational applications.

This ensures that our training programmes address not only regulatory compliance but also the real operational challenges faced by the industry.

Integrating Industry Standards and Inspection Requirements

Our training content is not based solely on IMO regulations. We also incorporate the expectations of oil majors, charterers and international inspection regimes into our educational framework.

Requirements arising from TMSA (Tanker Management and Self Assessment), OCIMF's SIRE 2.0 inspection programme, with its strong emphasis on the human element, and RightShip, one of the most influential benchmarking systems in the dry bulk sector, form integral components of our training library. As a result, our partners strengthen not only their training standards but also their inspection and audit performance.

The seafarers of the future cannot be prepared with traditional training methods. As technology evolves, so do the ways people learn. Training must be built around experience.

The Future Seaskills Vision

Our investment extends beyond today's operational needs—we are equally committed to preparing the workforce for tomorrow's competencies.

For this reason, we closely follow the Future Seaskills initiative developed by Singapore's Tripartite Maritime Cluster. Drawing upon these global insights, we continuously update, expand and diversify our digital training library, ensuring that emerging competency areas are rapidly integrated into our learning ecosystem.

Our strategy is straightforward.

We recognise the IMO and STCW standards as the essential foundation of our training programmes.

Building upon that foundation, however, we integrate the latest global best practices, technological innovations and operational expectations shaping the future of shipping.

Our mission is to bridge the gap between the naturally evolving pace of international regulations and the rapid transformation of the maritime industry, delivering practical solutions that address tomorrow's skills shortage—today.

We are living in an era where traditional classroom training and conventional Computer-Based Training (CBT) modules are no longer sufficient. How does Maritime Trainer position technologies such as Virtual Reality (VR), artificial intelligence and data analytics in addressing the global training challenges and growing skills gap within the maritime industry?

To begin with a straightforward observation, the era of passive CBT modules—where learners simply click the "Next" button until completion—and lengthy traditional classroom sessions is coming to an end.

Attempting to prepare today's seafarers for next-generation ship technologies using yesterday's training methods is no longer compatible with the realities of modern shipping. At Maritime Trainer, we do not see ourselves merely as a provider of training content.



Illustration: Digital / AI-generated

We position ourselves as a Maritime EdTech (Maritime Education Technology) company, developing innovative learning technologies that help shape the future of the global maritime industry. Our vision for the future learning ecosystem is built upon several complementary technological and strategic pillars.

Next-Generation 2D and 3D Learning Design

Whenever possible, we deliver our training through blended learning methodologies, using the most effective visualisation techniques available. However, the real differentiator lies in the pedagogical design of our digital learning library. We have completely moved beyond the traditional “read, memorise and pass” approach. Through storytelling, we place the seafarer at the centre of realistic operational scenarios rather than making them a passive observer. Gamification techniques increase learner engagement, while case studies based on real maritime accidents and highly interactive content transform learning into an active experience instead of a passive process.

We also develop three-dimensional training scenarios that recreate real-life incidents, allowing seafarers to gain valuable operational experience before encountering similar situations on board.

VR: Zero Risk, Maximum Muscle Memory

One of the greatest risks in shipping is that person-

nel often encounter critical or hazardous operations for the first time on an actual vessel. Perhaps the most striking example remains Enclosed Space Entry, which unfortunately continues to account for some of the highest numbers of fatalities in the maritime industry. These operations cannot be mastered simply by reading manuals or watching instructional videos. Developing the correct operational reflexes requires much more than theoretical knowledge. Through our VR applications, Maritime Trainer enables seafarers to enter a virtual ballast tank while they are still ashore.

Participants experience every critical stage of the

Real reflexes are not developed in the classroom, but through experiences that closely replicate real-life conditions. VR simulations, AI-powered knowledge systems, and dynamic competency management not only enhance seafarers' knowledge but also strengthen their decision-making skills. The future of training is being shaped by intelligent systems built on experience and data.

The Maritime EdTech approach transforms training from a one-time course into a continuously evolving learning ecosystem. Storytelling, gamification, and immersive technologies turn knowledge into lasting skills. The competitive advantage of the future will belong to the organizations that learn the fastest.

operation—from the correct use of gas detection equipment and ventilation procedures to Permit to Work requirements and emergency rescue scenarios—in an immersive environment that is remarkably realistic while remaining completely safe. Whenever an incorrect decision is made, participants immediately witness its consequences within the simulation, allowing them to develop the correct behavioural responses before facing the same situation in real operations.

As a result, when they finally board a vessel, they possess not only theoretical knowledge but also strong muscle memory and the practical confidence required for safe decision-making. We apply the same methodology to many other high-risk shipboard operations, continuously expanding our learning ecosystem by integrating VR solutions with computer-based training.

AI-Powered Knowledge Assistant: MTAI

One of our most significant technological investments is our artificial intelligence knowledge engine, MTAI.

Modern shipping relies on an enormous body of knowledge, including SOLAS, MARPOL, numerous international conventions, and hundreds of pages of company Safety Management System (SMS) procedures. During critical operations, searching through these documents not only wastes valuable time but can also create operational risks.

MTAI eliminates this challenge.

By analysing a company's entire SMS documentation together with international regulations within seconds, the AI assistant allows seafarers to ask questions in natural language.

For example:

“What is the emergency shut-down valve inspection procedure during methanol operations?”

or

“What is the minimum oxygen concentration requi-

red before entering an enclosed space?” Instead of requiring personnel to search through thousands of pages of documentation, MTAI immediately presents the relevant procedures, reference clauses and operational steps.

This dramatically accelerates access to critical information, strengthens operational safety and significantly improves decision-making.

Dynamic Competency Management

One of our newest developments is our Dynamic Competency Management module.

Rather than simply tracking completed training courses, the system digitally manages the technical and behavioural competencies required according to each seafarer's vessel type, rank and the company's operational expectations.

The platform consolidates training records, performance evaluations and managerial feedback within a single integrated data environment.

As a result, shipowners gain clear visibility into the actual competency level of every employee and can manage promotion planning, competency gaps and future training requirements entirely through data-driven decision-making.

Predictive Analytics and the Power of Data

Another strategic focus area is advanced data analytics. Through our MTData Business Intelligence module, companies can already analyse personnel assessment results, training records, competency profiles and well-being indicators, producing statistical analyses, benchmarking reports and trend analyses.

As MTAI continues to evolve, we will also be able to identify which topics seafarers search most frequently, where knowledge gaps exist, and which competencies require further development.

In the near future, managers will even be able to obtain these insights simply by interacting with an AI chatbot.

Imagine asking the system:

“Which of the three promotion candidates is currently the strongest?”

and receiving an evidence-based recommendation supported by objective performance data.

Based on these insights, we do far more than generate reports—we provide our partners with strategic recommendations that help identify and mitigate operational risks before they occur.



Illustration: Digital / AI-generated

rehensive technological infrastructure. It would therefore be incomplete to define Maritime Trainer today simply as a “training company.” How would you describe this end-to-end digital HR and training ecosystem? What exactly does this platform promise shipowners?

That’s a very accurate observation.

Since the day it was founded, Maritime Trainer has continuously evolved and transformed. Today, we no longer see ourselves simply as a company that produces training content. Instead, we position Maritime Trainer as a global Maritime HR & EdTech Ecosystem that prepares the maritime industry for the future.

We are no longer merely a provider of computer-based training and assessment solutions. Rather, we offer a fully integrated digital ecosystem capable of managing the entire employee lifecycle—from the moment a seafarer applies to a company through recruitment, assessment, onboarding, training, performance management, career development, promotion and employee well-being—all within a single digital platform. By doing so, we transform human resource management from intuition-based decision-making into a truly data-driven process.

Our platform is built upon six fundamental pillars.

Assessment & Recruitment

Safe operations begin with selecting the right people.

Through our digital assessment modules, shipowners can objectively and securely evaluate candidates’ technical knowledge, English language proficiency and psychometric characteristics before they ever step on board. Thanks to our fraud-resistant assessment infrastructure, HR managers receive far more than a CV. They gain access to a comprehensive digital competency profile that clearly identifies each candidate’s strengths and development areas.

This enables recruitment decisions to be based on objective data rather than assumptions.

Onboarding and Corporate Culture

Once recruitment has been completed, seafarers begin a company-specific onboarding programme through our platform before joining their vessel.

During this process, they become familiar with the company’s Safety Management System (SMS), operational procedures, corporate culture and expectations through interactive learning content. As a result, when they step on board for the first time, they are not entering an unfamiliar working environment but an organisation whose culture and operational

The geopolitical challenges of today, the growing global workforce shortage and tomorrow’s skills gap can no longer be solved through conventional training methods.

The future of maritime safety depends upon the integration of data-driven decision-making, AI-powered knowledge systems, dynamic competency management and advanced educational technologies within a single connected ecosystem.

At Maritime Trainer, our ambition is not merely to meet today’s training needs—we aim to shape the future of the maritime workforce itself.

Everything you have described—from training content and simulations to AI-powered solutions and competency management—points to a highly comp-

Selecting the right people is only part of the challenge; developing them and retaining them within the organization is equally strategic. Artificial intelligence and data analytics are transforming human resource management from intuition into a measurable, data-driven discipline. Human capital has become the new competitive frontier in the maritime industry.

philosophy they already understand. This significantly shortens the adaptation period while reducing operational risks.

Continuous Development and Personalised Learning

Maritime is no longer a profession where learning ends after obtaining a diploma. It has become a dynamic career that requires continuous professional development.

Through our platform, seafarers can continue learning anytime and anywhere—whether onboard or ashore—using our extensive library of 2D, 3D and VR learning content. Whenever they need information, our AI-powered assistant, MTAI, provides immediate access to the knowledge they require within seconds.

Training therefore becomes an integral part of daily operations rather than an occasional mandatory activity.

Employee Well-being and Mental Health – MTCare

Today, evaluating people solely on their technical competence is no longer sufficient. Geopolitical tensions, lengthy contracts and demanding working conditions create psychological pressures that directly affect operational safety. For this reason, we developed MTCare, a digital well-being management module that enables companies to monitor the welfare and mental well-being of their seafarers.

Through surveys, psychometric assessments and structured feedback mechanisms, organisations can regularly analyse stress levels, burnout risks and the need for psychological support.

Our objective is not simply to intervene after problems emerge, but to identify risks at an early stage so that HR teams can take timely preventive action.

Because we firmly believe that sustainable and safe ship operations cannot be achieved without mentally healthy seafarers.

Dynamic Competency Management

One of the platform's most strategic components is our Dynamic Competency Management module.

The system consolidates training records, performance evaluations and managerial feedback into a single digital data environment.

This enables HR and operational managers to visualise the real competency landscape of hundreds of employees across an entire fleet from one central dashboard.

They can immediately answer questions such as:

- Which employees demonstrate the strongest competencies?
- Where are individual development needs?
- Who is genuinely ready for promotion?
- Which vessels have competency gaps?

For the first time, these critical HR questions can be answered through measurable and objective data.

Data-Driven Promotion and Career Management

Promotion decisions are among the most critical human resource decisions in shipping.

When promotions rely primarily on subjective judgement, both employee motivation and operational safety may be compromised.

Our platform transforms this process into a fully data-driven model. Training history, competency scores, performance evaluations and individual development progress are analysed together before promotion recommendations are made.

As a result, promotion decisions are based on transparent and objective criteria rather than personal opinions. This strengthens employee trust while ensuring that the right people are assigned to the right positions at the right time.

Conclusion

The greatest value we deliver to shipowners is the ability to manage their entire workforce through a single integrated digital ecosystem. Human resources, training and operational departments no longer need to rely on disconnected systems operating independently of one another.

Through the Maritime Trainer platform, companies can digitalise workforce management, identify operational risks before they materialise, measure the effectiveness of training programmes and base every strategic decision on reliable, measurable data. The outcome is not only significant savings in time and cost but also a substantial competitive advantage in safety, sustainability and operational excellence.

We firmly believe that the foundation of safe and sustainable shipping is built not only on technology but also on people. By bringing together human potential and data within a single intelligent ecosystem, Maritime Trainer aims to help shape the future of the global maritime industry. ■

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Maritime in the Age of AI

The Human Element Remains Central

Artificial intelligence does not make decisions; when designed responsibly, it enables people to make better decisions. The new goal of maritime education is not to place technology at the centre, but to use it to develop competent professionals capable of making informed, data-driven decisions.



Capt. İsmail AKSOY

Although the maritime industry is not transforming as rapidly as some other sectors, it is undergoing one of the most significant workforce transitions in its history. According to the 2026 BIMCO/ICS Seafarer Workforce Report, the global commercial fleet employs approximately 2.55 million seafarers, while facing a shortage of nearly 39,000 officers.

However, this challenge extends far beyond a numerical workforce shortage. As shipping simultaneously embraces digitalisation, alternative fuels such as methanol, ammonia and hydrogen, and increasingly stringent environmental regulations, the technical and behavioural competencies expected of seafarers are becoming more diverse and more sophisticated.

As a result, the concept of the skill gap has gained increasing prominence throughout the maritime industry. It describes not only a shrinking supply of qualified professionals, but also the simultaneous rise in the level of competence required to operate safely and efficiently in a rapidly evolving sector.

Addressing this challenge requires a new generation of digital learning infrastructure capable of making learning measurable, personalised and verifiable through data. The objective is not simply to deliver training content, but to establish a sustainable, competency-based learning ecosystem supported by objective assessment and continuous improvement.

This article explores the core principles of next-generation digital learning platforms, the responsible

use of artificial intelligence, competency-based and adaptive learning, and the emerging competencies required in the AI era.

A New Generation of Digital Learning Infrastructure

Traditional classroom instruction and first-generation computer-based training (CBT) modules—often completed simply by clicking the “Next” button—now face two fundamental limitations.

The first is scalability. Bringing together a globally distributed workforce operating in shifts and continuous crew rotations for classroom-based training is no longer practical.

The second is measurability. Recording that a course has been completed or issuing a certificate does not demonstrate that learning has actually taken place.

The andragogical literature has long highlighted a fundamental distinction between knowing that and knowing how. Understanding a procedure is fundamentally different from being able to apply it correctly under operational pressure. The latter can only be developed through contextual learning, repetition and continuous feedback.

For this reason, the purpose of next-generation learning infrastructure is not simply to digitise existing training materials. Its primary objective is to transform learning from passive content consumption into measurable, sustainable competency development.

Four Principles of a Next-Generation Learning Infrastructure

In developing a regulated digital learning platform serving more than 100 maritime organisations, we

Revising the STCW Convention takes time. But new fuels and emerging technologies will not wait. Maritime training must evolve at the same pace.



have identified four fundamental principles that should be considered inseparable.

1. An Integrated Learning Ecosystem Built on Modular Components

Training, assessment, simulation, knowledge access and competency tracking should not exist as independent software solutions. Instead, they should operate as an integrated ecosystem built on a single data backbone.

From a software engineering perspective, we achieve this through Hexagonal Architecture, which clearly separates system components, and the Outbox Pattern, which preserves data integrity and prevents data loss during system integration. As a result, every transaction remains fully traceable from beginning to end.

2. Interoperability

A modern learning platform cannot function as a closed system. API-based integration with shipowners' human resources, operational and audit management systems has become a fundamental requirement.

Achieving the right balance is essential. Excessive standardisation cannot accommodate every organisation's needs, while excessive customisation results in solutions that cannot scale. Our approach combines a common core architecture with organisation-specific configuration layers, providing flexibility without compromising scalability.

3. Security and Compliance

We are certified to ISO 27001, and our processes comply with GDPR, KVKK and SOC 2 requirements.

However, we do not define security by certifications alone. It is embedded throughout the software development lifecycle.

Source code is continuously monitored through AI-assisted code analysis and automated vulnerability scanning from the earliest stages of development. Security therefore becomes an integral part of system design rather than a control mechanism added later.

At the same time, disciplined cloud cost management has reduced cloud infrastructure costs by approximately 30%, enabling more predictable and sustainable service delivery for our customers.

4. Beyond Regulatory Compliance Towards Industry Best Practice

We regard IMO and STCW requirements as the foundation of all training activities, but never as the final objective.

Although the comprehensive revision of the STCW Convention is inevitably a lengthy process, operational realities continue to evolve much more rapidly. Our approach is therefore to build current industry best practices on top of regulatory minimum standards, bridging the gap between regulatory requirements and operational needs in a sustainable manner.

An Integrated Architecture for AI, Competency Management and Adaptive Learning

Artificial intelligence is often portrayed as a "magic solution" for maritime training. In reality, its true value lies not in replacing people, but in strengthening learning and decision-making when applied

responsibly.

Within this architecture, AI serves as a powerful enabler across three core areas, all built around one non-negotiable principle: the human must always remain at the centre of the decision-making process (human-in-the-loop).

Layer 1 – Source-Grounded Knowledge Access

During critical operations, asking a seafarer to search through thousands of pages of the Safety Management System (SMS), vessel manuals and international regulations creates an operational risk in itself.

To address this challenge, we developed MTBuddy, an AI assistant built on a retrieval-grounded architecture rather than a general-purpose generative chatbot. Instead of generating responses from unrestricted sources, MTBuddy retrieves information exclusively from company-approved documentation, with every answer linked directly to the relevant source. This ensures speed, accuracy and traceability while significantly reducing the risk of AI hallucinations.

Data privacy is equally critical. Safety management documentation represents one of a shipping company's most sensitive corporate assets. Rather than transmitting these documents to public AI models, we use privately hosted domain models specifically designed for maritime regulations and company management systems. This approach keeps all data under the organisation's control while maintaining an optimal balance between performance, security and cost.

Security is not a control added afterwards; it is an integral part of the system's design from the outset. For us, IMO and STCW requirements are not the destination—they are the starting point. We build industry best practices on top of regulatory minimum standards.

Layer 2 – AI-Assisted Open-Ended Assessment

Multiple-choice examinations cannot fully evaluate a seafarer's judgement, decision-making process or ability to justify operational decisions.

For this reason, we use Google Cloud AI to assess open-ended responses across a large proportion of our customer base.

Fair and reliable assessment is built on three principles. First, every response is evaluated against pre-defined objective rubrics. Second, all AI-generated assessments remain fully reviewable and, where necessary, correctable by qualified human evaluators. Third, system consistency is continuously monitored to ensure reliable, verifiable assessment quality.

The objective has never been to replace human assessors. It is to improve assessment quality, increase consistency and reduce the workload of subject-matter experts.





The foundation of this approach is the integration of training performance, open-ended assessment results and operational feedback—such as inspection findings—into a unified competency profile.

One principle, however, remains fundamental:

Data informs decisions; people make them.

Entrusting a seafarer's career progression to an algorithm whose reasoning cannot be explained is neither ethically acceptable nor operationally reliable.

The appropriate approach is to provide managers with transparent, traceable and reviewable evidence, while ensuring that the final decision always remains with the human decision-maker.

Our competency management and predictive analytics framework has been developed around this principle.

New Competencies for the AI Era

Much of today's discussion focuses on how artificial intelligence should be used in training. Far less attention is given to the competencies that professionals will need to work effectively alongside AI.

As decision-support systems, increasing levels of autonomy and data-intensive operations become standard across modern fleets, the role of the seafarer is evolving rapidly.

Academic literature increasingly describes this transformation through concepts such as Seafarer 4.0, remote vessel operations and human-machine collaboration.

Alongside traditional maritime expertise, future professionals will require several additional competencies.

AI Literacy

Understanding what AI systems can and cannot do, recognising their limitations and critically evaluating whether their outputs are reliable.

Open-ended assessments provide a more accurate measure of judgement. Artificial intelligence supports the assessment process, while human assessors retain final oversight. This creates a consistent and standardised assessment system.

This architecture also enables organisations to establish inspection-ready assessment processes aligned with OCIMF's SIRE 2.0, where the human element plays an increasingly central role in vessel inspections.

Layer 3 – Adaptive Learning

Delivering identical training to every learner, at the same pace and with the same content neither uses time efficiently nor guarantees effective learning.

Adaptive learning personalises each learner's development journey by identifying individual strengths and competency gaps, then adapting training according to specific learning needs.

This approach brings well-established andragogical approaches—including Competency-Based Education, micro-learning and scenario-based learning—into a scalable digital environment.

All three layers operate in compliance with GDPR and the EU AI Act. In applications involving biometric data or other high-risk AI use cases, we apply the principles of informed consent, data minimisation and human oversight as fundamental requirements.

From Competency Data to an Auditable Career Framework

One of the most critical decisions in the maritime industry is promotion. Determining whether an officer is ready for promotion to the next rank has traditionally relied on managerial experience and subjective judgement.

Next-generation learning infrastructure aims to make this process more transparent, consistent and data-driven.

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Human Oversight and Judgement

Knowing when to accept AI recommendations and when to challenge them, while maintaining the human role at the centre of the decision-making process.

Data Literacy

Understanding how data is generated, what it represents and the limitations that influence its interpretation.

These competencies will inevitably become core elements of future maritime education. Artificial intelligence is no longer merely a tool that supports training; it has become a subject of training in its own right.

The same principle applies to organisational transformation. Within our engineering organisation, the standardisation of AI-assisted software development (agentic coding) reflects the institutional capability required to work effectively with AI.

Conclusion

The future of the maritime workforce is being reshaped by two defining forces: digitalisation and the green transition, amid geopolitical uncertainty and demographic change.

In this new environment, traditional training models

Data strengthens decision-making. Artificial intelligence provides managers with evidence, but the final decision always rests with people. This balance is the foundation of reliable competency management.

and approaches focused solely on regulatory compliance are no longer sufficient.

