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Petroleum and natural gas industries — Site-specific assessment of mobile offshore units —

Part 3: Floating units

Industries du pétrole et du gaz naturel — Évaluation spécifique au site d'unités mobiles en mer —

Partie 3: Unités flottantes

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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

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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).

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 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 second edition cancels and replaces the first edition (ISO 19905-3:2017), which has been technically revised.

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

— removed definitions of drift off and drive off in Clause 3 and consolidated under loss of position;

— Table 1 in Clause 5 removed and reference made to ISO 19900;

— FLS removed from 8.1.2 and 8.1.3;

— air gap requirements modified in 8.2;

— ISO 35104 referenced in 10.4;

— editorial revision.

A list of all parts in the ISO 19905 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.

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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 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 or assessment 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, are 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 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.

This document states the general principles and basic requirements for the site-specific assessment of mobile floating units. The technical information used in the assessment primarily resides in documents referenced herein. This document is intended to be used for assessment and not for design.

Site-specific assessment is normally carried out when an existing mobile floating unit is to be installed at a specific site. The assessment is not intended to provide a full evaluation of the unit; it is assumed that aspects not addressed herein have been addressed at the design stage using other practices and standards.

The purpose of the site-specific assessment is to demonstrate the adequacy of the mobile floating unit, its stationkeeping system and any connected systems for the applicable assessment situations and defined limit states, taking into account the consequences of failure. The results of a site-specific assessment should be appropriately recorded and communicated to those persons required to know or act on the conclusions and recommendations. Alternative approaches to the site-specific assessment can be used provided that they have been shown to give a level of reliability equivalent, or superior, to that implicit in this document.

In this document, the following verbal forms are used:

— “shall” indicates a requirement;

— “should” indicates a recommendation;

— “can” indicates a possibility or a capability;

— “may” indicates a permission.

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Petroleum and natural gas industries — Site-specific assessment of mobile offshore units —

Part 3: Floating units

1 Scope

This document specifies requirements and recommendations for the site-specific assessment of mobile floating units for use in the petroleum and natural gas industries. It addresses the installed phase, at a specific site, of manned non-evacuated, manned evacuated and unmanned mobile floating units.

This document addresses mobile floating units that are monohull (e.g. ship-shaped vessels or barges); column-stabilized, commonly referred to as semi-submersibles; or other hull forms (e.g. cylindrical/conical shaped). It is not applicable to tension leg platforms. Stationkeeping can be provided by a mooring system, a thruster assisted mooring system, or dynamic positioning. The function of the unit can be broad, including drilling, floatel, tender assist, etc. In situations where hydrocarbons are being produced, there can be additional requirements.

This document does not address all site considerations, and certain specific locations can require additional assessment.

This document is applicable only to mobile floating units that are structurally sound and adequately maintained, which is normally demonstrated through holding a valid RCS classification certificate.

This document does not address design, transportation to and from site, or installation and removal from site.

This document sets out the requirements for site-specific assessments, but generally relies on other documents to supply the details of how the assessments are to be undertaken. In general:

— ISO 19901-7 is referenced for the assessment of the stationkeeping system;

— ISO 19904-1 is referenced to determine the effects of the metocean actions on the unit;

— ISO 19906 is referenced for arctic and cold regions;

— the hull structure and air gap are assessed by use of a comparison between the site-specific metocean conditions and its design conditions, as set out in the RCS approved operations manual;

— ISO 13624-1 and ISO/TR 13624-2[1] are referenced for the assessment of the marine drilling riser of mobile floating drilling units. Equivalent alternative methodologies can be used;

— IMCA M 220 is referenced for developing an activity specific operating guidelines. Agreed alternative methodologies can be used.

NOTE RCS rules and the IMO MODU code[13] provide guidance for design and general operation of mobile floating units.

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.

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ISO 13624-1, *Petroleum and natural gas industries — Drilling and production equipment — Part 1: Design and operation of marine drilling riser equipment*

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

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

ISO 19906:2019, *Petroleum and natural gas industries — Arctic offshore structures*

ISO 35104, *Petroleum and natural gas industries — Arctic operations — Ice management*

International Marine Contractors Association, "Guidance on Operational Activity Planning", IMCA M 220

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 19900, ISO 19901-1, ISO 19901-7, ISO 19904-1 and the following 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
activity specific operating guidelines
ASOG
document that sets out the activities that need to be undertaken at specific *alert level thresholds* (3.4) for specified changes in conditions

Note 1 to entry: These guidelines are in a document that sets out high level actions to be undertaken at specific alert level thresholds.

Note 2 to entry: The ASOG for drilling operations is often called the well specific operating guideline document (WSOG).

Note 3 to entry: An example ASOG for DP (dynamic positioning) and moored units is given in Annex A.

3.2
air gap
distance between the highest water elevation and the lowest exposed part of the primary deck structure and permanent equipment not designed to withstand associated environmental action effects

[SOURCE: ISO 19900:2019, 3.5, modified — "structure" and "action effects" not defined herein, "and permanent equipment" added and "for defined return period" deleted.]

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3.3
alert level
condition when certain parameters are below the lower limit, or between limits, or above the upper limit

Note 1 to entry: Alert levels are often colour-coded. The colour-coding will often be green for normal, blue for advisory, yellow alert for reduced status, and red alert for emergency status. Parameters affecting the change of colour-coded alert levels can be, for example, approach of limiting metocean conditions, loss of equipment function, reduced available power levels, offset limits are reached [*watch circles* (3.17)], excessive vessel motions are predicted, etc. Actions to be taken can include, for example, discontinue drilling, disconnect riser, suspend lifts, etc.

3.4
alert level threshold
boundary between *alert levels* (3.3)

3.5
assessment
site-specific assessment
evaluation of a mobile floating unit and activity specific equipment to determine conformity with specific requirements

Note 1 to entry: The specific requirements are the requirements of this document (i.e. 19905-3).

Note 2 to entry: Definition derived from ISO 19905-1:2016, 3.4.

3.6
assessment situation
mobile floating unit configuration together with the metocean and ice actions that need to be assessed

3.7
assessor
entity performing the *site-specific assessment* (3.5)

[SOURCE: ISO 19905-1:2016, 3.6]

3.8
extreme storm event
extreme combination of wind, wave and current conditions used for the *assessment* (3.5) of the mobile floating unit

Note 1 to entry: This is the metocean event used for ULS storm assessment and varies depending on what is being assessed. For example, the metocean event for the ULS assessment of the mooring system can be different from that used in the ULS assessment of the hull strength or air gap.

3.9
loss of position
unintended move of a dynamically positioned or thruster-assisted vessel from its intended location [*watch circle* (3.17)] relative to its *set point position* (3.13), generally caused by loss of stationkeeping control or propulsion

Note 1 to entry: Loss of position can take on three main forms drift off, drive off, or force off.

3.10
operating manual
marine operations manual
latest approved document that defines the operational characteristics and capabilities of the mobile floating unit

[SOURCE: ISO 19905-1:2016, 3.45, modified — "jack-up" has been replaced by "mobile floating unit", Note 1 to entry has been deleted, and "manual" replaced by "latest approved document".]

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3.11
operator
representative of the company or companies leasing the site

Note 1 to entry: The operator is normally the oil company acting on behalf of co-licensees.

Note 2 to entry: The operator can be termed the owner or the duty holder.

[SOURCE: ISO 19900:2019, 3.35]

3.12
recognized classification society
RCS
member of the International Association of Classification Societies, with recognized and relevant competence and experience in mobile floating units, and with established rules and procedures for classification/certification of such units used in petroleum-related activities

[SOURCE: ISO 19901-7:2013, 3.23, modified — "floating structures" has been replaced by "mobile floating units", and "installations" has been replaced by "such units".]

3.13
set point position
intended location of the *unit* (3.15)

3.14
sudden hurricane
hurricane that forms locally and, due to speed of formation and proximity to infrastructure at time of formation, might not allow sufficient time to evacuate manned facilities

Note 1 to entry: The population of storms used to derive the sudden hurricane at a given site can be defined in terms of the time horizon required to evacuate the site.

3.15
unit
complete assembly, including hull structure, topsides, and stationkeeping systems

3.16
unit owner
representative of the companies owning or chartering the *unit* (3.15)

[SOURCE: ISO 19905-1:2016, 3.29, modified — Term "jack-up owner" has been replaced by "unit owner" and "jack-up" has been replaced by "unit".]

3.17
watch circles
concentric group of imaginary closed curves (e.g. circles) developed from the *alert levels* (3.3) with respect to the *set point position* (3.13) that indicate when specific activities need to be undertaken

Note 1 to entry: Watch circles, which are often colour coded to indicate the activities that need to be undertaken, are normally described in the activity specific operating guidelines.

4 Abbreviated terms

ALS	abnormal / accidental limit state
DP	dynamic positioning
FLS	fatigue limit state
FMEA	failure mode and effects analysis

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