



Monday 9 November

1300-1645

Industry visit, Babcock, Rosyth

Tuesday 10 November

0615

Becky's run club - 5k run around Arthurs Seat

845

Registration and coffee

915

Introduction from the Conference Chairs: Neil McCallum MIMarEST, Captain Rinze Geertsma, FIMarEST, Netherlands Defence Academy

930

Rear-Admiral Brian Metcalf, Deputy Portfolio Acquisition Executive Maritime for Combatants, US Navy

0945

Rear-Admiral Rachel Durbin, FIMarEST, Head of Naval Engineering. Royal Australian Navy

1000

Rear-Admiral Steve McCarthy, FIMarEST, CNEO. Royal Navy

1015

Vice Admiral Sanjay Sadhu, AVSM, NM, Indian Navy

1030

Keynote Discussion

1100

Coffee Break

1130

Morning Parallel Sessions

1200

Future capabilities

Power and propulsion system control

Digital support

Interactive Sessions

The internal battle and Survivability

Survivability

Room

Pentland

Prestonfield

Holyrood

Salisbury

1200

7NE
Autonomous Mine Hunting Capability Data Exploitation: Charting a Course Through the Digital Minefield
Stephen Taylor.
Royal Navy

23SC
Multi-Objective Optimisation of Diesel Engine Dynamics for Variable-Speed Naval Generators
Lars Mulder, Andrea Coraddu, Rinze Geertsma and Udai Shipurkar.
TU Delft and MARIN

16NE
Pirate Maths, Data Lions and Robot Birds: Emergent behaviour and misaligned incentives in the digital transformation of RN Support
Suzanna Seagrave.
Royal Navy

74NE
3D Naval Visualizations for increased Situation Awareness within the Internal Battle for Future Ready Navies
Bart-Peter Smit, Robert Voûte and Jasper Wieringa.
CGI Netherlands BV

9SC
Non-Causal Multi-Agent Control for Proactive and Smart Maritime Search and Rescue in Stochastic Wave Environments
Yutong Song.
University College London

1225	51NE Design and Development of a Large USV Series Jelle W. Moerdijk, Sander Knegt, Jaap L. Gelling and Austin Kana. Delft University of Technology.	25SC Dynamic Programming Analysis of Optimal Mode Selection in a Series-Parallel Hybrid Boat: A basis for Rule-based EMS design Luca Di Biase. Politecnico di Torino	32NE Designing Future Naval Support: A Requirements-Led Digital Architecture Shaped by IPS, HFI, and Enterprise Data Steve Wilding. Babcock International Group	89NE Improving the contribution that centre fed hose reels can make to firefighting response on ships and submarines James Glockling and Richard Alker. BAE Systems Maritime Submarines	24SC Design and automation of an ROV docking system for an XLUUV Martin Gülland, Ines Cebulla, Carsten Rethfeldt and Torsten Jeinsch University of Rostock, Institute of Automation	
1250	41NE Arctic: the Next Generation of Naval Platform Robert Taylor, Pilar Morales and Andrew Vanner. Babcock	27SC Analytical Derivation of an ECMS Based Energy Management Strategy for Hybrid Powertrains Francesco Novello, Federico Miretti and Daniela Anna Misul Politecnico di Torino	76NE Development of a Health Risk Assessment Screening Tool for Shipboard Indoor Air Exposure Nur Sarah Fatihah Tamsi. MZ Services & Consultancy Sdn Bhd	70NE Sick Boat Syndrome (SBoS) among Naval Ship Crews: The Importance of Indoor Air Quality (IAQ) Monitoring and Standard Compliance Nur Sarah Fatihah Tams. International Islamic University Malaysia		
1315	Session discussion	Session discussion	Session discussion			
1330	Lunch					
	Afternoon Parallel Sessions					
1430	Nuclear	Autonomous and uncrewed vessel control	System integration and assessment	Interactive Sessions - Smart maintenance	Interactive Sessions - Smart maintenance	Interactive Sessions - Smart maintenance
Room	Pentland	Prestonfield	Holyrood	Salisbury		
1430	4NE Energy System Design for a Nuclear-Powered Refuelling Vessel Supporting Unmanned Maritime Vehicles Ismar Klomp and Gert Jan Meijn. TU Delft/Damen Naval	13SC Control strategies for multi-vessel formation control; escorting a vessel in fixed, flexible, or changing formations Bas de Kruif and Ed van Daalen. Marin	27NE Very Light Reading: The Next Phase of Ship-LDEW Integration Hayden Cole and Fred Ogilvie. BAE Systems	5NE Unlocking Autonomy Through Tribological Condition Monitoring Jake Rigby and Matthew Knight. BMT	43SC A Generalizable Unsupervised Health-Monitoring Framework across Heterogeneous Time-Series Data Nicolò Faggioni, Alessandro Caviglia, Marco Antonelli and Giovanni Orrù. Fincantieri NexTech	
1455	31NE The Consideration of Working Fluids for Naval Micro Nuclear Reactors John Buckingham. BMT	21SC Traceable Virtual Sea Trials in the Marine Robotics Unity Simulator for Manoeuvring Assessment of Unmanned Surface Vehicles Paria Rezayan. Sheffield Hallam University	52NE Next-generation technology integration in naval vessel platforms through Product Line Engineering Job Perdon, Micha Stam, Koen Droste and Austin Kana. Delft University of Technology	2NE Strategic autonomy for naval structures: Approach to and economic feasibility of the remanufacturing of reclaimed stiffened panels Marije Deul, Massimo Coppola, Bernardete Goncalves Castro, Kevin Runge and Jeroen Pruyn.	3SC Exhaust-Gas Fault Detection in a Multi-Cylinder Natural Gas Engine Using Gas-Wise Autoencoder Residuals Cem Çaldağ, Luka Coremans, Gijs Begthel, Teun Augustinus, Marcel Roberscheuten, Youri Linden and Andrea Coraddu.	

