Fall 2024

Proceedings of WMU Maritime Week 2024 Beyond Horizons: Maritime Sustainability

World Maritime University

Korea Maritime Institute

Korea Research Institute of Ships and Ocean Engineering

WORLD MARITIME UNIVERSITY

PROCEEDINGS OF WMU MARITIME WEEK 2024

BEYOND HORIZONS: MARITIME SUSTAINABILITY

WMU.SE/WMUMARITIMEWEEK

CO-HOSTS

KRISO KOREA RESEARCH INSTITUTE OF SHIPS & OCEAN ENGINEERING

KMI KOREA MARITIME INSTITUTE

SPONSORS

KR KOREAN REGISTER

KSA Korea Shipowners' Association

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PROCEEDINGS OF

WMU MARITIME WEEK 2024

BEYOND HORIZONS: MARITIME SUSTAINABILITY

27 - 30 AUGUST 2024

MALMÖ, SWEDEN

WMU.SE/WMUMARITIMEWEEK

FOREWORD

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

The World Maritime University (WMU) was established in 1983 within the framework of the International Maritime Organization, a specialized agency of the United Nations. In the intervening four decades the University has grown to become a global centre of excellence in maritime postgraduate education, research and capacity development.

Knowledge-based organizations are indispensable to effective scientific exploration, collaboration, and communication. They are platforms in which knowledge converges, evolves, and ignites innovation. It was in fulfilment of this function that the University embarked on organizing the WMU Maritime Week Conference centred around the 2024 World Maritime Day theme of Navigating the Future: Safety First. The conference was structured around focused sessions on the topics of safety, sustainability, digitalization, decarbonization, maritime business and capacity development. The event brought together 43 speakers and 123 participants from around the world, fostered scientific dialogue that heightened collective awareness of the common challenges facing the maritime industry today, and deepened understanding of possibilities to build a safer and more sustainable future for the global maritime community.

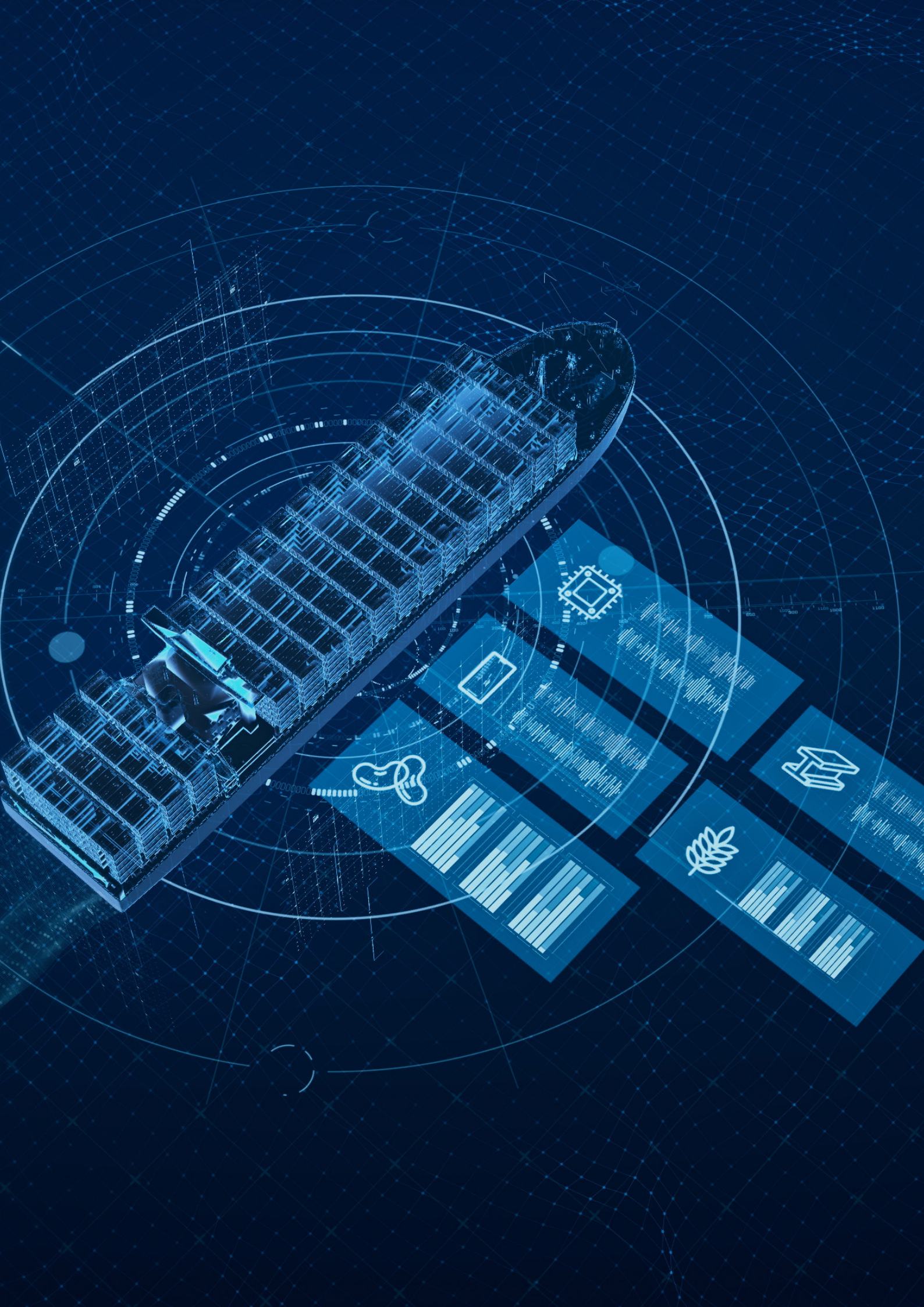
The participants explored deeply interconnected and interdependent topics. Their discussions effectively addressed the range of challenges requiring an interdisciplinary approach, combining expertise from diverse fields to generate holistic and meaningful solutions that can be applied across the maritime industry.

WMU Maritime Week 2024 noted the diverse strategies available within the industry regarding shipping decarbonizing, and the

importance of striking a balance between environmental sustainability and economic viability. For example, innovative research has shown how integrating autonomous vessels into shared maritime environments – where they coexist with conventional ships – requires an in-depth examination of human- automation interactions and the development of effective safety barriers. The thought-provoking conversations underscored the importance of research-driven strategies, and a collaborative approach to meet the evolving challenges. The distinguished speakers included industry leaders representing various organizations and fields, who are skillfully navigating the complexities and uncertainties of this rapidly evolving industry. We are proud to count many WMU alumni among them.

The WMU global network will continue to advance the University's educational mission and commitment to a sustainable maritime industry. Through the networking and scientific communication fostered at WMU Maritime Week 2024, we are advancing a resilient and forward-thinking knowledge base that contributes to a safe and sustainable future for the global maritime community.

On behalf of the World Maritime University, I extend my gratitude to all the co-hosts, sponsors, speakers and participants for their valuable contributions and for engaging in such a thoughtful intellectual exchange.



WORLD MARITIME UNIVERSITY

**With 6,087 alumni from 170 countries,
WMU has built a global network of maritime and ocean sector leaders.**

MISSION

The mission of WMU is to be the world centre of excellence in postgraduate maritime and oceans education, professional training and research, while building global capacity and promoting sustainable development.

CORE VALUES

1	Academic excellence: achieving the highest possible standards in teaching, learning and research
2	Innovation: developing innovative and interdisciplinary approaches to all areas of activity
3	A caring community: the creation of a diverse, caring and supportive environment where every student and member of staff can reach their full potential
4	Sustainable development: providing the research and teaching to give communities around the world the knowledge and skills necessary for sustainable economic development and growth
5	Gender equality: working towards gender equality in every aspect of our activities in support of women in the maritime and oceans sectors around the world
6	Leadership: leading global research on the sustainable use of the oceans, seas and marine resources for sustainable development
7	A global network: enhancing its global network of maritime and oceans expertise, in support of the United Nations' and the International Maritime Organization's mission and goals

STRATEGIC DIRECTIONS (2024-2027)

1	Educating Maritime and Ocean Leaders
2	Increasing Maritime and Ocean Research
3	Developing Long-lasting Partnerships with Key Stakeholders
4	Strengthening Institutional Financial Sustainability

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WMU MARITIME WEEK
THE BEGINNING OF INITIATIVES FOR MARITIME SUSTAINABILITY

BACKGROUND

The maritime sector is currently undergoing an unprecedented period of change. Digitalization driven by the Fourth Industrial Revolution; decarbonization with the goal of achieving net-zero greenhouse gas (GHG) emissions by 2050; and maritime sustainability, which considers various technologies, regulations, and policies; are all reshaping the overall paradigm of the maritime industry. Companies developing these technologies, international organizations and governments drafting relevant regulations, and policy-makers, focusing on maritime sustainability are all experiencing a transitional phase.

While decarbonization is being driven by regulations, setting targets and developing and applying the technologies required to achieve them, digitalization is evolving through technological advancements, with international organizations developing new regulations and policies to accommodate these innovations. In this complex and diverse landscape of technologies, regulations, and policies, there is a need for a conference in which stakeholders can discuss what they require in terms of technology, regulation, and policy development, and how these elements can complement each other to achieve common goals. Although there are various conferences on maritime topics worldwide, few focus intensively on these specific issues. WMU, as a capacity development and research institution within the framework of the IMO, is well-positioned to host such discussions on globally significant issues.Based on this assessment, WMU Maritime Week was proposed at September 2023. In October 2023. Following approval by the WMU President, the organizing committee was formed in November, marking the official start of preparations for the WMU Maritime Week conference. At the same time, discussions were held with institutions to sponsor the conference, and the arrangements were finalized with sponsorship from the Korea Research Institute of Ships and Ocean Engineering (KRISO), the Korea Maritime Institute (KMI), the Korean Register (KR), and the Korea Shipowners' Association (KSA).

The WMU Maritime Week (WMW) programme was proposed and implemented to achieve the following goals.

A. Bring together various experts to discuss contemporary maritime issues, produce practical and academic results, and contribute to international maritime communities.

B. Contribute to meeting WMU's core values of academic excellence, innovation, sustainable development, gender equality, leadership, and a global network. In addition, WMU Maritime Week 2024 will contribute to WMU's strategic directions: 1) Educating Maritime and Ocean Leaders; 2) Increasing Maritime and Ocean Research; and 3) Developing Long-lasting Partnerships with Key Stakeholders) directly and indirectly.

