1st IMHFS

IMHFS

International Maritime Human Factors Symposium

The First International Maritime Human Factors Symposium (IMHFS)

Safety, Risk and Human Reliability in the Maritime Domain

Symposium Chairs
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Summary Report

November -2022

SAFEMODE Project has funded the event.

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Preface

The maritime industry, a vital pillar of global trade, presents a complex ecosystem wherein Human Factors (HFs) play a crucial role in ensuring **safety, efficiency, and resilience.**

As the industry continues to evolve, so too does the understanding of these HFs and their impact on operations. In recognition of the need for focused discussion on these issues, the **University of Strathclyde** organised the First International Maritime HFs Symposium in Glasgow, UK, with support from the **EU-Horizon SAFEMODE project.**

The symposium brought together experts, researchers, and industry professionals from around the world to exchange knowledge, discuss, and collaborate on the topic of **HFs in the maritime industry.** The primary goal of the symposium was to explore how HFs can be better understood, managed, and utilized to enhance maritime safety, with each day of the two-day event dedicated to specific themes.

The symposium aimed to gather ideas and promote collaboration towards making the maritime industry more adaptive **to the needs and challenges of its most vital component - its people.**

Executive Summary:

The First International Maritime Human Factors Symposium (IMHFS), held in November 2022 at the University of Strathclyde, brought together global stakeholders from academia, industry, and regulatory bodies to address one of the most pressing challenges in maritime operations: the integration of human factors into safety, design, and organisational decision-making.

Funded by the European Union's Horizon 2020 SAFEMODE project, the symposium served as a platform for knowledge exchange and strategic dialogue on enhancing safety performance by understanding human limitations, strengths, and systemic roles in complex maritime environments. Over two days, the event featured keynote addresses, panel discussions, and themed sessions exploring the human element in operational safety, design processes, automation, mental well-being, and regulatory development.

The programme was structured around seven key themes:

01 **Safety Learning and Human Factors Taxonomies** – Highlighted the use of structured taxonomies like SHIELD in safety investigations and explored data-driven learning from incidents and near misses.

02 **Safety Culture** – Examined the importance of proactive reporting, learning from success, and addressing the impact of commercial pressures on safety practices.

03 **Human-Centred Design** – Presented tools like the HURID framework and HF Compass to promote human-informed design in ship systems and layouts.

04 **Automation Support Systems** – Discussed challenges in integrating autonomous systems and maintaining the human-in-the-loop for resilience and oversight.

05 **Crew Well-being and Occupational Risk** – Emphasised the psychological demands of seafaring and the need for trauma-informed practices and mental health support.

06 **Quantification of HF Risks** – Shared new approaches to modelling human reliability and quantifying the contribution of human performance in safety-critical scenarios.

07 **Human-in-the-Loop Systems** – Addressed the evolving interface between seafarers and automation, and the training implications for future operations.

The symposium marked the official launch of the Maritime Human Factors Centre (MHFC) at the University of Strathclyde, an initiative dedicated to advancing applied human factors research, education, and industry partnerships in maritime safety.

Key outcomes from the event include:

01

A call to integrate human factors more explicitly into IMO regulatory frameworks.

02

Recognition of the need for tools that capture not only failure but also success in maritime operations.

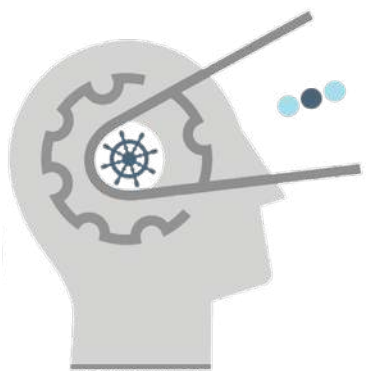
03

Consensus on the value of human-centred design and human reliability models for supporting safer systems.

04

An invitation to the wider community to continue this dialogue in future IMHFS editions and through collaboration with MHFC.

IMHFS 2022 affirmed that improving maritime safety requires systemic thinking, inclusive collaboration, and a continuous learning culture, one where the human element is not a variable to be managed, but a critical resource to be understood and empowered.