A sustainable solution lies in an integrated learning architecture that combines data-driven competency management, personalised learning and the responsible use of artificial intelligence within a single ecosystem.

The true role of technology in maritime is not to replace human judgement, but to enhance it by providing faster, more accurate and more reliable information.

This is the approach that will strengthen safety, operational excellence and long-term sustainability across the maritime industry. ■

Capt. İsmail AKSOY
Director of Product & Technology,
Maritime Trainer

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The Science of Human Behaviour

Observation Alone Is Not Enough

Behavioural assessment is no longer considered sufficient on its own. By objectively evaluating seafarers' attention, decision-making, situational awareness and overall cognitive performance, cognitive measurements introduce a new, data-driven approach to safety management.



Capt. Engin BÜYÜKTEPE

What do the concepts of behavioural assessment and cognitive measurement mean?

Performance assessments in the maritime industry have traditionally been centred on technical and operational performance. However, a behavioural assessment standard was established through the joint guidance developed by OCIMF and INTERTANKO, initially incorporated into TMSA 3 and later implemented through SIRE 2.0.

According to this guidance, behavioural assessment refers to the observation of non-technical competencies such as teamwork, communication, leadership, situational awareness and decision-making. Cognitive measurement, on the other hand, objectively evaluates the mental processes underlying these behaviours—including attention, perception, working memory, reaction time and decision-making—through digital assessment tools. When combined, these two approaches provide a far more comprehensive understanding of human performance.

Why is observing behaviour alone not sufficient?

Behaviour reveals the outcome of an action, but it does not explain the cognitive mechanisms behind it. While education, organisational culture and personal characteristics all influence behaviour, cognitive factors also play a significant role. For example, a deck officer's poor decision may result from distraction, excessive cognitive workload, fatigue or stress. Observation alone can identify these factors only to

a limited extent and is often subjective. Cognitive assessment helps make these otherwise invisible processes measurable and easier to interpret.

Human behaviour changes significantly under conditions of cognitive workload or stress. It is unrealistic to expect individuals to behave in the same way during routine operations as they do under crisis or high-pressure situations. This highlights the growing need for behavioural assessments that take the influence of cognitive psychology into account.

How are behavioural assessments currently conducted in the maritime industry?

Today, the industry primarily relies on Bridge Resource Management (BRM), Human Element, Leadership and Management (HELM) training, simulator-based exercises, performance observations and behavioural assessment forms. These methods are highly valuable; however, they remain largely dependent on the evaluator's judgement.

Supporting these observations with cognitive data would make the assessment process far more objective. In addition to periodic or end-of-contract performance reviews, behavioural assessments conducted during actual operations are considered particularly valuable, as they enable supervisors or authorised shore-based personnel to evaluate individuals while they are performing their duties.

Equally important is ensuring that assessment findings do not simply remain on paper. The systematic analysis, validation and interpretation of collected data should become an integral part of the evaluation process.

Behaviour reflects outcomes, while cognitive measurement reveals their underlying causes. When used together, they provide a more objective evaluation of human performance. Their true value, however, lies in the systematic analysis and validation of the data they generate.



How do cognitive measurements support behavioural assessment?

Cognitive measurements quantify performance indicators such as attention level, decision-making speed, mental workload and situational awareness. These numerical results can be compared with behavioural observations made during operations, allowing organisations to compare behavioural responses during operations with those observed outside operational settings. This provides valuable insights into performance under different conditions.

As a result, the underlying causes of observed behaviour can be explained more objectively, making the overall assessment process more reliable and credible.

Although developing maritime-specific cognitive assessments that can be applied effectively at different stages of a seafarer's career remains challenging, advances in digital technologies are making such applications increasingly practical.

How are non-technical skills such as communication, teamwork and leadership connected to cognitive processes?

Non-technical competencies can be just as important as technical expertise—and in many situations, even more so. Communication, teamwork and leadership are among the most essential competencies expected of officers, supervisors and managers.

Effective communication involves far more than speaking clearly. It requires perceiving the right information at the right time, prioritising it correctly, interpreting it accurately and conveying it effectively to others. All of these processes depend on attention, working memory and cognitive control. Consequently, communication performance cannot be separated from cognitive performance. Successful teams develop shared situational awareness, exchange

information efficiently and support one another's workload. Achieving this requires every team member to maintain attention, interpret information accurately and make timely decisions. Individual cognitive performance therefore has a direct impact on overall team effectiveness.

Likewise, a leader's communication style, task allocation, feedback approach and crisis management directly influence the team's cognitive workload. Effective leadership helps balance cognitive workload across the team, whereas poor leadership can increase distraction and contribute to decision-making errors.

What can cognitive measurements contribute to the maritime industry?

The maritime industry is one of the sectors in which the human element has the greatest impact on operational safety. Measuring this influence and taking appropriate action are therefore of critical importance. Cognitive assessments are already used across various industries and are increasingly being applied in maritime recruitment. Although maritime-specific cognitive assessment studies remain limited, existing tools still provide valuable insight into an individual's overall cognitive capabilities.

Their greatest advantage lies in providing objective and standardised evaluations. Advances in technology have made cognitive assessments easier to administer, faster to complete and more effective for comparing results over time. Developing maritime-specific cognitive assessments and combining them with behavioural evaluation will make a much greater contribution to optimal team composition and safer operational management.

Should this approach be limited to recruitment?

No. Recruitment is an important stage, but it is far from the only application. By administering the same assessments at different stages of a seafarer's career, organisations can monitor individual development, identify training needs and detect cognitive changes that may pose operational or safety risks at an early stage.

Assessment results obtained during recruitment and throughout subsequent employment can be consolidated into a single data pool, enabling organisations to analyse long-term trends and take timely action. This integrated approach not only provides a more comprehensive evaluation of personnel but also makes it possible to monitor both cognitive and behavioural development throughout a seafarer's career.

How can artificial intelligence contribute to behavioural assessment and cognitive measurement?

Although numerous digital initiatives and applications have already been introduced in the maritime industry, greater progress is still needed in transforming collected data into meaningful decisions. Collected data becomes truly valuable only when it is analysed effectively.

In this context, artificial intelligence can analyse assessment results, monitor changes in an individual's cognitive performance, identify potential risk patterns and provide personalised development recommendations. As a result, assessment evolves from a one-time evaluation into a continuous, data-driven process. AI can also support the development of new assessment applications, making these technologies more accessible and widely adopted across the industry.

How do you think the assessment of the human element in maritime will evolve in the future?

I believe the assessment of the human element will evolve beyond systems based solely on observation forms into integrated systems that combine behavioural assessments with digital cognitive measurement.

Recruitment evaluations, competency assessments related to operational duties, training needs analyses, onboard training and development, wellbeing monitoring, operational and behavioural assessments, together with the integration of all resulting data, will enable comprehensive competency management and long-term career planning.

This holistic approach will provide significantly stronger decision-support mechanisms for competency management, personnel wellbeing and safety management.

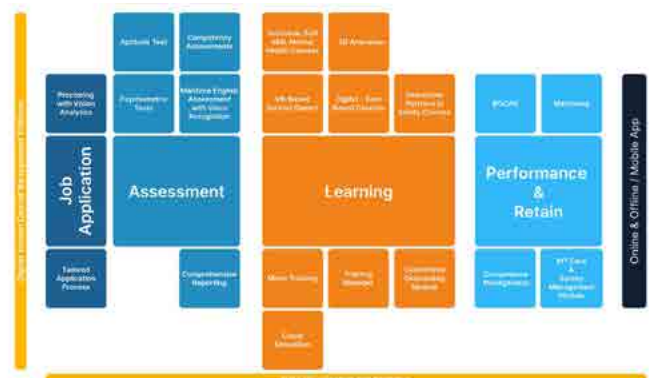
Finally, what message would you like to share with maritime industry stakeholders?

Cognitive measurements reveal the underlying causes of behaviour through quantitative data. Artificial intelligence can analyse this data to identify potential risks and areas for development. As a result, assessment evolves from a one-time evaluation into a continuous, data-driven process.

Improving maritime safety and seafarer wellbeing depends not only on adopting more advanced technologies but also on gaining a deeper understanding of human performance and the cognitive and psychological factors that influence it. Combining behavioural assessment with cognitive measurement will enable organisations to manage the human element through a more scientific, objective and data-driven approach.

As technology continues to evolve and AI-supported applications and simulator environments become increasingly accessible, I believe these methods will become an integral part of human resources practices across the maritime industry. Ultimately, I believe this approach will contribute to the sector's core objectives of achieving zero accidents, ensuring safer working environments, supporting healthier and happier seafarers, and protecting cleaner seas. ■

Capt. Engin BÜYÜKTEPE
Operations Director – Maritime Trainer



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The New Paradigm of Safety Culture

It Is Not Knowledge but Behaviour That Saves Lives

STCW standards provide the essential foundation for maritime training. However, true safety is determined not by what personnel know, but by how they make decisions and behave in critical situations. The new approach to maritime training focuses not on certificate completion, but on creating measurable behavioural change on board.



Ridvan SAĞLAM

Beyond STCW: A Behaviour-Based Approach to Maritime Training

A vessel may have complete training records. Certificates may have been issued, procedures read, and checklists signed. Yet if, at a critical moment, a crew member measures gas at the wrong location, fails to report a safety violation because of seniority pressure, or heads for the wrong equipment in a smoke-filled engine room, the training has failed to deliver its intended outcome.

Today, the key question in maritime training should no longer be simply, "Which regulatory requirement does this training satisfy?" The more important question is:

What behaviour will this training change on board?

STCW provides the essential foundation for maritime education and training. However, real safety performance is determined by whether that knowledge is translated into sound decisions, safe practices and effective teamwork on board. Safety culture is determined not only by what seafarers know, but also by how they behave under pressure, fatigue, time constraints and hierarchical authority.

Using an EEBD correctly during an emergency escape, reporting a safety violation during cargo operations, handing over critical information during watch changes, or selecting the correct emergency

equipment cannot be achieved through theoretical knowledge alone. These behaviours are developed through realistic scenarios, repetition, decision-making practice, meaningful feedback and training designed around the human element.

Modern maritime training should therefore aim not merely to issue certificates, but to create observable and measurable behaviour change on board.

Design Training Around Shipboard Reality

Design Training Around Shipboard Reality

Well-designed maritime training is not simply a digital version of lengthy procedures. Its true purpose is to enable personnel to make safer, more consistent and better-informed decisions on board.

For this reason, training design should begin not with a classroom, an e-learning platform or a content catalogue, but with operational reality at sea.

Every training programme should first answer three fundamental questions.

What is the operational objective?

Which operational outcome are we trying to improve?

Examples include:

- Reducing critical errors during evacuation procedures.
- Strengthening first-response decision-making during firefighting.
- Preventing information loss during watch handovers.
- Reducing unsafe practices during enclosed-space entry operations.

When a training objective is disconnected from operational outcomes, a course may be completed successfully while having little practical impact where it matters most—on board.

What is the critical behaviour?



VR, simulations and interactive training transform theory into practice. The goal is not simply to transfer knowledge, but to develop the ability to make the right decisions under pressure. At sea, safety begins with behaviour.

What should personnel do differently to achieve the desired outcome?

For example, they should use gas detection equipment at the correct location, follow the proper sequence and comply fully with established procedures. They should abort an enclosed-space entry whenever a hazardous atmosphere is detected and never bypass permits or safety checks simply because of schedule pressure.

Unless training is specifically designed to address these behaviours, learning often remains theoretical.

What prevents the desired behaviour?

Why are personnel unable to perform consistently today?

Is there excessive time pressure? Is the equipment insufficiently understood? Are procedures overly theoretical? Does the onboard culture discourage delaying operations? Or is there an overconfidence mindset—the belief that “nothing will happen to me”?

Unless these barriers are identified, training may suc-

cessfully transfer knowledge but still fail to change behaviour. Leaving personnel alone with PDF manuals, procedural documents and multiple-choice tests is not enough to prepare them for the complex decisions they will face at sea.

Real learning begins when people experience pressure, uncertainty and the consequences of their decisions within a safe learning environment.

Knowledge Alone Is Not Enough—Decision Quality Must Also Be Trained

Many critical maritime incidents occur not because people lack knowledge, but because they fail to translate that knowledge into appropriate action at the right moment.

Crew members may know the procedure perfectly. Yet urgency, authority pressure, silence within the team, fatigue or risk normalisation can prevent them from making the correct decision.

Modern maritime training should therefore assess more than correct answers. It should also strengthen how personnel think, where they hesitate, how they interpret risk signals and how effectively they communicate within the team.

For example, asking only the following question provides a limited assessment:

“Should an atmosphere test be conducted before entering an enclosed space?”

This assesses knowledge only. Real operational decisions are rarely that straightforward.

A more realistic training scenario would be:

“Atmospheric measurements taken before entering a cargo tank are close to the acceptable limits. The operation is already behind schedule, and the team is under significant time pressure. The supervisor says, ‘We’ll get in and out quickly.’ What would you do?”

Scenarios like these bring personnel much closer to real operational conditions. In maritime operations, safety often depends less on knowing the correct answer than on having the professional courage to defend the right decision under pressure.

The Right Technology Creates Value Only When It Supports the Right Behaviour

Today’s maritime training environment benefits from a mature technology ecosystem. Interactive e-learning, mobile microlearning applications, simulations, virtual reality, serious games, learning analytics and offline training platforms have become essential components of modern training systems.

Technology alone, however, does not guarantee effective learning. Its real value emerges only when the right technology is aligned with the right behavioural objective.

Interactive E-Learning Strengthens Decision-Making Skills

Interactive computer-based training (CBT) should not simply transfer ISM Code requirements, company procedures or policy documents onto a screen.

Its real strength lies in enabling personnel to experience the decision-making process within a safe learning environment.

For example, learners may be presented with the following scenario:

“During cargo operations you notice a safety violation. The person responsible is more senior than you. What would you do?”

Learning here is not limited to selecting the correct answer. Personnel make decisions, experience the consequences of those decisions and understand how different choices affect safety, communication, teamwork and individual responsibility.

This approach develops not only knowledge but also professional judgement, communication skills, accountability and the confidence to stop an operation whenever safety requires it.

Critical incidents are often caused not by a lack of knowledge, but by the inability to translate knowledge into the right behaviour at the right moment. Therefore, training should teach not only what is right, but also how to act under pressure. Real learning is achieved through repeated practice in a safe environment.

VR and 3D Simulations Reinforce Practical Performance

Some competencies cannot be taught through explanation alone. Muscle memory, spatial awareness, team coordination and the ability to perform correctly under stress all require practical experience.

This is where VR and 3D simulation technologies build a powerful bridge between learning and real-world application.

Realism in VR is not limited to high-quality graphics. Spatial accuracy is equally important. In a cargo vessel simulation, the bow and stern orientation, cargo hold arrangement, equipment locations, escape routes and operational workflow should accurately reflect the actual vessel.

A poorly designed virtual environment can distort a seafarer’s mental map. A well-designed VR application, however, transforms theoretical knowledge into practical experience within a completely safe envi-



ronment. Personnel can practise navigating through a smoke-filled engine room with restricted visibility, locating the correct firefighting equipment, applying the COLREGs under pressure and executing emergency communication procedures correctly.

Such simulations are particularly valuable for high-risk but low-frequency events, allowing critical behaviours to be rehearsed repeatedly long before an actual emergency occurs.

Microlearning Reduces Forgetting and Reinforces Retention

Learning at sea does not always take place through lengthy training sessions. Before joining a vessel, prior to taking over a watch, or while preparing for a specific operation, seafarers often need concise, targeted and immediately applicable information.

This is where microlearning delivers real value.

Short learning modules can quickly reinforce safe mooring procedures, the correct use of breathing apparatus, the selection of personal protective equipment, proper reporting practices and essential communication techniques used on board.

However, microlearning should not simply consist of short videos. An effective microlearning module focuses on a single behaviour and provides a practical decision aid, checklist or reminder that personnel can apply immediately in the workplace.

For example, a microlearning module covering lifeboat launching should answer one simple but essential question:

Which critical checks must be completed immediately before launching the lifeboat?

This approach transforms training into a natural extension of operational memory rather than an isolated learning activity.

Effective Training Is Built Through an Integrated Learning System

No single technology can create a strong safety culture on its own. Effective maritime training combines complementary learning methods into a structured system where each element strengthens the others.

Foundational knowledge can be delivered through microlearning modules. Before joining a vessel, personnel can review critical safety reminders, equipment operating procedures and essential operational requirements through concise learning sessions.

Decision-making skills are then developed through scenario-based computer-based training (CBT) and interactive learning modules. Personnel are presented with realistic operational dilemmas, required to make decisions and given the opportunity to experience the consequences of those decisions within a safe learning environment. Practical application is reinforced through VR and 3D simulations. High-risk operations—including enclosed-space entry, firefighting, abandon ship procedures, engine-room operations and cargo handling—can be practised repeatedly without exposing personnel to unnecessary risk.

Continuous learning is supported through offline accessibility, learning analytics and refresher modules. Even when internet connectivity is limited at sea, learning should continue uninterrupted. Whether personnel are in port, ashore or in the middle of the ocean, access to learning should never be interrupted.

This blended learning approach transforms training from a one-time certification exercise into a living, continuously evolving learning system that produces measurable behavioural change on board.

Behaviour That Is Not Measured Cannot Be Improved

Behaviour-based training does not end with the delivery of high-quality learning content. Organisations must also monitor which behaviours have improved, which risks remain and which personnel require additional support.

For this reason, data plays a critical role in modern maritime training. The objective is not simply to generate reports, but to convert learning data into operational intelligence that supports better decision-making. Training managers should be able to answer questions such as:



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How crew demonstrate understanding through actions and risk-aware decisions

- Which vessels demonstrate weaknesses in procedural knowledge?
- Which personnel repeatedly make the same decision-making errors?
- Which training programmes fail to produce measurable behavioural improvement despite being completed?
- Which operational risk areas require additional scenarios, refresher training or simulation exercises?

The answers to these questions transform training from a static collection of learning materials into a dynamic system of continuous improvement. Companies gain insight not only into who has completed training, but also into which vessels, departments or teams require additional support when faced with critical operational decisions. By measuring behavioural outcomes rather than simply recording course completion, organisations can identify recurring risks, allocate resources more effectively and continuously strengthen both operational performance and safety culture across the fleet.

The Maritime Trainer Approach: Assess, Train, Retain

Maritime Trainer has built its training philosophy around three interconnected stages: Assess, Train and Retain. The first stage identifies each learner's current level of knowledge together with areas for development. The second stage systematically develops the knowledge, skills and behaviours required for safe operational performance through the most

The purpose of training is not simply to transfer knowledge, but to create lasting behavioural change. True success lies in the ability of personnel to make the right decisions, even under pressure. It is this capability that strengthens safety culture.

appropriate learning technologies. The final stage reinforces long-term retention through refresher learning, performance analytics and continuous improvement processes.

Within this philosophy, technology is never the objective—it is simply the means.

E-learning, microlearning, virtual reality, serious games, reflective learning practices and learning analytics all serve a single purpose: helping seafarers make safer decisions and consistently demonstrate critical safety behaviours under every operational condition.

Maritime Trainer's role extends far beyond providing training content. Its objective is to help shipping companies establish sustainable learning ecosystems that integrate assessment, training, practical application and performance monitoring into a unified behaviour-based development strategy. ■

Rıdvan SAĞLAM
Training and Development Manager
Maritime Trainer

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A New Era in Maritime Education

From Regulatory Compliance to a Competency Ecosystem

The new era of maritime is no longer defined by courses, but by competencies. The competitive advantage of the future will belong not to organisations that merely comply with regulations, but to those that develop professionals capable of making sound decisions, managing risk and continuously improving.



Capt. Berk ZİNCİR

Holding a certificate does not, by itself, guarantee that a seafarer will make the right decision during a critical operation. On today's vessels, safety depends not only on possessing knowledge but also on the ability to translate that knowledge into safe and effective action under pressure. For this reason, maritime education is undergoing a quiet yet fundamental transformation.

International regulations such as SOLAS, MARPOL, the ISM Code and the STCW Convention remain the foundation of the industry. However, digitalisation, decarbonisation, automation, cyber risks, alternative fuel technologies and the growing importance of the human element are redefining the purpose of maritime education.

The key question is no longer simply:

“Has the training been completed?”

Instead, the industry is asking:

“Has the training enabled safer decisions, better operational behaviour and stronger operational performance on board?”

This shift is transforming maritime education from a compliance-driven activity into a competency-based learning ecosystem that directly influences safety performance, operational excellence and workforce capability.

STCW Provides the Foundation—Competence Is Built Upon It

The STCW Convention remains one of the most influential international instruments governing maritime education and certification. For decades, it has established the minimum standards of knowledge, skills and competence required for safe ship operations worldwide.

However, an important distinction must be made: STCW defines the minimum acceptable standard. It is essential, but it does not guarantee operational excellence on its own.

Completing mandatory courses, passing examinations and obtaining certificates are undeniably important. Nevertheless, these achievements alone do not prove that an officer will make sound risk assessments during complex operations, communicate effectively within the team or demonstrate effective leadership under pressure.

Maritime accident investigations consistently show that, alongside technical knowledge, human factors, communication failures, limited situational awareness, leadership deficiencies and weak risk perception frequently play a decisive role.

Consequently, today's industry expects far more than regulatory compliance. It expects organisations to build genuine operational competence, behavioural performance and continuous professional development upon the solid foundation established by STCW.

