

Tuesday 2 October 2018

0800 – 0900 Registration and coffee

0900 – 0915 Introduction | *Capt Matt Bolton RN, Chairman, INEC 2018*

0915 – 1100 Welcome and Keynotes Addresses

1100 – 1130 Coffee

OPENING PLENARY SESSION

1130 – 1200 Combined seapower: A combat power perspective

G Sturtevant, US Navy Department, USA; Dr I Whitelegg, Rolls-Royce, UK; J Voth, A Lowe, Herren Associates, Inc., USA

1200 – 1230 A quantitative analysis of possible futures of autonomous transport

Capt C L Benson USAF, Delft University of Technology/The United States Air Force, The Netherlands/USA; P Sumanth, Ir A P Colling, Delft University of Technology, The Netherlands
(Sir Donald Gosling Award Candidates)

1230 – 1300 Defence youth STEM outreach – 'inspiring the next generation'

Capt M Rose RN, Capt D Joyce RN, Ministry of Defence, UK

1300 – 1315 Discussion

1315 – 1430 Lunch

1430 – 1500 **More than a mission – modelling the impact of a support solution on submarine availability, cost and safety**
N Dewey, R Young, Babcock International Group, UK

The physical integration of a significant marine engineering package into the T23 Frigate
D G Dobbins, Naval Design Partnering, UK
(Sir Donald Gosling Award Candidate)

Waste heat recovery with simple Rankine cycle for maritime diesel engines – a simulation study
Sub Lt (E) P Eeuwijk RNLN, Royal Netherlands Naval Academy, The Netherlands
(Sir Donald Gosling Award Candidate)

Paper to be confirmed

Marine Bees – swarm inspired cooperative robotics for marine applications
C Lewis, Eauligo, France

1500 – 1530 **SUPREME: Submarine space partitioning in Rhino by Quaestor3**
Dr M van Hees, Maritime Research Institute Netherlands (MARIN), The Netherlands;
W H van den Broek-de Bruijn, Defence Materiel Organisation, The Netherlands

From automation to autonomy – designing a complete ship control system
C Field, Rolls-Royce, UK
(Sir Donald Gosling Award Candidate)

Charge air configurations for propulsion diesel engines on fast naval combatants – a simulation study on efficiency and performance
J Q Rusman, Delft University of Technology, The Netherlands
(Sir Donald Gosling Award Candidate)

The role of future information in control system design for shipboard power systems
Dr D F Opila, Cdr J Stevens USN, US Naval Academy, USA;
Dr A Cramer, University of Kentucky, USA

WAVE module for hybrid oceanographic autonomous underwater vehicle – prototype experimental validation and characterization
A Caiti, Dr R Costanzi, D Fenucci, Università di Pisa/ Interuniversity Center of Integrated Systems for the Marine Environment (ISME), Italy;
V Manzari, Università di Pisa/Naval Experimentation and Support Centre of Italian Navy (CSSN), Italy;
A Caffaz, GraalTech s.r.l., Italy;
M Stifani, Naval Experimentation and Support Centre of Italian Navy (CSSN), Italy

1530 – 1600 **The influence of the facility nuclear safety case on the design of naval refit support equipment**
H Cole, Babcock International Group, UK
(Sir Donald Gosling Award Candidate)

Systems engineering – the hard way
A Edmondson, BAE Systems Maritime - Submarines, UK;
B Twomey, Rolls-Royce, UK

Evaluation of electric-turbo-compounding applied to marine diesel-engines
Prof R Bucknall, S Suarez de la Fuente, University College London, UK;
S Szymko, W Bowers, Bowman Power Group Ltd, UK;
T Spencer, Lloyd's Register, UK;
A Sim, Rolls-Royce, UK

Deriving specifications for coupling through dual-wound generators
Dr L J Rashkin, J C Neely, D G Wilson, S F Glover, Sandia National Labs, USA;
N Doerry, NAVSEA, USA;
T J McCoy, McCoy Consulting, LLC, USA

USWATH: An innovative USV design towards the extended ship
G Bruzzone, A Odetti, M Caccia, M Bibuli, National Research Council ISSIA, Italy;
D Calcagni, I Santic, C Lugni, National Research Council INSEAN, Italy;
E F Campana, National Research Council DIITET, Italy

