
**Petroleum and natural gas
industries — Specific requirements
for offshore structures —**

**Part 5:
Weight control during engineering
and construction**

*Industries du pétrole et du gaz naturel — Exigences spécifiques
relatives aux structures en mer —*

Partie 5: Contrôle des poids durant la conception et la fabrication



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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 on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is 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 19901-5:2003), which has been technically revised.

ISO 19901 consists of the following parts, under the general title *Petroleum and natural gas industries — Specific requirements for offshore structures*:

- *Part 1: Metocean design and operating considerations*
- *Part 2: Seismic design procedures and criteria*
- *Part 3: Topsides structure*
- *Part 4: Geotechnical and foundation design considerations*
- *Part 5: Weight control during engineering and construction*
- *Part 6: Marine operations*
- *Part 7: Stationkeeping systems for floating offshore structures and mobile offshore units*
- *Part 8: Marine soil investigations*

The following parts are under preparation:

- *Part 9: Structural integrity management*

0 Introduction

0.1 General

The International Standards ISO 19900 to ISO 19906 relating to offshore structures constitute 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 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.

ISO 19900 to ISO 19906 relating to offshore structures are intended to provide a wide latitude in the choice of structural configurations, materials and techniques without hindering innovation. Sound engineering judgement is therefore necessary in the use of these International Standards.

0.2 Preface

It is proposed to canvass the TC 67/SC 7 member countries to widen the scope of this part of ISO 19901 for the third edition. As a consequence, the title might change.

- It is proposed to expand and re-structure this part of ISO 19901 to more comprehensively address topside weight engineering principles, roles, responsibilities and objectives for a complete platform life cycle.
- It is proposed to re-format into a more traditional ISO document layout.
- The use of weight class A, B and C tables will be reviewed.
- There will be an outline of how to control topside weight, and of the aims and expectations of a Weight Review Panel (or similar).
- A common topside operating philosophy will be included with a matrix of coincident drilling loads, operating loads, and laydown / storage loads to be included in topside weight databases.
- It is proposed to give guidance on applied design contractor allowances during detailed design, plus the use of client operational and management reserves.
- The weight and CoG accuracy expected from weighings will be addressed.
- Separate clauses will be added to give clarity to specific requirements of floating structures and jackets
- The contents and terminology will be coordinated to interface with ISO 19902, *Design of offshore structures*, and the forthcoming ISO19901-9, *Structural integrity management* (due to be published in 2017).

It is proposed to give more guidance on a range of topics encountered during the phases of a platform life cycle, typically:

- a) Weight control principles
 - Overview of principles, aims and objectives
 - Roles and responsibilities
 - Competency

- Software selection
- Deliverables for each project phase
- Weight report contents
- b) Floating structures and jackets
 - Specific requirements for floating structures
- c) Concept and feasibility phase
 - Use of historical volumetric weight norms
 - Use of area based weight calculations
 - Use of footprint ratios
- d) Front end engineering design phase
 - Design parameters to be fixed prior to setting Not-to-Exceed weights
- e) Detailed design phase
 - Control of weight using a Weight Review Panel or similar
 - Use of contractor allowances
 - Use of client reserves
 - Discipline reporting responsibilities
 - Coincident operating loads
 - Coincident drilling loads
 - Coincident laydown and storage loads
 - Laydown and storage drawings and area signage
 - Vendor weighing requirements
- f) Fabrication phase
 - Fabricator responsibilities
 - Reporting of site run materials
 - Weighing requirements
 - Preparations for weighing
 - Expected weight and CoG accuracy from weighings
 - Predictions and witnessing of weighings
 - Post-weighing reconciliation and weighing corrections
- g) Installation and hook-up phase
 - Reporting of hook-up weights
- h) Operational phase
 - Control of weight and CoG for topside modifications

Interfaces with ISO 19901-9 and ISO 19902

i) Decommissioning phase

Preparations for decommissioning

Some of the above proposed changes are outlined in Annex G of this document (informative).

It is proposed that preparation of the third edition of this part of ISO 19901 will begin immediately after the issue of this edition with a target publication date of 2017.

Petroleum and natural gas industries — Specific requirements for offshore structures —

Part 5:

Weight control during engineering and construction

1 Scope

This part of ISO 19901 specifies requirements for controlling the weight and centre of gravity (CoG) by means of mass management during the engineering and construction of structures for the offshore environment. The provisions are applicable to offshore projects that include structures of all types (fixed and floating) and materials. These structures can be complete new installations or the modifications to existing installations. Maintaining the weight control of existing installations is not part of the main body of this part of ISO 19901, but some guidance on this is included in the [Annex G](#).

This part of ISO 19901:

- specifies quality requirements for reporting of weights and centres of gravity;
- specifies requirements for weight reporting;
- provides a basis for overall project weight reports or management reports for all weight control classes;
- specifies requirements for weight and load budgets;
- specifies the methods and requirements for the weighing and the determination of weight and CoG of major assemblies;
- specifies requirements for weight information from suppliers, including weighing of equipment and bulk materials for offshore installations.

It can be used:

- as a basis for planning, evaluating and presenting the client's, contractor's or fabricator's weight management and reporting system;
- as a means of refining the structural analysis or model;
- as a contract reference between client, contractor and suppliers;
- as a basis for costing, scheduling or determining suitable fabrication method(s) or location(s).

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/IEC Guide 98-3, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*