

Preface to the Fourth Edition

This edition has been thoroughly revised, keeping in mind the rapid technological advances in this mammoth industry and also the feedback received from various quarters. Relevant extracts from current SOLAS, IACS, Lloyd's Register, DNV and ABS Rules, have been included with permission. However, these must be used only for academic purposes. Relevant current documents onboard ships must be referred to, for the purpose of complying with Classification Societies' and other Statutory Requirements.

Further, a Teaching Guide, suggesting a standard teaching methodology has been included; the question bank at the end of each chapter has also been enhanced to a total of about 1000 questions.

I am indebted to various learned and distinguished persons for continuing to guide me and also to leading world-class organisations for their invaluable support, updated information from their websites and related literature. These inclusions have undoubtedly enriched the content of this edition too. This encouragement is indeed a stimulus to my enthusiasm and has prompted me to launch a free website – www.marine-electricity.com (also accessible through www.shipelectrics.com). In this context, I have this beautiful quote to share with my readers:

“Real knowledge, like everything else of value, is not to be obtained easily. It must be worked for, studied for, thought for, and, more than all must be prayed for.”

Thomas Arnold (1795-1842), British Educator, Scholar

Though every effort has been made to cater to the needs of the growing shipping industry, any suggestions would be welcome. The e-mail addresses are elstan@shipelectrics.com and elstan@marine-electricity.com

Elstan A. Fernandez

- *Founder – www.marine-electricity.com and www.shipelectrics.com;*
 - *Electrical and Laboratory Superintendent / Faculty (Electrical Engineering),
The Great Eastern Institute of Maritime Studies
(A division of The Great Eastern Shipping Company Limited)
www.greatship.com*
-

Acknowledgement

I have tried my best to acknowledge all the wonderful people both in India and abroad who, without any inhibitions, have helped me in specific areas to realize this dream. Should there be any unintentional omissions, do forgive me. I am also indebted to many distinguished persons who in spite of their high office have been kind enough to encourage and guide me. Their kind permission has helped me to publish very valuable content for the purpose of education. These articles are relevant to the building, operation and survey of the entire fleet of merchant vessels at sea and has over the years, increased the awareness of the rapid advances in technology and statutory requirements.

- ★ **Mr. Ajoy Chatterjee**
Chief Surveyor with the Government of India and Chief Examiner of Engineers
Directorate General of Shipping, Ministry of Shipping
For his encouragement, valuable guidance and permission to share my acquired knowledge
- ★ **Mr. Amit Ray**
Area Manager for Asia, DNV SeaSkill™,
Det Norske Veritas Technology Centre, Singapore
For inspiring me to adopt a better approach to teaching and presenting this subject
- ★ **Mr. Brijendra. K. Saxena**
Principal, Tolani Maritime Institute
For being my mentor ever since I embarked on this project
- ★ **Dr. S.G. Dixit**
Advisor, PG Programs and Research Consultant, Tolani Maritime Institute
For enriching the topics on Insulating Materials, Polymers and Cathodic Protection; and also for his valuable advice at various stages
- ★ **Mr. I.K. Basu**
Program Chair, Marine Engineering, Tolani Maritime Institute
For enriching the topics on Steering Systems
- ★ **Mr. S. Kanungo**
Program Chair Practical Skills, Tolani Maritime Institute
For enriching the topic on Cathodic Protection
- ★ **Mr. J. Majumder**
Co-author of my second book titled “Marine Control Technology”;
Sailing Faculty and Electrical Officer, MV Spirit of MOL, Mitsui OSK Lines, Japan
For his valuable guidance while reviewing many chapters
- ★ **Commodore S.R. Dhareshwar (Retd.)**
Management Representative and Faculty (Marine Engineering)
The Great Eastern Institute of Maritime Studies
For his valuable guidance and inspiration for many years
- ★ **Captain Philip John**
Senior Gas Carrier / Tanker Master and Nautical Faculty
The Great Eastern Institute of Maritime Studies
For his valuable guidance on tanker safety

Acknowledgement

- ★ **Colin Wright**
Senior Technical Officer, International Association of Classification Societies,
IACS Permanent Secretariat, London
(www.iacs.org.uk)
For the permission to use any of the material / subject published and also for the good suggestion of involving our students in the IACS Work Programme tasks lists as a stimulation to discussion

- ★ **Stewart Wade**
Vice President, External Affairs, American Bureau of Shipping
(www.eagle.org)
For the permission to print specific extracts from ABS Rules for Building and Classing Steel Vessels

- ★ **Dr. Fai Cheng**
Senior Principal Surveyor, Manager and Head of Rules
Lloyd's Register of Shipping, London
(www.lr.org)
For the permission to publish specific extracts from Lloyd's Register - Classification of Ships – Rules and Regulations

- ★ **Annette Nymann**
ABB AS, Global Sales and Marketing
BU Marine, Automation Technologies Division
Hasleveien 50, Oslo, Norway
(www.abb.com)
For the useful manual on power generation, distribution and propulsion systems and for the permission to publish extracts from the same

- ★ **Arnfinn Ingjerd**
Communication Manager, Rolls-Royce Commercial Marine
(www.rolls-royce.com)
For his guidance, review and permission on the article "Controllable Pitch Main Propellers"

- ★ **Ben Wiens**
Applied Energy Scientist
Ben Wiens Energy Science Inc., Canada
(www.benwiens.com)
For some useful fundamentals that I have referred to, in the course of writing this book

- ★ **Bert de Wijs**
General Manager, Aqua Manoeuvra Systems, Dubai
(www.ams-thrusters.com)
For the useful information on the thrusters that he has designed and worked with for about 40 years

- ★ **Brian Beattie**
(www.marineengineering.org.uk)
For the permission to freely use the information from over 175 topics on his website and his interest in contributions for the improvement of the same, wherein students from all over the world would benefit from this effort.