1600 – 1615 Discussion

1615 – 1645 Tea

1645 – 1715	<p>A practical ultrasonic inspection method for detecting and characterising defects found within composite repairs</p> <p><i>J Downing, A Hook, Babcock International Group, UK</i> (<i>Sir Donald Gosling Award Candidates</i>)</p>	<p>When will autonomous ships arrive? A technological forecasting perspective</p> <p><i>Ir C Kooij, Ir A P Colling, Dr C L Benson, Delft University of Technology, The Netherlands</i> (<i>Sir Donald Gosling Award Candidates</i>)</p>	<p>The advanced technology corvette (railgun) – future weapons and small ship power systems</p> <p><i>Dr R Pawling, L Farrier, Prof R Bucknall, Dr M Bradbeer, University College London, UK</i></p>	<p>Robustness analysis of the next generation of EGR controllers in marine two-stroke diesel engines</p> <p><i>X Llamas, L Eriksson, Linköping University, Sweden</i></p>	<p>OCEANIDS: Building next generation maritime autonomous systems</p> <p><i>M Furlong, C Harris, A Lorenzo, S McPhail, A Munafó, M Pebody, A Phillips, D Roper, G Salavasidis, National Oceanography Centre, UK</i></p>
1715 – 1745	<p>Remedial solutions for excessive propeller induced hull vibrations on a landing craft</p> <p><i>B Aktas, W Shi, N Sasaki, P Fitzsimmons, M Atlar, University of Strathclyde, UK; Prof M Fan, Abu Dhabi Ship Building, UAE</i></p>	<p>Enhanced navigation at sea: An augmented reality-based tool for bridge operators</p> <p><i>Dr M Martelli, M Figari, Polytechnic School of Genoa University, Italy; M di Summa, G P Viganò, M Sacco, Institute of Automation and Industrial Technologies, (CNR-ITIA), Italy; P Cassarà, A Gotta, National Research Council, Institute of Science and Information Technologies, (CNR-ISTI), Italy; L Sebastiani, Seastema s.p.a, Italy; P Guglia, G Delucchi, Fincantieri s.p.a, Italy</i></p>	<p>Informing the power system performance envelope for pulse load operation</p> <p><i>K Mills, Rolls-Royce Naval Electrical Automation and Control, UK; J Xiong, Dr S Jian, P Venkatesh, Rolls-Royce@NTU Corporate Lab, Singapore; Dr L Xiong, Rolls-Royce Electrical, Singapore</i></p>	<p>Micro-pilot-induced ignition diesel/natural gas engine control system development and engine performance/emission optimization</p> <p><i>G Zhao, Harbin Engineering University, China</i> (<i>Sir Donald Gosling Award Candidate</i>)</p>	<p>An advanced guidance & control system for an unmanned vessel with azimuthal thrusters</p> <p><i>Dr M Bibuli, G Bruzzone, M Caccia, G Camporeale, D Chiarella, R Ferretti, M Giacomelli, A Odetti, A Ranieri, E Spirandelli, E Zereik, The Institute of Intelligent Systems for Automation (CNR-ISSIA), Italy</i></p>
1745 – 1815	<p>FAUSST – bridging the gap between steel and fibre reinforced materials</p> <p><i>Dr L Molter, Dr R Luterbacher, Center of Maritime Technologies e.V., Germany</i></p>	<p>Is there a case for emulating a fish or other sea borne creatures for propulsion of underwater vehicles?</p> <p><i>Cdre (Dr) R K Rana, Independent Consultant, India; N Johnson, P Dongare, S Barve, Savitribai Phule Pune University, India</i></p>	<p>Energy storage design considerations for an MVDC power system</p> <p><i>Dr L J Rashkin, J C Neely, D G Wilson, S F Glover, Sandia National Labs, USA; N Doerry, S Markle, NAVSEA, USA; T J McCoy, McCoy Consulting, LLC, USA</i></p>	<p>Ships diesel engine performance modelling with combined physical and machine learning approach</p> <p><i>Dr A Coraddu, University of Strathclyde, UK; Ir M Kalikatzarakis, Ir G J Meijn, Damen Schelde Naval Shipbuilding, The Netherlands; Dr L Oneto, University of Genoa, Italy; Lt Cdr Ir R Geertsma RNLN, Dr M Godjevac, Delft University of Technology, The Netherlands</i></p>	<p>An acoustic-based approach for real-time deep-water navigation of an AUV</p> <p><i>A Tesei, M Micheli, A Vermeij, M Mazzi, G Grenon, L Morlando, G Ferri, NATO STO CMRE, Italy; R Costanzi, D Fenucci, A Caiti, Università di Pisa, Italy; A Munafó, National Oceanographic Centre, UK</i></p>
1815 – 1830	Discussion				
1830 – 2000	Welcome Reception INEC/iSCSS 2018 Exhibition area				

