SLOVENSKI STANDARD
SIST EN ISO 13819-1:2000

01-december-2000

Petroleum and natural gas industries - Offshore structures - Part 1: General requirements (ISO 13819-1:1995)

Petroleum and natural gas industries - Offshore structures - Part 1: General requirements (ISO 13819-1:1995)

Erdöl- und Erdgasindustrien - Offshore-Konstruktionen - Teil 4: Allgemeine Anforderungen (ISO 13819-1:1995)

Industries du pétrole et du gaz naturel - Structures en mer - Partie 1: Exigences générales (ISO 13819-1:1995)

Ta slovenski standard je istoveten z: **EN ISO 13819-1:1997**

ICS:

75.180.10	Oprema za raziskovanje in odkopavanje	Exploratory and extraction equipment

SIST EN ISO 13819-1:2000 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 13819-1

August 1997

ICS 75.180.10

Descriptors: see ISO document

English version

Petroleum and natural gas industries - Offshore structures - Part 1: General requirements (ISO 13819-1:1995)

Industries du pétrole et du gaz naturel - Structures en mer - Partie 1: Exigences générales (ISO 13819-1:1995)

Erdöl- und Erdgasindustrien - Offshore-Konstruktionen - Teil 1: Allgemeine Anforderungen (ISO 13819-1:1995)

This European Standard was approved by CEN on 1997-04-10. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart,36 B-1050 Brussels

Foreword

The text of the International Standard from Technical Committee ISO/TC 67 "Materials, equipment and offshore structures for petroleum and natural gas industries" of the International Organization for Standardization (ISO) has been taken over as an European Standard by Technical Committee CEN/TC 12 "Materials, equipment and offshore structures for petroleum and natural gas industries", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 1998, and conflicting national standards shall be withdrawn at the latest by February 1998.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 13819-1:1995 has been approved by CEN as a European Standard without any modification.

INTERNATIONAL STANDARD

ISO 13819-1

First edition
1995-12-01

Petroleum and natural gas industries — Offshore structures —

Part 1: General requirements

Industries du pétrole et du gaz naturel — Structures en mer — Partie 1: Exigences générales

Reference number
ISO 13819-1:1995(E)

Contents

International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

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.

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.

International Standard ISO 13819-1 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum and natural gas industries*, Subcommittee SC 7, *Offshore structures*.

ISO 13819 will consist of the following parts, under the general title *Petroleum and natural gas industries — Offshore structures*:

— *Part 1: General requirements*

— *Part 2: Fixed steel structures*

— *Part 3: Fixed concrete structures*

— *Part 4: Floating systems*

— *Part 5: Arctic structures*

— *Part 6: Site specific assessment of MODUS*

Annex A of the present part of ISO 13819 is for information only.

Introduction

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 modifications 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.

International Standard ISO 13819 constitutes a common basis covering those aspects that address design requirements and assessments of all structures used by the petroleum and natural gas industries worldwide. Through its application the intention is to achieve reliability levels appropriate for manned and unmanned offshore structures, whatever the nature or combination of the materials used.

ISO 13819 is intended to provide a wide latitude in the choice of structural configurations, materials and techniques without hindering innovation. It shall, therefore, be used in conjunction with sound engineering judgment.

Part 1 of ISO 13819 applies to offshore structures and is in accordance with the principles of ISO 2394:1986, *General principles on reliability for structures*. It includes, where appropriate, additional provisions that are specific to offshore structures.

Petroleum and natural gas industries — Offshore structures — Part 1: General requirements

1 Scope

Part 1 of the Standard specifies general principles for the design and assessment of structures subjected to known or foreseeable types of actions. The principles specified are applicable worldwide.

The general principles are applicable to all types of offshore structures including bottom founded structures as well as floating structures.

The general principles are applicable to all types of materials used including steel, concrete, aluminum, etc.

The Standard is applicable to the design of complete structures including substructures, topside structures, vessel hulls, foundations, and mooring systems.

The Standard specifies design principles that are also applicable to the successive stages in construction (namely fabrication, transportation and installation), to the use of the structure during its intended life, and to its abandonment. Generally, the principles are also applicable to the reassessment or modification of existing structures. Aspects related to quality control are also addressed.

NOTE: The term "action" was introduced into ISO terminology to cover the effects due to imposed deformation as well as loads. The term "load", which is prevalent in some countries, can generally be used with essentially the same meaning as "action". In the past, "load" has often been used to describe direct actions only (see Clause 5.2.1).

