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28 October 2011

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IMarEST Marine Arc Flash Conference

**Preventing the arc flash hazard in ships
and ensuring a safe environment**

Tuesday 8 November 2011

America Square Conference Centre, London EC3

Official Publications

MER ShippingWorld
& Shipbuilder

Offshore
Technology

This conference
is eligible for

CPD

Continuing
Professional
Development

The aim

The arc flash hazard is beginning to be addressed in land-based industries and considerable research has gone into developing standards which allow the calculation of heat flux and advises on suitable personnel protection.

The aim of this technical conference is to help raise awareness of the arc flash hazard to ship operators, owners, designers, and maintainers. It will then explore effective ways of managing the arc flash hazard, helping to reduce the risk and to make ships safer places to work.

Why you should attend

IMarEST's Marine Arc Flash technical conference* will bring together those in the industry responsible for electrical safety to discuss the magnitude of the issue with respect to:

- ▶ Applicability of new design standards/methods
- ▶ Development of new safe working practices
- ▶ Introduction of Personal Protective Equipment
- ▶ Calculations and risk quantification methods
- ▶ Impact on marine electrical engineering and operation

**the first event for the marine industry*

Conference Chairman

- ▶ **Kevin Daffey**, Chief Technology Officer
Electrical Systems, Rolls-Royce plc

Keynote Speech

- ▶ **Jim Phillips**, PE Electrical Training Expert,
Brainfiller.com

Presenters

- ▶ **University of Manchester**
- ▶ **University of Strathclyde**
- ▶ **TAS Engineering Consultants**
- ▶ **Marine Accident Investigation Branch (MAIB)** – TBC
- ▶ **BP Shipping**
- ▶ **BMT Defence Services Ltd**
- ▶ **Lloyd's Register**
- ▶ **J & K Ross Ltd**
- ▶ **MOD DE&S**
- ▶ **Terasaki Electric Co., Ltd**
- ▶ **Converteam UK Ltd**
- ▶ **Aircraft Carrier Alliance**
- ▶ **Rolls-Royce plc**

Register online at: www.imarest.org/events
or call: **+44 (0)20 7382 2702/2636**

Dear Colleague

Electrical systems have been used successfully for over 150 years in ships and typically the main hazard from electricity is believed to arise from electrocution. However, with the rising demand for power on ships leading to the subsequent installation of electrical power systems with high fault current levels, there is an increased potential for arc flash accidents to occur.

The aim of **IMarEST's Marine Arc Flash technical conference*** is to help raise awareness of the arc flash hazard to ship operators, owners, designers and maintainers. It will then explore effective ways of managing the arc flash hazard, helping to reduce the risk and to make ships safer places to work.

We are delighted to confirm so many distinguished presenters including our **Keynote, Jim Phillips, Brainfiller.com**. Jim is a member of the IEEE 1584 Committee and also co-Chairman of the subcommittee IEEE 1584.1. He plays a major role in the development of arc flash standards and testing.

I hope you can join us for this first important conference for the marine industry.

Kevin Daffey, *Chief Technology Officer Electrical Systems, Rolls-Royce plc*

**the first event for the marine industry*

Programme (Subject to amendment)

Tuesday 8 November 2011

0830	Registration and refreshments
0900	Chairman's welcome and introduction <i>Kevin Daffey, Chief Technology Officer Electrical Systems, Rolls-Royce plc</i>
0905	Keynote Speech <i>Jim Phillips, PE Electrical Training Expert, Brainfiller.com</i>

Theory

Chairman: Ing Kees Posthumus, *Head of Electrical System Technology, Defence Materiel Organisation, The Netherlands*

0930	Arc flash – an overview of the phenomenon and methods for mitigation and protection <i>Dr Ian Cotton, University of Manchester and Dr Campbell Booth, University of Strathclyde</i>
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0955	Industrial experience in arc flash hazard calculations and risk assessment, including the DuPont™ Arc Guide <ul style="list-style-type: none"> • Evolution of methodologies • Risk assessment approaches • DuPont™ Arc Guide • Solutions for complex installations • Case studies <i>John Maplesden, Principal Consultant and Deputy Chairman, TAS Engineering Consultants</i>
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1020	Morning coffee
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Marine Experience

