
INSTITUTE OF MARINE Engineering, Science & Technology

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| **Monday 4th November** | | | | |
| 13:00 - 16:45 | Industrial visit to Cammell Laird shipyard | | | |
| | **Tuesday 5th November** | | | |
| 09:00 | Registration & breakfast | | | |
| 09.45 | Introduction from the Chairs, **RAdm JJ Bailey, Royal Navy and Cdr Rinze Geertsma, Netherlands Defence Academy** | | | |
| 10:00 | Keynote: Second Sea Lord Martin Connell, **Royal Navy** | | | |
| 10:15 | Keynote: Rear Admiral Tom Anderson, **US Navy** | | | |
| 10:30 | Keynote**:** Rear Admiral Rachel Durbin, *Head of Navy Engineering* **Royal Australian Navy** | | | |
| 10:45 | Keynote: Rear Admiral Steve McCarthy, CNEO UK, **Royal Navy** | | | |
| 11:00 | Discussion | | | |
| 11:30 | ***Coffee Break*** | | | |
| | Standard 25 minute presentations | | | Simultaneous Interactive sessions |
| **12:00** | **Ship design and integration** | **Auxiliary equipment** | **EU safe navigation special session** | **Human machine Integration** |
| **Room** | **Spaces One and Two** | **Spaces Four** | **Spaces Five** | **Spaces Eight** |
| **Chair** | **Toby Drywood, BMT** | **W01 Scott Chapman, Royal Navy** | **Dr Michele Martelli, University of Genova** | **Tamswin Dawe, Babcock** |
| 12:00 | T26 global combat ship – More than just a submarine hunter<br>***Speaker: Cdr Stephen Taylor***<br>**Royal Navy** | Improving energy efficiency of HVAC systems on navy ships<br>***Speaker: Younus Abbas***<br>**Babcock International** | A structured simulation framework to validate marine collision avoidance algorithms<br>**University of Genova** | Improving the internal battle in a navy ship by adding situation awareness by means of using a 3D geospatial model combined with a linked data model of this ship. Design phase<br>**Delft University of Technology & Material and IT Command Netherlands** |

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| 12:25 | Widening the net of the future air dominance system<br>***Speaker: Alex Pardoe***<br>**Steller Systems Ltd** | Supplementing experience-based platform system robustness requirements to network theory<br>***Speaker: Evelien Scheffers.***<br>**Delft University of Technology** | Continuous integration for the development of a COLREG-compliant decision support system<br>***Speakers: Qeuntin Ageneau, Guillaume Nulac***<br>**Sirehna** | Enhancing internal battle operations through the battle damage repair tool<br>***Speaker: Lesley van Zijl***<br>**RH Marine, TNO & M&IT Command, Netherlands** |
| 12:50 | Physical resistance components of a hydrofoil as a function of submergence<br>***Speaker: Lev Chernyshev***<br>**University of Canterbury & Emirates Team New Zealand** | Designing in reconfigurability and adaptability to deliver lean and mean naval combatants.<br>***Speaker: Harry Schweidler***<br>**Babcock International Group** | Comprehensive approaches to enhance maritime wireless networks: A survey<br>***Speaker:Dr Jas Powell,***<br>**Global Maritime Services** | RESILIENT: Advance a ship's HM&E resiliency through contextual information models and innovative ML/AI analytics At-The-Edge<br>***Speaker: Capt. Johnny Walker & Warren Johnson***<br>**Rockwell Automation, Thor Solutions** |
| 13:15 | Session discussions | | | |
| 13:30 | ***Lunch*** | | | |
| **14:30** | **People** | **EDDI &Green fuels** | **Data driven and model based optimisation** | **Power systems** |
| **Room** | **Spaces One and Two** | **Spaces Four** | **Spaces Five** | **Spaces Eight** |
| **Chair** | **Capt Sean Feenan, Royal Australian Navy** | **Capt. Neil 'Scotty' McCallum, Royal Navy** | **Dr Angelo Odetti, CNR-INM** | **Cdr (E) dr. ir. Rinze Geerstma, Netherlands Defence Academy** |
