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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*

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

ISO 19902:2020

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## iTeh STANDARD PREVIEW (standards.iteh.ai)

ISO 19902:2020

<https://standards.iteh.ai/catalog/standards/sist/a1a05c09-4e3e-41f8-a33c-62f40c074558/iso-19902-2020>

## Foreword

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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](http://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](http://www.iso.org/patents)).

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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](http://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*.

This second edition cancels and replaces the first edition (ISO 19902:2007), which has been technically revised. It also incorporates the Amendment ISO 19902:2007/Amd.1:2013. The main changes compared to the previous edition are as follows:

- duplication of symbols has largely been eliminated (see Clause 4);
- use of metocean versus environmental has been rationalized. Metocean now refers to wind, wave and current actions only while environmental encompasses metocean, ice and seismic;
- high strength steel: applicable specified minimum yield strength increased to 800 MPa but only with respect to non-material requirements;
- hazards and designing for hazards moved from 10.1.1 and 10.1.2, respectively, to 6.2.2 and 6.2.3, respectively;
- deck elevation (6.3.3.2) expanded to include air gap plus need to consider crest levels 15 % higher than calculated values;
- exposure levels (6.6) are addressed in ISO 19900 so text modified accordingly;

- damage tolerance now more appropriately addressed in 7.10.2 rather than 10.1.6.1;
- reserve strength ratio (7.11.1): detailed procedure introduced because of general lack of adequate, appropriate documentation;
- structural reliability analysis (7.13): text reordered and supplemented by text from completely rewritten A.9.9.3.3;
- onshore lifting (8.3): because offshore lifting is now addressed in ISO 19901-6, the text and tabulated information on DAFs have been modified accordingly;
- multi-crane lifts (8.3.4): for consistency with ISO 19901-6, now considered in place of dual lifts;
- gravity load partial action factors for extreme conditions reduced from 1.1 to 1.0 (Table 9.10-1 and Table 8.2-1);
- clarified that for abnormal design situations, verification is required even if wave-in-deck events do not occur to ensure that the appropriate robustness requirement is realized;
- ELE structural and foundation modelling: new first paragraph added in response to questions to Seismic Panel (responsible for ISO 19901-2) regarding the appropriate weight of personnel to consider during an event;
- tubular member diameter to thickness ratio non-dimensionalized (13.1);
- shear and torsion now included in all tubular member strength formulae including those addressing hydrostatic pressure;
- tubular member strength formulae for combined axial and bending loading now of cosine interaction form instead of previously adopted linear interaction;  
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- formulae (13.6-2) and (13.6-3) relating to conical transitions corrected;
- tubular joint strength formulae nearly all changed through adoption of the API RP 2A-WSD 21st Edition Supplement 2 (October 2005) tubular joint formulae supplemented by some limited non-linear FEA;
- grouted connections: pile outer diameter limited (15.1.5.2);
- use of HSS in fatigue applications: warning re possible hydrogen embrittlement when yield strength exceeds 700 MPa (16.11.2);
- fatigue damage design factors: effect of considering life cycle (16.12.2);
- Clause 17: detailed pile design requirements moved to ISO 19901-4 so no longer addressed;
- Clause 19: expanded to include more detailed requirements for Design class approach;
- Clause 20: expanded to include more detailed requirements for Design class approach;
- Clause 21: some requirements for Design class approach added to Tables 21.2-1 and 21.4-1 (previously 21.7-1);
- particular standards identified for NDT personnel qualification (21.3.3);
- Clause 21: existing 21.4 to 21.6 moved to ISO 19901-6;