International Standard

ISO 19901-2

Fourth edition
2026-07

Specific requirements for offshore structures —

Part 2: Seismic design

Exigences spécifiques relatives aux structures en mer —

Partie 2: Conception sismique

Reference number
ISO 19901-2:2026(en)

© ISO 2026



COPYRIGHT PROTECTED DOCUMENT

© ISO 2026

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ... **iv**

Introduction ... **v**

1 Scope ... **1**

2 Normative references ... **1**

3 Terms and definitions ... **1**

4 Symbols and abbreviated terms ... **4**
4.1 Symbols ... 4
4.2 Abbreviated terms ... 5

5 Seismic hazards ... **6**

6 Performance objectives and limit states ... **6**
6.1 General ... 6
6.2 Ultimate limit states ... 7
6.3 Performance objectives ... 8
6.4 Seismic risk category ... 9
6.5 ULS_{DL} verification (using hazardous events with intensity = $S_{a,ELE}$) ... 10
6.6 ULS_{NC} verification (using hazardous events with intensity = $S_{a,ALE}$) ... 10
6.7 Seismic design procedure ... 10
6.8 Methods for limit state verification ... 10

7 Analysis types for structural response ... **12**
7.1 Response spectrum analysis ... 12
7.2 Time history analysis ... 13
7.3 Nonlinear pushover analysis ... 14

8 Simplified procedure for determining $S_{a,ELE}$ and $S_{a,ALE}$ ... **14**
8.1 General ... 14
8.2 Spectral accelerations ... 14
8.3 Site class ... 15
8.4 Site correction factor coefficients ... 16
8.5 1 000-year horizontal acceleration spectrum ... 17
8.6 1 000-year vertical acceleration spectrum ... 18
8.7 Damping adjustment ... 19
8.8 Determining $S_{a,ELE}$ and $S_{a,ALE}$ ... 19

9 Detailed procedure for determining $S_{a,ELE}$ and $S_{a,ALE}$ ... **20**
9.1 Probabilistic seismic hazard analysis ... 20
9.2 Deterministic seismic hazard analysis ... 22
9.3 Determining C_c ... 23
9.4 Determining $S_{a,ELE}$ and $S_{a,ALE}$ ... 26
9.5 Dynamic site response analysis ... 27

10 Floating structures ... **27**

Annex A (informative) **Additional information and guidance** ... **28**

Annex B (normative) **Seismic maps with spectral accelerations for simplified action procedure** ... **41**

Annex C (normative) **Regional information** ... **88**

Bibliography ... **93**

© ISO 2026 – All rights reserved

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 document 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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.

This document was prepared by Technical Committee ISO/TC 67, *Oil and gas industries including lower carbon energy*, Subcommittee SC 7, *Offshore structures,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 12, *Oil and gas industries including lower carbon energy,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fourth edition cancels and replaces the third edition (ISO 19901-2:2022), which has been technically revised.

The main changes are as follows:

— the scope has been expanded to cover offshore wind and other renewable energy offshore structures;

— requirements from common industry specifications (IOGP JIP 35) have been incorporated;

— the seismic hazard maps have been updated.

A list of all parts in the ISO 19901 series can be found on the ISO website.

Any feedback or questions 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.

© ISO 2026 – All rights reserved

Introduction

The International Standards for offshore structures prepared by ISO TC 67/SC 7 comprise:

— ISO 19900, the unifying International Standard for offshore structures;

— the ISO 19901 series, providing specific requirements for offshore structures;

— ISO 19902, ISO 19903, ISO 19904-1, the ISO 19905 series and ISO 19906, “structure type” standards.

Figure 1 illustrates the relationships between the International Standards for offshore structures prepared by ISO TC 67/SC 7.

