
**Petroleum and natural gas
industries — Arctic operations —
Escape, evacuation and rescue from
offshore installations**

*Industries du pétrole et du gaz naturel — Opérations en Arctique —
Échappement, évacuation et sauvetage depuis les installations en mer*



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Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Abbreviated terms	9
5 General requirements and conditions for EER systems	9
5.1 Fundamental requirements	9
5.2 Methods — Design	10
5.2.1 General	10
5.2.2 Structural configuration — Design	11
5.3 Methods — Operations	11
5.3.1 General	11
5.3.2 Structural configuration — Operations	12
6 Escape, evacuation and rescue strategy	13
6.1 General EER strategy	13
6.2 Human and hardware performance in EER	13
7 Physical environment	13
7.1 General physical environment	13
7.2 Physical environmental conditions — Design	14
7.3 Physical environmental conditions — Operations	14
8 Escape, evacuation and rescue hazard identification and risk analysis — Design and operations	15
8.1 General	15
8.2 General HAZID and risk analysis	15
8.3 EER HAZID	16
8.4 EER risk analysis	16
9 Continuous assessment	16
9.1 Continuous assessment — Design	16
9.2 Continuous assessment — Operations	16
10 Escape, evacuation and rescue system capabilities	17
10.1 EER system capabilities — Design	17
10.2 EER system capabilities — Operations	18
11 Emergency response organization	19
11.1 ERO — Design	19
11.2 ERO — Operations	19
12 Competency assurance	19
12.1 Competency assurance — Design	19
12.2 Competency assurance — Operations	20
13 Communications and alarms	21
13.1 Communications and alarms — Design	21
13.2 Communications and alarms — Operations	22
14 Personal protective equipment (PPE)	22
14.1 PPE — Design	22
14.2 PPE — Operations	23
15 Man overboard recovery	23
15.1 MOB recovery — Design	23
15.2 MOB recovery — Operations	23

16	Escape	24
16.1	Escape — Design	24
16.1.1	General escape — Design	24
16.1.2	Escape routes — Design	24
16.1.3	TR — Design	25
16.1.4	MS — Design	26
16.2	Escape operations	27
16.2.1	General escape — Operations	27
16.2.2	Escape routes — Operations	27
16.2.3	TR — Operations	28
16.2.4	MS — Operations	28
17	Evacuation	29
17.1	Evacuation — Design	29
17.1.1	General evacuation — Design	29
17.1.2	Evacuation method — Design	29
17.2	Evacuation — Operations	31
17.2.1	General evacuation — Operations	31
17.2.2	Evacuation method — Operations	31
18	Rescue	32
18.1	Rescue — Design	32
18.2	Rescue — Operations	33
Annex A (informative) Additional information and guidance		34
Annex B (informative) Examples of Arctic EER risk analysis and operational EER systems		70
Bibliography		103

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 of the voluntary nature of standards, 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 8, *Arctic operations*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The International Standards on arctic operations (ISO 35101, ISO 35102, ISO 35103, ISO 35104, ISO/TS 35105 and ISO 35106) address design and operational requirements and provide guidance on their use by the petroleum and natural gas industries in offshore arctic and cold regions. These documents promote internationally agreed approaches for oil and gas operations in arctic and cold region offshore environments. They were developed in response to the offshore oil and gas industry's demand for a coherent and consistent definition of methodologies to design, analyze, assess and operate arctic and cold region offshore structures. Through their proper application, the intention is to help ensure the safety of life and to minimize damage to the arctic environment. These documents are intended to provide wide latitude in the selection of design and operational solutions without hindering innovation. Even so, sound engineering judgement is expected in the application of these documents.

Personnel working in petroleum and natural gas industries in the arctic offshore face a number of risks from the physical and work environments. These include prolonged periods of darkness (in the winter) and light (in the summer), remoteness, cold ambient air temperatures, wind chill, dense fog, cold water temperatures, sea ice in varying concentrations and thickness and potentially, icebergs. These environmental factors can affect worker safety, should the installation's integrity be compromised. Additionally, these harsh environmental factors can have a negative impact on equipment.

The escape, evacuation and rescue (EER) system facilitates the successful escape from an incident, subsequent precautionary or emergency evacuation from the installation, and the ultimate rescue of installation personnel. The EER provisions are the compensating measures mitigating risks which facilitate the safety of personnel working in arctic and cold region offshore environments.

This document specifies requirements and recommendations applicable to design and operational aspects of EER from oil and gas installations deployed in arctic and cold region offshore environments. Through their application, the intention is to achieve reliability levels appropriate for manned and normally unmanned offshore installations, regardless of the type of structure/facility and the nature or combination of the materials used and the severity of the environment to which the installation is subjected.