C. Help contribute to United Nations SDGs 3, 4, 6, 8, 9, 10, 13, 14 and 17.

D. Share knowledge in each subject area, fostering mutual understanding.

E. Identify potential research areas, continually share directions for academic, technical, policy, and regulatory development, and enhance potential collaboration.

F. Evolve into a platform for information exchange and capacity development for technical experts, policy specialists, and regulatory experts.

Moderated by Dr Chong-Ju Chae,
Chair of the Steering Committee of WMU Maritime Week, WMU

UN SDG CONTRIBUTIONS

The United Nations Sustainable Development Goals (SDGs) are a set of 17 integrated and interrelated goals to end poverty, protect the planet and ensure that peace and prosperity of humanity. The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared value system for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 SDGs, which are an urgent call for action by all countries – developed and developing – in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests.

SDG 4

WMU Maritime Week 2024 played a critical role in advancing quality education by providing a platform for knowledge exchange and capacity development. Through eight sessions focused on safety, sustainability, digitalization, decarbonization, maritime business and capacity development, the event fostered the exchange of research and best practices among global maritime experts and researchers

SDG 9

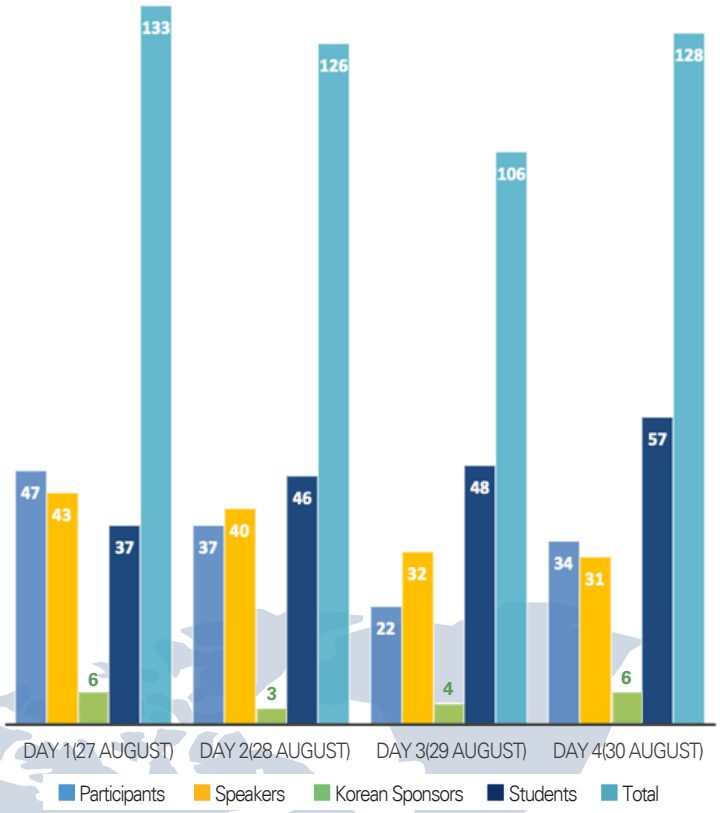
By addressing the latest technological advancements and alterative green fuels and by encouraging the adoption of green technologies, WMU Maritime Week 2024 supported the development of resilient infrastructure, promoted inclusive and sustainable industrialization, and fostered innovations that align with the broader goals of sustainable development.

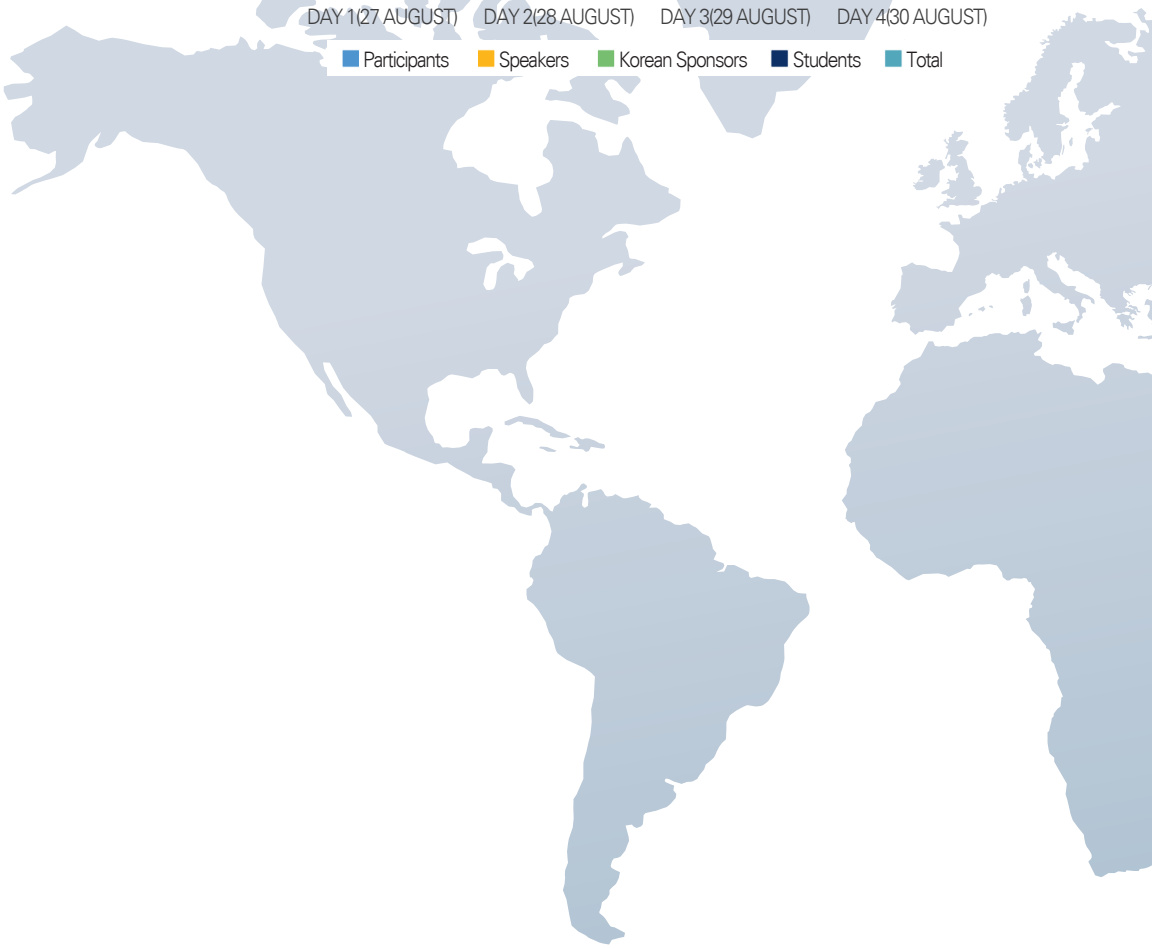
SDGs 13 and 14

Through its focused discussions on decarbonization and sustainability, WMU Maritime Week 2024 contributed to the SDG 13 and 14, related to climate action and life below water. Strategies for reducing the maritime industry's carbon footprint to combat climate change and its impacts have been discussed. In addition, the conference's emphasis on sustainability highlighted the importance of preserving marine ecosystems, and of conservation and sustainable use of the oceans and seas, as well as marine resources.

PARTICIPANTS OVERVIEW

WMU Maritime Week 2024 attracted robust participation from a diverse audience, with an average daily attendance of approximately 123 participants including maritime experts, researchers, international organizations, delegates from classification as well as students. Each day featured a dynamic mix of speakers, sponsors, and participants who engaged in meaningful discussions on critical maritime issues. The event attracted a total of 133 participants on Tuesday, 126 on Wednesday, 106 on Thursday and 128 on Friday.

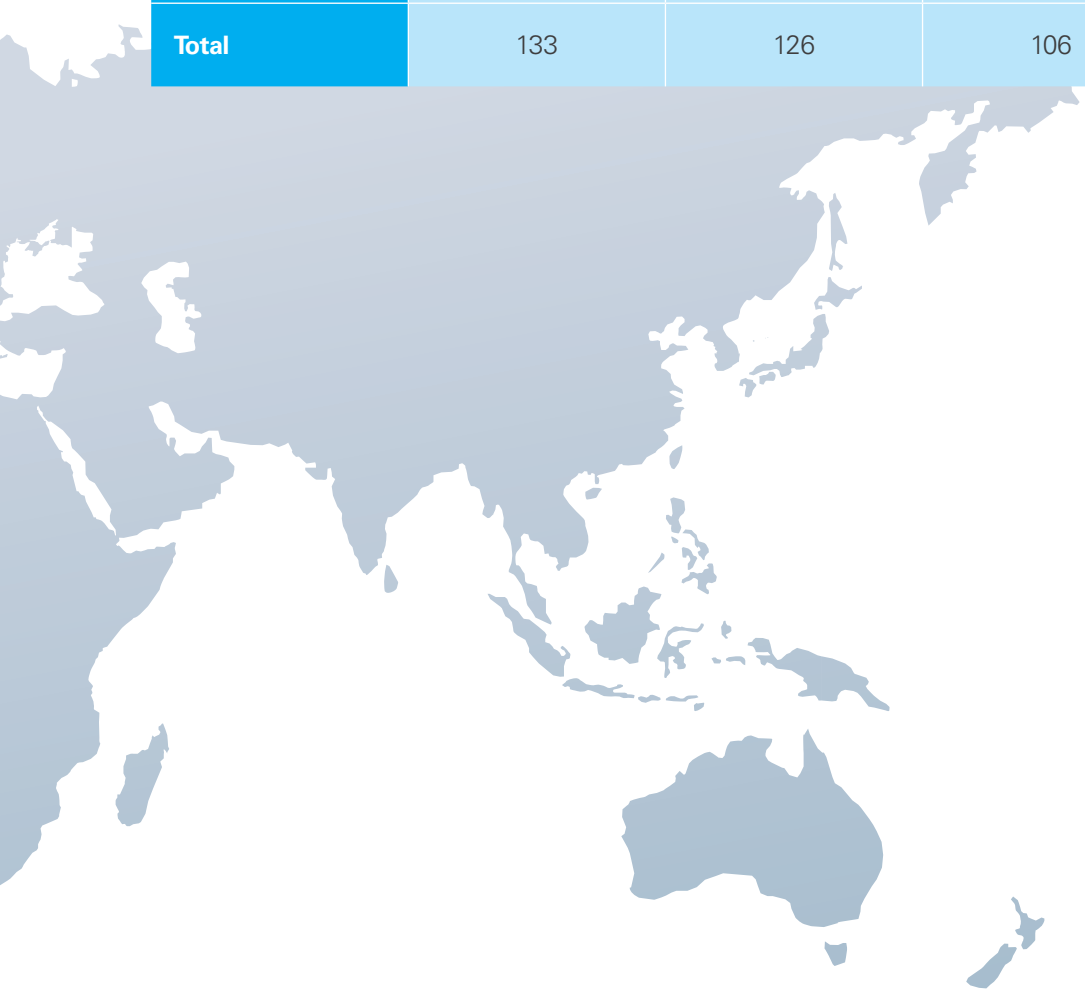




WMU Maritime Week 2024 served as a unique platform for collaboration among stakeholders in the maritime industry.

