SLOVENSKI STANDARD
oSIST prEN ISO 15544:2023

01-april-2023

Nadomešča:
SIST EN ISO 15544:2010

Industrija za predelavo nafte in zemeljskega plina - Plavajoči proizvodni objekti - Zahteve in smernice za ukrepanje v nujnih primerih (ISO/DIS 15544:2023)

Petroleum and natural gas industries - Offshore production installations - Requirements and guidelines for emergency response (ISO/DIS 15544:2023)

Erdöl- und Erdgasindustrie - Offshore-Produktionsanlagen - Anforderungen und Richtlinien für Notfallreaktionen (ISO/DIS 15544:2023)

Industries du pétrole et du gaz naturel - Installations de production en mer - Exigences et lignes directrices pour les interventions d'urgence (ISO/DIS 15544:2023)

Ta slovenski standard je istoveten z: **prEN ISO 15544**

ICS:

75.180.10	Oprema za raziskovanje, vrtanje in odkopavanje	Exploratory, drilling and extraction equipment

oSIST prEN ISO 15544:2023 **en,fr,de**

DRAFT INTERNATIONAL STANDARD

ISO/DIS 15544

ISO/TC **67**/SC **6**

Secretariat: **AFNOR**

Voting begins on:
2023-02-15

Voting terminates on:
2023-05-10

Petroleum and natural gas industries — Offshore production installations — Requirements and guidelines for emergency response

Industries du pétrole et du gaz naturel — Installations de production en mer — Exigences et lignes directrices pour les interventions d'urgence

ICS: 75.180.10

This document is circulated as received from the committee secretariat.

ISO/CEN PARALLEL PROCESSING

Reference number
ISO/DIS 15544:2023(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

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.

This document was prepared by Technical Committee ISO/TC *67, Oil and gas industries including lower carbon energy*, Subcommittee SC 6, *Process equipment, piping, systems, and related safety,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 12, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the second edition (ISO 13702:2020), which has been technically revised with improvements and simplifications to most of the sections in this international standard.

The main changes are as follows:

— Clarifications of requirements and editorial changes throughout the document. Recommendations and requirements are more precise. Abbreviations and definitions have been revised to align with relevant ISO standards.

— Several recommendations have bveen changed to requirements based on operational experiences.

— The first edition of this document was 20 years old and needed an update to be in accordance with ISO directive 2. ISO/IEC Directives, Part 2

— Annex F is made normative.

— Annex G has been removed and references are made to IOGP guidelines[6],[7] and[8].

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.

Annexes A, B, C, D and E of this document are for information only. Annex F is normative.

Introduction

Successful safety and environmental protection during the recovery of hydrocarbon resources requires a structured approach to be applied to the identification and assessment of the hazards present during the various phases in the lifecycle of an offshore installation. These principles also apply to the development of emergency response strategy, emergency response measures and procedures. Understanding of the hazards can be achieved by application of ISO 17776,[4] which gives guidelines for hazard identification and assessment for offshore installations.

The content in this document on escape, refuge, evacuation and rescue is consistent with the content of ISO 13702[3] but addresses in more detail how these aspects are built into development of emergency response measures.

This document has been prepared primarily to assist in the development of new installations. Retrospective application of this document is only relevant where it is reasonable to do so. During the planning of a major change to an installation there can be more opportunity to implement the requirements, and a review of this International Standard will enable identification of clauses which can be practically utilized in the change.

This document is based on an approach where the selection of measures for emergency response is determined by an evaluation of hazards on the offshore installation. The methodologies employed in this assessment and the resultant recommendations will differ depending on the complexity of the production process and facilities, type of facility (i.e. open or enclosed), manning levels, and the environmental conditions associated with the location of operation.

Local regulations are not addressed in this document.

The principal objectives of this document are to describe both the approach to be used and important considerations in determining the emergency response measures that are required on an offshore installation in order to:

— protect people;

— minimize impact on the environment;

— minimize impact on assets and operations.

The technical guidance in clauses 6 to 15 of this document is arranged as follows:

— **Objectives** identify the goals to be achieved by the emergency response measures being described.

— **Functional requirements** represent the minimum conditions to meet the stated objectives. The functional requirements are performance-orientated measures and, as such, are applicable to the variety of offshore installations utilized for the development of hydrocarbon resources throughout the world.

