INSTITUTE OF MARINE Engineering, Science & Technology

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: Vice Admiral Martin Connell CBE, **Second Sea Lord 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 ***Speakers: Cdr Stephen Taylor, Lt Cdr Mathew Fuge*** **Royal Navy**	Improving energy efficiency of HVAC systems on navy ships ***Speaker: Younus Abbas*** **Babcock International**	A structured simulation framework to validate marine collision avoidance algorithms ***Speaker: Dr Raphael Zaccone,*** **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 **Delft University of Technology & Material and IT Command Netherlands**

12:25	Widening the net of the future air dominance system ***Speaker: Alex Pardoe*** **Steller Systems Ltd**	Supplementing experience-based platform system robustness requirements to network theory ***Speaker: Evelien Scheffers.*** **Delft University of Technology**	Continuous integration for the development of a COLREG-compliant decision support system ***Speakers: Quentin Ageneau, Guillaume Nulac*** **Sirehna**	Enhancing internal battle operations through the battle damage repair tool ***Speaker: Lesley van Zijl*** **RH Marine, TNO & M&IT Command, Netherlands**
12:50	Physical resistance components of a hydrofoil as a function of submergence ***Speaker: Lev Chernyshev*** **University of Canterbury & Emirates Team New Zealand**	Designing in reconfigurability and adaptability to deliver lean and mean naval combatants***. Speaker: Harry Schweidler*** **Babcock International Group**	Comprehensive approaches to enhance maritime wireless networks: A survey ***Speaker: Dr Jas Powell,*** **Global Maritime Services**	RESILIENT: Advance a ship's HM&E resiliency through contextual information models and innovative ML/AI analytics At-The-Edge ***Speakers: Capt. Johnny Walker & Warren Johnson*** **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 ***Speaker: Lt James Ellis,*** **Royal Navy**	Truth behind green alternatives for future ship design ***Speaker: Jade Sheasby*** **BMT**	Enhancing Predictive Maintenance in the Maritime Industry with Unsupervised Learning**.** ***Speakers: Alessandro Caviglia, Dr Nicolo Faggioni.*** **Fincantieri NexTech & Argo IT**	Validation of power system control methodologies using a microgrid testbed employing low and medium voltage (MV) AC and DC sources ***Speaker: Dr. David Wetz,*** **UT Arlington**
14:55	Addressing the modern need for electrical skills in the maritime sector. ***Speaker: John Prousalidis*** **NTU Athens, University of Strathclyde, & Hellenic Electricity Distribution Network Operator**	A suggested energy efficiency index for warships ***Speaker: John Buckingham*** **BMT**	Digital twin simulation model of hull-propeller-engine interactions for ship condition monitoring in irregular sea navigation. ***Speaker: Dr Maria Acanfora*** **University of Naples "Federico II"**	Investigation on shipboard power quality on Cruise ships under high penetration of power converters. ***Speaker: Federico Graffione***, **University of Genoa & Carnival** Frequency control and stability of a ship electric power system emulator.

15:20	Autonomy is the answer, but what was the question? ***Speaker: W02 Peter Spayne*** **Cranfield University / Royal Navy**	Optimization of propulsion layout & energy management system for future marine powertrains using co-design ***Speakers: Dr. Nikolaos Sakellaridis, Gert-Jan Meijn,*** **Damen Naval**	Automatic Maneuvering of Vessels with Power-Optimized Thrust Allocation. ***Speaker: Dr Agnes Schubert,*** **University of Rostock, Institute of Automation, Germany**	***Speakers: John Prousalidis, Georgios Tsourakis*** **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**		**Dr David Wetz** **University of Texas**	**Capt. David Goldsmith** **Royal Navy**
16:30	Charting the Course: Navigating the Royal Navy's autonomous challenge with synthetic assurance ***Speaker: Reece Oliver,*** **NavyX, Royal Navy**	Dual Fuel Technology: A route to reduce emissions. ***Speakers: Dr Thomas Beard, Rhod Griffiths*** **BMT**	Energy profiling and planning and multi-objective optimization algorithms comparison performance ***Speaker: Despoina Mitropoulou*** **RH Marine**	Autonomy is the answer, but what was the question? ***Speaker: W02 Peter Spayne.*** **Cranfield University / Royal Navy** Is Regulation really the barrier? Exploring the opportunities and challenges in certifying maritime systems with increased automation and autonomy ***Speaker: Adrian Payne,*** **Safeguard Engineering Limited** Test and assurance of radical new ship designs ***Speaker: Matt Hood,*** **Nova Systems** Ensuring maritime cyber resilience ***Speaker: R. Srinivas*** **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 **Royal Australian Navy**	Solid hydrogen carriers as an alternative fuel and impact damper ***Speaker: Erin van Rheenen*** **Delft University of Technology**	Battery energy storage system sizing strategy for naval vessels through multi-objective optimization ***Speaker: Daniele Belvisi,*** **University of Genoa**	
17:20	Certifying for operate safely – Building trust in Naval USVs ***Speakers: Chris Baker, William Balfour*** **MOD**	Application of quantum technology for generation of green solar hydrogen from sea water for naval applications **Banaras Hindu University**	Selecting the Energy Storage Technology for Surface Combatants with DC Power Distribution ***Speaker: Lars Appelstroem*** **ABB**	
17:45	Session discussions			
18:00	**Welcome Reception**			

