The Royal Institution of Naval Architects

Design & Operation of Passenger Ships

International Conference on Design & Operation of Passenger Ships

20-21 November 2013, RINA HQ, London, UK

In Association with:

International Cruise & Ferry Review

Sponsored by:

LSA
LIFERAFT SYSTEMS AUSTRALIA

www.rina.org.uk/passenger_ships

Call Jade on +44 (0) 20 7235 4622
or email conference@rina.org.uk

DAY 1 PAPERS:

08.30-09.00 REGISTRATION & COFFEE

UNCONVENTIONAL DESIGN IDEAS OF RO-RO PASSENGER SHIPS: STRATEGIES AND RESULTS
Romanas Puisa, R&D Unit of Brookes Bell LLP, United Kingdom
Przemek Zagorski, Dracos Vassalos, Department of Naval Architecture and Marine Engineering University of Strathclyde, UK
The presented study was undertaken in the aftermath of the recent revision of damage survivability, i.e. the s-factor, conducted under EU project GOALDS1. Specifically, the study was aimed at optimising the baseline design of a large Ro-Ro passenger vessel, which was provided by a shipyard and assumed to be somehow optimised with respect to basic design requirements. It was therefore of great interest to apply out-of-the-box ideas to significantly raising the damage survivability of the vessel, and at the same time, ensuring required commercial viability of the design. This study resulted in an unconventional hull shape and a drastic change in the watertight arrangement, whereby the damage survivability was increased from 84 to 98 per cent. Additionally, the new hull shape provided flexibility to accommodate extra cargo on the main car deck, allowing to offset a potentially insignificant increase in the building cost. The paper addresses both strategies and results of the undertaking.

THE PRACTICAL DIFFICULTIES IN ASSESSING THE STABILITY OF CRUISE SHIPS
David Ridden, Principal Consultant, Burness Corlett Three Quays Ltd, UK
There has recently been significant growth in the number and size of cruise ships due to the popularity of cruising. Many new ships carry upwards of 2000 passengers. This growth in passenger numbers has occurred at the same time as regulatory changes to ensure adequate margins of stability in intact and damaged conditions are provided. Calculations are carried out during the design stages with these calculations starting from estimated loading conditions. However, the statutory requirements for confirming the accuracy and reliability of the lightship properties which form the basis of these loading conditions remain largely unchanged and do not reflect the increased risk presented by ever larger passenger ships. To stay ahead of the competition, cruise ship operators regularly seek to improve both the appearance of and the amenities on their vessels, resulting in weight changes. This then results in "unofficial" lightweight surveys to ensure that the ship still complies with statutory requirements. Or, if the changes are significant, official lightweight surveys will be performed. It is becoming increasingly popular to perform these surveys when the vessel is in service, thereby ensuring that if an inclining experiment is required, this can take place at the end of a refit or other suitable time. However, it is becoming more common to undertake an inclining experiment with the ship in service. This paper attempts to detail the practical difficulties in performing these checks with the ship in service and the attention to detail required to obtain an accurate result.

COFFEE

HYDRODYNAMIC ASPECTS IN THE DESIGN OF PASSENGER VESSELS
Rob Grin, Jaap van Heerd and Victor Ferrari, MARIN, Netherlands
Nowadays naval architects are requested to design passenger vessels with extremely high comfort levels, low operating cost and able to operate worldwide in both open ocean and in confined waters such as bays and rivers. Therefore, today's designs require very good performance in calm water, excellent manoeuvring capabilities and should meet stringent seakeeping requirements. The present paper discusses in detail the principal hydrodynamic aspects that challenge the design of passenger vessels. The content of the paper is largely supported by recent hydrodynamic studies (numerical and experimental) performed at MARIN. The first part of the paper deals with possibilities and impossibilities of hull lines and appendage optimisation and the trade-off between minimum fuel consumption, manoeuvring capability and passenger comfort. In this part also the propeller design and measures to keep good cavitation behaviour and vibration and noise levels as low as possible will be addressed. Secondly the manoeuvring capabilities on open sea and confined waters (e.g. crabbing) will be discussed. Thirdly, ship motions and related issues will be addressed. This include a broad range of seakeeping issues; e.g. roll stabilisation, discomfort due to first order ship behaviour and discomfort due to stern and bow flare slamming. Regulatory items like safe return to port, weather criterion. And safety issues like wave impacts on lifeboats and parametric roll.

RISK ASSESSMENT FOR PASSENGER SHIPS
Daniel Povel, FutureShip, Andreas Ullrich, Germanischer Lloyd, GERMANY
The recent number of incidents with cruise ships has reminded all stakeholders in the industry, that despite compliance with rules and regulations and the recently introduced SOLAS amendments and CLIA guidelines addressing operational issues, there is still a certain risk that for example propulsion and energy supply may get lost as a result of fire. Since July 2010 passenger ship newbuildings have to comply with Safe Return to Port regulations which among others addresses the redundancy of propulsion and safety systems following a fire or flooding incident. This is a huge step forward as risk based methods will largely applied for the design of the ships and certain systems necessary for propulsion, energy supply and safety systems like sprinkler and fire detection. The methodology applied for newbuildings and the philosophy of Safe Return to Port can also be applied to existing ships as the availability and functionality of certain systems during operation as well as in case of casualties is essential. As happened in the past this is not in any case given and might have serious consequences for the society as well as the owners. A detailed assessment of the systems of existing vessels can highlight critical areas for predefined operational scenarios or casualty thresholds. Such assessment will also provide proposals to enhance the system availability following pre-defined incidents. FutureShip and GL developed a method to assess the system availability especially for existing vessels. The method is based on the principles used for safe-return-to-port assessments but considers especially the design and arrangement of spaces and systems on existing vessels. The developed method provides a sound decision basis for measures to improve the availability of systems essential for a safe and reliable operation.

LUNCH

FUNCTION BASED BRIDGE ORGANISATION
Captain Hans Hederstrom, CSMART, Netherlands
The purpose of the Function Based Bridge Organisation is to create a resilient socio technical system where errors and threats are managed before leading to negative consequences. The system builds on the airline concept by introducing Navigator and Co-Navigator functions with clear task allocations. The Navigator who is conning the ship is required to communicate intentions and orders to the Co-Navigator. The function based bridge organization does not diminish the authority of the Captain. The Captain assigns officers to the particular functions based on the watch keeper's competence and experience with the upcoming operation, making it a very adaptable system. The philosophy behind the system encourages the Captain to assume the role of Operations Director, acting as a leader while the team undertakes the operation. By delegating the operational tasks, he/she demonstrates trust in his team. This has many positive effects, such as:

- available resources are used;
- enhanced learning of officers;
- readiness to actively participate in problem solving;
- enthusiasm and motivation to work;
- lowers hierarchical barriers;
- an engaged team directly leading to increased safety and efficiency.

The Operations Director should monitor the workload of each team member and take action if someone is overloaded. With the Captain in the role of Operations Director he/she will have excellent opportunities to coach, supervise and intervene if required. In order to confidently take the role of Operations Director as a leader of the team, the Captain must know the competence of his officers and also have confidence in his own ability and competence.

HUMAN ELEMENT IN A PERSON LOCALISATION & TRACKING SYSTEM FOR SHIP EMERGENCIES
Douglas Owen: Principal Consultant, LR Scandpower Ltd. , Theofanis Karayannis: Senior Specialist, Strategic Research Group, Lloyd's Register Group Limited
Recent high-profile incidents such as Costa Concordia have brought increased attention on passenger ship safety, particularly the importance of passenger and crew localisation during evacuation and abandonment for large passenger vessels. In this context, the objective of the research project LYNCEUS (People Localization for Safe Ship Evacuation During Emergency) is to investigate and demonstrate technologies for enabling unobtrusive localisation and tracking of people for onboard and overboard search and rescue, and for safe evacuation of ships during emergencies. We describe the set of functional user-centred Human Element design requirements developed to enhance the effectiveness of the LYNCEUS system to support evacuation and abandonment during real vessel emergencies and drills. We also summarise aspects of the operational environment that require consideration for the systems of this type to be effective. Three functional areas are covered:

- Person localisation to aid search and rescue activities during evacuation
- Passenger reconciliation and accounting at muster stations and Life Saving Appliance embarkation
- Person localisation in the sea following abandonment

The requirements are targeted at those who will ultimately operate and interact with the system in order to enable the system to be effective in its objective. The paper also emphasises the need to understand person localisation and tracking systems as a means of generating information to support the ship evacuation and abandonment process in the foreseeable emergency conditions.

COFFEE

SETTING A COMPUTER SIMULATION PLATFORM FOR PASSENGER SHIP DC POWER DISTRIBUTION NETWORKS
John Prousalidis, Theodoros Kourmpelis, National Technical University of Athens, Greece
As technology advances, the need is evident for an end to end simulation of the all-electric ship in order to investigate the effect of integrating the appealing DC into the Power Distribution subsystem of a ship grid, on the overall performance of the vessel. In this work, a Medium Voltage DC all-electric ship integrated power system is modeled, from the power generation module to the several distribution loads. In addition, a Low Voltage DC Bus is connected to the system through a DC-DC step-down converter. Furthermore, in a highly-integrated DC power system, the prevalence of power electronics connecting several loads brings about additional concerns regarding the effects of a potential DC fault on other loads connected to the same bus or about its impact on the rest of the power system. In order to encounter some of these issues, different fault events at the MVDC and LVDC buses were simulated to fully understand the fault characteristics and impacts. This analysis examines how direct current faults can react when incorporated into a naval integrated power system. In the second part of this paper, the necessity of DC Grid protection is discussed as all components of the MVDC grid are established except from the DC circuit breakers. The main problem with circuit breakers on the DC side is that conventional AC breakers cannot be used due to many important issues. Some of the dominant fault interrupting techniques are presented and compared regarding the application power range of each one. Finally, the breaker operation is validated through detailed simulation.

GENERAL DISCUSSION & EVENING DRINKS RECEPTION

DAY 2 PAPERS:

08.30-09.00 REGISTRATION & COFFEE

EEDI CORRECTION METHODOLOGY FOR RO-RO CARGO AND RO-RO PASSENGER SHIPS

J Bergholtz, Kattegatt Design AB, Sweden

During MEPC 62 the IMO adopted a new chapter to MARPOL Annex VI that conveys a package of mandatory technical and operational measures aiming for to reduce GHG-emissions from international shipping. The instruments, which entered into force 01 January 2013, include the Energy Efficiency Design Index, EEDI, developed to improve the energy efficiency for new ships through enhanced design and propulsion performance. The EEDI-concept as such may suit its purpose for homogenously composed fleets, e.g. ships engaged in deep-sea shipping, for which the spread in EEDI for ships of a certain size is relatively limited and normalisation of physics such as the influence of Froude's number may be disregarded without significantly affecting the fleet average. However, for diverse ship types, typically engaged in short sea shipping, the development of a robust reference line representing the average performance of the collective fleet data has proven to be problematic. Consequently, some ship types have been excluded from the first phase of implementation of the EEDI-requirements. As the ro-ro cargo and ro-ro passenger ship types are in full short-sea shipping segments, characterised by a significant diversity in mission profile, an enhanced robustness of the EEDI-methodology calls for some elements to take into account the pronounced variety in operational conditions and geometrical constraints governing the energy efficiency from a design perspective for these ship types. This paper details an EEDI-correction methodology as endorsed by MEPC 65, which aims for the establishment of normalised EEDI-conditions for the ro-ro ship segments.

ENERGY EFFICIENCY DESIGN INDEX CALCULATION OF PASSENGER SHIPS

Ivica Ančić, Ante Šestan, Nikola Vladimir, University of Zagreb, Croatia

Passenger ships operate in relatively shorter routes and maneuver more often in ports than other ship types. Diesel engines in conventional propulsion systems in these circumstances have higher SFOC and produce especially high emissions of NOx, SOx and PM. This is very pernicious for public health since it occurs in and near ports. Energy Efficiency Design Index (EEDI), introduced by the newest amendments to MARPOL Annex VI, aims to improve ships energy efficiency, but is not yet fully applicable to passenger ships since the required EEDI for them is still not defined. New regulations encourage new energy efficient technologies and ideas. This opens the door for integrated power systems, which are more complicated, but allow much more versatility with increased reliability and reduced environmental pollution. Also, these systems allow easier implementation of various innovative technologies and overall better use of energy. This paper deals with the method of calculation of the attained EEDI for passenger ships, considering their specific exploitation requirements and power system configurations. Based on the performed EEDI calculation of a passenger ship, inconsistencies in the existing guidelines are identified and discussed. Furthermore, influence of different power system configurations on the attained EEDI is also examined. Finally, possible improvements of the IMO guidelines are discussed.

COFFEE

COMPARATIVE ASSESSMENT OF ALTERNATIVE PROPULSION SYSTEMS OF FERRIES OPERATING IN ECAs

Gerasimos Theotokatos, University of Strathclyde, Glasgow, UK
George A. Livanos, Department of Naval Architecture, Technological Educational Institution of Athens, GREECE

The objective of this paper is to comparatively assess four main alternative propulsion plants based on reciprocating internal combustion engines of a typical ferry ship operating in Emission Control Areas (ECAs). Specifically, the DF engine propulsion plant is compared with a conventional Diesel engine plant. The cases of the installation or not of a Waste Heat Recovery system are also investigated. The DF engines are considered to operate using LNG and a small amount of MDO for initiating combustion, whereas the Diesel engines operate using low sulphur MDO. The propulsion plants and the WHR systems were modelled under steady state conditions, and the simulation results were analysed in order to compare the various configurations. Furthermore, using the simulation results, the improvement of energy efficiency design index (EEDI) is calculated and the impact of the WHR on the ship EEDI is discussed. Finally, the Life Cycle Cost for each alternative propulsion plant is calculated and used for completing an economical evacuation of the Dual fuel propulsion plant versus the conventional designs applied in ferries.

A STATISTICAL CONTROL OF THE SHIP FUEL CONSUMPTION

Bocchetti D. Grimaldi Group, Energy Saving Department, Naples, Italy, Lepore A., Palumbo B., Vitiello L., University of Naples Federico II, Department of Industrial Engineering, Naples, Italy

Proper and continuous monitoring of the fuel consumption is a crucial task to detect any progress after planned improving actions. Through multiple linear regression analysis, this paper proposes a statistical model which allows practitioners to exploit navigation information usually available from board sensors. In particular, the proposed model allows fuel consumption, and therefore CO2 emissions, to be predicted from a set of navigation parameters which describe the mission profile. Moreover, it allows to estimate the confidence region and prediction intervals for the fuel consumption. The latter can be used to control the fuel consumption by comparing the actual fuel consumption to the prediction limits expected by the model for the given mission profile. Such analysis is proposed to cope with actual decision-making problems faced by shipping companies as encouragingly shown by an application to real data collected for 15 months by sensor network installed on two twin ships Ro-Pax of the same Shipping Company sailing the same route.

LUNCH

AN INNOVATIVE, ENVIRONMENTALLY AND ECONOMICALLY SOUND ALTERNATIVE TO UNDERWATER SHIP HULL COATING

Boud Van Rompay, Founder and CEO of Hydrex

The type of coating used on the underwater ship hull makes an enormous difference to that ship's environmental impact as well as to the integrity and safety of the hull. The most basic consideration is the protection of the hull. This includes, to an increasing degree, passenger travel in ice and polar regions. Another major consideration is fuel economy which is an environmental concern because greater fuel efficiency equates to reduction of GHG and other atmospheric emissions. It is also an economic concern with bunker prices high and rising. There is the matter of the environmental effect of the emission of toxic substances such as heavy metals, biocides, silicone oils into the water column, sediment and also directly onto the ice. Finally there is the matter of hull-borne aquatic invasive species and their threat to biodiversity, which is of increasing concern internationally. This paper will talk about all these factors based on the presenter's experience over the last twelve years with the use of a hard, cleanable underwater hull coating system on an entire cruise line and on another smaller cruise ship. The paper will discuss an innovative, environmentally-friendly, economically-viable alternative to the hull coating systems in general use on the world fleet today. The paper will highlight the specific application of a surface treated composite (STC) with a balanced discussion of the advantages and disadvantages of its use, specifically on passenger ships, using as a case study a major cruise line which has been using Ecospeed on all of its ships for the last eight years.

NEXT GENERATION ULTRA-LUXURY CRUISE SHIP: A PASSIVE DESIGN ECO-LUXURY CRUISE SHIP FOR THE MEDITERRANEAN

S McCartan and C Kvilums, EBDIG, CEPAD, Coventry University, UK

The ultra-luxury small cruise ship sector has experienced significant growth in recent years. This paper reports on a design proposal for a catamaran eco-luxury cruise ship, which integrates a Passive Design methodology within the marine design process, with the objective of reducing the energy consumption of the vessel as an ecological statement enhancing the sense of luxury within the design. The design is an engagement in luxification, an evolution of luxury in cruising, creating a new market through Design-Driven Innovation, with the objective of offering green luxury user experience with a sense of intimacy similar to that of a superyacht. The concept design shows the potential of Passive Design as a means of reducing emissions in line with EEDI legislation, by reducing hotel loads such as HVAC systems and lighting.

