

STN	Ropný a plynárenský priemysel. Zariadenia príbrežných plošín. Manažérstvo nebezpečenstiev závažných havárií počas navrhovania nových zariadení (ISO 17776: 2016).	STN EN ISO 17776 45 0942
------------	--	--

Petroleum and natural gas industries - Offshore production installations - Major Accident hazard management during the design of new installations (ISO 17776:2016)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 05/17

Obsahuje: EN ISO 17776:2016, ISO 17776:2016

Oznámením tejto normy sa ruší
STN EN ISO 17776 (45 1417) z októbra 2002

124800

Úrad pre normalizáciu, metrológiu a skúšobníctvo Slovenskej republiky, 2017
Podľa zákona č. 264/1999 Z. z. o technických požiadavkách na výrobky a o posudzovaní zhody a o zmene a doplnení niektorých zákonov v znení neskorších predpisov sa slovenská technická norma a časti slovenskej technickej normy môžu rozmnožovať alebo rozširovať len so súhlasom slovenského národného normalizačného orgánu.

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 17776

December 2016

ICS 75.180.10

Supersedes EN ISO 17776:2002

English Version

**Petroleum and natural gas industries - Offshore
production installations - Major Accident hazard
management during the design of new installations (ISO
17776:2016)**

Industries du pétrole et du gaz naturel - Installations
des plates-formes en mer - Lignes directrices relatives
aux outils et techniques pour l'identification et
l'évaluation des risques (ISO 17776:2016)

Erdöl- und Erdgasindustrie - Offshore-
Produktionsanlagen - Management der Gefährdungen
durch schwere Störfälle bei der Konstruktion neuer
Offshore-Anlagen (ISO 17776:2016)

This European Standard was approved by CEN on 19 October 2016.

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 CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents	Page
European foreword.....	3

European foreword

This document (EN ISO 17776:2016) has been prepared by Technical Committee ISO/TC 67 "Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries" in collaboration with Technical Committee CEN/TC 12 "Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries" the secretariat of which is held by CYS.

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 June 2017, and conflicting national standards shall be withdrawn at the latest by June 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 17776:2002.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 17776:2016 has been approved by CEN as EN ISO 17776:2016 without any modification.

**Petroleum and natural gas
industries — Offshore production
installations — Major accident hazard
management during the design of new
installations**

*Industries du pétrole et du gaz naturel — Installations des plates-
formes en mer — Lignes directrices relatives aux outils et techniques
pour l'identification et l'évaluation des risques*





COPYRIGHT PROTECTED DOCUMENT

© ISO 2016, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms, definitions and abbreviated terms	1
3.1 Terms and definitions	1
3.2 Abbreviated terms	4
4 Major accident hazard management overview	5
4.1 General	5
4.2 Project management commitment	5
4.3 Project management accountability	6
4.4 Project plan to manage major accident hazards	6
4.5 Objectives of major accident hazard management	6
4.6 Selection of hazard evaluation and risk assessment methods	7
4.7 Good engineering practice	7
4.8 Documentation	8
4.8.1 General	8
4.8.2 Register of major accident hazards	9
4.9 Actions management	9
4.10 Management of change	9
5 Management of major accident hazards in design	10
5.1 Overview of MA hazard management	10
5.2 Key concepts	11
5.2.1 Understanding the MA hazards	11
5.2.2 Inherently safer design (ISD)	12
5.2.3 Design strategies for managing MA hazards	13
5.2.4 Barriers	13
5.2.5 Performance standards	14
5.2.6 Communication with technical and operational teams	15
6 Screening and concept selection process	15
6.1 General	15
6.2 Objectives	16
6.3 Functional requirements	17
6.3.1 Screening	17
6.3.2 Hazard identification	17
6.3.3 Major accident hazards evaluation	17
6.3.4 ISD and barriers	18
6.3.5 Performance standards	18
6.3.6 Sufficiency of measures	18
6.3.7 Documentation	18
7 Concept definition and optimization	19
7.1 General	19
7.2 Objectives	20
7.3 Functional requirements	20
7.3.1 Hazard identification	20
7.3.2 Major accident hazard evaluation	20
7.3.3 Risk assessment	20
7.3.4 Inherently safer design (ISD)	20
7.3.5 Barriers	21
7.3.6 Performance standards	21
7.3.7 Sufficiency of measures	21
7.3.8 Documentation	22