Defining the Seafarer of the Future

Several international initiatives—including IMO's Future Skills programme, Singapore's Tripartite Advisory Panel (TAP) for Future-ready Maritime Workforce, SIRE 2.0, the updated RISQ 3.2 standard and revised quality requirements for maritime training providers—are delivering the same message:

Maritime education must evolve beyond knowledge transfer and focus instead on competency development.

The IMO Future Skills initiative seeks to define the

competencies future seafarers will require. Beyond traditional technical knowledge, it highlights digital literacy, data analytics, automation systems, remote operations, alternative fuel technologies, cybersecurity, sustainability and systems thinking as essential capabilities for tomorrow's workforce.

The role of a modern officer is changing rapidly. Today's officers are expected not only to operate radar systems, keep watch and follow procedures, but also to interpret data, work effectively with automated systems, manage human-machine interaction, coordinate across multiple disciplines and make safe decisions under intense operational pressure.

One of the most influential recent publications addressing this transformation is the Tripartite Advisory Panel (TAP) for Future-ready Maritime Workforce, published by the Singapore Maritime Foundation in 2024.

Rather than merely recommending curriculum updates, the report presents a comprehensive framework for preparing the maritime workforce required beyond 2030.

The seafarer of the future must possess not only technical knowledge but also digital and behavioural competencies. Training should be viewed not as something that ends with graduation, but as a lifelong learning journey. Sea-going and shore-based careers should likewise be recognised as complementary parts of a single career ecosystem.

It identifies three fundamental competency areas:

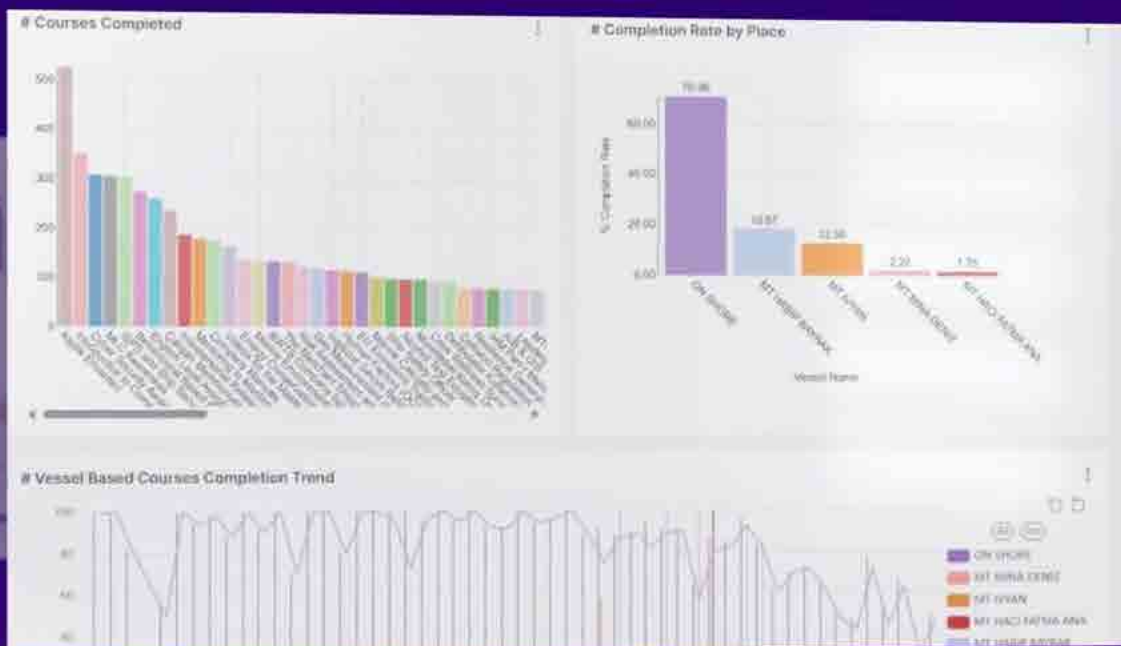
- **Technical (Domain) Competencies:** Ship operations, safety management, deck and engine operations, international regulations and operational risk management.
- **Digital Competencies:** Data literacy, automation systems, cybersecurity, artificial intelligence, remote operations and digital decision-support systems.
- **Behavioural (Soft) Competencies:** Leadership, communication, teamwork, intercultural collaboration, analytical thinking, decision-making under pressure and situational awareness.

Perhaps the report's most significant contribution lies in its educational recommendations. It argues that preparing the maritime workforce for the future requires redesigning education itself.

Higher education institutions and maritime training providers are encouraged to expand practical learning, introduce short-term sea placements, strengthen industry engagement and integrate emerging technologies into their curricula. Furthermore, life-long professional development should be supported through micro-credentials, modular training programmes and continuous learning.

The report also redefines career management. Rather than treating sea-going and shore-based careers as separate paths, it presents them as interconnected elements of a single career ecosystem. Facilitating transitions between sea and shore positions, creating diverse career pathways and improving talent retention are identified as strategic priorities.

The TAP framework therefore represents a genuine



Inspections no longer focus solely on records; they also assess decision-making processes and behaviours. The success of training is measured not by the knowledge imparted, but by the performance demonstrated in real operations. Maritime education is evolving from knowledge transfer to competency management.

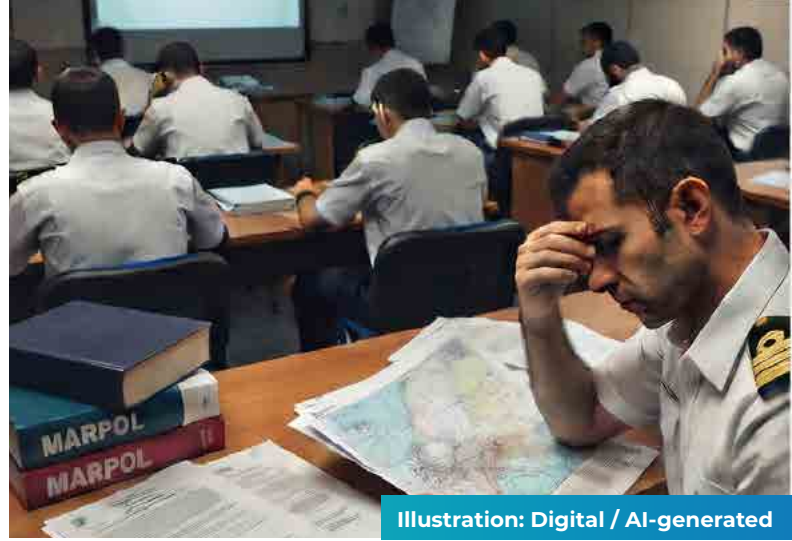


Illustration: Digital / AI-generated

paradigm shift in maritime education. The question is no longer which subjects should be taught, but which competencies future seafarers will need—and how those competencies can be developed and sustained throughout their careers.

SIRE 2.0 and RISQ 3.2: The Shift to Behaviour-Based Assessment

SIRE 2.0, the new tanker inspection programme developed by OCIMF, represents one of the most significant transformations in tanker inspection practices over the past two decades.

Where previous inspection models focused primarily on procedures, records, documentation and equipment, SIRE 2.0 places far greater emphasis on behaviour, decision-making, leadership, risk perception and the human element.

Similarly, the updated RISQ 3.2 standard has expanded its assessment to include not only a training provider's ability to deliver courses, but also its quality management system, instructor competence, training effectiveness and continuous improvement processes.

As a result, today's inspections increasingly focus on questions such as:

- **Do crew members genuinely understand the tasks they perform?**
- **Can they explain why a particular risk is significant?**
- **Are procedures followed merely from memory, or are they applied with a clear understanding of their operational purpose?**
- **Do leadership, communication and decision-making processes actively support safe behaviour?**
- **Is the human element recognised as an integral part of operational risk management?**

Today's inspections evaluate far more than the existence of records. They also assess whether crew members truly understand the operations they perform, how they interpret risks and how they justify the decisions they make.

This represents a fundamental shift in maritime education. The effectiveness of training will no longer be measured solely by the content delivered, but by the quality of operational decisions, behavioural performance and measurable improvements in operational outcomes.

Taken together, these developments clearly demonstrate that maritime education is evolving globally from knowledge transfer towards competency management.

How Should Maritime Training Evolve?

The new approach to maritime education cannot simply be described as offering more modern courses. The real transformation lies in moving from training as a standalone activity to a comprehensive competency ecosystem.

This ecosystem consists of five essential stages:

Define: Which technical, digital and behavioural competencies are required for each operational role?

Assess: What are the strengths of existing teams, and where are the competency gaps?

Develop: Which competencies should be strengthened through training programmes, simulations, operational scenarios and practical exercises?

Apply: How will newly acquired knowledge be translated into safe operational behaviour?

Monitor: How will performance, decision quality and behavioural change be measured after training?

For many years, traditional maritime education focused on a single question:



Illustration: Digital / AI-generated

The success of training should be measured not by course completion, but by behavioural change. True competence lies in demonstrating the right behaviour at the right time. Training should develop the ability to make safe decisions.

“Has the participant completed the training?”

A competency-based learning ecosystem asks a far more meaningful question:

“Does the participant behave more safely, make better decisions and perform more effectively during operations after completing the training?”

This is the question that will define the future of maritime education.

Training design must therefore move well beyond classroom-based theoretical instruction. It should enable participants to experience the critical decision-making situations they are likely to encounter during real operations within a safe learning environment.

Future maritime training programmes should therefore be designed around questions such as:

- **In which operational situations will this knowledge be applied?**

- **What operational consequences could result from an incorrect decision?**

- **How can participants experience these decisions safely within the training environment?**

- **How will safe behaviour be observed, evaluated and measured?**

This approach places scenario-based learning, simulator-supported exercises, case studies, teamwork, decision-making exercises, behavioural observations and performance assessment at the heart of maritime education.

Whether dealing with a fire, enclosed space entry, bridge watchkeeping, fuel changeover, a cyber incident or a challenging communication scenario, training should extend far beyond simply explaining procedures.

Instead, participants should experience realistic operational conditions involving uncertainty, time pressure, incomplete information, team coordination and risk perception within a controlled learning environment.

Ultimately, true competence is not simply about knowing the correct answer—it is about demonstrating the right behaviour, at the right time and in the right way.

From Training to Competency Management

For maritime companies, this transformation is no

longer confined to training departments. It represents an organisational shift that directly influences safety management, human resources, fleet operations, quality management systems and long-term sustainability strategies.

For organisations seeking to adapt to this transformation, the first steps are clear.

Training matrices should no longer be based solely on regulatory requirements but also on operational risks. Which vessel types, operational activities, operational roles and human-factor risks require greater emphasis on training, observation and assessment? The answers to these questions should form the foundation of every training strategy.

Competencies should also be redefined under three complementary categories: technical, digital and behavioural. Organisations should evaluate not only the certificates employees hold but also how effectively they perform their duties and how they perform during real operations.

Training evaluation must also evolve. Participation rates, course completion statistics and examination results remain important indicators, but they are no longer sufficient. The true value of training is demonstrated only when it leads to measurable behavioural change and improved operational performance.

Learning should likewise become continuous and modular. Micro-learning, short digital modules, refresher programmes, simulator-based exercises and role-specific learning pathways can transform training from a one-time event into a continuous learning journey throughout a seafarer's career.

Finally, training data should become an integral part of organisational decision-making. When training, competency, assessment and performance data are analysed together, organisations gain far greater insight—not only into who has completed which courses, but also into where competencies across the fleet need to be strengthened.

Maritime Trainer's Approach: From Course Provider to Competency Development Partner

The ongoing transformation of maritime education is also redefining the role of training providers. Value no longer lies simply in delivering more courses, but in helping organisations identify the competencies they truly need, develop them systematically and measure continuous improvement.

At Maritime Trainer, we view this transformation not merely as an update to training programmes but as a comprehensive shift in the future of maritime education. Training must continue to support complian-

The new approach to maritime education is based on the transition from knowledge transfer to competency management. Measurable development and continuous learning are becoming central to maritime education. The ultimate goal is to achieve lasting behavioural change that contributes to reducing operational risk.

ce with international regulations, but it cannot stop there. Its primary objective should be to reduce operational risks, strengthen safe behaviours and promote measurable competency development.

Our approach is built upon four fundamental principles.

From regulatory compliance to risk management. International regulations will always provide the foundation of maritime training. However, training should ultimately be designed to reduce the operational risks encountered on board.

From knowledge transfer to behavioural change. Scenarios, case studies, simulator-based exercises and lessons drawn from real operations should help participants not only acquire knowledge but also translate that knowledge into safe operational behaviour.

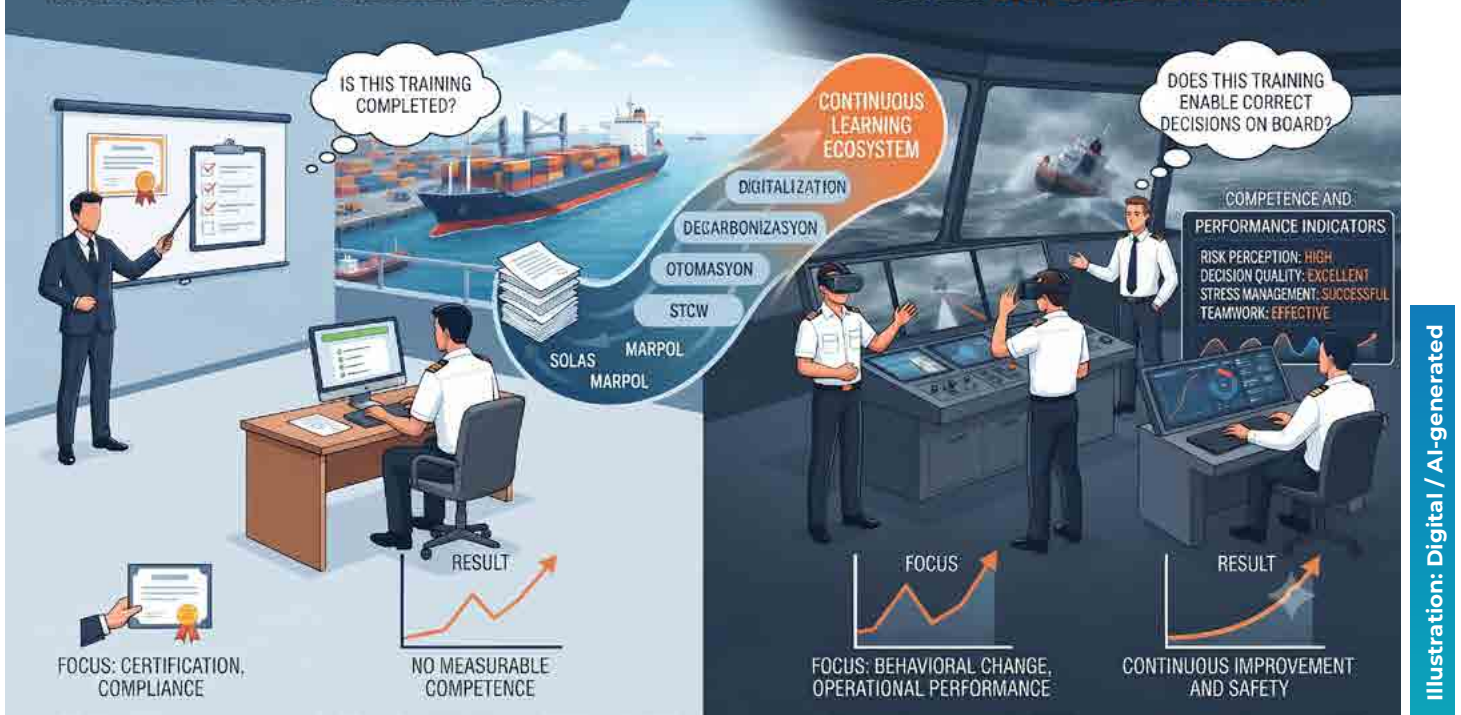
From course completion to measurable development. The effectiveness of training should no longer be measured solely by attendance or the number of completed courses, but by improvements in decision-making, risk perception, team communication and operational performance.

From one-time training to continuous competency management. Changing responsibilities, advancing technologies and emerging operational risks require learning to become a lifelong process. Continuous development is no longer optional—it is essential.

For this reason, Maritime Trainer's vision extends beyond delivering training. Our goal is to serve as a trusted knowledge and solution partner, guiding maritime organisations throughout their competency development journey.

The Future of Maritime Education

Over the next decade, the future of maritime education will not be shaped solely by new technologies. More importantly, it will depend on developing professionals who can use these technologies safely, effectively and responsibly.



The success of training should no longer be measured by course completion alone, but by behavioural change. True competence is demonstrated by the ability to take the right action at the right time. Training must ultimately strengthen safe decision-making.

The next generation of maritime education will be defined by five key characteristics.

Personalised Learning. Training programmes will increasingly be tailored to each participant's experience, operational responsibilities and individual development needs.

Practical Learning. Simulators, virtual reality (VR), augmented reality (AR) and digital twin technologies will enable participants to experience critical operations within realistic yet completely safe learning environments.

Performance-Based Assessment. Evaluation will extend beyond attendance to include decision quality, behavioural change and practical application.

Flexible and Modular Learning. Micro-learning, short digital modules and continuous refresher training will become integral elements of professional development.

Balancing Technical and Behavioural Skills. Leadership, communication, teamwork, human factors, situational awareness and safety culture will become inseparable from technical training.

This transformation will redefine not only training programmes but also the role of training providers within the maritime industry. Success will no longer

be measured by the number of courses delivered, but by the competent professionals developed and the measurable improvements achieved in operational performance.

Conclusion

The maritime industry is not simply adapting to new regulations; it is undergoing a far broader transformation. The STCW updates, IMO Future Skills initiative, Tripartite Advisory Panel (TAP), SIRE 2.0 and RISQ 3.2 are not isolated developments. Together, they point towards a single objective: redefining the maritime workforce to build a safer, more sustainable and more resilient industry.

The success of training institutions will therefore no longer be measured solely by the number of courses they provide, but by the competent professionals they prepare for the industry. Maritime education is evolving beyond regulatory compliance into a strategic investment that supports operational excellence. Training providers and maritime organisations that adapt to this transformation in a timely manner will not only comply with future regulations but also gain a lasting competitive advantage.

Because the future of maritime shipping will be determined not only by new technologies, but by the people who can use those technologies safely, responsibly and effectively.

The most critical investment for the future of maritime is no longer made only in ships or systems—it is an investment in human competence. ■

Capt. Berk ZİNCİR
Project Director – Maritime Trainer

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The Future of Human-Centred Shipping

Seafarers at the Heart of the Green Transition

Decarbonization, digitalization, and evolving international regulations are reshaping the future of shipping. According to INTERCARGO, the true driving force behind this transformation is not technology alone, but well-trained seafarers working in safe conditions whose welfare remains a top priority.



Dimitris N. MONIOUDIS
Chairman of the Technical Committee,
INTERCARGO

How are recent geopolitical crises, decarbonisation targets, and digitalisation shaping human resource management within the dry bulk sector? What is INTERCARGO's role in navigating this transformation?

Dry bulk shipping is being reshaped by three forces at once: geopolitics, decarbonisation and digitalisation. That means human resource management is no longer just about crewing a vessel; it is about building resilience. Shipowners and operators need to plan simultaneously for security risks, disrupted trade routes, new regulatory demands, increasingly complex technologies and, above all, the wellbeing of the people operating their ships.

INTERCARGO's role, representing quality dry cargo shipping, is to ensure that the sector has a clear and practical voice in international discussions, particularly at the IMO. Our message is simple: safety, competence and seafarer welfare must remain at the heart of this transformation.

Data indicates a declining interest among the younger generation in pursuing seafaring careers. Considering the sheer size of the global dry bulk fleet,

what strategic HR steps must be taken to sustain a reliable supply of qualified seafarers?

The global shipping sector cannot take its future workforce for granted. We need to inspire young people earlier, strengthen the link between shipowners, operators and maritime education, and offer cadetships, mentoring and career paths that are visible and credible.

However, recruitment is only half the answer. Retention depends on making a career at sea more attractive through reliable crew changes, fair contracts, better connectivity, safer working conditions and genuine respect from all maritime stakeholders—including charterers, shippers and port authorities—for seafarers as key workers.

If we want the next generation to choose the sea, we must demonstrate that our industry values not only their professional skills but also their quality of life.

How are the green transition and new fuel technologies, such as ammonia and methanol, altering the training requirements for crew serving aboard dry bulk carriers? What are INTERCARGO's ongoing initiatives or projects regarding this matter?

The green transition will only be safe if it is also a training transition that fully embraces newly developed digital tools. Fuels such as ammonia and methanol introduce new risks and responsibilities, ranging from toxicity and flammability to bunkering procedures, emergency response and maintenance.

Seafarers cannot be expected to manage these challenges with outdated or unproven training. INTERCARGO is actively contributing to the IMO's ongoing review of the STCW Convention and Code, as well as discussions on training guidance for ships

"In dry bulk shipping, human resources now mean more than just finding crew; it means building resilience. Safety, competency, and seafarer welfare are at the center of this transformation. INTERCARGO also champions this approach on international platforms."



operating with alternative fuels and emerging technologies.

We are fortunate to have pioneering members who are already testing new fuels and other decarbonisation technologies. Their practical experience enables us to support our membership through knowledge sharing and safety-focused learning resources, because competence must be built before new fuels and technologies can be implemented on a wider scale.