By bringing together a diverse group of professionals, we have sought to ignite meaningful scientific discussions, foster partnerships and pave the way for innovative and sustainable solutions in maritime operations, today and in the future.

Total number of participants				
	DAY 1 27 AUGUST	DAY 2 28 AUGUST	DAY 3 29 AUGUST	DAY 4 30 AUGUST
Participants	47	37	22	34
Speakers	43	40	32	31
Korean Sponsors	6	3	4	6
Students	37	46	48	57
Total	133	126	106	128



WELCOME REMARKS

President Mejia welcomed the participants to WMU. He noted that maritime transport is an essential mechanism of global mobility, providing critical infrastructure that enables the movement of people and goods across the world. The world's expansive shipping network sustains international trade and economic development, connects diverse cultures and contributes to the equality and advancement of societies.

President Mejia highlighted that the challenges we face today – ranging from climate change and decarbonization to supply chain stability, safety and well-being of our seafarers – are multifaceted and cannot be overlooked. Addressing these challenges requires innovation, regulation, and collaboration among maritime stakeholders. It calls for individuals who possess maritime expertise and the ability to think critically, act ethically, and communicate effectively on the global stage. He noted that these are qualities nurtured at WMU, in preparing future maritime and ocean leaders, to tackle the complex challenges of the maritime industry.

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

Ms Carina Nilsson, the Mayor and Chairperson of Malmö City Council, extended a warm welcome to all participants, expressing her delight at hosting this maritime event in Malmö. She highlighted the city's engagement in fostering international cooperation, innovation and sustainable development. Ms Nilsson acknowledged the significance of maritime week in bringing together global experts to address critical maritime issues, and emphasized Malmö's role as a forward-thinking maritime hub in Sweden.

Malmö is home to people from 186 different nationalities, making it a place where the whole world feels connected. Our city is often celebrated for its openness, warmth, and inclusivity.

Ms Carina Nilsson
Mayor and Chairperson, Malmö City Council

"I sincerely hope you feel at home here and enjoy everything Malmö has to offer during the conference"

Dr Keyyong Hong
President, Korea Research Institute of Ships and Ocean Engineering (KRISO)

The Korea Research Institute of Ships and Ocean Engineering (KRISO) emphasized the need for environmentally friendly ships and alternative fuels, given the International Maritime Organization (IMO) stricter regulations on emissions. While there is growing interest in alternatives such as LNG, ammonia and methanol, the industry faces challenges transitioning away from conventional fuels. Dr Hong emphasized the importance of sustained collaboration and dialogue for addressing multifaceted challenges. WMU Maritime Week is providing a platform for discussing industry shifts in policy, technology and environmental regulation.

KRISO reaffirms the commitment to advancing ocean technologies by advancing eco-friendly fuel propulsion systems, developing autonomous vessels and focusing on offshore energy production using Small Modular Reactors (SMRs) and marine renewable energy, and looks forward to continued collaboration with global partners.

"Digitalization, exemplified by autonomous ships, presents a revolutionary shift in the shipping and maritime sectors. However, alongside this exciting technological progress comes numerous technical, legal, and ethical challenges that must be addressed."

- Keyyong Hong, President, Korea Research Institute of Ships and Ocean Engineering (KRISO)

Dr Jong-Deog Kim
President, Korea Maritime Institute

The co-host, Dr Jong-Deog Kim, President of the Korea Maritime Institute (KMI), expressed his gratitude to the World Maritime University (WMU) for organizing Maritime Week, and emphasized that the conference was a critical platform to discuss pressing maritime issues such as safety, sustainability, digitalization and decarbonization.

Dr Kim noted the transformative impact of emerging technologies, such as MASS and smart port systems, are reshaping the maritime sector. While these innovations bring new opportunities, they also pose challenges, particularly the shortage of skilled seafarers and the need for robust education and training to support digital and green transitions.

"As we move forward, I hope that the discussions and collaboration initiated here will continue to flourish. Let us keep pushing the boundaries of innovation and education to ensure that the maritime industry remains competitive, sustainable, and resilient in the face of evolving challenges"

- Jongdoek Kim, President of Korea Maritime Institute

WMU MARITIME WEEK 2024

BEYOND HORIZONS: MARITIME SUSTAINABILITY

SESSIONS

Day1

01

Navigating the Future: Safety First

02

Maritime Sustainability

Day2

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Digitalization (Technology)

04

Digitalization (Regulation & Policy)

Day3

05

Decarbonization (Technology)

06

Decarbonization (Regulation & Policy)

Day4

07

Maritime Business & Logistics

08

Capacity Development

DAY 1

On the opening day, the morning session featured opening and welcome addresses from top experts in the maritime field, including the President of WMU, the Mayor and Chairperson of Malmö City Council, the President of Korea Research Institute Of Ships & Ocean Engineering, and the President of Korea Maritime Institute. Each year, IMO sets a theme to encourage discussions and growth in a particular area. The 2024 IMO world maritime theme is "Navigating the future, safety first."

As a specialized university established within the framework of the IMO, WMU has a responsibility to actively engage in discussions related to this theme. Immediately after the opening address, the morning session covered the 2024 IMO World Maritime Day theme. In the afternoon session, topics such as maritime digitalization, decarbonization, threats to maritime navigation, and marine environmental protection were presented. These presentations were intended to enhance understanding of maritime sustainability, and a panel discussion was conducted to gather diverse insights. The discussions in this session were intended to provide an overall view of the topics of the entire conference.

SESSION 1

NAVIGATING THE FUTURE: SAFETY FIRST

MARITIME ASPECTS TO MITIGATE CLIMATE CHANGE

Shipping accounts for approximately 3 per cent of all carbon dioxide emissions.

The trend GHG emissions from shipping has been increasing as highlighted in the Third IMO GHG Study conducted in 2014.

In response to this, the IMO has implemented several strategies and measures to reduce these emissions. The Initial GHG Strategy – which was introduced in 2018 – set the ambitious goal of reducing GHG emissions from international shipping by 50 per cent by 2050 compared to 2008 levels. This strategy laid out a timeline for implementing measures. it began with short-term actions between 2018 and 2023 followed by mid-term measures to be finalized between 2023 and 2030 and long-term measures, potentially to be finalized beyond 2030.

In support of these goals, the IMO introduced the Data Collection System (DCS) in 2017, which serves as a foundation for developing Market-Based Measures (MBM). Additionally, the IMO passed MEPC RESOLUTION.366(79), which invited member states to encourage voluntary cooperation between ports and shipping sectors to contribute to reduction of GHG emissions.

IMO's 2023 revised GHG Strategy has further strengthened its commitment to combatting climate change. This revised strategy sets a more ambitious target of achieving net-zero GHG emissions from international shipping by or around 2050. It also includes a focus on ensuring uptake of alternative zero and near-zero GHG fuels by 2030, with specific checkpoints to monitor progress toward these goals.

The concept of Green Corridors gained considerable attention at COP26 in 2021, where 22 governments endorsed the Clydebank Declaration. This Declaration set out the intention to establish six Green Corridors by 2025, accelerating the development of sustainable fuels, infrastructure, and regulatory frameworks necessary for decarbonizing the maritime industry.

In addition to these long-term strategies, the IMO has also adopted short-term GHG reduction measures through amendments to MARPOL Annex VI. These measures, which came into force in November 2022, combine mandatory technical and operational requirements designed to reduce the carbon intensity of international shipping by at least 40 per cent by 2030 compared to 2008 levels.

Looking ahead, the maritime industry is exploring the potential for digitalization and automation to enhance efficiency and sustainability. These technological advancements are expected to play a crucial role in achieving both environmental goals and economic benefits for the shipping industry.

* Sources:

  IMO (2015), Third IMO Greenhouse Gas Study 2014, Executive Summary and Final Report

  IMO (2021), Fourth IMO Greenhouse Gas Study 2020, Full Report

  IMO (2023), RESOLUTION MEPC.377(80) (adopted on 7 July 2023), 2023 IMO Strategy on Reduction of GHG Emissions from Ships

2023 IMO STRATEGY ON REDUCTION OF GHG EMISSIONS FROM SHIPS

Improved energy efficiency for ships

Strengthen energy efficiency design requirements for new ships to further reduce carbon intensity.

Reduction in carbon intensity

Cut CO2 emissions for transport work by at least 40 per cent across international shipping by 2030, compared to 2008 levels.

Adoption of zero or near-zero GHG technologies

Increase the use of zero or near-zero GHG emission technologies, fuels, and energy sources to at least 5 per cent, aiming for 10 per cent of energy used by international shipping by 2030.

Net-zero GHG emissions by 2050

Peak GHG emissions from international shipping as soon as possible, with the goal of achieving net-zero emissions by around 2050, in line with the Paris Agreement's long-term temperature goals.

* Source: International Maritime Organization, MEPC 80/17/Add.1 Annex 15, page 6, RESOLUTION MEPC.377(80) (adopted on 7 July 2023)

DAY 1 | SESSION 1

NAVIGATING THE FUTURE: SAFETY FIRST

Moderated by Dr Jens-Uwe Schröder-Hinrichs, Vice-President (Academic Affairs), WMU

Safety in Maritime – What Does the Future Hold?