8	Detailed design and construction phase	22
8.1	General	22
8.2	Objectives	23
8.3	Functional requirements	23
8.3.1	Overview	23
8.3.2	Hazard identification	24
8.3.3	Major accident hazards evaluation	24
8.3.4	Risk assessment	24
8.3.5	Inherently safer design (ISD)	24
8.3.6	Barriers	24
8.3.7	Performance standards	25
8.3.8	Sufficiency of measures	25
8.3.9	Register of major accident hazards	25
8.3.10	Documentation	25
8.3.11	Procurement of equipment	26
8.3.12	Construction, completion and commissioning	26
8.3.13	Transfer to operation	26
8.3.14	Actions management	26
9	Major accident hazard management in operation	27
9.1	General	27
9.2	Objectives	27
9.3	Functional requirements	28
9.3.1	Barrier management	28
9.3.2	Revalidation	28
9.3.3	Safety-critical tasks	28
9.3.4	Temporary changes	29
9.3.5	Non-availability of barrier performance	29
9.3.6	Management of change (MOC)	29
	Annex A (informative) Example of a framework for risk-related decision support	31
	Annex B (informative) Plan to manage major accident hazards	32
	Annex C (informative) Major accident hazard management identification and evaluation tools	41
	Annex D (informative) Strategy for managing major accident hazards	71
	Annex E (informative) Barrier system performance standards	77
	Annex F (informative) HAZID guidewords	80
	Bibliography	94

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 World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 6, *Processing equipment and systems*.

This second edition cancels and replaces the first edition (ISO 17776:2000), which has been technically revised and the title changed from *Petroleum and natural gas industries — Offshore production installations — Guidelines on tools and techniques for hazard identification and risk assessment* to the present title.

Introduction

The purpose of this document is to establish requirements and provide guidance for the effective management of major accident (MA) hazards during the design of new offshore installations for the petroleum and natural gas industries.

The management of MA hazards involves the application of engineering expertise and knowledge to provide the measures needed to meet the objectives set by the organizations involved in the project development. A range of tools for evaluating and assessing the likelihood and consequences of MAs is needed to help select the measures to be implemented, and to judge when sufficient measures have been provided.

This process is built on the underlying integrity provided by the application of internationally recognized codes and standards.

This document covers the following main elements:

- establishing general requirements for identifying MA hazards and their causes;
- assessing MA hazards to understand their likelihood and possible consequences;
- developing suitable strategies for managing MA hazards;
- progressively improving the understanding of MA hazards and their consequences to guide design decisions during the development phases of the installation;
- providing the measures needed to manage all credible MAs;
- maintaining the measures throughout the life of the installation.

The technical content of this document is arranged as follows:

- a) objectives: the goals to be achieved;
- b) functional requirements: specifying requirements considered necessary to meet the stated objectives;
- c) annexes: guidelines in support of the functional requirements.

This document should be read in conjunction with ISO 13702 and ISO 15544.

Petroleum and natural gas industries — Offshore production installations — Major accident hazard management during the design of new installations

1 Scope

This document describes processes for managing major accident (MA) hazards during the design of offshore oil and gas production installations. It provides requirements and guidance on the development of strategies both to prevent the occurrence of MAs and to limit the possible consequences. It also contains some requirements and guidance on managing MA hazards in operation.

This document is applicable to the design of

- fixed offshore structures, and
- floating systems for production, storage and offloading

for the petroleum and natural gas industries.

The scope includes all credible MA hazards with the potential to have a material effect on people, the environment and assets.

This document is intended for the larger projects undertaken to develop new offshore installations. However, the principles are also applicable to small or simple projects or design changes to existing facilities and can also be relevant to onshore production facilities.

Mobile offshore units as defined in this document are excluded, although many of the principles can be used as guidance. The design of subsea facilities are also excluded, though the effects of mobile and subsea facilities are considered if they can lead to major accidents that affect an offshore installation. This document does not cover the construction, commissioning, abandonment or security risks associated with offshore installations.

The decision to apply the requirements and guidance of this document, in full or in part, is intended to be based on an assessment of the likelihood and possible consequences of MA hazards.

2 Normative references

The following documents are referred to in text in such a way that some or all of their content constitutes requirements 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 31000, *Risk management — Principles and guidelines*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN