

A practical primer for ship design

Reviewed by Jaime Perez Martinez MSc BEng, technical manager, RINA

Ship Design in Practice: First Things First

By Jan Babicz

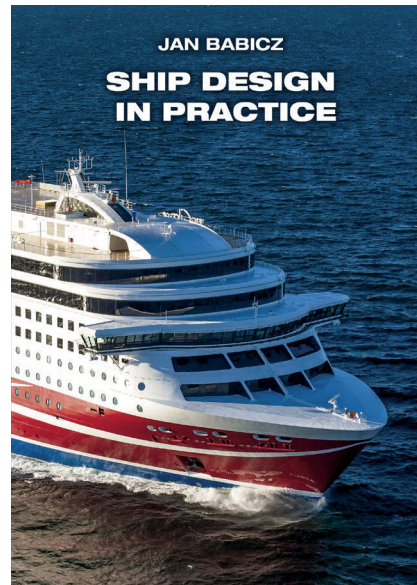
Published by Baobab Naval Consultancy, Gdansk, 2020. 352pp

ISBN 10: 8392515528
ISBN 13: 978839558019

Ship Design in Practice: First Things First is a guide for conventional and practical ship design, in which the reader is able to consult design recommendations and other theoretical knowledge, supported by illustrated examples of previously applied solutions. Throughout the five chapters Jan Babicz, previously chief designer at Gdansk Shipyard and a surveyor for Bureau Veritas, tackles various complex designs decisions by applying standard approximations, experience and databases collected during his 40 years of experience as a naval architect.

This book works as a visual reference book, somewhat reminiscent of earlier publications such as the *Wärtsilä Encyclopaedia of Ship Technology*. The reader is introduced to the ship design process, arrangement, equipment and safety which are all analysed, as well as a brief introduction into the basics of Naval Architecture. This publication includes references work carried out by Baobab Naval Consultancy, the author himself, and other well-known ships. The publication mainly focuses upon cargo ships, including container ships, bulk carriers, tankers, ro-ro vessels, car carriers, chemical carriers, LNG carriers and LPG carriers, with some mention of others such as ro-pax ferries and offshore support vessels.

The author mentions various sources that can be consulted, either as further reading on specific topics such as accident reports mentioned, rules and regulations, or other publications deemed of interest. RINA's own publications such



as *Significant Ships* and *Significant Small Ships* are cited as a primary source of basic information on new vessels, while Babicz also includes references to other works written by himself. The rules and regulations cited mainly come from the American Bureau of Shipping (ABS), particularly with regard to ship vibration. IACS and IMO rules are referenced in areas such as ship arrangement and deck equipment among others. IMO's SOLAS convention is used to illustrate the common understanding of major topics such as the navigation bridge visibility.

Clearly one of the biggest contributions of *Ship Design in Practice* are the examples provided in most of the chapters, which give practical solutions to common challenges during the design of vessels. This book includes examples of accidents and real ships in operation, considering the lessons learned from design flaws, cargo operation, and other causes. Those include the tragic *Christopher* and *Honghae Sanyo* bulker accidents in 2001 or visibility restriction cases such as the *City of Rotterdam* collision (2015).

The ship's cargo loading considerations, including the particular requirements when designing for different types of commodity, are discussed in the ship's arrangement. The book gives an overview

of cargo and layout decisions and aims to provide the reader with an understanding of the various challenges that may arise while considering the accommodation, cargo hold, engine room and other areas to ensure safe and effective operation of the vessel. The reader can find accommodation layouts to help improve living conditions, but also valuable schematics, pictures and technical drawings which are present throughout this publication to support and illustrate the hints and solutions proposed by the author.

The first part of the book deals with the Ship Design Process, looking at design requirements, the use of reference ships, selection of main dimensions and lightship calculations. Included are guidelines on writing different ship documentation including the technical specification, the capacity plan, and more briefly the stability documentation. It also provides main dimensions and relevant details of different sizes and cargo for reference ships, which serve as the starting point for future designs.

