SLOVENSKI STANDARD
oSIST prEN ISO 19901-3:2022

01-oktober-2022

Industrija za predelavo nafte in zemeljskega plina - Posebne zahteve za naftne ploščadi - 3. del: Strukture na palubi (ISO/DIS 19901-3:2022)

Petroleum and natural gas industries - Specific requirements for offshore structures - Part 3: Topsides structure (ISO/DIS 19901-3:2022)

Erdöl- und Erdgasindustrie - Spezielle Anforderungen an Offshore-Anlagen - Teil 3: Topsides structure (ISO/DIS 19901-3:2022)

Industries du pétrole et du gaz naturel - Exigences spécifiques relatives aux structures en mer - Partie 3: Structures Top Sides (ISO/DIS 19901-3:2022)

iTeh STANDARD PREVIEW
(standards.iteh.ai)
oSIST prEN ISO 19901-3:2022
https://standards.iteh.ai/catalog/standards/sist/753a3e8b-a76d-44a9-9ee2-d30e62a6deeb/osist-pren-iso-19901-3-2022

Ta slovenski standard je istoveten z: **prEN ISO 19901-3**

ICS:

75.180.10	Oprema za raziskovanje, vrtanje in odkopavanje	Exploratory, drilling and extraction equipment

oSIST prEN ISO 19901-3:2022 **en,fr,de**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

oSIST prEN ISO 19901-3:2022
https://standards.iteh.ai/catalog/standards/sist/753a3e8b-a76d-44a9-9ee2-d30e62a6deeb/osist-pren-iso-19901-3-2022

oSIST prEN ISO 19901-3:2022

DRAFT INTERNATIONAL STANDARD
ISO/DIS 19901-3

ISO/TC **67**/SC **7**
Secretariat: **BSI**

Voting begins on:
2022-08-03

Voting terminates on:
2022-10-26

Petroleum and natural gas industries — Specific requirements for offshore structures —

Part 3:
Topsides structure

Industries du pétrole et du gaz naturel — Exigences spécifiques relatives aux structures en mer — Partie 3: Superstructures

ICS: 75.180.10

iTeh STANDARD PREVIEW
(standards.iteh.ai)
oSIST prEN ISO 19901-3:2022
https://standards.iteh.ai/catalog/standards/sist/753a3e8b-a76d-44a9-9ee2-d30e62a6deeb/osist-pren-iso-19901-3-2022

This document is circulated as received from the committee secretariat.

ISO/CEN PARALLEL PROCESSING

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

Reference number
ISO/DIS 19901-3:2022(E)

© ISO 2022

oSIST prEN ISO 19901-3:2022

iTeh STANDARD PREVIEW
(standards.iteh.ai)
oSIST prEN ISO 19901-3:2022
https://standards.iteh.ai/catalog/standards/sist/753a3e8b-a76d-44a9-9ee2-d30e62a6deeb/osist-pren-iso-19901-3-2022

COPYRIGHT PROTECTED DOCUMENT

© ISO 2022

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

© ISO 2022 – All rights reserved

oSIST prEN ISO 19901-3:2022

Contents

Page

iTeh STANDARD PREVIEW
(standards.iteh.ai)
oSIST prEN ISO 19901-3:2022
https://standards.iteh.ai/catalog/standards/sist/753a3c8b-a76d-44a9-9ee2-
...oSIST-pren-iso-19901-3-2022

© ISO 2022 – All rights reserved

oSIST prEN ISO 19901-3:2022

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST prEN ISO 19901-3:2022
https://standards.iteh.ai/catalog/standards/sist/753a3e8b-a76d-44a9-9ee2-d30e62a6deeb/osist-pren-iso-19901-3-2022

© ISO 2022 – All rights reserved

oSIST prEN ISO 19901-3:2022

iTeh STANDARD PREVIEW
(standards.iteh.ai)
oSIST prEN ISO 19901-3:2022

© ISO 2022 – All rights reserved

oSIST prEN ISO 19901-3:2022

iTeh STANDARD PREVIEW
(standards.iteh.ai)
oSIST prEN ISO 19901-3:2022
https://standards.iteh.ai/catalog/standards/sist/753a3e8b-a76d-44a9-9ee2-d30e62a6deeb/osist-pren-iso-19901-3-2022

© ISO 2022 – All rights reserved

oSIST prEN ISO 19901-3:2022

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).