				TNO		Delft University of Technology	
1520	58NE Considerations for commercial nuclear reactor types on medium sized ships Martijn Hoogeland, Sjors Kremer, Casper Versteylen, Gert-Jan Meijn, Robert Van de Ketterij and Klaas Visser. TNO	19NE Data-driven decision support for maritime operations Remco Hageman, Fenneke Sterlini, Marcel Wokke, Douwe Rijpkema, Bas de Kruif, Bulent Duz and Yvette Klinkenberg. Marin	46NE The Importance of Radar Cross Section Prediction to the Survivability of Modern Surface Combatants in the Future Operating Environment Kirrie Wallace, Malcolm Robb and Jill Savva. BAE Systems	81NE Towards Net-Zero Shipbuilding: A Mathematical Model for Emissions from Construction and Maintenance Phases with a Case Study Ahmed Balata. University of Liverpool			
1545	Session discussion	Session discussion	Session discussion				
1600	Coffee Break						
1630	Modern naval power and propulsion	Autonomous navigation		Climate and emissions	Interactive Sessions: methanol on warships	Interactive sessions: Environmental impact reduction	Interactive Sessions: Hull fouling and protection
Room	Pentland	Prestonfield	Holyrood	Salisbury			
1630	37NE Novel Naval Power Generation: Utilising Modern Technology to Challenge Conventional Concept Design Josiah Carron, Elliot Brown and Romana Majid. Babcock International Group	50SC Learning to Approach: An AI-Driven Decision Support System for Underwater Manipulation Planning from Expert Demonstrations Sara Aldhaeri. University College London	71NE Challenge response with a retrofit Andreas Junglewitz, Franco Michele Bennati and Moustafa Abdel Maksoud. Siemens Energy Global GmbH & Co, KG	17NE Methanol on Warships: Quantifying the Risk of Vapour Cloud Explosions and Toxic Exposure Marnix Rhijnsburger, Dorien Stroeve, Chris de Ron and Farah Bziker. TNO	93NE Passive Air Lubrication through Salvinia-Inspired Surfaces for Vessel Drag Reduction and Decarbonization: A Review of Coating Mechanisms, Biofouling Interactions, and Operational Performance Mansi Chawla, Debesh Lahiri, Pravin Roy and Devarshi Dutta. National Centre of Excellence in Green Ports and Shipping, The Energy and Resources Institute	94NE The Digitalization of Asset Integrity: Corrosion and Biofouling Control with Intelligent Digital Skin (CIDS) Farzad Hashemi and Michael Maguire. Copsy Technologies Inc.	
1655	41SC Transform Shipboard Power and Propulsion Plant operational data at-the-edge to gain smart,	8SC An Explainable Symbolic COLREG Classifier for Autonomous Ships	16SC An integrated analysis on energy, economic and environmental performances for an	73NE Benefits of two-stage turbocharging in static and dynamic operation for conventional diesel fueled	57SC Long-term environmental and economic assessment of cruise ships under Maritime regulations.	54NE Revisiting cathodic protection due to extensive electrification – The Aegis project	

