

# **THEORY AND PRACTICE OF SHIP HANDLING**

By Kinzo Inoue  
Professor Emeritus, Kobe University

SEIZANDO-SHOTEN

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## Preface

Ship handling is the operation to shift or stop a ship as intended safely and effectively under any given environmental circumstances. The operations required for this purpose in actual ship handling include course keeping, alteration of course, action to avoid collision, maneuverings for leaving from and entering into port, berthing and unberthing, mooring and anchoring. A person engaged in ship handling is expected to perform its role safely and effectively as an "expert". For this purpose, any person engaged in ship handling is required to master basic scientific knowledge related to buoyancy, stability, maneuverability, seaworthiness as well as static and dynamic characteristics of the commanding ship so that they can carry out optimum ship handling taking the effects of environmental disturbances such as wind, waves and currents into account. That is to say, the expertise required of the person engaged in ship handling must be a reasonable application of expertise acquired from empirical achievements backed by scientific knowledge.

From the above point of view, this book is prepared not only for persons engaged in ship handling but also for those who are intending to study ship handling from the beginning so that they may study related basic scientific knowledge as theoretically as possible. In explanation, care was exerted as much as possible to keep consistency with the descriptions of preceding textbooks based on static equilibrium in a ship's motion to avoid readers' puzzlement. In addition, I especially tried to give clear answer to the most concerned and probable question of readers "How a ship reacts when a specific external force affects." To enable to forecast a ship's motion in immediate future, dynamical analysis in a certain time span by simulation method is often used. Besides, this book is designed so that you may get a specific ship's motion even if you skip its intricate equations for explanation although there are many of the kind in this book.

Actually the ship type and size you handle may vary. Regardless of the ship type and size you may handle, it is indispensable for you to grasp the characteristics of maneuverability of the ship you will handle beforehand to do ship handling based on its proper data. For this reason, the database of various ship types and sizes is included in Volume 4. I hope this data can serve you to combine "Theory" and "Practice" of Ship Handling.

It can be said that the conventional "Study of Ship Handling" has been a scholarly achievement purposed to improve the individual expertise of person engaged in ship handling. However, it is also important for persons engaged in ship handling today to

realize that they are not only expected to fulfill their duties for their own ships, but also expected to give feedback with their own expertise for promotion of safe ship operation to prevent accidents and to protect the marine environment for the global maritime industry. For this purpose I would like to recommend the readers of this book to read "Scientific Marine Safety Management" (Oct., 2008, Seizando Shoten) together with this book.

The ship maneuverability data included in the database of this book were collected through the trials and calculations using a ship handling simulator of my research laboratory, Faculty of Maritime Sciences, Kobe University, and fast time ship maneuvering simulation system produced by Japan Marine Science Inc. in cooperation with the "Working Group for Compilation of Ship Maneuverability Characteristics Database". I would like to express my sincere thanks to the members who cooperated to achieve the Compilation of Ship Maneuverability Characteristics Database by listing their names below. Finally, I would also like to express my heartfelt thanks for warm support of Prof. Keinosuke Honda, the author of "General Theory of Ship Maneuvering" and Mr. Minoru Ogawa, Chairman of Seizando Shoten to publish this book.

February, 2011

Dr. Kinzo Inoue  
Professor Emeritus  
Graduate School of Maritime Sciences  
Kobe University

**Working Group for Compilation of Ship Maneuverability Characteristics Database**

Chairman Dr. Kinzo Inoue, Professor Emeritus, Graduate School of Maritime Sciences, Kobe University

Dr. Daichi Hara, Senior Researcher, Japan Marine Science Inc.

Capt. Shinji Ohishi, Member of Osaka Bay Pilot's Association

Dr. Wataru Sera, Associate Professor, Graduate School of Maritime Sciences, Kobe University

Mr. Hironori Ohuchi, Master's Degree Student, Graduate School of Maritime Sciences, Kobe University

Mr. Shuhei Kawamoto, Master's Degree Student, Graduate School of Maritime Sciences, Kobe University

### **The publication of the English version of "Theory and Practice of Ship Handling"**

In Japan, it's been our hope to have updated ship handling textbooks to reflect the ever evolving technological innovations in the maritime industry. We'd all been waiting for such definitive textbooks, current enough to pass on to the next generation.

Several decades have passed since the publication of the last ship handling textbooks, and it wasn't until March 2011, when I published and released the Japanese version of "Theory and Practice of Ship Handling" that an updated version for those involved in ship handling was available. It was a wonderful surprise to me that immediately after its publication, people involved in the domestic maritime cluster, here in Japan, told me that the book should be used for maritime education all over the world.

What made me happier was that in November 2011, the book received the Shoichi Sumida Award for the best book from the Japan Shipping Exchange, Inc. The reason for winning the award was its contemporaneity description of recent versatile ship types including larger ships, for which information and data was updated for today's maritime world.

Inside, or even outside Japan, few books exist which systematically connect the "theory" and "actuality" of ship handling necessary for safe navigation. In that sense, it's my greatest pride and joy to offer an English version of the book to maritime clusters and their educational communities all over the world.

In the end, I would like to express my most sincere gratitude to my friend James E Middleton and Misako Middleton for their tireless efforts in preparation of the English version. Their great contributions, including their constant moral support to me made it possible to complete the English version.

With all my heart, I'm hoping this book makes a difference somewhere in the world...

October, 2012

Dr. Kinzo Inoue  
Author

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