

AS ISO 19900:2022  
ISO 19900:2019



STANDARDS  
Australia



# Petroleum and natural gas industries — General requirements for offshore structures



Currently in preview, click buy full version

AS ISO 19900:2022

This Australian Standard ® was prepared by ME-092, Materials, equipment, structures and related services for petroleum, petrochemical and natural gas industries. It was approved on behalf of the Council of Standards Australia on 21 April 2022.

This Standard was published on 13 May 2022.

The following are represented on Committee ME-092:

- Australian Industry Group
- Australian Organisation for Quality
- Australian Petroleum Production and Exploration Association
- Australian Pipelines and Gas Association
- Department for Energy and Mining, SA
- Department of Mines, Industry Regulation and Safety WA
- DNV-GL Oil and Gas
- Energy Safe Victoria
- Engineers Australia
- National Energy Resources Australia
- Resources Safety & Health Queensland
- University of Western Australia

This Standard was issued in draft form for comment as DR AS ISO 19900:2022

#### **Keeping Standards up-to-date**

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:

[www.standards.org.au](http://www.standards.org.au)

ISBN 978 1 76113 740 2

# Petroleum and natural gas industries — General requirements for offshore structures

First published as AS ISO 19900:2022.

## **COPYRIGHT**

© ISO 2022 — All rights reserved  
© Standards Australia Limited 2022

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth).

## Preface

This Standard was prepared by the Standards Australia Committee ME-092, Materials, equipment, structures and related services for petroleum, petrochemical and natural gas industries.

The objective of this document is to specify general requirements and recommendations for the design and assessment of bottom-founded (fixed) and buoyant (floating) offshore structures.

This document is applicable for all phases of the life of the structure, including the following:

- (a) Successive stages of construction (i.e. fabrication, transportation, and installation).
- (b) Service in-place, both during design life and during any life extensions.
- (c) Decommissioning, and removal.

This document contains general requirements and recommendations for both the design of new build structures and for the structural integrity management and assessment of existing structures.

This document does not apply to subsea and riser systems or pipeline systems.

This document is identical with, and has been reproduced from, ISO 19900:2019, *Petroleum and natural gas industries — General requirements for offshore structures*.

As this document has been reproduced from an International document, a full point substitutes for a comma when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms “normative” and “informative” are used in Standards to define the application of the appendices or annexes to which they apply. A “normative” appendix or annex is an integral part of a Standard, whereas an “informative” appendix or annex is only for information and guidance.

# Contents

Preface .....	ii
Foreword .....	vi
Introduction .....	vii
<b>1 Scope .....</b>	<b>1</b>
<b>2 Normative references .....</b>	<b>1</b>
<b>3 Terms and definitions .....</b>	<b>2</b>
<b>4 Symbols and abbreviated terms .....</b>	<b>8</b>
4.1 Symbols .....	8
4.2 Abbreviated terms .....	9
<b>5 Fundamental requirements .....</b>	<b>9</b>
5.1 General .....	9
5.2 Structural integrity requirements .....	9
5.3 Functional requirements .....	10
5.4 Requirements for specific phases of the life of the structure .....	10
5.4.1 Planning .....	10
5.4.2 Construction and deployment .....	11
5.4.3 Structural integrity management .....	11
5.4.4 Decommissioning and removal .....	11
5.5 Requirements for durability and robustness .....	11
5.5.1 Durability, maintenance and inspection .....	11
5.5.2 Robustness .....	12
<b>6 Basis for design/assessment .....</b>	<b>13</b>
6.1 General .....	13
6.2 Platform location and orientation .....	13
6.3 Physical environmental conditions .....	13
6.4 Geotechnical and geophysical conditions .....	14
6.4.1 Marine site investigations .....	14
6.4.2 Seabed instability .....	15
6.4.3 Seabed disturbance .....	15
6.5 Specific design/assessment requirements .....	15
6.5.1 Topsides structures .....	15
6.5.2 Deck elevation .....	16
6.5.3 Splash zone .....	16
6.5.4 Stationkeeping systems .....	17
6.5.5 Conductor and riser systems .....	17
6.5.6 Foundations and anchoring .....	17
6.5.7 Additional operational requirements .....	18
<b>7 Development of design/assessment situations .....</b>	<b>18</b>
7.1 Hazards .....	18
7.2 Hazardous events .....	18
7.3 Exposure levels .....	19
7.3.1 General .....	19
7.3.2 Exposure level L1 .....	20
7.3.3 Exposure level L2 .....	20
7.3.4 Exposure level L3 .....	20
7.4 Design/assessment situations .....	21
7.4.1 General .....	21
7.4.2 Operational design/assessment situations .....	21
7.4.3 Extreme design/assessment situations .....	22
7.4.4 Abnormal design/assessment situations .....	22
7.4.5 Accidental design/assessment situations .....	23

