IEC 62682

Edition 2.0 2022-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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Management of alarm systems for the process industries

Gestion de systèmes d'alarme dans les industries de transformation

IEC 62682:2022-12(en-fr)

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ICS 13.320; 25.040.40

ISBN 978-2-8322-5885-9

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MANAGEMENT OF ALARM SYSTEMS FOR THE PROCESS INDUSTRIES

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IEC 62682 has been prepared by subcommittee 65A: System aspects, of IEC technical committee 65: Industrial-process measurement, control and automation. It is an International Standard.

This second edition cancels and replaces the first edition published in 2014. This edition constitutes a technical revision.

This edition includes minor technical changes with respect to the previous edition, based on changes to ANSI/ISA-18.2:2016. These include the inclusion of packaged systems in the scope (Clause 1), definitions (Clause 3) and alarm system requirements specification (Clause 7). There are changes to improve clarity in wording throughout the document.

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The text of this International Standard is based on the following documents:

Draft	Report on voting
65A/1046/FDIS	65A/1064/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

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INTRODUCTION

This International Standard addresses the development, design, installation, and management of alarm systems in the process industries. Alarm management includes multiple work processes throughout the alarm management life cycle. This document defines the terminology and models to develop an alarm system, and it defines the work processes recommended to effectively maintain the alarm throughout the life cycle. Ineffective alarm systems have often been cited as contributing factors in the investigation reports following major process incidents. This document is intended to provide a methodology that will result in the improved safety, quality, and operation in the process industries.

The first edition of this document was adapted from ANSI/ISA-18.2-2009, *Management of Alarm Systems for the Process Industries*, an International Society of Automation (ISA) standard, and with due consideration of other guidance documents that have been developed throughout industry. This second edition has incorporated some changes made in ANSI/ISA-18.2-2016.

This document is not the first effort to define terminology and practices for effective alarm systems. In 1999 the Engineering Equipment and Materials Users' Association (EEMUA) issued Publication 191, *Alarm Systems: A Guide to Design, Management and Procurement*, with the 2nd edition published in 2007 and the 3rd edition published in 2013. In 2003 the User Association of Process Control Technology in Chemical and Pharmaceutical Industries (NAMUR) issued worksheet NA 102, *Alarm Management*, which was updated in 2008. During the development and maintenance of this document, every effort was made to keep terminology and practices consistent with the previous work of these respected organizations and committees.

This document provides requirements for alarm management and alarm systems. It is intended for those individuals and organizations that

a) manufacture or implement embedded alarm systems,

b) manufacture or install third-party alarm system software,

c) design or install alarm systems,

d) operate and maintain alarm systems, and

e) audit or assess alarm system performance.

This document is organized in parts. The first part (Clause 1 to Clause 3) are normative without any mandatory requirements. Clause 4 contains mandatory requirements. Clause 5 is normative without any mandatory requirements. The main body of the standard (Clause 6 to Clause 18), describes mandatory requirements and non-mandatory recommendations.

Within this document, mandatory requirements are stated with "shall", non-mandatory recommendations are stated with "should", and permissible requirements are stated with "may". The phase "is required" indicates the requirement has been stated previously in the document.