Chairman: Tony Chronnell, *Engineering Manager, L-3 Offshore, UK*

1050	The catastrophic failure of a capacitor and explosion in the aft harmonic filter room of RMS Queen Mary 2 <i>Dr Gopinath Chandroth, Marine Accident Investigation Branch (MAIB) – TBC</i>
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1115	Arc flash incidents, studies and risk assessments on a merchant tanker fleet This presentation reviews arc flash incident data from BP Shipping and BP Group, looks at the results of arc flash studies on two BP Shipping operated tankers and how this data can inform risk assessments and the selection of potential risk mitigation methods. <i>Ian Cole, Electrical Systems Technical Authority, BP Shipping</i>
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1140	The arc flash hazard: assessment and mitigation on marine platforms Electric shock is the hazard type that is normally identified when discussing electricity, however electrical workers are commonly exposed to another type of hazard, namely arc flash. The marine context exacerbates this problem and so the arc flash hazard needs to be addressed and mitigation methods put in place. This paper reviews the consequences of arc flash, quantifies the hazard, and discusses the possible control measures that can be applied to manage the hazard. <i>Oliver J Simmonds, Senior Engineer, BMT Defence Services Ltd</i>
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1205	A Class Society's perspective on arc safety This presentation considers the role of Classification in helping to ensure arc safety. It describes the development of arc safety requirements for Lloyd's Register's merchant and naval ship rules. The new requirements are then summarised along with information about the guidance that will be provided for the application of them to merchant and naval ship projects. <i>Gary Wilson, Project Engineer Marine Product Development – Engineering Systems, Lloyd's Register</i>
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1230	Lunch
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arc flash hazard in ships and ensuring a safe environment

Mitigation Methods

Chairman: Shaun White, Engineering Operations Manager – Rotating Machines Rugby, Converteam UK Ltd

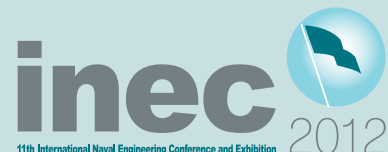
- 1330 Arc flash mitigation, the role of PPE**
- PPE – Where does it fit?
 - The limitations of PPE
 - Can everyday workwear constitute a risk
 - How can we work out what PPE to select
- Chris Ross, Managing Director, J & K Ross Ltd**
- 1355 Arc flash: policy development in the naval service**
- Arc flash policy and mitigation in the RN: existing measures
 - Additional measures implemented since the hazard has been identified
 - The future of arc flash policy within the RN
- 1/0(SE) Mark Royston-Tonks RFA, MOD DE&S**
- 1420 Internal arc fault protection for low voltage switchboard on ship**
- Our medium voltage switchboard experience
 - In house testing for low voltage switchboard
 - Countermeasures against low voltage marine distribution system
- Masanari Tsuji, Director of System Division and Kazuo Saeki, Marketing Department of System Division, Terasaki Electric Co., Ltd**
- 14.45 Afternoon tea**

Design Best Practice

Chairman: Paul Eaton, QEC & Type 45 Engineering Manager – Naval Engineering, Converteam UK Ltd

- 1515 Arc flash management – HV system design and integration for ships**
- HV system arc flash management principles and standards
 - HV system and equipment design and validation techniques
 - HV system and equipment physical and functional integration experience
 - HV system and equipment best practice for future vessels
- Shaun White, Engineering Operations Manager – Rotating Machines Rugby, Converteam UK Ltd**
- 1540 Queen Elizabeth Class Carriers – Managing the arc flash hazard**
- Arc flash and the initial QEC design
 - Hazard reduction – design enhancements
 - Hazard reduction – commissioning and operational recommendations
 - Other measures considered
- Nick Cowper, Delegated Design Authority – Power & Propulsion System, Aircraft Carrier Alliance**

- 1605 Arc flash issues in marine electrical power installations – hazard identification and risk mitigation**
- Quantifying the energies involved – discussing worldwide standards and calculation methods for incident energy and exposure distances
 - Mitigating risks associated with arc flash whilst considering the practicalities surrounding the operation of current marine electrical installations
 - Matters associated with the arrangement of electrical equipment for new installations in order to minimise risk
- Jamie McCarthy, Electrical Power Systems Engineer, Rolls-Royce plc**
- 1630 Discussion session**
- Kevin Daffey, Chief Technology Officer Electrical Systems, Rolls-Royce plc**
- 1715 Closing remarks and close of conference**
- Professor Chris Hodge FEng, Chief Electrical Engineer, BMT Defence Services Ltd**
- 1730 Conference Reception**



ENGINEERING NAVAL CAPABILITY

11th International Naval Engineering Conference and Exhibition

Tuesday 15 – Thursday 17 May 2012 Edinburgh, UK

The aim

Recent developments have seen shrinking defence budgets yet worldwide instability and natural phenomenon require military scale interventions with multinational forces structures. In order to continue with this trend of doing more with less, fewer hull numbers, continued pressure to reduce crew sizes, taking the man out of harm's way and yet still providing platforms capable of global and expeditionary operations will require an unparalleled degree of engineering skill not seen before. These austere circumstances will similarly require a degree of flexibility never experienced before, as we learn from other industries, evolve and adapt, innovate and collaborate.

Sponsorship and exhibition

A supporting exhibition will be held in conjunction with the conference enabling companies to exhibit their latest products and services. If your organisation is interested in sponsoring INEC 2012, please email: christine.martin@imarest.org for further details.

