



# inec 2014

12th International Naval Engineering Conference and Exhibition

## Innovative solutions to global trends

**Tuesday 20 – Thursday 22 May 2014**

Marine Establishment Amsterdam, the Netherlands

Organised by The Institute of Marine Engineering, Science and Technology (IMaREST)

### Conference themes:

- Effects of Trends on Defence
- Green Ship
- IPMS
- Ship Design
- Ship Systems
- Submarines
- Waste Heat Recovery
- Materials
- Human Factors
- UXV
- Simulation
- Signatures
- Gas Turbines
- Electrical Systems
- Maintenance

### INEC at a glance:

- Over 300 expert participants
- Over 75 peer-reviewed technical papers
- The Sir Donald Gosling Award
- 15 plus focussed exhibition stands
- International attendance from over 15 nations
- Excellent networking opportunities and social programme
- Industrial visit on Friday 23 May

“INEC continues to be the leading conference for the naval engineering community with a range of topics to appeal to a wide range of people, industries and nationalities” delegate from INEC 2012

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– see page 9

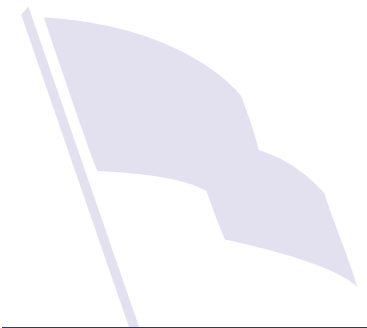
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**mER** maritime  
ELECTRONICS

## WELCOME



### Dear Delegate

It is perhaps feasible to predict some trends in seagoing operations, even if there are a number of potential scenarios but in other areas such as politics, the trends are very difficult to predict. So, the challenge before us is to design innovative engineering solutions to requirements that give us sufficient flexibility to respond to the most likely plausible scenarios.

Navies and the international defence industry have risen to the challenge set by INEC 2014 and a truly inspiring programme has been developed by the Technical Advisory Committee. The themes of the technical programme address the topics which most affect the maritime operating environment and require the best that our engineers and industry can provide whilst, of course, remaining within tight financial constraints.

As part of this response, the Sir Donald Gosling Award has attracted a record number of outstanding candidates and the award will culminate on the last afternoon of the conference when our Patron, Vice Admiral Sir Robert Hill KBE FREng HonFIMarEST will present the prizes.

The Royal Netherlands Navy, as always, has played a significant role in INEC 2014 and is hosting the conference and exhibition at the Marine Establishment Amsterdam. In addition, the RNLN have arranged for HNLMS Tromp, an Air-defence and Command Frigate (LCF) to be at the heart of our networking and industrial visit programme; a fascinating opportunity for all participants to visit this lean manned and novel designed naval ship.

I very much look forward to seeing you in May for INEC 2014.

**Commodore John Newell MBE RN**  
**INEC 2014 Conference Chairman**

## INEC OVERVIEW (subject to amendment)

### Tuesday 20 May 2014

**0800 Registration**

**0900 Opening Plenary Session**

**Chairman's Introduction**

*Cdre John Newell MBE RN, Ministry of Defence, UK*

**Keynote Addresses followed by plenary papers**

**1400 Afternoon Parallel Sessions**

**A: Green Ship B: IPMS C: Ship Design  
D: Ship Systems**

**1800 Close of sessions followed by Welcome Reception and Dinner**

### Wednesday 21 May 2014

**0800 Registration**

**0900 Morning Parallel Sessions**

**E: Submarines F: Waste Heat Recovery  
G: Materials H: Human Factors**

**1400 Afternoon Parallel Sessions**

**I: UXV J: Simulation K: Signatures  
L: Gas Turbines**

**1800 Conference Reception aboard HNLMS Tromp**

### Thursday 22 May 2014

**0800 Registration**

**0900 Morning Parallel Sessions**

**M: Ship Design N: Electrical Systems  
O: Maintenance**

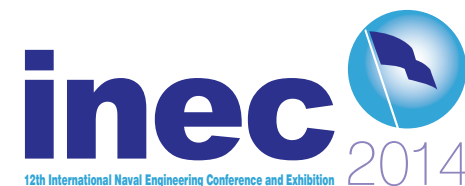
**1400 Afternoon Plenary Session**

**1600 Presentation of the Sir Donald Gosling Award**

**1630 Close of INEC 2014**

### Friday 23 May 2014

**Industrial Visit: HNLMS Tromp**



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## Who attends INEC?

Government attendance is typically drawn from navies and naval procurement officials from over 10 countries, at all levels between Lieutenant and Vice Admiral. Commercial attendance includes a range of companies from Prime Contractors to SMEs from over 20 countries.



## CONFERENCE NETWORKING EVENTS

### Welcome Reception and Dinner

At the end of day one all participants are cordially invited to a Welcome Reception and Dinner to be held at the Marine Establishment Amsterdam. This will give everyone an opportunity to visit the exhibition stands, ship models, poster displays and demonstrators before enjoying an informal dinner with colleagues, friends and new acquaintances.

### Conference Reception

The Conference Reception for INEC 2014 will be hosted by the Royal Netherlands Navy aboard HNLMS Tromp. This is a unique opportunity for all participants to visit this innovative class of ship and to learn more about the role of the Royal Netherlands Navy worldwide. HNLMS Tromp will be moored in Amsterdam and transportation will be

provided for all participants from the Marine Establishment Amsterdam at the close of sessions on day two.

### HNLMS Tromp (F803)

HNLMS Tromp is one of four De Zeven Provinciën-class Air-defence and Command Frigates (LCF) built by Damen Schelde Naval Shipbuilding. The Frigates perform two important roles: A command role in facilitating the operations of the deployable and operational staff, and providing anti air warfare (AAW) protection for an entire fleet. The most striking characteristics are the ships' stealth technology and high degree of automation of the ships' systems which means that they can be operated by a ship's company of just over 200.



