

This is a preview of "ISO 10418:2019". [Click here to purchase the full version from the ANSI store.](#)

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)

© ISO 2019

This is a preview of "ISO 10418:2019". [Click here to purchase the full version from the ANSI store.](#)



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, 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
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

This is a preview of "ISO 10418:2019". [Click here to purchase the full version from the ANSI store.](#)

Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms, definitions and abbreviated terms	1
3.1 Terms and definitions.....	1
3.2 Abbreviated terms.....	5
4 Symbols and identification for protection devices	5
4.1 Objectives.....	5
4.2 Functional requirements.....	6
5 Safety analysis concepts	6
5.1 Objectives.....	6
5.2 General functional requirements.....	6
5.3 Functional requirements for analysis using structured review techniques.....	7
6 Process safety system design	8
6.1 Objectives.....	8
6.2 Functional requirements.....	8
Annex A (informative) Support systems	12
Annex B (informative) Toxic gases	15
Bibliography	17

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 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.

This is a preview of "ISO 10418:2019". [Click here to purchase the full version from the ANSI store.](#)

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.

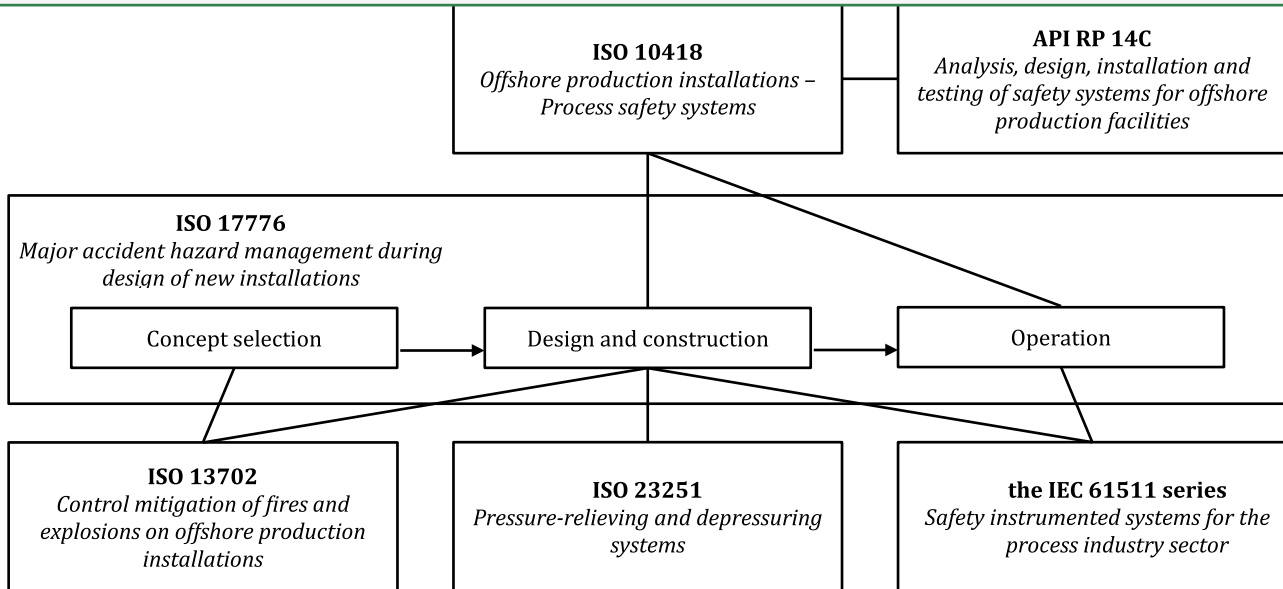
This document sets out three options for identifying appropriate process safety systems. The first option is to adopt the prescriptive approach specified in API RP 14C. The second approach is to use structured review techniques to identify hazards and evaluate risk, with process safety systems being 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.

This is a preview of "ISO 10418:2019". [Click here to purchase the full version from the ANSI store.](#)



NOTE The lines between the standards illustrate the main relationships.

Figure 1 — Relationship between offshore-relevant standards