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Asset management — Asset management system — Requirements

Gestion d'actifs — Systèmes de gestion d'actifs — Exigences

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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 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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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 251, *Asset management*.

This second edition cancels and replaces the first edition (ISO 55001:2014), which has been technically revised.

The main changes are as follows:

— application of the Harmonized Structure for Management System Standards, which includes the incorporation of the common core management system terminological entries in Clause 3;

— inclusion of new subclauses dealing with asset management decision-making, the strategic asset management plan and knowledge;

— making clear that operational planning and control includes life cycle management;

— making a clear distinction between how an organization shall address "risk" and how it shall address "opportunities";

— renaming the subclause "preventive action" to "predictive action" and full technical revision of the content of this subclause (see 10.3);

— a stronger emphasis on leadership and its role in supporting the enablement and success of the asset management system.

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.

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Introduction

This document specifies requirements for the establishment, implementation, operation, maintenance and improvement of a management system for asset management, referred to as an "asset management system".

This document can be used by any organization of any size and type. The organization determines to which of its assets this document applies, taking into account its legal, regulatory and contractual requirements. This document can be applied to all types of assets both physical and non-physical.

This document is primarily intended for use by:

— those involved in the establishment, implementation, operation, maintenance and improvement of an asset management system;

— those contracted or involved in delivering asset management activities and service providers;

— internal and external parties involved in assessing an organization's ability to meet asset management system requirements.

The order in which requirements are presented in this document does not reflect their importance nor imply the order in which they are to be implemented.

General information on asset management, and information on the terminology applicable to this document, is provided in ISO 55000.

Further guidance regarding the application of the requirements in this document is provided in ISO 55002.

Additional guidance on specific elements of the asset management system as specified in this document is provided in ISO/TS 55010 (alignment between financial and non-financial functions of the organization), ISO 55012 (people involvement and competence) and ISO 55013 (management of asset data).

Guidance on development of public policy to enable asset management is provided in ISO 55011.

There are some important principles associated with asset management, including:

— value: asset management focuses on the value assets provide to the organization over time;

— alignment: asset management aligns financial, technical and operational decisions with the organizational objectives, promoting vertical and horizontal coordination;

— leadership: leadership and sustained commitment at all levels are crucial for successful asset management.

The primary outcomes of asset management are the realization of value and the achievement of organizational objectives. There are also some characteristics that result from the implementation of a systematic approach to asset management, including the following:

— assurance: asset management provides better organizational oversight and accountability;

— adaptability: asset management enables organizations to adapt more rapidly and effectively to changes in internal and external context;

— sustainability: asset management promotes long-term thinking, considering future impacts, risks, uncertainties and opportunities to realize value.

This document has been prepared using the Harmonized Structure for ISO Management System Standards (i.e. identical clause numbers, clause titles, text and common terms and core definitions) intended to enhance alignment among Management System Standards and to facilitate their combined and integrated implementation. This document is therefore designed to enable an organization to align and integrate its asset management system with related management system requirements.

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Asset management — Asset management system — Requirements

1 Scope

This document specifies requirements for an asset management system.

This document is applicable to all types of assets and all types and sizes of organizations.

Consistent with the organization's asset management policy, the intended results of an asset management system include:

— realized value from assets throughout their life for the organization and its stakeholders;

— achievement of asset management objectives and fulfilment of applicable requirements;

— continual improvement of asset management, the asset management system and the performance of assets.

This document does not specify financial, accounting nor technical requirements for managing specific asset types.

NOTE For the purposes of ISO 55000, this document and ISO 55002, the term "asset management system" is used to refer to a management system for asset management.

2 Normative reference

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 55000, *Asset management — Vocabulary, overview and principles*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 55000 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
organization
person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its *objectives* (3.6)

Note 1 to entry: The concept of organization includes, but is not limited to, sole-trader, company, corporation, firm, enterprise, authority, partnership, charity or institution, or part or combination thereof, whether incorporated or not, public or private.

Note 2 to entry: If the organization is part of a larger entity, the term "organization" refers only to the part of the larger entity that is within the scope of the asset *management system* (3.4).

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3.2
stakeholder
interested party
person or *organization* (3.1) that can affect, be affected by, or perceive itself to be affected by a decision or activity

3.3
top management
person or group of people who directs and controls an *organization* (3.1) at the highest level

Note 1 to entry: Top management has the power to delegate authority and provide resources within the organization.

Note 2 to entry: If the scope of the *management system* (3.4) covers only part of an organization, then top management refers to those who direct and control that part of the organization.