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MANAGEMENT OF ALARM SYSTEMS FOR THE PROCESS INDUSTRIES

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1 Scope

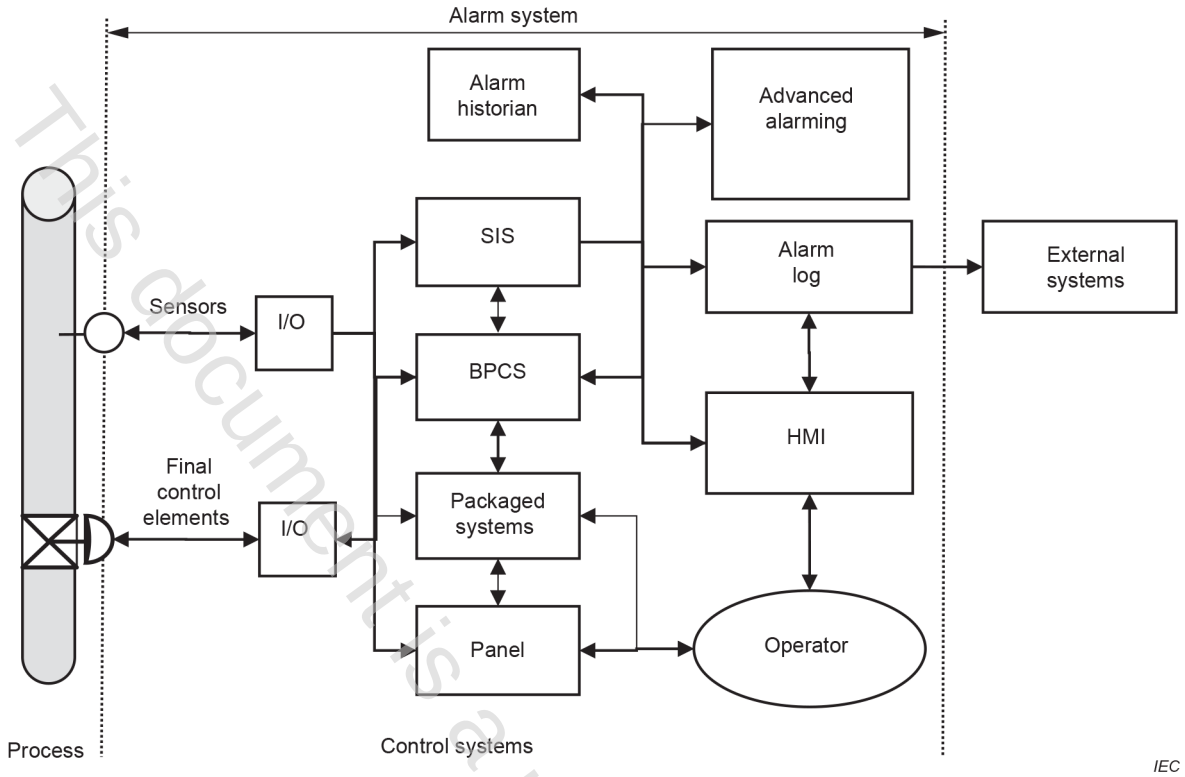
1.1 General applicability

This document specifies general principles and processes for the management of alarm systems based on controls system and human-machine interfaces (HMI) for facilities in the process industries. It covers all alarms to be presented to the operator through the control system, which includes alarms from basic process control systems, annunciators, packaged systems, and safety instrumented systems.

The practices in this document are applicable to continuous, batch, and discrete processes. There can be differences in implementation to meet the specific needs based on process type.

The primary function within the alarm system is to notify operators of abnormal process conditions or equipment malfunctions and support the response. The alarm systems can include both the basic process control system (BPCS) and the safety instrumented system (SIS), each of which uses measurements of process conditions and logic to generate alarms. Figure 1 illustrates the concepts of alarm and response dataflow through the alarm system. The alarm system also includes a mechanism for communicating the alarm information to the operator via an HMI, usually a computer screen or an annunciator. Additional functions of the alarm system are an alarm and event log, an alarm historian, and the generation of performance metrics for the alarm system. There are external systems that can use the data from the alarm system.

Figure 1 is not intended to represent physical wiring.



NOTE 1 Packaged systems (e.g., refrigeration machines) can be included in the control system.

NOTE 2 Panel can refer to annunciator panel or other panel types.

NOTE 3 The lines are intended to represent data flow and not physical wiring.

Figure 1 – Alarm system dataflow

1.2 Exclusions and inclusions

1.2.1 Operators

The functions of the operator receiving and responding to alarms are included in the scope of this document. Management of operators is excluded from the scope of this document.

1.2.2 Process sensors and final control elements

The alarms implemented in sensors and final control elements are included in the scope of this document. The design and management of process sensors and final control elements are excluded from the scope of this document.

1.2.3 Annunciators

The integration of annunciators into an alarm system is included in the scope of this document. The specification and design of annunciators is excluded from the scope of this document.

1.2.4 Human machine interface

The appearance of alarms in the HMI and functions of alarm related displays are included in the scope of this document. The design and maintenance of the HMI are excluded from this document.

NOTE ANSI/ISA-101.01-2015 provides information on HMI design and maintenance.

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1.2.5 Safety instrumented systems

The alarms implemented in a safety instrumented system are included in the scope of this document. The design and management of safety instrumented systems are excluded from this document.

NOTE IEC 61511-1 provides information on safety instrumented systems.

1.2.6 Fire and gas detection and protective systems

The alarms from fire and gas detection and protective systems presented to the operator through the control system are included in the scope of this document. The design and management of fire and gas detection and protective systems is excluded from the scope of this document.

1.2.7 Security systems

The alarms from security systems presented to the operator through the control system are included in the scope of this document. The design and management of security systems is excluded from the scope of this document.

1.2.8 Packaged systems

The alarms from packaged systems presented to the operator through the control system are included in the scope of this document. The design and management of packaged systems is excluded from the scope of this document.

1.2.9 Event data

The indication and processing of analog, discrete, and event data other than alarm indications are excluded from the scope of this document. The analysis techniques using both alarm and event data are excluded from the scope of this document.

1.2.10 Alarm identification methods

Required methods of alarm identification are not specified in this document. Examples of alarm identification methods are listed.

1.2.11 Management of change

A specific management of change (MOC) procedure is not included in this document. Some requirements and recommendations for an MOC procedure are included.

1.2.12 Purchase specification

This document is not intended to be used as an alarm system purchase specification.

2 Normative references

There are no normative references in this document.

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