The prolonged voyage durations of dry bulk carriers, combined with increasingly short port stays due to rapid loading and discharging operations, can induce severe fatigue among crew members. What concrete standards or guidelines does INTERCARGO recommend to its member shipowners to mitigate burnout and safeguard mental health?

Fatigue is not a paperwork issue; it is a safety issue. Compliance with the Maritime Labour Convention and the STCW hours-of-rest requirements is the minimum standard, but responsible operators should always strive to go further.

All maritime stakeholders—including ports, terminals, shippers, authorities, charterers and regulators—must contribute to realistic port-call planning, monitor actual workloads, reduce unnecessary administrative burdens and foster a culture in which seafarers can report fatigue without fear.

Mental health support, respectful onboard leadership, shore leave whenever possible and regular contact with families all play a vital role. In dry bulk shipping, where port stays are often extremely short and cargo operations highly intensive, fatigue prevention must begin well before the vessel arrives in port.

INTERCARGO actively advocates this industry-wide collaboration, where practical solutions are developed rather than merely discussed. DryBMS, the recently launched Dry Bulk Self-Assessment Standard, provides a valuable framework for helping companies achieve these objectives.

Following the crises experienced during the pandemic, has there been a permanent improvement in ideal contract lengths and crew change processes within the dry bulk segment?

The pandemic taught shipping a hard lesson: crew change is not merely a logistical detail—it is a human necessity and a fundamental safety requirement.

There has been meaningful progress. Many companies now plan more effectively, communicate more transparently and better recognise the importance of seafarers as key workers. Nevertheless, the challenge has not disappeared. Border restrictions, visa issues, geopolitical instability and limited flight availability continue to delay crew relief in many parts of the world.

INTERCARGO therefore continues to advocate for global crew-change systems that are predictable, humane and resilient—not only during times of crisis, but as a permanent standard of responsible shipping. How has the expansion of free, high-speed satellite internet access, such as Starlink systems, onboard affected seafarer welfare? What is INTERCARGO's official stance on recognising onboard internet access as a fundamental right?

Connectivity has become one of the clearest indicators of modern seafarer welfare. Reliable internet access enables seafarers to remain in close contact



with their families, access essential services, reduce isolation and participate in training opportunities while at sea.

Naturally, connectivity must be managed responsibly to ensure that it supports adequate rest and safe shipboard operations. We are fully aware of the concerns expressed ashore regarding the potential risks associated with excessive social media use.

However, the underlying principle remains clear: seafarers should not be isolated from the world while they keep global trade moving. INTERCARGO regards meaningful access to communication as an essential component of welfare at sea and a reasonable expectation aboard modern ships. Furthermore, internet connectivity offers access to a growing range of digital tools that can support both the physical and mental wellbeing of seafarers.

According to INTERCARGO data, is there a current shortfall percentage in officers and ratings specifically within the dry bulk sector, including Capesize, Panamax and Supramax vessels? What are your projections for the next five years?

INTERCARGO does not publish a separate crew-shortage metric specifically for the dry bulk sector. The most reliable indicators currently available come from broader industry workforce studies, including the BIMCO/ICS Seafarer Workforce Report, which projects a global shortage of more than 100,000 qualified officers by 2030 if demand continues to grow.

For the dry bulk sector, the conclusion is straightforward: competition for experienced and competent seafarers will continue to intensify. Companies that invest early in cadet programmes, training, retention and long-term career development will be far better positioned than those that wait until the shortage directly affects their own operations.

How do seafarer retention rates—both within the same company and across the dry bulk segment as a whole—compare to other sectors such as tankers or

containers? Statistically speaking, what is the single most significant factor driving company loyalty?

Reliable statistical comparisons of retention rates between the dry bulk, tanker and container sectors are not consistently available, so any definitive ranking would be misleading.

What we can say with confidence is that loyalty has traditionally been built by the employer rather than by the vessel type. Greek shipping, for example, developed over many decades on precisely this principle. Ultimately, trust remains the single most important factor. Seafarers remain with companies that provide safe ships, fair treatment, reliable pay, transparent communication, predictable relief schedules, genuine career development opportunities and a sincere commitment to their welfare.

In today's highly competitive labour market, companies that invest in people will retain competence. Those that regard crewing merely as a cost will inevitably struggle to attract and retain qualified professionals.

Upon reviewing recent INTERCARGO Bulk Carrier Casualty Reports, what percentage of fatal accidents or cargo losses can be attributed directly to the human element, such as fatigue, inadequate training or lack of mental focus? What is the most up-to-date statistical breakdown available?

INTERCARGO's annual Bulk Carrier Casualty Reports

"Decarbonization cannot be achieved through technology alone. The training, well-being, and rest of seafarers are inseparable parts of this transition. Human-centric investment is the key to sustainable shipping."

provide valuable insight into the causes of total losses, including grounding, cargo liquefaction, flooding and other casualty categories. However, they do not assign a single percentage of fatalities or cargo losses to the broad category of the “human element”, because virtually every maritime accident—whether ashore or onboard—involves some degree of human contribution.

The latest reports continue to highlight cargo liquefaction as one of the leading causes of loss of life, while grounding remains among the principal causes of ship losses over the past decade.

The key message is that technical, operational and human factors cannot be viewed in isolation. Better training, accurate cargo declarations by shore-based stakeholders, stronger safety management both onboard and ashore, effective fatigue management and timely casualty investigations all form essential links in the same safety chain.

In recent Port State Control inspections, is there a rising or declining trend in the detention rates of dry bulk carriers due to Maritime Labour Convention deficiencies? What is the statistically most frequent MLC deficiency encountered?

Port State Control detentions related to Maritime Labour Convention (MLC) deficiencies have increased as a proportion of overall detentions in recent years.

Across the industry, the most frequently identified MLC-related deficiencies include hours of rest, seafarers’ employment agreements, wage documentation, food and catering, accommodation standards, medical certification and repatriation arrangements.

For quality shipowners and operators, MLC compliance should never be regarded as merely an administrative exercise. It must be actively managed, properly documented and consistently verified onboard, because deficiencies affecting crew welfare are often early indicators of broader operational risks.

Representing more than 220 quality dry cargo operators managing nearly 5,000 bulk carriers worldwide, INTERCARGO supports its members by sharing best practices, training experiences and practical initiatives that promote high MLC standards across the sector.

As the concept of a “Just Transition” gains momentum across the maritime industry, what is INTERCARGO’s vision for encouraging dry bulk shipowners to adopt a more human-centred approach to investment?

For INTERCARGO, a Just Transition means ensuring that environmental progress and human progress advance together within a genuinely sustainable framework. New fuels, emerging technologies,

digital systems and energy-efficiency regulations must not simply transfer additional complexity and responsibility onto seafarers without providing the necessary support.

All stakeholders—including shipowners, managers, regulators, charterers, shippers, ports and insurers—must invest in training and experience-sharing before new technologies are introduced, actively seek feedback from crews, develop procedures that reflect real onboard conditions, and ensure that welfare and adequate rest remain integral parts of every transition strategy.

Decarbonisation will not succeed through technology alone. It will succeed only if the people who operate the global maritime logistics chain are properly trained, adequately protected, genuinely listened to and consistently supported.

Finally, what is the single most important message you would like to convey to global dry bulk shipowners and HR managers regarding the future of seafarer welfare?

Our message is simple but urgent: seafarer welfare is not separate from safety, sustainability, operational performance or commercial success—it is the foundation of all four.

Dry bulk shipowners, operators, HR managers and every stakeholder across the maritime supply chain should regard crew welfare as a strategic investment in long-term resilience rather than as a cost.

That means providing safe ships and ports, competent crews, fair employment conditions, reliable crew relief, meaningful internet connectivity, mental health support, practical training and, above all, a culture built on respect.

The dry bulk sector cannot deliver a safer, greener and more sustainable future unless it also delivers a more humane future for the people who keep global trade moving. ■



A New Era in Maritime Engineering Education

Marine Engineering in the Age of Decarbonisation

Decarbonisation, alternative fuels, and digitalisation are redefining marine engineering. Professor Adnan Parlak emphasises that engineering education and academic curricula must evolve at the same pace as this technological transformation.

grandi



Prof. Dr. Adnan PARLAK
Founder & CEO, Grandi Maritime R&D,
Training and Consultancy Ltd.

From Machinery Operator to Proactive Energy Manager

Ship platforms are integrated yet isolated macro-engineering environments incorporating thermo-fluid systems, power cycles, and complex mechanical components.

The rapid technological transformation taking place across the maritime industry through decarbonisation, alternative fuel systems, and digitalisation now requires marine engineers to possess not only a solid theoretical foundation but also strong analytical reasoning and systems thinking skills.

The competencies expected of a marine engineer are increasingly shaped by the principles of thermodynamic optimisation, proactive parametric monitoring, and an eco-economic approach to sustainability. Evaluating onboard components—such as cargo steam turbine systems operating on the Rankine Cycle—through a sound theoretical engineering perspective directly influences numerous operational processes, from improving efficiency to preventing equipment failures.

Energy efficiency should not be regarded merely as an indicator of fuel economy. It also represents a proactive preventive maintenance philosophy aimed at preventing incipient failures by applying the P-F Curve approach, which forms the basis of predictive maintenance and reliability-centred maintenance (RCM) planning for machinery and equipment.

Within this context, the curricula, academic staff profiles, and technological infrastructures of Marine Engineering departments in Türkiye are evaluated. Practical recommendations are presented, including bidirectional academia-industry collaboration models, modular curriculum structures, shipowner-university consortia, and accreditation strategies based on MÜDEK and ABET standards.

A Changing Maritime Industry Requires a New Engineering Mindset

Ship platforms are micro-industrial environments where complex multidisciplinary engineering systems operate in an integrated manner. Consequently, engineers working within this ecosystem must thoroughly internalise engineering philosophy at an analytical level. Such competence can only be achieved by synchronising the methodological approach provided by a strong theoretical foundation with the ability to apply engineering knowledge effectively in real operational environments.

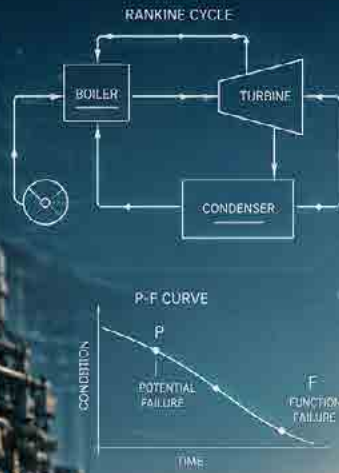
Unlike many other engineering disciplines that share common engineering principles, the maritime sector requires engineers to make decisions under highly dynamic operating conditions and severe time constraints. While fault diagnosis and troubleshooting in land-based engineering can often be conducted through collaborative teamwork over extended periods, ship operations constitute an isolated environment that demands individual initiative and decisive engineering leadership during critical situations.

A competent marine engineer must be capable of analytically understanding the direct relationship between every complex mechanical component onboard and the fundamental engineering sciences—including thermodynamics, fluid mechanics, heat transfer, refrigeration, and air conditioning.

For example, when operating a cargo steam turbine

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during cargo handling on a tanker, an engineer who fully understands that the machinery functions as an integral component of a steam power system based on the Rankine Cycle can technically evaluate how to improve cycle efficiency. Without this theoretical understanding, however, it becomes impossible to comprehend the thermodynamic correlation between the boiler, condenser, and turbine, or to recognise the macro-level influence these components exert on cycle efficiency. The system is then operated merely with the reflexes of a technician rather than the judgement of an engineer.

Success within this engineering ecosystem ultimately depends on integrating the methodological approach derived from a strong theoretical foundation with effective practical engineering competence in the field.

Three Fundamental Principles That Define the Engineering Approach

The engineering philosophy that shapes a marine engineer's approach to onboard systems is founded upon three fundamental pillars.

• Thermodynamic Optimisation and an Exergy-Based Philosophy of Energy Efficiency

A ship is essentially an integrated, self-contained thermo-fluid micro power plant. Within this framework, the engineer is responsible for minimising entropy generation (irrecoverable energy losses) throughout the entire energy conversion process—from converting the chemical energy of fuel into mechanical power to producing fresh water through evaporators by recovering waste heat from exhaust gases (cascade heat recovery).

In engineering literature, energy efficiency is defined as reducing specific energy consumption per unit of output (e.g., SFOC) without compromising either operational quality or production output in industrial systems. In other words, it means delivering the same functional performance with lower energy input.



Illustration: Digital / AI-generated

"In maritime, strong engineering is formed by the union of theoretical knowledge and field experience. The goal is not merely to operate the system, but to manage it analytically. True competency is gained through this holistic perspective."

In line with the principle that "the cleanest and cheapest energy is the energy that is not consumed," one of the primary objectives of marine engineering is to achieve the same voyage distance or operational performance while using the minimum possible amount of energy.

Operating onboard systems at high thermal efficiency not only improves fuel economy but also reduces thermal and mechanical loads, thereby serving as a proactive preventive maintenance strategy that minimises unplanned operational breakdowns.

• Proactive Parametric Monitoring and Predictive Maintenance (A Philosophy of System Health and Reliability)

Operating outside nominal design conditions can significantly reduce system efficiency. Examples



Illustration: Digital / AI-generated

include clogged air coolers, poor fuel injector atomisation, and cavitation in pumps. Such conditions convert accumulated energy losses into excessive mechanical and thermal stresses acting on system components.

This process gradually compromises the structural integrity of the system long before any externally visible signs of failure appear. In engineering literature, these hidden deterioration processes are referred to as incipient failure and degradation mechanisms.

This invisible damage cycle, which develops progressively within the system, is described by the P-F Curve (Potential Failure–Functional Failure), a widely accepted model used in predictive maintenance and reliability-centred maintenance planning.

Point P (Potential Failure)

This is the stage at which internal degradation begins as a result of inefficient system operation. Although no functional failure has yet occurred, the damage can only be detected through advanced diagnostic techniques such as vibration analysis, ferromagnetism, thermography, and other condition-monitoring methods.

Point F (Functional Failure)

This represents the final stage at which the component completely loses its functionality, the machinery ceases operation, or catastrophic failure occurs.

An engineering philosophy centred on energy efficiency maintains operational parameters within their optimum limits, thereby preventing excessive

mechanical stresses and material fatigue. As a result, shipowners and operators are protected against significant financial losses associated with unplanned dry-docking, emergency repairs, or mid-voyage breakdowns.

Ultimately, operational efficiency remains one of the strongest guarantees of predictive maintenance and long-term system reliability.

• Resource-Constrained Operations and Environmental Sustainability (The Eco-Economic Philosophy)

Ships operate as isolated ecosystems during ocean voyages, where both logistical resources and fuel capacity are inherently limited. Managing energy conversion processes with maximum efficiency therefore directly enhances a vessel's operational range and autonomy.

Furthermore, in today's maritime industry, energy efficiency is no longer merely an economic preference; it has become a regulatory obligation under global IMO requirements such as the Carbon Intensity Indicator (CII) and the Energy Efficiency Existing Ship Index (EEXI).

A marine engineer is therefore responsible for managing energy from a technical, economic, and environmental perspective in order to safeguard both the commercial competitiveness of the shipping company and the sustainability of the global environment by minimising emissions, reducing carbon footprints, and supporting decarbonisation objectives.

In summary, marine engineering is a dynamic discipline in which theoretical engineering knowledge is continuously tested under some of the world's most demanding operational conditions, strict resource constraints, and relentless time pressure.

Prioritising energy efficiency is far more than a strategy for reducing fuel consumption. It is also a proactive operational safety philosophy that reduces thermal and mechanical stresses on machinery, enabling engineers to eliminate incipient failures before they develop into catastrophic breakdowns.

In the isolated operating environment of the open sea, today's marine engineer is no longer merely a machinery operator managing limited resources while complying with the global regulations of the

decarbonisation era. Instead, the modern marine engineer is a proactive energy manager who transforms theoretical engineering knowledge into operational excellence, energy efficiency, financial sustainability, and environmental responsibility.

The Imperative for Academic Adaptation in Response to Global Transformation

The maritime industry is experiencing a profound paradigm shift driven by the IMO's stringent environmental regulations, net-zero emission targets, next-generation alternative fuel systems (LNG, ammonia, methanol, and hydrogen), and the growing adoption of autonomous and intelligent ship technologies.

This transformation affects not only onboard operational processes but also necessitates the rapid adaptation of engineering education, academic curricula, and faculty competencies to meet the demands of an evolving technological landscape.

An assessment of Marine Engineering departments in Türkiye reveals several structural issues that must be addressed to ensure successful adaptation to this global transformation.

• Strengthening Engineering Theory within Practice-Oriented Academic Staff

At some universities, academic staff possess extensive seagoing experience and strong operational expertise. However, there remains room for improvement in strengthening the theoretical foundations of engineering education.

This situation may also be reflected in the curriculum. Fundamental engineering subjects such as thermodynamics, fluid mechanics, heat transfer, and energy systems are, in some cases, no longer offered as compulsory courses and have instead been transferred to the elective curriculum.

Furthermore, the shortage of subject-matter experts in these disciplines may prevent students from acquiring the depth of knowledge necessary to master the core philosophy of systems engineering. Consequently, graduates may struggle to develop a robust engineering mindset and the analytical capabilities required to model and manage increasingly complex next-generation engineering systems.

• Strengthening Industry Integration within Theory-Oriented Academic Staff

Conversely, some long-established universities possess exceptionally strong academic traditions and research capabilities in engineering. However, the limited seagoing experience or current industry engagement of certain administrators and academic staff may create a gap between theoretical knowl-

“Smart ship technologies necessitate a radical transformation in maritime education. Robust engineering theory, current industry experience, and dynamic curricula must meet within the same structure. The foundation of this transformation consists of modern laboratories and university-industry collaboration.”

edge and operational practice. International standards governing maritime education (STCW), together with the isolated, time-critical, and high-risk nature of shipboard operations, differ substantially from those encountered in land-based engineering.

When academic staff remain disconnected from current industrial practice, it becomes increasingly difficult to translate theoretical knowledge into practical engineering capabilities—including fault diagnosis, crisis management, and predictive maintenance—and to effectively transfer these skills to students.

Keeping Curricula Current in Newly Established Departments

In many newly established universities, the curricula of newly established Marine Engineering departments are often developed by directly replicating the curricula of long-established institutions.

This approach may create a mismatch between the expertise of existing academic staff and the rapidly evolving needs of the maritime industry.

Despite rapid advances in green propulsion systems, cybersecurity, digital twin technologies, and next-generation automation solutions, static curricula make it increasingly difficult to develop the flexible and innovative engineers required by today's global maritime industry.

Strengthening Laboratory and Simulator Infrastructure

In addition to curricula and academic staff, technological infrastructure represents another critical component of engineering education.

One of the most significant structural shortcomings in Türkiye is the limited availability of advanced research laboratories and training facilities capable of supporting simulation-based training on next-generation fuel systems. Most existing simulators have been designed around conventional diesel propul-

“Global transformation is leaving the static curriculum approach in maritime education behind. University-industry collaboration and dynamic educational models are now becoming a necessity. The goal is to train engineers prepared for the technologies of the future.”

sion systems. There is an urgent need to expand educational infrastructure capable of simulating dual-fuel propulsion systems, together with the thermal management of emission control technologies, including scrubbers and Selective Catalytic Reduction (SCR) systems.

University-Industry Collaboration Models and Recommendations for Curriculum Reform

Maintaining the global competitiveness of maritime education in Türkiye depends on bridging the gap between theoretical depth and operational experience while developing curricula capable of continuous adaptation to technological change.

The principal reform proposals required to achieve this objective are outlined below.

• Bidirectional Academic-Industry Mobility Programmes

Universities with strong engineering programmes but academic staff possessing limited maritime operational experience should be encouraged to appoint experienced Chief Engineers and Technical Superintendents as visiting lecturers. At the same time, it is equally essential to establish a framework

that safeguards the integrity of engineering education by ensuring that visiting lecturers with extensive practical experience, but insufficient theoretical engineering foundations, do not compromise the core principles of engineering education.

Likewise, theory-oriented academics should be encouraged to undertake periodic placements in shipyards, the technical departments of shipping companies, and onboard ships in order to gain first-hand exposure to contemporary industry practices.

Such a two-way exchange of knowledge and experience would deliver significant benefits to both academia and the maritime industry.

