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Petroleum and natural gas industries - General requirements for offshore structures (ISO 19900:2019)

EESTI STANDARDIKESKUS
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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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See Eesti standard EVS-EN ISO 19900:2019 sisaldab Euroopa standardi EN ISO 19900:2019 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 19900:2019 consists of the English text of the European standard EN ISO 19900:2019.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 10.07.2019.	Date of Availability of the European standard is 10.07.2019.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 75.180.10

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 19900

July 2019

ICS 75.180.10

Supersedes EN ISO 19900:2013

English Version

Petroleum and natural gas industries - General requirements for offshore structures (ISO 19900:2019)

Industries du pétrole et du gaz naturel - Exigences générales relatives aux structures en mer (ISO 19900:2019)

Erdöl- und Erdgasindustrie - Allgemeine Anforderungen an Offshore-Bauwerke (ISO 19900:2019)

This European Standard was approved by CEN on 9 June 2019.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No. EN ISO 19900:2019 E

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European foreword

This document (EN ISO 19900:2019) has been prepared by Technical Committee ISO/TC 67 "Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries" in collaboration with Technical Committee CEN/TC 12 “Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries” the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2020, and conflicting national standards shall be withdrawn at the latest by January 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 19900:2013.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 19900:2019 has been approved by CEN as EN ISO 19900:2019 without any modification.

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Contents

Page

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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).

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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, *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 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.

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Introduction

The International Standards on offshore structures prepared by TC 67/SC 7 (i.e. ISO 19900, the ISO 19901 series, ISO 19902, ISO 19903, ISO 19904-1, the ISO 19905 series, ISO 19906) constitute a common basis addressing design requirements and assessments of all types of offshore structures used by the petroleum and natural gas industries worldwide.

NOTE These are sometimes referred to as the ISO 19900 series on offshore structures.

Through their application, the intention is to achieve adequate structural integrity and performance based on reliability levels appropriate for manned and unmanned offshore structures, whatever the nature or combination of the materials used.

Structural integrity is an overall concept comprising: models for describing actions, structural analyses, design rules, safety elements, workmanship, quality management, and national requirements, all of which are mutually dependent. The modification of any of these elements in isolation can cause an imbalance or inconsistency, with possible impact on the reliability inherent in the offshore structure. The implications involved in modifying one element, therefore, need to be considered in relation to all the elements and the overall reliability of the offshore structure.

The International Standards on offshore structures prepared by TC 67/SC 7 are intended to provide latitude in the choice of structural configurations, materials and techniques and to allow for innovative solutions. Sound engineering judgement is, therefore, necessary in the use of these documents.

Figure 1 gives a general indication of the relationships between the International Standards on offshore structures prepared by TC 67/SC 7.

This document, i.e. ISO 19900, follows the principles of ISO 2394 and is the unifying document for International Standards on offshore structures prepared by TC 67/SC 7, which encompass both specific requirements for offshore structures (the ISO 19901 series) and "structure type" documents (ISO 19902, ISO 19903, ISO 19904-1, ISO 19905-1, ISO 19905-3, and ISO 19906).

The ISO 19901 series addresses particular aspects of the design, construction, and operation of offshore structures for the petroleum and natural gas industries. The provisions can be applicable to structures of different types, materials and operating environments.

In addition to the relationships between the "structure type" documents and the ISO 19901 series, there is also some interdependence among the "structure type" documents, in that one can reference another, e.g. ISO 19906 on arctic offshore structures builds upon the requirements of ISO 19902 on fixed steel offshore structures.

In ISO International Standards, the following verbal forms are used:

— "shall" and "shall not" are used to indicate requirements strictly to be followed in order to conform to the document and from which no deviation is permitted;

— "should" and "should not" are used to indicate that, among several possibilities, one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required, or that (in the negative form) a certain possibility or course of action is deprecated but not prohibited;

— "may" is used to indicate a course of action permissible within the limits of the document;

— "can" and "cannot" are used for statements of possibility and capability, whether material, physical or causal.

Additional information and guidance are given in Annex A, where the clause numbering mirrors the normative clauses to facilitate cross referencing.