Wednesday 3 October 2018

0800 – 0900 Registration and coffee

MORNING PARALLEL SESSIONS	INEC Standards	INEC Damage control and survivability part 1	INEC Energy storage	iSCSS System identification and simulation	Interactive session 0900 – 1415 Power and propulsion
0900 – 0930	International Naval Safety Association – the first 10 years <i>N Overfield, Chair, INSA Steering Committee, UK</i>	Machinery space fire fighting – modern alternative methods <i>T Goode, Babcock International Group, UK</i> <i>(Sir Donald Gosling Award Candidate)</i>	Investigating the faulted performance of warship power systems with integrated energy storage <i>L Farrier, University College London, UK</i> <i>(Sir Donald Gosling Award Candidate)</i>	Energy efficient propulsion system for dynamic positioning application: Design and assessment <i>Dr A Coraddu, K Chu, University of Strathclyde, UK;</i> <i>Dr S Donnarumma, M Figari, University of Genoa, Italy</i>	TVA by bondgraph modelling <i>Ing T Heeringa, Heeringa Engineering, The Netherlands</i>
0930 – 1000	Efficient procurement of low vulnerability warships <i>J S Schofield, D J Wright, Survivability Consulting Limited, UK</i>	Royal Canadian Navy fighting the internal battle with a battle damage control system and embedded killcards <i>M Nottegar, T Gauthier, Naval Engineering Test Establishment, Canada; S Pakianathan, Department of National Defence, Canada; Y Lamontagne, L3 MAPPS, Canada</i>	Active control of a hybrid energy storage module (HESM) driving transient loads <i>I J Cohen, Dr D A Wetz, University of Texas at Arlington (UTA), USA; J M Heinzl, Naval Surface Warfare Center, USA</i>	Fingerprinting the ship propulsion system: Low hanging fruit or mission impossible? <i>Dr A Vrijdag, Delft University of Technology, The Netherlands</i>	Optimising technique in matching a combined diesel engine or gas turbine (CODOG) propulsion system to hull and propulsor of a frigate <i>Prof K D Bob-Manuel, B O Okim, Rivers State University, Nigeria</i>
1000 – 1030	Selection of standards in naval programmes: Harmonising classification rules with commercial and military standards <i>G Salas-Berrocal, C Marrugo-Puerta, COTECMAR, Columbia</i> <i>(Sir Donald Gosling Award Candidates)</i>	COSIMAR: Continuous Operational Signature Monitoring Awareness and Recommendation <i>Dr J Janssen, TNO, The Netherlands; H Hasenpflug, CSSM, The Netherlands;</i> <i>M Janssen, CSSM, Germany</i>	Battery & ultra-capacitor based energy storage, vessel integration, capabilities, considerations and challenges <i>M Southall, K Ganti, GE Power Conversion, UK</i>	Submarine autopilot performance optimization with system identification <i>Dr F Belanger, Dr X Cyril, L3 MAPPS, Canada; D Millan, National Research Council, Canada</i>	Comparison between GTL and F76 <i>Lt R Tol RNLN, Royal Netherlands Naval Academy, The Netherlands; Lt Cdr Y Linden RNLN, Defence Materiel Organisation, The Netherlands</i>
1030 – 1045	Discussion				Study on intelligent speed control algorithm for diesel engine <i>E Song, C Ma, G Zhao, C Yao, Harbin Engineering University, China</i>
1045 – 1115	Coffee				

**MORNING
PARALLEL
SESSIONS**

**INEC | Aviation
integration**

**INEC | Damage control
and survivability part 2**

**INEC | Real time control
of power systems**

iSCSS | Safety

1115 – 1145

The role of modelling and simulation in the preparations for flight trials aboard the Queen Elizabeth Class Aircraft Carriers

