

# IMarEST Annual Conference 2024

9 July 2024

Leonardo Royal Hotel Grand Harbour in Southampton

***The future of ships, shipping and environmental sustainability'***

**Technology | Human contributions | Environment**

*Sponsored by Lloyd's Register*



## Confirmed Speakers

1. **Ralph Rayner FIMarEST**, Professorial Research Fellow, Grantham Research Institute on Climate and the Environment, **London School of Economics and co-chair IMarEST Operational Oceanography SIG**
2. **John Chudley FIMarEST**, Chair, **Engineering Council**
3. **Bev Mackenzie FIMarEST**, *Head of Intergovernmental Engagement*, **BIMCO**
4. **Claudene Sharp-Patel FIMarEST**, *Technical Director, Marine and Offshore*, **Lloyd's Register**
5. **Dr. Andrea Coraddu**, *Associate Professor*, **Delft University of Technology**
6. **Tobi Menzies**, *Director, Business Development*, **Core Power Energy**
7. **Paul Marshall MIMarEST**, *Engineer*, Maritime Industry
8. **Richard Partridge FIMarEST**, *Chief of Naval Systems*, **Rolls-Royce Naval**
9. **Alan Crowle FIMarEST**, *Researcher*, **University of Exeter**
10. **Sahan Abeysekara MIMarEST**, *Principal Specialist - Environment, Technical Directorate*, **Lloyds Register**
11. **Alina Prylipko SIMarEST**, *Lecturer*, **World Maritime University**
12. **Philip Parvin FIMarEST**, *Vice Chair of Council*, **IMarEST**
13. **Jake Rigby**, *Global Head of Innovation and Research*, **BMT**
14. **Dr. Anand Hiremath**, *Chief Sustainability Officer, Sustainable Ship and Offshore Recycling Program (SSORP)*, **GMS**
15. **Ashley Noseworthy**, *President / CEO*, **Edgewise Environmental Ltd**
16. *Senior Representative*, **Maritime Research and Innovation UK**
17. **Anthony Linden**, *Area Manager*, **DNV**
18. **Stephen Hall FIMarEST**, *Head of Partnerships*, **The Nippon Foundation & GEBCO Seabed 2030**
19. **Kevin Daffey FIMarEST**, *Vice President NautIQ Solutions and Governmental Engineering*, **Rolls-Royce Naval**
20. **Reece Oliver MIMarEST** *Experimentation Plans Team Leader - NavyX*, **Royal Navy**
21. **Niru Dorrian FIMarEST**, *Senior Offshore Ecologist*, **ESB**
22. **Wouter Vuikj**, *Business Manager Sustainable Transport*, **Port of Rotterdam**
23. **Adam Sobey**, *Program Director*, **Turing Institute**
24. **Simon Graves MIMarEST**, *Inspector of Marine Accidents*, **MAIB**