| 14:30 | A revised operating model for the marine engineering general service to improve the lived experience of surface fleet marine engineers<br>***Speaker: Cdr James Ellis,***<br>**Royal Navy** | Truth behind green alternatives for future ship design<br>***Speaker: Jade Sheasby***<br>**BMT** | Enhancing Predictive Maintenance in the Maritime Industry with Unsupervised Learning.<br>***Speakers: Alessandro Caviglia, Dr Nicolo Faggioni.***<br>**Fincantieri NexTech & Argo IT** | Validation of power system control methodologies using a microgrid testbed employing low and medium voltage (MV) AC and DC sources<br>***Speaker: Dr. David Wetz,***<br>**UT Arlington** |
| 14:55 | Addressing the modern need for electrical skills in the maritime sector.<br>***Speaker: John Prousalidis***<br>**NTU Athens, University of Strathclyde, & Hellenic Electricity Distribution Network Operator** | A suggested energy efficiency index for warships<br>***Speaker: John Buckingham,***<br>**BMT** | Digital twin simulation model of hull-propeller-engine interactions for ship condition monitoring in irregular sea navigation.<br>***Speaker: Dr Maria Acanfora***<br>**University of Naples "Federico II"** | Investigation on shipboard power quality on Cruise ships under high penetration of power converters.<br>***Speaker: Federico Graffione***,<br>**University of Genoa & Carnival** |

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| 15:20 | Autonomy is the answer, but what was the question?<br>***Speaker: W02 Peter Spayne***<br>**Cranfield University / Royal Navy** | Optimization of propulsion layout & energy management system for future marine powertrains using co-design<br>***Speaker: Dr. Nikolaos Sakellaridis, Gert-Jan Meijn,***<br>**Damen Naval** | Automatic Maneuvering of Vessels with Power-Optimized Thrust Allocation.<br>***Speaker: Dr Agnes Schubert,***<br>**University of Rostock, Institute of Automation, Germany** | Frequency control and stability of a ship electric power system emulator.<br>***Speakers: John Prousalidis, Georgios Tsourakis***<br>**NTUA, School of Electrical & Computer Engineering,** |
| 15:45 | Session discussions | | | |
| 16:00 | ***Coffee Break*** | | | |
| **16:30** | **Regulations & autonomy** | **Hydrogen Fuels** | **Energy Storage/DC architecture** | **Safety assurance and autonomy** |
| **Room** | **Spaces One and Two** | **Spaces Four** | **Spaces Five** | **Spaces Eight** |
| **Chair** | **Cdr Amy Glover, Royal Navy** | | **Prof. Mehdi Zadeh, NTNU** | **Capt. David Goldsmith, Royal Navy** |
| 16:30 | Charting the Course: Navigating the Royal Navy's autonomous challenge with synthetic assurance<br>***Speaker: Reece Oliver,***<br>**NavyX, Royal Navy** | Dual Fuel Technology: A route to reduce emissions.<br>***Speaker: Dr Thomas Beard***<br>**BMT** | Energy profiling and planning and multi-objective optimization algorithms comparison performance<br>***Speaker: Despoina Mitropoulou***<br>**RH Marine** | Autonomy is the answer, but what was the question?<br>***Speaker: W02 Peter Spayne.***<br>**Cranfield University / Royal Navy**<br><br>Is Regulation really the barrier? Exploring the opportunities and challenges in certifying maritime systems with increased automation and autonomy<br>***Speaker: Adrian Payne,***<br>**Safeguard Engineering Limited**<br><br>Test and assurance of radical new ship designs<br>***Speaker: Matt Hood,***<br>**Nova Systems**<br><br>Ensuring maritime cyber resilience<br>***Speaker: Srinivas Revuru***<br>**Indian Register of Shipping** |
| 16:55 | Analysis of the current regulatory landscape for autonomous and remotely operated vessels in development and use by the Australian Defence maritime enterprise<br>**Royal Australian Navy** | Solid hydrogen carriers as an alternative fuel and impact damper<br>***Speaker: Erin van Rheenen***<br>**Delft University of Technology** | Battery energy storage system sizing strategy for naval vessels through multi-objective optimization<br>***Speaker: Daniele Belvisi,***<br>**University of Genoa** | |
| 17:20 | Certifying for operate safely – Building trust in Naval USVs<br>***Speakers: Chris Baker, William Balfour***<br>**MOD** | Application of quantum technology for generation of green solar hydrogen from sea water for naval applications<br>**Banaras Hindu University** | Selecting the Energy Storage Technology for Surface Combatants with DC Power Distribution<br>***Speaker: Lars Appelstroem***<br>**ABB** | |