— **Execution and guidelines** describe recognized practices for consideration in developing the measures for emergency response. The guidelines are limited to principal elements and are intended to provide specific guidance which, due to the wide variety of offshore operating environments, may in some circumstances not be applicable.

— **Functional requirements and guidelines** are supplemented by annexes A to F. The guidelines and annexes are intended for use in conjunction with statutory requirements, industry standards and individual company philosophy, to determine the particular measures that are necessary for emergency response.

Petroleum and natural gas industries — Offshore production installations — Requirements and guidelines for emergency response

1 Scope

This document describes objectives, functional requirements and guidelines for emergency response (ER) measures on installations used for the development of offshore hydrocarbon resources. It is applicable to:

— fixed offshore structures;

— floating systems for production, storage and off-loading.

NOTE For mobile offshore units, the ER plans developed in conformance with the requirements and recommendations of the International Maritime Organization (IMO) are generally adequate for the normal, independent operation of the unit in most locations. The following aspects of ER planning are not generally addressed by IMO and are topics intended for inclusion in the scope of this document where relevant to the specific installation:

— area evacuation, e.g., precautionary evacuation in areas of tropical revolving storms;

— combined operations (where an integrated command and ER system is relevant;

— arctic operations;

— un-controlled flow from a well.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
abandonment
act of personnel onboard leaving an installation in an emergency

3.2
accommodation
place where personnel onboard 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
control
<of hazards> limiting the extent or duration of a *hazardous event* (3.17)

Note 1 to entry: The definition of control is specific in this International Standard and other definitions are used in other standards.

3.4
central control room
place on the installation from which personnel can monitor the status of the installation, initiate appropriate shutdown actions and undertake *emergency* (3.7) communication

3.5
exercises
periodic practice event based on a potential and credible emergency scenario where the emergency response arrangements (including interactions with relevant external parties) are tested to verify their workability, identify improvements, and build familiarity and competence

Note 1 to entry: Includes emergency response drills involving routine and regular events where an emergency response action (e.g. mustering) is practiced to maintain familiarity and awareness.

3.6
embarkation area
place from which personnel abandon the installation during *evacuation* (3.13)

EXAMPLE A helideck and associated waiting area or a lifeboat/liferaft boarding area.

3.7
emergency
hazardous event (3.17) which cannot be handled by normal measures and requires immediate action to limit its extent, duration or consequences

3.8
emergency response
ER
action taken by personnel on or off the installation to control or mitigate a hazardous event or initiate and execute *abandonment* (3.1)

3.9
emergency response plan
systematic procedures that clearly detail what is to be done, how, when, and by whom before, during and after the time an emergency occurs

[SOURCE: ISO 27917:2017, 3.4.12 without the notes]

3.10
emergency response measure
systems, equipment and processes provided for use in the event of an *emergency* (3.7)

Note 1 to entry: This is a generic term including hardware provided for emergency response as well as the planning, procedural and organisational aspects of responding to emergencies.

3.11
escape
act of personnel moving away from a hazardous event to a place where its effects are reduced or removed

[SOURCE: ISO 13702:2023, 3.16]

3.12
escape route
route from an area of an installation leading to a *muster area* (3.23), *temporary refuge* (3.32), *embarkation area* (3.6), or means of *escape* (3.11) to the sea

3.13
evacuation
planned method of abandoning the installation

3.14
escape, evacuation and rescue
EER
range of possible actions in an emergency

Note 1 to entry: Such actions include escape, muster, refuge, evacuation, escape to the sea and rescue/recovery.

3.15
evacuation route
escape route (3.12) which leads from the muster area to the place(s) used for primary or secondary *evacuation* (3.13) from the installation

3.16
hazard
potential source of harm

Note 1 to entry: Hazard can be a risk source of potential for human injury, damage to the environment, damage to property, or a combination of these

[SOURCE: ISO/IEC Guide 51:2014, 3.2]

3.17
hazardous event
event that can cause harm

EXAMPLE The incident which occurs when a hazard is realized such as release of gas, fire, loss of buoyancy.

