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Book review

The Theory and Practice of Hydrodynamics and Vibration by S.K. Chakrabarti, World Scientific, Singapore, 2002, pp. xviii + 464, price £46, hardback ISBN 981-02-4921-7, £26 paperback ISBN 981-02-4922-5

The book by Dr. Chakrabarti is vol. 20 of the Advanced Series on Ocean Engineering printed by the same publisher. The aim of the volume is to cover the topics of vibrations and hydrodynamics, which have been treated separately in previous monographs, in the same book. The volume is written in a textbook form for undergraduate (or first year graduate) students; on the other hand, ocean engineers will take advantage of the almost 70pp. of practical and design cases in the last section of the book.

The material is organized in nine chapters: (1) Introduction to the book; (2) Basic theory of hydrodynamics; (3) Basic theory of vibration; (4) Experiments in hydrodynamics and vibration; (5) Statistical theory in vibration; (6) Random vibration; (7) Fluid–structure interaction; (8) Fluid-induced vibration; (9) Practical and design case studies. A few exercises are proposed at the end of each chapter, which ends with the list of references. A short subject index is provided at the end of the book.

The most interesting and original parts of the book are Chapter 9 with practical and design cases, and Chapter 4 dealing with experiments. In these sections it is easy to feel the personal experience of the author that captures the attention of the reader. In particular, the description of test facilities (generation of currents, towing tanks, mechanics to reproduce oscillations of offshore structures, generation of waves and wind tunnels) and scaling laws are given in Chapter 4. Practical and design cases, given in Chapter 9, include: damping of a caisson with sharp bottom edges, vibration of a riser, impact on fixed offshore platforms, sloshing in an elastic caisson, stability of articulated offshore towers in waves, mobile floating offshore structures, dynamics of a flexible jack-up unit and impact of a submarine with a jacket structure.

Hydrodynamics, fluid–structure interaction, and flow-induced vibrations are introduced in Chapters 2, 7, and 8. These topics can be found in other available titles, such as *Flow-Induced Vibration* by R.D. Blevins, but effort has been made to select the material needed for offshore applications.

The Introduction, where some definitions are given, and the sections dealing with vibrations are the less interesting in the book. Here rigor in the definitions and completeness in discussions could be improved. For this reason, I consider the book more useful for engineers than for undergraduate students.

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