inec 2024 iSCSS 2024
5 – 7 November 2024 / SPACES AT THE SPINE, LIVERPOOL, UK

	Monday 4th November
14:00 – 16:00	Industrial visit to Cammell Laird shipyard

	Tuesday 5th November
09:00	Registration
10:00	Introduction from the Chairs
10:15	Keynote
10:35	**Keynote:** Rear Admiral Rachel Durbin, *Head of Navy Engineering* **Royal Australian Navy**
10:55	Keynote
11:15	Discussion
11:30	*Coffee Break*

Standard 25 minute presentations				Simultaneous Interactive sessions
12:00	**Ship design and integration**	**Equipment specifics**	**EU safe navigation special session**	**Human machine Integration**
12:00	T26 Global Combat Ship – More than just a submarine hunter	Replacement of CuNi pipework with GRE pipework for SW systems	A structured simulation framework to validate marine collision avoidance algorithms	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
12:25	TYPE 23 RAPID CAPABILITY INSERTION OF FTUAS & NSM	Improving Energy Efficiency of HVAC Systems on Navy Ships	Continuous integration for the development of a COLREG-compliant decision support system	Enhancing Internal Battle Operations Through the Battle Damage Repair Tool
12:50	Widening the net of the Future Air Dominance System	Ships waste to energy: A feasibility study	Comprehensive Approaches to Enhance Maritime Wireless Networks: From Routing Protocols to Delay Tolerant Networking	UK's Intelligent Ship project phase 3 – Focusing on the Human in HAT / RESILIENT: Advance a Ship's HM&E resiliency through contextual information
13:15	Session discussions			
13:30	*Lunch*			

	EDDI &Green fuels	People	Autonomous navigation Part II	Power systems
				models and innovative ML/AI analytics At-The-Edge
14:30	**EDDI &Green fuels**	**People**	**Autonomous navigation Part II**	**Power systems**
14:30	Truth behind Green Alternatives for Future Ship Design	A revised Operating Model for the Marine Engineering General Service to improve the lived experience of Surface Fleet Marine Engineers.	Neural Network based Control of Unmanned Underwater Vehicle: Blucy	Electrical Specifications and Requirements for Marine battery integration
14:55	A Suggested Energy Efficiency Index for Warships	Navigating the Prospects of Seafaring and Maritime Professions	Development of a Low Cost Unmanned Surface Vessel for Autonomous Navigation in Shallow Water	Hierarchical reconfiguration of MVDC naval shipboard power systems using deep reinforcement learning
15:20	Optimization of Propulsion Layout & Energy Management System for Future Marine Powertrains using Co-Design	Addressing the modern need for electrical skills in the maritime sector	Towards Design of an Autonomous Navigation Framework for Unmanned Surface Vessels using Marine Robotics Unity Simulator	Validation of Power System Control Methodologies using a Microgrid Testbed Employing Low and Medium Voltage (MV) AC and DC Sources
15:45	Session discussions			Why are there differences in class and DefStan rules depending on who's rules you use?
16:00	_Coffee Break_			
16:30	**Regulations & autonomy**	**Hydrogen Fuels**	**Energy Storage/DC architecture**	**Safety assurance and autonomy**
16:30	Charting the Course: Navigating the Royal Navy's Autonomous Challenge with Synthetic assurance.	Application of Quantum Technology for Generation of Green Solar Hydrogen from Sea Water for Naval Applications	Energy profiling and planning and multi-objective optimization algorithms comparison performance	Autonomy is the answer, but what was the question?
16:55	Analysis of the application of existing seaworthiness requirements to autonomous and remotely operated vessels used by the Australian Defence maritime regulated community	Liquid organic hydrogen carrier and hydrogen internal combustion engine ship system integration	Battery Energy Storage System Sizing Strategy for Naval Vessels through Multi-Objective Optimization	Is Regulation really the barrier? Exploring the Opportunities and Challenges in Certifying Maritime Systems with Increased Automation and Autonomy.

17:20	Certifying for Operate Safely - Building Trust in Naval USVs	Solid hydrogen carriers as an Alternative Fuel and Impact Damper	Optimising and Managing a Mean Value First Principle Model for Hybrid DC Power Supply on Naval Vessels	Test and assurance of radical new ship designs
17:45	Session discussions			Ensuring Maritime Cyber resilience
18:00	**Welcome Reception**			
	Wednesday 6th November			
08:00	Registration and coffee			
09:00	Plenary – Industry collaboration			
09:15	CDRE (E) Flos *Program Director* **International Maritime Materiel Collaboration**			
09:35	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	**Vessel Design**	**Nuclear**	**Efficiency & Electrical DC**	**Maintenance I**	**Workshop**
11:00	Margins – their use as Key Performance Indicators when Designing and Building Warships	Dynamic Power Behavior of a Nuclear Power Plant integrated in Naval Vessels	Enhancing U.S. Naval Power through Energy Supportability and Demand Reduction	Reducing the cost of maintenance with through life supportability analysis	
11:25	Should Royal Navy Ships Designed for Optional Crewing Only Enable Humans to Survive, or Also Enable Them to Thrive?	Molten Salt Reactors: Current Technology Status and the Challenges for Maritime Applications	Fuel Saving Benefits from DC Power System Architectures	Enhancing remote inspection in ship machinery spaces with telexistence capability	BMT workshop
11:50	Enhancing Unmanned Surface Vessel Design in Response to Evolving Global Conflicts: A Circular Economy Approach	Mobile Marine Fuel Generation Based on a Micro Nuclear Reactor	DC secondary distribution grids on future naval ships: a comparison with conventional AC distribution systems and their safety aspects	A Future Green Navy – Sustainable Support to the Royal Navy	
12:15	Session Discussions				