## KEYNOTE SPEAKERS

### Vice Admiral Matthieu J M Borsboom, Commander of the Royal Netherlands Navy

Admiral Borsboom joined the Royal Netherlands Navy in 1978 as midshipman. He subsequently graduated as a Principal Warfare Officer and following a number of distinguished postings he moved to the Admiralty in The Hague. He was assigned to several strategic posts before being promoted in 2007 to Rear Admiral and became



Director of Operational Policy, Requirements and Plans. He was Deputy Chief of Staff Stability at ISAF Headquarters in Kabul, Afghanistan responsible for the lines of operation concerning governance and development in Afghanistan and the elections held within the country. Admiral Borsboom was promoted to Vice Admiral in January 2010 and was subsequently appointed Commander of the Royal Netherlands Navy.

### Vice Admiral Simon Lister CB OBE, Chief of Materiel (Fleet), Ministry of Defence, UK

Admiral Lister joined the Royal Navy in 1978 and studied Naval Engineering; following further periods of study he gained an MSc in Nuclear Engineering. He was the first Naval Officer to attend the Sloan Fellowship at the London Business School graduating with distinction, and subsequently he held a number of



strategic and performance management roles. A fluent Russian speaker, he was appointed Naval Attaché in Moscow in 2001. Following promotion to Rear Admiral he subsequently became Director Submarines and in 2011, he assumed responsibility as Chief Naval Engineer Officer. Promoted to Vice Admiral in 2013 he is responsible for all defence equipment and support outputs across ships, submarines and naval bases.

## CONFERENCE PROGRAMME (subject to amendment)

### TUESDAY 20 MAY 2014: AM

#### 0800 Registration and coffee

#### Opening Plenary Session

#### Effects of Trends on Defence

#### 0900 Chairman's Introduction

**Cdre John Newell MBE RN**, Ministry of Defence, UK;  
*INEC 2014 Conference Chairman*

#### 0915 Keynote Address

**Vice Admiral Matthieu J M Borsboom**, Commander of the Royal Netherlands Navy

#### 0945 Keynote Address

**Vice Admiral Simon Lister CB OBE**, Chief of Materiel (Fleet), Ministry of Defence, UK

#### 1015 Coffee

#### 1045 Change in RNLN technical domain

**Capt (E) J W Hartman RNLN**, Ministry of Defence, the Netherlands

#### 1115 Technology transfer and industrial participation in the context of cross-border naval platform trade

**C Forrester**, IHS Jane's, UK  
*(Sir Donald Gosling Award candidate)*

#### 1145 Unmanned naval aviation and its impact on future carrier design

**D Burger**, Steller Systems Ltd, UK  
*(Sir Donald Gosling Award candidate)*

#### 1215 Supporting the Royal Navy – The Surface Ship Support Alliance

**Capt S J Thompson RN**, Ministry of Defence, UK;  
**T Quaye**, BAE Systems, UK; **C Saxby**, Babcock Marine, UK

#### 1245 Discussion

#### 1300 Lunch

“A strong programme of presentations, networking opportunities and social informal events that allowed the theme to be explored and shared in full” *delegate from INEC 2012*

## TUESDAY 20 MAY 2014: PM PARALLEL SESSIONS

A: Green Ship		B: IPMS	C: Ship Design
<b>1400</b>	<b>QUEEN ELIZABETH Class Aircraft Carriers – Integrated Waste Management System</b> <i>P Lamb, Ministry of Defence, UK; M Caddy, BMT Defence Services Ltd, UK</i>	<b>Experiences on implementation of advanced automation support within the Royal Netherlands Navy</b> <i>Lt Cdr R D Geertsma RNLN, Ing P J Verdult, Lt F J Driegen RNLN, Defence Materiel Organisation, the Netherlands</i>	<b>Enabling the Arctic Pivot – strategies, mitigating circumstances, and necessary requirements for success</b> <i>A Dalianis, H Marshall, Herren Associates, USA (Sir Donald Gosling Award candidates)</i>
<b>1430</b>	<b>A Future Green Navy – managing environmental expectation on naval ships</b> <i>A Laird, L Ledingham, J Goodship, BAE Systems Maritime – Naval Ships, UK (Sir Donald Gosling Award candidates)</i>	<b>Enabling a successful IPMS delivery utilising a collaborative systems approach, whilst working in an Alliance environment</b> <i>H Escott, L-3 Communications Marine Systems UK Limited, UK; Cdr T Drywood RN, Ministry of Defence, UK</i>	<b>Implications of Ice Class for an Offshore Patrol Vessel</b> <i>R Braithwaite, D Khan, Naval Design Partnership, UK</i>
<b>1500</b>	<b>The green ship challenge – “Delivering more with less”</b> <i>Cdr J J Bailey RN, Lt Cdr R J Hardy RN, Ministry of Defence, UK</i>	<b>The advantageous use of serial data links to deliver greater capability for Type 26 IPMS</b> <i>K L Meikle, G Barnett, BAE Systems Maritime – Naval Ships, UK</i>	<b>Marine Engineering challenges for Trimaran Small Waterplane Area Centre Hull (TriSWACH) Warships</b> <i>Dr A Greig, E Muk-Pavic, Dr R Pawling, University College London, UK</i>
<b>1530</b>	<b>Discussion</b>		
<b>1545</b>	<b>Tea</b>		
A: Green Ship – continued		B: IPMS – continued	D: Ship Systems
<b>1615</b>	<b>Surface ship energy posture: Short and long term strategies for reducing US surface navy fuel consumption</b> <i>T Levac, T Sullivan, C Grocki, Herren Associates, USA (Sir Donald Gosling Award candidates)</i>	<b>Application of network theory in a marine engineering context: Generating network topologies</b> <i>P de Vos, Delft University of Technology, the Netherlands (Sir Donald Gosling Award candidate)</i>	<b>Central cooling systems for warships</b> <i>Y Abbas, C Lyster, R Steward, Babcock International Group, UK</i>
<b>1645</b>	<b>CO2 Reduction Design Strategies for Naval Ships</b> <i>Lt B W Michalchuk RCN, UK; Prof R W G Bucknall, University College London, UK</i>	<b>Distributed Intelligent Networked Control Systems (DINCS) applied to a whole ship integrated Platform Management System (PMS)</b> <i>Lt S J M van Osch RNLN, Ministry of Defence UK; P Worthington, W Galloway, BAE Systems, UK; Lt Cdr R D Geertsma RNLN, Defence Materiel Organisation, the Netherlands; J A A J Janssen, C S Smit, TNO, the Netherlands</i>	<b>Considerations in the design of emergency fire pump capability in modern naval auxiliary platforms</b> <i>A Mason, BMT Defence Services Ltd, UK (Sir Donald Gosling Award candidate)</i>
<b>1715</b>	<b>MARIN’s perspective on future trends in ships, offshore and operations at sea</b> <i>Ir J H de Jong, MARIN, the Netherlands</i>	<b>A functional approach to the integration of combat and platform systems</b> <i>Capt Dr F Bolderheij, Netherlands Defence Academy, the Netherlands</i>	<b>New technologies for fire suppression on board naval craft, FiST</b> <i>M Rahm, T Hertzberg, J Lindström, SP Technical Research Institute of Sweden, Sweden; R van der Wal, TNO, the Netherlands; J Hiltz, Defence R&amp;D Canada Atlantic, Canada</i>
<b>1745</b>	<b>Discussion</b>		
<b>1800</b>	<b>Welcome Reception and Dinner, Marine Establishment Amsterdam</b>		