• A Modular and Continuously Updated Curriculum

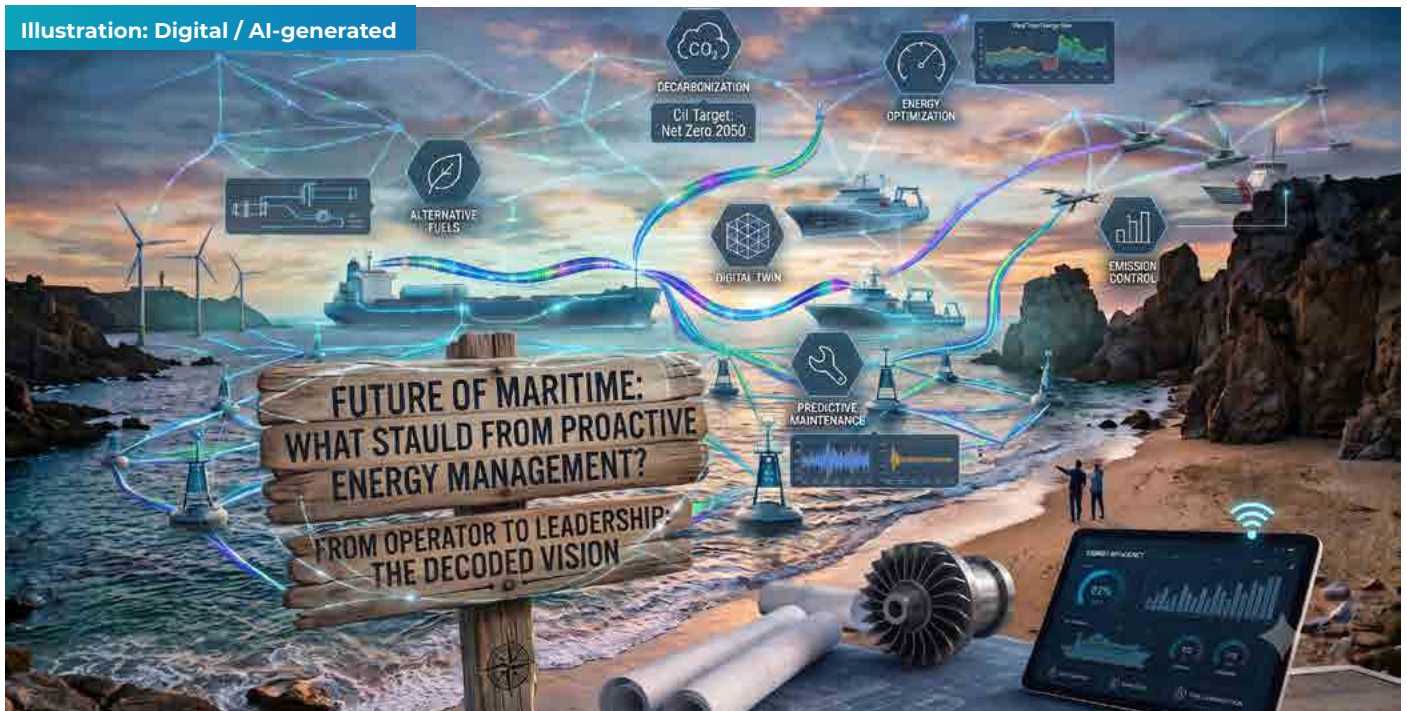
Core engineering subjects—including thermodynamics, fluid mechanics, and heat transfer—must continue to form the backbone of the curriculum.

At the same time, modular courses covering alternative fuel systems, maritime cyber security, applied electrical, electronic, and automation engineering, software systems, data analytics, and condition-based maintenance should be incorporated into the programme. Their content should be reviewed and updated regularly in close collaboration with industry stakeholders to ensure continued relevance.

• Joint Research Laboratories and Consortium-Based Investment

The substantial investment required for next-generation simulators and advanced laboratory facilities often exceeds the capacity of individual universities. These investments can therefore be realised through

Illustration: Digital / AI-generated



collaborative consortia involving universities, ship-owners, and maritime industry organisations.

Furthermore, the active participation of manufacturers of onboard systems widely used throughout the industry would accelerate both technological development and the sector's ability to adapt to emerging innovations. Such a collaborative approach would not only strengthen technological infrastructure but also make a direct contribution to developing the highly qualified workforce required by the maritime industry.

• Expanding International Accreditation

Institutions providing maritime education should aim not only to satisfy national quality assurance requirements but also to obtain internationally recognised engineering accreditations such as MÜDEK and ABET.

Achieving these accreditations would enable graduates to pursue broader career opportunities not only at sea but also in sectors such as energy, machinery manufacturing, classification societies, and research and development centres.

Conclusion

This analysis demonstrates that the ongoing processes of decarbonisation and digitalisation within the global maritime industry are fundamentally redefining the competencies expected of marine engineers.

Modern ship platforms—where integrated thermo-fluid systems, gas and steam power cycles, and internal combustion engines operate simultaneously—now require professionals who possess not only operational expertise but also a strong theoretical foundation, analytical thinking skills, and the ability to evaluate complex engineering systems from a holistic perspective.

Reactive approaches focused solely on mechanically operating shipboard systems are no longer sufficient to meet the demands of today's advanced marine technologies. As illustrated by cargo steam turbine systems operating on the Rankine Cycle, integrating rigorous theoretical knowledge with practical onboard application is one of the key determinants of operational efficiency.

An operational philosophy centred on energy efficiency delivers far more than fuel savings. It also enables the early identification of degradation mechanisms that compromise system health through the P-F Curve approach, allowing incipient failures to be eliminated before they develop into catastrophic breakdowns. Consequently, shipowners and operators are protected from the substantial costs associated with unplanned downtime.

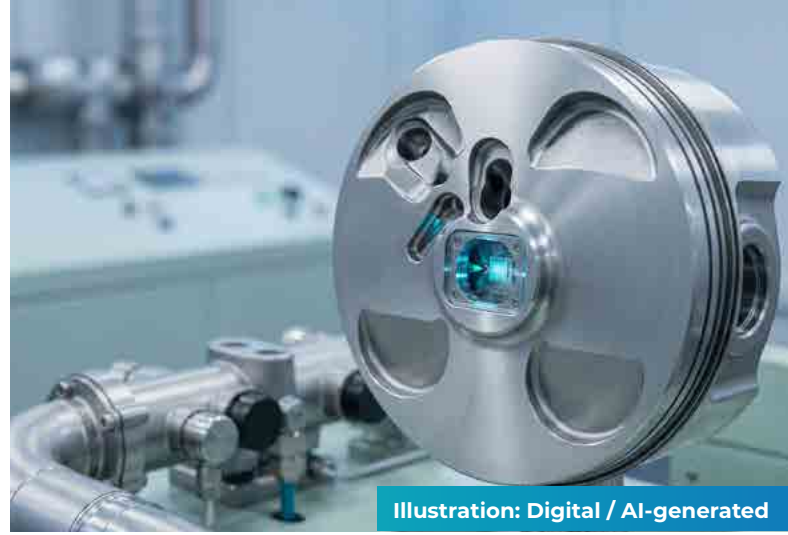


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An assessment of Marine Engineering education in Türkiye also reveals the need for significant structural improvements to ensure alignment with global technological developments. In some institutions, practical experience has come to outweigh theoretical engineering foundations, while in others, strong academic foundations are not sufficiently reinforced by current industry experience. This imbalance is further compounded by static curricula in newly established departments and by shortcomings in laboratory and simulator infrastructure.

Within this context, the proposed curriculum reforms and university–industry collaboration models should be regarded not merely as recommendations for educational improvement but as a strategic roadmap for the future of Turkish maritime. Bidirectional mobility programmes, through which experienced Chief Engineers and Technical Superintendents contribute their expertise to academia while academics gain practical experience in contemporary industry environments, have the potential to make a substantial contribution to the quality of engineering education.

Likewise, creating more flexible and continuously updated curricula, rapidly integrating alternative fuel systems and automation technologies into educational programmes, and expanding international accreditation should no longer be viewed as optional initiatives, but rather as essential requirements for maintaining global competitiveness.

In the resource-constrained, time-critical, and high-risk operating environment of the open sea, the marine engineer in the decarbonisation era is no longer merely a machinery operator. Instead, the modern marine engineer is a proactive energy manager who transforms theoretical engineering knowledge into operational excellence, energy efficiency, financial sustainability, and environmental responsibility.

Restructuring maritime education in Türkiye in line with this vision will not only produce highly qualified marine engineers but will also further strengthen the global competitiveness of the Turkish maritime industry. ■

A New Competitive Frontier in Maritime

The New Competition Is for Talent

Ships are becoming larger, technology is advancing and fleets are being modernised. Yet the future of the maritime industry will ultimately be shaped by organisations that can attract and develop qualified talent. Ebru Kasap, Co-Founder of QSM Global, discusses the evolving approach to human capital in global shipping and the key competencies that will define the seafarers of the future.



Ebru KASAP
Co-Founder, QSM Global

Human resource management in the maritime industry extends far beyond recruitment. How has your career journey led you to your current position? Could you tell our readers about your role and key responsibilities?

I began my maritime career in 2009 and have since worked in recruitment, crewing operations and personnel management for one of the world's leading ship management companies. Throughout this journey, I have worked with thousands of seafarers, gaining first-hand insight into the evolving expectations of international shipowners, global workforce trends and the changing role of human resources in the maritime industry.

Today, as Co-Founder of QSM Global, I develop strategic partnerships with international ship management companies and shipowners while delivering sustainable human capital solutions that strengthen the presence of Turkish seafarers in global fleets and respond to the industry's evolving workforce needs.

The most significant transformation I have witnessed has been the evolution of human resources

from an operational support function into a strategic pillar of the business. While competition once centred on fleet size, operational efficiency and technical performance, today's competitive advantage lies in attracting, developing and retaining qualified professionals. Human resources is no longer a support function; it has become a core element of corporate strategy.

To me, human resource management has never been limited to recruitment. It encompasses the entire employee journey—from a seafarer's first contact with an organisation to the successful completion of a contract. Strong teams are built not only by selecting the right people, but also by creating a culture that fosters professional development, trust and a genuine sense of belonging.

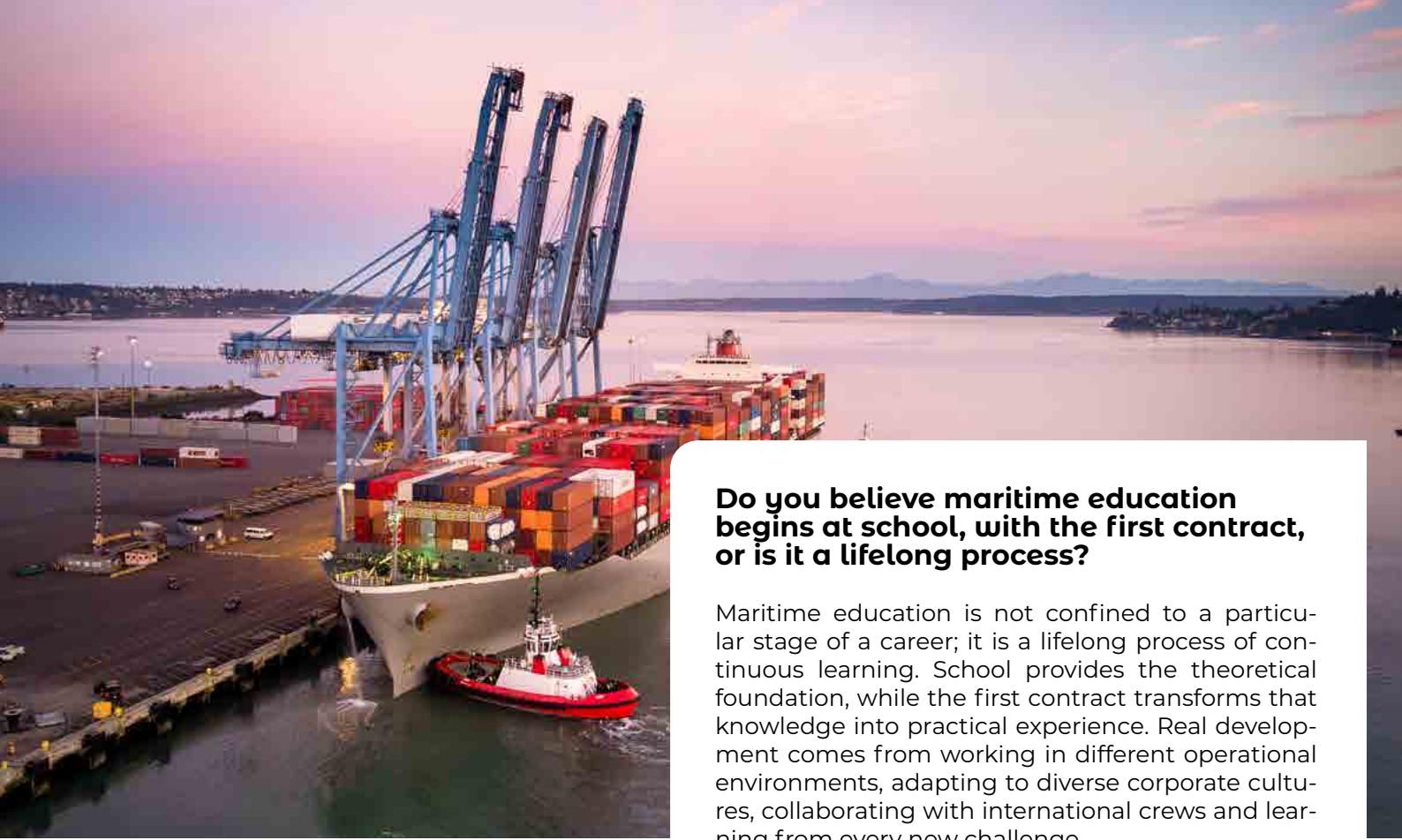
Our responsibility is therefore not simply to fill vacancies, but to understand the industry's changing dynamics, contribute to our partners' long-term workforce strategies and strengthen the international presence of Turkish seafarers.

I believe the greatest competitive advantage in the years ahead will not be technology itself, but people. Technology will eventually be accessible to everyone; the real advantage will belong to organisations that can attract, develop and retain the right talent.

You work with international shipping companies. How do you balance training, recruitment, career development and operational management in your role?

These functions cannot be managed in isolation. Training, recruitment, career development and operations are interconnected elements of a single strategy. A weakness in any one of them affects not only operational performance but also safety culture and an organisation's long-term success.

The expectations of our international partners have evolved accordingly. Companies are no longer looking only for professionals who can meet today's operational needs; they are seeking future masters, chief engineers and leaders. Recruitment has therefore become the starting point of long-term talent development rather than simply fulfilling an immediate operational requirement.



Do you believe maritime education begins at school, with the first contract, or is it a lifelong process?

Maritime education is not confined to a particular stage of a career; it is a lifelong process of continuous learning. School provides the theoretical foundation, while the first contract transforms that knowledge into practical experience. Real development comes from working in different operational environments, adapting to diverse corporate cultures, collaborating with international crews and learning from every new challenge.

Career expectations among seafarers have changed significantly. Today, professionals evaluate not only salary levels but also development opportunities, corporate culture, leadership quality, communication with management and long-term career prospects. This shift has transformed both human resource strategies and the way companies approach training.

Training is no longer limited to mandatory certification. It has evolved into a continuous development process that also embraces leadership, communication, intercultural competence and adaptability.

The organisations that will succeed in the future are those that recognise human resources as a strategic business function rather than an operational support service. Building a strong fleet is important, but lasting competitive advantage comes from attracting, developing and retaining talented people.

Lasting competitive advantage in shipping will come not from technology, but from qualified talent. Strong teams are built not by recruitment alone, but by fostering a culture of continuous development and belonging. The organisations that will shape the future are those that place people at the centre of their strategy.

Our experience shows that technical knowledge alone does not define a successful seafarer. The ability to adapt to change, make sound decisions and remain committed to continuous learning is equally important. As technology advances, experience is no longer measured solely by years spent at sea, but also by how quickly professionals can adapt to changing conditions.

For this reason, the future of maritime education cannot rely on technical competence alone. Critical thinking, problem-solving, communication, leadership and lifelong learning must become integral parts of training. Technical knowledge can be updated over time, but the willingness to learn, adapt and continuously improve remains one of the most valuable qualities throughout a seafarer's career.

Many companies say that finding qualified seafarers has never been more difficult. In your view, is the challenge a shrinking talent pool, or have the industry's expectations changed?

In reality, the industry is undergoing two significant transformations simultaneously.

On one hand, the profile of those choosing a maritime career is changing. Today's professionals look beyond salary. They also value career development, corporate culture, leadership, work-life balance and psychological well-being. By its nature, shipping demands discipline, responsibility and long perio-



Human resources is no longer an operational support function; it has become a core element of corporate strategy. Lasting competitive advantage is achieved by organisations that can develop and retain qualified talent. Every successful fleet is built on the strength of its people.

In the years ahead, competition will be driven not only by investments in new ships but also by investments in people. Sustainable success depends not only on hiring the right professionals, but also on developing, supporting and retaining them over the long term.

Two candidates may have equally impressive CVs, yet one excels on board while the other struggles to meet expectations. Beyond technical competence, what distinguishes an outstanding seafarer?

This reflects one of the fundamental realities of human resource management. A CV can highlight a candidate's sea service, technical experience and certifications, but it reveals little about character, judgement under pressure, sense of responsibility, teamwork or leadership potential.

Our experience with international partners confirms that technical competence is no longer a competitive advantage; it is simply the baseline. What truly distinguishes exceptional professionals are their behavioural competencies. The ability to maintain sound judgement under pressure, take initiative when needed, inspire trust, collaborate across cultures and remain committed to continuous learning sets outstanding seafarers apart.

Shipping is built on teamwork rather than individual achievement. Safe and efficient operations depend on mutual trust and a shared commitment among everyone on board. An outstanding seafarer is not only someone who performs their own duties well, but also someone who supports the team, shares knowledge, accepts responsibility and contributes positively to the onboard working environment.

For this reason, behavioural competencies have become just as important as technical qualifications in international recruitment. Technical knowledge can be acquired and experience gained, but integrity, reliability, accountability and professional ethics are developed over time and become most evident under pressure. Strong organisations are ultimately

ds away from home. One of the industry's greatest challenges is to understand these changing expectations, attract qualified professionals and retain them throughout their careers.

On the other hand, employers' expectations have never been higher. Technical competence alone is no longer enough. International organisations now seek professionals with strong communication skills, intercultural competence, digital adaptability, leadership potential and a strong safety culture.

Rather than asking why it has become more difficult to find qualified seafarers, we should ask how we can make a maritime career more attractive and sustainable for qualified professionals. Improving recruitment alone will not solve the problem.

The 2026 BIMCO/ICS Seafarer Workforce Report clearly shows that the industry's priority is no longer simply attracting new entrants, but developing and retaining the existing workforce. Human resource management has therefore evolved beyond recruitment into a comprehensive strategy encompassing talent acquisition, professional development and employee engagement.

This is why Crew Welfare should not be viewed simply as employee satisfaction. It is a strategic investment that strengthens workforce capability, improves retention and supports long-term organisational performance. Companies that invest in their people throughout their careers will gain a clear competitive advantage.

built by people who share common values, trust one another and uphold the same safety culture.

Alternative fuels, automation and digitalisation are transforming shipboard operations at an unprecedented pace. Do these developments require us to redefine maritime education?

Absolutely. In fact, we need to redefine not only maritime education, but also the profile of the future seafarer.

The maritime industry has experienced many technological revolutions, yet today's transformation is fundamentally different. Technology is transforming not only ships, but also the knowledge, skills and decision-making capabilities expected of seafarers. Education must evolve at the same pace.

Alternative fuels, automation, data analytics and AI-enabled applications are reshaping maritime operations. Tomorrow's seafarers must do more than operate equipment—they must interpret data, anticipate risks and make sound decisions in increasingly complex environments.

For this reason, education can no longer focus solely on technical competence. Analytical thinking, digital literacy, problem-solving, leadership and adaptability must become integral elements of maritime training. Competitive advantage will belong not to organisations with the most advanced technology, but to those that develop people capable of using it effectively.

At the same time, one fundamental principle remains unchanged: shipping will always be a people-centred industry. No matter how advanced technology becomes, it cannot replace human judgement, ethical decision-making or leadership. The most successful professionals of the future will not simply be those who master technology, but those who know how to combine it with human judgement.

Seafarers from different nationalities live and work together on board for months at a time. Can we now say that

Experience is no longer measured solely by years spent at sea. The ability to adapt to change and commit to continuous learning is becoming one of the most valuable competencies for the future. It is this mindset that truly sets successful seafarers apart.

communication, cultural awareness and teamwork are just as important as technical competence?

Without question. These are no longer soft skills—they are essential to operational excellence and a strong safety culture.

International crews work and live together for extended periods in a demanding environment. Technical competence is indispensable, but it is only one part of the equation. Effective communication, mutual trust, understanding different perspectives and the ability to build a shared working culture are fundamental to safe and efficient operations.

Our international experience confirms this. The strongest teams are distinguished not only by technical expertise, but also by their ability to communicate openly, collaborate across cultures and remain focused on common goals.