Mr Jakob Larsen, Head of Maritime Safety and Security at BIMCO, explored the future of maritime safety. After a short introduction to BIMCO, he provided a forward looking perspective maritime safety in the context of mega trends such as digitalization, the demography of the seafarer workforce, and the unfolding climate changes. He noted that at the end of the day shipping is a business that needs to deliver a return on investment, and explained how shipowners are driven by a combination of earnings, regulation and care for the global commons.

Looking for a Silver Bullet for Sustainable Maritime - Is There One?

Dr Anita Mäkinen, Alternate Permanent Representative of Finland to the IMO and Chief Advisor at the Finnish Transport and Communication Agency Traficom, tackled the IMO theme for the year 2024: "Navigating the future: safety first!" from the perspective of climate change, and the kinds of harmful effects climate change has on shipping, for example, the increasing number of hurricanes and tornados with high destructive power. Climate change is also melting the glaciers in the polar regions, as a result of which icebergs are breaking off, threatening the safety of navigation in the polar regions and even beyond.

"The Paris Agreement is intended to limit the rise in global temperatures to below 2°C, with efforts to cap it at 1.5°C, to reduce climate change risks. The maritime industry must act to reduce greenhouse gas emissions accordingly."

- Dr Anita Mäkinen, Alternate Permanent Representative of Finland to the IMO

Ensuring Safety for Seafarers in a Just Transition

Ms Jacqueline Smith, Maritime Coordinator at the International Transport Workers Federation, focused on the human element of maritime safety.
She emphasized the need to ensure safety for seafarers during the industry's transition towards more sustainable practices, and advocated a just transition that prioritizes the well-being of maritime workers.

PANEL DISCUSSION 1 - NAVIGATING THE FUTURE: SAFETY FIRST

Maritime safety is always at the heart of regulatory work. It is the foundation for ensuring safe, secure and efficient operations at sea. As the industry undergoes rapid transformations driven by digitalization and decarbonization, maintaining safety standards has become even more critical.

The first panel discussion was entitled "Navigating the Future: Safety First", and focused on the critical role of maritime safety and the human element. The speakers highlighted that while technological innovations – for example autonomous ships and green energy solutions – are reshaping the maritime landscape, the safety of operations and the well-being of seafarers must remain a top priority. The human element was emphasized as a key factor, particularly in adapting to new technologies and ensuring that crew members are adequately equipped and supported during this shift.

SESSION 2

MARITIME SUSTAINABILITY

DAY 1 | SESSION 2

MARITIME SUSTAINABILITY

Moderated by Dr Jens-Uwe Schröder-Hinrichs Vice-President (Academic Affairs), WMU

Shipping into the 4th Industrial Revolution: The People at the Heart of It All

Ambassador Nancy Karigithu, Advisor and Special Envoy for Maritime and Blue Economy in the Executive Office of the President of Kenya, delivered a presentation on "Shipping into the 4th Industrial Revolution - The People at the Heart of it All". She emphasized the importance of the role we must play in navigating the technological advancements of the fourth industrial revolution, and exhorted a people-centred approach to maritime innovations.

Maritime Sustainability and ESCAP's Initiatives in Asia and the Pacific

Mr Weimin Ren, Director of the Transport Division at UNESCAP, shared insights on the issue of maritime sustainability and provided a comprehensive and detailed overview of maritime sustainability initiatives in Asia and the Pacific. He emphasized ESCAP's role in promoting sustainable development in the region and contributing to the relevant global initiatives. His presentation was insightful and highlighted key challenges and strategies aimed at enhancing maritime sustainability across Asia and the Pacific.

The Effect of the Tonnage Tax Regime of South Korea

Dr Chang-Ho Yang, Executive Vice-Chairman of Korea Shipowners' Association, shared his expertise on the tonnage tax regime in Korea. He explained how this taxation system which imposes tax based on the net tonnage of ships rather than on profits has provided a stable and predictable tax environment for shipowners. Dr Yang highlighted the benefits of this regime in supporting the growth of the maritime industry in South Korea and how the competitive edge was maintained in the market.

PANEL DISCUSSION 2 - MARITIME SUSTAINABILITY

As the industry faces the challenges of reducing greenhouse gas emissions and adapting to climate change, the discussion in this panel emphasized the importance of innovation,collaboration, and regulatory alignment at global level in driving a greener maritime future. The human element was a central theme with panellists agreeing that sustainability efforts must also focus on the training and well-being of seafarers, who will be at the forefront of implementing new technologies and practices.

The Future of Shipping: At the Biodiversity-Climate Nexus

Dr Mary S. Wisz from WMU discussed the crucial need to address biodiversity and pollution alongside shipping decarbonization. She emphasized that reducing pollution strengthens ecosystem resilience and support international agreements. Early adoption of sustainable practices presents economic incentives and fosters innovation. Dr Wisz also pointed out the potential for new partnerships and capacity sharing and positioning the shipping industry as a leader in sustainability and environmental stewardship.

KEY TAKEAWAYS FROM DAY 1

Maritime sustainability goes beyond environmental protection. It also involves ensuring economic resilience, fostering social equity and safeguarding the well-being of maritime workers. It includes the sustainable use of ocean resources, the advancement of green technologies and the development of regulatory frameworks that support innovation, safety, health and well-being.

A holistic view is needed, and we need to find balance between ecological preservation, economic growth and social responsibility, to ensure that the maritime industry can thrive while meeting the challenges of a rapidly changing world.

DAY 2

Digitalization is evolving alongside technological advancements driving the fourth industrial revolution, in areas such as AI, the internet of things, and big data. Notably, technology and regulations are continuing to develop for smart ships and MASS. In particular, MASS – driven by technological advancements – has led the IMO to develop the goal-based ship construction standards (GBS) MASS code to facilitate the acceptance of such technology from an international convention perspective, with a target entry into force on 1 January 2032. For developers involved in MASS technology and regulations, understanding the regulations from a technology developer's perspective and comprehending the technology from a regulation developer's standpoint can be crucial for narrowing potential gaps that may exist. To address this, the morning session on Day 2 focused on a discussion of digitalization technology, while the afternoon session covered related regulations and policy directions. This was intended to facilitate discussions that can address and bridge potential gaps between technology and regulation developers.

SESSION 3

DIGITALIZATION (TECHNOLOGY)

DAY 2 | OPENING SESSION

Opening Address

Mr James Fanshawe, Recipient of the Order of the Commander of the British Empire (CBE), a distinguished former Royal Navy officer, delivered the opening address for the day and set an insightful and forward- looking tone for the discussions to follow. He highlighted the efforts the United Kingdom is making toward the regulatory development of MASS, outlined the strides the maritime industry has taken in embracing autonomy and emphasized that these technological and digital advancements are reshaping the future of maritime operations.

DAY 2 | SESSION 3

DIGITALIZATION (TECHNOLOGY)

Moderated by Dr Raphael Baumler
Head of Maritime Safety and Environmental Administration specialization, World Maritime University

Ship Autonomy – The Assurance Challenge: Research, Rules and Scalable Tools

Dr Grunde Løvoll, Principal Researcher at DNV, made a presentation on the challenges of ensuring ship autonomy, from research to rules, and how scalable tools are necessary for the assurance of autonomous vessels. He discussed the complexities of developing and implementing safety standards that can keep pace with rapid technological advancements in ship autonomy, and presented simulation cases illustrating the complexities.

The Sea-trials for Demonstration of KASS Developed Technologies

Mr Geuntae Yim, Director of the MASS Remote Control Center at the Korea Research Institute of Ships and Ocean Engineering (KRISO), shared insights from sea trials conducted to demonstrate technologies developed under the Korean Autonomous Ship System (KASS). His presentation highlighted the technological status and the practical challenges and successes in the deployment of these advanced maritime technologies, and emphasized their potential to transform the future of shipping.

Towards the Digital Twin of the Navigable Waters - Progress in the Implementation of IHO's S-100 Concept

Dr Mathias Jonas, Secretary-General of the International Hydrographic Organization (IHO), discussed progress towards creating a digital twin of navigable waters by implementation of the IHO S-100 concept. He explained how this advanced digital framework will enhance maritime navigation and safety by providing real-time and precise data for mariners and autonomous vessels

Implementation of Ship Cyber Resilience

Mr JunTae Kim, Principal Surveyor for Cybersecurity at the Korean Register, addressed the implementation of ship cyber resilience. He outlined the current cybersecurity challenges facing the maritime industry and the critical need for robust defences to protect against cyber threats. This is particularly important as ships become increasingly digitalized and autonomous, with increased vulnerability to cyber risks and attacks.

A Cyber Security Look at the IMO MASS Regulations

Dr Kimberly Tam, Associate Professor in Cybersecurity at the University of Plymouth, provided a cybersecurity perspective on the IMO's regulations for MASS. She emphasized the importance of integrating strong cybersecurity measures into the regulatory frameworks governing autonomous vessels, and ensuring that as the industry advances it remains protected against emerging cyber risks.

PANEL DISCUSSION 3- DIGITALIZATION (TECHNOLOGY)

The panel discussed the growing importance of cybersecurity in the maritime industry, especially with the increasing reliance on digital systems and autonomous technologies. The panellists noted the need for shipping companies to adopt proactive measures to safeguard their vessels from cyber threats, which can disrupt operations, compromise safety and result in financial losses. The discussion highlighted the importance of developing comprehensive cybersecurity frameworks, conducting regular risk assessments, and ensuring that crew members are trained in cyber hygiene.

SESSION 4

DIGITALIZATION (REGULATION & POLICY)

DAY 2 | SESSION 4

DIGITALIZATION (REGULATION & POLICY)

Moderated by Dr Dimitrios Dalaklis
Professor, Safety and Security, World Maritime University

MASS Developments at the IMO

Mr Henrik Tunfors, International Liaison Officer at the Swedish Transport Agency, has provided an overview of developments at the IMO regarding MASS. He detailed the ongoing efforts and discussions within the IMO to establish a regulatory framework that accommodates the growing presence of autonomous and remotely controlled ships, while ensuring ship safety and security.

IMO MASS Autonomy Degrees

Degree 1

Seafarers are on board to operate and control shipboard systems and functions. Some operations may be automated and at times be unsupervised, but seafarers are on board and ready to take control.

Degree 2

The ship is controlled and operated from another location. Seafarers are available on board to take control and to operate the shipboard systems and functions.

Degree 3

The ship is controlled and operated from another location. There are no seafarers on board.

Degree 4

The operating system of the ship is able to make decisions and determine actions by itself .