Guidelines on Ship Arrangement is the second part of the publication and where, as the title suggests, the layout of the ship is described with examples to illustrate different cargo ships. Divided into the fore part, cargo hold region, machinery space, aft part and superstructure, the different ship's parts are considered. Examples include the structural arrangement, accommodation block, collision block and boarding facilities, with recommendations on matters ranging from habitability to deck and cargo arrangements. Cargo areas for bulk carriers, multipurpose vessels and containers ships are compared and exemplified with transverse sections and structural characteristics. The underwater aft part is discussed, mentioning the importance of the right shape selection as well as the rudder type. Design inputs such as the relative position of the propeller and the rudder, and propeller clearance are also considered. Lastly, the chapter includes basic guidelines for engine room layout to achieve a good working condition space.

BOOK REVIEW

Deck Equipment comprises the third part, where the author discusses mooring, anchoring, towing and lifesaving devices. Here the reader is able to consult mooring layouts, arrangements and alternatives accompanied by pictures and drawings. Lifesaving devices such as lifeboats, survival craft and rescue boats are discussed with layouts and recommendations for an efficient and safe launching and operation. There is also a brief mention of lifesaving equipment, including immersion suits and embarkation ladders, with recommendations for stowage and deployment.

Safety is paramount and is the primary design factor that is returned to throughout the publication. Most of the chapters include safety recommendations, but chapter four gives particular emphasis to this important topic. Not only are

onboard and onshore operations (such as mooring) discussed, but also collisions and flooding. From collisions, the author introduces the buffer bow design concept to increase the energy absorbed by the striking ship to reduce the chances of fatal damage on the struck ship. The notorious *Baltic Ace* collision in 2012 is used as an example to highlight the extreme outcomes that can derive from such incidents.

Naval Architecture itself is briefly covered with basic concepts on ship resistance, propulsion and manoeuvrability in this fifth and final chapter. Conventional methods of hull form analysis, propeller selection and design and rudder design are discussed. Energy saving devices, including Grothues spoilers, pre-swirl stators, wake equalising ducts, Mewis ducts, twisted fins and boss cap fins are also described.

Ship Design in Practice dives into this challenging and multidisciplinary subject of ship design by serving as a toolbox of guidelines useful for newcomers as well as more seasoned naval architects. This book offers a practical approach that rather than be centred on theoretical and scientific naval architecture, offers a visual approach that combines technical drawing with pictures. Included with the publication is a CD-ROM where the reader can consult examples of general arrangements, capacity plans, midship sections, etc., that otherwise would be illegible. **NA**

Ship Design in Practice: First Things First is available directly from the author. For further details email baobab@post.pl

Head of Engineering

Ferguson Marine (Port Glasgow Ltd) is searching for a Head of Engineering to join their Executive Team. This individual will be the most senior engineer and the head of naval architecture for the business, responsible for all design and engineering. Working closely with the Head of Procurement and Head of Production, all vessel creation happens within this team.

As part of the senior management, you will be the engineering authority for Ferguson's with both Marine Engineers and Naval Architects under your control. Ultimately, you will be the person in charge of all technical specifications for the building of two current vessels, and in the longer term, the other ocean-going vessels won and delivered through the organisation.

With the design outsourced for the current build, you will play a key role in taking over the management of the process and ensuring the design authority remains with Fergusons Marine and will be leading the strategic decision on the future shape of the Engineering function.

You will have significant experience of designing, building and manufacturing vessels in high-pressure situations and with exacting specifications and should have excellent and detailed ship-building knowledge & experience, particularly for significant commercial vessel design specification.

This position will suit individuals with an appetite for a challenge. You will relish the chance to get your hands on the transformation project that is underway in Ferguson's, to be part of the team that turns a business around to a successful outcome and enables the organisation to become the success story that Scottish Government are expecting it to be.

For applications contact:

Amy O'Flynn
aof@cleeveexec.co.uk
+44 (0)7841531772

Closing date 31st March 2020.



CLEEVE EXECUTIVE

www.cleeveexecutive.com