COFFEE

DESIGN-DRIVEN INNOVATION: NEXT GENERATION HIGH SPEED TRANSATLANTIC SUPERLINER

S McCartan, B Verheijden and P Crotty, EBDIG, CEPAD, Coventry University, UK
J Roy, BMT Nigel Gee, UK

This paper reports on a transatlantic superliner design concept, which engages in Design-Driven Innovation to develop a new market sector for high speed multifunctional vessel to compete with both air freight and business class air travel in addition to the role of a superliner cruise ship. Resulting in a more sustainable transport solution with lower carbon footprint. UK long-haul scheduled business travel was 11 million passengers in 2007, with North Atlantic destinations representing 40%, mainly to and from New York. In 2008 the USA was the largest market for UK air freight, representing 31% of the total market, with over 300,000 tonnes being shipped in both directions. This presents a significant business opportunity as the door to door logistics delivery costs per kg of air freight is 10 times more expensive than conventional ocean freight. This design proposal offers the business traveller a personalised office space with global connectivity to make the journey a seamless extension of the working environment. This is specifically targeted at the creative design industries, with large design office spaces for collaborative working. There is also conference facilities and exhibition spaces, to facilitate product launches and client negotiations. The logistics role of the vessel gives the cruising passengers and business travellers a lower carbon footprint that a single function vessel, thereby engaging in green luxury. The vessel is based on the BMT ADX Express fast container ship Lo-Lo platform, capable of 37 Knots, offering a significant reduction in fuel consumption compared with conventional monohull platforms.

TRIMARAN HIGH SPEED CRUISE LOGISTICS FERRY (CLF) FOR EUROPE'S MOTORWAYS OF THE SEA

S McCartan, B Verheijden, S Grand and L Swinfield, EBDIG, CEPAD, Coventry University, UK
D Boote, DINAV, Genoa University, Italy

The EU Trans-European network "motorways of the sea" concept aims at introducing new intermodal maritime-based logistics chains in Europe, which should bring about a structural change in transport organisation. These chains will be more sustainable, and should be commercially more efficient, than road-only transport. Motorways of the sea will thus improve access to markets throughout Europe, and bring relief to the over-stretched European road system [1]. The design concept presented in this paper is a high speed vessel to compete with road transport and air transport, supported by specialised infrastructure to optimise the vessel loading and unloading process for cars and HGVs. The vessel design combines the following functions: high speed ferry as an alternative to HGV road transport; passenger ferry as a alternative to flights; luxury cruising cabins. It is based on a 120m trimaran platform designed to operate at 40 knots as a coastal cruiser in the Mediterranean, connecting the coast of Spain, France and Italy. This project is an engagement in Design-Driven Innovation (DDI), with the objective of changing the design meaning of what a multi-purpose commercial vessel can be, proposing the CLF as a new market sector for the commercial marine industry. The key driver is sustainable luxury, as the vessel is multifunctional, providing a high speed alternative to less sustainable modes of transport. This addresses the growing European definition of green luxury and could create a new market sector between cruise ships and high end passenger ferries, reducing motorway traffic and hence logistics carbon footprint.

GENERAL DISCUSSION

International Conference
DESIGN & OPERATION OF PASSENEGER SHIPS

20-21 November 2013
RINA HQ, 8-9 Northumberland Street, London, UK

To register, simply complete all sections of this form and return it with your payment to:
The Conference Department, RINA
8-9 Northumberland Street
London, WC2N 5DA

TEL: +44 (0)20 7235 4622
FAX: +44 (0)20 7259 5912
E-MAIL: conference@rina.org.uk

TITLE (Dr, Mr, Eur Ing):

NAME (as it should appear on name badge):

POSITION:

COMPANY (as it should appear on name badge):

INVOICE ADDRESS:

POSTCODE:
COUNTRY:
TELEPHONE:
FAX:
E-MAIL:

CONTACT MAILING ADDRESS (if different):

POSTCODE:
COUNTRY:
TELEPHONE:
FAX:
E-MAIL:

PLEASE INDICATE YOUR PREFERRED METHOD OF PAYMENT:

I enclose a cheque for:
(made payable to RINA) £

Please send me an invoice for : £

Bank Transfer details enclosed for: £

Please debit my credit card by: £

Card Number: (Visa/Amex/Mastercard)