* Source: MSC.1/Circ.1638, Outcome of the regulatory scoping exercise for the use of Maritime Autonomous Surface Ships (MASS), 3 June 2021.

Non-mandatory MASS Code - Drafting Human Element Chapter

Ms Jihyeon Gina Kim, IMO Liaison Assistant at the International Transport Workers' Federation (ITF), provided information on the progress of drafting of the human element chapter for the non-mandatory MASS Code. Furthermore, the presentation addressed critical issues to be considered before adoption of the non-mandatory Code in 2025 and approval of the mandatory MASS Code in 2028. She informed participants of the importance of addressing human factors in the development and implementation of remotely operated and autonomous maritime systems; the importance of the welfare, safety and sustainability of future maritime workforce seafarers; and protection of the environment.

UK Maritime Autonomous Systems Regulatory Development

Mr James Fanshawe CBE, Chair of the UK Maritime Autonomous Systems Regulatory Working Group, shared insights into the regulatory challenges and opportunities presented by MASS, and discussed the UK's approach to integrating autonomous systems into existing maritime operations and the need for international collaboration to establish coherent and effective regulations.

Adoption of Maritime Autonomous Surface Ships

SWOT ANALYSIS

STRENGTHS

- With fewer or no crew members on board, the risk of onboard accidents, injuries or fatalities is likely to be minimized.
- Autonomous ships eliminate or greatly reduce human exposure to dangerous situations such as handling chemicals, gases or working in extreme weather conditions.

WEAKNESSES

- Continuous, reliable connectivity and data transmission are critical for operations, which could make it vulnerable to system failures or disruptions.
- MASS may require significant upfront investment in technology and infrastructure.

OPPORTUNITIES

- Opening up new shipping routes that were previously inaccessible or too risky for manned vessels.
- Optimizing the global supply chains by offering more predictable, efficient, and cost-effective shipping solutions.

THREATS

- Autonomous ships are at risk of cyberattacks or system hacking, which could lead to operational disruptions or accidents.
- In remote or extreme environments – for example, Arctic waters or heavy storms – autonomous systems may face operational challenges that are difficult to mitigate without human intervention.

MARITIME AUTONOMOUS SURFACE SHIP (MASS) REFERS TO A SHIP WHICH, TO A VARYING DEGREE, CAN OPERATE INDEPENDENT OF HUMAN INTERACTION, AS DEFINED BY THE IMO.

* Sources:

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Kim, T. E., Perera, L. P., Sollid, M. P., Batalden, B. M., & Sydnes, A. K. (2022). Safety challenges related to autonomous ships in mixed navigational environments. WMU Journal of Maritime Affairs, 21(2), 141-159.

Maritime Autonomous Surface Ships (MASS) in Mixed Navigational Environments

Dr Tae-Eun Kim, Associate Professor of Maritime Safety Management at the University of Tromsø (UiT) – the Arctic University of Norway, presented insightful research on the complexities of operating autonomous ships within mixed navigational environments. Her presentation addressed the safety challenges arising from the interactions between autonomous and conventional vessels, highlighting the importance of defining safety barriers and establishing regulatory frameworks for mixed navigational environments. These measures are fundamental for the safe integration of autonomous systems into future maritime operations.

"MASS represents a transformative shift in shipping, offering potential gains in efficiency, safety and sustainability, while also posing challenges to regulatory adaptation, technological infrastructure and workforce transition.

To navigate these challenges, a stepwise and coordinated approach is essential to ensure that regulations evolve alongside technological advancements, infrastructure remains robust and secure, and operators are equipped for their new roles in managing and overseeing autonomous operations."

The UNCITRAL Model Law on Electronic Transferable Records as Enabler of the Use of Electronic Bills of Lading

Dr Luca Castellani, Legal Officer at the UNCITRAL Secretariat, presented on the role of the UNCITRAL Model Law on Electronic Transferable Records in facilitating the use of electronic bills of lading. He explained how this legal framework supports the digitalization of maritime trade documents to enable more efficient and secure transactions in the global shipping industry.

PANEL DISCUSSION 4 – DIGITALIZATION (REGULATION & POLICY)

The panel noted that continued collaboration between industry stakeholders, technology developers, and regulatory bodies will be essential for overcoming the challenges and fully realizing the benefits of MASS.

DAY 3

Climate change is a global issue, and the maritime industry is no exception. The IMO has set the target of achieving zero GHG emissions by 2050. To meet this goal, research and technological development are ongoing, including on the transition to sustainable fuels, and on alternative fuels for ships in particular. Maritime decarbonization involves regulation-driven technological advancements to achieve specified goals, requiring global research and technological development to meet established regulations. Unlike maritime digitalization, this approach focuses on how to technically meet defined goals and regulations. Furthermore, various technologies are being considered for short-term, medium-term, and long-term perspectives to determine optimal solutions. Given the potential integration of digitalization technologies, a comprehensive approach to technological development considering different aspects is essential.

Understanding the stages of technology development based on these regulations will be crucial information for comprehending responses to climate change. Therefore, on Day 3, the morning session focused on discussing current decarbonization technologies, while the afternoon session covered related regulations and policies.

SESSION 5

DECARBONIZATION (TECHNOLOGY)

DAY 3 | OPENING SESSION

Opening Address 1

Mr Yeon Tae Kim, Executive Vice-President Technical Division, Korean Register, Republic of Korea, delivered the first opening address for the Day 3 on the topic of decarbonization's impact on the maritime industry. He highlighted the impact of decarbonization on shipping companies, shipyards, classification societies. He also emphasized the complexities of alternative fuel, the financial burden, and training in relation to shipping companies. From the perspective of shipyards, he highlighted changes in production methods, the application of new technologies, and the potential for errors as a result. As for classification societies, he stressed the need for faster approval processes and the need for joint development of technologies.

Opening Address 2

Mr Hee Jin Kang, Senior Director, KRISO, Republic of Korea, delivered the second opening address for Day 3 on decarbonization. He highlighted the green shipping corridor connecting Busan Port in Korea and Tacoma Port in the United States. He also, discussed issues related to establishing a supply chain for environmentally friendly alternative fuels, such as green methanol, taking into account technical, operational and economic measures for GHG reduction. He also highlighted that building a safe and reliable supply chain for environmentally friendly alternative fuels and establishing green shipping corridors will require international cooperation and a mutually beneficial approach, to ensure that both developed and developing countries benefit from the realization of carbon neutrality.

Opening Address 3

Ms KiKi Larsen, Academia & Funding Manager at Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping Demark, delivered the final opening address for Day 3. She emphasized the need for all maritime stakeholders to take immediate action to achieve zero carbon by 2050, and stressed the importance of policy and financial support for this goal. In particular, she highlighted the need for financial support and cooperation for decarbonization. Additionally, she underlined the importance of collaboration among all stakeholders to achieve zero carbon.

DAY 3 | SESSION 5

DECARBONIZATION (TECHNOLOGY)

Moderated by Dr Aykut I. Ölçer
Nippon Foundation Chair, Director of Maritime Research and Head of the Maritime Energy Management Specialization, World Maritime University

The Port's Role in Decarbonization and the Green Transition

Mr Malthe Mulvad, Public Affairs Lead at Copenhagen Malmö Port, delivered a presentation outlining the port's goal to become one of the most sustainable ports in the world by 2025. He discussed how the port is contributing to the decarbonization of its own operations and supporting the maritime transport sector in its efforts to reduce carbon emissions. Further, Mr Mulvad highlighted the evolving role of the port as an energy hub and its strategic position to enable transformative green projects and drive the broader transition towards sustainability.

Cost-effective Green Ammonia Production and Safe Utilization

Dr Hyung-Chul Yoon, Principal Researcher at the Korea Institute of Energy Research, made a presentation on the production and utilization of green ammonia as a cost-effective and potentially safe alternative fuel for the maritime industry. His research emphasized the potential of ammonia to contribute to the decarbonization of shipping, while addressing challenges related to its production and safe use.

Closing the Energy Gap

Mr Peter Lystrup Christensen, Head of Ship Technology Systems at the Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping, addressed the issue of closing the energy gap in the transition to zero-carbon shipping. He explored the technologies and systems needed to bridge the gap between current energy sources and the future demands of a zero-carbon maritime industry, focusing on innovations in ship design and alternative fuels.

Development and Real-Sea Demonstration of an Electric Propulsion Car Ferry Powered by Swappable Roll-on/Roll-off Battery Systems

Dr Young Shik Kim, Principal Researcher at the Korea Research Institute of Ships and Ocean Engineering, showcased how this innovative technology can reduce emissions in the short sea shipping sector, offering a practical solution for greener ferry operations.

Maritime Decarbonization – a Tanker Perspective

Ms Katharina Stanzel, Managing Director of INTERTANKO, provided an overview of measures taken by tanker owners to decarbonize their fleets and operations. She discussed the unique challenges and opportunities facing the tanker sector as it continues to improve towards its targets, emphasizing the need for cross sector collaboration as well as zero carbon fuels to achieve sustainable progress.

PANEL DISCUSSION 5 - DECARBONIZATION (TECHNOLOGY)

The panel on maritime decarbonization discussed strategies for reducing greenhouse gas emissions and transition to a low-carbon future. The panellists began by addressing the IMO's target of a 50 per cent reduction in GHG emissions by 2050 and highlighted the need for swift action to meet this ambitious goal.

Key themes in the discussion included the adoption of alternative fuels such as hydrogen, ammonia, and biofuels, as well as the integration of energy efficient technologies and renewable energy sources. The panellists explored the potential of these technologies for decarbonization efforts and noted several current challenges, such as cost, scalability, and regulatory approval. The role of collaboration between shipping companies, fuel suppliers, and policymakers was emphasized as essential for creating a supportive ecosystem that promotes innovation and the widespread adoption of green technologies.


CO2

SESSION 6

DECARBONIZATION (REGULATION & POLICY)

DAY 3 | SESSION 6

DECARBONIZATION (REGULATION & POLICY)

Moderated by Dr Maria Carolina Romero Lares
Associate Professor, Head of Maritime Law and Policy Specialization,
World Maritime University

United Nations and Sustainable Transport: A Legal Perspective

Dr Matteo Del Chicca provided a legal perspective on the role of the United Nations in sustainable transport. His presentation explored the legal frameworks and international agreements that underpin sustainable transport initiatives and noted how global legal instruments can drive the transition to more sustainable maritime practices

Decarbonization Roadmap for the Domestic Fleet of the Republic of Korea (ZED-PK)

Dr Aykut I. Ölçer, Head of the Maritime Energy Management Specialization at WMU, presented a decarbonization roadmap for the domestic fleet of the Republic of Korea (ZED-PK). He outlined the strategic steps and technological innovations needed to achieve zero emissions in Korean domestic maritime operations, and highlighted the importance of a structured and well-planned transition to meet ambitious decarbonization targets.