<b>8AM</b>	Registration & networking breakfast		
<b>9:00</b>	<b>Chair's opening remarks</b> Ralph Rayner, FIMarEST, <i>Professorial Research Fellow, Grantham Research Institute on Climate and the Environment</i> , <b>London School of Economics and co-chair IMarEST Operational Oceanography SIG</b>		
<b>9:05AM</b>	Keynote presentation		
<b>9:15AM</b>	<p>Opening plenary presentations and panel discussion</p> <div style="background-color: #00728f; color: white; text-align: center; padding: 5px;"><b>Navigating the uncharted waters: Unveiling the future of ships &amp; shipping</b></div> <p>This opening plenary will dissect the interconnected forces of technology, human factors, and the environment, unveiling the challenges and opportunities that lie ahead. It will involve three high-level presentations with a subsequent panel discussion.</p> <p>Demystifying fuel options and scrutinising the diverse fuel landscape, analysing available technologies, infrastructure capabilities, and long-term viability.</p> <p>Examining the intricate web of regulations and political landscapes impacting them and the crucial role of state-led support. Determining how the fuels are perceived by the crew and also the public.</p> <p>Achieving emission targets and Looking at the ripple effects of new fuel productions and evolving emission targets on the maritime industry's wider sustainability footprint and contribution to climate change mitigation.</p> <p><i>10-minute presentation from each speaker followed by a 45-minute panel discussion with audience Q&amp;A (15mins)</i></p> <p><b>Speakers</b></p> <p><b>Ralph Rayner FIMarEST</b> (moderator) <i>Professorial Research Fellow, Grantham Research Institute on Climate and the Environment, London School of Economics and co-chair IMarEST Operational Oceanography SIG</i></p> <p><b>Claudene Sharp-Patel, FIMarEST</b>, <i>Technical Director, Marine and Offshore, Lloyds Register</i></p> <p><b>Dr Richard Bucknall</b> <i>Head of Mechanical Engineer, UCL, Maritime Research and Innovation UK</i></p>		
10:45–11:15 Morning Break			
<b>11:15AM</b>	<b>Interchangeability of Current and Future Fuels in the Shipping Industry: A Technical Analysis</b>	<b>Learning from the past, charting a safer course: Health &amp; safety on vessels</b>	<b>A course to cleaner seas: meeting emission targets in shipping</b>
	<ul style="list-style-type: none"> <li>Examine the states of various fuel options, during their use analysing their physical and chemical properties relevant to maritime applications.</li> <li>-Evaluate the feasibility and limitations of using ammonia as a carrier for green fuel, exploring its potential impact on logistics and infrastructure.</li> <li>-Analyse best practices and lessons learned from the established ammonia transportation sector within</li> </ul>	<ul style="list-style-type: none"> <li>Leveraging operational failure data and accident profiles to identify and mitigate risks, proactively improving safety culture.</li> <li>The latest statistics and trends on worker fatigue, analysing its impact on accidents and implementing data-driven solutions like sleep deprivation studies.</li> <li>The need for accelerated regulatory reforms, including fatigue risk management use of new technologies and clear</li> </ul>	<ul style="list-style-type: none"> <li>The current anti-pollution measures and the impact of upcoming changes, including the EU ETS and its reporting requirements.</li> <li>How major shipping companies prepare for stricter emissions regulations and potential penalties for non-compliance.</li> </ul> <p><b>Speaker:</b> Anthony Linden, <i>Area Manager, DNV</i></p>

	the chemical industry.	standards/requirements for machinery operation. <ul style="list-style-type: none"> <li>The critical role of proper rest hours and fatigue management/monitoring for crew well-being and operational safety.</li> </ul> <b>Speaker:</b> Simon Graves MIMarEST , <i>Inspector of Marine Accidents, MAIB</i>	
	<i>5 minute intermission for movement to next session</i>		
<b>11:45AM</b>	<b>LNG operations: current landscape and future challenges</b>	<b>Health and safety considerations for operating with new technologies</b>	<b>Achieving net zero carbon emissions and sustaining military capability on complex warships</b>
	<ul style="list-style-type: none"> <li>A look at the operational intricacies of LNG-powered vessels through the lens of an existing operational fleet</li> <li>Best practices, challenges, and lessons learned.</li> <li>The technical and regulatory issues surrounding methane slip from LNG operations, evaluating its environmental impact and mitigation strategies.</li> <li>The feasibility and limitations of widespread LNG adoption across diverse marine sectors, considering vessel types, infrastructure needs, and economic viability</li> </ul>	<ul style="list-style-type: none"> <li>Safety practices for large capacitors and lithium-ion batteries in ship electrification</li> <li>Developing new safety standards for emerging technologies.</li> <li>Maintaining safety standards without compromising operational progress, finding the right equilibrium between owner requirements, crew protection and client expectations</li> <li>Training needs for safety protocols around new fuels and technologies, maintaining demanding maintenance levels as complexity increases.</li> <li>The potential health and safety pitfalls of relying solely on automation, advocating for balanced human-machine interaction.</li> </ul>	<ul style="list-style-type: none"> <li>The challenge of achieving net zero carbon emissions</li> <li>Achieving net zero and sustaining military capability on complex warships</li> <li>Insight into the fundamental requirements for naval fuels and the potential alternatives.</li> <li>The problem of no obvious direct sustainable replacement for marine gas oil</li> <li>Observations to signpost and inform the direction of travel</li> </ul> <b>Speaker:</b> Richard Partridge FIMarEST, <i>Chief of Naval Systems, Rolls-Royce Naval</i>
	<i>5 minute intermission for movement to next session</i>		
<b>12:15</b>	<b>NavyX's journey to surface ship autonomy</b>	<b>Sustainable inland shipping: how is it possible?</b>	<b>Unveiling the ocean depths: seabed 2030 update</b>
	<ul style="list-style-type: none"> <li>The journey to date using remote control with the Autonomous Pacific 24 and MADFOX</li> <li>The gaps and challenges this gave to the RN and why remote is not good enough</li> <li>The plan to achieve full autonomy on XV PATRICK BLACKETT</li> </ul> <b>Speaker:</b> Reece Oliver MIMaEST,	<ul style="list-style-type: none"> <li>Considerations for ship owners when converting to alternative fuels</li> <li>The Importance of modular ship design</li> <li>In setting to improve business case.</li> </ul> <b>Speaker:</b> Wouter Vuijk, <i>Business Manager Sustainable Transport, Port of Rotterdam</i>	<ul style="list-style-type: none"> <li>Hear an update from The Nippon Foundation and GEBCO on the Seabed 2030 project, aiming to map the entire ocean floor by 2030.</li> <li>The latest findings and advancements in bathymetric mapping, shedding light on previously hidden features of our planet's underwater landscape.</li> <li>The importance of international cooperation and data sharing in</li> </ul>

