AGENDA

inec 2024 / **iSCSS** 2024

Tuesday 5th November

Time	Event
09:00	**Registration & breakfast**
09:45	**Introduction from the Chairs, RAdm JJ Bailey,** *Royal Navy* and **Capt Rinze Geertsma**
10:00	**Keynote: Vice Admiral Martin Connell CBE,** *Second Sea Lord*
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
SESSION	**SHIP DESIGN AND INTEGRATION**	**AUXILIARY EQUIPMENT**	**EU SAFE NAVIGATION SPECIAL SESSION**	**HUMAN MACHINE INTEGRATION**
Room	*Spaces One and Two*	*Spaces Four and Five*	*Spaces Eight and Nine*	*Spaces Six*
Chair	**Toby Drywood,** *BMT*	**Lt Scott Chapman,** *Royal Navy*	**Prof. Massimo Figari,** *University of Genova*	**Tamsin 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 Michele Martelli** *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** Speakers: **Robert Voute, Bart-Peter Smit** *Delft University of Technology, CGI Netherlands*
12:25	**AI in ship design** Speaker: **Jake Rigby Pardoe** *BMT*	**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 Zjil** *RH Marine*
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** Speakers: **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**			
SESSION	**PEOPLE**	**EDDI & GREEN FUELS**	**DATA DRIVEN AND MODEL BASED OPTIMISATION**	**POWER SYSTEMS**
Room	*Spaces One and Two*	*Spaces Four and Five*	*Spaces Eight and Nine*	*Spaces Six*
Chair	**Capt Sean Feenan** *Royal Australian Navy*	**Capt. Neil 'Scotty' McCallum** *Royal Navy*	**Dr Andrea Coraddu** *TU Delft*	**Capt (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*

AGENDA

Tuesday 5th November *Continued*

SESSION *Continued*	PEOPLE	EDDI & GREEN FUELS	DATA DRIVEN AND MODEL BASED OPTIMISATION	POWER SYSTEMS
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*	**A modular and autonomous propulsion system for unmanned marine vehicles** Speaker: **Dr Angelo Odetti** *CNR-INM*	**Investigation on shipboard power quality on Cruise ships under high penetration of power converters.** Speaker: **Federico Graffione** *University of Genoa & Carnival*
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*	**Frequency control and stability of a ship electric power system emulator** Speakers: **John Prousalidis, Georgios Tsourakis** *NTUA, School of Electrical & Computer Engineering*
15:45	Session discussions			
16:00	Coffee Break			

SESSION	REGULATIONS & AUTONOMY	HYDROGEN FUELS	ENERGY STORAGE/DC ARCHITECTURE	SAFETY ASSURANCE AND AUTONOMY
Room	*Spaces One and Two*	*Spaces Four & Five*	*Spaces Eight and Nine*	*Spaces Six*
Chair	**Cdr Amy Glover** *Royal Navy*	**Oliver Simmonds** *BAE*	**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** *Ministry of Defence*	**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*
16:55	**Analysis of the current regulatory landscape for autonomous and remotely operated vessels in development and use by the Australian Defence maritime enterprise** Speaker: **Dr Rachel Horne** *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, Luca Maloberti** *University of Genoa*	**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*
17:20	**Certifying for operate safely – Building trust in Naval USVs** Speakers: **Chris Baker, William Balfour** *Ministry of Defence*	**Naval sector and decarbonisation using Industry 4.0** Speakers: **Commodore (Dr) R K Rana,** *Indian Navy Veteran*	**Selecting the energy storage technology for surface combatants with DC power distribution** Speaker: **Lars Appelstroem** *ABB*	**Test and assurance of radical new ship designs** Speaker: **Matt Hood** *Nova Systems* **Ensuring maritime cyber resilience** Speaker: **R. Srinivas** *Indian Register of Shipping*
17:45	Session discussions			
18:00	Welcome Reception			

AGENDA

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	Wednesday 6th November
08:00	**Registration and coffee**
09:00	PLENARY – INDUSTRY COLLABORATION Opening remarks – Conference chairs: **RAdm JJ Bailey,** *Royal Navy* and **Capt (E) dr.ir. Rinze Geertsma,** *Netherlands Defence Academy*
09:15	Keynote: **Marnix Krikke,** *Deputy Director, International Military Maritime Cooperation, Netherlands, MoD*
09:35	Keynote: **Marco Coli,** *Department Product Leader of Unmanned Command and Control System Fincantieri*
09:55	Keynote: **Sarah Kenny, OBE,** *Chief Executive, BMT*
10:15	Discussion
10:30	**Coffee Break**

	Standard 25 minute presentations			Simultaneous Interactive sessions
SESSION	**DATA EXPLORATION NUCLEAR**	**EFFICIENCY & ELECTRICAL DC**	**DATA EXPLOITATION**	**WORKSHOP**
Room	*Spaces One and Two*	*Spaces Four and Five*	*Spaces Eight and Nine*	*Spaces Seven*
Chair	**Prof. Alistair Greig** *UCL*	**Prof. Mehdi Zadeh** *NTNU*	**Commodore (Dr) R K Rana**	**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*	**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"*	**Optimizing fuel management for Halifax class frigates: leveraging sensor data for enhanced efficiency** Speaker: **Dr. Reza Shafie-Pour** *L3Harris*	**Towards modularity and adaptability: Do uncrewed ships hold the key to enhanced versatility?** Speakers: **Jake Rigby, Will Alexander, Andy Kimber, Dr 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*	**Necessity is the digital mother of invention** Speaker: **Lt Cdr. Liam Talbot** *Royal Navy*	
11:50	**Mobile marine fuel generation based on a micro nuclear reactor** Speakers: **Dr Rachel Pawling, Neil Kapoor** *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*	**Ensuring maritime cyber resilience** Speakers: **R. Srinivas** *Indian Register of Shipping*	
12:15	Session discussions			
12:30	**Lunch**			
SESSION	**HULL DESIGN**	**ALTERNATIVE FUELS**	**RESILIENT HUMAN MACHINE INTERACTION**	**SAFETY & AUTONOMY**
Room	*Spaces One and Two*	*Spaces Four and Five*	*Spaces Eight and Nine*	*Spaces Six*
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*	**Charting a greener course: A review of mature technologies for lowering vessel GHG emission** Speaker: **Tom Klakeel** *Royal Australian Navy &, Australian Maritime College*	**Enhancing internal battle operations through the battle damage repair tool** Speakers: **Lt CDR (E) Youri Linden, Lesley van Zijl,** *Royal Netherlands Navy, RH Marine*	**Safety critical items in naval systems** Speakers: **Daniel Gardner & Charles Brooking** *MOD - DE&S*

