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Petroleum and natural gas industries - Offshore production installations - Process safety systems (ISO 10418:2019)

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. 09/19

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English Version

**Petroleum and natural gas industries - Offshore
production installations - Process safety systems (ISO
10418:2019)**

Industries du pétrole et du gaz naturel - Plates-formes
de production en mer - Systèmes de sécurité des
procédés (ISO 10418:2019)

Erdöl- und Erdgasindustrie - Offshore-
Produktionsanlagen - Sicherheitssysteme für Prozesse
(ISO 10418:2019)

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EN ISO 10418:2019 (E)

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European foreword

This document (EN ISO 10418:2019) 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 NEN.

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of an identical text or by endorsement, at the latest by December 2019, and conflicting national standards shall be withdrawn at the latest by December 2019.

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Endorsement notice

The text of ISO 10418:2019 has been approved by CEN as EN ISO 10418:2019 without any modification.

**INTERNATIONAL
STANDARD**

**ISO
10418**

Third edition
2019-05

**Petroleum and natural gas
industries — Offshore production
installations — Process safety systems**

*Industries du pétrole et du gaz naturel — Plates-formes de production
en mer — Systèmes de sécurité des procédés*



Reference number
ISO 10418:2019(E)

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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 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 6, *Processing equipment and systems*.

This third edition cancels and replaces the second edition (ISO 10418:2003), which has been technically revised. It also incorporates the Technical Corrigendum ISO 10418:2003/Cor.1:2008. The main changes compared to the previous edition are as follows:

- safety analysis tables (SATs) and safety analysis checklists (SACs), which previously were reproduced from API RP 14C, have been deleted and replaced by references to the analysis methods included in API RP 14C;
- simplification of annexes to avoid duplication of API RP 14C content.

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

Effective management systems are required to address health and safety aspects of activities undertaken by companies associated with offshore recovery of hydrocarbons. These management systems are applied to each stage in the lifecycle of an installation and to related activities.

One key aspect of effective management systems is a systematic approach of identification of hazards and the assessment of the risk, in order to aid decision-making on the need for risk-reduction measures.

Selection of risk-reduction measures entails the use of sound engineering judgement informed by recognition of the particular circumstances, which can prompt variation to past practices and previously applied codes and standards.

Risk reduction measures include those to minimize and eliminate hazards by design (i.e. use of inherently safer designs), to prevent incidents (i.e. reducing the probability of occurrences), to control incidents (i.e. limit the scale, intensity and duration of a hazardous event), and to mitigate effects (i.e. reducing the consequences).

Extent of hazard identification and risk assessment activities will vary depending on the stage in the installation lifecycle, as well as process conditions, degree of standardization, complexity, number of persons on board and the installation's overall estimated level of risk.

For installations in the early design phases, the evaluations will necessarily be less detailed than those undertaken during later design phases. Design assumptions developed during these early stages are normally verified before the installation becomes operational.