	Experimentation Plans Team Leader – <b>NavyX, Royal Navy</b>		<p>achieving this ambitious global project.</p> <ul style="list-style-type: none"> <li>• Potential applications of comprehensive seabed mapping, from resource</li> <li>• Demonstrating how this can influence commercial operations</li> </ul> <p>Speaker: <b>Stephen Hall FIMarEST, Head of Partnerships, The Nippon Foundation &amp; GEBCO Seabed 2030</b></p>
<b>12:45</b>	<b>New nuclear for maritime: the environmental &amp; economic disruptor</b>	<b>Optimising ship O&amp;M: Lessons from leaders &amp; emerging challenges</b>	<b>The art and science of removing plastic bottles from ships</b>
	<ul style="list-style-type: none"> <li>• –Outlining the potential of advanced reactors in a maritime setting (esp. compared to e-Fuels)</li> <li>• –Addressing some common misconceptions</li> <li>• –Setting out the acceptance criteria for new nuclear technologies on a floating asset</li> <li>• –Introducing the concept of a sustainable nuclear fuel inventory that can span several generations of vessels, and including that concept into a look at a hypothetical</li> <li>• nuclear-electric bulk carrier of the future.</li> </ul> <p>Speaker: <b>Tobi Menzies, Director, Business Development, Core Power Energy</b></p>	<ul style="list-style-type: none"> <li>• Operational failures rooted in human error and poor design and the need for emphasising thorough training and proactive risk management.</li> <li>• Quality Crew, Quality O&amp;M: links between O&amp;M costs and crew competency.</li> <li>• Safety challenges of new fuels and prioritise comprehensive training for safe handling and operational practices.</li> <li>• How industry giants like Maersk approach maintenance planning and execution</li> <li>• Determining who apart from the system operators need training and what that training is</li> </ul>	<p>The talk will introduce the BIMCO best practice guide to removing plastic bottles from cargo ships- highlighting the following:</p> <ul style="list-style-type: none"> <li>• Understanding the environmental Impact- introducing the impact of single-use plastic bottles, particularly in marine ecosystems, and the urgent need for the shipping industry to take proactive steps in reducing plastic waste.</li> <li>• Exploring alternatives to Single-Use Plastic Bottles – introducing the various technologies and methods that can be used to replace single-use plastic bottles on ships- selecting the best system and what to do about bottles that cannot be removed</li> <li>• Changing attitudes and behaviours – strategies for challenging seafarers' attitudes towards tap water and encouraging them to trust and consume water produced onboard – the role of testing regimes, engagement and dispelling misconceptions about tap water.</li> </ul> <p><b>Speaker:</b> Bev Mackenzie FIMarEST, Head of Intergovernmental Engagement, <b>BIMCO</b></p>
	<i>13:15 LUNCH</i>		
<b>14:15</b>	<b>New technologies in ship operations and maintenance</b>	<b>3D printing and class rules/IP: Navigating the seas of innovation</b>	<b>Collaborative strategies for mitigating industry impacts on marine mammals: perspectives from global experts</b>
	<ul style="list-style-type: none"> <li>• How AI and data can improve the design process and increase operational efficiency.</li> <li>• The latest advancements in</li> </ul>	<ul style="list-style-type: none"> <li>• A look at the exciting possibilities for 3D printing in the maritime industry</li> <li>• –Class rules and intellectual property (IP): existing regulations and approval</li> </ul>	<p><b>Fireside Chat:</b> Exploring innovative approaches and international collaboration efforts to mitigate industry impacts on marine mammals, including insights on marine mammal mitigation from industry operations</p>

