DR LUIS GUARIN

Naval Architect, MSc.Eng, PhD

Principal Naval Architect

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Dr Luis Guarin is a naval architect with over 20 years of experience in the maritime industry. Since joining Brookes Bell in 2011, he has contributed to the firm's ship safety and performance expertise. Before his tenure at Brookes Bell, Dr Guarin was Director at a UK-based consultancy firm specializing in passenger ship safety. He was also a Research Fellow at the University of Strathclyde, UK, where he undertook extensive ship safety research. His academic credentials include a PhD in ship seakeeping in extreme weather conditions from the University of Strathclyde, obtained in 2002. He also holds an undergraduate degree in Naval Architecture / Master of Engineering in ship structural design from Gdansk University of Technology, Poland, which he completed in 1997.

In March 2022, Dr Guarin relocated to the United States to join 3D Marine, a US company acquired by Brookes Bell.

As a ship design risk analysis specialist, he has expertise in performance verification of ships' seakeeping, stability, marine structures, fire safety and evacuation. He has considerable experience assessing alternative design & arrangements and has facilitated navigational risk assessment of berths and port facilities. Dr Guarin's research efforts have contributed to changes in ship design statutory and class requirements. He has conducted ship damage surveys, attended wreck removal operations, provided expert advice in legal cases, and testified in court.

Academic and Qualifications

PhD "A Probabilistic Risk Model of Green Seas Loads on Bulk Carriers"
University of Strathclyde - Overseas Research Student (ORS) Award.

MEng (with distinction) – Specialization in Structural Ship Design
Gdansk University of Technology

Professional Membership

AMRINA - Associate Member of the Royal Institution of Naval Architects.

Previous Employment History

Brookes Bell, Glasgow, UK

Responsible for risk-based ship design verification work, including evaluation of alternative designs and arrangements, carried out on behalf of the designers, builders and owners of some of the largest passenger ships and offshore construction vessels. Responsible for developing products and services to support the implementation of safe-return-to-port regulations in the design and operations of cruise ships. Responsible for conducting marine risk assessment work, including facilitating HAZID workshops and navigation and port risk assessment studies for port operators and users.

Safety at Sea Ltd, Glasgow, UK

Director of Safety Engineering. Conducted Formal Safety Assessment (FSA) studies of bulk carriers and ro-ro passenger ferries on behalf of ship owners. Acted as IMO consultant in delivering FSA workshops on the safety of domestic passenger services in the Philippines and Malaysia. Conducted structural strength analysis and regulatory impact studies relating to IACS Unified Requirements and Common Structural Rules for bulk carriers, including studies on corrosion margins on behalf of ship owners. Naval architect working on implementing the Stockholm Agreement for Northern European ro-ro passenger vessels. Overseers of academic projects on fire safety.

University of Strathclyde

Post-doctoral Research Fellow with responsibilities for delivering EU-funded ship safety research. PhD researcher, charged with an extensive model tests program on the seaworthiness of bulk carriers in extreme weather conditions, carried out on behalf of the UK's DETR in support of the re-opened formal investigation into the loss of MV DERBYSHIRE.

Naval Architecture and Consultancy Experience

Ship Design

- Alternative design: oversized lifeboats, innovative LSA systems, LSA arrangement, oversized main vertical fire zones, passive fire insulation, lift machinery arrangements (cruise ships, Ro-Ro passenger ships, offshore vessels);
- Managed damaged ship stability model tests and upgrades of Ro-Ro passenger ships (Stockholm Agreement) and damage stability probabilistic assessment and flooding survivability simulations for cruise ships;
- Seakeeping (passenger comfort) analysis;
- Evacuation analysis for over 30 passenger ships;
- Escape, evacuation and rescue (EERA) for large offshore vessels, including floatels, pipelay, offshore construction/heavy-lift vessels and an offshore substation platform;
- Fire risk screening, including verification of compliance with SOLAS fire safety provisions for several passenger (cruise) ships;
- Prevention of fire and explosions and rescue assessment (PFERA) for various MODU/MOU;
- Verification of MARPOL compliance with EEXI and CII for a ro-ro passenger ship fleet;
- Design verification and in-service compliance with SOLAS safe return to port (essential ship system redundancy) requirements for several cruise ships;
- Concept design risk assessment for various ships, including a residence ship, offshore construction vessels, a rock dumping ship, a drilling vessel, and a wind and hydrogen-powered cargo ship;

- Structural verification of bulk carriers' structures (PRS 18P);
- Study on bulk carriers' corrosion margins in relation to the implementation of IACS Common Structural Rules (CSR).

