



SLOVENSKI STANDARD
oSIST prEN ISO 13702:2023
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Industrija za predelavo nafte in zemeljskega plina - Nadzor in zajezitev požarov in eksplozij na plavajočih proizvodnih objektih - Zahteve in smernice (ISO/DIS 13702:2022)

Petroleum and natural gas industries - Control and mitigation of fires and explosions on offshore production installations - Requirements and guidelines (ISO/DIS 13702:2022)

Erdöl- und Erdgasindustrie - Überwachung und Eindämmung von Feuer und Explosionen auf Offshore-Produktionsplattformen - Anforderungen und Leitlinien (ISO/DIS 13702:2022)

Industries du pétrole et du gaz naturel - Contrôle et mitigation des feux et des explosions des installations en mer - Exigences et lignes directrices (ISO/DIS 13702:2022)

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

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Petroleum and natural gas industries — Control and mitigation of fires and explosions on offshore production installations — Requirements and guidelines

Industries du pétrole et du gaz naturel — Contrôle et atténuation des feux et des explosions dans les installations en mer — Exigences et lignes directrices

ICS: 75.180.10

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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).

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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, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 6, *Processing equipment and systems*, 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 third edition cancels and replaces the second edition (ISO 13702:2015), which has been technically revised with improvements and simplifications to most of the sections in this international standard.

The main changes are as follows:

- visualized the risk treatment process in a flow diagram in [clause 6.8](#);
- improved description of the explosion blast description in Annex [A.3](#) explosion events;
- improved guidance with respect to risk mitigation in Annex [B.1](#) installation layout;
- introduction of ESD hierarchy and guidance related to principles to protect pressurised equipment against fire – Annex [B.2](#) ESD and blowdown;
- improved guidance on ignition source control – Annex [B.3](#);
- included guidance for control of spills related to floating LNG in Annex [B.4](#);
- expanded guidance related to gas detection in Annex [B.6](#);
- included guidance related to ignition source control for firewater pump drivers and external power supplies – Annex [B.8.2](#);
- addressing personnel safety related to CO₂ or other asphyxiating gases – Annex [B.8.11](#);
- introduced guidance related to passive fire-retarding surface for helidecks – Annex [B.8.13](#);
- introduced guidance related to tests – Annex [B.13](#);

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— introduced the terms A-class and H-class for fire barriers – Annex [C.4.3](#).

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.

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Introduction

The successful development of the arrangements required to promote safety and environmental protection during the recovery of hydrocarbon resources requires a structured approach to the identification and management of health, safety, and environmental hazards applied during the design, construction, operation, inspection, maintenance, and decommissioning of a facility.

This document has been prepared primarily to assist in the development of new installations through their lifecycle. For existing installations that predate this document, not all requirements are necessarily appropriate. Retrospective application of this document can be undertaken where it is reasonably practicable to do so. During the planning for a major change to an installation, there will be more opportunity to implement the requirements. A careful review of this document will determine those sections which can be utilized in the change.

The technical content of this document is arranged as follows.

- **Objectives:** lists the goals to be achieved by the control and mitigation measures being described.
- **Functional requirements:** represent the minimum criteria 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.
- **Annex A (informative):** typical fire and explosion hazardous events.
- **Annex B (informative):** describes recognized practices to be considered in conjunction with statutory requirements, industry standards, and individual operator philosophy to determine that the measures necessary are implemented for the control and mitigation of fires and explosions. The guidelines are limited to principal elements and are intended to provide specific guidance which, due to the wide variety of offshore operating environments, cannot be applicable in some circumstances.
- **Annex C (informative):** typical examples of design requirements for large integrated offshore installations.
- **Bibliography:** lists documents to which informative reference is made in this document.

Petroleum and natural gas industries — Control and mitigation of fires and explosions on offshore production installations — Requirements and guidelines

1 Scope

This document describes the objectives and functional requirements for the control and mitigation of fires and explosions on offshore installations used for the development of hydrocarbon resources.

This document is applicable to the following:

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

Mobile offshore units as defined in this document and subsea installations are excluded, although many of the principles contained in this document can be used as guidance.

This document is based on an approach where the selection of control and mitigation measures for fires and explosions primarily caused from loss of containment 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 environmental conditions associated with the area of operation.

NOTE Statutory requirements, rules, and regulations can, in addition, be applicable for the individual offshore installation concerned.

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/IEC Guide 73, *Risk management — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC Guide 73 and the following 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

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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

active fire protection

AFP

equipment, systems, and methods which, following initiation, can be used to control, mitigate, and extinguish fires

3.4

area classification

division of an installation into hazardous areas and non-hazardous areas and the sub-division of hazardous areas into zones

Note 1 to entry: This classification is based on the materials which can be present and the probability of a flammable atmosphere developing. Area classification is primarily used in the selection of electrical equipment to minimize the likelihood of ignition if a release occurs.