[SOURCE: ISO/IEC Guide 51:2014, 3.3]

3.18
key personnel
persons with specific skills and training to perform their ER roles that are replaced by deputy if not available

3.19
life-jacket
device worn by personnel which has sufficient buoyancy and stability in water to turn the body of an unconscious person and keep the person's mouth clear of the water

3.20
mitigation
limitation of the undesirable effects of a particular event

3.21
manned installation
installation which is normally occupied

3.22
mobile offshore unit
mobile platform, including drilling ships, equipped for drilling for subsea hydrocarbon deposits andmobile platforms for purposes other than production and storage of hydrocarbon deposits

Note 1 to entry: Includes mobile offshore drilling units, drill ships, accommodation units, construction and pipe lay units, well servicing and well stimulation vessels.

3.23
muster
movement of people to a designated area so that the person in overall charge can account for all people and facilitate subsequent *emergency response* (3.8) actions

3.24
muster area
designated area to which personnel report when required to do so in an *emergency* (3.7)

3.25
primary method
<of evacuation> preferred method of leaving the installation in an emergency which can be carried out in a fully controlled manner under the direction of the person in charge

3.26
redundancy
use of more than one independent means to accomplish a given function

[SOURCE: ISO/TR 15916:2015(en), 3.90]

3.27
recovery
process by which personnel in *survival craft* (3.31) are retrieved to a place of safety

3.28
rescue
urgent process by which those who have entered the sea directly or are in life rafts are retrieved to a place of safety

3.29
risk
combination of the probability of occurrence of harm and the severity of that harm

Note 1 to entry: A more general definition of risk is given in ISO Guide 73:2009

[SOURCE: ISO 13702:2023, 3.38, with modified Note]

3.30
secondary method
<of evacuation> method of leaving the installation in an *emergency* (3.7) which can be carried out in a fully controlled manner under the direction of the person in charge, independent of external support

3.31
survival suit
protective suit made of materials which reduces body heat-loss of a person wearing it in cold water

Note 1 to entry: The suit can also have sufficient buoyancy and stability in water to turn the body of an unconscious person and keep the person's mouth clear of the water

3.32
survival craft
vessel capable of sustaining the lives of persons abandoning the installation until *rescue* (3.27)

3.33
temporary refuge
TR
place provided where personnel can take shelter for a predetermined period whilst investigations, emergency response and evacuation preparations are undertaken

Note 1 to entry: A temporary refuge, where provided, need not necessarily be useable under all accident scenarios.

3.34
tertiary method
<for escape to the sea> method which relies on the individual's own action.

4 Abbreviated terms

EPIRB	emergency position-indicating radio beacon
ERS	emergency response strategy
ESD	emergency shutdown
F&G	fire and gas
HSE	health, safety and environment
IMO	International Maritime Organization
SOLAS	Safety of Life at Sea (conference)

5 Objectives

Effective management systems are required to address the health and safety aspects of the activities undertaken by all companies associated with the offshore recovery of hydrocarbons. These management systems are applied to all stages in the life cycle of an installation and to all related activities. Such a management system, which has been developed for environmental issues, is described in ISO 14001[1] and the principles contained therein can also be applied to issues relating to health and safety.

EXAMPLE Operators are expected to have an effective management system. Contractors are expected to have either their own management system or conduct their activities consistently with the operator's management system.

One key element of effective management systems is a systematic process of identification of hazards, followed by evaluation and risk management. Risk reduction is an important component of risk management, and the selection of risk reduction measures will predominantly entail the use of sound engineering judgement. However, such judgements are supplemented by recognition of the particular circumstances, which can require variation to past practices and previously applied codes and standards. In certain circumstances, risk assessment can provide useful input to the decision-making process provided that the operator has established criteria for this purpose. Risk reduction measures include those to prevent incidents (i.e. reducing the probability of occurrence), to control incidents (i.e. limit the extent and duration of a hazardous event) and to mitigate the effects (i.e. reducing the consequences). Preventative measures such as using inherently safer designs and ensuring asset integrity are emphasized wherever practicable. Measures to recover from incidents are provided based on the evaluation, and developed considering possible failures of the control and mitigation measures. Based on the results of the evaluation, detailed health, safety and environmental objectives and functional requirements are set at appropriate levels.

The above is general and applies to all hazards and potentially hazardous events, and ER shall be treated in the same manner.