Keynote Speakers

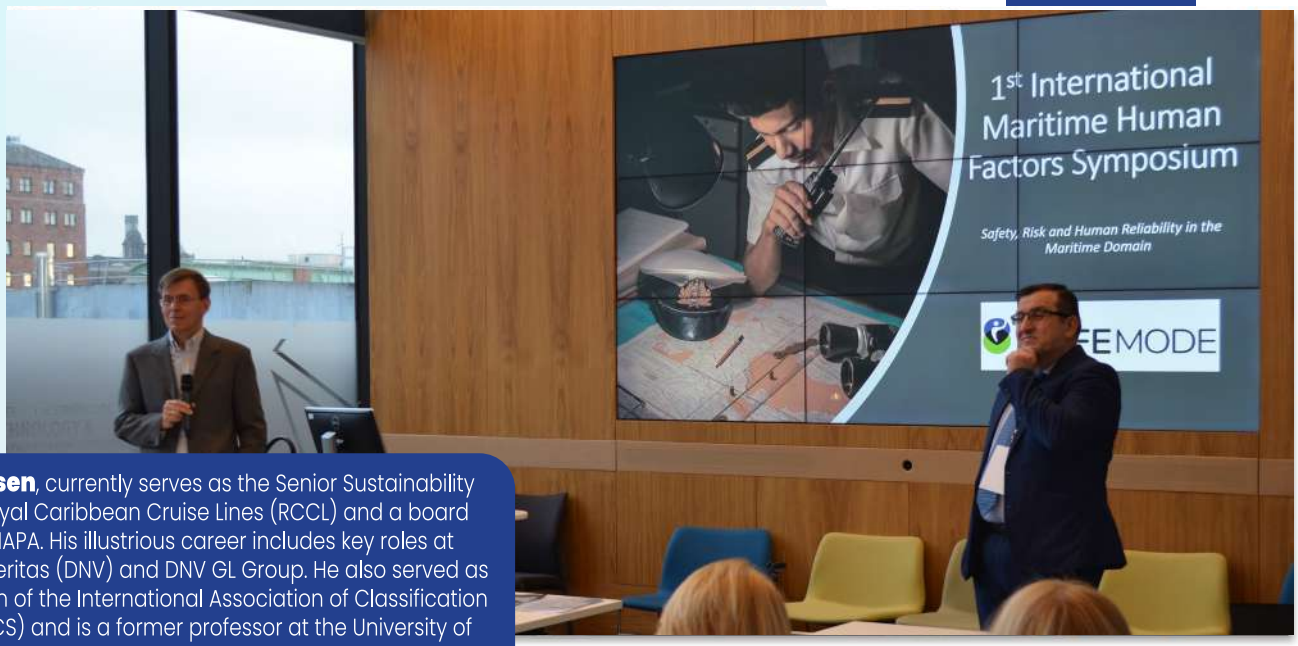
The Symposium was privileged to host two esteemed keynote speakers, each a leader in their respective fields, who shared their insights and experiences on critical aspects of Maritime Human Factors.

Enrico Gironella, a Senior Project Officer at the European Maritime Safety Agency (EMSA)

Enrico Gironella , from the European Maritime Safety Agency (EMSA), underscored the importance of the human element in marine safety investigations. He highlighted the significant role of human error in maritime incidents and introduced the European Marine Casualty Information Platform (EMCIP) and its role in safety analysis. Gironella also discussed the application of the SHIELD taxonomy within EMSA, emphasizing the need to incorporate context and multiculturalism in reporting and analysis.

During the panel discussion, Gironella emphasized the complexity of multiculturalism in maritime safety investigations. He noted that while taxonomies provide a structured approach to capturing data, they often lack the flexibility to capture the nuanced context of multicultural environments onboard vessels. **He suggested that free text fields in reports are often used to provide this context, highlighting the importance of understanding the cultural dynamics at play in any given incident.**

Gironella also pointed out that multiculturalism is not necessarily detrimental to safety; **in fact, it can add value in interactions with local authorities and in specific circumstances.** Thus, he argued for a balanced approach that uses both structured taxonomies and free text fields to capture a comprehensive picture of the circumstances surrounding an incident.



Tor E. Svensen, currently serves as the Senior Sustainability Advisor at Royal Caribbean Cruise Lines (RCCL) and a board member at NAPA. His illustrious career includes key roles at Det Norske Veritas (DNV) and DNV GL Group. He also served as the Chairman of the International Association of Classification Societies (IACS) and is a former professor at the University of Strathclyde.2

Tor Sevensen **from Royal Caribbean Cruise Lines (RCCL) introduced a new bridge layout driven by a safety evidence-based design tool.** He highlighted the challenges associated with training for the new bridge design and discussed the variable positioning of the pilot on the bridge.