AGENDA

Wednesday 6th November *Continued*

SESSION *Continued*	HULL DESIGN	ALTERNATIVE FUELS	RESILIENT HUMAN MACHINE INTERACTION	SAFETY & AUTONOMY
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*	Application of commercial advances to support the naval energy transition Speaker: **William Ayliffe** *BMT*	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			

SESSION	VESSEL DESIGN	MAINTENANCE	FULL ELECTRICAL ARCHITECTURE	NETWORKING & ARCHITECTURE
Room	*Spaces One and Two*	*Spaces Four and Five*	*Spaces Eight and Nine*	*Spaces Six*
Chair	**Toby Drywood** *BMT*	**Tamsin Dawe** *Babcock*	**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? Speaker: **Alexandra Ward** *Royal Navy*	A future green navy – sustainable support to the Royal Navy Speakers: **Elliot Tucker, Jim Goodship** *Ministry of Defence*	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 Speaker: **Evelien Scheffers** *Delft University of Technology*
15:55	Margins – their use as metrics and Key Performance Indicators when Designing and building warships Speaker: **Simon Fleisher** *Gibbs and Cox Australia*	Towards a data-driven naval maintenance organisation: the importance of a social roadmap Speakers: **Dr Wieger Tiddens, Lt. Sophie Zeldam** *Royal Netherlands Navy*	Conceptual design and verification of the power, propulsion, and energy system for a future surface combatant Speakers: **Moritz Kirjgsman, Udai Shipurkar** *MARIN*	A triple-network-layer method for designing high resilience system architectures Speakers: **Dr Giota Paparistodimou, Dr Philip Knight** *BAE Systems & University of Strathclyde*
16:20	Advancing unmanned surface vessel design: a circular economy response to global conflict evolution Speaker: **Henrique Faria** *SubSea Craft*	Safety critical items in naval systems Speakers: **Daniel Gardner & Charles Brooking** *MOD - DE&S*	From cruise ships to combat - Evaluating power and propulsion technologies for a lean warship Speaker: **Edward Penn** *Rolls-Royce*	Designing in reconfigurability and adaptability to deliver lean and mean naval combatants Speaker: **Harry Schweidler** *Babcock International Group*
16:45	Session discussions			
19:00	**Event Social** *Hilton Hotel, Liverpool* *3 Thomas Steers Way, Liverpool L1 8LW City Centre*			

AGENDA

Thursday 7th November

08:00	Registration and coffee			
	Standard 25 minute presentations			**Simultaneous Interactive sessions**
SESSION	**AUTONOMOUS NAVIGATION**	**POWER SYSTEMS**	**MACHINE LEARNING AND AI**	**AUTONOMOUS POWER AND PROPULSION**
Room	*Spaces One and Two*	*Spaces Four and Five*	*Spaces Eight and Nine*	*Spaces Six*
Chair	**Dr Angelo Odetti** *CNR-INM*	**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** Speakers: **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** Speaker: **Michael Roa** *NAVSEA*
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** Speakers: **Emily Pence, Henry Jones** *US Navy*	**Energy-efficient speed planning considering dynamic environmental conditions for inland vessels** Speaker: **Ir. Simeon Slagter** *Delft University of Technology*	**A modular and autonomous propulsion system for unmanned marine vehicles** Speaker: **Dr Angelo Odetti** *CNR-INM*
09:50	**Neuro adaptive integral sliding mode control based on composite learning for path following of underactuated underwater vehicle: Blucy** Speaker: **Siva Kumar Mallipeddi** *University of Bologna*	**Hybrid turbocharging for alternatively fueled internal combustion engines in naval applications** Speaker: **Ir 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: **Lt CDR (E) Youri Linden** *Royal Netherlands Navy*	**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			
SESSION	**EMISSIONS PART 1**	**SAFETY AND AUTONOMY**	**ELECTRICAL POWER SYSTEMS**	**NNCC WORKSHOP 11:00-15:00**
Room	*Spaces One and Two*	*Spaces Four & Five*	*Spaces Eight & Nine*	*Spaces Seven*
Chair	**Lt Cdr Rob Manson** *Royal Navy*	**RAdm Klass Visser** *TU Delft*	**Prof. Mehdi Zadeh** *NTNU*	**Capt (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*

AGENDA

SESSION *Continued*	EMISSIONS PART 1	SAFETY AND AUTONOMY	ELECTRICAL POWER SYSTEMS	NNCC WORKSHOP 11:00-15:00
11:25	Hydrogen carriers for zero-emission ship propulsion using PEM fuel cells: an evaluation Speaker: *Erin van Rheenen, TU Delft*	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*	*Northern Naval Capabilities Cooperation Workshop* *Invitation only*
11:50	Through life carbon emissions and mitigation opportunities Speaker: **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			