M F Kelly, N A Watson, M D White, Prof I Owen, University of Liverpool, UK; S J Hodge, BAE Systems, UK

Towards a novel design perspective for system vulnerability using a Markov chain

*A Habben Jansen, A Kana, Delft University of Technology, The Netherlands; E Duchateau, Defence Materiel Organisation, The Netherlands
(Sir Donald Gosling Award Candidates)*

T26 PMS – real time control of power generation, propulsion & auxiliaries

*W Miners, H Arikkat, L3 MAPPS UK, UK
(Sir Donald Gosling Award Candidates)*

Lessons learnt from IEC61508 software assessments and utilising experiences from other industries

*R Campbell, C Allsopp, R Phillips, Frazer-Nash Consultancy, UK
(Sir Donald Gosling Award Candidates)*

1145 – 1215

Superstructure aerodynamics of the Type 26 Global Combat Ship

R Mateer, P M Scott, Prof I Owen, M D White, University of Liverpool, UK

Impact of finch technology on damage control and survivability

D Berenbaum, Dr R Shafie-Pour, L3 MAPPS, UK

Optimal control and real-time simulation of hybrid marine power plants

Dr T Q Dinh, T M N Bui, J Marco, Warwick Manufacturing Group (WMG), UK; Dr C Watts, Babcock International Group, UK

Three laws good: Technology is a dangerous master

J Coulthard, Dr M J Cook, BAE Systems Submarines, UK

1215 – 1245

De-risking flight trials using airwake simulation

*Dr C Ward, Frazer-Nash Consultancy, UK
(Sir Donald Gosling Award Candidate)*

The use of network theory based metrics for the assessment of distributed systems architectures on naval platforms

G Papanastasiou, A Duffy, P Knight, I Whitfield, University of Strathclyde, UK; M Robb, C Voong, BAE Systems Naval Ships, UK

Extended heterogeneous controller hardware-in-the-loop testbed for evaluating distributed controls

Dr K Schoder, M Stanovich, Dr T Vu, Dr C S Edrington, M Steurer, Florida State University, USA

Hauling safety regulation into the marine industry

A LabonteJones, N Lerigo-Smith, L3 MAPPS UK, UK

1245 – 1300

Discussion

1300 – 1415

Lunch

1415 – 1445

Cold metal spray coatings for repair and protection of marine components

M Pal, D Goodman, BAE Systems Maritime Services, UK; N Gilfillan, Dycomet UK Limited, UK

Improving safety and propulsion efficiency of ships using retractable bridge

C Maheshwar, Anglo Eastern Maritime Academy, India

Mixed-integer linear programming approach as an offline control technique in a hybrid-electric power-propulsion ferry control system

N Mohammadzadeh, F Baldi, Fédérale de Lausanne (EPFL), Switzerland; E J Boonen, DAMEN Shipyard, The Netherlands (Sir Donald Gosling Award Candidates)

A random sampling based algorithm for ship path planning with obstacles

R Zaccone, Dr M Martelli, Polytechnic School of Genoa University, Italy (Sir Donald Gosling Award Candidates)

1445 – 1515

Condition based data trending to optimise maintenance on Sandown class propulsion system

P Richardson, Babcock International Group, UK

Environmental modelling and simulation for naval ships

Y Abbas, Babcock International Group, UK

New developments in energy management; now including battery lifetime and power consumption forecasting

D Mitropoulou, RH Marine Netherlands BV, The Netherlands; L Elling, Royal Netherlands Navy, The Netherlands (Sir Donald Gosling Award Candidates)

Assessment of wind heeling lever determined through CFD against the current naval stability standards

J Alderton, QinetiQ, UK (Sir Donald Gosling Award Candidate)

1515 – 1545

Automatic 3D design tool for spool fitting in shipbuilding industry

F Uzcategui, UMI UDC-Navantia, Spain; J Vilar, Á Brage, H Moro, Navantia, Spain; A Paz, Mytech IA, Spain; A Mallo, Dr F Bellas, University of Coruña, Spain

The high capacity expanding lifeboat HiCEL – meeting the modern SAR challenge

J Wright, Ministry of Defence, UK; G Payne, Steller Systems Ltd, UK (Sir Donald Gosling Award Candidates)