	Wednesday 6th November			
08:00	Registration and coffee			
09:00	Plenary – Industry collaboration 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**	**Prof. Mehdi Zadeh NTNU**	**Tamsin Dawe Babcock**	**Toby Drywood BMT**
11:00	Dynamic power behaviour of a nuclear power plant integrated in naval vessels ***Speakers: Gert-Jan Meijn, Tom Wien*** **Damen Naval**	Challenges for adapting logistics drone for naval operations. **BonV Aero**	A future green navy – sustainable support to the Royal Navy ***Speakers: Elliot Tucker, Jim Goodship*** **Ministry of Defence**	**Towards modularity and adaptability: Do uncrewed ships hold the key to enhanced versatility?** Speakers: Jake Rigby, Will Alexander, Andy Kimber, Eshan Rajabally
11:25	Molten salt reactors: Current technology status and the challenges for maritime applications ***Speaker: Matthew Dunn*** **Occam Group Ltd**	DC secondary distribution grids on future naval ships: a comparison with conventional AC distribution systems and their safety aspects ***Speakers: Despoina Mitropoulou, Dr Djurre Wikkerink*** **Power Systems & RH Marine**	Towards a data-driven naval maintenance organisation: the importance of a social roadmap ***Speakers: Dr Wieger Tiddens, Lt. Sophie Zeldam*** **Royal Netherlands Navy**	
11:50	Mobile marine fuel generation based on a micro nuclear reactor ***Speaker: Dr Rachel Pawling*** ***UCL***	Validation of power system control methodologies using a microgrid testbed employing low and medium voltage (MV) AC and DC sources ***Speaker: Dr. David Wetz,*** **UT Arlington, Clarkson University, Florida State University & NSWC - Philadelphia**	Safety critical items in naval systems ***Speaker: Daniel Gardner*** **MOD - DE&S**	
12:15	Session Discussions			
12:30	**Lunch**			

13:30	**Hull Design**	**Alternative Fuels**	**Resilient Human Machine interaction**	**Safety & Autonomy**
Room	***Spaces One and Two***	***Spaces Four***	***Spaces Five***	***Spaces Eight***
Chair	**Michel Janssen Netherlands Defence Materiel Organisation**	**Lt Cdr Henry Prior Royal Navy**	**Jeff Cohen Naval Surface Warfare Center**	**Mel Scot QinetiQ**
13:30	Design for adaptation – Ships and the systems of the future ***Speaker: Paolo Orefice,*** **Royal Australian Navy**	Application of commercial advances to support the naval energy transition ***Speaker: William Ayliffe,*** **BMT**	Enhancing internal battle operations through the battle damage repair tool **RH Marine & Material and IT Command Netherlands**	Safety critical items in naval systems ***Speaker: James Inge*** **MOD - DE&S**
13:55	The application of physics-based 3D modelling software in ship design and maneuverability trials ***Speaker: Dr Talal Alhajeri.*** **Mekhtaf Design and Engineering**	'Alternative Fuels' or 'Koolaid'?: Maintaining focus and perspective when considering options for future naval fuels ***Speaker: John Polgaze*** **PGM Environment**	UK's Intelligent ship project phase 3 – Focusing on the human in HAT ***Speaker: Andy Tate*** **Dstl**	Rationalising safety cases for naval systems ***Speaker:James Inge*** **Defence Equipment & Support**
14:20	Comparative analysis of AI-Based optimisation techniques for a conceptual frigate hull form design ***Speakers: Nicola Paterson, Fernando Gamboa*** **BAE Systems**	Charting a greener course: A review of mature technologies for lowering vessel GHG emission ***Speaker: Tom Klakeel,*** **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 ***Speakers: Capt. Johnny Walker & Warren Johnson*** **Rockwell Automation, &Thor Solutions**	Maritime autonomy and safety at sea ***Speakers: Dr Eshan Rajabally, Matt Wylie*** **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? **Royal Navy**	Optimizing fuel management for Halifax class frigates: leveraging sensor data for enhanced efficiency **L3Harris**	Designing Fit-to-Receive DC power systems for alternate energy sources and future loads ***Speaker: Jørgen Hagset Stavnesli*** **ABB**	Supplementing experience-based platform system reliability requirements to network theory ***Delft University of Technology***
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	