	optimized, and sustainable performance Warren Johnson and Johnny Walker. <i>Rockwell Automation</i>	Nicola Sabatino. <i>University of Genoa</i>	ammonia-fuelled large passenger vessel. Simone Piccardo. University of Genova - Thermochemical Power Group	and high-pressure direct injection methanol fueled medium speed generator sets. Jasper Kole, Jasper Vollbrandt, Dorien Stroeve and Rinze Geertsma. <i>Dutch Ministry of Defence - COMMIT</i>	Simone Piccardo. <i>University of Genova - Thermochemical Power Group</i>	John Prousalidis and Dora Tsiourva. <i>National Technical University of Athens</i>
1720	79NE Sustainable power plant for modern defence assets Panagiotis Karvounis and Gerasimos Theotokatos. <i>University of Strathclyde</i>	59SC High-Resolution Flash Lidar for Short-Range Underwater 3D Perception David Nguyen, Jannis Holzer, Eleonoor Bosch, Enrico Manuzzato, Leonardo Gasparini and Christophe Pache. <i>CSEM</i>	35NE Lifecycle Assessment to Minimise Emissions in Ships Stewart Downie. <i>Babcock International</i>	10SC Dual-Fuel Engine Low-Load Combustion Optimization and Clean Energy Economic Evaluation Ying Long Luo <i>University of Strathclyde</i>		99NE Improving hull corrosion protection and reducing related threat signatures for naval platforms Paul Rawlins
1745	Session discussion	Session discussion	Session discussion			
1800	Welcome reception					

	Wednesday 11 November					
800	Registration and coffee					
900	Plenary – Industry collaboration Opening remarks – Conference chairs					
915	Sir Simon Lister, BAE Systems					
930	Roberto Chiti, Product Manager Automation & Control, Fincantieri NexTech					
945	Claudia Hessen, Manager Regulatory & Integrity Energy & Control, Kongsberg					
1000	Discussion					
1030	Coffee Break					
1100	Cyber Security	Intelligent control	Operations and resilience	Interactive Sessions: Decision support and autonomy	Interactive Sessions: Autonomy and cyber security	
Room	Pentland	Prestonfield	Holyrood	Salisbury		
1100	6NE Electronic Warfare: The Invisible Enemy of Maritime Autonomy Peter Macaulay. <i>Royal Navy</i>	19SC Time-domain simulation tool for propulsion performance assessment of a nuclear-powered naval vessel Eleonora Zanaboni, Veronica Vigna and Luca Maloberti <i>University of Genoa</i>	4SC Enhancing maritime Search And Rescue operations through LiDAR and thermal imaging fusion Filippo Ponzini. <i>University of Genoa</i>	8NE Modern Technology and the Redistribution of Human Autonomy Peter Spayne, Laura Lacey and Alistair Saddington, <i>Cranfield University</i>	54SC A Preliminary Study of Cyber Attacks on Maritime LiDAR Situational Awareness Giacomo Longo, Giacomo Ratto, Alessio Merlo and Enrico Russo. <i>Universita degli Studi di Genova</i>	
1125	9NE The Combat Network as the Weapon Morgan Colbeck. <i>Royal Navy</i>	14SC Hive-Mind at Sea: Bio-Inspired Swarm Intelligence for Resilient, Decentralized Power Management in Autonomous Marine DC Microgrids Divya Divya and Navneet Krishna. <i>Indian Maritime University</i>	57NE Enhancing Operational Availability of Surfaced Submarines in Waves using a Reinforcement Learning Controller Mathieu Courdier, Gaspard Ducamp and Marta Ibarrondo. <i>MARIN</i>	2SC Port Vessel Traffic Control for Multi-Type Ships: A Proposed Methodology for Decision Support System Considering Marine Conditions Ferhan Buyukcolak and Silvia Donnarumma, <i>University of Genoa</i>	58SC Securing Shared Accounts in Naval Operational Technology: IAM and Zero Trust Implementation Aligned with ISA/IEC 62443, NIST SP 800-82, and the EU Cyber Resilience Act Patric Dove. <i>Siemens Government Technologies</i>	