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).

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

For an explanation on 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 the following URL: 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,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 12, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 19901-3:2014 (2nd edition)), which has been technically revised.

The main changes compared to the previous edition are as follows:

— an alignment of the terminology to ISO 19900;

— a rational re-arrangement of the clauses content and numbering;

— adoption with modifications of IOGP supplementary requirements (S-631-04);

— ‘national or regional codes’ and ‘national or regional building codes’ have been replaced by ‘national building standards’ throughout the whole document;

— ‘supporting structure’ has been replaced by ‘substructure’ and definition of ‘substructure’ is added to clause 3;

— ‘wave, wind and current’ has been replaced by ‘metocean’;

— ‘design assessment/situations’ has replaced ‘design situations’ according to ISO 19900;

— in clause 3, terms already defined in ISO 19900 and ISO 19902 have been moved to clause A.3;

— a new clause 5.7 “Critical structures” has been added;

— in clause 6.7 and A.6.7, design for fatigue, Table 2 has been updated with introduction of ’restricted access for inspection, maintenance and repair’ partial damage factors and reduction in case of

© ISO 2022 – All rights reserved

oSIST prEN ISO 19901-3:2022

fully accessibility (with reference to ISO 19904-1, Norsok N-004[32], Reference [30] and DNVGL-OS-C101[31]);

— in clause A.7.2, addition of Table A.1 with typical minimum values for local, primary and global design of operational actions (Q), in accordance with ISO 19904-1;

— wind actions, 7.6.1.4 and A.7.6.1.4, introduction of national building standards for the evaluation of the representative wind actions; alignment with ISO 19900 and ISO 19901-1 and addition of more guidance;

— alignment of minimum lateral acceleration for seismic (7.7.2 and A.7.7.2) with ANSI/API RP 2TOP[82].

— all sources of topsides accelerations collected (7.9.9 and A.7.9.9) and aligned;

— technical review of the accidental events normative and informative clauses (7.9 and A.7.9), with introduction of Risk-informed and Reliability-based approaches for fire and explosion in addition to the default semi-probabilistic approach;

— addition of clause 9 dedicated to the description of the limit state verification approaches including Risk-informed and Reliability-based approaches for fire and explosion (see clause 9.2, 9.3, A.9.2 and A.9.3) in addition to the default semi-probabilistic approach;

— K_c correspondence factors (8.1 and A.8.1) defined according to an equivalent reliability procedure for ANSI/AISC 360-16[12], CSA-S16:19[14] and EN 1993-1-1[13];

— addition of 8.6 and A.8.6 on Design for structural stability in alignment with ANSI/API RP 2TOP[82] and based on ANSI/AISC 360-16[12] and EN 1993-1-1[13] criteria;

— helicopter landing facilities (10.5) updated according to CAP 437[21] for emergency landing and definition of design load combinations adapted from Norsok C-004[89]. Deletion of Table A.5 .

— crane support structure clauses, 10.6 and A.10.6 have been reviewed. Crane support structure is to be designed according to API Spec 2C or EN 13852-1 and additional provisions reported. The simplified fatigue method has been aligned with ANSI/API RP 2TOP[82];

— material, 11.2, update of Table 7 similarly to the Topsides Annex of the under revision Norsok N-004[32] and addition of some example figures for DC;

— reduction or removal of the Structural integrity clauses (12.5, clause 14, A.12.5 and A.14) in accordance with ISO 19901-9 and ISO 19902 content;

— Annex B – updated example of K_c calculations by utilization ratio for ISO 19902 and ANSI/AISC 360-16[12].

removal of Annex C, K_c is reported as normative value in Table 4, in 8.1 for ANSI/AISC 360-16,[12] CSA-S16:19[14] and EN 1993-1-1[13].

© ISO 2022 – All rights reserved

oSIST prEN ISO 19901-3:2022

Introduction

The series of International Standards applicable to types of offshore structure, ISO 19900 to ISO 19906, constitutes a common basis covering those aspects that address design requirements and assessments of all offshore structures used by the petroleum and natural gas industries worldwide. Through their application, the intention is to achieve reliability levels appropriate for manned and unmanned offshore structures, whatever the type of structure and the nature or combination of the materials used.