## WEDNESDAY 21 MAY 2014: AM PARALLEL SESSIONS

### 0800 Registration and coffee

E: Submarines	F: Waste Heat Recovery	H: Human Factors
<b>0900 A comparison of energy storage methods for conventional diesel-electric submarines</b> <i>R J van de Mheen RNLN, Defence Materiel Organisation, the Netherlands; I Whitelegg, Ministry of Defence, UK</i> <i>(Sir Donald Gosling Award candidates)</i>	<b>Advanced CO2 heat recovery for tomorrow's energy efficient ships</b> <i>Dr E Maxeiner, Echogen Power Systems, USA; S Maynard, GE Marine, USA</i>	<b>Provision of appropriate human machine interface at remote, local and in-between</b> <i>K L Meikle, BAE Systems Maritime – Naval Ships, UK</i> <i>(Sir Donald Gosling Award candidate)</i>
<b>0930 The UK Submarine Dismantling Project and the Initial Dismantling Phase</b> <i>M Donnington, Babcock International Group, UK</i> <i>(Sir Donald Gosling Award candidate)</i>	<b>Waste heat recovery on naval platforms</b> <i>R Fearnley, BMT Defence Services Ltd, UK</i>	<b>Human factors and human behaviour in the safety management of warships</b> <i>Cdr M T W Bolton RN, Ministry of Defence, UK; A Bennett, Institute of Naval Medicine, UK</i>
<b>1000 Vanguard life extension – a holistic approach to submarine ageing and life extension</b> <i>N Dewey, Babcock International Group, UK</i> <i>(Sir Donald Gosling Award candidate)</i>	<b>Comparison of Ship Plant Layouts for Power and Propulsion Systems with Energy Recovery</b> <i>G Benvenuto, A Trucco, U Campora, University of Genoa, Italy</i>	<b>Human factors in operational maintenance on future naval vessels</b> <i>Dr W M Post, M L W Rakhorst, Dr J van Diggelen, TNO Human Factors, the Netherlands; J C Schreurs, N A Badon-Ghijben, Defence Materiel Organisation, the Netherlands</i>

### 1030 Discussion

### 1045 Coffee

E: Submarines – continued	G: Materials	H: Human Factors – continued
<b>1115 “How to Exploit Fundamental Design Modularity to obtain Cost-Effect Life Extension and Through-Life Capability Management for Submarines”</b> <i>K Gravil, C Hayes, Frazer-Nash Consultancy Ltd, UK; A Mistry, Babcock International Group, UK</i> <i>(Sir Donald Gosling Award candidates)</i>	<b>Controlling costs for corrosion protection</b> <i>G M Ferrari, J W Klijstra, TNO, the Netherlands; H Bakuwel, C van Sevenhoven, Defence Materiel Organisation, the Netherlands</i>	<b>Understanding whole body vibration exposures on high speed marine craft</b> <i>Dr T Coe, P King, J Hirst, Naval Design Partnering Team, UK</i> <i>(Sir Donald Gosling Award candidates)</i>
<b>1145 In search for the best design – A coherent design methodology for submarines during the early phases</b> <i>Cdr (E) M Nordin, Swedish Defence Research Agency, Sweden</i>	<b>Novel corrosion monitoring using electrochemical noise</b> <i>A M Homborg, Royal Netherlands Navy, the Netherlands</i> <i>(Sir Donald Gosling Award candidate)</i>	<b>Consequences of bridge alert management on integration of bridge systems</b> <i>Dr Ir P G M van der Klugt, Ing S M Kransse, Imtech Marine Netherlands BV, the Netherlands; KLTZE J C Schreurs RNLN, LTZT1 R D Geertsma RNLN, Ministry of Defence, the Netherlands</i>
<b>1215 Trading submarine platform mobility and procurement cost: a concept design study</b> <i>Dr N Bradbeer RCNC, University College London, UK</i> <i>(Sir Donald Gosling Award candidate)</i>	<b>Strengthening of metallic structures using proven composite repair methods and innovative non destructive examination techniques</b> <i>M Sansom, B Munro, Babcock International Group, UK</i>	<b>Towards comfort in crew habitability onboard ships</b> <i>A A Ali, Arab Academy for Science, Technology and Maritime Transport, Egypt; Prof A F Elsafty, American University of the Middle East (AUM), Kuwait</i>