The design process, which spanned eight months, entailed visiting nine vessels, conducting four workshops for observation and analysis, **and carrying out 57 expert interviews with a diverse group of maritime professionals.**

Following Tor's presentation, a panel discussion ensued, illuminating the following relevant points:

01

The importance of training for new bridge designs was discussed, with a particular focus on the need for standardization and the challenges posed by different types of ships.

02

The role of the pilot in navigation was addressed, **noting that the pilot's position can change depending on their involvement in manoeuvring.** The panel also highlighted the need for collaboration with pilots, especially in ports where ships frequently dock.

03

The panel emphasized the importance of competency standards for mooring masters and pilots, **suggesting the development of a certification system akin to deep-sea certifications.**

04

The interaction between the bridge and the Engine Control Room (ECR) was also addressed, noting the need for optimal layouts and the challenges of standardization.

05

The importance of maintaining navigators connected to the surrounding sea environment **despite the advancements in bridge equipment was brought up.**

06

The panel discussed the importance of allowing officers to choose their working positions on the bridge, whether sitting or standing, **to ensure comfort and efficiency.**

07

The panel discussed the evaluation process for promotions at every rank, which includes knowledge testing and simulation testing. **The panel noted that the knowledge test has moved online, making it more accessible for officers.**

Themes and Panel Discussions

The IMHFS was enriched by the contributions of numerous esteemed guest speakers, each a specialist in their respective field. Their presentations and discussions offered invaluable insights into various facets of HFs within the maritime sector.

The symposium was structured around seven key themes, each representing a significant aspect of HFs in the maritime industry. **These themes served as a framework for the presentations and discussions, providing a comprehensive perspective on the current state of HFs in the maritime industry and offering a roadmap for future enhancements.** Seven sessions were organized, each concluding with a panel discussion. This structure facilitated a thorough exploration of the themes and fostered engaging and insightful dialogues among the participants.

I.Safety learning and HF taxonomies

The session titled 'Learning from Accidents and Incidents - **Taxonomies and Databases' began with Dr Rafet Emek Kurt from the University of Strathclyde presented on the SAFEMODE project[3] which was further expanded upon by Dave Watkins from CHIRP[4], who demonstrated the use of the SHIELD taxonomy .** through a demonstration of **the SHIELD**[5] taxonomy. The session wrapped up with a report by David Gana from the Global Offshore Wind Health and Safety Organisation **(G+)**[6] on offshore wind incident data. Key insights and takeaways from the session were highlighted.

"In SAFEMODE, project we had a, a work package dedicated to making regulatory impact & institutionalisation. **We are closely collaborating with the IMO, sharing our findings and insights.** We're expanding our focus on the human element to widen its scope. We're definitely moving in the right direction."
Prof. Osman Turan

[3] **SAFEMODE** is an EU-H2020 project that aims at capturing human elements / human element aspects and their interaction with other components/elements of the systems, in order to enhance safety in maritime and aviation operations.
[4] **CHIRP:** Confidential HFs Incident Reporting Programme

[5] **The SHIELD** (Safety Human Incident & Error Learning Database) Open Data Repository has been developed in the SAFEMODE project. The database and its taxonomy enable systematic analysis and collection of HFs in safety occurrences (incidents / accidents) in transportation, especially for aviation and maritime operations. Data queries using SHIELD provide feedback to system and operation designers, to safety management, and to quantification of human components in safety risk models.
[6] **G+** run in partnership with the Energy Institute, focusing on incident data reporting, good practice guidance, Safe by Design workshops, and learning from incidents.

The panel discussion brought to light several key points:

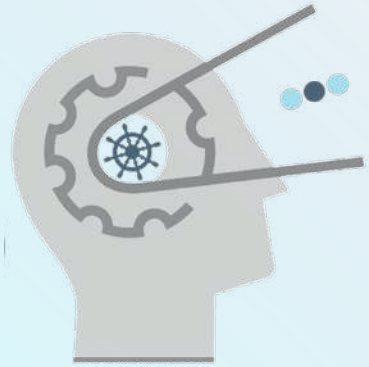
01 **Socio-Economic and Cultural Influence:** The impact of socio-economic and cultural backgrounds on communication and comprehension of orders was deliberated. The need for an environment that encourages open communication and feedback was also emphasized.