It is important to recognize that structural integrity is an overall concept comprising models for describing actions, structural analyses, design rules, safety elements, workmanship, quality control procedures and national requirements, all of which are mutually dependent. The modification of one aspect of design in isolation can disturb the balance of reliability inherent in the overall concept or structural system. The implications involved in modifications, therefore, need to be considered in relation to the overall reliability of all offshore structural systems.

The series of International Standards applicable to types of offshore structure is intended to provide wide latitude in the choice of structural configurations, materials and techniques, without hindering innovation. Sound engineering judgement is therefore necessary in the use of these International Standards.

This part of ISO 19901 has been prepared for those structural components of offshore platforms which are above the wave zone and are not part of the substructure or of the hull. Previous national and international standards for offshore structures have concentrated on design aspects of substructures, and the approach to the many specialized features of topsides has been variable and inconsistent, with good practice poorly recorded.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Historically, the design of structural components in topsides has been performed to national building standards for onshore structures, modified in accordance with experience within the offshore industry, or to relevant parts of classification society rules. While this part of ISO 19901 permits use of national building standards, and indeed remains dependent on them for the formulation of component resistance equations, it provides modifications that result in a more consistent level of component safety between substructures and topsides structures.

https://standards.iteh.ai/catalog/standards/sist/753a5e86-a76d-44a9-9ee2-d30e62a6deeb/osist-pren-iso-19901-3-2022

In some aspects, the requirements for topsides structures are the same as, or similar to, those for fixed steel structures; in such cases, reference is made to ISO 19902, with modifications where necessary. Annex A provides background to, and guidance on, the use of this part of ISO 19901, and is intended to be read in conjunction with the main body of this part of ISO 19901. The clause numbering in Annex A follows the same structure as that in the body of the normative text in order to facilitate cross-referencing.

Annex B provides an example of the use of national building standards for onshore structures in conjunction with this part of ISO 19901.

© ISO 2022 – All rights reserved

iTeh STANDARD PREVIEW
(standards.iteh.ai)

oSIST prEN ISO 19901-3:2022
https://standards.iteh.ai/catalog/standards/sist/753a3e8b-a76d-44a9-9ee2-d30e62a6deeb/osist-pren-iso-19901-3-2022

oSIST prEN ISO 19901-3:2022

Petroleum and natural gas industries — Specific requirements for offshore structures —

Part 3: Topsides structure

1 Scope

This part of ISO 19901 provides requirements, guidance, and information for the design and, fabrication of topsides structure for offshore structures. It complements ISO 19902, ISO 19903, ISO 19904-1, ISO 19905-1 and ISO 19906, which provide requirements for various forms of substructure.

The actions on topsides structure, and the action effects in the structural components are derived from this part of ISO 19901, where necessary in combination with other International Standards in the ISO 19901 series.

The resistances of non-cylindrical structural components of the topsides structure can be determined by the use of national building standards, as specified in this part of ISO 19901.

The resistance of cylindrical structural components are to be in accordance with ISO 19902 but may be according to national building standards, as specified in this part of ISO 19901.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

This part of ISO 19901 is applicable to the following:

— topsides of fixed offshore structures;

— discrete structural units placed on the hull structures of floating offshore structures and mobile offshore units;

— topsides of arctic offshore structures, excluding winterization (ISO 19906).

oSIST prEN ISO 19901-3:2022
https://standards.iteh.ai/catalog/standards/sist/753c...-d30e62a6deeb/osist-pren-iso-19901-3-2022

If any part of the topsides structure forms part of the primary structure of the overall structural system which resists global platform actions, the requirements of this part of ISO 19901 are supplemented with applicable requirements in ISO 19902, ISO 19903, ISO 19904-1, ISO 19905-1 and ISO 19906.

This part of ISO 19901 does not apply to those aspects of topsides structure that form part of the overall structural system of floating offshore structures and mobile offshore units that are governed by the rules of a recognized certifying authority and which are within class rules.