1150	30NE Adopting the IMO MASS Code for Naval USVs: A Class Perspective on Network and Cyber Resilience Srinivas Revuru. Indian Register of Shipping	24SC Design and automation of an ROV docking system for an XLUUV Martin Gülland, Ines Cebulla, Carsten Rethfeldt and Torsten Jeinsch University of Rostock, Institute of Automation	75NE Admiralty Salvage at a Crossroads - Evolving Maritime Recovery for Next-Generation Naval Platforms Jake Guest. Defence Equipment And Support - Salvage And Marine Operations DE&S - Salvage & Marine Operations	38NE Allocation of Function (AoF) for Human Autonomy Teaming (HAT) Luca Gallo and Eshan Rajabally. BMT		
1215	Session discussion	Session discussion	Session discussion			
1230	Lunch					
Afternoon Parallel Sessions						
1330	Increasing autonomy and reduced crews	Digital Twins	Resilient naval ship design	Interactive Sessions: MOST 1	Interactive Sessions: MOST 2	
Room	Pentland	Prestonfield	Holyrood	Salisbury		
1330	11NE Temporal Assurance in Autonomous Systems: The Problem of Justifying Decision-Making Under Uncertainty in Open-Environments Liam Talbot. Price Waterhouse Coopers	12SC Digital Twins for Naval Gearboxes Nikolas Albrecht, Werner Sigmund and Theresa Sibich RENK GmbH	10NE Assessing the Functional Vulnerability of Naval Combatants in early Ship Design Tom Philipson and Stefan Krüger. Hamburg University of Technology	6SC Improving Maritime Situational Awareness: A Spectral Filtering Method for Weak Target Detection Giovanni Ludeno, Francesco Soldovieri and Gianluca Gennarelli. Institute of Electromagnetic Sensing of the Environment, National Research Council of Italy	45SC A Framework for the development of a decision support system for ship underwater radiated noise Fabio Colotto, Tomaso Gaggero, Yuri Cotroneo, Paola De Ruggiero, Simone Di Palma, Massimiliano Esposito, Luigi Gifuni and Giorgio Budillon. University of Genoa	
1355	15NE Use of a Commercial Crew for Sea Trials John Newell and James Charsley. Babcock International	53SC A Digital Twin and Multi-Criteria Optimization Platform for Design and Operation of Ship Power and Propulsion Systems Ahmed Elkafas and Iraklis Lazakis	33NE An early concept-stage resilience network tool for identification of vulnerable connectivity in distributed engineering systems Giota Paparistodimou, Philip Knight and Malcolm Robb. BAE	11SC A Real-Time GNC Architecture for Marine Autonomous Surface Ships Raphael Zaccone and Dr Michele Martelli. Università degli Studi di Genova		
10	18NE Aligning Naval Electrical Systems and Minimum Crewing: Challenges, Implications, and	96NE Digital Twins: Foundation of connected naval autonomous operations Ivan Pena et al.	82NE Battle Barges and Mega Modules - possible applications for multi-part vessels Dr Rachel Pawling.	28SC Quantitative Evaluation of Marine Vehicle Cooperative Control in Harbour-Like Experiments		

