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Security and resilience — Emergency management — Guidelines for monitoring facilities with identified hazards

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Foreword

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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 292, *Security and resilience*.

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

In recent years, there has been a growing awareness of the risks and consequences of natural and industrial disasters. Monitoring hazards can reduce potential losses through improved prevention, mitigation, preparedness and a more effective response to incidents resulting from the hazards.

Effective monitoring can provide public and private sector emergency management with ongoing, timely, accurate, easily understood relevant monitoring data to support decision-making in emergency management.

Security standards are continually evolving and improving. Advances in monitoring technology will provide opportunities for further improvement of these guidelines and for development and application of innovative monitoring solutions.

The purpose of this document is to contribute to an overall emergency management framework which seeks to reduce the risk to people, operations, property and the environment.

This document provides guidelines for the entire process of hazard monitoring at facilities with identified hazards, including planning, implementation, operation and control, and review and continual improvement. This document is applicable to all facilities with identified hazards and may be used by stakeholders and authorities responsible for safety and security, such as

— owners and operators of facilities,

— engineers, installers and contractors during facility planning, construction, and maintenance,

— public authorities responsible for emergency prevention activities and incident response,

— insurance companies and potentially affected residents,

— legislators, and

— the scientific community and researchers.

Security and resilience — Emergency management — Guidelines for monitoring facilities with identified hazards

1 Scope

This document gives guidelines for monitoring hazards within a facility as a part of an overall emergency management and continuity programme by establishing the process for hazard monitoring at facilities with identified hazards.

It includes recommendations on how to develop and operate systems for the purpose of monitoring facilities with identified hazards. It covers the entire process of monitoring facilities.

This document is generic and applicable to any organization. The application depends on the operating environment, the complexity of the organization and the type of identified hazards.

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 22300, *Security and resilience — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 22300 and the following apply.

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

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

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

3.1
data analysis
systematic investigation of relevant, evidence-based information obtained in the monitoring process and its flow in a real or planned system

3.2
monitoring process owner
individual or legal entity responsible for receipt, integration, generation, analysis, transfer and output of data

Note 1 to entry: A monitoring process or owner of a system within the monitoring process can be represented, e.g. by a sub-contractor.

3.3
critical indicator
quantitative, qualitative or descriptive measure used to assess the hazard being monitored to identify the potential for the development of an incident, accident or emergency

Note 1 to entry: Critical indicators provide information about the most important integral characteristics of the structural state of a facility.

3.4
facility
plant, machinery, property, building, transportation units at sea/land/airport, and other items of infrastructure or plant and related systems that have a distinct and quantifiable business function of service

Note 1 to entry: A facility can have formal boundaries as defined by, for example, legislation.

4 Monitoring

4.1 General

Monitoring should identify dynamic hazard development at facilities with identified hazards that can lead to incidents. This should include the provision of timely relevant and reliable data about the hazards.

NOTE 1 Annex A provides examples of facilities with identified hazards.

The selection of hazards to be monitored should be based on the results of the hazard identification and risk analysis.

NOTE 2 Annex B provides examples of possible hazards.

Monitoring should provide progressive notification as the incident escalates; at a minimum: normal, caution and emergency.

Monitoring should reflect administrative and organizational considerations. It should include hardware and software appropriate to the hazard to support the monitoring process described in 4.2.

NOTE 3 Annex C provides an example for monitoring a facility.

4.2 Monitoring process

The monitoring process involves receipt, integration, generation, analysis, transfer and output of data. The process involves the facility owner, authorities responsible for safety and security and other stakeholders interested in obtaining monitoring data.

The monitoring process should provide data to facility owners, authorities and stakeholders by using pre-established procedures for sharing the data.

The monitoring process should

a) monitor hazards and critical indicators,

b) include information resulting from human intervention in the facility's operation modes,

c) provide continuous, reliable, trustworthy (independent from maintenance service of the facility), dynamic critical indicators applicable to the identified hazards,

d) provide real-time data transfer on critical indicator changes,

e) prioritize the use of automated and manually operated systems, and

f) evaluate the results of related maintenance for possible improvements to the monitoring process.

4.3 Data characteristics

The monitoring process should ensure that data

a) are accumulated at the facilities,

b) have the agreed characteristics,

c) are easily analysed and interpreted,

d) are transmitted via secured channels, and

e) are capable of being integrated to support decision-making.

4.4 Data analysis and interpretation

Monitoring should ensure data are analysed and interpreted to meet emergency management needs and display facility indicators in a prioritized manner to support decision-making. Data should be displayed such that the most recent relevant indicators can be easily identified.

NOTE Annex D provides examples of decision support documents.

Data should be displayed in a comprehensive and understandable format which may include

a) text messages,

b) graphics including those displaying dynamic processes,

c) audible signals, and

d) video.

Data should be displayed in a manner such that the most recent and the most relevant indicators can be easily identified by an automated system. For the purpose of continuous improvement of the monitoring system and improving overall preparedness, data should be analysed by using incident statistics and forecasting models.

4.5 Output

In the event of increased risks the results of the monitoring process should be shared with pre-identified authorities and stakeholders (see 4.2). The stakeholders are identified during the development/improvement stage of the monitoring process.

The output should be provided in an appropriate format for the pre-identified recipients based on the increased level of risks.

The information should be transferred in reliable and redundant manner and should be verified by the stakeholders.

5 Implementing and operating the monitoring process

5.1 General

The monitoring process owner should develop agreements that describe the monitoring process and the interaction between the process owner and others involved in the process as described in 4.2.

This involves

a) planning (5.2),

b) implementation (5.3),

c) operation and control (5.4), and

d) review and continuous improvement.