Anchoring Change: Legal Strategies for the Decarbonization of Shipping

Dr Beatriz Martinez Romera, Associate Professor of Environmental and Climate Change Law at the University of Copenhagen, contributed her knowledge of the legal and regulatory challenges associated with climate change and environmental protection in the maritime sector. Her presentation focused on the intersection of international law and maritime practices and brought insights into how legal frameworks can support the global effort to combat climate change.

Baltic Ports Towards Decarbonization Era – Policy, Regulations, Case Studies (Strategies and Investments)

Mr Bogdan Ołdakowski, Secretary General of the Baltic Ports Organization, discussed the decarbonization efforts of Baltic ports, sharing policy insights, regulations, and case studies that illustrate the strategies and investments being implemented across the region. His talk provided a comprehensive overview of how Baltic ports are adapting to the decarbonization era, highlighting successful initiatives and the challenges that lie ahead.

Eye of the Storm – The Energy Transition through a Wind Propulsion Lens

Mr Gavin Allwright, Secretary of the International Windship Association, presented a unique perspective on the energy transition through the lens of wind propulsion. His presentation explored the potential of wind propulsion technologies to significantly reduce the maritime industry carbon footprint, and advocated the broader adoption of wind-assisted shipping as a viable and sustainable solution.

PANEL DISCUSSION 6 - DECARBONIZATION (REGULATION & POLICY)

The discussion in this panel continued the highlights from panel 5 and addressed the challenges of implementing decarbonization regulations, particularly for specific regions and smaller shipping companies, and underscored the need for financial and technical support. The panellists agreed that international collaboration is critical for developing uniform regulations that prevent market fragmentation and promote widespread adoption of green technologies.

Looking ahead, the panel emphasized the importance of continuous dialogue between industry and regulators to ensure that policies remain adaptable to technological advancements and evolving environmental goals.

DAY 4

Shipping plays a crucial role in handling over 70 per cent of global trade volume, making it a vital sector in international commerce. However, shipping routes and logistics are facing significant risks due to unpredictable geopolitical tensions, which have a direct impact on global populations and the supply of goods. Discussing the current threats to international logistics through maritime routes, and exploring alternatives, can be instrumental to finding potential solutions. Additionally, sharing cases of policy decisions based on various technologies, regulations, and logistics-related challenges – including digitalization and decarbonization – may play a significant role in the growth of developing nations. Based on this understanding, on Day 4, the morning session focused on sharing various policies addressing key issues in maritime logistics and policy.

Maritime is an intensely international domain, and the understanding and development of specific countries alone may not contribute to the collective interests. Sharing technologies, regulations, and policies related to key issues in the maritime sector and creating opportunities for joint growth are crucial, especially for developing countries. Communicating these values and sharing examples and ideas of capacity development being undertaken to convey this message is of utmost importance. Based on this understanding, the afternoon session on Day 4 emphasized the importance of sharing knowledge, fostering collaboration, and creating opportunities for joint growth in the maritime sector.

SESSION 7

MARITIME BUSINESS & LOGISTICS

DAY 4 | OPENING SESSION

Opening Address 1

Ms Sanjam Gupta, Founder of Maritime SheEO, delivered the opening address on Day 4. She highlighted that Maritime resilience, innovation, and sustainability are key concepts, emphasizing that regional tensions have a significant impact on the cost-effectiveness of international maritime logistics, and that this has increased the uncertainty in maritime logistics. She also stressed the importance of joint efforts through international cooperation to address the issue of piracy. Therefore, she emphasized that the most crucial consideration in solving the various challenges currently facing maritime logistics is the implementation of appropriate policies through international cooperation.

Opening Address 2

Dr Lauri Ojala, Professor at the University of Turku, delivered the opening address on Day 4. He highlighted the insight of concurrent emissions regulation in shipping and its supply implications. Through this he emphasized how emissions regulation affects global transport chains, providing theoretical underpinnings of the policy-making debate, and presenting an indicative observation of the economic severity of concurrent regulation as perceived by EU-based shippers and logistics providers.

DAY 4 | SESSION 7

MARITIME BUSINESS & LOGISTICS

Moderated by Dr Dong-Wook Song
Professor, Republic of Korea Chair, Head of Shipping Management and Logistics, and Port Management; Director of Academic Publications, World Maritime University

Innovation in Shipping – a Historical Perspective on the Road to Net Zero

Dr Stig Tenold, Vice-Rector for Academic Affairs at NHH Norwegian School of Economics, offered a historical perspective on innovation in shipping. His presentation traced the evolution of technological and operational advancements in the maritime industry and highlighted key innovations that have transformed global shipping practices over time. By examining the past, Professor Tenold provided valuable context for understanding current and future trends in maritime innovation.

Trends of the 21st-century Maritime Silk Road

Dr Jasmine Siu Lee Lam, Professor at the Technical University of Denmark, discussed the emerging trends of the twenty-first century Maritime Silk Road. She explored how this modern trade route is reshaping global shipping routes and economic connections, and noted its significance for the future of international trade and maritime logistics. Her analysis highlighted the strategic importance of the Maritime Silk Road in enhancing connectivity and fostering economic growth across Asia and beyond.

AI-enhanced Smart Maritime Logistics: Spotlighting Port Logistics in South Korean Case Studies

Dr Hyerim Bae, Director of the Safe and Clean Supply Chain (SCSC) Research Centre at Pusan National University, discussed AI applications in maritime and port logistics to optimize productivity while addressing environmental and safety issues. He presented case studies demonstrating intelligent service implementation through real-world data collection and utilization from research projects conducted in Korea.

Valuing the Cost of Compliance and Monitoring in Shipping

Dr Nikos Nomikos, from Bayes Business School City St George's, University of London, provided an economic analysis of the costs associated with compliance and monitoring in shipping. His presentation examined the financial implications of adhering to international regulations and the monitoring processes required to ensure compliance. Professor Nomikos emphasized the importance of balancing regulatory compliance with operational efficiency and provided the audience with insights into how shipping companies can manage these costs effectively.

PANEL DISCUSSION 7 – MARITIME BUSINESS & LOGISTICS

This panel explored the evolving dynamics of global shipping, supply chain management and the integration of new technologies in transforming the maritime business landscape. A key focus of the discussion was the increasing complexity of global supply chains and the need for enhanced agility and resilience. The panellists highlighted how recent disruptions such as the COVID-19 pandemic and geopolitical tensions, as well as new developments such as the twenty-first century maritime Silk Road, will influence the logistics strategies and trade flow.

SESSION 8

CAPACITY DEVELOPMENT

DAY 4 | SESSION 8

CAPACITY DEVELOPMENT

Moderated by Dr Momoko Kitada
Professor, Nippon Foundation Professorial Chair in Gender and Innovation;
Head, Maritime Education & Training specialization, World Maritime University

New Fuels and Its Impact on Port Management

Mr Kang-Ki Lee, Senior Vice-President, HPS, AVL List GmbH, discussed the future need for robust primary energy sources such as internal combustion engines and fuel cells for the maritime industry. The presentation stressed the importance of collaborative action to address the industrial challenges and adapt to the evolving energy landscape. Mr Lee also outlined a future scenario for shipping fuels and emphasized the need for complexity and flexibility in fuel solutions, which must be addressed immediately to ensure readiness for future demands in port management.

IAMU's Commitment to the Sustainable Development of MET through the Capacity Development Strategy on a Global Scale

Dr Takeshi Nakazawa, Executive Director of the International Association of Maritime Universities (IAMU), made a presentation on IAMU's commitment to the sustainable development of maritime education and training (MET) through a comprehensive global capacity development strategy. He outlined the key activities IAMU has undertaken to enhance capacity development for both students and faculty members at maritime universities globally. He also introduced the Global Maritime Professional Initiative that the IAMU has recently undertaken through certain publications and fellowship programmes for students and future academic staff, which will successfully achieve the sustainable development of MET.

Swedish Engagement in Capacity Building for a Sustainable Blue Economy

Dr Jakob Granit, Director General of the Swedish International Development Cooperation Agency (Sida), shared insights on the role of international cooperation in supporting sustainable development within the maritime sector. He emphasized the importance of global partnerships and strategic investments in capacity development to address the challenges faced by developing countries in enhancing their maritime capabilities and ocean sustainability.

Development of Capacity for Marine Aids to Navigation and VTS: Current State, Learned Lessons and Challenges

Ms Latifa Oumouzoune, Education and Training Manager at IALA World Wide Academy, discussed the development of capacity for Marine Aids to Navigation (AtoN) and Vessel Traffic Services (VTS). Her presentation covered the current state of capacity development in this critical area, the lessons learned from past initiatives, and the ongoing challenges that need to be addressed to improve safety and efficiency in global maritime navigation.

The Future of Seafaring in an Age of Safer, Smarter, Greener Shipping

Mr Gerardo Borromeo, CEO of the PTC Group, focused on shaping the future of seafaring in an age of safer, smarter, and greener shipping. He highlighted the transformative impact of new technologies and sustainable practices on the seafaring profession, emphasizing the need for continuous education and training to prepare seafarers for the challenges and opportunities of a rapidly changing maritime landscape

PANEL DISCUSSION 8 – CAPACITY DEVELOPMENT

The panel on capacity development addressed the role of building and enhancing skills, knowledge and institutional frameworks to meet the evolving needs of the maritime industry. With a focus on both the human element and the broader structural capacities of organizations, the panel discussion explored strategies to strengthen the workforce and improve institutional resilience in an increasingly digital and sustainable maritime environment.

CONCLUDING REMARKS

Dr Jose Matheickal
Director,
Technical Cooperation and Implementation Division, International Maritime Organization

Dr Jose Matheickal, Director of the TechnicalCooperation and Implementation Division at the IMO, delivered the closing remarks on behalf of Mr Arsenio Dominguez, Secretary-General of IMO.