### 1245 Discussion

### 1300 Lunch

## WEDNESDAY 21 MAY 2014: PM PARALLEL SESSIONS

I: UXV	J: Simulation	K: Signatures
<b>1400 UXV enabled totally modular combatant</b> <i>R Skarda, R Goddard, Steller Systems Ltd, UK</i>	<b>Advanced power management controllers for marine applications</b> <i>S M Mankevich, P E Stone, GE Energy Power Conversion, USA</i>	<b>Challenges in development of low noise and vibration blowers for submarine</b> <i>G Ramakrishna Reddy, Venn Tech (P) Ltd, India; Cdre (Dr) R K Rana, Lloyd's Register Asia, India</i>
<b>1430 Development overview of a launch and recovery system standardization</b> <i>Dr F G J Kremer, MARIN, the Netherlands; E Takken, Defence Materiel Organisation, the Netherlands</i>	<b>An insight into the theoretical modelling and analysis of arc flash in legacy platforms, and considerations for future designs</b> <i>C Pollard, BMT Defence Services Ltd, UK (Sir Donald Gosling Award candidate)</i>	<b>Management of signature in large electrical machines – a longitudinal view</b> <i>C Lewis, K Waried, B Salter, GE Power Conversion, UK</i>
<b>1500 Navigation of unmanned vessels – history, enablers, challenges and potential solutions</b> <i>Prof Dr Ir E Theunissen, Netherlands Defence Academy, the Netherlands</i>	<b>Dynamic simulation as a tool to integrate, verify and optimise hybrid propulsion control systems</b> <i>M J de Boer, I S Hardy, Damen Schelde Naval Shipbuilding, the Netherlands</i>	<b>Operational Ship Signature Management System (OSSMS)</b> <i>H Hasenpflug, Centre for Ship Signature Management, the Netherlands; M Fehr, Centre for Ship Signature Management, Germany</i>
<b>1530 Discussion</b>		
<b>1545 Tea</b>		
I: UXV - continued	J: Simulation - continued	L: Gas Turbines
<b>1615 How will the UK test, evaluate and certify truly autonomous marine capabilities?</b> <i>D Venn, A Higgins, QinetiQ Maritime, UK</i>	<b>Propulsion simulation: Total system analysis by integration of mechatronics and CFD</b> <i>W Sichermann, F Oberhokamp, C Thieme, ThyssenKrupp Marine Systems, Germany</i>	<b>LM6000 Mechanical Drive Gas Turbine: Operations with a direct-coupled low pressure turbine in Naval mechanical drive applications</b> <i>Capt J S Maynard USN (ret), D Nelson, GE Marine, USA</i>
<b>1645 Rotary wing unmanned aerial system, maritime capability</b> <i>C Day, Schiebel Elektronische Geraete GmbH, Austria</i>	<b>Maintaining a continuous service with a limited number of critical assets</b> <i>R Jarman, C Hill, Babcock International Group, UK (Sir Donald Gosling Award candidates)</i>	<b>Re-writing the propulsion rule book for the 21st Century</b> <i>R Partridge, B Thorp, Rolls-Royce plc, UK</i>
<b>1715 Discussion</b>		
<b>1730 Close of sessions</b>		
<b>1800 Conference reception aboard HNLMS Tromp</b>		

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## THURSDAY 22 MAY 2014: AM PARALLEL SESSIONS

### 0800 Registration and coffee

M: Ship Design	N: Electrical Systems	O: Maintenance
<b>0900 Design and mission modularity – The Damen Schelde approach</b> <i>R Hoogenboom, K Audenaert, R Brouwer, Damen Schelde Naval Shipbuilding, the Netherlands</i>	<b>DC: The alternative choice for naval power distribution</b> <i>O J Simmonds, GE Power Conversion, UK (Sir Donald Gosling Award candidate)</i>	<b>Application of innovative predictive maintenance concepts to improve life cycle management</b> <i>Prof T Tinga, Netherlands Defence Academy, the Netherlands</i>
<b>0930 Modern flexible operational mission modularity for naval vessels</b> <i>K P Katenkamp, ThyssenKrupp Marine Systems, Germany</i>	<b>Comparison of DC vs AC via ship electric grid emulators</b> <i>Prof J Prousalidis, H Patsios, Y Tsourakis, S Dallas, G Antonopoulos, National Technical University of Athens, Greece; P Katsikas, N Karlovits, V Georgiou, Protasis SA, Greece</i>	<b>Testing of naval systems in the global environment</b> <i>P Norton, GE Power Conversion, UK</i>
<b>1000 Squat effect investigations using a submarine model test</b> <i>S Kim, National Defence Headquarters, Canada; M He, G Hermanski, G Savage, J Millan, National Research Council, Canada</i>	<b>Technology development from the advanced propulsion motor project</b> <i>Lt D J Blatcher RN, Ministry of Defence, UK (Sir Donald Gosling Award candidate)</i>	<b>Type 26 Global Combat Ship Support Solution Decision Point Project</b> <i>Cmdr G Price RAN, P Kyte, Ministry of Defence, UK; D Wilson, Frazer-Nash Consultancy Ltd, UK; Dr P J Rottier, The MathWorks, UK</i>
<b>1030 Discussion</b>		
<b>1045 Coffee</b>		
M: Ship Design – continued	N: Electrical Systems – continued	O: Maintenance – continued
<b>1115 Innovation in the hydrodynamic support for design of submarines</b> <i>B Overpelt, MARIN, the Netherlands (Sir Donald Gosling Award candidate)</i>	<b>Is IFEP a realistic future propulsion system for flexible warships?</b> <i>G Gemmell, B McIntyre, M Reilly, BAE Systems Surface Ships Ltd, UK (Sir Donald Gosling Award candidates)</i>	<b>Operational maintenance &amp; repair</b> <i>Cdr N Boyd RN, Ministry of Defence, UK</i>
<b>1145 The use of vertical axis wind turbines for better energy utilisation of naval ships</b> <i>M O'Connor, MOConnor Marine Design, Australia (Sir Donald Gosling Award candidate)</i>	<b>Interaction between superconducting and normal degaussing coils</b> <i>O J G Somsen, G P M Wagemakers, R Hunik, R Ross, Netherlands Defence Academy, the Netherlands</i>	<b>Operational maintenance support in a changing technical domain</b> <i>Cdr Ing D J M Meijer RNLN, Cdr Ing G M Walraven RNLN, Cdr J C Schreurs RNLN, Defence Materiel Organisation, the Netherlands</i>
<b>1215 Wave piercing monohulls for offshore and military applications</b> <i>P van Diepen, NAVMAR Technologies, Canada</i>	<b>The harmonic analysis of machine phase windings and its application to marine propulsion motors</b> <i>Prof C Hodge FREng, BMT Defence Services Ltd, UK; Prof F Eastham FREng FRSE, Bath University, UK</i>	<b>Warship through life support – The future challenge</b> <i>I Cowper, Babcock International Group, UK</i>
<b>1245 Discussion</b>		
<b>1300 Lunch</b>		