The EER provisions are largely performance-based stipulations which include verifiable attributes or benchmarks that provide qualitative levels or quantitative measures of performance. The key characteristic of a performance-based standard is that it is focused on what needs to be achieved rather than on how it should be done. One of the performance targets is that use of the EER minimizes the possibility of casualties in the process. The performance target is developed in the context of a design HSE case.

The main body of this document considers the overall EER system design and operational aspects. [Annex A](#) provides EER system design and operational background information and guidance intended to assist the user of this document in understanding the requirements and how they can be met. The clause numbering in [Annex A](#) is the same as in the main body text to facilitate cross-referencing. [Annex B](#) provides a risk analysis example and information pertaining to operational EER systems.

In this document, the following verbal forms are used:

- “shall” indicates a requirement;
- “should” indicates a recommendation;
- “may” indicates a permission;
- “can” indicates a possibility or a capability.

Users of this document are expected to be familiar with ISO 15544, ISO 17776 and ISO 31000.

Petroleum and natural gas industries — Arctic operations — Escape, evacuation and rescue from offshore installations

1 Scope

This document establishes the principles, specifies the requirements and provides guidance for the development and implementation of an escape, evacuation and rescue (EER) plan. It is applicable to offshore installation design, construction, transportation, installation, offshore production/exploration drilling operation service life inspection/repair, decommissioning and removal activities related to petroleum and natural gas industries in the arctic and cold regions.

Reference to arctic and cold regions in this document is deemed to include both the Arctic and other locations characterized by low ambient temperatures and the presence or possibility of sea ice, icebergs, icing conditions, persistent snow cover and/or permafrost.

This document contains requirements for the design, operation, maintenance, and service-life inspection or repair of new installations and structures, and to modification of existing installations for operation in the offshore Arctic and cold regions, where ice can be present for at least a portion of the year. This includes offshore exploration, production and accommodation units utilized for such activities. To a limited extent, this document also addresses the vessels that support ER, if part of the overall EER plan.

While this document does not apply specifically to mobile offshore drilling units (MODUs, see ISO 19905-1) many of the EER provisions contained herein are applicable to the assessment of such units in situations when the MODU is operated in arctic and cold regions.

The provisions of this document are intended to be used by stakeholders including designers, operators and duty holders. In some cases, floating platforms (as a type of offshore installations) can be classified as vessels (ships) by national law and the EER for these units are stipulated by international maritime law. However, many of the EER provisions contained in this document are applicable to such floating platforms.

This document applies to mechanical, process and electrical equipment or any specialized process equipment associated with offshore arctic and cold region operations that impacts the performance of the EER system. This includes periodic training and drills, EER system maintenance and precautionary down-manning as well as emergency situations.

EER associated with onshore arctic oil and gas facilities are not addressed in this document, except where relevant to an offshore development.

2 Normative references

The following documents are referred to in the 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 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 — Major accident hazard management during the design of new installations*

ISO 19901-6, *Petroleum and natural gas industries — Specific requirements for offshore structures — Part 6: Marine operations*

ISO 19906, *Petroleum and natural gas industries — Offshore production installations — Arctic offshore structures*

ISO 31000, *Risk management — Guidelines*

ISO 35104, *Petroleum and natural gas industries — Arctic operations — Ice management*

ISO 35106, *Petroleum and natural gas industries — Arctic operations — Metocean, ice, and seabed data*

IMO International Convention for the Safety of Life at Sea (SOLAS), 1974

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

abandonment

act of personnel on-board leaving an installation in an emergency

3.2

accommodation

place where personnel on-board sleep and spend their off-duty time

Note 1 to entry: It can include dining rooms, recreation rooms, lavatories, cabins, offices, sickbay, living quarters, galley, pantries and similar permanently enclosed spaces.

3.3

annual risk tolerability criterion

ARTC

value of the individual and collective *risks* (3.50) per year of a fatality for persons, considering the amount of time spent in the operation and considering all risk sources, including workplace accidents, other incidents and *EER* (3.18) risks

3.4

anti-icing

measures to prevent ice from forming on surfaces, structures or equipment

Note 1 to entry: The intent of anti-icing is to make the surfaces, structures or equipment immediately available for use.

3.5

as low as reasonably practicable

ALARP

implementation of *risk* (3.50) reducing measures until the cost (including time, capital costs or other resources/assets) of further risk reduction is grossly disproportional to the potential risk reducing effect achieved by implementing any additional measure

3.6

casualty

serious injury or fatality resulting from an accident that occurs during the *EER* (3.18) process