International Standard

ISO 19650-6

Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling —

Part 6:
Health and safety information

Organisation et numérisation des informations relatives aux bâtiments et ouvrages de génie civil, y compris modélisation des informations de la construction (BIM) — Gestion de l'information par la modélisation des informations de la construction —

Partie 6: Informations relatives à la santé et à la sécurité

**First edition
2025-01**

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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 document 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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This document was prepared by Technical Committee ISO/TC 59, *Buildings and civil engineering works,* Subcommittee SC 13, *Organization and digitalization of information about buildings and civil engineering works, including building information modelling (BIM) ,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 442, *Building Information Modelling (BIM),* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

A list of all parts in the ISO 19650 series can be found on the ISO website.

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

At the heart of this document is the requirement to identify, record, use and share information on health and safety risks which can result in harm to any person involved in the asset throughout its life. Information captured can include any site-wide health and safety risks associated with location, previous use, or the site's physical characteristics. ISO 31000 and ISO 45001 to ISO 45006 cover risk management and occupational health and safety

Health and safety related tasks such as allocation, registration and treatment can be performed by any party. They represent a specific opportunity for making improvements to asset management using the ISO 19650 series but also a challenge because health and safety information is a collective responsibility rather than a deliverable by an individual appointed party.

The exchange and use of health and safety information is intended to support:

— representation of the nature and characteristics of the works being undertaken, the site and the asset;

— representation of health and safety risks, hazards and associated factors;

— generalization, dissemination and re-use of health and safety knowledge and experience.

Health and safety information becomes meaningful when interpreted in the light of the history of events and accidents associated with such risk, and in the context of the immediate and underlying circumstances in which the risk is identified. The schema provided within this document includes a structure for recording contextual information and incidents. One important use of incident information is to link incidents to design factors, so that designers can learn about how their designed assets perform in use.

Organizational information requirements developed by the appointing party can reflect the required integration of health and safety as well as modelling and sharing of information across the supply chain. This contextual information can include information to identify characteristics of location, product, systems, element or plant or equipment, and scope of work activity to be carried out, which are associated as sources of the health and safety risk. Health and safety risks can be linked where appropriate to risk treatments which prioritize the production of inherently safer outcomes during the delivery and operational phases of an asset's life cycle. Prior to construction, health and safety risks can be progressively defined and linked to the context in which the harm can occur. During the construction stage the health and safety information can be used to identify, record, use and share barriers and controls to reduce health and safety risk.

During handover and close out of the project, the health and safety information can be used to ensure that the project information model is used to update the asset information model. This information is handed over to those who will be responsible for managing and assessing health and safety risks during the operational phase of the asset.

This document intends to support the use of health and safety and related information to:

— provide a safer and healthier environment for end users as well as for design, construction, operation and maintenance personnel;

— mitigate the inherent health and safety risks and hazards across the asset life cycle;

— result in improved health and safety performance, fewer incidents and associated impacts;

— provide for clearer, more assured and relevant health and safety information to the 'right people' at the 'right time';

— increase construction and operational value.

Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling —

Part 6:
Health and safety information

1 Scope

This document specifies concepts and principles for classifying, sharing and delivering health and safety information collaboratively, to secure the economic, environmental and social benefits.

This document:

a) specifies requirements for the collaborative sharing of structured health and safety information throughout project and asset life cycles;

b) supports the digitization of structured health and safety information in project and asset life cycles progressively from the outset;

c) provides specification on how health and safety information is shared for use throughout project and asset life cycle;

d) sets out a health and safety information cycle framework for the identification, use, sharing and generalization of health and safety information through information management processes.

This document is applicable to individuals and organizations that contribute to and influence the procurement, design, construction, use (including maintenance) and end-of-life of building and infrastructure assets.

The principles and requirements of this document can be applied equally to delivery or in-use phases not using BIM.

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 19650-1, *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 1: Concepts and principles*

ISO 19650-2, *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 2: Delivery phase of the assets*

ISO 19650-3, *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 3: Operational phase of the assets*

ISO 19650-4, *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 4: Information exchange*

ISO 19650-5, *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 5: Security-minded approach to information management*

ISO 31000, *Risk management — Guidelines*

ISO 45001, *Occupational health and safety management systems — Requirements with guidance for use*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 19650-1, ISO 19650-2, ISO 19650-3, ISO 19650-4, ISO 19650-5, ISO 31000, ISO 45001 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
health and safety information
information relating to the health and safety risks across the project and asset life cycle

Note 1 to entry: Health and safety information includes, but is not limited to, health and safety risks and risks arising from the environment and from an activity.

3.2
risk treatment
action to lessen risk

Note 1 to entry: Eliminating, reducing, informing and controlling are ways a risk can be modified.

Note 2 to entry: A risk treatment can be that the risk is accepted and no action is required.

Note 3 to entry: ISO 45001 uses 'corrective action' in a slightly different sense.

[SOURCE: ISO 31073:2022, 3.3.32, modified — The original notes to entry have been replaced by 3 new ones.]

3.3
generalization
act of removing or modifying details to make information suitable for wider publication and re-use

Note 1 to entry: This can include replacing personal and protected characteristics.

3.4
hazard
source of potential harm

[SOURCE: ISO 31073:2022, 3.3.12, modified — Note 1 to entry has been removed.]

3.5
level of risk
risk priority
risk level
magnitude of risk or combination of risks

Note 1 to entry: ISO 31000 uses 'level of risk' and ISO 45002 uses 'risk level'.