Marine Risk Assessment

- Fire risk assessment of a bulk carrier fleet following fire casualty;
- Risk assessment of the carriage of electric vehicles on a fleet of ro-ro and Containerships;
- Formal safety assessment (FSA) study of bulk carrier safety. Focus on hull structural integrity, single vs double side shell requirements, and hatch covers;
- Assessment of bulk carriers' compliance with SECA requirements;
- FSA study: Carriage of Dangerous Goods (DG) on a ro-ro passenger fleet;
- Cyber security risk assessment on ships' OT;
- FSA scoping study: Operation of passenger ships in domestic waters (for IMO);
- Assessment of the impact of implementing MARPOL's SOx Emission Control Areas (SECA) provisions on a fleet of bulk carriers;
- FSA study: Oil pollution associated with oil tanker operations (West of Scotland); operations of shuttle oil tankers in the Arctic; operation of passenger ships in Antarctica;
- Marine risk assessment in connection with the upgrade of a bulk carrier berth within a large UK port;
- Assessment of the turnaround (embarkation/disembarkation) time for a new ro-ro passenger ship and new terminal;
- Risk assessment of oil bunker storage terminal. In connection with ISPS certification.
- QRA study: Natural gas pipeline crossing busy navigational channel;
- Safety audit of Recognized Organization;
- Marine risk assessment: crew transfer boat operations in remote area;
- Risk assessment of man-overboard rescue arrangements for a fleet of small ro-ro passenger ships;
- Manning assessment for ro-ro passenger ship fleet;
- Safety and reliability performance analysis of a fleet of ro-ro passenger ships.

Surveying and Consultancy

- Technical advisor (SOLAS and FTP Code regulations) to the manufacturer of a marine safety product in connection with a global recall;
- Expert opinion in connection with a tugboat allision with underwater dredging pipe;
- Expert opinion in connection with a dispute regarding the installation of a gyro stabilizer unit on a 74 ft sport fish boat;
- Survey and investigation of structural failure of barge crane;
- Attendance at a shipyard to resolve a capesize bulk carrier's dry-docking problem;
- Survey of machinery failure of oil tanker;
- Survey of structural damage and follow-up of repairs to a bulk carrier following a collision;
- Survey and investigation of a cruise ship's windows failure due to green water loads;
- Expert opinion on structural degradation, corrosion and fatigue of bulk carriers' structures;
- Attendances in connection with fuel oil and liquid cargo sampling on tankers;
- Survey of and opinion on dock damages;
- Seakeeping analysis in connection with the loss of a handysize bulk carrier in heavy weather;
- Port traffic impact assessment in connection with a UK Public Inquiry into the construction of a motorway over the port's property;
- Cable burial risk assessment;
- Warranty survey in connection with the sea transport of a large yacht.

Research

- Flooding ship vulnerability assessment in the context of damaged stability regulations as part of larger international consortia (EMSA and EC FLARE project);
- Fire engineering analysis capability-building, Knowledge Transfer Partnership program with the University of Strathclyde;
- EU FP6 Research Program SAFEDOR on safety in design, operations, and regulations. Conducted FSA studies of Ro-Ro passenger vessels and presented the results to the IMO FSA Experts' Group;
- Extensive seakeeping model tests of bulk carriers (PhD research);
- Structural reliability of bulk carriers' hatch covers (PhD research);

Publications

- Vassalos, D., Boulougouris, E., Guarin, L., Jasionowski, A. (2023). Regulatory, Design, Operational and Emergency Response Measures for Improving the Damage Survivability of Existing RoPax. In: Spyrou, K.J., Belenky, V.L., Katayama, T., Bačkalov, I., Francescutto, A. (eds) Contemporary Ideas on Ship Stability. Fluid Mechanics and Its Applications, vol 134. Springer, Cham. https://doi.org/10.1007/978-3-031-16329-6_31
- Guarin, L., Hifi, Y., Vassalos, D. (2014). Passenger Ship Evacuation – Design and Verification. In: Shumaker, R., Lackey, S. (eds) Virtual, Augmented and Mixed Reality. Applications of Virtual and Augmented Reality. VAMR 2014. Lecture Notes in Computer Science, vol 8526. Springer, Cham. https://doi.org/10.1007/978-3-319-07464-1_33
- Guarin, L., Konovessis,D., Vassalos, D. (2009). Safety Level of Damaged RoPax Ships: Risk Modelling and Cost-Effectiveness Analysis, Ocean Engineering, Volume 36, Issues 12–13, 2009, Pages 941-951, ISSN 0029-8018. https://doi.org/10.1016/j.oceaneng.2009.06.005.
- Konovessis, D., Vassalos, D., & Guarin, L. (2007). Risk-Based Ship Design: A Framework for the Carriage of Dangerous Goods by Sea. Safety and Reliability, 27(4), 8–25. https://doi.org/10.1080/09617353.2007.11690844
- Vassalos, D., Jasionowski, A. & Guarin, L. Passenger ship safety - science paving the way. Mar. Syst. Ocean Technol. 2, 63–71 (2006). https://doi.org/10.1007/BF03449185
- Vassalos, D., Guarin, L., Jasionowski, A., Zheng, Y. A Risk-Based First-Principles Approach to Assessing Green Seas Loading on the Hatch Covers of Bulk Carriers in Extreme Weather Conditions, Marine Structures, Volume 16, Issue 8, 2003, Pages 659-685, ISSN 0951-8339, https://doi.org/10.1016/j.marstruc.2004.01.004.

Conference papers

- A Tool for the Assessment of the Operability of Ship Systems in Accordance with SOLAS Safe Return to Port Requirements. ICCAS 2011: International Conference on Computer Applications in Shipbuilding, September 2011.
- Assessment of Ship Systems' Capabilities in Accordance with New SOLAS Requirements for Safe Return to Port. RINA, Design and Operation of Passenger Ships, February 2011.
- Fire Risk Screening of Passenger Ships Layout in Support of the Assessment of Alternative Design and Arrangements. RINA, Design and Operation of Passenger Ships, February 2011.