# CONFERENCE PROGRAMME (subject to amendment)

## THURSDAY 22 MAY 2014: PM

### Closing Plenary Session

- 1400 Shipboard electric plant architecture design: A historical perspective with vision toward the future**

**T Dalton**, BMT Syntek Technologies, USA; **Dr T J McCoy**, McCoy Consulting LLC, USA

- 1430 Type 45 Destroyer full electric propulsion – Lead act or a step too far?**

**R Bolwell**, **Lt A Allen RN**, **Cdr M Douglas RN Rtd**, Ministry of Defence, UK

- 1500 Analysing potential military utility of landing craft by ship-to-shore manoeuvre modelling**

**R A Logtmeijer**, **S R Otten**, Defence Materiel Organisation, the Netherlands; **Maj H J de Vries**, **Capt K D Budde**, Royal Netherlands Marine Corps, the Netherlands; **Lt Col J M Slack**, Royal Marines, UK

- 1530 Discussion**

- 1545 Closing summary**

- 1600 Presentation of the Sir Donald Gosling Award**

Presented by **VAdm Sir Robert Hill KBE FREng HonFIMarEST**

- 1615 Closing remarks**

**Cdre John Newell MBE RN**, Ministry of Defence, UK, INEC 2014 Conference Chairman

## FRIDAY 23 MAY 2014

### Industrial visit

An unprecedented opportunity has been offered by the Royal Netherlands Navy for INEC delegates to join the crew of HNLMS Tromp to make a short journey from Amsterdam. Delegates interested in joining this unique Industrial Visit should indicate appropriately using the box provided on the registration form. Please note that this Industrial Visit is subject to operational demands of the ship. The number of attendees is limited and will be offered on a first come first served basis; additional personal security information may be requested.

## POSTERS

### Reducing maintenance costs by innovating up from the shop floor – Proven techniques from the maintenance line that will show on the bottom line

**P Drayton**, Newton, UK

### Dutch National Technology Project Holon

**A A F Bloemen**, TNO Defence, the Netherlands

### Goal based regulation – The NATO Naval Ship Code

**P James**, Lloyd's Register EMEA, UK

### Knowledge Management – cost effective management of the technical datum pack

**P Crago**, **I Witt**, Babcock International Group, UK

### Ageing and degradation of electrical cables in Naval Ships

**Dr R W Meggs**, BMT Defence Services Ltd, UK

### The engine or the weapon? The case for using operations analysis during the early stage design and procurement of warships

**Dr B van Oers**, **R Logtmeijer**, Defence Materiel Organisation, the Netherlands

### IAQ in ships vehicle garage

**N A Nasr**, Arab Academy for Science, Technology and Maritime Transport, Egypt; **Prof A F Elsafy**, American University of the Middle East (AUM), Kuwait

### A table top setup for experimental magnetic signature detection

**G P M Wagemakers**, **O J G Somsen**, Netherlands Defence Academy, the Netherlands

### Managing the risks associated with emerging UMS technology

**J Williams**, **P Upshall**, **J Lockett**, Frazer-Nash Consultancy Ltd, UK

### Health and usage monitoring systems: Enabling the future prediction of remaining useful life in submarines

**Dr D Flynn**, **D Lofting**, **G Fagogenis**, **Prof D Lane**, **Dr P Record**, **D Herd**, Heriot-Watt University, UK; **N Skinner**, MacTaggart Scott Ltd, UK

## Venue and security

INEC 2014 will be held at the Marine Establishment Amsterdam, Kattenburgerstraat 7, 1018 JA Amsterdam, the Netherlands; this venue requires all attendees to carry photographic ID at all times. Delegates may be asked to provide additional personal data prior to the conference for security purposes. Please note that no photography is permitted around the Marine Establishment, except within the Conference Centre buildings. Map and directions can be accessed online at [www.imarest.org/inec](http://www.imarest.org/inec). All delegates are responsible for making their own travel and accommodation arrangements.