[SOURCE: ISO 31073:2022, 3.3.22, modified — The admitted terms "risk priority" and "risk level" have been added; "expressed in terms of the combination of consequences and their likelihood" has been removed from the definition; note 1 to entry has been added.]

4 Health and safety information

4.1 Objective

To deliver effective health and safety outcomes, health and safety information shall be documented, stored, shared and presented as outlined in 4.2 to 4.5.

4.2 General requirements

4.2.1 Initiation

The appointing party shall adopt the common method for structuring health and safety information (defined in 4.3 to 4.5) to support the risk management cycle including identification, sharing, use and generalization of information and supporting evidence relating to:

a) health and safety risk management;

b) hazard and incident management;

NOTE   ISO 45001 defines 'incident'.

c) optionally, the recording of previous and existing states of the health and safety information which can affect works on the current project or asset.

The appointing party in determining the expectations in 4.3 to 4.5 shall consider the legal, regulatory, supervisory and management concerns.

4.2.2 Types of health and safety risk

The scope of the health and safety risk management should include sharing sufficient information to support the collaborative management of the risks and hazards concerning:

a) health, safety and well-being;

b) optionally, environment;

c) optionally, social/community interest.

NOTE   Other types of risk can be managed using this method without collaborative sharing.

4.2.3 Context

The context within which health and safety risks are being managed shall be documented in terms of:

a) the site and surroundings, and any exceptional spatial zones or space-types or activities;

b) the asset and any exceptional physical systems or product types;

c) the project/program and any exceptional work-packages or method-statements and work sequences.

4.2.4 Health and safety risk prioritization

All known or perceived health and safety risks shall be documented. Health and safety risks shall be prioritized to identify those needing further scrutiny to ensure the correct risk treatment is proposed.

Prioritization shall be assessed:

a) before consideration of the opportunities for risk treatment;

b) after agreement on risk treatment.

4.2.5 Risk treatment

Opportunities for risk treatment shall be documented including:

a) those agreed;

b) those identified as relevant but not agreed.

NOTE   All parties can propose treatment measures; the parties responsible for agreeing treatment can accept them depending on their scope of services.

4.2.6 Incidents

All incidents shall be recorded including 'near miss events', where an incident is perceived to have been possible but did not occur.

NOTE   The recording of incidents can depend on legislation and the scope of services of parties. Incidents can be formally reportable. It can be necessaryy for the recording to reflect personal and protected categories of information.

4.3 Schema

4.3.1 Overview

Health and safety context, risks, incidents and treatments shall be described using the schema in 4.3.2 to 4.3.5 or as identified in the project/asset information standard. Figure 1 illustrates the relationships between health and safety context, risks, incidents and treatments, showing that a project/asset context can have both risks and incidents which can have treatments.
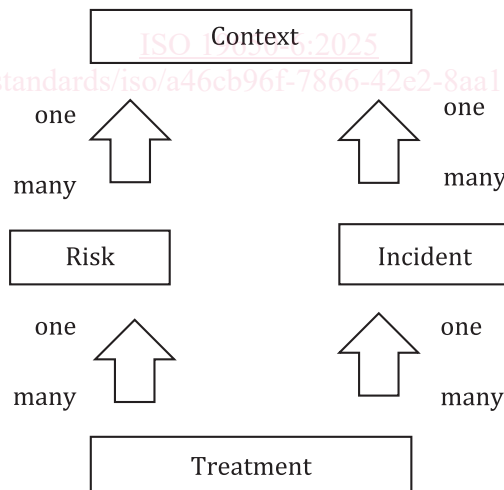
Figure 1 — Relationships between context, risks, incidents and treatments

NOTE 1   Annex A contains a tabulated summary of this schema.

NOTE 2   Annex D suggests an implementation using IFC 4.3 schema and other versions in ISO 16739-1 which supports the documentation of the health and safety risk situation in a geometric or construction and operation model.

There shall be consideration of the implementation requirements need to ensure that the provided health and safety information meets necessary integrity, availability and confidentiality requirements.

4.3.2 Context sub-schema

Information about the context shall be described so that any risks and incidents can be assessed appropriately. The context sub-schema shall use the property fields defined in Table 1.

Table 1 — Context sub-schema

Property field	Specification	Description	Notes
Identifier	Text	Unique context identifier	See 4.3.3
Category	Enumeration	Classification of the asset	-
Description	Text	Detailed description and narrative of the asset	-
Associated product	Text or identifier	Facility or system	Only systems that are exceptional given the overall context need to be recorded
Associated activity	Text or identifier	Asset life cycle stage or work package	Only work packages that are exceptional given the overall context need to be recorded
Associated location	Text or identifier	Site or zone	Only zones that are exceptional given the overall context need to be recorded
Contextual location	Coordinates	Coordinate system-based location	Optional This can be cartesian, geo-spatial or alignment based
Context link	Text or link to main context	-	See 4.3.2
Context linkage	Inverse links to sub-contexts	-	Optional depending on implementation See 4.3.2
Risk linkage	Inverse linkage to risks	-	Optional depending on implementation See 4.3.3
Incident linkage	Inverse linkage to incidents	-	Optional depending on implementation See 4.3.4
History	Varies	Record of dates and actions including creation, updates	Entries shall not be deleted

4.3.3 Risk sub-schema

Risks shall be described to support their communication and assessment. The health and safety risk schema shall use the property fields defined in Table 2.