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First edition  
2007-12-01

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## **Petroleum and natural gas industries — Fixed steel offshore structures**

*Industries du pétrole et du gaz naturel — Structures en mer fixes en  
acier*



Reference number  
ISO 19902:2007(E)

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## Foreword

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 19902 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 first edition of ISO 19902 cancels and replaces ISO 13819-2:1995, which has been technically revised.

ISO 19902 is one of a series of standards for offshore structures. The full series consists of the following International Standards:

- 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*
- ISO 19901-3, *Petroleum and natural gas industries — Specific requirements for offshore structures — Part 3: Topsides structure<sup>1)</sup>*
- 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<sup>2)</sup>*
- 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 19902, *Petroleum and natural gas industries — Fixed steel offshore structures*

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1) Under preparation.

2) To be published.

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- ISO 19903, *Petroleum and natural gas industries — Fixed concrete offshore structures*
- ISO 19904-1, *Petroleum and natural gas industries — Floating offshore structures — Part 1: Monohulls, semi-submersibles and spars*
- ISO 19904-2, *Petroleum and natural gas industries — Floating offshore structures — Part 2: Tension leg platforms<sup>3)</sup>*
- ISO 19905-1, *Petroleum and natural gas industries — Site-specific assessment of mobile offshore units — Part 1: Jack-ups<sup>3)</sup>*
- ISO/TR 19905-2, *Petroleum and natural gas industries — Site-specific assessment of mobile offshore units — Part 2: Jack-ups commentary<sup>3)</sup>*
- ISO 19906, *Petroleum and natural gas industries — Arctic offshore structures<sup>3)</sup>*

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

Annex A provides background to and guidance on the use of this document and needs to be read in conjunction with the main body of this document. The clause numbering in Annex A is the same as in the normative text to facilitate cross-referencing.

Materials, welding and weld inspection requirements can be based either on a "material category" or on a "design class" approach, as discussed in Clauses 19 and 20. If the material category approach is used, the corresponding provisions of Annexes C and E are normative; if the design class approach is used, the corresponding provisions of Annexes D and F are normative.

Annex G gives requirements on fabrication tolerances.

Regional information on the application of the document to certain specific offshore areas is provided in informative Annex H.

To meet certain needs of industry for linking software to specific elements in this International Standard, a special numbering system has been permitted for figures, tables, equations and bibliographic references.

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# Petroleum and natural gas industries — Fixed steel offshore structures

## 1 Scope

This International Standard specifies requirements and provides recommendations applicable to the following types of fixed steel offshore structures for the petroleum and natural gas industries:

- caissons, free-standing and braced;
- jackets;
- monotowers;
- towers.

In addition, it is applicable to compliant bottom founded structures, steel gravity structures, jack-ups, other bottom founded structures and other structures related to offshore structures (such as underwater oil storage tanks, bridges and connecting structures), to the extent to which its requirements are relevant.

This International Standard contains requirements for planning and engineering of the following tasks:

- a) design, fabrication, transportation and installation of new structures as well as their future removal;
- b) in-service inspection and integrity management of both new and existing structures;
- c) assessment of existing structures;
- d) evaluation of structures for reuse at different locations.

NOTE 1 Specific additional requirements for the design of fixed steel offshore structures in arctic environments are to be contained in ISO 19906<sup>[1]</sup>.

NOTE 2 Requirements for topsides structures are to be contained in ISO 19901-3<sup>[2]</sup>, for marine operations in ISO 19901-6<sup>[3]</sup> and for the site-specific assessment of jack-ups in ISO 19905-1<sup>[4]</sup>.

## 2 Normative references

The following referenced documents are indispensable for the application 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 10414-1, *Petroleum and natural gas industries — Field testing of drilling fluids — Part 1: Water-based fluids*

ISO 12135, *Metallic materials — Unified method of test for the determination of quasistatic fracture toughness*

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

ISO 19900:2002, *Petroleum and natural gas industries — General requirements for offshore structures*