

Marine Operations

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This American National Standard is under the jurisdiction of the API Subcommittee on Offshore Structures. This standard modified from the English version of ISO 19901-2:2004. ISO 19901-2 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.

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Contents

Page

API Foreword	ii
Foreword	vii
Introduction	ix
1 Scope	1
2 Normative references	2
3 Terms and definitions	2
4 Symbols and abbreviated terms	15
4.1 Symbols	15
4.2 Abbreviated terms	18
5 General considerations	20
5.1 Introduction	20
5.2 Jurisdiction	21
5.3 HSE plan	22
5.4 Risk management	23
5.5 Job safety analysis	23
5.6 Environmental impact study	24
5.7 Manning, qualifications, job and safety training	24
5.8 Incident reporting	24
5.9 Personnel tracking	25
5.10 Approval by national authorities	25
6 Organization, documentation and planning	25
6.1 Introduction	25
6.2 Organization and communication	25
6.3 Quality assurance and administrative procedures	27
6.4 Technical procedures	27
6.5 Technical documentation	27
6.6 Certification and documentation	30
6.7 Systems and equipment	31
7 Metocean and earthquake requirements	33
7.1 Introduction	33
7.2 Weather-restricted/weather-unrestricted operations	34
7.3 Metocean conditions	34
7.4 Metocean criteria	36
7.5 Weather windows	37
7.6 Operational duration	38
7.7 Metocean forecast	38
7.8 Earthquake	39
8 Weight control	39
8.1 Introduction	39
8.2 Weight control classes	39
8.3 Contingencies for class A	40
8.4 Weight and CoG constraints	40
8.5 Weight control audits	40
8.6 Dimensional control	40
9 Stability	40
9.1 Introduction	40
9.2 General requirements	41
9.3 Stability calculations	41
9.4 Intact stability	41

9.5	Damage stability	43
9.6	Single-barge transports	45
9.7	Multi-barge transports	46
9.8	Classed vessels	46
9.9	Self-floating structures.....	46
9.10	Loadout operations	48
9.11	Watertight integrity and temporary closures	49
9.12	Inclining tests.....	49
10	Ballasting operations	50
10.1	Introduction	50
10.2	Ballast system.....	51
10.3	Protection against damage and deterioration	52
10.4	Prevention of progressive flooding in damage condition	53
10.5	Control and indicating systems	53
10.6	Pumps	54
10.7	Valve arrangements.....	54
10.8	Vent systems.....	54
10.9	Air cushion system capacity	55
10.10	System testing	55
11	Loadout.....	55
11.1	Introduction	55
11.2	Categories of loadout	56
11.3	Structure being loaded.....	56
11.4	Site and quay.....	57
11.5	Barge.....	57
11.6	Link beams, skidways and skidshoes	58
11.7	Moorings.....	58
11.8	Grounded loadouts.....	59
11.9	Pumping and ballasting	59
11.10	Loadouts by trailers, SPMTs or hydraulic skidshoes	61
11.11	Propulsion system design, redundancy and back-up	61
11.12	Float-on onto submersible barges or vessels	63
11.13	Barge reinstatement and sea fastenings.....	64
11.14	Tugs.....	65
11.15	Management and organization	65
11.16	Loadout manual	65
12	Transportation.....	65
12.1	Introduction	65
12.2	General considerations	66
12.3	Towline pull required, fleet composition and towing arrangement.....	68
12.4	Tow out from dry dock	70
12.5	Inshore tow	71
12.6	Offshore tow.....	72
12.7	Transport by dry tow or onboard a heavy transport vessel.....	72
12.8	Transport manual.....	75
13	Temporary mooring and stationkeeping for marine operations.....	75
13.1	Introduction	75
13.2	Environmental criteria	75
13.3	Determination of mooring response.....	76
13.4	Sizing of mooring lines	77
13.5	Sizing of anchors	78
13.6	Sizing of attachments.....	78
13.7	Sizing of mooring line components.....	79
13.8	Clearances under extreme conditions.....	79
13.9	Tensioning of moorings	79
13.10	Other stationkeeping means	80
14	Construction and outfitting afloat.....	81
14.1	Introduction	81
14.2	Structural strength and stresses	81
14.3	Construction spread.....	82