	Design Principles for Future Platforms Sacha Eke-Duchars. BMT		UCL	Angelo Odetti, Enrica Zereik, Gabriele Bruzzone, Filippo Ponzini and Michele Martelli CNR-INM		
1445	Session discussion	Session discussion	Session discussion			
1500	Coffee Break					
1530	Mission modularity	Technology development and safety	Power and propulsion	Interactive Sessions: Energy optimisation	Interactive Sessions - Power systems hardware in the loop	Interactive Sessions: Power system loads
Room	Pentland	Prestonfield	Holyrood	Salisbury		
1530	13NE Beyond the Blueprint: Mission Modularity's Impact on Modern Naval Design, Assurance, and Operations Kaya Nightingale. Lloyd's Register EMEA	45NE Let's Not Tie Ourselves in Knots: Adapting Safety Case Regimes for Spiral Development Programmes Alexander Barker and Jessica Morris. Safeguard Engineering Ltd	34SC Techno-Economic Framework for Hybrid-Electric Propulsion Retrofitting in Harbor Tugboat Fleets: A Pathway for Sustainable Port Operations in Developing Maritime Infrastructure Iddi Sungura Tanzania Ports Authority	7SC Time-Indexed Mixed-Integer Optimisation of Electric Harbour-Fleet Assignment, Routing and Shore-Power Charging Sankarshan Durgaprasad. Delft University of Technology	20SC Developing a suite of Hull, Mechanical, and Electrical (HM&E) Control Systems Vincent Piesetzkie, Graig Jolley and Peter Grech NAVSEA Philadelphia	51SC Modelling Extra-Propulsive Loads in Shipboard Power Systems Federico Graffione, Marco Gallo, Federico Silvestro and Fabio D'Agostino. University of Genoa
1555	28NE Thinking inside the box. Deployable capability for the future navy Steven Howick and Jessica Scott. BAE Systems	53NE Towards the Certification of Naval Systems Employing Artificial Intelligence Matthew Wylie, Stephen Perry and Thomas Howe. BMT	60SC Fuel cells operating on methanol as power supply for naval ships Carsten Cremers and Maximilian Jaekel. Fraunhofer Institute for Chemical Technology (ICT)	46SC A Short-Term, AI-based Electric Load Forecaster for a High Responsive Shipboard Energy Management Daniele Belvisi, Francesco Bellotti, Massimo Figari and Riccardo Berta. Italian Navy	31SC Real Time Simulation Validation of a Decentralized Economic Dispatch for Marine Power Systems Joseph Amato, Kevin Lin, Sarah Ellis, Qing Dong and Sina Zarrabian Naval Surface Warfare Center	
1620	48NE Evaluation and validation of the added value of modularity for specialized ships during concept exploration: A critical systematic review Micha Stam, Austin Kana and Jeroen Pruyn. Delft University of Technology	80NE When Looking to Win the Race of Technological Advantage, Do Royal Navy Leaders Need to Change? Alexandra Ward. Royal Navy	85NE Autonomous Vessels – Don't forget to bring the brainpower. Thoughts on how to feed the 'crew' on an unmanned warship Nick Smith GE Vernova	17SC Physics-based Multidomain Energy Model for a Cruise Vessel: Development, Validation & Operational Application Dr Giovanni Vaccarini. Fincantieri Spa	29SC Closed-loop back-to-back testing for replacing obsolete naval gas-turbine control systems George Tucker and Teysseer Satti Rolls Royce Plc	

1645	Session discussion	Session discussion	Session discussion			
1900	Industry Dinner Edinburgh Suite Sheraton Grant, Hotel & Spa, Edinburgh					