02 **IMO Regulatory Framework:** It was pointed out that the human elements aspect is not yet included in the IMO regulatory framework for seafarer education and training. However, the SAFEMODE project has proposed a paper to the IMO to modify the existing investigation code and foster a safety learning culture.

03 **SHIELD 2.0:** The need for a SHIELD 2.0 that focuses on learning from success rather than waiting for things to go wrong was discussed. The plan to develop a positive events taxonomy to learn more systematically from positive events and promote positive reporting to demonstrate the value of reporting was concluded.

04 **SHIELD Taxonomy:** The application of the SHIELD taxonomy in the European Maritime Safety Agency was thoroughly discussed, emphasizing the need to incorporate context and multiculturalism in reporting and analysis.

05 **Mental Health Considerations:** The absence of mental health screening or psychological safety measures in the offshore wind industry was discussed. The need for collecting mental health data was acknowledged, but also highlighted were the challenges of complying and the difficulty of associating mental health factors with accidents reactively.



II.Safety Culture

Safety Culture is a concept that delves into the collective attitudes towards safety within a workplace or an organisation. It highlighted the critical need to nurture a proactive safety culture that prioritises accident and incident prevention, considering the inherent risks of maritime operations. **The theme also underscored the importance of a positive safety learning culture that recognises and learns from successes and best practices, not just failures.**

The session emphasised the need for a proactive approach to address Human Factors (HFs) and safety culture in the maritime domain. The session kicked off with a demonstration of the **SafetyEye App**[7] by Louis de Wolf and Simone Pozzi from CalMac Ferries and deepblue (DBL) respectively, showcasing one of the tools developed by the SAFEMODE project.

This was followed by a presentation on safety culture assessment in maritime by Volkan Arslan from the Lloyds Register. **The session wrapped up with a presentation by Bahadir Inozu from SeaFocus, discussing the opportunities and challenges of accident investigations in the US and how to integrate HFs related causes for high reliability.**

"In various industries, including aviation, developing a culture of awareness and sensitivity is crucial. Training and combining it with actions that promote awareness ensures individuals know what to observe and report."
Simone Pozzi

[7] SafetyEye is an application that allows taking quick and anonymous surveys on safety perception in organizations.

The panel discussion brought forth several key points:

01 **Proactive Approach:** The discussions emphasized the importance of a proactive approach in addressing HFs and safety culture. They highlighted the need for regulations and best practices to enhance safety standards.

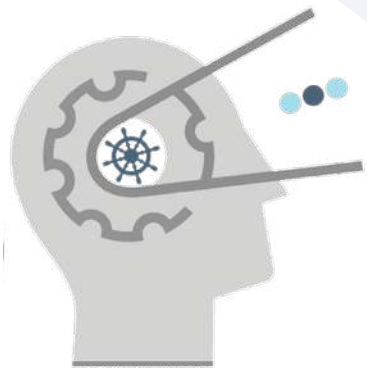
02 **Impact of Commercial Pressures:** The panel discussed the influence of commercial pressures on safety standards and the need for minimum safety standards. They pointed out that the structure of shipping companies and the flag of convenience system contribute to a lack of proactive measures and

03 **Comparison with Other Industries:** It was highlighted in several discussions that the maritime industry's delay in addressing human factors, especially when compared to sectors like nuclear, aviation, and rail. However, the panel clarified that it's crucial to acknowledge that the maritime industry possesses unique characteristics and contexts that render the integration and address of HFs in its systems more complex.

04 **Fatigue and Official Records:** The panel emphasized the importance of addressing fatigue and including it in official records. However, they noted that commercial pressures often hinder the recognition and communication of such factors.

05 **Safety Culture and Training:** The panel underscored the importance of developing a safety culture, raising awareness, and providing training to enable effective reporting and identification of safety issues.characteristics and contexts that render the integration and address of HFs in its systems more complex.

06 **Role of Regulatory Bodies:** The panel discussed the role of regulatory bodies in investigating accidents and considering HFs, highlighting the need for more effective regulation.



The session, "Human Factors in Design," unfolded with a series of presentations from maritime experts. Pelin Erdem from the University of Strathclyde initiated the session, unveiling the Human Risk-Informed Design **(HURID)**[8] Framework , a key outcome of the SAFEMODE project.