## Hotel accommodation

Special rates for INEC 2014 have been arranged with Efficient Hotel Partner; please access the online web portal via the INEC 2014 webpage [www.imarest.org/inec](http://www.imarest.org/inec) or email [mail@hotelpartner.nl](mailto:mail@hotelpartner.nl). A limited number of rooms on a bed and breakfast basis are available at the Marine Establishment Amsterdam; this accommodation is only available to naval delegates or those employed in a defence role for Government. Please indicate on the registration form to receive further information.

## Dress code

All Dutch serving naval personnel are required to wear uniform throughout the duration of INEC; all serving naval officers from other navies are kindly requested to wear uniform, particularly on Tuesday 20 May.

## Partners' programme

Accompanying guests are an important part of INEC 2014; it is hoped that many will attend for the three days and enjoy the networking programme. Accompanying guests of registered participants are invited to join the Welcome Reception and Dinner, and the Conference Reception. Guests may wish to join a small informal group to sample the many attractions of Amsterdam, please indicate your interest on the registration form and further details will be supplied nearer the date of the conference. All partners must register due to the security requirements of the Marine Establishment Amsterdam.



# REGISTRATION FORM

20 – 22 May 2014, Marine Establishment Amsterdam

Save €148 if you register by 8 April 2014

Priority code: IN14/v1

## Enquiries and 4 easy ways to register

- 1 ☎ +44 (0)20 7382 2702
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- 3 @ events@imarest.org
- 4 ✉ IMarEST Conferences, Aldgate House,  
33 Aldgate High Street, London EC3N 1EN, UK

## Delegate details

Please print clearly or attach business card. Photocopy this form for further delegates.

Surname \_\_\_\_\_

Title (Prof, Mr, Dipl Ing, Cdr) \_\_\_\_\_ Initials \_\_\_\_\_

First name \_\_\_\_\_

Name for badge \_\_\_\_\_

Nationality \_\_\_\_\_

Job title \_\_\_\_\_

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\_\_\_\_\_

ZIP/postcode \_\_\_\_\_ Country \_\_\_\_\_

Tel \_\_\_\_\_ Fax \_\_\_\_\_

Mobile \_\_\_\_\_

Email \_\_\_\_\_

Company website \_\_\_\_\_

How do you wish to receive future communication? ☐ Email ☐ Post

IMarEST/SNAME Member ☐ Yes ☐ No If yes, Membership no. \_\_\_\_\_

If no, you will receive complimentary membership of IMarEST until the end of the subscription year (30 September 2014) with a complimentary MER and other membership services.  
(Applies to 3-day attendees only.)

## Conference registration fees - Save €148 if you register by 8 April 2014 (fees include Dutch VAT at 21%)

DELEGATES 3 day attendance	Bookings received before 8 April 2014	Bookings received after 8 April 2014	1 day delegate attendance <input type="checkbox"/> Tuesday <input type="checkbox"/> Wednesday <input type="checkbox"/> Thursday
IMarEST/SNAME Member	<input type="checkbox"/> €1,298	<input type="checkbox"/> €1,446	<input type="checkbox"/> €798
IMarEST Marine Partner/supporting organisations/academics	<input type="checkbox"/> €1,558	<input type="checkbox"/> €1,706	<input type="checkbox"/> €958
Non-member IMarEST	<input type="checkbox"/> €1,958	<input type="checkbox"/> €2,106	<input type="checkbox"/> €1,158

AUTHORS NB: The day your paper is presented is free of charge	Bookings received before 8 April 2014	Bookings received after 8 April 2014	The Author fees listed, apply to each additional day's attendance
IMarEST/SNAME Member	<input type="checkbox"/> €598	<input type="checkbox"/> €746	<b>Authors</b> - Please select the days you will be attending <input type="checkbox"/> Tuesday <input type="checkbox"/> Wednesday <input type="checkbox"/> Thursday
IMarEST Marine Partner/supporting organisations/academics	<input type="checkbox"/> €658	<input type="checkbox"/> €806	
Non-member IMarEST	<input type="checkbox"/> €758	<input type="checkbox"/> €906	

CONCESSIONS	<input type="checkbox"/> €158	Includes retired members of IMarEST and students. All students must provide proof of student status from their head of department.
<b>PARTNER'S REGISTRATION</b> <input type="checkbox"/> €120 Includes opening and closing plenary sessions and networking programme		
Mr/Mrs/Ms etc _____ Surname _____ Initials _____		
Name for badge _____	<input type="checkbox"/> Please tick box if you would be interested in joining an informal tour	
Nationality _____		

<b>Total payable €</b>	
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## Parallel sessions (tick one/two boxes per line to select choice of sessions)

<b>TUESDAY 20 MAY 2014</b> Afternoon Parallel Sessions	<input type="checkbox"/> A: Green Ship	<input type="checkbox"/> B: IPMS	<input type="checkbox"/> C: Ship Design <input type="checkbox"/> D: Ship Systems
<b>WEDNESDAY 21 MAY 2014</b> Morning Parallel Sessions	<input type="checkbox"/> E: Submarines	<input type="checkbox"/> F: Waste Heat Recovery <input type="checkbox"/> G: Materials	<input type="checkbox"/> H: Human Factors
<b>WEDNESDAY 21 MAY 2014</b> Afternoon Parallel Sessions	<input type="checkbox"/> I: UXV	<input type="checkbox"/> J: Simulation	<input type="checkbox"/> K: Signatures <input type="checkbox"/> L: Gas Turbines
<b>THURSDAY 22 MAY 2014</b> Morning Parallel Sessions	<input type="checkbox"/> M: Ship Design	<input type="checkbox"/> N: Electrical Systems	<input type="checkbox"/> O: Maintenance