| 17:45 | Session discussions | | | |
| 18:00 | **Welcome Reception** | | | |

| | Wednesday 6th November | | | |
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| 08:00 | Registration and coffee | | | |
| 09:00 | Plenary – Industry collaboration<br>Opening remarks – Conference chairs: **RAdm JJ Bailey, Royal Navy and Cdr Rinze Geertsma, Netherlands Defence Academy** | | | |
| 09:15 | *Keynote: TBC* | | | |
| 09:35 | Keynote: Lino Magnoni, *Head of Unmanned Integration Department* **Fincantieri – Naval Business Unit** | | | |
| 09:55 | Keynote: Sarah Kenny, OBE, *Chief Executive*, **BMT** | | | |
| 10:15 | Discussion | | | |
| 10:30 | Coffee Break | | | |
| **11:00** | **Nuclear** | **Efficiency & electrical DC** | **Maintenance** | **Workshop** |
| **Room** | **Spaces One and Two** | **Spaces Four** | **Spaces Five** | **Spaces Six & Seven** |
| **Chair** | **Prof. Alistair Greig, UCL** | **Dr David Wetz** | **Tamsin Dawe, Babcock** | **Toby Drywood, BMT** |
| 11:00 | Dynamic power behaviour of a nuclear power plant integrated in naval vessels<br>***Speakers: Gert-Jan Meijn, Tom Wien***<br>**Damen Naval** | Challenges for adapting logistics drone for naval operations.<br>**BonV Aero** | A future green navy – sustainable support to the Royal Navy<br>***Speakers: Elliott Tucker, Jim Goodship***<br>**Ministry of Defence** | BMT workshop |
| 11:25 | Molten salt reactors: Current technology status and the challenges for maritime applications<br>***Speaker: Matthew Dunn***<br>**Occam Group Ltd** | DC secondary distribution grids on future naval ships: a comparison with conventional AC distribution systems and their safety aspects<br>***Speaker: Despoina Mitropoulou,***<br>**Power Systems & RH Marine** | Towards a data-driven naval maintenance organisation: the importance of a social roadmap<br>***Speakers: Dr Wieger Tiddens, Lt. Sophie Zeldam***<br>**Royal Netherlands Navy** | |
| 11:50 | Mobile marine fuel generation based on a micro nuclear reactor<br>***Speaker: Dr Rachel Pawling***<br>***UCL*** | Validation of power system control methodologies using a microgrid testbed employing low and medium voltage (MV) AC and DC sources<br>***Speaker: Dr. David Wetz,***<br>**UT Arlington, Clarkson University, Florida State University & NSWC – Philadelphia** | Safety critical items in naval systems<br>***Speaker: James Inge***<br>**MOD – DE&S** | |
| 12:15 | Session Discussions | | | |
| 12:30 | **Lunch** | | | |

| **13:30** | **Hull Design** | **Alternative Fuels** | **Resilient Human Machine interaction** | **Safety & Autonomy** |
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| **Room** | **Spaces One and Two** | **Spaces Four** | **Spaces Five** | **Spaces Eight** |
| **Chair** | **Michel Janssen** | **Lt Cdr Henry Prior** | **Jeff Cohen, US Navy** | **Mel Scot, QinetiQ** |
| 13:30 | Design for adaptation – Ships and the systems of the future<br>***Speaker: Paolo Orefice,***<br>**Royal Australian Navy** | Application of commercial advances to support the naval energy transition<br>***Speaker: William Ayliffe,***<br>**BMT** | Enhancing internal battle operations through the battle damage repair tool<br>**RH Marine & Material and IT Command Netherlands** | Safety critical items in naval systems<br>***Speaker: James Inge***<br>**MOD - DE&S** |
| 13:55 | The application of physics-based 3D modelling software in ship design and maneuverability trials<br>***Speaker: Dr Talal Alhajeri.***<br>**Mekhtaf Design and Engineering** | 'Alternative Fuels' or 'Koolaid'?: Maintaining focus and perspective when considering options for future naval fuels<br>***Speaker: John Polgaze***<br>**PGM Environment** | UK's Intelligent ship project phase 3 – Focusing on the human in HAT<br>***Speaker: Andy Tate***<br>**Dstl** | Rationalising safety cases for naval systems<br>***Speakers: Daneil Gardner, Charles Brooking, James Inge***<br>**Defence Equipment & Support** |