7.4.6	Short duration design/assessment situations	23
7.4.7	Serviceability design/assessment situations	24
<b>8</b>	<b>Limit state verification</b>	<b>24</b>
8.1	General	24
8.2	Basic variables and representative values	25
8.3	Limit states	26
8.3.1	Categories of limit states	26
8.3.2	Ultimate limit states	26
8.3.3	Abnormal/accidental limit states	27
8.3.4	Serviceability limit states	27
8.3.5	Fatigue limit states	27
8.4	Limit state verification procedure	28
<b>9</b>	<b>Actions</b>	<b>28</b>
9.1	Classifications of actions	28
9.2	Permanent actions and their representative values	29
9.3	Operational actions and their representative values	29
9.4	Environmental actions and their representative values	30
9.5	Accidental actions and their representative values	31
9.6	Repetitive actions	31
<b>10</b>	<b>Design values and partial factors</b>	<b>32</b>
10.1	Design values of actions	32
10.2	Actions acting in combination	32
10.2.1	Principal and companion actions for the same action type	32
10.2.2	Principal and accompanying actions for specific design/assessment situations	33
10.3	Design values of resistance	33
10.3.1	General	33
10.3.2	Design values of materials including joints	33
10.3.3	Design values of geometric variables	34
10.3.4	Uncertainties in analysis models	34
10.4	Partial factors for operational and extreme design/assessment situations	34
10.5	Partial factors for abnormal and accidental design/assessment situations	34
10.6	Partial factors for serviceability design/assessment situations	35
10.7	Partial factors for fatigue design/assessment verification	35
10.8	Probabilistic modelling and analysis	35
<b>11</b>	<b>Models and analysis</b>	<b>35</b>
<b>12</b>	<b>Quality management</b>	<b>36</b>
12.1	General	36
12.2	Installation inspection	36
12.3	In-service inspection, maintenance and repair	36
12.4	Records and documentation of design and construction	37
12.4.1	General	37
12.4.2	Calculations	37
12.4.3	Weight and centre of gravity reports	38
12.4.4	Drawings and specifications	38
<b>13</b>	<b>Assessment of existing structures</b>	<b>38</b>
13.1	General	38
13.2	Condition assessment	39
13.2.1	General	39
13.2.2	Service and operating requirements	39
13.2.3	Environmental conditions	39
13.2.4	Testing, inspection, maintenance and repair history	39
13.3	Action assessment	40
13.4	Resistance assessment	40
13.5	Component and system failure consequences	40

13.6 Mitigation.....	40
<b>Annex A</b> (informative) <b>Additional information and guidance</b> .....	<b>41</b>
<b>Bibliography</b> .....	<b>64</b>

Currently in preview, click buy full version

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 7, *Offshore structures*.

This third edition cancels and replaces the second edition (ISO 19900:2013), which has been technically revised. The main changes compared to the previous edition are as follows:

- Terms and definitions have been updated;
- Design/assessment situations are described, and the process for limit state design/assessment verification has been clarified;
- Contents have been reorganized and many clarifications to provisions have been made;
- [Annex A](#) has been reorganized to mirror the numbering of the normative clauses and it has been updated with substantial guidance moved from normative clauses.

Any feedback or question on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).