	<p>build and repair technologies, from advanced welding techniques to 3D printing.</p> <ul style="list-style-type: none"> <li>• Seeing through the mist of Digital Twins – exploring how predictive maintenance can ensure reliable operation and reduce downtime.</li> <li>• Over the Horizon – Discussing the potential of quantum and autonomous technologies to change operational models and bring real benefits to end operators.</li> </ul> <p>Speaker: <b>Jake Rigby</b>, <i>Global Head of Innovation and Research, BMT</i></p>	<p>processes for additively manufactured components.</p> <ul style="list-style-type: none"> <li>• -Applications in ship design, spare parts fabrication, and custom components.</li> <li>• -Best practices and emerging trends: strategies for leveraging 3D printing responsibly and ethically while protecting your intellectual property</li> </ul>	<p>and the significance of protected areas.</p> <p><b>Speakers:</b> Niru Dorrian CSci CMarSci FIMarEST, <i>Senior Offshore Ecologist, ESB</i> Ashley Noseworthy, <i>President / CEO, Edgewise Environmental Ltd</i></p>
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5 minute intermission for movement to next session

14:45	Leveraging data from vessels to forecast power requirements	Floating wind turbines: construction and installation considerations	Amendments to the ballast water management convention
	<ul style="list-style-type: none"> <li>• Leveraging data from vessels for predictive and prescriptive analytics</li> <li>• -The optimal control, hybrid and fuel electric system, rule based approach</li> <li>• -Predicting the status from short to medium term</li> <li>• -Optimising control of power and propulsion and forecasting needs over time</li> <li>• -How to forecast the status of the power demand of hybrid and fuel electric drivetrains to improve control</li> </ul> <p><b>Speaker:</b> Dr. Andrea Coraddu, <i>Associate Professor, Delft University of Technology</i></p>	<ul style="list-style-type: none"> <li>• Physical requirements of constructing and installing floating wind turbines.</li> <li>• Training and industrial relations, considerations</li> <li>• How to minimise effects on the environment with noise mitigation during pile driving and reducing the effect of damage to the seabed.</li> </ul> <p><b>Speaker:</b> Alan Crowle FIMarEST, <i>Researcher, University of Exeter</i></p>	<ul style="list-style-type: none"> <li>• Concepts for financial incentives to promote wider adoption and proper implementation of BWM regulations.</li> <li>• -Strategies for navigating regulatory implementation discrepancies and ensuring consistent BWM compliance.</li> <li>• -Technologies for detecting organisms and their use in monitoring BWM Convention adherence</li> <li>• -Knowledge sharing and PSC/crew training programs to improve understanding of BWM regulations and operational efficiency of ballast water management systems.</li> <li>• -Possible potential for use of ultrasonics in BWM</li> </ul>

5 minute intermission for movement to next session

15:15	Role of machine learning and sensor data in condition monitoring and informed decision making	Stakeholder management for sustainable maritime development	LR Clean hull notations: delivering environmental and efficiency benefits
	<ul style="list-style-type: none"> <li>• How sensor data &amp; machine learning have the possibility of shaping the future of condition based maintenance &amp; easing process of decision-making.</li> <li>• -Considering the following aspects:</li> </ul>	<ul style="list-style-type: none"> <li>• Specifics of stakeholder engagement in the context of sustainable maritime development;</li> <li>• Brief definitions of social sustainability and stakeholder management, identifying the</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental Impact: Hull Fouling vs GHG emissions.</li> <li>• Biofouling as a vector for the transfer of Invasive Alien Species (IAS).</li> <li>• Energy efficiency during energy transition and beyond</li> </ul>