Thursday 12 November						
800	Registration and coffee					
900	Introduction from the Chairs					
915	Capt Mo Magzoub, FIMarEST, Head of Force Development. Royal Navy					
930	Dr Bas Buchner, Program Director of Maritime Uncrewed. Royal Netherlands Navy					
945	Discussion					
1000	Coffee Break					
	Morning Parallel Sessions					
1030	Autonomous ships and systems	Diesel engine maintenance	The internal Battle	Interactive Sessions: Ship design and build	Interactive Sessions: Ship design and build	Interactive Sessions: Ship design and build
Room	Pentland	Prestonfield	Holyrood	Salisbury		Duddingston
1030	18SC Synthesis of an Architecture for the Integration of Controllable Autonomous Behaviour in Naval Ship Design Moritz Luckey, Paul Dahlke and Frank Mantwill <i>Helmut Schmidt University</i>	26NE Reducing Maintenance Burden and building resilience for naval engineering systems Tamsyn Hills and James Fawcett. BMT	12NE Structural Damage Detection in Ships Using a TCN Autoencoder and Motion Response Anomaly Scoring Ieza Souza Ramos. NHL Stenden	26SC Design and Development of an Advanced Robotic Fish Marco Bibuli, Elena Ciappi, Elena Paifelman, Angelo Odetti, Edoardo Spirandelli, Antonio Carcaterra, Antonio Culla and Silvia Milana <i>CNR-INM</i>	24NE Beyond the Business Case: Structured Evaluation of Digital Transformation Projects in a Naval Shipyard Miguel Calvache, Jeroen Pruyn, Javier Calderon-Tellez and Diego Cabuya. <i>Delft University of Technology</i>	BMT/RN Workshop Hybrid Navy: What Could Stop Us Getting There?
1055	22NE Conceptual Architecture and operational design considerations for a large unmanned surface vessel in anti-submarine warfare escort roles Wytse Hogeveen. Ministry of Defence (NL), Command Materiel & IT (COMMIT),	43NE Memory-safe physics-based modelling of marine diesel engines using Rust Mieszko Kaminski and Chaitanya Patil. University of Strathclyde	68NE Optimising Agent-Based Fault Diagnosis for Naval Machinery Breakdown Drills: Closing the Cognitive Gap in Decision Support Architecture Martin Veltman, Youri Linden and Eric Pauwels <i>Dutch Navy</i>	29NE Progressing the understanding of Engineering Maturity for left shifting risk in complex programmes Matthew Cook, Martin Douglass and Andy Carr. BAE Systems	14NE From Siloed Systems to Connected Decisions: Systems Elements Analysis in Early-Stage Naval Ship Design Zacharias Panagiotis Oikonomou, Jeroen Pruyn and Austin Kana. <i>TU Delft</i>	
1120	67NE Designing the Future Fleet: An Immersive Mixed-Methods Approach to Evaluating Operational Management Concepts	62NE Exploring the Added Value of In-cylinder Pressure for Anomaly-Based Fault Detection in Marine Diesel Engines Youri Linden.	84NE Supporting Naval Damage Control Cognition with AI Igor Lapin. L3 Harris	95NE Synthesis of an Architecture for the Integration of Autonomous System Behaviour in Naval Ship Design Moritz Luckey, Niels Demke, Paul Dahlke, Robert	47NE Integrating Risk-Based Design into Model-Based Systems Engineering for Naval Ship Design Niek Verhoeven, Koen Droste and Austin Kana.	

	Nikki Okkels and, Heike Diepeveen. <i>Marin</i>	Delft University of Technology		Burmeister and Frank Mantwill. Helmut Schmidt University	Delft University of Technology	
1145	Discussion					
1200	Lunch					
1300	Autonomous ships and systems		DC power systems		Human machine interface	
Room	Pentland		Prestonfield		Holyrood	
1300	23NE Naval Engineering Collaboration to deliver Capability in a world of ever-growing Competition. Simon McCowan. <i>Royal Australian Navy</i>		55NE Investigation of harmonic distortion in modern ships with On-shore Power Supply and high integration of power electronic converters Panos Kotsampopoulos and John Prousalidis. <i>National University of Athens</i>		36SC From Theory to Practice: Implementing CRM Principles in Safety-Critical Systems (2011-2026) Daniel Kelly & Robert Sgroi <i>Naval Surface Warfare Center, Philadelphia Division</i>	
1325	66NE The Challenge of Crewing Future Surface Combatants Malcolm Robb, Ewan MacIntyre, Matthew Ashley and Simon Saunders. <i>BAE Systems Maritime</i>		85NE Autonomous Vessels – Don’t forget to bring the brainpower. Thoughts on how to feed the ‘crew’ on an unmanned warship Nick Smith <i>GE Vernova</i>		5SC Human-in-the-Loop AI for Safe and Intelligent Ship Control Systems Dr Sajid Hussain FIMarEST. <i>Bangladesh Marine Academy</i>	
1350	SSI		83NE Added value of supercapacitors in the dynamics of a variable speed genset in a maritime DC architecture; an experimental study. Menno Merts, Udai Shipurkar, Bas Boerrigter and Jeroen Willemsen, <i>Marin</i>		47SC The Critical Role of the Graphical User Interface in Modern Shipboard Control Systems Chetan Vajapey and Jeffrey Cohen <i>KAI Solutions Inc</i>	
1415	Discussion					
1430	Coffee Break					
	Closing Plenary Session					
1500	Plenary Session					
1525	Discussion					
1540	Closing Keynote: Sarah Kenny OBE, CEO, BMT					
1555	Presentation of the Sir Donald Gosling Award					
1610	Closing remarks					
1625	Close of conference					