ER measures shall be provided based on an evaluation that takes into account possible failures of the control and mitigation measures. It is these ER measures, which, as an integrated system, provide the appropriate response to an incident occurring on or near the installation.

The results of the evaluation process and the decisions taken with respect to the need for, and role of, any measures required for ER should be fully recorded, in which case the record shall be available to those who operate the installation and to those involved in any subsequent change to the installation. This record is the emergency response strategy (ERS).

ISO 13702[3] introduced the concept of strategies but stated that such strategies do not have to be separately documented, as the relevant information can be included with other HSE information for an installation or can be contained in recognized codes and standards that are relevant to the operating location. Indeed, there can be significant overlap between strategies and other HSE information, so that combining this information into one source is likely to assist the understanding of the people on the installation of how the various measures are integrated.

The ERP should set out the operational and procedural requirements to be follow under the various emergency scenarios that are relevant for a particular installation.

The resources that typically are involved in ER can be divided into three categories:

a) **Installation resources**

Resources which are under the direction of the person in overall charge of the installation, and which are immediately available. They include personnel and equipment, vessels and helicopters that have been assigned ER duties.

b) **Area resources**

Resources which are not under the direction of the person in overall charge of the installation, but which are located in the same area. The resources are made available by a mutual aid or cooperation agreement, and can include installations in the vicinity, supply vessels, other vessels and helicopters.

c) **External resources**

Resources which are not under the direction of the person in overall charge of the installation, and which are not located in the area. Such resources can be the organization and resources of national and international rescue services, as well as other resources who professional bodies or others can place at the disposal of the field or installation manager. This can include aircraft, helicopters, coast guard and navy vessels, shore-based personnel resources, regional or national oil pollution resources, the public health service and resources governed by international agreements and other agreements among the operators of installations.

6 Emergency response strategy

6.1 Objectives

The objectives are to identify and record the intended approach for ER.

6.2 Functional requirements

An emergency response strategy (ERS) shall be developed for offshore installations based on an assessment of the potential emergencies that can arise.

The ERS shall address the issues of organization, procedures, equipment, information, training and the role of other measures that are necessary to achieve a successful ER.

ER measures shall be identified and recorded in the ERS. Performance requirements for each ER measure shall be set consistent with its role defined in the ERS.

The ERS shall account for the potential unavailability of personnel with key ER roles in an emergency situation.

In developing the ERS, the reliability and availability of equipment shall be evaluated to determine whether additional components are required to deal with periods of non-availability, e.g. due to maintenance or breakdown.

The ERS shall be:

— periodically revalidated;

— updated whenever there is a change in risk which affects the content of the strategy;

— subject to ongoing improvement by learning from incidents, accidents, exercises and drills.

6.3 Execution and guidelines

Emergency planning should include sufficient flexibility to remain effective given the uncertainties in how an emergency could develop. Emergency communication arrangements shall inform relevant personnel of their required actions.

For new installations the development of the ERS, and the associated emergency response measures, should be an integral part of the design process.

ER measures shall be provided based on an evaluation that accounts for potential failures of the control and mitigation measures. It is these ER measures which, as an integrated system, provide the appropriate response to an incident occurring on or near the installation.

The results of the evaluation process and the decisions taken about the need for, and role of, the emergency response measures shall be recorded in the ERS. This record shall be made available to those who operate the installation and to those involved in subsequent change to the installation.

Key assumptions used in the development of the ERS shall be recorded, so that they can be reviewed to confirm that they are still valid.

The ERS shall be periodically reviewed by the custodian of the strategy.

ER measures to deal with acute oil pollution shall be integrated into the overall ERP. The company responsible for an offshore installation shall liaise with relevant authorities to develop plans to deal with oil spills that could affect the shoreline.

When developing the ERS, the maximum number of people who might be involved in an emergency shall be evaluated and recorded. During some phases of life cycle of an installation, such as during major construction work, the number of people on the installation can be significantly higher than assumed in the ERS. Prior to such phases of work, the impact on ER shall be evaluated so that changes to the ER measures can be implemented before the complement increases.

Further guidance in strategies is given in Annex A.

7 Emergency response plan

7.1 Objective

The objective is to provide a statement of the key ER actions expected under emergency conditions and the information required to support those actions.