	<ul style="list-style-type: none"> <li>Expectation from AI based engine operational &amp; sensor data analysis.</li> <li>How the sensor data and machine learning can shape the predictive maintenance.</li> </ul>	<p>stakeholders in social sustainability;</p> <ul style="list-style-type: none"> <li>An overview of the unique challenges of managing stakeholders with a specific focus on social sustainability</li> <li>In focus: attraction and retention of cadets as a stakeholder management issue.</li> </ul> <p><b>Speaker:</b> Alina Prylipko SIMarEST, Lecturer, <b>World Maritime University</b></p>	<ul style="list-style-type: none"> <li>Synergy between energy efficiency and Biofouling management</li> <li>LR Clean Hull Notation Solution</li> </ul> <p><b>Speaker:</b> Sahan Abeysekara MIMarEST, <i>Principal Specialist - Environment, Technical Directorate, Lloyds Register</i></p>
<b>15:45</b>	<i>Afternoon break</i>		
<b>16:15</b>	<b>Maritime cybersecurity -the risks today and how to mitigate them</b>	<b>Shaping the future of marine engineering: training &amp; talent</b>	<b>Decommissioning &amp; recycling of marine infrastructure</b>
	<ul style="list-style-type: none"> <li>What IMarEST can do to highlight this 21st-century challenge</li> <li>The Risk - SCADA and Op Tech: how ships and other vessels are poorly protected</li> <li>Using AI as a force for good in the maritime environment: how AI is being weaponised at state and individual level.</li> <li>Critical Infrastructure: Port Security - securing riverine and port areas from illegal activity above and below the waterline.</li> </ul> <p><b>Speaker:</b> Philip Parvin, FIMarEST, <i>Vice Chair of Council, IMarEST</i></p>	<ul style="list-style-type: none"> <li>Developing and training young engineers specifically for the unique demands of the industry.</li> <li>The potential impact of AI on employment and training within the sector.</li> <li>Strategies for retaining talent and minimising training costs through effective team development, creating a motivating and rewarding work environment.</li> </ul> <p><b>Speaker:</b> John Chudley, FIMarEST, <i>Chair, Engineering Council</i></p>	<ul style="list-style-type: none"> <li>Guidelines for decommissioning of marine infrastructure</li> <li>The impact of the Hong Kong Convention's entry into force, its key provisions, and how it will reshape ships decommissioning and recycling landscape.</li> <li>Best practices for safe and environmentally sound recycling, emphasising responsible waste management and worker safety.</li> <li>Remaining challenges in dismantling infrastructure, financing, and ensuring compliance, exploring potential solutions and innovations.</li> <li>The future design of marine assets and promoting practices that facilitate easier and more sustainable end-of-life management</li> <li>Development of materials which are less hazardous to operators and the environment.</li> </ul> <p><b>Speaker:</b> Dr. Anand Hiremath, <i>Chief Sustainability Officer Sustainable Ship and Offshore Recycling Program (SSORP)</i> <b>Global Marketing Systems (GMS)</b></p>
	<i>5 minute intermission for movement to next session</i>		
	<b>16:50 Topical Roundtables (ALL RUNNING AT THE SAME TIME, )</b>		
<b>16:45</b>	<b>Technology roundtable 1: Looking at responsible ai in shipping</b>	<b>Human factors roundtable 2 Navigating change - culture &amp; ownership in shipbuilding</b>	<b>Environment roundtable 3: Greenwashing or green giant? Demystifying decarbonisation in the maritime industry</b>

