Navarch
Naval Architecture Expert


**DR KIERAN DODWORTH**

Beng (Hons), PhD, MIMarEST, CEng, FRINA

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Dr Kieran Dodworth is the owner and sole expert at Navarch Ltd. He was previously Director of Naval Architecture at Brookes Bell LLP (UK). Prior to that he was employed in the offshore industry working for consultancy firms based in the UK in the area of non-linear dynamics of offshore structures. He studied for a PhD in damaged vessel hydrodynamics at the University of Strathclyde which he achieved in 2000. His undergraduate degree was in Naval Architecture and Small crafts from the University of Strathclyde which was completed in 1995. His areas of expertise are in aero/hydrodynamics marine structures and stress engineering and has been an advocate of advanced analysis methods in the claims sector. He has also carried out a considerable body of work in the area of seakeeping and vessel dynamics. He has advised clients on a number of important legal cases and given evidence in the Scottish High Court, Norwegian courts and many times in arbitration under various jurisdictions.

**Academic and Professional Qualifications**

Chartered Engineer of the UK Engineering Council

Fellow of the Royal Institute of Naval Architects (RINA)

Member of Institute of Marine Engineers Scientists and Technologists (IMarEST)

PhD "The Application of Potential Flow Theory to Damaged Hull Dynamics" University of Strathclyde

BEng. Hons (1st Class) Naval Architecture and Small Crafts University of Strathclyde

**Previous Employment History**

***Brookes Bell LLP, Glasgow, UK***

Became a Partner at Brookes Bell LLP following the acquisition of Safety at Sea Ltd later becoming Director of Naval Architecture. Responsible for company's activities in naval architecture, Computational Fluid Dynamics (CFD) and Finite Element Analysis (FEA). Acted as an independent expert in numerous commercial disputes and criminal matters. Naval Architecture advisor on various salvage cases the company was engaged on.

***Safety at Sea Limited, Glasgow, UK***

Responsible for the running of the company as part of the board of directors. Leading specialist in hydrodynamic and ship structures responsible for development of business and services in this area. Responsible for structural projects in subsea engineering, marine operations and ship design. Acted as expert witness on commercial disputes and criminal cases. Advisor to shipyards and ship owners in aero and hydrodynamic projects including development of hull forms and superstructure designs. Overseer on academic projects towards analysis of damaged hulls following collision.

***MCS International, Aberdeen, UK - Riser Engineer***

Responsible for riser design studies for various North Sea and West Africa developments. Responsible for local structural analysis of risers and development of company capability in this area. Involved in several riser failure investigations on behalf of clients.

***Noble Denton Europe, London, UK - Structural Engineer, General Engineering***

Engineer working within general engineering department specialising in site specific assessment of jack-up rig deployments. Carried out structural and sea-keeping calculations for dry-towage of jack-up rigs. Development of non-linear finite element software for jack-up analysis including structure soil interaction models.

## Naval Architecture and Consultancy Experience

***Aerodynamic & Hydrodynamic Evaluation and Design***

Application of Computational Fluid Dynamics (CFD) for the design of cruise liner superstructure forms. Development of hull forms for large yachts, fishing vessels, cruise liners, RoPax, river cruise vessels and cargo vessels.

***Total Loss Cases***

Lead investigator and expert witness on various total loss cases including the break-up of a tanker, the sinking of various bulk carriers due to alleged structural failure, the sinking of fishing vessels from small potters to large factory trawlers; the loss of floating drydocks, barges and pontoons wide scale fires of large container carriers and a bulk carrier. Total loss case of a bulk carrier due to collision

***Accident Investigation and Research for Governmental Bodies***

Investigations of two serious accidents involving capsize with water-on-deck for RoPax vessel. Research work on survival time of damaged car ferries and model testing methods. Analysis of capsize resistance of small fishing vessels.

***Container Collapse and Other Cargo Losses***

Investigation of various container loss cases involving singe containers, stacks, bays and multiple bays. Examination and analysis of the loss of project cargo involving the failure of lashing gear and the failure of packing. Analysis of failed and design compliance of container lashing components.

***Failure of Machinery Parts and Structural Components***

Failure investigations of rudder stocks and crank shafts due to fatigue. Failure of welded structure of large reduction gear. Failure of lifting lugs for offshore and dock equipment. Failure of gearbox components and pinions. Failure of large sailing yacht swinging keel. Failure of various GRP structures including yacht keels, yacht hulls and industrial gratings.

***Newbuilding Disputes and intellectual Property***

Disputes related to the compliance with Ship Building Contracts for large yachts, tankers, bulk carriers and offshore assets. Intellectual Property disputes regarding large yachts and a floating offshore structure.

***Collapse of Marine Cranes***

Have acted as independent expert on a number of failed cranes and lifting equipment including the collapse of jibs, failure of lifting lugs, slings and other lifting equipment.

***Speed and Other Propulsion Hydrodynamic Performance Disputes***

Investigated, written reports and given evidence on a wide range of performance disputes including cases involving hull fouling, Light Running Margin or speed deficits.

***Design and Failure Analysis of Flexible Hoses, Risers and Umbilicals***
Investigated a number of flexible hose failures including drag chain pipes, dropped risers, burst export hoses. Preliminary design of riser systems for various fields in the North Sea and West Africa. Calculation of potential damage in storm conditions, vessel movements and from fatigue. Some development work of mathematical models for armour wire stress in bending and due to internal pressure.

***Mooring Design and Accidents***
Design and analysis of quayside mooring systems. Investigation of various ship passing cases in which moorings failed due to ship interaction. Investigation of accidents involving of catenary; multiple and single buoy moorings systems.

***Vessels in Distress and Salvage***
Assisted insurers and salvors on various issues of vessels in distress including vessels at risk due to flooding; LOF salvage hearings and disputes involving fire and flooding. Assisted in various wreck removals and given evidence on naval architecture issues such as residual strength and available buoyancy.

**Publications**

Vassalos, D.; Jasionowski, A.; Dodworth, K.; Allan, T.; Matthewson, B. – Time-based Survival Criteria for Ro-Ro Vessels. RINA 594 Spring Meeting, January 1998.

Jasionowski, A.; Dodworth, K; Vassalos D. – Proposal for passenger survival-based criteria for Ro-Ro vessels, International Shipbuilding Progress, Marine Technology Quarterly, Vol 46, December 1999, No 448, pp 473/487.

Dodworth K. Pennycott A., Douglas A, Doherty N, Kwon T., Hwang I. – The Application of Dynamic Energy Modelling to the Design of Cruise Vessel HVAC Systems, International Symposium on Marine Engineering (ISME), 2009, BEXO, Busan, October 2009.

Ganea, B.; Dodworth, K. – Propellor overload factors for the direct power method, The Naval Architect, September 2017, pp 44/47.

Ganea, B.; Dodworth, K. – A power correction method for speed-power sea trials data analysis, The Naval Architect, July/August 2018, pp 34/36.