## PAYMENT

- ☐ Please invoice
- ☐ VAT receipt (Dutch VAT registration number NL 823 7728 58 B01)
- ☐ Cheque in Euro payable to IMarEST
- ☐ Bank transfer payable to IMarEST. Barclays Bank, 1 Churchill Place, London E14 5HP, UK  
Bank Sort Code 207767 Account Number 70517291 Ref: INEC14 + delegate surname  
SWIFT Code: BARCGB22 IBAN no. GB46BARC20776770517291
- ☐ Credit Card (please fill in details below)  
The total fee due will be debited in full on receipt of your registration form
- ☐ Visa Debit Card ☐ Visa ☐ Mastercard

Card no

Card holder's name

Expiry date

Start date

Issue number (if applicable)

Security Code

Address at which card is registered

Signature

### Industrial Visit

- ☐ Please tick the box if you would like to be considered for the Industrial Visit aboard HNLMS Tromp on Friday 23 May 2014. Provisional itinerary: HNLMS Tromp will depart Amsterdam mid-morning. Participants will be required to make their own return travel arrangements from the final destination; transportation will be provided to the nearest mainline train station if required.

### Additional requirements

- ☐ Vegetarian/special dietary meals (please specify)
- ☐ Access requirements (please specify)
- ☐ I would like to apply for accommodation at the Marine Establishment Amsterdam, I understand that by ticking the box, I will receive further information and a booking form

### Registration and fees

To register, please complete and return this form together with the chosen payment method. The completion of the registration form constitutes a confirmed booking. Fees cover Dutch VAT at 21%, participation in the technical sessions, administration, documentation and refreshments including lunch and the networking programme. Registrations received before 8 April 2014 will be eligible for an early bird discount. You will receive a confirmation email, an invoice or VAT receipt and further information following receipt of your registration form. Please contact IMarEST Events (events@imarest.org; +44 (0)20 7382 2702) if you do not receive confirmation.

### Group discounts

Group discounts may be available for bookings of 5 or more delegates, registering at the same time from the same organisation to qualify for a discount. Group discounts apply to the 3 day registration fees only. Contact Christine Martin: conferences@imarest.org.

### Cancellations

Cancellation of a registered place must be received in writing no later than 17 April 2014; a charge of €120 + VAT will be made for cancellations received before this date. It is regretted that no refunds will be issued after this date but substitute delegates are welcome.

### Continuing Professional Development (CPD)

All delegates will be sent a CPD certificate after the event.

### Technical papers and programme

Papers will be presented in English, with time allocated for questions and discussion. Each registered attendee will receive a hard copy of the proceedings containing each full technical paper (available at the time of printing).

### Enquiries

For further information contact: IMarEST Conferences

☎ +44 (0)20 7382 2702

@ events@imarest.org

🌐 www.imarest.org/inec

### Data Protection Act 1998

- ☐ Please tick this box if you do not wish to receive further information from IMarEST. Your details will not be shared with external or third parties. If you have any questions, please write to the Database Manager, IMarEST, Aldgate House, 33 Aldgate High Street, London EC3N 1EN, UK; email events@imarest.org.

**“ INEC is one of the most informative and best organised conferences in Europe ” delegate from INEC 2012**

## FURTHER INFORMATION

### INEC 2014 Technical Advisory Committee

#### Conference Chairman

Cdre John Newell MBE RN, Ministry of Defence, UK

#### Committee Members

Jens Ballé, ThyssenKrupp Marine Systems GmbH, Germany; Cdr Matt Bolton RN, Ministry of Defence, UK; Capt Mark Dannatt RN (Rtd), GE Power Conversion; Lt Alex Davies RN, Ministry of Defence, UK; Frans de Wildt, ProRail, the Netherlands; Ian Grant, QinetiQ; Dr Alistair Greig, University College London; Tim Hardy, BMT Defence Services Ltd; Dr Michael Harper, Office of Naval Research Global; Lt Cdr Ian Hassall RN, Ministry of Defence, UK; Lt Cdr André Hertsberg RNLN, Royal Netherlands Navy; Keith Howard, Babcock International Group; Simon Knight, Babcock International Group; Lt Cdr Hugh Maddison RN, Ministry of Defence, UK; Paul Maillardet, Ministry of Defence, UK; Dr Phil Rottier, The MathsWorks Limited; Cdr Dr Paul Schulten RNLN, Netherlands Defence Academy; Prof Douwe Stapersma, Netherlands Defence Academy; Cdr John Voyce RN, Ministry of Defence, UK

#### Patrons

Vice Admiral Sir Robert Hill KBE FREng HonFIMarEST; Rear Admiral (Ret) Ruurd Lutje Schipholt KNL OON HonFIMarEST; Rear Admiral Dr Arie Jan de Waard; Commodore (Dr) Rakesh K Rana; Tony Graham RCNC

### Sir Donald Gosling Award

The IMarEST is delighted to announce that Sir Donald Gosling has, once again, given his patronage of the Sir Donald Gosling Award to be presented at INEC 2014. Sir Donald has long been a strong supporter of the Royal Navy and his award, for authors aged 35 or under, aims

to encourage involvement and attendance from younger participants from the military, industry and academia, allowing them to demonstrate a fresh and imaginative approach, together with ingenuity, in delivering a practical proposal which contributes to improved future naval operations and support.

The award ceremony will take place on the final day; there will be three prizes, a first prize of £5,000; a second prize of £2,500; and a third prize of £1,500.

### INEC 2014 Sponsorship and exhibition

INEC 2014 is the ideal platform to promote your company and reach potential customers directly – both face to face with delegates and to the wider audience who see IMarEST's promotional material.

#### Exhibition

A supporting exhibition will be held in conjunction with the conference enabling companies to exhibit their latest products to the most senior naval and maritime decision makers.