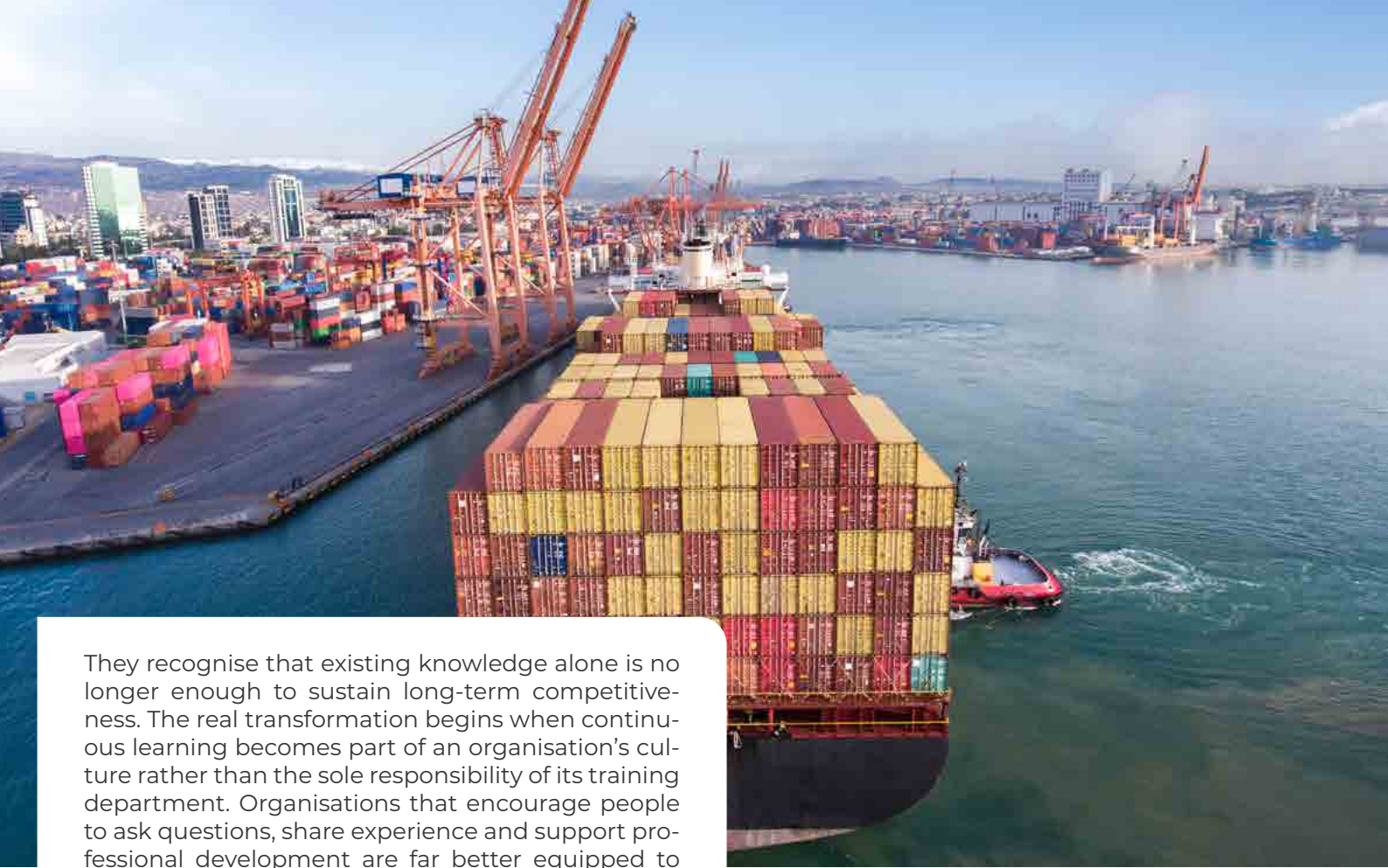
Research on the human element in shipping consistently shows that many operational incidents result not from inadequate technical knowledge, but from communication failures, weak teamwork and shortcomings in decision-making.

For this reason, communication, intercultural competence and teamwork should no longer be viewed as personal attributes. They are essential components of safety culture and operational performance. The most successful maritime professionals of the future will be more than skilled masters or chief engineers. They will be leaders who build trust, strengthen collaboration and unite multicultural teams around a shared purpose. In shipping, sustainable success ultimately depends not only on managing ships, but on managing people effectively.

For many years, the prevailing belief in shipping was that experience was everything. Today, however, the focus has shifted to continuous learning, reskilling and competency development. Has the industry truly embraced this transformation?

For many years, experience in shipping was measured primarily by time spent at sea. Today, that definition is changing. In an industry where knowledge evolves rapidly, continuous learning is no longer optional—it has become a prerequisite for long-term professional sustainability.

Although awareness of this transformation is growing, not all organisations have reached the same level of maturity. Leading ship management companies and forward-thinking shipowners are investing not only in technical training, but also in leadership development, digital learning platforms, mentoring programmes and talent management.



They recognise that existing knowledge alone is no longer enough to sustain long-term competitiveness. The real transformation begins when continuous learning becomes part of an organisation's culture rather than the sole responsibility of its training department. Organisations that encourage people to ask questions, share experience and support professional development are far better equipped to adapt to change.

Today, experience should no longer be measured solely by years at sea. It also reflects the ability to embrace change, evaluate different perspectives, apply new knowledge and pass that knowledge and experience on to future generations. Knowledge may belong to individuals, but experience creates lasting value only when it is shared.

Today, Turkish seafarers serve on some of the world's most advanced fleets, from LNG carriers to offshore vessels. From the perspective of international shipowners, what are their greatest strengths and where is there still room for improvement?

Through our work with international ship management companies and shipowners, we have gained valuable insight into different corporate cultures and the expectations of global operators. From this perspective, it is clear that Turkish seafarers have earned growing recognition and trust across the international maritime industry.

They are widely respected for their discipline, adaptability, strong sense of responsibility and ability to remain calm under pressure. Their capacity to adapt quickly to new operational environments and consistently deliver strong performance has enabled them to succeed across a wide range of sectors, including LNG carriers, offshore operations, tankers and bulk carriers.

At the same time, global competition continues to intensify. Rather than relying on our existing strengths, we must prepare for future expectations. A higher level of English proficiency, stronger communication skills within multinational teams, leadership capability, digital adaptability and a commitment to lifelong learning will further strengthen the competitiveness of Turkish seafarers.

We should no longer measure success solely by the number of Turkish seafarers serving in international fleets. It is equally important to see more Turkish professionals taking leadership roles in ship management companies, fleet management, technical management and executive decision-making. I firmly believe their knowledge, experience and leadership potential deserve far stronger representation at the highest levels of the global maritime industry.

In shipping, competitive advantage is no longer determined by ships, but by the people organisations develop. Artificial intelligence can support decision-making, but it cannot replace leadership or the human element. Strong organisations develop not only today's professionals, but tomorrow's leaders.

Is it enough to prepare a seafarer for the position they hold today? How do training and career planning complement each other, and how should companies manage this process?

Certainly not. Planning a workforce solely around today's operational needs means trying to manage tomorrow using today's assumptions. Successful organisations do not simply prepare people for current roles—they develop the masters, chief engineers and leaders of the future.

For this reason, training and career planning should never be treated as separate processes. Training must go beyond technical competence to strengthen decision-making, leadership, communication, adaptability and a culture of accountability. A seafarer's career is defined not only by time spent at sea, but also by the level of responsibility they are prepared to assume.

From a company's perspective, career management extends far beyond promotion planning. Development opportunities, regular feedback, mentoring and transparent career pathways from the very beginning of employment all have a direct impact on employee engagement and retention.

Across the international maritime industry, this approach is becoming increasingly widespread. Companies are focusing not only on recruiting the right people, but also on developing existing talent and offering long-term career opportunities as a strategic priority.

The return on investment in people cannot be measured solely by today's operational performance. Lasting success lies in developing leaders who embrace the organisation's culture and pass their knowledge and experience on to future generations. Ultimately, what distinguishes great organisations is not the ships they own, but how effectively they develop the people who operate them.

Artificial intelligence, digital interviews and data-driven assessment systems are transforming recruitment. How far can technology go in identifying the right candidate? Do you believe it can ever replace human judgement?

Technology has become an invaluable tool in identifying the right candidates. AI-powered assessment systems and data analytics enable organisations to evaluate knowledge, technical competence and performance using objective criteria. This improves consistency in recruitment while supporting faster and more informed decision-making.

However, I do not believe technology will ever replace the human element. Team fit, communication



skills, leadership potential, behaviour under pressure and cultural fit still require human judgement and professional experience. Technology should not replace decision-makers; it should empower them.

The strongest recruitment decisions are made by combining objective data with human judgement and experience. Data provides consistency and transparency, while professional experience adds context, sound judgement and deeper understanding. It is this balance that leads to better hiring decisions.

Finally, looking ahead, which three competencies do you believe young people entering the maritime industry should develop if they aspire to build an international career?

Three competencies stand out.

First, a strong technical foundation combined with a commitment to continuous learning. Shipping is evolving rapidly through digitalisation, automation and new environmental regulations, making life-long learning essential.

Second, strong English language and communication skills. Maritime is a truly global industry, and the ability to communicate effectively within multinational teams and adapt to international standards provides a significant career advantage.

Third, the ability to embrace change, think analytically and use technology effectively. Artificial intelligence, digital learning platforms, data-driven decision-making and smart ships are now integral to the industry. Those who adapt to this transformation will be better positioned for international careers.

Above all, a willingness to learn, take responsibility and continuously improve will distinguish the next generation of maritime professionals. ■

The Human Factor and Invisible Risks in Maritime

Safe Ships Are Operated by Psychologically Resilient Seafarers

Technical competence alone is no longer enough to ensure safe maritime operations. Long contracts, war zones, pandemics, isolation and the weight of responsibility have made seafarers' psychological resilience an integral part of operational safety. Specialist Psychological Counsellor Fatma Nur Yalçinkaya believes it is time to rethink the human element in the maritime industry.



Fatma Nur YALÇINKAYA
Specialist Psychological Counsellor

First of all, we would like to introduce both you and the Maritime Psychology Association to our readers. How did you become involved in the field of maritime psychology? Why was the Association established, how long has it been operating, and what kind of work does it carry out within the maritime industry today?

I have been working in the field of psychology for nearly ten years, and in recent years I have dedicated my work entirely to maritime psychology. I also completed my master's thesis on the psychological well-being of seafarers. However, it was not academic curiosity alone that led me to this field. My primary motivation was recognising that the psychological dimension had been overlooked for many years in the maritime industry, where the human element is critical.

Today, aviation, sports and military psychology are all well-established fields of expertise. Yet despite humanity having worked at sea for thousands of years, maritime psychology was only formally recognised as a subfield of psychological research in 2017. This highlights an important reality: while enormous

effort has been devoted to advancing technical systems in shipping, we began paying attention to the people operating those systems much later.

The Maritime Psychology Association was established precisely to address this need. Founded in 2022 by psychologists and maritime professionals, our Association is one of the world's first non-governmental initiatives dedicated exclusively to this field. Our objective is not simply to provide psychological support, but also to raise awareness of the human element in the maritime industry, promote scientific research, and translate academic knowledge into practical applications that enhance both seafarers' quality of life and operational safety.

For this reason, we do not limit our activities solely to seafarers working on board ships. We work with stakeholders across the entire maritime ecosystem—from ports and shipyards to shipping companies, educational institutions, seafarers' families and students. We organise training programmes, seminars, workshops, academic partnerships, scientific research and social awareness projects. We do not see maritime as merely an industry built around ships. Rather, we see it as a living ecosystem shaped by its people, their families, its institutions and its culture.

Which issues generate the greatest number of enquiries received by the Maritime Psychology Association? What types of needs do individual seafarers, shipowning companies, educational institutions and families bring to you? What have been the most common requests so far?

In reality, every stakeholder who contacts us highlights a different need within the maritime sector. Therefore, it is impossible to define a single profile of the people who seek our support.

Individual seafarers most frequently seek support in coping with the stress associated with long contracts, difficulties in family relationships, burnout, anxiety, adjustment problems and, in some cases, the psychological consequences of traumatic experiences. In recent years, we have observed a significant increase in such requests, particular-



Illustration: Digital / AI-generated

“The most critical element in maritime is not the ships, but the humans who manage them. Psychological well-being is the foundation not only of the individual but of operational safety. Strengthening the human factor is the most significant investment made in the future of the industry.”

ly following transits through war zones, piracy incidents and fatalities at sea.

Educational institutions primarily approach us for programmes designed to prepare maritime students for the psychological demands of the profession. In our view, maritime psychology should not be something learned only after graduation; it should become a natural component of maritime education from the moment professional identity begins to develop.

Families usually contact us because they want to better understand the experiences of seafarers. The effects of prolonged separation on family life, communication with children, and readjustment after returning home are becoming increasingly important topics. We see this as a very positive development. We do not regard a seafarer's well-being as something limited only to the time spent on board; we see the relationship with their family as an inseparable part of their overall well-being.

We have also witnessed a remarkable shift over the past few years. Previously, people generally contacted us only after a problem had already emerged. Today, both individuals and organisations increasingly ask, “What can we do before problems emerge?” In my opinion, this change is one of the most encouraging signs that a culture of psychological well-being is beginning to take root within the maritime industry.

The maritime profession is characterised by prolonged isolation, confined living conditions, shift work, extended periods away from family and demanding sea conditions—all of which create unique sources of stress. How does this working environment affect seafarers' mental health over the long term? Compared with shore-based employees, what are the most common psychological challenges and sources of resilience you observe among seafarers?

Seafaring is one of the few professions in which people are required to cope with multiple sources of stress simultaneously. Prolonged isolation, shift work, confined living conditions, high levels of responsibility, uncertainty and separation from family are not experienced independently; they occur at the same time. The challenge, therefore, is not any single source of stress but the cumulative burden created by these conditions over time.

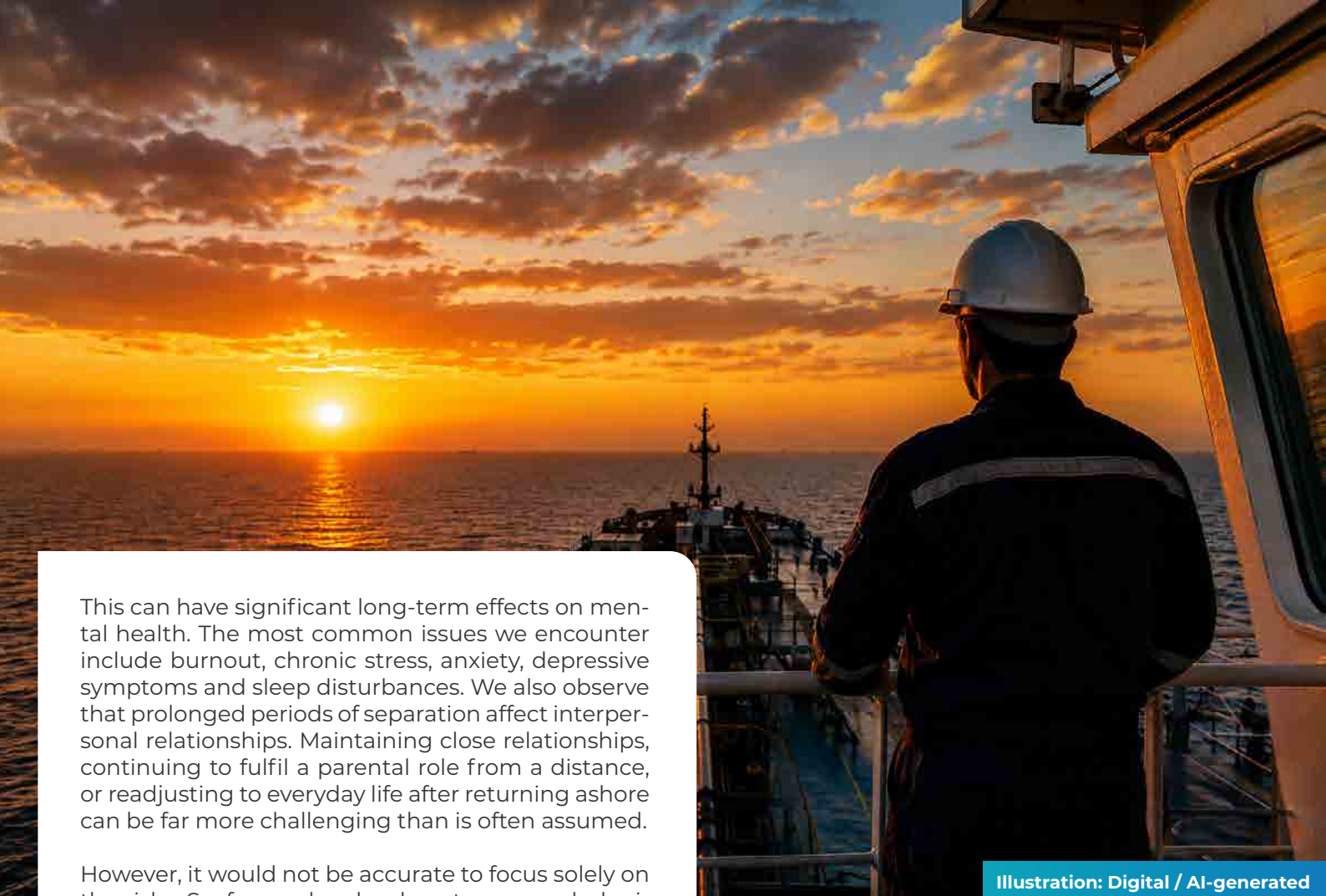


Illustration: Digital / AI-generated

This can have significant long-term effects on mental health. The most common issues we encounter include burnout, chronic stress, anxiety, depressive symptoms and sleep disturbances. We also observe that prolonged periods of separation affect interpersonal relationships. Maintaining close relationships, continuing to fulfil a parental role from a distance, or readjusting to everyday life after returning ashore can be far more challenging than is often assumed.

However, it would not be accurate to focus solely on the risks. Seafarers also develop strong psychological resilience. The ability to cope with uncertainty, remain calm during crises, work effectively as part of a team and find solutions under difficult conditions are among the profession's greatest strengths. Maritime psychology focuses not only on addressing psychological challenges but also on preserving and strengthening these qualities.

The most important point to emphasise is this: for many years, a significant proportion of these challenges were normalised as simply "part of the job." Yet the fact that something has existed for a long time does not mean it is healthy. That is precisely why psychological well-being is receiving greater attention within the maritime industry today. Our aim is not to portray seafarers as vulnerable, but rather to help make the resilience they already possess more sustainable.

Maintaining psychological resilience throughout contracts that may last for months is essential not only for professional performance but also for safe vessel operations. In your opinion, what coping skills and mental strategies should seafarers develop in order to maintain their mental flexibility and psychological resilience?

I do not define psychological resilience as simply "remaining strong no matter what happens." To me, psychological resilience is the ability to adapt to changing circumstances, manage difficult emo-

tions and seek support when necessary. That is why the concept we should focus on most is mental flexibility.

Uncertainty is an inherent part of the maritime profession. Weather conditions change, routes are altered, crews rotate and operational plans evolve. As a result, one's mindset must also be flexible enough to adapt. We have found that seafarers who focus on what they can control, rather than attempting to control everything, who make effective use of their problem-solving skills, and who adapt to changing circumstances are far more successful in managing these challenges.

Another key factor is social support. Although seafaring is often perceived as a solitary profession, it is fundamentally built upon teamwork. Research consistently shows that both the trust established on board and strong social support networks ashore are among the most important protective factors contributing to psychological resilience. Seeking help or sharing emotions should therefore never be viewed as a sign of weakness, but rather as a healthy coping strategy.

At the same time, we cannot place the entire responsibility for psychological resilience on the individual. Telling a seafarer simply to "be more resilient"

is unrealistic if they are simultaneously expected to cope with excessive workloads, insufficient rest, poor leadership or a psychologically unsafe working environment. Resilience is not only an individual capability; it is also something that organisations and leaders have a responsibility to foster and support.

In the future, the most successful companies will not simply be those that develop technically proficient crews, but those that create working environments that protect and strengthen the psychological resilience of their people.

In recent years, war-related threats, missile and drone attacks, and increasing security risks to commercial vessels in high-risk regions such as the Strait of Hormuz and the Red Sea have significantly changed seafarers' working conditions. How do geopolitical crises of this nature affect the psychological well-being of seafarers? What kinds of acute stress and anticipatory anxiety do they create? What measures should be taken to prevent these experiences from developing into long-term psychological trauma?

To understand the psychological impact of geopolitical crises on seafarers, we must first recognise an important reality: trauma is not always caused by an event that actually occurs. Sometimes, the mere possibility of such an event can create a psychological burden almost as severe as the event itself. In psychology, we refer to this as anticipatory anxiety.

Seafarers transiting high-risk areas such as the Strait of Hormuz and the Red Sea may remain in a constant state of heightened alertness for days or even weeks. Questions such as "Will we come under attack?", "Are we the next target?" or "Will I make it home safely?" can dominate their thoughts. The human brain is remarkably well equipped to cope with short-term threats. However, when uncertainty persists, the brain's alarm system cannot simply switch off. As a result, sleep disturbances, impaired concentration, irritability, physical tension and difficulties in decision-making may develop. These effects influence not only an individual's mental health but also operational safety.

For this reason, psychological support should not begin only after a traumatic incident has occurred. Crews should be psychologically prepared before entering high-risk areas, have access to readily available support throughout the transit, and receive structured follow-up support and assessments once the mission has been completed. Psychological first aid should form an integral part of this continuous support process.

One of the most important contributions companies can make is to reduce uncertainty. More often than not, people are more distressed by a lack of reliable information than by bad news itself. Regular

"Psychological resilience is not a filtering criterion, but a professional competency that can be developed. This is why strong seafarers are nurtured. And this is how strong teams are built."

and transparent communication, involving crews in the decision-making process, and reinforcing the message that "we are not facing this alone" are among the most important protective factors supporting psychological resilience.

Finally, it is important to remember that not every seafarer responds to the same event in the same way. Trauma is shaped not only by what happens, but also by how each individual experiences it. That is why, rather than relying solely on standardised procedures, we need accessible, continuous psychological support systems that recognise and respond to individual differences.

During high-risk operations and times of crisis, remotely delivered psychological support and mentoring services have become increasingly important. In your opinion, how should remote psychological first aid be structured? What fundamental principles should be followed to establish trust in a digital environment and ensure that such support genuinely benefits seafarers?

Remotely delivered psychological support during high-risk operations is extremely valuable. However, to be truly effective, it must be carefully designed and professionally structured. Psychological first aid is not simply about asking "How are you?" or encouraging someone to talk. It is a professional intervention designed to promote safety, reduce distress, assess needs accurately, facilitate access to reliable information and, when necessary, connect individuals with appropriate support services.