Following this, Simone Pozzie of DBL introduced the **"HFs Compass"**[9]— another tool developed under SAFEMODE, offering a roadmap for incorporating Human Factors techniques tailored to various objectives. Terry Luke from The Oil Companies International Marine Forum **(OCIMF)**[10] contributed insights on the instrumental role of Human Factors Self-Assessment in design. **The session concluded with an engaging presentation by Panagiotis Sotiralis from the National Technical University of Athens (NTUA), focusing on the incorporation of the HURID framework within the Maritime Risk-Based Design process.**

"In the quest for enhanced safety and design standards in the maritime industry, we must adopt a proactive approach. The early identification and resolution of design issues can prevent incidents. A learning and information-sharing database could be instrumental in this process."
Terry Luke

[8] **HURID** aims to provide tools for designers and risk assessors to use daily for addressing gaps in current design and operational processes, as far as the consideration of HF risks is concerned.
[9] **The HF Compass** is a step-by-step guide to implementing the HURID framework. It presents HFs techniques, tools, and methods in guided paths for you to follow, helping the user to choose and apply the most suitable ones for his project.
[10] **OCIMF** is a voluntary association of oil companies with an interest in the shipment and terminalling of crude oil, oil products, petrochemicals, and gas.

The panel discussion brought forth several key points:

Integration of human factors: The panel stressed the need to incorporate human factors in systems design, operations, and platform-based systems across different environments. This includes understanding how different crew members interact with various parts of the ship.

Decision Trees and Risk Models: The panel highlighted the importance of using decision trees and risk models in the design process. They also emphasized the need to involve Human Factors engineers in the decision-making process and mentioned the use of the HURID process, which employs risk models to evaluate design solutions.

Regulation and Training: The discussions underscored the need for regulation to ensure that Human Factors education and training is a requirement in the maritime domain. characteristics and contexts that render the integration and address of HFs in its systems more complex.

In regard to the design and placement of machinery on ships, the panellists discussed the potential impact on human performance and ergonomics. They highlighted the necessity for improved integration of human factors assessments into ship design and the implementation of effective feedback loops between operators and system designers. Additionally, the panellists stressed the importance of incorporating expertise in human factors within the maritime industry, particularly among shipyards and designers, and the need for a feedback loop from front-end operators to those responsible for the design and construction of ships.

The panel deliberated on the concept of Human Assurance, specifically in the initial assessment of safety-critical systems and emphasized the importance of conducting thorough evaluations of human interaction with said systems. **Additionally, it was proposed that naval architects should spend a period of time sailing on new vessels to gain a deep understanding of how the crew interacts with the ship's spaces and equipment.** This in-depth understanding is crucial in ensuring safety and efficiency in maritime operations.

IV.Automation Support Systems

The theme of Automation Support Systems addressed the growing prevalence of automation in maritime operations. **It explored the challenges and solutions associated with automation, emphasizing the need for intuitive and user-friendly design for effective usage of maritime human elements within futuristic autonomous systems.**

The session titled "Automation and Support" included a series of compelling presentations. The dialogue commenced with Scott MacKinnon from Chalmers University, who focused on the role of "Automation and Support" within maritime operations.
This was followed by a presentation from Gerasimos Theotokatos of the University of Strathclyde, who shared key findings from the EU-funded **AUTOSHIP Project**[11], thereby enhancing our understanding of autonomous vessel deployment.

The session concluded with Fotios Stefanidis, also from the University of Strathclyde, who shed light on the outcomes of the **SafePASS Project**[12], another EU-backed initiative.
Collectively, these presentations offered valuable insights into the integration of autonomous technologies in maritime operations, underscoring the delicate balance between human involvement and technological advancement.

"Currently, the interaction between traditional and autonomous vessels operating in restricted waterways across various countries is not fully understood. Although there are test beds established to study this interaction, potential conflicts could arise with the increasing automation of vessels if the system doesn't evolve in tandem."

[11] **AUTOSHIP project**– Autonomous Shipping Initiative for European Waters – aims at speeding-up the transition towards a next generation of autonomous ships in EU.
[12] **SafePASS project** aims for safe and swift evacuation operations on high capacity passenger ships in extreme scenarios and conditions

The panel discussion brought forth several key points:

01 **Risk Assessment and Regulatory Challenges:** The panel emphasized the need for a systematic approach to risk assessment when integrating autonomous and traditional vessels. They highlighted the complexities involved in regulating and deploying autonomous vessels and advocated for a more comprehensive approach that extends beyond current test beds operating in restricted waterways.