2 Definitions

For the purposes of this International Standard, the following definitions apply:

2.1 Air gap:

The clearance between the highest water surface that occurs during the extreme environmental conditions and the underside of the deck.

2.2 Compliant structure:

A structure that is sufficiently flexible, such that applied lateral dynamic actions can be balanced substantially by the inertial reaction.

2.3 Fitness for purpose:

A structure condition describing a structure that meets the intent of this Standard, but does not meet certain provisions of this standard in local areas, such that failure in these areas will not cause unacceptable risks to life-safety or the environment.

2.4 Fixed structure:

A structure that is bottom founded and transfers all actions that act upon it to the sea floor.

2.5 Jack-up:

A mobile unit that can be relocated and is bottom founded in its operating mode. The jack-up reaches its operational mode by lowering the legs to the sea floor and then jacking the hull to the required elevation.

2.6 Return period:

The average time (usually years) between occurrence of events or actions of a specified magnitude or larger.

2.7 Riser:

The piping connecting the facilities or piping on the production deck with the subsea facilities or pipelines.

2.8 Semi-submersible:

A floating unit that can be relocated. A semi-submersible normally consists of a deck structure with a number of widely spaced, large diameter, supporting columns that are attached to submerged pontoons.

2.9 Tension leg platform:

A buoyant structure that is anchored to the sea floor by vertical mooring legs.

2.10 Well conductor:

A tubular pipe extending upward from the sea floor (or below) that contains the pipes (casing) that extend into the petroleum reservoir.

3 General requirements and conditions

NOTE: The requirements and conditions set forth in this section define the objective of the design. Criteria to enable designers and builders to reach this goal are provided throughout this Standard. However, unforeseen events that cause a structure to not achieve its objectives during its service life does not automatically imply a lack of compliance with this Standard.

3.1 Fundamental requirements

A structure and its structural components shall be designed, constructed, and maintained so that it is suited to its intended use. In particular, it shall, with appropriate degrees of reliability, fulfill the following performance requirements:

a) It shall withstand actions liable to occur during its construction and anticipated use (ultimate limit state requirement).

b) It shall perform adequately under all expected actions (serviceability limit state requirement).

c) It shall not fail under repeated actions (fatigue limit state).

d) In the case of hazards (accidental or abnormal events), it shall not be subsequently damaged disproportionately to the original cause (accidental limit state).

e) Appropriate degrees of reliability may depend upon:

- the cause and mode of failure
- the possible consequences of failure in terms of risk to life, environment and property
- the expense and effort required to reduce the risk of failure
- different requirements at national, regional or local level

This standard is set forth to provide criteria so that the above requirements are fulfilled during the intended life of the structure.

A structure designed and constructed in accordance to the present standard is assumed to comply with the above requirements.

3.2 Durability, maintenance and inspection

The durability of the structure in its environment shall be such that the general state of the structure is kept at an acceptable level during its life.

Maintenance shall include the performance of regular inspections, inspections on special occasions (e.g., after an earthquake or other severe environmental event), the upgrading of protection systems and repair of structural components.

Durability shall be achieved by either:

a) a maintenance program, or

b) designing so that deterioration will not invalidate the state of the structure in those areas where the structure cannot be or is not expected to be maintained.

In the first case above, the structure shall be designed and constructed so that no significant degradation is likely to occur within the time intervals between the inspections. The necessity of relevant parts of the structure being available for inspection - without unreasonably complicated dismantling - shall be considered during design. Degradation may be reduced or prevented by providing a suitable protection system.

The rate of deterioration may be estimated on the basis of calculations, experimental investigations, experience from other structures or a combination of these.

NOTE: Structural integrity, serviceability throughout the intended service life, and durability are not simply functions of the design calculations but are also dependent on the quality control exercised in manufacture, the supervision on site, and the manner in which the structure is used and maintained.

3.3 Hazards

3.3.1 General

Hazardous circumstances, that alone or in combination with normal conditions could cause the serviceability or ultimate limit states to be exceeded, shall be taken into account.

Possible hazards to the structure and its components include:

a) an error caused by lack of information, omission, misunderstanding, etc.,

b) effects of abnormal actions, or

c) operation malfunction that could lead to fire, explosion, capsizing, etc.

The measures taken to counter such hazards should basically consist of:

a) careful planning at all phases of development and operation,

b) avoiding the structural effects of the hazards by either eliminating the source or by bypassing and overcoming them,

c) minimizing the consequences, or

d) designing for hazards.

If a specific hazard has to be considered, it shall be used to define a design situation (see Clause 4.2.2). This design situation will normally be dominated by one hazardous occurrence with expected concurrent normal operating conditions.