Expiry Date: **Signature:**

REGISTRATION FEE (Inc VAT*)	**By 20/10/13**	**After 20/10/13**
RINA MEMBERS:	**£650**	**£750**
NON-MEMBERS:	**£750**	**£850**
CONCESSIONS: *(Retired/Students etc.)*	**£330**	**£330**
PRINCIPAL AUTHOR	**£125**	**£125**
ADDITIONAL AUTHOR	**£650**	**£650**

The registration fee includes printed conference papers, lunch, refreshments, drinks reception, a CD of the papers and presentations after the conference, and VAT

CONFERENCE PAPERS
Delegates will receive a copy of the conference CD-ROM which will include the presentations, this will be posted out around 10-12 weeks after the conference.

Aditional copies of the conference papers will also be for sale after the event in both print and CD ROM versions. If you would like to order copies, please fill in the relevant sections.

I am unable to attend the conference, please reserve me _____ set(s) of Conference proceedings

Papers @ **£110** (members) ☐ **£130** (non-members) ☐

CD ROM **£110** (members) ☐ **£130** (non-members) ☐

For a full list of the Institution's Conference papers, CD-ROM's and other technical publications please contact Billy Allen, Bookshop Assistant on +44 (0)20 7235 4622 or via e-mail at: publications@rina.org.uk

PAYMENTS
Payment must be made in pounds sterling by Eurocheque, cheque drawn on a bank with a UK branch address, credit card (VISA/Amex/Mastercard) or bank transfer. Please note RINA requires payment before the conference date.
Account Name: The Royal Institution of Naval Architects;
Account Number: 10042127; **Account Code:** 160016
Bank Address: Royal Bank of Scotland PLC, Belgravia Branch, 24 Grosvenor Place, London, SW1X 7HP, UK.
IBAN No: GB14RBOS16001610042127
SWIFT No: RBOSGB2L

*VAT: Under UK Customs and Excise regulations delegates from all countries are required to pay VAT on any course taking place in the UK. Delegates from outside the UK may be entitled to reclaim this cost.

VENUE
The Venue for the conference is the RINA Headquarters, 8-9 Northumberland Street, London, UK

EVENING DRINKS RECEPTION
Following the end of day one (20 November 2013), delegates are invited to attend an evening drinks reception at the conference venue.

ACCOMMODATION
Upon registration you will be provided with details of a hotel booking service offering reduced rate accommodation for conference participants.

CONTINUING PROFESSIONAL DEVELOPMENT
RINA Certificates of Attendance will be issued at the event, which contributes towards the Institution's Continuing Professional Development Scheme. For further details regarding the scheme please contact Giuseppe Gigantesco, Director, Professional Affairs on Tel: +44 (0)20 7235 4622 or e-mail: membership@rina.org.uk

STUDENT SPONSORSHIP
A number of sponsored places at this conference are available for Student Members of RINA. For more information, please contact Yuen Yee Pang, Professional Affairs, RINA on Tel: +44 (0)20 7235 4622 or e-mail:ypang@rina.org.uk.

PROMOTIONAL OPPORTUNITIES
Why not use this conference to promote your company's products and services? It provides an excellent opportunity to increase your profile and to network with a highly focused audience. We offer a number of cost effective options, including various conference sponsorship packages, exhibition space and literature distribution. If you are interested in any of these promotional opportunities please contact the Conference Organiser to discuss your individual requirements.

CANCELLATION CHARGES
Cancellations received in writing two weeks before the event takes place will be subject to administration charge of £200+VAT. Cancellations received after this time cannot be accepted and are subject to the full event fee. Delegates may be substituted; however, this must be sent in writing and confirmed with the conference Co-ordinator. It may be necessary for reasons beyond our control to alter the content and timing of the programme. In the unlikely event that RINA cancels the event for any reason, our liability is limited to the return of the registration fee.

DATA PROTECTION
Personal data is gathered in accordance with the Data Protection Act 1998. Your details may be passed to other companies who wish to communicate with you offers related to your business activities. Please tick the box below where appropriate:

☐ Please do not pass my information to any third party.

☐ I wish to receive email notification of future RINA events or publications

If you have any questions regarding this or any other RINA event please contact, Jade Whitelaw, Conference Organiser, on:

Tel: +44 (0)20 7235 4622 Fax: +44 (0)20 7259 5912
E-Mail: jwhitelaw@rina.org.uk www.rina.org.uk/events