Effects of varying ramp rate and amount of ES

D Gonsoulin, G Ozkhan, B Papari, Dr C S Edrington, Florida State University, USA

The key role of dynamic feedback control in autonomous manoeuvring of ships

A U Schubert, M Gluch, O Simanski, University of Applied Sciences Wismar, Germany; M Kurowski, T Jeinsch, University of Rostock, Germany

1545 – 1600

Discussion

1600 – 1630

Tea

AFTERNOON PARALLEL SESSIONS	INEC Support part 2	INEC Safety	INEC Electrical power management	iSCSS Human factors
1630 – 1700	Optimizing maintenance causing docking alongside <i>A S I M A Ghowel, Arab Shipbuilding and Repair Yard, Bahrain</i>	Effective safety management – the tale of the engineer, safety manager and accountant <i>A Franks, LR Consulting, UK; P James, LR Marine and Offshore, UK</i>	Model predictive control of hybrid power system configuration and load sharing in marine vessels <i>A R Dahl, L Thorat, Norwegian University of Science and Technology, Norway (Sir Donald Gosling Award Candidates)</i>	Enabling lean manning through automation <i>J Chilcott, N Kennedy, L3 MAPPS UK, UK</i>
1700 – 1730	An introduction to the Babcock designed super-dock blocks <i>G Kerr, N Georgantzi, Babcock International Group, UK</i>	“Having a blast” – assessment of compartment overpressure following an arcing fault <i>P Worthington, I Thompson, W Galloway, G Stark, BAE Systems Naval Ships, UK; A Scott, A Lane, BAE Systems Maritime Services, UK</i>	Nonlinear power flow control design methodology for navy electric ship microgrid energy storage requirements <i>Dr D G Wilson, S F Glover, M A Cook, Sandia National Labs, USA; W W Weaver, R D Robinett, Michigan Technological University, USA; J Young, OptimoJoe, LLC, USA; S Markle, NAVSEA, USA; T J McCoy, McCoy Consulting, LLC, USA</i>	Maximising workforce productivity across engineering and production – an end-to-end approach <i>P Drayton, Newton, UK</i>
1730 – 1800	HMCS Victoria repair work period – a strategic partnership between a naval repair facility and an industry partner fostering ground up cultural change and pushing the limits of integration at the waterfront <i>Cdr A Bagga RCN, Royal Canadian Navy, Canada; T Dupuis, Babcock Canada, Canada</i>	Play it again Sam: Recurrent themes in interface development in safety critical systems for underwater platforms <i>Dr M J Cook, Dr S Bury, T Simpson, M Thody, D Garrett, BAE Systems Submarines, UK</i>	Paper to be confirmed	Lighting future naval ships – mission optimized and human centric <i>G G Langer, Thyssenkrupp Marine Systems GmbH, Germany; N Launert, LINKSrechts GmbH, Germany</i>
1800 – 1815	Discussion			
1830	Transportation to The Riverside Museum			
1900 – 2100	Conference Reception, The Riverside Museum			

