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Specific requirements for offshore structures - Part 7: Stationkeeping systems for floating offshore structures and mobile offshore units (ISO 19901-7:2026)

Öl- und Gasindustrie einschließlich kohlenstoffarmer Energieträger - Spezielle Anforderungen für Offshore-Bauwerke - Teil 7: Positions-Erhaltungssysteme für schwimmende Offshore-Bauwerke und mobile Offshore-Einheiten (ISO 19901-7:2026)

Exigences spécifiques relatives aux structures en mer - Partie 7: Systèmes de maintien en position des structures en mer flottantes et des unités mobiles en mer (ISO 19901-7:2026)

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Stationkeeping systems for floating offshore structures
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Energieträger - Spezielle Anforderungen für Offshore-
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schwimmende Offshore-Bauwerke und mobile
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EN ISO 19901-7:2026 (E)

Contents	Page
European foreword.....	3

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European foreword

This document (EN ISO 19901-7:2026) has been prepared by Technical Committee ISO/TC 67 "Oil and gas industries including lower carbon energy" in collaboration with Technical Committee CEN/TC 12 "Oil and gas industries including lower carbon energy" the secretariat of which is held by NEN.

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International Standard

ISO 19901-7

Specific requirements for offshore structures —

Part 7: Stationkeeping systems for floating offshore structures and mobile offshore units

Exigences spécifiques relatives aux structures en mer —

*Partie 7: Systèmes de maintien en position des structures en mer
flottantes et des unités mobiles en mer*

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ISO 19901-7:2026(en)

Contents

Page

Foreword	vi
Introduction	vii
1 Scope	1
2 Normative references	2
3 Terms, definitions, symbols and abbreviated terms	3
3.1 Terms and definitions	3
3.2 Symbols	12
3.3 Abbreviated terms	13
4 Mooring hardware	14
4.1 General	14
4.2 Off-vessel mooring line components	15
4.2.1 General	15
4.2.2 Anchors	15
4.2.3 Chain	15
4.2.4 Fibre rope	15
4.2.5 Steel wire rope	15
4.2.6 Connecting hardware	16
4.2.7 Buoys	16
4.2.8 Clump weights	16
4.2.9 Mooring connectors	16
4.2.10 Disconnectable turret buoy	17
4.3 On-vessel mooring line components	17
4.3.1 General	17
4.3.2 Fairleads	17
4.3.3 Bending shoes	17
4.3.4 Chain stoppers	17
4.3.5 Uni-joints	17
4.3.6 Turret	17
4.4 On-vessel tensioning equipment	18
4.5 Monitoring equipment	18
4.5.1 General	18
4.5.2 Line tension or line payout	18
4.5.3 Floating structure position and heading	19
5 Metocean and other site data	19
5.1 General	19
5.2 Metocean data	19
5.2.1 General	19
5.2.2 Wave data	19
5.2.3 Wind data	20
5.2.4 Current data	20
5.3 Bathymetry	20
5.4 Geotechnical and geophysical data	20
5.5 Marine growth	21
5.6 Physicochemical parameters	21
5.7 Ice-related	21
6 Design and site-specific assessment of stationkeeping systems	21
6.1 General	21
6.2 Functional requirements	21
6.3 Safety requirements	22
6.4 Planning requirements	23
6.4.1 General	23
6.4.2 Design basis	23
6.4.3 Design practices	23

ISO 19901-7:2026(en)

