

Book review

Arctic Offshore Engineering

Andrew Palmer and Ken Croasdale. World Scientific, Singapore, 2012, ISBN 978-981-4368-77-3, £71.00, 357 pp.

As interest grows in exploiting the petroleum reserves in the inhospitable regions of the Arctic, engineers who are highly trained in conventional offshore engineering may be increasingly called upon to work in polar conditions and must therefore quickly gain an understanding of the workings of this final terrestrial frontier. The 'Offshore Mechanics and Arctic Engineering (OMAE)' conference series, now in its 33rd year, has long recognised the region's importance, but available textbooks have been slow to catch up. It is therefore timely to see this contribution to the available literature.

Engineering topics covered in the book are, in broad terms: formation, mechanics and testing of ice; ice-structure interaction; arctic pipeline engineering; environmental impacts and health and safety. Each topic is dealt with in a very readable manner. Although the necessary equations are indeed presented and discussed, much of the teaching is through example as the authors bring their vast experience to bear on each subject. Detailed examples of field tests and trials, interesting case studies and practical research projects act to illustrate each principle explained. We learn, for example, about field strength tests carried out by a device like a giant nutcracker; about attempts to helicopter onto ice floes in order to install instrumentation before impact; and how Strudel scour may be demonstrated using a glass of water, but also why it is extremely hazardous to investigate in nature. Scientific knowledge and engineering know-how are both right up to date, making this book a development on earlier books on ice mechanics.

The authors' combined experience enables them to voice authoritative and convincing opinion on topics where the scientific literature may be apparently undecided. A strength of the book is in identifying where knowledge is lacking. This is an important standpoint to highlight, because this is by no means a design handbook. The book is very clear that much of current practice is based on very immature understanding, and cautions against placing too much trust in the confident-sounding code of practice. This reviewer agrees heartily, but is aware that some potential readers may prefer a more 'recipe' type book to assist with a specific problem.

The book also devotes a little space to the peoples of the Arctic, as well as to the ecological setting. The reviewer was surprised by this at first, but it exemplifies the affection that the authors clearly have for the region. These sections do not detract from the more technical content, and this reviewer believes they add value in ensuring that no engineer need enter any debate concerning Arctic exploitation unversed in its non-engineering properties.

To summarise, this is an extremely well-written book for engineers who have time to invest in reading and who really want to understand both what we know about engineering in the Arctic and, perhaps more importantly, what we do *not* know. Those seeking a quick design guide might prefer to look elsewhere first, but such readers ignore the opportunity to learn from the experiences presented herein at their peril.

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