02 **Human-Centred Communication and Role:** The importance of human-centred communication was underscored, including the social aspect of navigation and unwritten rules. The panel also discussed the crucial role of humans in autonomous vessels, focusing on competencies, leadership, communication, and listening skills. They emphasized that technology serves as an aid, not a replacement for human operators.

03 **Impact of Automation and Human Involvement:** The discussion touched on the potential impact of automation on the shipping industry, including potential job losses and new economic opportunities. The panel also highlighted the importance of human involvement in new systems, noting that humans provide success 99.9% of the time and that monitoring human activities is crucial.characteristics and contexts that render the integration and address of HFs in its systems more complex.

04 **Quantifying Improvement:** The panel discussed the challenges in quantifying the improvement in Human Factors related to the implementation of a decision support tool, indicating a need for further research in this area.

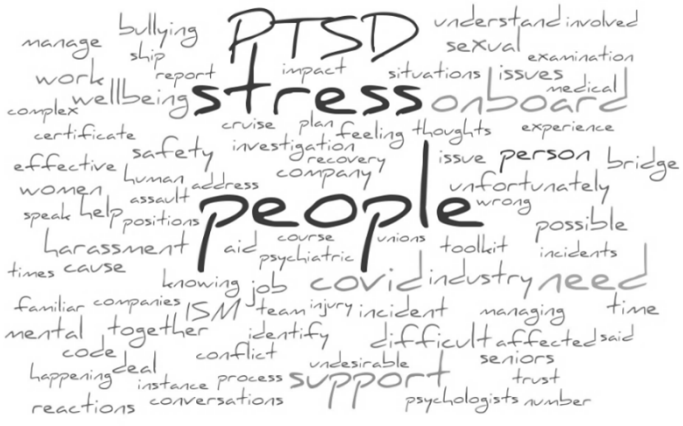
In conclusion, the panel discussion underscored the need for a balanced approach to incorporating autonomous vessels, considering both the benefits and challenges associated with it, **and the importance of considering the human factor in the development and deployment of these systems.**

V.Crew Well-being and Risks

Well-being acknowledged the physical and mental stresses of maritime operations, discussing strategies for promoting seafarers' well-being. **This theme incorporated discussions on mental health, stress management, and support for seafarers dealing with psychological trauma.**

The session, "Wellbeing and Occupational Incidents," unveiled the often under-explored mental health and psychological trauma in maritime occupations. The conversation was initiated with a presentation from Rachel Glynn-Williams and Lesley Walker, representing **Recall Recover Ltd**[13]. and Seaways Psychology Services, who advocated for a trauma-informed maritime industry that emphasizes both safety and well-being. Olanrewaju Okunribido from HSE followed with an in-depth look into data and evidence-based safety challenges at sea. Concluding the session, Adam Kelly from SEAPEAK presented an insightful examination of crew workload assessment and the notable impact of the COVID-19 pandemic. **Through this collaborative dialogue, the panel brought much-needed attention to critical wellness and safety issues that reverberate across the maritime industry.**

"Training doesn't make you immune, but it provides a toolkit. It helps you understand that symptoms like sleeplessness, irritability, forgetfulness, and avoidance are normal reactions to stress."
Dr Rachel Glynn-Williams



[13] Recall Recover presents a novel approach to marine casualty investigations, emphasizing crew welfare. This method, developed by experts in marine consulting and clinical psychology, introduces Trauma-informed Interviewing in a Marine Setting (TIMS)

The panel discussion brought to light several significant issues and potential solutions related to mental health and psychological trauma among seafarers:

01 **Conflict Management:** The panel underscored the potential disastrous outcomes of conflicts between crew members, highlighting the need for effective management matrices and assessment methods to identify and address such conflicts.

02 **ISM Code and Psychological Distress:** A lively debate questioned the current ISM code's effectiveness in addressing the unique psychological distresses faced by seafarers, with a consensus suggesting potential inadequacies of the code in effectively encompassing these critical issues.

03 **Reporting of Injuries:** The panel emphasized the importance of prompt and comprehensive reporting of injuries, including those leading to prolonged incapacitation. This should also extend to psychological responses, which should be acknowledged as normal human reactions to extreme circumstances.characteristics and contexts that render the integration and address of HFs in its systems more complex.

04 **Post-Incident Interventions:** The panel proposed an innovative concept of post-incident interventions, including psychological support and trauma education for affected individuals. The implementation of these interventions could significantly mitigate the impact of traumatic incidents on seafarers' mental health.