6.4.4	Installation considerations at design stage	24
6.4.5	Integrity management strategy	24
6.5	Rules and regulations	25
6.6	Independent verification for permanent systems	25
6.7	Numerical tools	25
6.8	Design situations	25
6.8.1	Limit states	25
6.8.2	Analysis cases for ultimate limit state	26
6.8.3	Analysis cases for serviceability limit state	28
6.8.4	Analysis cases for fatigue limit state	29
6.8.5	Analysis cases for abnormal and accidental limit states	30
6.8.6	Analysis cases for temporary phases	30
7	Design and site-specific assessment criteria	31
7.1	Safety factors for mooring component strength	31
7.1.1	Line tensions	31
7.1.2	Safety factors for buoyancy elements	33
7.1.3	Anchor holding capacity safety factors	33
7.2	Vessel offsets and heading	35
7.3	Requirements for clearances	35
7.3.1	General	35
7.3.2	Mooring line with seabed (thrash zone)	35
7.3.3	Mooring line with sea surface	36
7.3.4	Mooring line with hull	36
7.3.5	Mooring line with riser, umbilical, mooring line, pipeline, seabed assets and exclusion zones	36
7.3.6	Submerged turret buoy	37
7.3.7	Anchor with mooring line, pipeline, seabed assets and exclusion zones	37
7.4	Safety factors for mooring component fatigue resistance	37
8	Analysis	40
8.1	General	40
8.2	Analysis methods	41
8.3	Coupling effects	41
8.4	Environmental loads on the floating structure	42
8.4.1	General	42
8.4.2	Wave forces	42
8.4.3	Wind forces	42
8.4.4	Current forces and VIM	43
8.5	Environmental loads on mooring lines and risers	43
8.6	Mooring analysis for strength, offsets and clearances	43
8.6.1	Basic considerations	43
8.6.2	Extreme value statistics	43
8.6.3	Design values for responses to transient wind squalls	44
8.6.4	Mitigating mooring line trenching effects on AHC	44
8.7	Mooring analysis for fatigue	44
8.7.1	Basic considerations	44
8.7.2	Analysis approach	44
8.7.3	Fatigue damage calculation methods	45
8.8	Response based analysis	47
9	Dynamic positioning and thruster-assisted mooring	47
9.1	General	47
9.1.1	Dynamic positioning	47
9.1.2	Thruster assisted mooring	48
9.2	DP and TAM equipment classes	48
9.3	Available effective thrust	49
9.4	Determination of allowable thrust	49
9.5	Load sharing of TAM system	49
9.5.1	General	49

ISO 19901-7:2026(en)

9.5.2	Mean load reduction method	49
9.5.3	Weathervaning structures	50
9.5.4	System dynamic analysis	50
9.6	Failure mode and effects analysis	50
9.7	Design, test and maintenance	51
9.8	Operating personnel	51
9.9	Determination of stationkeeping capability	51
10	Installation, test load and as-installed survey	51
10.1	General	51
10.2	Installation considerations and storm-safe criteria	52
10.3	Mooring line handling and installation procedure	52
10.4	Test loading requirements	53
10.4.1	General	53
10.4.2	Anchor test load for permanent mooring systems	53
10.4.3	Anchor test load for mobile mooring systems	53
10.5	Installation tolerances	53
10.6	Traceability records	54
10.7	As-installed survey and establishment of as-installed capacity	54
11	Integrity management, survey and inspection, and monitoring	55
11.1	Integrity management	55
11.2	Surveys and inspections	55
11.2.1	In-service inspection program	55
11.2.2	As-built inspection	55
11.2.3	Annual survey	55
11.2.4	5-year survey	56
11.3	Conformity assessment	57
11.4	Monitoring	58
11.4.1	Position and heading monitoring	58
11.4.2	Line failure detection	58
Annex A (informative)	Additional information and guidance	59
Annex B (normative)	Regional requirements and supporting information	140
Bibliography		185

ISO 19901-7:2026(en)

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).

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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 third edition cancels and replaces the second edition (ISO 19901-7:2013), which has been technically revised.

The main changes are as follows:

- addition of requirements for a mooring integrity management system;
- emphasis on the definition of the operator's expectations on the performance standard;
- inclusion of fibre ropes as a standard material such as chain and steel wire ropes;
- alignment of text relating to the geotechnical design of anchors with ISO 19901-4;
- inclusion of guidance on OPB (out of plane bending) fatigue and squall design cases.

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

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ISO 19901-7:2026(en)

Introduction

The International Standards on offshore structures prepared by TC 67 (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 covering those aspects that address design requirements and assessments of offshore structures used by the oil and gas industries worldwide. The intention in their application is to achieve reliability levels appropriate for manned and unmanned offshore structures, irrespective type of structure and the nature or combination of materials used.

It is important to recognize that structural integrity is a concept comprised of models that describe 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 design or structural system. The implications involved in modifications therefore should be considered in relation to the overall reliability of all offshore structural systems.

The International Standards on offshore structures prepared by TC 67 are intended to provide a wide breadth of choice for structural configurations, materials and techniques without hindering innovation. Informed engineering judgement is therefore necessary in the use of these International Standards.

This document was developed in response to the worldwide offshore industry's demand for a coherent and consistent definition of methodologies to analyse, design and evaluate stationkeeping systems used for floating energy production platforms (with and without storage) of various types (e.g. semi-submersibles, spar platforms, ship-shaped structures) and to assess site-specific applications of mobile offshore units (such as mobile offshore drilling units and flotels) and construction units (such as heavy lift vessels and pipelay units).