Shell scheme stands include:

- Carpet
- Exhibitor name board
- 2 spot lights (per stand)
- 1 table
- 2 chairs
- 1 main power socket (230v/1kw max)
- 2 exhibitor passes (not available for conference access)
- Listing on the INEC 2014 website

#### Stand rates

Space only €413 per sqm ex VAT

Shell €530 per sqm ex VAT

Corner stands €560 per sqm ex VAT

There is limited space at the venue, so stands will be allocated on a first come first served basis. If your organisation is interested in exhibiting or sponsoring at INEC, please visit our website for further details:

**[www.imarest.org/inec](http://www.imarest.org/inec)**

#### Contact Cheryl Fraser

+44 (0)20 7382 2627

@ [cheryl.fraser@imarest.org](mailto:cheryl.fraser@imarest.org)

## Forthcoming IMarEST Events

### 1st Ballast Water Technology Asia Conference

20 MARCH 2014, Marina Bay Sands, Singapore

### 3rd Ballast Water Technology Conference

27-28 MARCH 2014, London, UK

### 111th IMarEST Annual Dinner

28 MARCH 2014, London, UK

### European International Submarine Races

7-11 JULY 2014, Gosport, UK

### 2nd Offshore Oil and Gas Engineering Conference

10-11 SEPTEMBER 2014, Houston, USA

### 5th Condition Based Maintenance Conference

23-24 SEPTEMBER 2014, London UK

### 5th Ship Propulsion Systems Conference

25-26 NOVEMBER 2014, London, UK

### INEC@IMDEX Asia 2015

19-21 MAY 2015, Singapore

### European International Submarine Races (eISR)

The second biennial European International Submarine Race (eISR) will be held from the 7-11 July 2014 in Gosport, England. Teams of University students will race their human-powered submarines against the clock around a demanding slalom course in a unique sporting and engineering challenge.

### Master classes, Graduate Fair and VIP day

The companies and organisations that are sponsoring the European International Submarine Races are looking specifically to meet and recruit young graduate engineers. They and the Race Organisers are joining together to provide an opportunity for this to happen: the Underwater Technology Masterclasses and Graduate Fair which is taking place on 9 July 2014.

**For further information visit: [www.subrace.eu](http://www.subrace.eu)**



*James Horton  
from Frazer-Nash  
Consultancy  
winning the  
2012 Sir Donald  
Gosling Award*



# MER

Marine Engineers Review (MER) published ten times a year by the Institute of Marine Engineering, Science and Technology, is dedicated to the seagoing engineer, engineering superintendent and technical manager/director. Each issue highlights all the major elements associated with marine propulsion technology including main engines and auxiliaries, drive systems, fuel and lubricants etc. The focus is also on critical operations, advancements, machinery problems and solutions, and the latest regulations in the merchant and naval arena across a wide range of vessel types. MER, is perhaps the most informative technical industry journal available worldwide with an audited circulation of 10,815 (ABC Jan-Dec 2011). A supplement 'Directory of Marine Diesel Engines' is published annually.

## maritime ELECTRONICS

Maritime IT & Electronics keeps you informed on IT, satcoms and other technologies in the marine industry. As communications and IT systems throughout the maritime sector grow ever more important and ever more complex, Maritime IT & Electronics (MITE) delivers comprehensive and authoritative coverage of the technological advances which are impacting on the industry today - both on board ship and ashore. The core themes of satellite communications, navigation and back-office software feature prominently in every issue, accompanied by a selection of features highlighting the wider impact of digital technology through every stage of the maritime business cycle. Objective editorial explains the latest innovations in an easy-to-digest and accessible fashion, while taking care not to confuse the non-specialist readers with unintelligible jargon. MITE draws tangible conclusions on the potential of new technology to boost vessel safety, fleet efficiency and the commercial bottom-line.

# IMarEST Membership

Come and join *the* network of 15,000 marine professionals around the globe

## About Us

The IMarEST is the leading international membership body for marine professionals. With 15,000 members, we bring together marine engineers, scientists and technologists in over 100 countries into one multidisciplinary professional body.

We provide opportunities for the exchange of ideas and practices across industry sectors and uphold the status, standards and expertise of dedicated marine professionals worldwide.

In addition we represent our members at international level, consulting on Marine Laws & Governance and work towards creating a world where marine resources & activities are sustained, managed and developed for the benefit of humanity.

## Information & Resources

A key responsibility for the Institute is to validate, safeguard and share, professional learnings and provide recognition for those who provide them. The digital revolution has made keeping members up to date much easier and we connect online wherever possible.

### News & Thought Leadership

Providing a number of ways for members to stay in touch with industry developments.

**Learned journals:** collate latest sector specific papers & insights. **Industry magazine subscription:** stay informed on progress within your sector. **Quarterly newsletters:** provide industry commentary & perspective.

**Events and Conferences:** bringing professionals together to share in discussions, insight and contacts.

## Your Professional Development

Professional capabilities in any field are built on work experience beyond academic qualifications and professional qualifications (e.g. becoming Chartered) acknowledges the value of those skills.

It also aids your Initial and Continuing Professional Development (IPD and CPD) to focus, structure & develop your career. Whether your priorities are to keep abreast of evolving technologies, work across disciplines or improve management skills, building your IPD or CPD provides a framework of development. To find out more please visit [www.imarest.org/GrowWithUs](http://www.imarest.org/GrowWithUs)

## Join a Network of Global Marine Professionals

Get started in three easy steps:

- 1 Log onto [www.imarest.org/JoinUs](http://www.imarest.org/JoinUs)
- 2 Complete the short online form
- 3 Start receiving all the benefits of being an IMarEST member

Alternatively, please email [membership@imarest.org](mailto:membership@imarest.org) or call +44 (0) 20 7382 2694

PROFESSIONAL DEVELOPMENT FOR THOSE ABOVE AND BELOW THE WATERLINE

[www.imarest.org](http://www.imarest.org)