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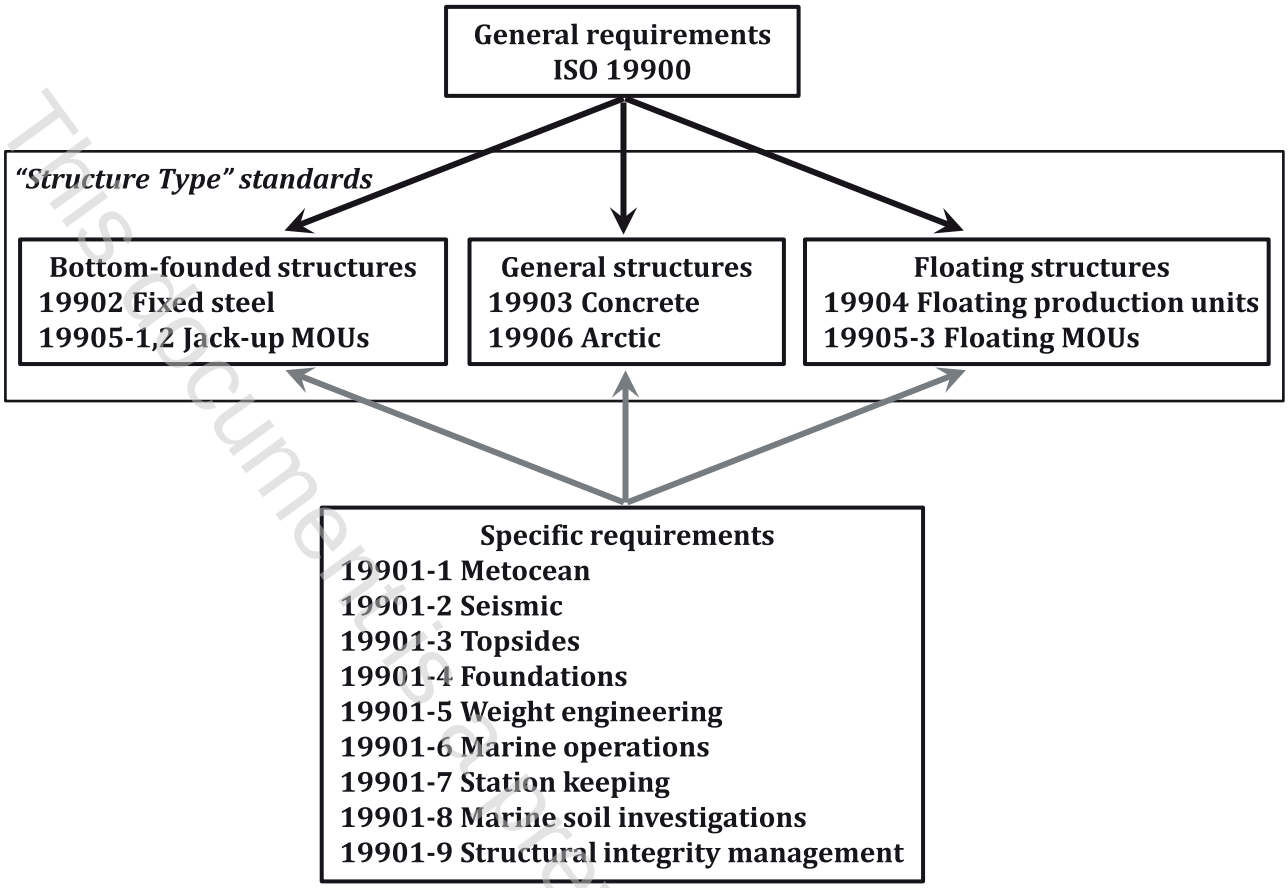

Figure 1 — Relationship of International Standards on offshore structures prepared by TC67/SC7

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Petroleum and natural gas industries — General requirements for offshore structures

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1 Scope

This document specifies 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:

— successive stages of construction (i.e. fabrication, transportation, and installation),

— service in-place, both during design life and during any life extensions, and

— 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.

2 Normative references

The following documents are referred to in the text in such a way that some or all of 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 19901-1, *Petroleum and natural gas industries — Specific requirements for offshore structures — Part 1: Metocean design and operating considerations*

ISO 19901-2, *Petroleum and natural gas industries — Specific requirements for offshore structures — Part 2: Seismic design procedures and criteria*

ISO 19901-3, *Petroleum and natural gas industries — Specific requirements for offshore structures — Part 3: Topsides structure*

ISO 19901-4, *Petroleum and natural gas industries — Specific requirements for offshore structures — Part 4: Geotechnical and foundation design considerations*

ISO 19901-5, *Petroleum and natural gas industries — Specific requirements for offshore structures — Part 5: Weight control during engineering and construction*

ISO 19901-6, *Petroleum and natural gas industries — Specific requirements for offshore structures — Part 6: Marine operations*

ISO 19901-7, *Petroleum and natural gas industries — Specific requirements for offshore structures — Part 7: Stationkeeping systems for floating offshore structures and mobile offshore units*

ISO 19901-8, *Petroleum and natural gas industries — Specific requirements for offshore structures — Part 8: Marine soil investigations*

ISO 19901-9, *Petroleum and natural gas industries — Specific requirements for offshore structures — Part 9: Structural integrity management*

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

ISO 19903, *Petroleum and natural gas industries — Concrete offshore structures*

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ISO 19904-1, *Petroleum and natural gas industries — Floating offshore structures — Part 1: Monohulls, semisubmersibles and spars*

ISO 19905-1, *Petroleum and natural gas industries — Site-specific assessment of mobile offshore units — Part 1: Jack-ups*

ISO 19905-3, *Petroleum and natural gas industries — Site-specific assessment of mobile offshore units — Part 3: Floating unit*

ISO 19906, *Petroleum and natural gas industries — Arctic offshore structures*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

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

3.1
abnormal environmental event
environmental *hazardous event* (3.27) having probability of occurrence not greater than 10^{-3} per annum (1 in 1 000 years)

3.2
accidental event
non-environmental *hazardous event* (3.27) having probability of occurrence not greater than 10^{-3} per annum (1 in 1 000 years)

Note 1 to entry: Accidental events, as referred to in this document, are associated with a substantial release of energy, such as vessel collisions, fires, and explosions.

Note 2 to entry: Lesser accidents that could be expected during the life of the structure, such as dropped objects and low energy vessel impact, are termed incidents and are addressed under operational design situations.

3.3
action
external load applied to the *structure* (3.53) (direct action) or an imposed deformation or acceleration (indirect action)

EXAMPLE An imposed deformation can be caused by fabrication tolerances, differential settlement, temperature change or moisture variation. An imposed acceleration can be caused by an earthquake.

3.4
action effect
result of *actions* (3.3) on a *structural component* (3.49) (e.g. internal force, moment, stress, strain) or on the *structure* (3.53) (e.g. deflection, rotation)

3.5
air gap
distance between the highest water elevation and the lowest exposed part of the primary deck *structure* (3.53) not designed to withstand associated environmental *action effects* (3.4) for a defined *return period* (3.42)

Note 1 to entry: This definition can be refined for different platform types in their respective standards.

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