The fire and explosion provisions of this part of ISO 19901 can however be applied to those parts of the hulls of floating offshore structures and mobile offshore units that contain hydrocarbon processing, piping or storage.

This part of ISO 19901 addresses the following aspects of topsides structure:

— design, fabrication, installation and modification;

— prevention, control and assessment of fire, explosions and other accidental events.

NOTE Requirements for structural integrity management are presented in ISO 19901-9.

This part of ISO 19901 applies to structural components including the following:

— primary and secondary structure in decks, module support frames and modules;

— flare structures;

© ISO 2022 – All rights reserved

oSIST prEN ISO 19901-3:2022

— crane pedestal and other crane support arrangements;

— helicopter landing decks (helidecks);

— permanent bridges between separate offshore structures;

— masts, towers and booms on offshore structures.

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.

API Spec 2C, *Offshore Pedestal-mounted Cranes*

API Spec 2SC, *Manufacture of Structural Steel Castings for Primary Offshore Applications*

ASTM A307, *Standard Specification for Carbon Steel Bolts, Studs and Threaded Rod 60000 PSI Tensile Strength*

ASTM F1136/F1136M, *Standard Specification for Zinc/Aluminum Corrosion Protective Coatings for Fasteners*

ASTM F2329/F2329M, *Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners*

ASTM F2833, *Standard Specification for Corrosion Protective Fastener Coatings with Zinc Rich Base Coat and Aluminum Organic/Inorganic Type*

ASTM F3125/F3125M, *Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 Mpa and 1 040 Mpa Minimum Tensile Strength*

EEMUA PUB NO 176, *Specification for structural castings for use offshore*

EN 13852-1, *Cranes — Offshore cranes — Part 1: General-purpose offshore cranes*

ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs with specified property classes — Coarse thread and fine pitch thread*

ISO 2631-1, *Mechanical vibration and shock — Evaluation of human exposure to whole-body vibration — Part 1: General requirements*

ISO 2631-2, *Mechanical vibration and shock — Evaluation of human exposure to whole-body vibration — Part 2: Vibration in buildings (1 Hz to 80 Hz)*

ISO 13702, *Petroleum and natural gas industries — Control and mitigation of fires and explosions on offshore production installations — Requirements and guidelines*

ISO 17776, *Petroleum and natural gas industries — Offshore production installations — Major accident hazard management during the design of new installations*

ISO 19900, *Petroleum and natural gas industries — General requirements for offshore structures*

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*

iTeh STANDARD PREVIEW
(standards.iteh.ai)
https://standards.iteh.ai/catalog/standards/sist/753a3e8b-a76d-44a9-9ee2-d30e62a6deeb/osist-pren-iso-19901-3-2022

© ISO 2022 – All rights reserved

oSIST prEN ISO 19901-3:2022

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 management*

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

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*

ISO 19904-1, *Petroleum and natural gas industries — Floating offshore structures — Part 1: Ship-shaped, semi-submersible, spar and shallow-draught cylindrical structures*

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

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

ISO 20088-1, *Determination of the resistance to cryogenic spillage of insulation materials — Part 1: Liquid phase*

ISO 20088-2, *Determination of the resistance to cryogenic spill of insulation materials — Part 2: Vapour exposure*

ISO 20088-3, *Determination of the resistance to cryogenic spillage of insulation materials — Part 3: Jet release*

ISO 22899-1, *Determination of the resistance to jet fires of passive fire protection materials — Part 1: General requirements*

ISO 834-1, *Fire-resistance tests — Elements of building construction — Part 1: General requirements*

Norsok M-122 *Cast structural steel, rev. 2, October* 2012

iTeh STANDARD PREVIEW
(standards.iteh.ai)
oSIST prEN ISO 19901-3:2022
https://standards.iteh.ai/catalog/standards/sist/d30e62a6deeb/osist-pren-iso-19901-3-2022

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 19900, ISO 19902 and the following apply.

Annex A.3 lists key terms already defined in ISO 19900, ISO 19902.

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 https://www.electropedia.org/

3.1
active fire protection
equipment systems, and methods which, following initiation, can be used to control, mitigate, and extinguish fires

[SOURCE: ISO 13702]

© ISO 2022 – All rights reserved