| 14:20 | Comparative analysis of AI-Based optimisation techniques for a conceptual frigate hull form design<br>***Speakers: Nicola Paterson, Fernando Gamboa***<br>**BAE Systems** | Charting a greener course: A review of mature technologies for lowering vessel GHG emission<br>***Speaker: Tom Klakeel,***<br>**Royal Australian Navy &, Australian Maritime College** | RESILIENT: Advance a ship's HM&E resiliency through contextual information models and innovative ML/AI analytics At-The-Edge<br>***Speakers: Capt. Johnny Walker & Warren Johnson***<br>**Rockwell Automation, &Thor Solutions** | Maritime autonomy and safety at sea<br>***Speakers: Dr Eshan Rajabally, Matt Wylie***<br>**BMT** |
| 14:45 | Session Discussions | | | |
| 15:00 | ***Coffee Break*** | | | |
| **15:30** | **Vessel design** | **Data exploitation** | **Full electrical architecture** | **Networking & Architecture** |
| **Room** | **Spaces One and Two** | **Spaces Four** | **Spaces Five** | **Spaces Eight** |
| **Chair** | **Rob Skarda, Stellar Systems** | **Dr Commodore Rakesh K Rana** | **Pete Deverill, Rolls Royce** | **Julian Lowe, L3Harris** |
| 15:30 | Should royal navy ships designed for optional crewing only enable humans to survive, or also enable them to thrive?<br>**Royal Navy** | Optimizing fuel management for Halifax class frigates: leveraging sensor data for enhanced efficiency<br>**L3Harris** | Designing Fit-to-Receive DC power systems for alternate energy sources and future loads<br>***Speaker: Jørgen Hagset Stavnesli***<br>**ABB** | Supplementing experience-based platform system reliability requirements to network theory |
| 15:55 | Margins – their use as metrics and Key Performance Indicators | Necessity is the Digital Mother of Invention | Conceptual design and verification of the power, propulsion, and energy | |

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| | when Designing and building warships<br>***Speaker: Simon Fleisher***<br>**Gibbs and Cox Australia** | ***Speaker: Lt Cdr. Liam Talbot***<br>**Royal Navy** | system for a future surface combatant<br>***Speaker Udai Shipurkar***<br>**MARIN** | ***Delft University of Technology***<br>A triple-network-layer method for designing high resilience system architectures ***Speaker: Giota Paparistodimou***<br>**BAE Systems**<br>Designing in reconfigurability and adaptability to deliver lean and mean naval combatants<br>***Speaker: Harry Schweidler***<br>**Babcock International Group** |
| 16:20 | Advancing unmanned surface vessel design: a circular economy response to global conflict evolution<br>**SubSea Craft** | Ensuring Maritime Cyber resilience.<br>***Speaker: Srinivas Revuru,***<br>**Indian Register of Shipping** | From cruise ships to combat - Evaluating power and propulsion technologies for a lean warship<br>***Speaker: Edward Penn***<br>**Rolls-Royce** | |
| 16:45 | Session Discussions | | | |
| 19:00 | **Event Social, Hilton Hotel, Liverpool**<br>**3 Thomas Steers Way, Liverpool L1 8LW City Centre** | | | |
| | **Thursday 7th November** | | | |
| 08:00 | Registration and Coffee | | | |
| **09:00** | **Autonomous navigation** | **Power systems** | **Machine Learning and AI** | **Autonomous power and propulsion** |
| **Room** | **Spaces One and Two** | **Spaces Four** | **Spaces Five** | **Spaces Eight** |
| **Chair** | **Dr Andrea Coraddu, TU Delft** | **Oliver Simmonds, BAE** | **Dr Krishna Nagalingam, Kongsberg Maritime** | **Dr Michele Martelli, University of Genova** |
| 09:00 | "Development of a Low Cost Unmanned Surface Vessel for Autonomous Navigation in Shallow Water<br>***Speaker: Dr. Yogang Singh***<br>**Sheffield Hallam University**"" | Shocking permanent magnet motors for naval applications<br>***Speakers: WO2 Peter Hart, Ben Mound***<br>**GE Power Conversion** | Real-time critical marine infrastructure multi-sensor surveillance via a constrained stochastic coverage algorithm<br>***Speakers: Nicola Sabatino, Filippo Ponzini***<br>***University of Genoa*** | Autonomous machinery control systems for naval unmanned surface vessels<br>***United States Navy*** |