In the maritime sector, accessibility is the key characteristic of such a system. Seafarers cannot always reach a mental health professional as easily as people ashore. Therefore, support services must be designed with practical realities in mind, including time-zone differences, limitations in internet connectivity, the difficulty of maintaining privacy on board and demanding operational schedules. To build trust in a digital environment, clarity, continuity and confidentiality are indispensable. Seafarers should know from the outset who they are speaking with, the scope and limits of the service, how their personal information will be protected and under what circumstances it may be shared.

Remote support should never be viewed as a one-off conversation held only during a crisis. Instead,

“People often hide not their illness, but the consequences of their illness. Where there is no trust, even the best procedures fail. In moments of crisis, it is not just accurate information that saves lives, but the feeling of trust.”

it should form part of a comprehensive framework that includes psychological preparation before high-risk transits, accessible support throughout the operation and structured follow-up afterwards. In some cases, individuals appear emotionally strong during the incident itself, while psychological symptoms emerge only after they have reached a safe area or completed their contract.

Companies also have a vital role to play. Remote psychological support should not exist merely as a written procedure or compliance requirement. It should become a trusted, accessible service that seafarers feel comfortable using without fear of stigma or negative consequences. Psychological support must never be perceived as a tool for evaluating performance. Instead, it should be recognised as a professional service designed to protect, strengthen and connect employees with the appropriate support whenever they need it.

Although the psychological impact of the COVID-19 pandemic has not yet fully subsided, the emergence of fatal Hantavirus cases on cruise ships has raised new concerns. When an infectious disease outbreak occurs on board, how do the pressures of a confined environment, uncertainty and isolation affect seafarers psychologically? From a psychological perspective, how should we understand situations in which crew members hesitate to report symptoms or attempt to conceal their illness?

The COVID-19 pandemic taught us that outbreaks are not only biological crises but also psychological ones. In confined living environments such as ships, uncertainty is felt even more intensely. When a suspected case of illness arises on board, crew members are concerned not only about becoming infected but also about contract extensions, being denied entry to port, being placed in quarantine, being unable to reunite with their families or putting their colleagues at risk. In other words, the psychological stress experienced during an outbreak is driven not by a single fear, but by multiple uncertainties occurring simultaneously.

This is why some seafarers may hesitate to report their symptoms. However, it would be inaccurate to interpret this simply as avoiding responsibility or breaking the rules. In many cases, such behaviour

is driven by fear of stigma, fear of losing one's job, anxiety over placing additional pressure on fellow crew members or financial worries. More often than not, individuals are not trying to conceal the illness itself—they are trying to avoid the consequences that may follow.

This is precisely where organisational culture becomes critical. If people believe they will be punished, blamed or excluded for reporting symptoms, even the most well-designed procedures will fail to achieve their intended purpose. Conversely, in a psychologically safe working environment, crew members feel able to report mistakes, seek help when they need it and speak openly about health concerns without hesitation. Such an approach protects not only the individual's mental well-being but also the safety of everyone on board.

One of the most important lessons the pandemic has taught us is that, during times of crisis, trust can save lives just as much as accurate information. For this reason, outbreak management should not be viewed solely as infection control. It should be approached as a comprehensive process that integrates effective communication, psychological support and the building of trust.

In the face of highly contagious viruses such as the Andes variant, which can spread through close human-to-human contact, how might the team spirit and the sense of “we’re all in the same boat”—which lie at the heart of life at sea—be affected? How do you evaluate the impact of emotions such as fear, mistrust and paranoia on team dynamics during such periods?

One of the greatest strengths of the maritime profession is its strong sense of teamwork. Seafarers typically embrace the mindset that “we’re all in the same boat.” They trust one another and feel a shared responsibility for each other's safety. This culture of solidarity is one of the maritime industry's greatest strengths. However, when invisible threats such as infectious diseases emerge, team dynamics can naturally begin to change.

As uncertainty and fear increase, people tend to perceive threats as greater than they actually are. This can trigger mistrust, keeping their distance from one another, blame and exclusion within the crew. Individuals displaying symptoms of illness may, unintentionally, come to be viewed primarily as a source of risk, leading to feelings of stigma and isolation. Yet, at precisely such times, what people need most is not exclusion but access to accurate information and meaningful social support.

Social psychology teaches us an important truth: during periods of uncertainty, people often fill information gaps with assumptions. When organisations fail to communicate transparently, rumours



Illustration: Digital / AI-generated

and misinformation spread rapidly, fuelling fear and paranoia. For this reason, during times of crisis, it is essential to manage not only the outbreak but also communication within the team and the sense of mutual trust.

Leadership plays a critical role throughout this process. A good leader is not simply someone who manages operations; they also shape the team's psychological climate. When people feel able to ask questions, express their concerns and receive support without fear of judgement, team spirit is not weakened—it becomes even stronger. True solidarity is measured not in the absence of risk, but in how we treat one another when risk becomes a reality.

With the widespread adoption of satellite internet, digital psychological support and online mentoring have become far more accessible across the maritime industry. As a specialist in this field, how do you assess the potential of these digital solutions to support seafarers' mental well-being? What opportunities do they offer, and where do you see their limitations?

One of the most significant developments in maritime psychology in recent years has been the advancement of technology. One of the greatest challenges seafarers have traditionally faced is the inability to access a mental health professional whenever they need one. With the widespread availability of satellite internet, that barrier has been significantly reduced. Today, regardless of where they are in the world, seafarers can access psychological support,

"The question that needs to be asked is not whether psychological support services exist, but whether people have the courage to seek that support. It is precisely this trust that defines institutional culture. Real transformation begins here."

consult a mental health professional during a crisis or participate in psychoeducational programmes whenever the need arises. Compared with the past, this represents a major transformation.

However, it would be a mistake to regard technology as a solution in itself. Psychological support is far more than a video call. Building trust, understanding an individual's working environment, safeguarding confidentiality and providing ongoing follow-up whenever necessary are just as important as the technology itself. Technology is a powerful enabler of psychological care—it is not a substitute for the therapeutic relationship.

At the Maritime Psychology Association, we use technology not only to deliver psychological support but also to raise awareness. One of the most important examples is our recently launched project, "Same Sea, Different Minds." Through this initiative, psychologists and seafarers come together on social media to discuss the psychological challenges commonly encountered in the maritime sector, share scientific knowledge in language that is accessible to everyone, and offer practical guidance that can be applied in everyday life. Sometimes, timely access to accurate information—communicated in the right way—is the very first step towards genuine psychological support.

In the future, digital solutions will extend well beyond online counselling services. Psychological screening and assessment systems, psychoeducation



Illustration: Digital / AI-generated

platforms, mentoring programmes for leaders and AI-assisted early risk identification tools will become increasingly common in the maritime industry. However, regardless of how advanced technology becomes, the human element must always remain at the centre. I believe the future of maritime psychology lies not merely in responding to problems after they arise, but in recognising risks early, preventing them wherever possible and supporting seafarers throughout their entire professional journey. Technology will be one of the most powerful tools for turning that vision into reality.

For many years, the maritime industry has been shaped by a culture of “appearing strong” and “keeping problems to oneself.” This is widely regarded as one of the greatest barriers to seeking psychological support. In your opinion, what kind of cultural transformation should shipowning companies and maritime organisations undertake to ensure that psychological support is recognised as a natural and professional part of working life?

The maritime profession genuinely requires resilience. Making rapid decisions during crises, coping with uncertainty and continuing to perform under challenging conditions are all inherent aspects of life at sea. It is therefore understandable that a culture of being strong has developed over the years. However, there is an important distinction that must be made: being resilient is not the same as feeling obliged to appear resilient.

If a seafarer feels unable to talk about the difficulties they are experiencing, believes that seeking support could damage their career or fears being judged for receiving psychological help, then we are no longer dealing with an individual problem—we are dealing

“Safety in maritime is not achieved solely through technical systems. Stress management, leadership, and team cohesion are just as critical as technical proficiency. The future of maritime will be shaped by organizations that place the human factor at the center.”

with an issue of organisational culture. Indeed, the greatest barrier to effective psychological support is precisely this fear of stigma.

I believe this cultural transformation must begin with education. Psychological well-being should be consistently presented within organisations not as a service reserved only for people in crisis, but as a natural part of professional life—just like occupational health and safety. Leaders must set the example, managers should receive training in psychological safety, and employees must know that they can access support confidentially. These are the foundations of this cultural transformation.

In my opinion, the most important question organisations should ask themselves is not, “Do we provide psychological support services for our employees?” but rather, “Do our employees feel safe enough to use those services whenever they need them?” The first question merely asks whether the service exists; the second reveals whether people genuinely trust it.

Encouragingly, we have seen significant progress in recent years. Whereas companies once tended to focus on psychological support primarily after crises had occurred, an increasing number are now investing in preventive mental health initiatives. I believe this proactive approach should become standard practice. Psychological support is not merely a resource for difficult times—it is an essential pillar of a healthy, safe and sustainable working culture.

It is now increasingly recognised that psychological well-being is not only an individual concern but also a fundamental component of operational safety. In your opinion, will psychological resilience become as important as technical competence as a professional competence in the maritime industry of the future? How should this transformation be reflected in maritime education and corporate policies?

Absolutely. In fact, I believe this transformation has already begun. We now know that many maritime accidents are not caused solely by technical failures. Fatigue, impaired concentration, communication breakdowns, conflicts within the crew, ineffective leadership and decisions made under stress are all human factors that have a direct impact on operational safety. The successful seafarer of the future will not only be technically proficient but also psychologically healthy, adaptable and capable of working effectively as part of a team.

However, it is important to make one distinction. Ps-

ychological resilience should not be viewed as another criterion for screening out candidates during recruitment. Rather, I see it as a professional competence that can be developed. Just like leadership, communication and crisis management, psychological skills can be developed, strengthened and refined throughout a person's career.

For this reason, I believe the transformation must begin within maritime education. Maritime students should learn far more than ship operations, engine operations and international regulations. From the very beginning of their education, they should also be introduced to stress management, psychological first aid, team dynamics, intercultural communication and psychological safety. Professional identity is shaped not only by technical knowledge but also by human relationships.

From a corporate perspective, the idea that psychological well-being is solely the responsibility of human resources or occupational health departments must now become a thing of the past. Psychological support services, leadership development, crisis preparedness and employee well-being programmes should not be viewed as separate initiatives but as complementary elements of the same organisational culture.

In the maritime industry of the future, technical competence and the human element will be inseparable. An organisation may possess the most advanced technology available, but if the people operating it are not psychologically well, it will never be possible to manage that technology safely, effectively and sustainably.

The most important lesson maritime psychology teaches us is this: Safe ships are operated by psychologically resilient seafarers. Investing in the psychological well-being of seafarers is therefore not simply an investment in individuals—it is an investment in operational safety, the long-term success of maritime companies and the future of the maritime industry. ■



Illustration: Digital / AI-generated

Future of Education

The Era of Smart Maritime Training

A new era in maritime training is emerging—one that prioritizes measurable competence over rote learning, personalized development over standardized instruction, and data-driven decision-making over intuition.



Capt. İzzettin Umut BARUT
Training Inspector

Could you briefly introduce yourself and your role at Manta Shipping for our readers? How did your career path lead you to maritime training?

Hello, I am İzzettin Umut Barut, serving as Training Inspector at Manta Shipping. I began my seagoing career aboard bulk carriers, where I spent many years gaining hands-on operational experience. Those years at sea clearly demonstrated that operational safety, environmental protection, and efficiency onboard depend entirely on a well-trained and competent crew. My transition into maritime training was driven by recognizing this critical need in the industry and by my desire to transfer my seagoing experience and ship management perspective across the entire fleet from a shore-based position. By managing training matrices and continuously improving competency standards, I aim to contribute to safer and more efficient fleet operations.

Selecting the right personnel directly affects everything from operational safety to company performance. How has Maritime Trainer's Assess module transformed your recruitment and candidate evaluation processes? How has its digital assessment system changed your decision-making process?

Selecting the right personnel is the first and most critical step in minimizing operational risks across our fleet. Maritime Trainer's Assess module has enabled us to replace traditional—and at times subjective—interview processes with a fully objective, standardized digital assessment process. By evaluating candidates through standardized simulations and assessments, we have shifted our hiring decisions away from personal judgment and toward a completely data-driven and reliable process.

Security is one of the most discussed issues in remotely conducted examinations. How does the Assess module's exam security and anti-cheating infrastructure give you confidence that candidates are being evaluated objectively based on their actual knowledge and competence?

The greatest challenge in remote assessments is ensuring that candidates demonstrate their own capabilities without external assistance. The Assess module's robust security and anti-cheating infrastructure reinforces our confidence in the transparency and reliability of the assessment results. This enables us to accurately evaluate the true technical and theoretical competence of candidates before they even reach the interview stage, leaving no room for doubt.

In recruitment, understanding not only whether a candidate passes an exam but also their strengths and areas for improvement is highly valuable. How do the Assess module's analytics and reporting tools enhance your evaluation process?

Rather than simply knowing whether a candidate

"The ship departs from the dock, and the project is completed. However, the knowledge and experience left behind are the most valuable capital that shapes the future of the industry. Every experience shared is an investment made in the success of tomorrow."



has “passed” or “failed,” it is far more valuable for us to identify the specific operational areas where improvement is needed. Thanks to the detailed analytics provided by the Assess module, we can identify development areas in advance and assign customized training matrices and courses before candidates even step on board. This allows us to create personalized, goal-oriented training plans from day one.

How critical do you think it is for newly recruited seafarers to learn a company’s culture, operational procedures, and safety approach before joining a vessel? How do you evaluate the contribution of digital onboarding to operational efficiency?

The joining process is already a demanding and intensive stage for every seafarer. Allowing personnel to become familiar with our company’s ISM procedures, safety culture, and operational practices through digital onboarding before they board significantly shortens their familiarization period onboard. A seafarer who already understands what to expect and is familiar with our safety standards begins contributing to operational efficiency and safe operations from the very first day.

Effective maritime training depends not only on accurate content but also on the quality of its delivery. How

have Maritime Trainer’s extensive visual content and comprehensive training library contributed to learner engagement and knowledge retention?

Maritime operations are fundamentally built on practical application and what we refer to as situational awareness. Simply reading procedures rarely results in lasting behavioral change. Maritime Trainer’s interactive, visually rich, and scenario-based training modules keep personnel engaged throughout the learning process. Delivering training in a practical, scenario-based format enables knowledge to be translated directly into safe operational behavior onboard.

Compliance with international standards such as STCW, TMSA, and SIRE 2.0 is one of the key responsibilities of shipping companies. What advantages do Maritime Trainer’s standards-aligned training programs provide during audits and operational readiness?

We are currently operating in an environment where RightShip (RISQ 3.2) requirements and IMO/MARPOL regulations are becoming increasingly demanding. During these audits, one of the primary focus areas is the competence of personnel and the continuity of training. Having training modules that are fully aligned with these international standards and continuously updated ensures that

we remain audit-ready at all times while significantly streamlining and strengthening our internal audit processes.

Today, seafarer wellbeing is measured not only by physical safety but also by psychological wellbeing. How have training programs covering bullying, harassment, communication, and mental health influenced the onboard working environment and team cohesion?

Working for extended periods inside a steel vessel under challenging environmental conditions requires considerable mental resilience. Today, ensuring psychological safety is just as important as ensuring physical safety. We clearly observe that training programs addressing communication, mental health, workplace bullying, and harassment strengthen team spirit onboard, reduce conflicts within the chain of command, improve stress management, and ultimately contribute to reducing accident risks.

Retaining qualified seafarers has become increasingly important. How has Maritime Trainer's MTCare module contributed to making seafarers feel supported and valued? What impact has it had on employee engagement and retention?

Retaining talented seafarers is one of today's greatest human resources challenges. Through solutions such as MTCare, we are able to address not only the professional but also the mental and social needs of our personnel, demonstrating that, as an organization, we care not only about their work

performance but also about their overall wellbeing. This sense of being valued strengthens employees' sense of belonging, reduces turnover, and fosters long-term organizational commitment.

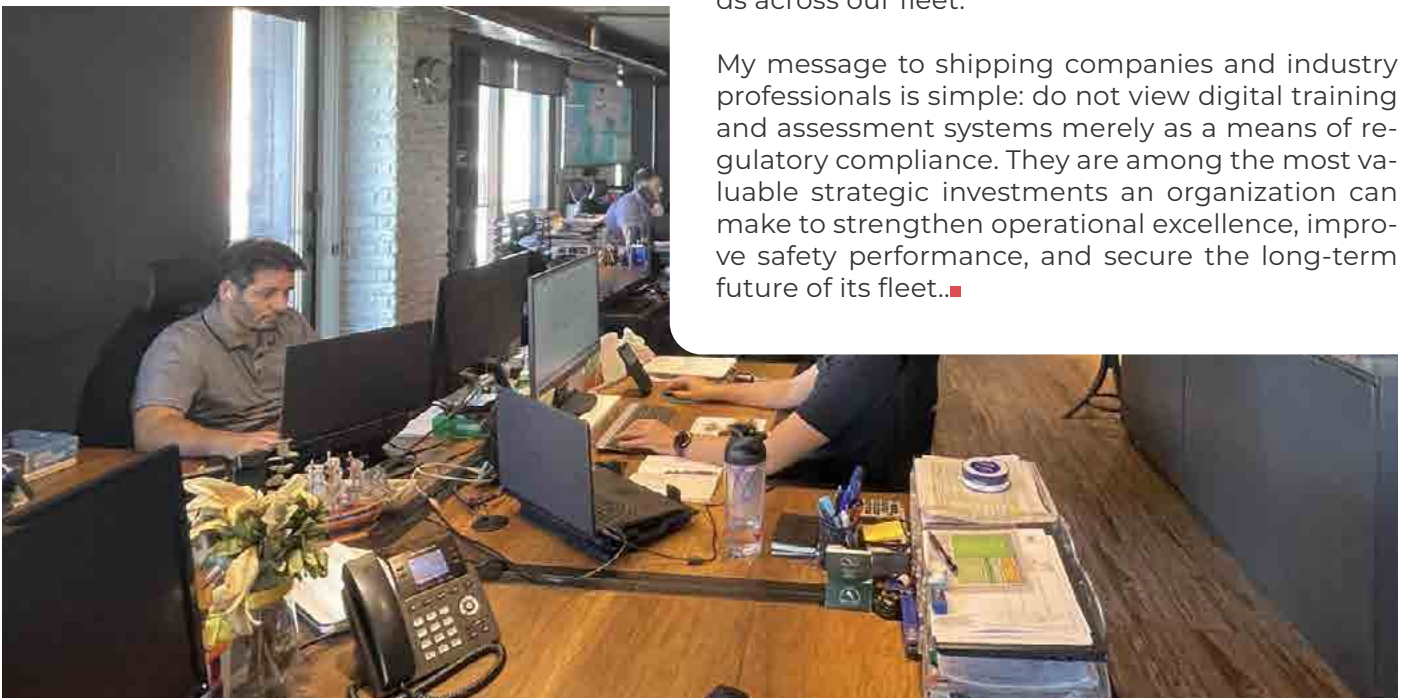
Analyzing training data plays a vital role in making informed strategic decisions. How do the insights you obtain through MTData influence your training planning, risk management, and human resources strategies?

Anything that cannot be measured cannot be effectively managed. The reports generated through MTData enable us to identify fleet-wide training trends, recurring operational shortcomings, and regulatory knowledge gaps at a macro level. This allows us to move from a reactive approach to a proactive one. Our future training strategies and risk management priorities are shaped by real operational data gathered from the field, enabling us to make more informed and forward-looking decisions.

As digital transformation accelerates, educational technologies have become indispensable in the maritime industry. Finally, how would you summarize the greatest benefit Manta Shipping has gained through its collaboration with Maritime Trainer? What message would you like to share with shipping companies and industry professionals considering investing in digital training systems?

For Manta Shipping, the greatest achievement of this partnership has been the successful transition of our fleet's entire training process into a standardized, measurable, transparent, and continuously audit-ready digital ecosystem. While this system has significantly reduced our operational workload, it has also enhanced the overall safety standards across our fleet.

My message to shipping companies and industry professionals is simple: do not view digital training and assessment systems merely as a means of regulatory compliance. They are among the most valuable strategic investments an organization can make to strengthen operational excellence, improve safety performance, and secure the long-term future of its fleet..■





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The Foundation of Safe Operations

The Right People First

Safety in shipping begins not only with advanced vessel technology but also with selecting the right people and providing them with the right training. Digital assessment systems are replacing intuition with measurable, data-driven decision-making.



Capt. Ali KETENCI
Deck & Training Superintendent

directly influence safety, operational efficiency, and team performance. For this reason, I see our people not merely as employees, but as our company's most valuable investment.

Placing the right seafarer on the right vessel and in the right position is one of the cornerstones of safety in tanker operations. What innovations has Maritime Trainer's Assess module brought to YMN Tankers' recruitment and candidate evaluation processes? How does its digital assessment approach support your hiring decisions?

Given the large number of applications we receive for shipboard positions, an effective digital pre-screening process has become an essential requirement for selecting the right candidates and matching them with the most suitable vessels.

Within Maritime Trainer's CV module, the assessment tests completed by candidates—particularly psychometric analyses and role-specific competency assessments—make a significant contribution to our recruitment process. These tests enable us to objectively evaluate candidates' adaptability, risk profiles, and other psychological indicators. In addition, topic-based analyses of professional competency tests clearly identify each candidate's strengths as well as areas requiring further development.