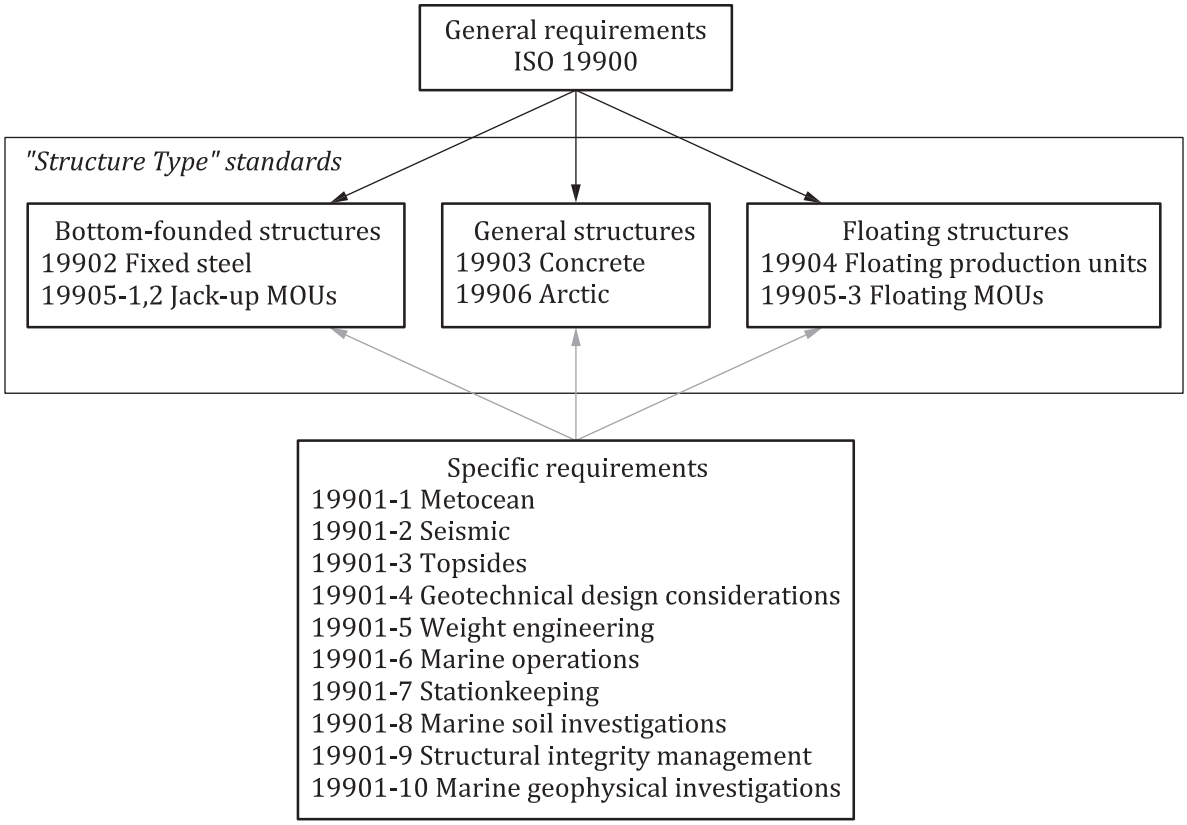


Figure 1 — Relationship of International Standards for offshore structures prepared by ISO/TC 67/SC 7

Seismic conditions vary widely around the world, and the design criteria depend primarily on observations of historical seismic events together with consideration of seismotectonics and local soil conditions. Additional information and guidance are given in Annex A, where the clause numbering mirrors the normative clauses to facilitate cross referencing.

Statements containing requirements (“shall” and “shall not”), recommendations (“should” and “should not”) or permissions (“may”) are collectively referred to as provisions.

© ISO 2026 – All rights reserved

Specific requirements for offshore structures —

Part 2:
Seismic design

1 Scope

This document contains requirements for seismic design and assessment of offshore structures.

This document includes recommendations for the effects of seismic events on floating structures.

This document addresses specifically the design and assessment of offshore structures subjected to earthquake-induced ground motions. It also covers briefly other geologically induced hazards such as liquefaction, slope instability, fault surface displacement, tsunamis, mud volcanoes and shock waves.

This document provides requirements for site-specific probabilistic seismic hazard analysis for offshore structures in high seismic areas and for offshore structures with high consequence levels.

2 Normative references

The following documents are referred to in the text in such a way that some or all their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 19900, *Oil and gas industries including lower carbon energy — General requirements for offshore structures*

ISO 19902, *Petroleum and natural gas industries — Fixed steel offshore structures*

IOGP S-631-11, *Supplementary Specification for Fixed Steel Offshore Structures, International Oil & Gas Producers Association, Version 2, 8 February 2021*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 19900 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
abnormal level earthquake
ALE
ground motion (3.6) due to a rare intense earthquake with a very low probability of occurrence during the life of the structure

Note 1 to entry: Typically, having an annual *probability of exceedance* (3.10) of one in a few thousand years.

3.2
active fault
fault likely to have another earthquake in the future

© ISO 2026 – All rights reserved