Acknowledgement

- ★ **Carter Saunders**
Charlottesville, Virginia, USA
(www.sperry-marine.com)
For the permission to download and print material on Steering Systems and GYROFIN Stabilisers

- ★ **Crystal Arena-Tucker**
Marketing Specialist, Raytheon Marine Auto Pilots
Raymarine, Inc.
(www.raymarine.com)
For the CD Rom and information from the website on Autopilots - NautoSteer - Anschütz Auto Steering

- ★ **Henning E. Larsen, Marketing Manager**
Gertsen & Olufsen AS / G & O Technologies AS, Savsvinget 4 Denmark-2970 Hørsholm
(www.gertsen-olufsen.dk)
For the information and permission to reproduce the article "SafePage 3000™ Wireless Paging, Info & Dead Man Alarm System"

- ★ **Henrik Dan Kaspersen**
Marine Engineer, Manager, MAN Diesel A/S, Group Marketing Documentation (GMD 11)
Teglholmegade 41, 2450, Copenhagen SV, Denmark
(www.mandiesel.com)
For the information and permission to reproduce the article 04 00 0 Electricity Production

- ★ **Jeff Snowden**
Senior Technical Writer, Woodward Industrial Controls, Fort Collins, Colorado, USA
(www.woodward.com)
For the permission to print the information on Speed Droop and Power Generation

- ★ **Kurt A Scholz**
Manager Public Relations, Schottel GmbH and Co. KG, Mainzer Str. 99, D – 56322, Spay/Rhein
(www.schottel.de)
For the permission to print the information on SCHOTTEL products





















- ★ **Lee Sacks**
General Manager, Maryland Metrics, PO Box 261, Owings Mills, Maryland, USA
(www.mdmetric.com)
For the permission to use valuable inputs from the article "European and Japanese Fuses from USA Stocks - An Overview" This site also hosts online converters and many other interesting articles.

- ★ **Paul Wagner**
Executive Chairman, Autonav Marine Systems Inc., Canada
(www.autonav.com)
For the CD Rom, the article "Compass Considerations for Steering and Autopilots" and permission to use other information on Steering Systems

- ★ **Shroff Publishers and Distributors (My Publishers)**
For the permission to publish extracts from relevant SOLAS editions published by them and also for giving me a platform to share my knowledge and experience with the maritime community.

Acknowledgement

The following world-class publications have been my wellspring of knowledge. The eminent authors / organisations are listed in alphabetical order. Those readers who are interested in delving into specific topics can, without hesitation refer to these valuable contributions to the world of technology. Other publications apart, these have been my main-stay for about 30 years...and continue to be...

-  ABB Marine, Norway - *Electric Power, Switchgear, Drives & Propulsion Manuals*
-  A.K. Sawhney - *Electrical and Electronics Measurements and Instrumentation.*
-  American Bureau of Shipping - *Rules for Building and Classing Steel Vessels - 1999 and 2005 editions.*
-  B.G. Smith - *Application of Automatic Machinery and Alarm Equipment in Ships.*
-  B.L. Theraja and A.K. Theraja - *A Text Book of Electrical Technology – 24th Edition*
-  D.A. Taylor - *Marine Control Practice*
-  Dennis T. Hall - *Practical Marine Engineering Knowledge.*
-  Douglas M. Considine - *Process / Industrial Instruments and Controls Handbook – Fourth Edition*
-  Edmund G.R. Krall - *Reeds Advanced Electro Technology for Engineers - Vol. 7*
-  G.O. Watson - *Marine Electrical Practice - 6th Edition*
-  H.D. McGeorge - *Marine Electrical Equipment and Practice - 2nd Edition.*
-  H.D. McGeorge - *Marine Auxiliary Machinery - 7th Edition.*
-  Dr. J. Cowley - *The Running and Maintenance of Marine Machinery*
-  J.R. Strott - *Marine Engineering Practice Volume 1 Part 4 - Refrigerating Machinery and Air Conditioning Plant.*
-  Kamewa (now part of Rolls-Royce Commercial Marine) – *Controllable Pitch Main Propellers' Manual.*
-  L. Sterling - *Marine Engineering Practice Volume 1 Part 1 - Selection, Installation and Maintenance of Marine Compressors.*
-  Siemens A.G. Industrial Projects and Technical Services - Marine Engineering, Hamburg.
SIMAR DRIVE - Advanced Diesel-electric Propulsion Systems.
-  Sterling Book House (Shroff Publishers and Distributors) *SOLAS Consolidated Edition – 2004*
-  Sterling Book House (Shroff Publishers and Distributors) *SOLAS Amendments 2003, 2004, 2005*
-  Soren T. Lyngso, Electronic Automation, Denmark - *Your Contact to Automation.*
-  W. Laws (Revised by R. Tyrrell) - *Electricity Applied To Marine Engineering.*