INEC 2012 synopsis submission

Prospective authors are invited to submit titles of papers, keywords and synopses of between 250 to 500 words (text only) to the Events Department either by email or online. The closing date for receipt of synopses is **21 October 2011**. Synopses may be accepted after this date subject to availability in the conference programme.

To register your interest, or receive further information visit:

www.imarest.org/inec

Tel: +44 (0)20 7382 2636; Fax: +44 (0)20 7382 2667

Email: christine.martin@imarest.org

Registration hotline: **+44 (0)20 7382 2702**

IMarEST Marine Arc Flash Conference

Tuesday 8 November 2011

America Square Conference Centre, London EC3

4 easy ways to register

1. Tel: +44 (0)20 7382 2702
2. Fax: +44 (0)20 7382 2667

3. Email: events@imarest.org
4. Web: www.imarest.org/events

Quote Ref:
MAF2011/BR

Delegate details

Please print clearly or attach your business card – your details may appear incorrectly listed if this part of the form is unclear. *Please photocopy this form for further delegates.*

Surname _____ Title (Prof, Mr, Dipl Ing, Cdr) _____ Initials _____

Name for badge _____

Job title _____

Organisation/Company _____

Address _____

Postcode _____ Country _____

Tel _____ Fax _____ Mobile _____

Email _____ Company website _____

IMarEST Member Yes No Membership no _____

Please send further information on becoming an IMarEST Member

Registration fees – SAVE £100 if you register by 28 October 2011

(Fees include VAT at standard rate – please select delegate type and fee)

Conference Registration Delegate type	Bookings received before 28 October 2011	Bookings received after 28 October 2011
IMarEST Member	<input type="checkbox"/> £340	<input type="checkbox"/> £440
IMarEST Marine Partner	<input type="checkbox"/> £430	<input type="checkbox"/> £530
Non-Member IMarEST	<input type="checkbox"/> £580	<input type="checkbox"/> £680
MOD and Academic attendance	<input type="checkbox"/> £230	<input type="checkbox"/> £230
Student/Retired Member	<input type="checkbox"/> £120	<input type="checkbox"/> £120

Exhibitor: Table top exhibition stand £500 **Total payable £**

Payment

Please invoice VAT receipt Cheque/Eurocheque in Sterling payable to IMarEST

Bank transfer payable to IMarEST

Barclays Bank, 1 Churchill Place, London E14 5HP

Bank Sort Code 207767 Account Number 70517291 Ref: MAF11 + delegate surname

Credit Card (please fill in details below)

The total fee due will be debited in full on receipt of your registration form

Amex Diners Card Debit Card Visa Mastercard Other

Card no

Card holder's name _____

Signature _____

Expiry date _____ Start date _____ Issue no _____ Security Code

Address at which card is registered _____

Additional requirements

Vegetarian/special dietary meals (please specify) _____

Access requirements (please specify) _____

You will receive a confirmation email, an invoice or VAT receipt and further information on receipt of your registration form. Please contact us if you do not receive confirmation.

IMarEST Events, Aldgate House, 33 Aldgate High Street, London EC3N 1EN, UK

Fees and VAT

All conference fees are inclusive of VAT @ 20% and cover participation at the conference, lunches, available documentation and the Evening Reception. Delegates are responsible for making their own travel and accommodation arrangements. **Special concessions are available to MOD, academics, retired members of IMarEST and students.** All students MUST provide proof of student status from their head of department.

Group discounts

Discounts are available for 3 or more delegates. Group registrations must be made at the same time from the same organisation to qualify for a discount. Contact Laura Jarman +44 (0)20 7382 2702 for further details.

Venue and accommodation

The conference is being held at the **America Square Conference Centre**, 1 America Square, 17 Crosswall, London EC3N 2LB. A map and directions will be sent to you upon receipt of your registration. Ellis Salsby has been appointed as the accommodation agent for this event and special rates are available by contacting them on 0845 241 5150 or online at: www.ellis-salsby.co.uk/events (click on link for IMarEST)

Cancellations

Cancellation of a registered place must be received in writing no later than 28 October 2011; a charge of £100 + 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.

CPD

Continuing Professional Development

All delegates will be sent a Continuing Professional Development (CPD) certificate after the event.

Sponsorship opportunities

To discuss sponsorship or exhibition opportunities, please call: +44 (0)20 7382 2636 or email: sponsorship@imarest.org

IMarEST Forthcoming Events 2012

IMarEST Ballast Water Conference

23 – 24 February 2012, London, UK

IMarEST 109th Annual Dinner

9 March 2012, London, UK

11th International Naval Engineering Conference & Exhibition (INEC 2012)

15 – 17 May 2012, Edinburgh, UK

Data Protection Act 1998

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