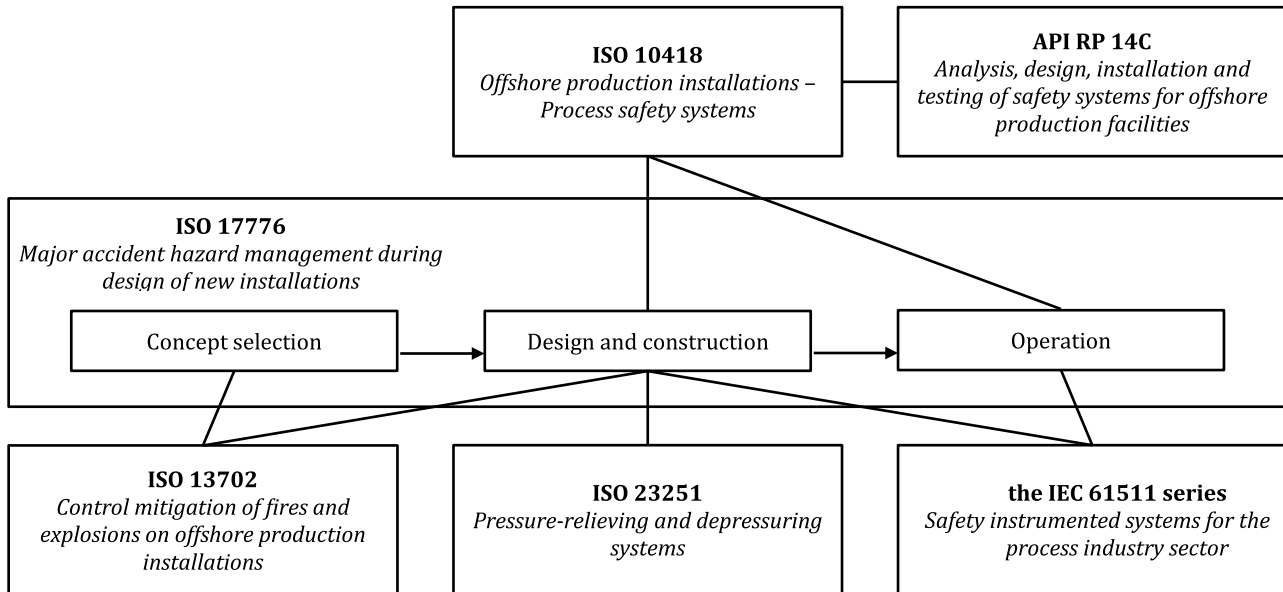
Process safety systems are provided to prevent, detect, control or mitigate undesirable events in process equipment.

This document sets out three options for identifying appropriate process safety systems. The first option is to adopt the prescriptive approach specified in API RP 14C. The second approach is to use structured review techniques to identify hazards and evaluate risk, with process safety systems being provided based on the results of this more specific analysis. The third option is to use a combination of the first two. The use of the structured review techniques is likely to be of benefit for more complex, novel or higher hazards systems.

[Figure 1](#) illustrates the relationship of this document to other documents that play a key role in designing offshore process safety systems. Under the overarching risk management principles of ISO 31000, ISO 17776 provides a framework for managing major accident hazards throughout the facility lifecycle. This document provides requirements and guidelines for process safety systems with more detailed and specific guidance and requirements for particular elements provided in other documents, most notably ISO 13702, ISO 23251 and the IEC 61511 series.

The approach described in this document is intended to be applied in an iterative way. As the design proceeds, hazards that are introduced or changed are systematically identified and the need for additional risk-reduction measures evaluated.

This document has been prepared primarily to assist in the development of new installations. It is not always appropriate to apply certain requirements to an existing installation. During the planning of a major modification to an installation, there can be greater opportunity to implement the requirements.

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NOTE The lines between the standards illustrate the main relationships.

Figure 1 — Relationship between offshore-relevant standards

Petroleum and natural gas industries — Offshore production installations — Process safety systems

1 Scope

This document provides objectives, functional requirements and guidelines for techniques for the analysis and design of surface process safety systems for offshore installations used for the recovery of hydrocarbon resources.

It also provides recommendations and requirements on support systems which complement the process safety systems in reducing risk.

NOTE These are not intended to be exhaustive.

The scope of this document is limited to specifying the methods by which the asset is protected against loss of containment of hydrocarbon or other hazardous materials.

This document is applicable to

- a) fixed offshore structures, and
- b) floating offshore production installations

for the petroleum and natural gas industries.

This document is not applicable to mobile offshore units and subsea installations.

NOTE Nevertheless, many of the principles contained in this document can be used as guidance.

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 13702, *Petroleum and natural gas industries — Control and mitigation of fires and explosions on offshore production installations — Requirements and guidelines*

IEC 61511 (all parts), *Functional safety — Safety instrumented systems for the process industry sector*

API RP 14C, *Analysis, Design, Installation, and Testing of Safety Systems for Offshore Production Facilities*

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