05 **Underreporting of Psychological Health Incidents:** The discussion highlighted the underreporting of psychological health incidents, noting that fear of jeopardizing job security and financial stability often deters seafarers from reporting such concerns

06 **Gap in Marine Safety Investigations:** A participant identified a gap in marine safety investigations, which often focus predominantly on direct ship operation incidents and tend to overlook the pivotal role of psychological issues.

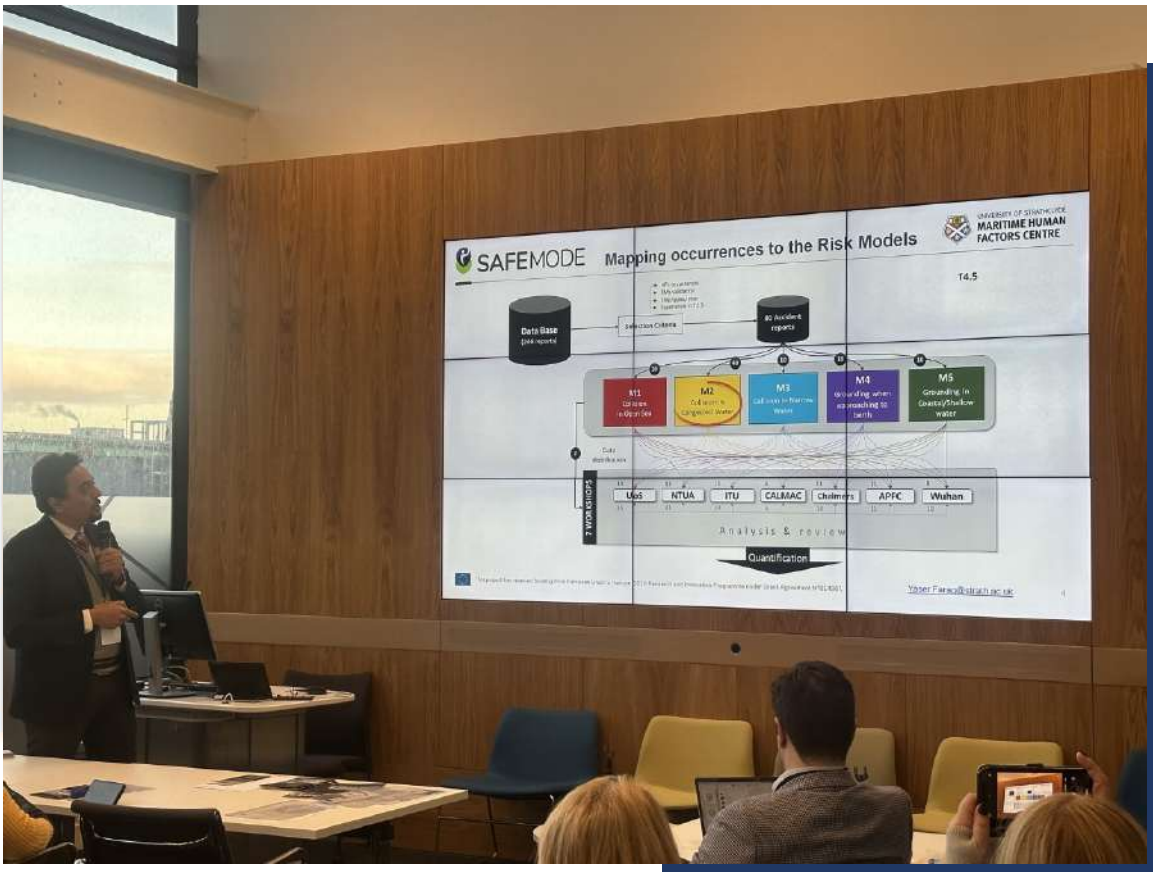
07 **Training in Stress Mitigation:** The panel discussed the potential effectiveness of training in stress mitigation and traumatic incident management, agreeing that training could provide seafarers with tools to better manage their reactions and mitigate negative stress responses.characteristics and contexts that render the integration and address of HFs in its systems more complex.

08 **Supporting Crew Members:** The panel acknowledged the critical importance of supporting all crew members, including those in senior roles, to enhance crew resilience and foster a healthier mental environment onboard.

VI.Risk Models and Quantification

The sixth session, titled "Quantification of HF Risk and Safety," offered an engaging line-up of presentations. Manolis Annetis from NTUA started the discourse with an intriguing exploration of how SAFEMODE Risk Models are developed, applied, and quantified to support learning from maritime accidents.