12:30	Lunch			
13:30	**Hull Design**	**Alternative Fuels**	**Cyber**	**Safety & Autonomy**
13:30	Design for Adaptation - Ships and the Systems of the Future	Application of Commercial Advances to Support the Naval Energy Transition	AI-based Malware Arresting Recommendation System (MARS) for Segregating Malware-Encrypted Files Onboard Naval Assets	Safety Critical Items in naval systems
13:55	The impact of physics-based 3D modelling of a surface vessel in a simulated sea acceptance trial environment on design reviews	'Alternative Fuels' or 'Koolaid'?: Maintaining Focus and Perspective When Considering Options for Future Naval Fuels	Explainable AI for Robust SAR-based Ship Recognition: Mitigating Vulnerabilities to Adversarial Samples	Rationalising safety cases for naval systems — Maritime Autonomy and Safety at Sea
14:20	Comparative Analysis of AI-Based Optimisation Techniques for a Conceptual Frigate Hullform Design	Charting a Greener Course: A Review of Mature Technologies for Lowering Vessel GHG Emission	Beneath the Surface: a Stealth Cyber Threat to Battery-Operated Submarines in the Digital Age	Design and Development of tide safe gangway for naval ships
14:45	Session Discussions			
15:00	*Coffee Break*			
15:30	**Hydrodynamics**	**Data exploitation**	**Full electrical architecture**	**Networking & Architecture**
15:30	Naval combatant performance gains in waves utilising a dynamic bow wing	Transforming IOT (Internet of Things) into onboard shipping	Designing a DC Power System for «Fit-to-Receive» Capability	Supplementing Experience-Based Platform System Reliability Requirements to Network Theory
15:55	Evaluating Hydrofoil Resistance Components from RANS and Lifting Line Fluid Simulations	Optimizing Fuel Management for Halifax Class Frigates: Leveraging Sensor Data for Enhanced Efficiency	Evaluating prime mover technologies for next-generation warship power systems.	A triple-network-layer generative pattern approach for designing high resilience monitored system architectures
16:20	Energy saving by drag reduction for auv design using passive flow technique	Data-Driven Advisory Functions for Optimizing Transit Operations of Ships	Conceptual Design and Verification of the Power, Propulsion, and Energy System for a Future Surface Combatant	Reconfigurability to enable lean, mean naval combatants — Sensor Network Data Recorders: Improving Safety

				and Incident Analysis in Critical Transport Systems
16:45	Session Discussions			
19:00	Event Social			
Thursday 7th November				
08:00	Registration and Coffee			
09:00	**Maintenance II**	**Electrical Equipment Machines**	**Machine Learning and AI**	**Emission Part I**
09:00	"Lean" – Reducing costs as competition for resources grow – Predictive Maintenance	The new wave of efficiency – Next generation high efficiency propulsion concept	Reinforcement Learning of Neural Network Controllers with Safety Objectives via Reachability Analysis	Dual Fuel Technology: A route to reduce emissions
09:25	Leveraging Artificial Intelligence for Smart Predictive Maintenance and Enhanced Sea Worthiness of Ships	Shocking Permanent Magnet Motors for Naval Applications	Real-time critical marine infrastructure multi-sensor surveillance via a constrained stochastic coverage algorithm	Naval sector and Decarbonisation using Industry 4.0
09:50	Towards a data-driven naval maintenance organisation: the importance of a social roadmap	Researching Residuals and Regulations	Energy-Efficient Speed Planning Considering Dynamic Environmental Conditions for Inland Vessels	Through Life Carbon Emissions and Mitigation Opportunities
				Selecting the Energy Storage Technology for Surface Combatants with DC Power Distribution
10:15	Session Discussions			
10:30	Coffee Break			
11:00	**Data driven optimisation**	**Emission Part II**	**Electrical Power Systems**	**Autonomous power and propulsion**
11:00	The use of Unmanned Aircraft Systems in Naval Marine industry to improve safety, efficiency and quality of engineering survey and inspections	Experimental and modelling studies on HVO-methanol mixtures separation for superyachts applications	PMS Load Power Regulation for Zonal Secondary DC-Grids Survivability: A Load Priority-Based Approach	Autonomous Machinery Control Systems for Naval Unmanned Surface Vessels
11:25	Enhancing Predictive Maintenance in the Maritime Industry with Unsupervised Learning	Methanol Dual Fuel Retrofit Solutions for Sustainable Naval Powertrains	Investigation on shipboard power quality on Cruise ships under high penetration of power converters	A Modular and Autonomous Propulsion System for Unmanned Marine Vehicles

11:50	Digital twin simulation model of hull-propeller-engine interactions for ship condition monitoring in irregular sea navigation	Hybrid turbocharging for alternatively fueled internal combustion engines in naval applications	Frequency control and stability of a ship electric power system emulator	State-of-the-art Full-Scale Simulator for Ship Hybrid Power System in a Shuttle Tanker ——— Automatic Maneuvering of Vessels with Power-Optimized Thrust Allocation
12:15	Session discussions			
12:30	Lunch			
13:15	A Lean, Mean, Atomic Queen? – The ultimate mission module (not confirmed)			
13:40	Second Plenary			
14:05	Closing Keynote			
14:20	Presentation of the Sir Donald Gosling Award			
14:35	Close of Conference			