This document assumes that permanently moored hydrocarbon production systems that are equipped with stationkeeping systems as a minimum have the ability to both shut-in wells and the facility in case of emergency (e.g. emergency shut-down valves on the seabed), otherwise the consequence of mooring failure can be significantly different.

Stationkeeping is a generic term covering systems for keeping a floating structure, which is under the constant influence of external actions, either at a pre-defined location or at a pre-defined heading or both with limited excursions. Stationkeeping systems resist external actions by means of any of the following:

- mooring systems (e.g. spread mooring systems or single point mooring systems);
- dynamic positioning systems (generally consisting of thrusters)
- a combination of mooring system and thrusters (thruster assisted mooring systems).

The external actions generally consist of wind, wave, current and ice actions on the floating structure, mooring and risers.

The procedures for the design of permanent or site-specific assessment of mobile mooring systems specified in this document are based on a deterministic approach where mooring system responses (such as line tensions, vessel offsets, and anchor loads) are evaluated for a design environment defined by an annual probability of exceedance or return period. Mooring system responses are then checked against specified requirements for mooring strength, offsets and orientation, clearances, anchor capacity, fatigue resistance, etc. The minimum specified requirements are defined either in this document or by the operator if more stringent.

NOTE Stationkeeping systems designed based on this deterministic approach can have differing levels of reliability.

For moored structures (vessels), system responses are calculated and compared to minimum specified requirements for:

- Ultimate limit states (ULS): mooring component strength. Vessel offset, orientation, and clearance constraints. Herein the ULS includes both intact and single failure condition for stationkeeping systems.

ISO 19901-7:2026(en)

- Serviceability limit states (SLS): vessel offset, orientation, and clearance constraints. For mooring components this includes clearances with the vessel, risers, umbilicals, seabed, water surface, field infrastructure, exclusion zones, etc.
- Fatigue limit states (FLS) : cumulative mooring component fatigue damage.
- Accidental and abnormal limit state (ALS): no criteria are given for accidental or abnormal limit state which are left to operator decision or local authorities requirements.

The methodology described in this document identifies a set of coherent analysis techniques that, combined with an understanding of the site-specific metocean conditions, the characteristics of the floating structure under consideration, and other factors, can be used to determine the adequacy of the stationkeeping system to meet the functional requirements specified in this document.

Descriptions of characteristics and typical components found in these systems are given in [Annex A](#).

Some background to, and guidance on, the use of this document is provided in [Annex A](#). The clause numbering in [Annex A](#) is the same as in the main text to facilitate cross-referencing.

Regional information, where available, is provided in [Annex B](#).

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Specific requirements for offshore structures —

Part 7:

Stationkeeping systems for floating offshore structures and mobile offshore units

1 Scope

This document specifies methodologies for:

- a) the design, analysis and evaluation of stationkeeping systems for floating offshore structures;
- b) the assessment of stationkeeping systems for site-specific applications of mobile offshore units and construction units.

Originally developed for floating structures used in the oil and gas industry, this document is now also used in the renewable energy sector. The extent of application of this document to floating structures used in other industries is at the discretion of the relevant standard entity and its users. For example, IEC 61400-3-2 for floating wind applies this document to determine stationkeeping system responses while incorporating its own load conditions, safety factors, and environmental return periods.

This document is applicable to the following types of stationkeeping systems, which are either covered directly in this document or through reference to other guidelines:

- spread mooring systems;
- single point mooring systems;
- dynamic positioning systems;
- thruster-assisted mooring systems.

This document is not applicable to:

- stationkeeping systems which do not have redundancy against failure of any single component, e.g., single anchor leg moorings (SALMs);
- stationkeeping systems which use any means other than mooring lines or thrusters such as tower soft yoke systems, or tension leg platforms (TLPs) that use tendons.

The requirements for this document address spread mooring systems and single point mooring systems with mooring lines composed of steel chain, steel wire or synthetic fibre rope.

This document is applicable to all aspects of the life cycle of mooring systems. It includes requirements relating to the selection of mooring components, mooring system configuration and performance, components design, installation, post-installation survey, and as-installed assessments as needed for mooring integrity management.

For mooring systems deployed in ice-prone environments, additional requirements in ISO 19906 apply.