14.4	Welding.....	83
15	Float-over topsides installation	83
15.1	Introduction.....	83
15.2	Environmental considerations	83
15.3	Structural considerations	83
15.4	Clearances.....	84
15.5	Guidance systems for topsides set-down	85
15.6	Operational aspects	86
15.7	Float-over manual.....	88
16	Pre-laid mooring including foundation	88
16.1	Introduction.....	88
16.2	Installation planning.....	89
16.3	Fluke anchor installation	91
16.4	Plate anchor installation	92
16.5	Suction anchor installation	92
16.6	Anchor pile installation	94
16.7	Gravity anchor installation	95
16.8	Mooring system connectors.....	96
16.9	Chain.....	96
16.10	Steel wire rope	97
16.11	Synthetic fibre rope	98
16.12	TLP tendons.....	99
16.13	Mooring installation manual.....	99
17	Offshore installation operations	100
17.1	Introduction.....	100
17.2	Installation site.....	100
17.3	Actions on and motions of floating units	100
17.4	Systems and equipment	101
17.5	Launching.....	101
17.6	Float-off	103
17.7	Upending	104
17.8	Ballasting.....	105
17.9	Lifting and lowering by external means	105
17.10	Lowering by ballasting.....	107
17.11	Precise positioning on the sea floor by active and passive means.....	107
17.12	Skirt penetration	108
17.13	Underbase grouting	109
17.14	Piling	110
17.15	Attachment to pre-laid mooring system	112
17.16	Connection to a tendon system	113
17.17	Offshore completion	114
17.18	Installation manual	115
18	Lifting operations	115
18.1	Introduction.....	115
18.2	Rigging geometry	116
18.3	Actions and action effects.....	117
18.4	Strengths of slings, grommets and shackles.....	126
18.5	Design verifications	134
18.6	Lift point design.....	137
18.7	Clearances.....	139
18.8	Bumpers and guides	141
18.9	Heave compensated lifts	143
18.10	Lifts using DP.....	143
18.11	Practical considerations	143
18.12	Lifting operation manual.....	144
19	Decommissioning and removal	144
19.1	Introduction.....	144
19.2	Removal planning.....	145
19.3	Preparation for removal	148
19.4	Removal.....	149

19.5	Transportation and disposal	151
19.6	Site clearance.....	151
Annex A	(informative) Additional information and guidance	152
A.1	General.....	152
A.2	Guidance for 6.6.2: Required or recommended documentation	152
A.3	Guidance for 11.16: Loadout manual.....	154
A.4	Guidance for 12.8: Transport manual	156
A.5	Guidance for 17.18: Installation manual.....	157
A.6	Guidance for 18.8.4: Bumper and guide loads	158
Annex B	(informative) Regional information	163
B.1	Introduction.....	163
B.2	Canada	163
	Bibliography	167

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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.

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.

ISO 19901-6 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*.

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 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*

The following part is under preparation:

- *Part 3: Topsides structure*

ISO 19901 is one of a series of International Standards for offshore structures. The full series consists of the following:

- ISO 19900, *Petroleum and natural gas industries — General requirements for offshore structures*
- ISO 19901 (all parts), *Petroleum and natural gas industries — Specific requirements for offshore structures*
- ISO 19902, *Petroleum and natural gas industries — Fixed steel offshore structures*
- 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 19905-1, *Petroleum and natural gas industries — Site-specific assessment of mobile offshore units — Part 1: Jack-ups* ¹⁾
- ISO/TR 19905-2, *Petroleum and natural gas industries — Site-specific assessment of mobile offshore units — Part 2: Jack-ups commentary* ¹⁾
- ISO 19906, *Petroleum and natural gas industries — Arctic offshore structures* ¹⁾

1) Under preparation.

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, petrochemical 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 materials used.

It is important to recognize that structural integrity is an overall concept comprising models for describing actions, structural analysis, 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. It is necessary, therefore, to consider the implications involved in modifications in relation to the overall reliability of offshore structural systems.

The series of International Standards applicable to types of offshore structure is intended to provide a wide latitude in the choice of structural configuration, material and techniques without hindering innovation. Sound engineering judgment is, therefore, necessary in the use of these International Standards.