	when Designing and building warships ***Speaker: Simon Fleisher*** **Gibbs and Cox Australia**	***Speaker: Lt Cdr. Liam Talbot*** **Royal Navy**	system for a future surface combatant ***Speaker Udai Shipurkar*** **MARIN**	A triple-network-layer method for designing high resilience system architectures ***Speaker: Giota Paparistodimou*** **BAE Systems** Designing in reconfigurability and adaptability to deliver lean and mean naval combatants ***Speaker: Harry Schweidler*** **Babcock International Group**
16:20	Advancing unmanned surface vessel design: a circular economy response to global conflict evolution **SubSea Craft**	Ensuring Maritime Cyber resilience. ***Speaker: R. Srinivas*** **Indian Register of Shipping**	From cruise ships to combat - Evaluating power and propulsion technologies for a lean warship ***Speaker: Edward Penn*** **Rolls-Royce**	
16:45	Session Discussions			
19:00	**Event Social, Hilton Hotel, Liverpool** **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 ***Speaker: Dr. Yogang Singh*** **Sheffield Hallam University**""	Shocking permanent magnet motors for naval applications ***Speakers: WO2 Peter Hart, Ben Mound*** **GE Power Conversion**	Real-time critical marine infrastructure multi-sensor surveillance via a constrained stochastic coverage algorithm ***Speakers: Nicola Sabatino, Filippo Ponzini*** ***University of Genoa***	Autonomous machinery control systems for naval unmanned surface vessels ***United States Navy*** A modular and autonomous propulsion system for unmanned marine vehicles ***Speaker: Dr Angelo Odetti,*** **CNR-INM**
09:25	Towards Design of an Autonomous Navigation Framework for Unmanned Surface Vessels using Marine Robotics Unity Simulator. ***Speaker: Dr. Yogang Singh*** **Sheffield Hallam University"**	Enhancing U.S. Naval Power through Energy Supportability and Demand Reduction. ***Speaker: Emily Pence,*** **US Navy**	Energy-efficient speed planning considering dynamic environmental conditions for inland vessels ***Speaker: Ir. Simeon Slagter*** **Delft University of Technology**	

09:50	Neuro Adaptive Integral Sliding mode Control based on Composite Learning for Path Following of Underactuated Underwater Vehicle : Blucy. **University of Bologna**	Hybrid turbocharging for alternatively fueled internal combustion engines in naval applications. ***Speaker: Jasper Vollbrandt,*** **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. ***Speaker: Robert Voute*** ***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 ***Speaker: Pramod Ghimire,*** **Kongsberg Digital** Automatic maneuvering of vessels with power-optimized thrust allocation ***Speaker: Dr. Agnes Schubert*** **University of Rostock, Institute of Automation, Germany**
10:15	Session Discussions			
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. ***Speaker: Ir. Ernesto La Colla*** **Feadship & Delft University of Technology**	Test and assurance of radical new ship designs. ***Speaker: Matt Hood*** **Nova Systems**	Power management system load power regulation for zonal secondary DC-grids survivability: A load priority-based approach ***Speaker: Bart Wingelaar*** **Royal IHC**	*Northern Naval Capabilities Cooperation Workshop – **Invitation only***
11:25	Naval sector and decarbonisation using industry 4.0. ***Speaker: Dr Commodore R K Rakesh*** **Centre for joint Warfare Studies**	Rationalising safety cases for naval systems. ***Speaker: James Inge*** **Defence Equipment & Support**	Investigation on shipboard power quality on Cruise ships under high penetration of power converters ***Speaker: Federico Graffione*** **University of Genoa & Carnival**	
11:50	Through life carbon emissions and mitigation opportunities. ***Speakers Dr. Thomas Beard, Rowan Wilkinson*** **BMT**	Maritime Autonomy and Safety at Sea. ***Speakers: Dr. Eshan Rajabally, Matt Wylie,*** **BMT**	Frequency control and stability of a ship electric power system emulator ***Speakers: John Prousalidis, Dr Georgios Tsourakis*** **NTUA, School of Electrical & Computer Engineering,**	

12:15	Session discussions
12:30	**Lunch**
13:15	A Lean, Mean, Atomic Queen? - The ultimate mission module ***Nicholas Smith, Executive: Global Systems Product and Technology Leader,* GE Power Conversion**
13:40	Autonomous Machinery Control Systems for Naval Unmanned Surface Vessels. ***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 Presentation of the Patrons award
14:50	Close of Conference