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Second edition
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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

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Foreword

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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;

— 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;