3.5

cellulosic fire

CF

fire involving primarily cellulosic material such as wood, timber, or paper.

3.6

class of fire

type of fire

classification of fires, based on the nature of the fuel

Note 1 to entry: ISO 3941 describes the classes of fires.

3.7

control

<of hazards> limiting the extent or duration of a hazardous event

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

3.8

control station

place on the installation from which personnel can monitor the status of the installation, initiate appropriate shutdown actions, and undertake any emergency communication

3.9

deluge system

system to apply fire-water through an array of open spray nozzles by operation of a valve on the inlet to the system

3.10

embarkation area

place from which personnel leave the installation during evacuation

EXAMPLE Helideck and associated waiting area or a lifeboat/life raft boarding area.

3.11

emergency depressurization

EDP

controlled disposal of pressurized fluids to a flare or vent system when required to avoid or minimize a hazardous situation

3.12**emergency response**

action taken by personnel on or off the installation to control or mitigate a hazardous event or initiate and execute abandonment

3.13**emergency response team**

group of personnel who have designated duties in an emergency

3.14**emergency shutdown****ESD**

control actions undertaken to shut down equipment or processes in response to a hazardous situation

3.15**escalation**

spread of impact from fires, explosions, toxic gas releases to equipment or other areas thereby causing an increase in the consequences of a hazardous event

3.16**escape**

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

3.17**escape route**

route from an area of an installation leading to a muster area, temporary refuge (TR), embarkation area, or means of escape to the sea

3.18**critical safety system**

any system which has a major role in the control and mitigation of fires and explosions and in any subsequent evacuation, escape, and rescue activities

3.19**evacuation**

planned method of leaving the installation in an emergency

3.20**evacuation, escape, and rescue****EER**

range of possible actions including escape, muster, refuge, evacuation, escape to the sea, and rescue/recovery

3.21**evacuation route**

escape route which leads from the temporary refuge (TR) to the place(s) used for evacuation from the installation

3.22**gas explosion**

combustion of a flammable gas or mist which generates blast waves due to confinement of the combustion-induced flow or the acceleration of the flame front by obstacles in the flame path

3.22.1**physical explosion**

explosion arising from the sudden release of stored energy such as from failure of a pressure vessel

ISO/DIS 13702:2022(E)**3.23****fire and explosion strategy****FES**

results of the process that uses information from the fire and explosion evaluation to determine the measures required to manage these hazardous events and the role of these measures

3.24**functional requirements**

minimum criteria which shall be satisfied to meet the stated health, safety, and environmental objectives

3.25**hazard**

potential source of harm

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

[SOURCE: ISO/IEC Guide 51:2014]

3.26**hazardous area**

three-dimensional space in which a flammable atmosphere can be expected to be present at such frequencies as to require special precautions for the control of potential ignition sources

3.27**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]

3.28**human factors**

environmental, organisational, and job factors which influence behaviour of work in a way that can affect health and safety

3.29**ignition sources**

any source with sufficient energy to initiate combustion

3.30**integrated installation**

offshore installation which contains, on the same structure, accommodation, and utilities in addition to process or wellhead facilities

3.31**jet fire****JF**

turbulent diffusion flame resulting from the combustion of a fuel continuously released with momentum in a particular direction

3.32**manned installation**

installation on which people are routinely accommodated

3.33**mobile offshore unit**

mobile platform, including drilling ships, equipped for drilling for subsea hydrocarbon deposits and mobile platform for purposes other than production and storage of hydrocarbon deposits

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

3.34**muster area**

designated area where personnel report when required to do so

3.35**operator**

individual, partnership, firm, or corporation having control or management of operations on the leased area or a portion thereof

Note 1 to entry: The operator can be a lessee, designated agent of the lessee(s), or holder of operating rights under an approved operating agreement.

3.36**passive fire protection****PFP**

coating or cladding arrangement or free-standing system which, in the event of fire, will provide thermal protection to restrict the rate at which heat is transmitted to the object or area being protected

3.37**pool fire**

turbulent diffusion fire burning above a horizontal pool of vaporizing hydrocarbon fuel under conditions where the fuel has zero or very low initial momentum

3.38**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 and is “effect of uncertainty” where:

- an effect is a deviation from the expected, and
- uncertainty is a state of having limited knowledge where it is impossible to exactly describe the existing state and future outcomes.

[SOURCE: ISO 17776 :2016]

3.39**running liquid fire**

fire involving a flammable liquid flowing over a surface

3.40**temporary refuge****TR**

place provided where personnel can take refuge for a predetermined period while investigations, emergency response, and evacuation preplanning are undertaken

3.41**zone**

part of a hazardous area based upon the frequency of the occurrence and duration of an explosive gas atmosphere during normal operating conditions.