Thursday 4 October 2018

0800 – 0900 Registration and coffee

MORNING PARALLEL SESSIONS	INEC Digital transformation part 1	INEC Electric and hybrid	INEC Environmental compliance	iSCSS Power conversion
0900 – 0930	Enabling, equipping and empowering the maritime support enterprise through digital transformation <i>Lt Cdr R T A Hancock RN, S N Waterworth, Lt Cdr R J McClurg RN, Capt M T W Bolton RN, Ministry of Defence, UK</i>	Light frigate low-speed electric drive – when does it make sense? <i>S Newman, O Simmonds, BMT, UK</i>	Instead of simply asking "what?", naval engineers need to ask "why?": Environmental compliance challenges and relevance in warship design <i>J F Polglaze, PGM Environment, Australia</i>	Sequence-based control for electro-thermal management of next generation integrated power systems <i>Dr T Vu, F Diaz, Dr C S Edrington, Florida State University, USA</i>
0930 – 1000	Personnel, material, and mission – EHM impact <i>Lt Cdr A Mascarenhas RCN, Royal Canadian Navy, Canada; Y Lamontagne, L3 MAPPS, Canada</i>	Towards the holy grail? A novel power dense, low noise permanent magnet motor <i>B Salter, C Lewis, GE Power Conversion, UK</i>	Marine dual fuel engine control system modelling and safety implications analysis <i>Dr G Theotokatos, S Stoumpos, V Bolbot, E Boulougouris, Prof D Vassalos, University of Strathclyde, UK</i>	Fast coordination of power electronics converters for energy routing in shipboard power systems <i>Dr H L Ginn, J Bakos, A Benigni, University of South Carolina, USA</i>
1000 – 1030	Turning data into reality <i>S Leinster-Evans, BAE Systems, UK; S Luck, BMT, UK; J Newell MBE, J2Consulting, UK</i>	Naval hybrid power take-off and power take-in – lessons learnt and future advances <i>Dr M Benatmane, B Salter, GE Power Conversion, UK</i>	Emissions reduction at The Netherlands Ministry of Defence: Potential, possibilities and impact <i>Prof Dr Ir R G van de Ketterij, Netherlands Defence Academy, The Netherlands</i>	Exergy analysis of ship power systems <i>Prof G Parker, E Trinklein, R D Robinett, Michigan Technological University, USA; T J McCoy, McCoy Consulting LLC, USA</i>
1030 – 1045	Discussion			
1045 – 1115	Coffee			

MORNING PARALLEL SESSIONS	INEC Digital transformation part 2	INEC UXV	INEC QEC Class	iSCSS Human factors
1115 – 1145	An investigation into contracted loaded tip propellers <i>N Williams, Plymouth University, UK</i> <i>(Sir Donald Gosling Award Candidate)</i>	Securing interoperable and integrated command and control of unmanned systems – building on the successes of Unmanned Warrior <i>Dr P Smith, Dstl, UK; W Biggs, QinetiQ, UK</i>	Capable, adaptable, flexible: The design of a cost-effective naval platform with focus on the increasing use of off-board assets <i>R Irvine, Babcock International Group, UK</i>	QEC the technical challenge <i>J K McKelvie, P Lakey, L3 MAPPS UK, UK</i>
1145 – 1215	Paper to be confirmed	JIP LAURA, ensuring future flexible off board capability in todays and tomorrows surface combatants <i>Dr M Robb, D Lewis, A Burgess, BAE Systems Maritime - Naval Ships, UK; D Smith, Naval Design Partnering Team, UK; Ir E H Takken, Defence Materiel Organisation, The Netherlands; Dr Ing F G J Kremer, Maritime Research Institute Netherlands (MARIN), The Netherlands</i>	OHMS Queen Elizabeth Aircraft Carrier: The challenges and successes of commissioning, trialling and delivering an integrated electric power and propulsion system <i>P Eaton, GE Power Conversion, UK; D Webster, Thales, UK</i>	No process for initiative <i>CPO G J Parkes, 1710 Naval Air Squadron, UK</i>
1215 – 1245	Digital – benefits for naval platforms <i>D R Chaderton, GE Power Conversion, UK</i>	Generational shift: How technology is shaping a step change in the future of mine counter-measures <i>J Rigby, J Johnson, D Ridgwell, BMT, UK; J McWilliams, QinetiQ, UK</i>	Learning lessons to de-risk future complex projects: Design and integration of the world's largest ship platform management system Queen Elizabeth Class Aircraft Carriers <i>M Williams, Thales Naval, UK</i>	Button it: Managing human factors requirement more effectively in expressed designs <i>Dr M J Cook, T Simpson, BAE Systems Submarines, UK</i>
1245 – 1300	Discussion			
1300 – 1415	Lunch			

1415 – 1445 Future concepts in multi-role ship design

D Smith, D Evans, Naval Design Partnering Team, UK

1445 – 1515 Integration of battle damage repair management in an Integrated Mission Management System

Lt Cdr F Geertsma RNLN, Defence Materiel Organisation, The Netherlands

1515 – 1545 Combat safety and survivability in the Royal Navy

D Manley, Ministry of Defence, UK

1545 – 1600 Discussion

1600 – 1615 Closing Summary

1615 – 1625 Presentation of the Sir Donald Gosling Award

1625 – 1630 Closing Remarks | *Capt Matt Bolton RN, Chairman, INEC 2018*

1630 Close of Conference