Yasser Farag from the University of Strathclyde then shared some insights into the retrospective application of SAFEMODE Risk Models, interpreting their potential to mitigate maritime risks. Sung Il Ahn from the University of Strathclyde wrapped up the presentations, delving into the complex topic of Human Reliability Assessment in Maritime Operations.



"Human reliability assessments carry inherent uncertainty due to the influence of contextual elements like fatigue, work situation, and interfaces used. Understanding these factors is key to accurately assessing human reliability and managing potential uncertainties."
Dr Rafet Kurt

The session concluded with an open panel discussion around the intersecting dimensions of human and machine elements in maritime risk management.

The session explored several critical aspects:

01 **Application and development of risk models:** The session highlighted using SAFEMODE risk models for future scenarios like integrating autonomous ships into current traffic. It also discussed the development of dynamic risk models for autonomous ships, which would monitor information, calculate risk, and make decisions when critical areas are identified.

02 **HFs and reliability assessment:** The complexity of HFs and human reliability assessment was discussed, acknowledging that the maritime industry has not fully exploited these analyses, unlike other safety-critical sectors such as aviation and nuclear.

03 **Autonomous ships and operator training:** The role of pilots in operating autonomous ships was a key topic, with discussions around the control mechanisms for fully autonomous ships. The need for specific training for operators in land remote control stations was emphasized, highlighting the difference in situation awareness between a real ship and a control station. characteristics and contexts that render the integration and address of HFs in its systems more complex.

04 **Human performance and error:** The variability of human performance and the possibility of providing a range of results rather than unique calculations were discussed. The panel differentiated between human error (unintended) and violation (intentional).

05 **Maintenance and equipment failure:** An open question was raised about who would perform routine maintenance and handle unexpected equipment failure on autonomous ships. The operator is responsible for managing the ship and controlling navigation, but there should be someone else to assist if there is equipment failure.

06 **Future of autonomous ships:** The panel concluded by acknowledging the unanswered questions surrounding the transition to autonomous vessels, emphasizing that this is the real question moving forward.

VII.Human in the Loop

Routing the multifaceted relationship between humans and technology, the symposium's session "Human in the Loop" assembled a set of speakers to dissect this pivotal interface. The session commenced with an analysis by Stephen Symes from Liverpool John Moores University, demonstrating the value of simulators in assessing human performance within the confines of ship engine rooms.

The conversation then shifted towards the of autonomous vessels, with Emre Akyuz from the Istanbul Technical University (ITU) detailing how operational errors in Human-Machine Interface (HMI) can be predicted for Maritime Autonomous Surface Ships (MASS). Then, Esma Uflaz, from the University of Strathclyde, shared the case studies of human responses observed in full mission bridge simulators during collision scenarios.

"Predicting the future based on today can be misleading. Autonomous ships are a game-changer, requiring a fresh perspective and continuous research."
Prof. Gerasimos Theotokatos

The presentations were followed by a panel discussion that highlighted the following points:

01 The advent of autonomous ships necessitates a shift in seafarer's education, with universities and colleges playing a crucial role in this transformation.

02 The development of an Autonomous Navigation System (ANS) was discussed. This system, designed to detect and avoid potential collisions, is a significant step towards safer autonomous maritime operations.

03 The need for a minimal, well-trained crew on board to handle emergencies was emphasized, indicating a shift in crew requirements with the advent of autonomous ships.

04 The role of the lookout in ship operations was discussed, underscoring the need for clear regulations on bridge manning levels.

05 The future of seafarers in the era of autonomous ships was discussed, highlighting the increasing importance of problem-solving abilities.

06 The panel addressed the challenge of long-voyage maintenance on autonomous ships, suggesting a complete overhaul of the current maintenance model.

Conclusion

In conclusion, the symposium successfully brought together a diverse group of experts and stakeholders to discuss the status of maritime human factors. The discussions highlighted the importance of human factors, the role of culture and communication, and the need for robust data collection and analysis.

The symposium also underscored the value of proactive safety measures and learning from success, not just failures. The insights gained from this symposium will undoubtedly contribute to ongoing efforts to enhance safety in the maritime sector. As we move forward, the challenge lies in translating these insights into practical strategies and actions that can bring about real and lasting improvements in maritime safety.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Summary Report

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