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| 09:25 | Towards Design of an Autonomous Navigation Framework for Unmanned Surface Vessels using Marine Robotics Unity Simulator.<br>***Speaker: Dr. Yogang Singh***<br>**Sheffield Hallam University"** | Enhancing U.S. Naval Power through Energy Supportability and Demand Reduction.<br>***Speaker: Emily Pence,***<br>**US Navy** | Energy-efficient speed planning considering dynamic environmental conditions for inland vessels<br>***Speaker: Lr. Simeon Slagter***<br>**Delft University of Technology** | A modular and autonomous propulsion system for unmanned marine vehicles<br>***Speaker: Dr Angelo Odetti,***<br>**CNR-INM** |
| 09:50 | Neuro Adaptive Integral Sliding mode Control based on Composite Learning for Path Following of Underactuated Underwater Vehicle : Blucy.<br>**University of Bologna** | Hybrid turbocharging for alternatively fueled internal combustion engines in naval applications.<br>***Speaker: Jasper Volbrandt,***<br>**TU Delft** | Improving the internal battle in a navy ship by adding situation awareness by means of using a 3D geospatial model combined with a linked data model of this ship. Design phase.<br>***Delft University of Technology & Material and IT Command Netherlands*** | State-of-the-art full-scale simulator for ship hybrid power system in a shuttle tanker<br>***Speaker: Pramod Ghimire,***<br>**Kongsberg Digital** |
| 10:15 | Session Discussions | | | Automatic maneuvering of vessels with power-optimized thrust allocation<br>***Speaker: Dr. Agnes Schubert***<br>**University of Rostock, Institute of Automation, Germany** |
| 10:30 | **Coffee Break** | | | |
| 11:00 | **Emissions Part 1** | **Safety and autonomy** | **Electrical Power Systems** | **NNCC Workshop 1100-1500** |
| Room | **Spaces One and Two** | **Spaces Four** | **Spaces Five** | **Spaces Six and Seven** |
| Chair | **Lt Cdr Rob Manson, Royal Navy** | **RAdm Klass Visser, TU Delft** | **Prof. Mehdi Zadeh, NTNU** | **Cdr (E) dr. ir. Rinze Geerstma, Netherlands Defence Academy** |
| 11:00 | Experimental and modelling studies on HVO-methanol mixtures separation for superyachts applications.<br>***Speaker: Lr. Ernesto La Colla***<br>**Feadship & Delft University of Technology** | Test and assurance of radical new ship designs.<br>***Speaker: Matt Hood***<br>**Nova Systems** | Power management system load power regulation for zonal secondary DC-grids survivability: A load priority-based approach<br>***Speaker: Bart Wingelaar***<br>**Royal IHC** | *Northern Naval Capabilities Cooperation Workshop – **Invitation only*** |
| 11:25 | Naval sector and decarbonisation using industry 4.0.<br>***Speaker: Dr Commodore R K Rakesh*** | Rationalising safety cases for naval systems.<br>***Speakers: Daniel Gardner, Charles Brooking & James Inge*** | Investigation on shipboard power quality on Cruise ships under high penetration of power converters<br>***Speaker: Federico Graffione*** | |

| | Centre for joint Warfare Studies | Defence Equipment & Support | University of Genoa & Carnival | |
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| 11:50 | Through life carbon emissions and mitigation opportunities.<br>***Speakers Dr. Thomas Beard, Rowan Wilkinson***<br>**BMT** | Maritime Autonomy and Safety at Sea.<br>***Speakers: Dr. Eshan Rajabally, Matt Wylie,***<br>**BMT** | Frequency control and stability of a ship electric power system emulator<br>***Speakers: John Prousalidis, Dr Georgios Tsourakis***<br>**NTUA, School of Electrical & Computer Engineering,** | |
| 12:15 | Session discussions | | | |
| 12:30 | **Lunch** | | | |
| 13:15 | A Lean, Mean, Atomic Queen? - The ultimate mission module<br>Nicholas Smith, *Executive*: *Global Systems Product and Technology Leader*, **GE Power Conversion** | | | |
| 13:40 | Autonomous Machinery Control Systems for Naval Unmanned Surface Vessels.<br>Michael Roa, **Naval Sea Systems Command (NAVSEA), US Navy** | | | |
| 14:05 | Discussion | | | |
| 14:20 | Closing Keynote: VAdm Paul Marshall, **DE&S Royal Navy** | | | |
| 14:40 | Presentation of the Sir Donald Gosling Award | | | |
| 14:50 | Close of Conference | | | |