Synthesis Lectures on
Ocean Systems Engineering

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Alexander Arnfinn Olsen

Accidental Load Analysis and Design for Offshore Structures

Springer

Synthesis Lectures on Ocean Systems Engineering

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ISSN 2692-4420 ISSN 2692-4471 (electronic)
Synthesis Lectures on Ocean Systems Engineering
ISBN 978-3-031-74772-4 ISBN 978-3-031-74773-1 (eBook)
https://doi.org/10.1007/978-3-031-74773-1

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

This short book has been written to address the process of identifying, and assessing the effects of, structural loads arising from accidental events. An essential element in the determination of accidental loads in this text is the use of risk-based assessment techniques. The traditional approach to accident-induced structural loads is the use of prescriptive criteria that are said to be primarily derived from experience and studies done for similar situations. Prescriptive criteria may be stated in terms of loading scenarios that may give specific load or pressure magnitudes, directions, durations, area of pressure application, etc. Alternatively, some prescriptive criteria may be stated in terms of presumed accident consequences, such as the loss of a major bracing member, extents of accidental collision penetration and flooding, missing mooring components, etc.

Over at least the last decade, there has been greater recognition of the use of risk-based procedures to replace or support the prescriptive criteria. For example, many classification societies have sought to develop and clarify the classification criteria for Mobile Offshore Drilling Units and Floating Production Installations. These have typically taken the form of risk-based evaluations to establish alternatives to the usual criteria given in the Class Rules and associated guidance publications. For new or novel situations, and structural types, the accidental load criteria may state primary reliance on the risk-based accidental load determination.

With the use of risk-based criteria, the guidance provided herein is meant to provide an overview of an approach that can be used to identify and assess the effects of accidental structural loads arising from any one of four hazards: dropped objects, vessel collision, fire and blast). The given methodologies should be adapted to accidental structural loads arising from other hazards as specified in the classification criteria of a particular type of offshore installation or MODU.

Readers are cautioned that regulatory bodies having jurisdiction over the offshore installation or unit may require the use of prescriptive accidental loads criteria. Accordingly, it is the responsibility of the asset owner to discuss with the applicable authorities the acceptance of alternatives based on risk evaluations.

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The original version of the book has been revised. A correction to this book can be found at https://doi.org/10.1007/978-3-031-74773-1_7

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