Dr Matheickal expressed gratitude to the WMU for hosting this event and extended appreciation to the Republic of Korea and other partners for their unwavering support and leadership in maritime affairs. He noted that the week, themed Beyond Horizons: Maritime Sustainability, showcased the power of collaboration and innovation in driving the maritime industry towards a sustainable future.

IMO's Vision for a Sustainable Maritime Future

The maritime industry is significant for global transport and handles over 80 per cent of global trade, but it faces challenges such as climate change and marine pollution. The IMO's key priorities include decarbonization, digitalization, maritime safety and security. Specific efforts include reducing greenhouse gas emissions, promoting alternative fuels, and advancing digital technologies in navigation and reporting systems.

Focus on Seafarers and the Human Element

The well-being of seafarers was a critical topic of discussion during maritime week and emphasized the need for safer working environments. IMO initiatives addressing issues such as harassment and abuse on board ships were highlighted, along with efforts to expand training opportunities for cadets from developing countries. The World Maritime University's role in equipping future maritime professionals for a decarbonized and digitalized sector was also recognized.

Empowering Women in the Maritime Sector

The conference highlighted the importance of gender equality in the maritime sector, with a focus on the Women in Maritime programme and regional Women in Maritime Associations (WIMAs). The upcoming IMO/WISTA women in maritime survey – which is intended to provide a comprehensive global overview of women's participation in the sector – was announced.

Capacity Development and Technical Cooperation

Capacity development was another key theme, particularly through the IMO's integrated technical cooperation programme. This initiative provides crucial training and advisory services to developing countries to enhance their maritime capabilities. The recent restructuring of technical cooperation efforts is intended to improve maritime safety, security and environmental protection on a global scale

2025 World Maritime Day Theme: Our Ocean – Our Obligation – Our Opportunity

Dr Matheickal concluded by announcing the theme for the 2025 World Maritime Day: "Our Ocean – Our Obligation – Our Opportunity", which will focus on the maritime industry's responsibility to protect and sustainably manage ocean resources. It aligns with global efforts to support the SDGs.

CLOSING REMARKS

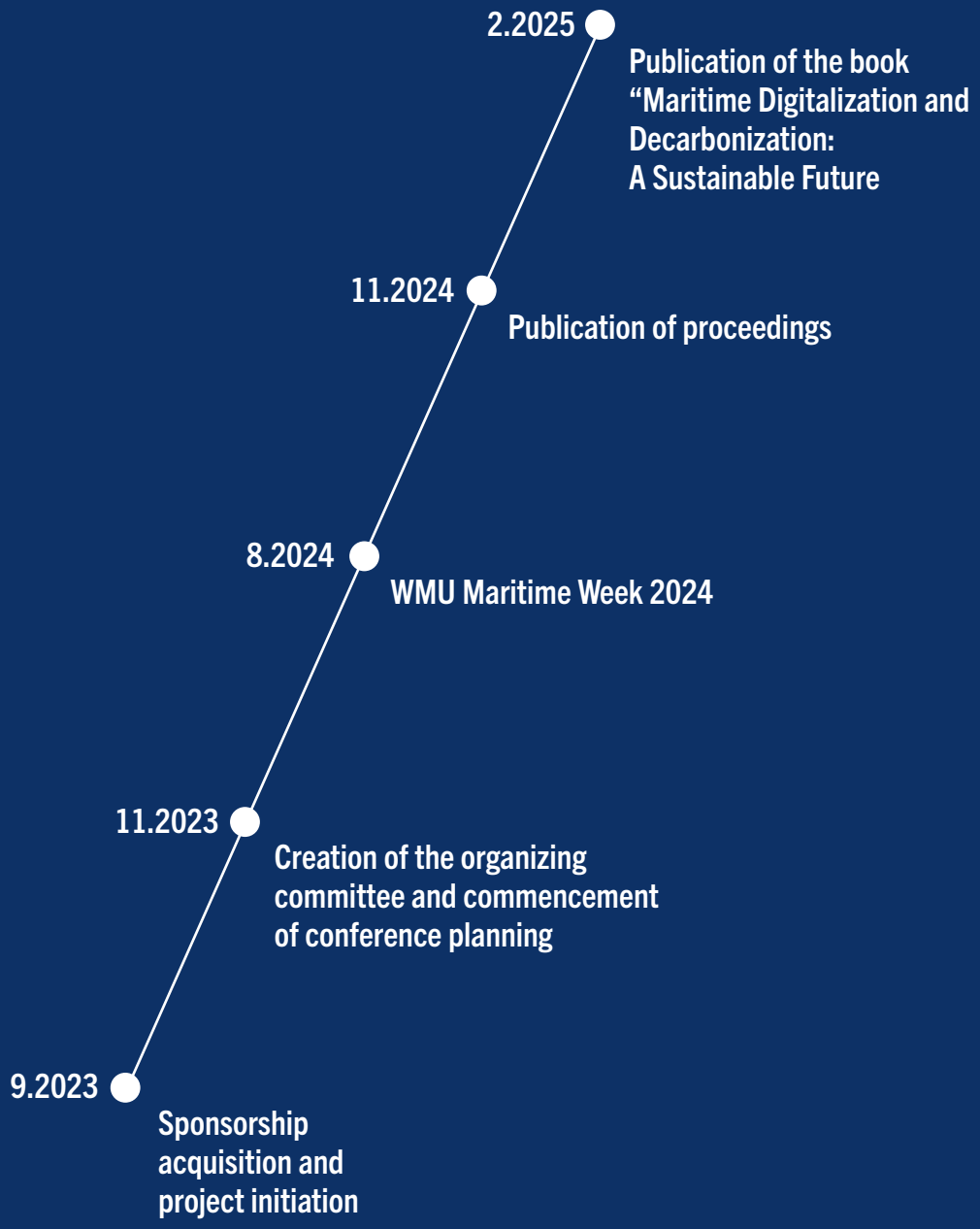
Professor Maximo Q. Mejia, Jr.
President
World Maritime University

In closing remarks, Professor Maximo Q. Mejia, Jr., WMU President, extended his appreciation to the Korea Research Institute of Ships & Ocean Engineering (KRISO), Korea Maritime Institute (KMI), Korean Register (KR), and Korea Shipowners' Association (KSA) for their support of WMU Maritime Week.

President Mejia highlighted that WMU Maritime Week fulfilled the goal of bringing together industry, academia, and international organizations to address critical issues within the maritime sector. The event aimed to facilitate a mutual understanding of diverse perspectives, fostering collaborative opportunities in support of the sector's growth and advancement.

He also observed that the wide array of topics discussed across the four-day event exemplified the intrinsic complexities and connections between them, providing important balance in addressing a broad range of key maritime challenges. He emphasized that the broad understanding presented in WMU Maritime Week provided valuable insights to nurture a network of cross-sector collaboration in support of a sustainable future for the maritime industry.

WMU MARITIME WEEK 2024 PREPARATION TIMELINE



ORGANIZING COMMITTEE

CHAIR OF THE STEERING COMMITTEE

Dr Chong-Ju Chae
Assistant Professor, World Maritime University

CONFERENCE PROCEEDING EDITORS

Dr Tae-Eun Kim,
Associate Professor, University Of Tromsø (Uit) - The Arctic University Of Norway

Dr Chong-Ju Chae,
Assistant Professor, World Maritime University

STEERING COMMITTEE MEMBERS

Dr Claudio Aporta
Professor, World Maritime University

Dr Fabio Ballini
Associate Professor, World Maritime University

Dr Inga Bartuseviciene
Associate Professor, World Maritime University

Dr María Carolina Romero Lares
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Ms Maia Brindley Nilsson
Communications And Conference Officer, World Maritime University

Ms Flavia Destro
Conference And Events Coordinator, World Maritime University

2024 WMU MARITIME WEEK SECRETARIAT

Ms HyeJin Erica Lee

PHOTOGRAPHER

Mr Kavsar Kurash

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CO-HOSTS

KRISO KOREA RESEARCH INSTITUTE OF SHIPS & OCEAN ENGINEERING

KMI KOREA MARITIME INSTITUTE

SPONSORS

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WORLD MARITIME UNIVERSITY

DAY 1 Programme

Central European Summer Time CEST, Onsite at the World Maritime University

08:00-09:00	Registration
09:00-10:00	**Opening Session**
	Moderator : **Dr Chong-Ju Chae** Chair of the Steering Committee of WMU Maritime Week, WMU, Sweden
09:00-09:15	**Professor Maximo Q. Mejia, Jr.** President, WMU, Sweden
09:15-09:30	**Ms Carina Nilsson** Mayor and Chairperson, Malmö City Council, Sweden
09:30-09:45	**Dr Keyyong Hong** President, KRISO, Republic of Korea
09:45-10:00	**Dr Jong-Deog Kim** President, KMI, Republic of Korea
10:00-10:30	**Coffee Break**
10:30-11:50	**SESSION 1. Navigating the Future: Safety First**
	Moderator : Dr Jens-Uwe Schröder-Hinrichs Vice-President Academic Affairs, WMU, Sweden
10:30-10:50	**IMO Theme 2024: Navigating the Future: Safety First - A Member State's Perspective** **Ms Pernilla Wallin** Deputy Director, Swedish Transport Agency, Sweden
10:50-1110	**Safety in Maritime - What Does the Future Hold?** **Mr Jakob Larsen** Head of Maritime Safety and Security, BIMCO, Denmark
1110-11:30	**Looking for a Silver Bullet for Sustainable Maritime - Is There One?** **Dr Anita Mäkinen** Chief Advisor, Permanent Representative of the Permanent Mission of Finland to the IMO
11:30-11:50	**Ensuring Safety for Seafarers in a Just Transition** **Ms Jacqueline Smith** Maritime Coordinator, International Transport Workers' Federation, United Kingdom
12:00-13:30	**Lunch**
13:30-15:00	**SESSION 2. Maritime Sustainability**
	Moderator : Dr Jens-Uwe Schröder-Hinrichs Vice-President Academic Affairs, WMU, Sweden
13:30-13:50	**Shipping into the 4th Industrial Revolution - The People at the Heart of It All** **Ambassador Nancy Karigithu** Advisor and Special Envoy for Maritime and Blue Economy, Executive Office of the President, Kenya
13:50-14:10	**Maritime Sustainability and ESCAP's Initiatives in Asia and the Pacific** **Mr Weimin Ren** Director, Transport Division, UNESCAP
14:10-14:30	**The Effect of Tonnage Tax Regime of South Korea** **Dr Chang-Ho Yang** Executive Vice-Chairman, Korea Shipowners' Association, Republic of Korea
14:30-15:00	**Panel Discussion and Q&A: :30 minutes**
15:00-15:20	**The Future of Shipping: At the Biodiversity-Climate Nexus** **Dr Mary S. Wisz** Professor, Marine Science, WMU
15:20-15:25	**Close of Day One** **Dr Chong-Ju Chae** Chair of the Steering Committee of WMU Maritime Week, WMU, Sweden
15:25-16:00	**Coffee and Mingle**
18:30-21:30	**Speakers' Dinner** **Location: WMU 6th Floor, Bistro**