	<ul style="list-style-type: none"> <li>• <i>-Advocating for an ethical approach to AI integration, ensuring human oversight and decision-making remain central.</i></li> <li>• <i>The critical role of clean, well-organized data in maximising AI's effectiveness</i></li> <li>• <i>and reliability within the maritime industry.</i></li> <li>• <i>The importance of transparent and explainable AI algorithms, building trust and understanding among stakeholders.</i></li> <li>• <i>International cooperation in developing AI standards and regulations for responsible use in the maritime domain.</i></li> <li>• <i>The need for upskilling and reskilling initiatives to prepare the workforce for the evolving landscape of AI-powered shipping.</i></li> <li>• <i>Examine the potential to use existing skills in different ways</i></li> </ul> <p><b>Host:</b> Adam Sobey, Program Director, <b>Turing Institute</b></p>	<ul style="list-style-type: none"> <li>• <i>Strategies for identifying and aligning the needs of diverse stakeholders, ensuring net gains solutions for ship design and construction.</i></li> <li>• <i>The need for more collaboration between engineering and design teams</i></li> <li>• <i>The crucial role of soft skills like teamwork, communication, and adaptability in creating a successful and positive workplace culture.</i></li> <li>• <i>The impact of investment funds and brokers on the ship ownership market, including potential consequences for O&amp;M quality and new build standards.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Exposing greenwashing tactics and advocating for transparency in decarbonisation efforts within the maritime industry.</i></li> <li>• <i>Realistic pathways and timelines for achieving decarbonisation goals, prioritising effectiveness over symbolic actions.</i> <i>-Industry-wide collaboration, knowledge sharing, and investment in proven technologies and sustainable fuels and examination of new ideas</i></li> <li>• <i>Frameworks for monitoring and reporting decarbonisation progress, ensuring accountability and preventing misleading claims.</i></li> </ul>
	<p><b>Technology roundtable 4: Autonomy, security, and responsibility in maritime operations</b></p>	<p><b>Human factors roundtable 5: Building the future workforce - attracting &amp; retaining top talent</b></p>	<p><b>Roundtable 6: navigating future marine environmental regulations</b></p>
	<ul style="list-style-type: none"> <li>• <i>What is the optimal level of human involvement in autonomous operations? What type of training for personnel involved in autonomous operation</i></li> <li>• <i>-Should we view AI as an intelligent assistant, enhancing human capabilities, or a potential</i></li> </ul> <p><b>Host:</b> Paul Marshall MIMarEST, Engineer, Maritime Industry</p>	<ul style="list-style-type: none"> <li>• <i>The negative effects of new employment contracts on ship training and O&amp;M</i></li> <li>• <i>Taking a holistic approach to talent development, providing support at all stages of the career journey, from recruitment to upskilling and career progression.</i></li> <li>• <i>Strategies to attract younger generations to the marine industry, highlighting its unique offerings, career potential, and commitment to innovation.</i></li> <li>• <i>The need for improved career development programs and targeted recruitment to ensure the right talent fills critical roles within the industry.</i></li> <li>• <i>The necessary mindset shift, educational adaptations, and specialised training required for technicians and engineers to handle new fuels.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Evolution in Regulations and anticipation of significant changes in marine environmental regulations over the next 25 years.</i></li> <li>• <i>-Global Initiatives Impacting Shipping: COP 28 outcomes and triple planetary crisis</i></li> <li>• <i>High Seas Treaty and shipping responsibility</i></li> <li>• <i>Challenges and opportunities for the shipping industry</i></li> <li>• <i>Zero emissions and Zero harmful discharges</i></li> </ul> <p><b>Host:</b> Sahan Abeysekara MIMarEST, Principal Specialist - Environment, Technical Directorate, <b>Lloyds Register</b></p>
	<p><b>Technology roundtable 3:</b></p>	<p><b>Human factors roundtable 6:</b></p>	<p><b>Environment roundtable 8:</b></p>

	The crew of the future - optimizing ship O&M with autonomy	Human-centered shipbuilding	Unlocking environmental benefits of offshore surveys with new technology
	<ul style="list-style-type: none"> <li>• <i>How can PMS and operational data inform the optimal balance of crew and autonomous systems onboard, ensuring efficiency and safety?</i></li> <li>• <i>Is there currently enough high-quality, standardised operational data to fully leverage the potential of autonomous technologies?</i></li> <li>• <i>What new job opportunities will emerge with automation, requiring different skill sets and expertise?</i></li> <li>• <i>Remote Control of the Seas: Can remote manoeuvrability for cargo exchange and docking revolutionise operational efficiency and safety?</i></li> <li>• <i>How will automation truly impact personnel needs? Will it eliminate jobs, or simply shift them to remote roles?</i></li> </ul> <p><b>Host:</b> Kevin Daffey FIMarEST, Vice President NautIQ Solutions and Governmental Engineering, <b>Rolls-Royce Naval</b></p>	<ul style="list-style-type: none"> <li>• <i>The feasibility and challenges of retrofitting existing ships for multi-fuel use, considering technical, economic, and logistical factors.</i></li> <li>• <i>The risks and rewards associated with adopting emerging fuel technologies in shipbuilding, emphasising informed decision-making and collaboration.</i></li> <li>• <i>The human element of digitisation in shipyards, ensuring successful technology adoption and workforce upskilling.</i></li> <li>• <i>Inclusive approaches where designers and users work together, creating ships that prioritise efficiency, safety, and crew well-being.</i></li> <li>• <i>Building effective training programs for engineers and technicians on the principles and applications of human-centred design in shipbuilding.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Opportunities for collaboration between commercial and research vessels, identifying shared goals and potential avenues for joint data collection and scientific investigation.</i></li> <li>• <i>The economic benefits for commercial operators participating in scientific surveys, highlighting reputational gains and potential research partnerships.</i></li> <li>• <i>The effectiveness of new technologies in minimising environmental impacts of offshore surveys, exploring areas for further development and research.</i></li> <li>• <i>The importance of open data sharing and collaboration between stakeholders, maximising the environmental benefits of offshore surveys.</i></li> </ul>
<b>17:30</b>	<b>End of Conference</b>		