This part of ISO 19901 was developed to provide requirements and guidance for the planning, engineering and safe execution of marine operations for all types of offshore structures except for drilling rigs, pipe-laying barges and diving support vessels. Marine operations for offshore structures are parts of the construction, transportation and installation phases when the structure is at risk from the marine environment. Marine operations can extend to decommissioning, redeployment, removal, etc.

This part of ISO 19901 describes the principles of and provides requirements and guidance for marine operations associated with fixed and floating offshore structures, from the point of view of planning, engineering, implementation and documentation. Alternative requirements, methods and provisions can fulfil the intention of this part of ISO 19901 and may be applied, provided it can be demonstrated that they achieve at least the same level of confidence. The overall objective of this part of ISO 19901 is to ensure that marine operations are conducted within defined and recognized safety/confidence levels, wherever they are performed. Additional standards, codes and guidelines should also be taken into account, where applicable. Special attention should be paid to national regulations governing the area in which the marine operations are performed.

It is not the intent of this part of ISO 19901 to govern the design of structures, systems and components used in marine operations, beyond the principles given. Recognized codes and standards are normally accepted as the basis for the detailed design and the fabrication requirements of such components.

Annex A provides some background and some additional information to the main body of the document and it is intended that it be read in conjunction with the main body of the document.

Annex B provides regional information on the application of the document to certain specific offshore areas.

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

Part 6: Marine operations

1 Scope

This part of ISO 19901 provides requirements and guidance for the planning and engineering of marine operations, encompassing the design and analysis of the components, systems, equipment and procedures required to perform marine operations, as well as the methods or procedures developed to carry them out safely.

This part of ISO 19901 is applicable to marine operations for offshore structures including

- steel and concrete gravity base structures (GBS);
- piled steel structures and compliant towers;
- tension leg platforms (TLP);
- deep draught floaters (DDF), including spars or deep draught caisson vessels (DDCV);
- floating production semi-submersibles (FPSS);
- floating production, storage and offloading vessels (FPSO);
- other types of floating production systems (FPS);
- mobile offshore units (MOU);
- topsides and components of any of the above;
- subsea templates and similar structures;
- gravity, piled, drag embedded and suction or other anchors;
- tendon foundations;
- associated mooring systems.

This document is also applicable to modifications of existing structures, e.g. installation of additional topsides modules.

This part of ISO 19901 is not applicable to the following marine operations:

- a) construction activities, e.g. in a fabrication yard onshore, where there is no exposure to the marine environment;
- b) drilling, processing and petrochemical activities;

- c) routine marine activities during the service life of the structure;
- d) drilling from mobile offshore drilling units (MODU);
- e) installation of pipelines, flowlines, risers and umbilicals;
- f) diving.

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

ISO 19901-1:2005, *Petroleum and natural gas industries — Specific requirements for offshore structures — Part 1: Metocean design and operating considerations*

ISO 19901-4:2003, *Petroleum and natural gas industries — Specific requirements for offshore structures — Part 4: Geotechnical and foundation design considerations*

ISO 19901-7:2005, *Petroleum and natural gas industries — Specific requirements for offshore structures — Part 7: Stationkeeping systems for floating offshore structures and mobile offshore units*

ISO 15544, *Petroleum and natural gas industries — Offshore production installations — Requirements and guidelines for emergency response*

ISO 17776, *Petroleum and natural gas industries — Offshore production installations — Guidelines on tools and techniques for hazard identification and risk assessment*

IMCA M 179, *Guidance on the Use of Cable Laid Slings and Grommets*. The International Marine Contractors Association

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 19900, ISO 19901-1, ISO 19901-4, ISO 19901-7 and ISO 19904-1 and the following apply.

NOTE Other terms and definitions relevant for the use of this part of 19901 are also found in ISO 19901-5^[28], ISO 19902^[29], ISO 19903^[35] and ISO 19904-1^[30].

3.1 action

external load applied to the structure (direct action) or an imposed deformation or acceleration (indirect action)

EXAMPLE An imposed deformation can be caused by fabrication tolerances, settlement, temperature change or moisture variation.

NOTE An earthquake typically generates imposed accelerations.

[ISO 19900:2002, 2.1]