DAY 2 Programme

09:20-09:30	**Opening Session**
	Moderator: Dr Anish Hebbar Associate Professor, WMU, Sweden
09:20-09:30	**Mr James Fanshawe** Chair, UK Maritime Autonomous Systems Regulatory Working Group, United Kingdom
09:30-10:00	**Coffee Break**
10:00-12:10	**SESSION 3. Digitalization (Technology)**
	Chair : Dr Raphael Baumler Head of Maritime Safety and Environmental Administration Specialization, WMU, Sweden
10:00-10:20	**Ship Autonomy – The Assurance Challenge: Research, Rules and Scalable Tools** **Dr Grunde Løvoll** Principal Researcher, DNV, Norway
10:20-10:40	**Sea Trials for the Demonstration of KASS Developed Technologies** **Mr Geuntae Yim** Director, MASS Remote Control Center, KRISO, Republic of Korea
10:40-11:00	**Towards the Digital Twin of the Navigable Waters - Progress in the Implementation of IHO's S-1:00 Concept** **Dr Mathias Jonas** Secretary General, International Hydrographic Organization, United Kingdom
11:00-11:20	**Implementation of Ship Cyber Resilience** **Mr Juntae Kim** Principal Surveyor - Cybersecurity, Korean Register, Republic of Korea
11:20-11:40	**A Cyber Security Look at the IMO MASS Regulations** **Dr Kimberly Tam** Associate Professor in Cybersecurity, University of Plymouth, United Kingdom
11:40-12:10	**Panel Discussion and Q&A 30 minutes**
12:10-13:30	**Lunch**
13:30-16:10	**SESSION 4. Digitalization (Regulation & Policy)**
	Chair : Dr Dimitrios Dalaklis Professor of Safety and Security, WMU, Sweden
13:30-13:50	**MASS Developments at the IMO** **Mr Henrik Tunfors** Senior Advisor, Swedish Transport Agency, Sweden
13:50-14:10	**Non-Mandatory MASS Code - Drafting Human Element Chapter** **Ms Jihyeon Gina Kim** Liaison Assistant, International Transport Workers' Federation, United Kingdom
14:10-14:30	**UK Maritime Autonomous Systems Regulatory Development** **Mr James Fanshawe CBE** Chair, UK Maritime Autonomous Systems Regulatory Working Group, United Kingdom
14:30-15:00	**Coffee Break**
15:00-15:20	**Maritime Autonomous Surface Ships (MASS in Mixed Navigational Environments)** **Dr Tae-Eun Kim** Associate Professor of Maritime Safety Management, The Arctic University of Norway, Norway
15:20-15:40	**The UNCITRAL Model Law on Electronic Transferable Records as Enabler of the Use of Electronic Bills of Lading** **Dr Luca Castellani** Legal Officer, UNCITRAL Secretariat
15:40-16:10	**Panel Discussion and Q&A 30 minutes**
16:10-16:15	**Close of Day Two** **Dr Anish Hebbar** Associate Professor, WMU, Sweden

DAY 3 Programme

09:00-09:30	**Opening Session**
	Moderator : Dr Fabio Ballini Associate Professor, WMU, Sweden
09:00-09:10	**Decarbonization Impact on Maritime Industry** **Mr Yeontae Kim** Executive Vice-President Technical Division, Korean Register, Republic of Korea
09:10-09:20	**Decarbonizing for the Sustainable Shipbuilding and Shipping Industry** **Dr Hee Jin Kang** Senior Director, KRISO, Republic of Korea
09:20-09:30	**Dr Kiki Larsen** Academia and Funding Manager, Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping, Denmark
09:30-10:00	**Coffee Break**
10:00-12:10	**SESSION 5. Decarbonization (Technology)**
	Chair : Dr Aykut I. Ölçer Nippon Foundation Chair, Director of Maritime Research and Head of the Maritime Energy Management Specialization, WMU, Sweden
10:00-10:20	**The Port's Role in Decarbonization and the Green Transition** **Mr Malthe Mulvad** Public Affairs Lead, Copenhagen Malmö Port, Denmark
10:20-10:40	**Cost-effective Green Ammonia Production and Safe Utilization** **Dr Hyung-Chul Yoon** Principal Researcher, Korea Institute of Energy Research, Republic of Korea
10:40-11:00	**Closing the Energy Gap** **Mr Peter Lystrup Christensen** Head of Ship Technology Systems, Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping, Denmark
11:00-11:20	**Development and Real-Sea Demonstration of an Electric Propulsion Car Ferry Powered by Swappable Roll-on/Roll-off Battery Systems** **Dr Young-Shik Kim** Principal Researcher, KRISO, Republic of Korea
11:20-11:40	**Maritime Decarbonization - a Tanker Perspective** **Ms Katharina Stanzel** Managing Director, INTERTANKO, United Kingdom
11:40-12:10	**Panel Discussion and Q&A 30 minutes**
12:10-13:30	**Lunch**
13:30-16:10	**SESSION 6. DDecarbonization (Regulation & Policy)**
	Chair : Dr Maria Carolina Romero Lares Associate Professor; Head of Maritime Law and Policy Specialization, WMU, Sweden
13:30-13:50	**United Nations and Sustainable Transport: A Legal Perspective** **Dr Matteo Del Chicca** Italy
13:50-14:10	**Decarbonization Roadmap for the Domestic Fleet of the Republic of Korea (ZED-PK)** **Dr Aykut I. Ölçer** Nippon Foundation Chair, Director of Maritime Research and Head of the Maritime Energy Management Specialization, WMU, Sweden
14:10-14:30	**Anchoring Change: Legal Strategies for the Decarbonization of Shipping** **Dr Beatriz Martinez Romera** Associate Professor of Environmental and Climate Change Law, University of Copenhagen, Denmark
14:30-15:00	**Coffee Break**
15:00-15:20	**Baltic Ports Towards Decarbonization** **Mr Bogdan Ołdakowski** Secretary General, Baltic Ports Organization, Poland
15:20-15:40	**Eye of the Storm – The Energy Transition through a Wind Propulsion Lens** **Mr Gavin Allwright** Secretary, International Windship Association, United Kingdom
15:40-16:10	**Panel Discussion and Q&A: 30 minutes**
16:10-16:15	**Close of Day Three** **Moderator : Dr Fabio Ballini** Associate Professor, WMU, Sweden

DAY 4 Programme

09:20-09:40	**Opening Session**
	Moderator: Dr Satya Sahoo Assistant Professor, WMU, Sweden
09:30-09:40	**Dr Lauri Ojala** Professor of Logistics, Turku School of Economics, University of Turku, Finland
09:20-09:30	**Ms Sanjam Gupta** Founder, Maritime SheEO, India
09:40-10:10	**Coffee Break**
10:10-12:00	**SESSION 7. Maritime Business & Logistics**
	Chair : Dr Dong-Wook Song Professor, Republic of Korea Chair, Head of Shipping Management and Logistics, and Port Management; Director of Academic Publications, WMU, Sweden
10:10-10:30	**Innovation in Shipping – A Historical Perspective on the Road to Net Zero** **Dr Stig Tenold** Vice-Rector for Academic Affairs, NHH Norwegian School of Economics, Norway
10:30-10:50	**Trends of the 21st-century Maritime Silk Road** **Dr Jasmine Siu Lee Lam** Professor, Technical University of Denmark, Denmark
10:50-11:10	**AI-enhanced Smart Maritime Logistics: Spotlighting Port Logistics in South Korean Case Studies** **Dr Hyerim Bae** Professor, Pusan National University, Republic of Korea
11:10-11:30	**Valuing the Cost of Compliance and Monitoring in Shipping** **Dr Nikos Nomikos** Professor, Bayes Business School, United Kingdom
11:30-12:00	**Panel Discussion and Q&A 30 minutes**
12:00-13:30	**Lunch**
13:30-16:10	**SESSION 8. Capacity Development**
	Chair: Dr Momoko Kitada Professor Nippon Foundation Post; Head, Maritime Education & Training Specialization, WMU, Sweden
13:30-13:50	**New Fuels and Their Impact on Port Management** **Mr Kang-Ki Lee** Senior Vice-President of HPS, AVL List GmbH, Republic of Korea
13:50-14:10	**IAMU's Commitment to the Sustainable Development of MET through the Capacity Development Strategy on a Global Scale** **Dr Takeshi Nakazawa** Executive Director, International Association of Maritime Universities, Japan
14:10-14:30	**Swedish Engagement in Capacity Building for a Sustainable Blue Economy** **Dr Jakob Granit** Director General, Swedish International Development Cooperation Agency Sida, Sweden
14:30-15:00	**Coffee Break**
15:00-15:20	**Development of Capacity for Marine Aids to Navigation and VTS: Current State, Learned Lessons and Challenges** **Ms Latifa Oumouzoune** Education and Training Manager, IALA World Wide Academy, France
15:20-15:40	**The Future of Seafaring in an Age of Safer, Smarter, Greener Shipping** **Mr Gerardo Borromeo** CEO, Philippine Transmarine Carriers, Philippines
15:40-16:10	**Panel Discussion and Q&A 30 minutes**
16:10-16:15	**Close of Day Four** **Dr Satya Sahoo** Assistant Professor, WMU, Sweden
16:15-16:25	**Concluding Remarks**
16:15-16:25	**Dr Jose Matheickal** Director, Technical Cooperation and Implementation Division, International Maritime Organization, United Kingdom
16:25-16:35	**Closing Remarks**
16:25-16:35	**Professor Maximo Q. Mejia, Jr.** President, WMU, Sweden

World Maritime University
PO Box 500
S-201 24 Malmö
Sweden
www.wmu.se

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