The insights generated through these assessments play an important role not only in selecting the right candidate but also in matching that individual with the vessel whose operational requirements and working conditions best suit their capabilities. As a result, a more efficient, safer, and more sustainable fit is achieved for both the company and the employee.

Ensuring reliability in remotely conducted examinations has always been a major concern. How does the exam security and anti-cheating infrastructure provided by the Assess module give you confidence in objectively evaluating candidates' knowledge and competencies?

Naturally, conducting assessments in a digital environment introduces certain security risks. However, the infrastructure provided by Maritime Trainer offers considerable reassurance in this regard. Verifi-

To help our readers get to know you better, could you first tell us about yourself and your role at YMN Tankers? How have your experiences in the maritime industry shaped your perspective on human resources and training?

I graduated from the Department of Maritime Transportation and Management Engineering at Istanbul Technical University in 2013. Following my graduation, I gained nearly 11 years of seagoing experience on chemical tankers, progressing to the rank of Master. During this period, I also completed the Executive Maritime Management Master's programme at the World Maritime University between 2023 and 2024. Since 2024, I have been serving as Deck & Training Superintendent at YMN Tankers. Today, I apply my seagoing experience to support the development of training programmes, operational excellence, and human resources.

Both my maritime education and my career journey—from serving as a Master on board to my current position as Marine & Training Superintendent—have shown me that people are the industry's most critical asset. Having served in various positions throughout my career, I have witnessed firsthand how proper training and continuous development



cation mechanisms, such as capturing candidates' photographs at predetermined intervals during the examination and monitoring examination time, make a significant contribution to ensuring that every candidate is evaluated fairly and objectively.

During recruitment, not only examination results but also candidates' strengths and areas for development are of great importance. How do the detailed analysis and reporting features of the Assess module enhance your evaluation process?

The results obtained from role-specific assessment tests enable us to analyse candidates' strengths and areas for development in detail. For example, during assessments for Junior Officer candidates, we can identify the specific areas of navigation in which a candidate needs improvement. If the candidate is recruited, the necessary training can then be planned in advance. This allows us to clearly determine which areas should become the primary focus of the individual's development programme.

This approach not only supports the selection of the most suitable candidate but also makes a valuable contribution to creating personalised training and development plans.

How important do you believe it is for a seafarer to become familiar with company procedures, safety culture, and operational standards before joining a vessel? How has Maritime Trainer's digital onboarding process influenced the adaptation and readiness of new personnel at YMN Tankers?

Before joining a vessel, our personnel and officers undergo a comprehensive familiarisation programme at our office. Prior to this stage, they complete training courses and assessment tests through the Maritime Trainer platform covering company policies as well as the Company's Safety Management System (SMS) procedures relevant to their assigned duties.

These assessments enable us to analyse our seafa-

thers' level of preparedness before they join the vessel, allowing us to tailor the content and focus of our office-based familiarisation programme according to actual needs.

Furthermore, our personnel can individually review their assessment results, identify areas requiring improvement in advance, and focus on those areas before joining the vessel. As a result, the training process becomes more efficient, while both on-board adaptation and operational readiness are significantly enhanced.

In maritime training, delivering knowledge in an engaging and memorable way is just as important as ensuring its accuracy. How do Maritime Trainer's rich visual materials, interactive content, and comprehensive training library influence seafarers' engagement and learning performance?

The maritime sector is a dynamic industry that requires deck and engine officers, as well as all ship-board personnel, to comply with a wide range of operational procedures, international regulations, and company requirements. For this reason, it is essential that seafarers continuously develop their professional knowledge and competencies in line with evolving industry standards.

To ensure that this extensive body of knowledge is delivered effectively and sustainably, training programmes must meet modern learning needs in terms of both content and delivery methods. Maritime Trainer addresses this need through its digital and interactive training platform, making the learning

Illustration: Digital / AI-generated



culture, team communication, and the overall safety culture?

There is no question that the human element is at the heart of the maritime industry. In this respect, ensuring seafarer welfare is one of the fundamental pillars of safe and sustainable operations. Maintaining a high level of mental well-being among seafarers depends greatly on the effective management of interpersonal relationships on board.

Providing regular seafarer welfare training—based on internationally recognised research—to both office staff and shipboard personnel, while monitoring the outcomes through structured feedback, makes a significant contribution to achieving the desired onboard culture. These programmes strengthen team communication, support psychological well-being, and help embed a strong safety culture as a natural part of everyday life on board.

Retaining qualified seafarers has become one of the maritime industry's most important human resource objectives. What role does Maritime Trainer's MT-Care module play in helping employees feel valued, strengthening their sense of belonging, and increasing their commitment to YMN Tankers?

For shipping companies, selecting and recruiting the right people is only part of the challenge. Equally important is strengthening the commitment of qualified seafarers to the company in order to ensure long-term, sustainable success. Academic research consistently shows that employee feedback is one of the most effective ways to increase engagement and organisational commitment.

Through the surveys created within the MTCare module, we are able to gather our personnel's expectations and needs across various aspects of their working experience. The data collected are analysed in detail, enabling us to implement meaningful improvements. Demonstrating that employees' opinions are valued, responding to their expectations, and turning their feedback into tangible actions strengthens their sense of belonging while reinforcing their commitment to the company.

A data-driven management approach is becoming increasingly important in training as well. How do the analyses generated through Maritime Trainer's MTData module support your training planning, risk management, and human resource strategies?

As part of our Management Review process, the accurate collection and analysis of training data are essential for evaluating onboard and externally delivered training records against our KPI objectives

process more efficient, accessible, and measurable.

In addition, post-training evaluation surveys completed by participants provide valuable insight into the effectiveness of the system. User satisfaction and its contribution to learning performance can be monitored through measurable data.

Compliance with STCW, TMSA, SIRE 2.0, and other international standards is particularly critical in tanker operations. How do Maritime Trainer's training programmes support YMN Tankers' audit preparedness and operational excellence objectives by aligning with these requirements?

At YMN Tankers, our objective is to achieve high operational standards that not only comply with the mandatory requirements of flag administrations and classification societies but also meet the expectations of the Oil Majors. To achieve this, it is essential that our seafarers are prepared in accordance with international requirements and that their competencies are continuously developed.

Maritime Trainer forms an integral part of our training system, particularly by delivering STCW-required training effectively. It also makes a significant contribution to our compliance with TMSA requirements during office audits, especially in helping us achieve the training and competency development objectives defined under Elements 2 and 3.

Furthermore, it supports compliance with the training and competency expectations required under the SIRE 2.0 inspection programme. In particular, it contributes to developing the knowledge and awareness required for the Behavioural Competency Assessment (BCA) outlined in Section 3, enabling our personnel to participate in inspections with a higher level of preparedness.

Today, seafarer welfare extends beyond physical safety to include communication, mental health, the prevention of bullying, and psychological well-being. How do you evaluate the impact of training in these areas on onboard working

and conducting meaningful trend analyses.

Through the data generated by the MTData module, we can monitor our seafarers' training completion rates and quickly identify programmes where participation or completion levels fall below expectations. Based on these analyses, we develop new training plans and carry out the necessary risk assessments.

In addition, MTData enables us to monitor the progress of training programmes delivered through Maritime Trainer using objective performance data, in line with the objectives established during our Management Review process. It also allows us to evaluate the effectiveness of corrective actions, ensuring that our training system is continuously improved through a structured, data-driven approach.

As digitalisation continues to accelerate, training technologies have become one of the driving forces shaping the future of the maritime industry. Finally, how would you summarise the most significant benefits that your collaboration with Maritime Trainer has brought to YMN Tankers? What message would you like to share with shipping companies and industry professionals considering investing in digital training systems?

Digital training systems are no longer optional—they have become a necessity for the sustainable

“Data-driven education management facilitates the early detection of risks. By analyzing training performance against KPI targets, necessary corrective actions can be planned. Thus, decisions are based on measurable outcomes.”

success of the maritime industry. Our collaboration with Maritime Trainer has enabled us to make every stage of our processes—from recruitment and onboarding to training management and compliance with international standards—more systematic, measurable, and data-driven.

In today's highly competitive maritime industry, training is no longer simply a means of meeting regulatory requirements. It has become a strategic tool for strengthening safety culture, improving operational efficiency, and developing a sustainable and competent workforce.

Our advice to shipping companies considering investing in digital training systems is to view training not as a cost, but as one of the most valuable long-term investments in safety, operational excellence, and sustainable corporate success.

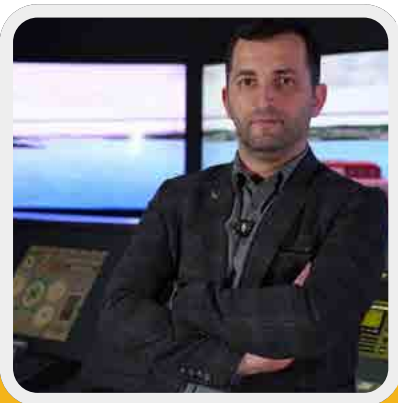
The right training develops the right seafarers—and the right seafarers deliver safe and sustainable operations. ■



Maritime Education in the Era of Maritime 4.0

Preparing Officers for the Digital Ships of Tomorrow

As the maritime industry undergoes rapid digitalisation, maritime education is also experiencing a fundamental transformation. The officers of tomorrow are being trained through simulators, VR laboratories, and hands-on training. Furkan Eyüp Kızılay, Head of the Maritime Department at Piri Reis Maritime Vocational and Technical Anatolian High School, shares his insights on this transformation in maritime education and the industry's expectations of newly graduated officers.



Furkan Eyüp KIZILAY
Head of the Maritime Department

How are you updating your curriculum in line with the rapid digital transformation of the industry, Maritime 4.0, and the latest international regulations?

The maritime industry is constantly evolving through digitalisation, automation, and international regulations. Therefore, maritime education is no longer only about transferring existing knowledge; it is equally important to prepare students for the future needs of the industry.

At Piri Reis Maritime Vocational and Technical Anatolian High School, while continuing our educational activities within the framework of the curriculum of the Turkish Ministry of National Education and the STCW requirements, we also strive to reflect the industry's current expectations in both our classroom instruction and practical training processes. Digital learning materials, simulator-supported applications, and, most recently, the VR laboratory established within our school are concrete examples of this approach.

Particularly with the emergence of Maritime 4.0, it has become increasingly important to educate students who are familiar with digital maritime systems, possess a strong safety mindset, demonstrate sound decision-making skills, and can readily adapt to technological tools. Our goal is for our students to graduate not only with theoretical knowledge but also with practical competence and professional readiness.

To what extent do you utilise modern technologies such as simulators, virtual reality (VR), and 3D animations throughout your students' education? How do these technologies improve students' learning process?

Maritime education is a field where theoretical knowledge must be reinforced through practical application. For this reason, alongside simulator-based training, we have also begun integrating virtual reality technology into our educational processes.

Thanks to the VR laboratory we have introduced at Piri Reis Maritime Vocational and Technical Anatolian High School, our students can practise procedures that they may not always have the opportunity to perform onboard an actual ship. They can do so in a safe, controlled, and repeatable environment. Technologies of this kind make a significant contribution to students' learning process.

Which training scenarios are currently the most actively used in your VR modules?

"The future of maritime education is being shaped not only in the classroom but also in virtual environments. VR and simulator technologies strengthen students' reflexes for sound decision-making while transforming theoretical knowledge into permanent skills. The goal is not just to use technology, but to train seafarers who are ready for the field."



Illustration: Digital / AI-generated

At present, our VR laboratory focuses on four core scenarios: launching a lifeboat, anchoring operations, operating the emergency generator, and enclosed space entry procedures.

We deliberately selected these scenarios because each one relates to critical situations that may be encountered onboard a vessel. Through these applications, students do not simply learn the subjects theoretically; they also gain a much more concrete understanding by observing each operational step.

Compared with traditional education, how have you observed the impact of VR technology on students' situational awareness and muscle memory?

"Virtual reality enables the student not just to watch, but to consciously follow the process."



“Transforming theoretical knowledge into practical application is one of the most critical stages of maritime education. Learning to apply the right step at the right time forms the foundation of professional competency.”

In traditional education, students generally learn through classroom instruction, visual materials, or videos. These are, of course, essential teaching methods. However, in a practice-oriented profession such as maritime, it is extremely important for students to visualise the entire process and understand each step in context.

We have observed that VR technology significantly enhances students’ attention, engagement, and retention. When students experience an operation in a virtual environment, they more easily understand which step comes first, what requires particular attention, and the correct sequence of operations. This makes an important contribution to developing situational awareness.

The opportunity for repetition offered by VR is par-

ticularly valuable, as it helps operational procedures become firmly embedded in students’ long-term memory. When students experience the same application multiple times, each operational step becomes more firmly retained.

Practical training onboard real ships requires substantial costs and extensive organisation. How do you evaluate the contribution of VR technology in improving the efficiency of such training while supporting the school’s budget and time management?

Practical training onboard real ships will always remain irreplaceable. At our school, after completing theoretical instruction and obtaining the necessary permissions, technical visits are organised aboard vessels operated by various maritime companies, allowing our students to experience real shipboard environments firsthand. However, it is not always feasible to repeat every practical exercise onboard an actual vessel for every student due to time, cost, safety, and logistical considerations.

VR technology provides our school with a significant advantage in this regard. Students are able to observe and practise certain procedures safely and under controlled conditions within the school environment. This reduces the need for external venues, transportation, equipment preparation, permission procedures, and organisational arrangements. As a result, educational resources can be utilised more efficiently, while lesson time is managed in a more structured manner.

Furthermore, allowing students to repeat the same exercises also makes the teaching process easier for instructors. Identifying the sta-



Electrical Actuators
Rubber Expansion Joints
Compressed Air Systems
Fuel/Chemical Transfer Hoses
Tank Level and Pressure Transmitters
Breakaway and Dry Disconnect Couplings
Yacht Hoses and Exhaust Hoses
Plastic Pipes and Fittings

Key Parts

marine

key parts all you need.



Illustration: Digital / AI-generated

"Every investment made in vocational high schools is an investment in the future of Turkish maritime. A strong human resource can only be cultivated through the collaboration of educational institutions, the industry, and technology."

ges where students encounter difficulties, revisiting specific topics, and preparing students before hands-on applications all become more systematic with the support of VR technology.

How do Gen Z and Gen Alpha students respond to VR modules?

Since today's students have grown up surrounded by technology, they adapt to VR modules remarkably quickly. Visual and interactive content, in particular, significantly increases their interest in lessons.

Within VR applications, students do not simply listen to the subject matter; they learn by observing and experiencing the entire process. This encourages more active participation throughout the learning experience.

Overall, we have observed noticeable increases in our students' curiosity, enthusiasm, and motivation

to learn. For this reason, we regard VR technology as a highly engaging and motivating educational tool, especially for the new generation of learners.

How have shipowners' and ship managers' expectations of newly graduated officers changed in recent years? Which new competencies are most in demand?

In recent years, the expectations of shipowners and ship managers towards newly graduated officers have clearly increased. Possessing basic professional knowledge alone is no longer considered sufficient. Newly graduated officers are now expected to be capable of using technology effectively, adapting to digital shipboard systems, and maintaining a strong awareness of safety.

In addition, English proficiency, effective communication, teamwork, and problem-solving skills have become increasingly important.

Among the competencies most sought after by the industry are a willingness to take responsibility, the ability to make accurate and timely decisions, strict adherence to safety procedures, and openness to technological developments.

What are the most common technical or practical deficiencies you observe among newly graduated officers? What initiatives is your institution undertaking to address these shortcomings?

At times, newly graduated officers experience difficulties in transferring theoretical knowledge into practical application. Although students may have learned the subject in the classroom, experiencing when, where, and how to perform each procedure onboard a real vessel is of great importance.

For this reason, we place considerable emphasis on strengthening practice-oriented education. Our VR laboratory forms an integral part of this approach. By observing and practising professional procedures in a safe and controlled environment, students develop a much clearer understanding of each operational step.

How do you assess newly graduated officers' ability to adapt to life at sea, multi-cultural working environments, and the discipline required by the maritime profession? Do today's graduates fully meet the industry's expectations?

Life at sea requires a level of discipline that is significantly different from life ashore. Shift systems, hierarchical structures, confined working environments, and working alongside people from different cultures all require a period of adaptation for newly graduated officers.

A considerable proportion of our graduates prepare for this process with enthusiasm and awareness. However, as the industry's expectations continue to evolve, technical knowledge alone is no longer sufficient.

Students must also possess strong communication skills, a sense of responsibility, teamwork capabilities, English proficiency, and a well-developed safety culture.

For this reason, we believe our graduates have signi-

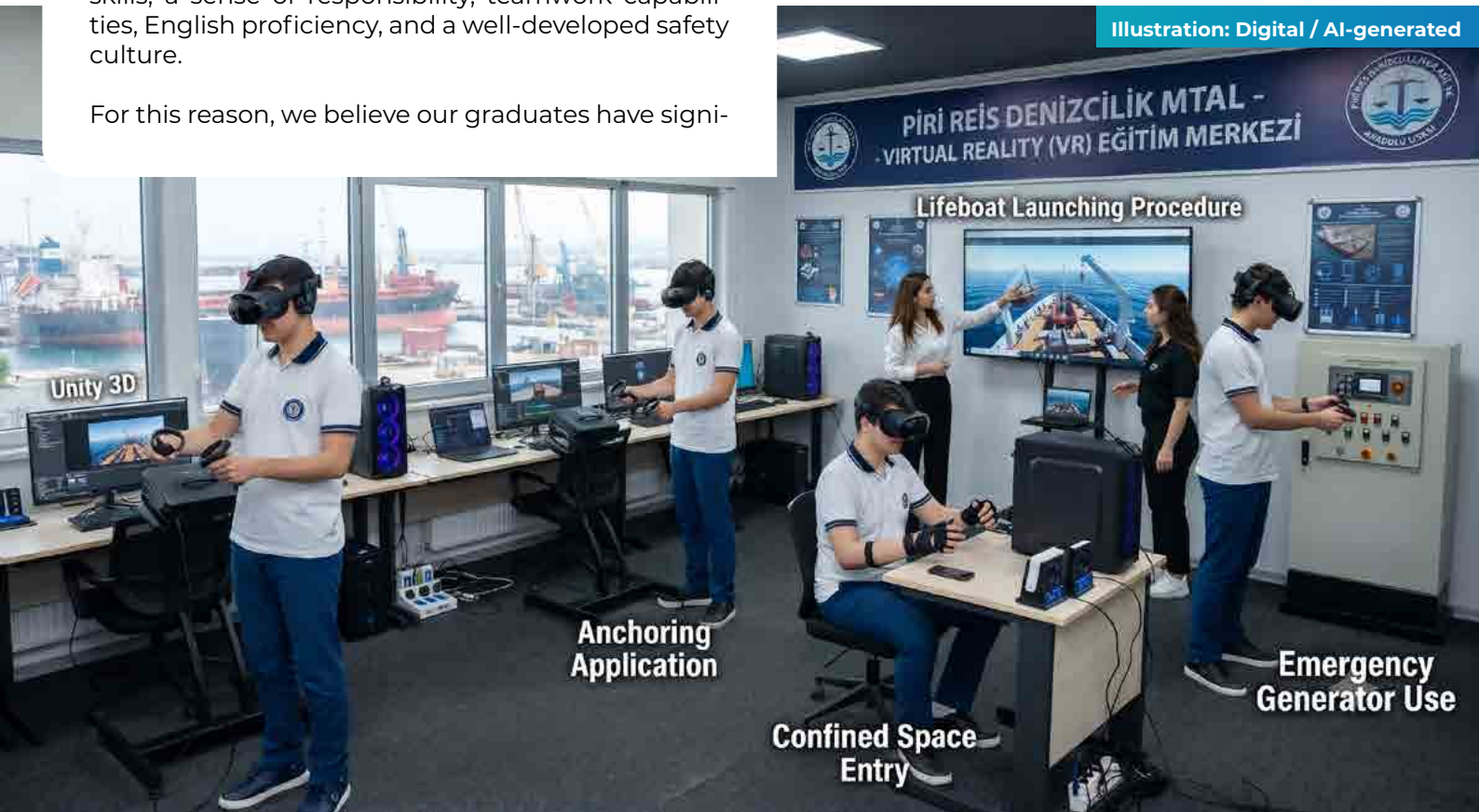
ficant potential to adapt successfully to the industry. To further strengthen this potential, we believe greater school-industry cooperation, expanded practical training opportunities, and increased access to advanced educational technologies are essential.

Finally, would you like to share a message with the Turkish maritime industry, shipowners, or young people preparing to embark on a maritime career?

The Turkish maritime industry possesses a strong heritage and tremendous potential. To take this potential even further, I believe educational institutions, industry stakeholders, and technology providers must work together in close cooperation.

My most important advice to young people considering a maritime career is to view this profession not merely as a job, but as a way of life that demands discipline and responsibility. In maritime, professional knowledge is essential, but so too are safety awareness, English proficiency, teamwork, and a commitment to continuous self-improvement.

I would also like to address our shipowners and industry representatives: vocational maritime schools are invaluable institutions where the future seafarers of Türkiye are trained. Every contribution made to these schools is, in reality, an investment in the future of our industry. As Piri Reis Maritime Vocational and Technical Anatolian High School, we will continue to equip our students with the knowledge, skills, and mindset required for the maritime world of the future. ■





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