3.4
management system
set of interrelated or interacting elements of an *organization* (3.1) to establish *policies* (3.5) and *objectives* (3.6), as well as *processes* (3.8) to achieve those objectives

Note 1 to entry: A management system can address a single discipline or several disciplines.

Note 2 to entry: The management system elements include the organization's structure, roles and responsibilities, planning and operation.

3.5
policy
intentions and direction of an *organization* (3.1) as formally expressed by its *top management* (3.3)

3.6
objective
result to be achieved

Note 1 to entry: An objective can be strategic, tactical, or operational.

Note 2 to entry: Objectives can relate to different disciplines (such as finance, health and safety, and environment). They can be, for example, organization-wide or specific to a project, service, product or *process* (3.8).

Note 3 to entry: An objective can be expressed in other ways, e.g. as an intended result, as a purpose, as an operational criterion, as an asset management objective or by the use of other words with similar meaning (e.g. aim, goal, or target).

Note 4 to entry: In the context of asset *management systems* (3.4), asset management objectives are set by the *organization* (3.1), consistent with the asset management *policy* (3.5), to achieve specific results.

3.7
risk
effect of uncertainty on *objectives* (3.6)

Note 1 to entry: An effect is a deviation from the expected — positive or negative.

Note 2 to entry: Uncertainty is the state, even partial, of deficiency of information related to, understanding or knowledge of, an event, its consequence, or likelihood.

Note 3 to entry: Risk is often characterized by reference to potential events (as defined in ISO 31073) and consequences (as defined in ISO 31073), or a combination of these.

Note 4 to entry: Risk is often expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated likelihood (as defined in ISO 31073) of occurrence.

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3.8
process
set of interrelated or interacting activities that uses or transforms inputs to deliver a result

Note 1 to entry: Whether the result of a process is called an output, a product or a service depends on the context of the reference.

3.9
competence
ability to apply knowledge and skills to achieve intended results

3.10
documented information
information required to be controlled and maintained by an *organization* (3.1) and the medium on which it is contained

Note 1 to entry: Documented information can be in any format and media and from any source.

Note 2 to entry: Documented information can refer to:

— the *management system* (3.4), including related *processes* (3.8);

— information created in order for the organization to operate (documentation);

— evidence of results achieved (records).

3.11
performance
measurable result

Note 1 to entry: Performance can relate either to quantitative or qualitative findings.

Note 2 to entry: Performance can relate to managing activities, *processes* (3.8), products, services, systems or *organizations* (3.1).

Note 3 to entry: For the purposes of asset management, performance can relate to assets in their ability to fulfil *requirements* (3.17) or *objectives* (3.6) and thereby their ability to realize value.

3.12
continual improvement
recurring activity to enhance *performance* (3.11)

3.13
effectiveness
extent to which planned activities are realized and planned results are achieved

3.14
requirement
need or expectation that is stated, generally implied or obligatory

Note 1 to entry: "Generally implied" means that it is custom or common practice for the *organization* (3.1) and *stakeholders* (3.2) that the need or expectation under consideration is implied.

Note 2 to entry: A specified requirement is one that is stated, e.g. in *documented information* (3.10).

3.15
conformity
fulfilment of a *requirement* (3.14)

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3.16
nonconformity
non-fulfilment of a *requirement* (3.14)

Note 1 to entry: Nonconformity can be any deviation from asset *management system* (3.4) requirements (e.g. from relevant work standards, practices, procedures, legal requirements), or any failure of an asset to meet or perform to specification.

3.17
corrective action
action to eliminate the cause(s) of a *nonconformity* (3.16) and to prevent recurrence

3.18
preventive action
action to eliminate the cause of a potential *nonconformity* (3.16) or other undesirable potential situation

Note 1 to entry: There can be more than one cause for a potential nonconformity.

Note 2 to entry: Preventive action is taken to prevent occurrence and to preserve an asset's function whereas *corrective action* (3.17) is taken to prevent recurrence.

Note 3 to entry: Preventive action is normally carried out while the asset is functionally available and operable or prior to the initiation of functional failure.

Note 4 to entry: Preventive action includes the replenishment of consumables where the consumption is a functional requirement.

[SOURCE: ISO 55000:2024, 3.3.20]

3.19
incident
unplanned event or occurrence

[SOURCE: ISO 55000:2024, 3.3.22]

3.20
audit
systematic and independent *process* (3.8) for obtaining evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled

Note 1 to entry: An audit can be an internal audit (first party) or an external audit (second party or third party), and it can be a combined audit (combining two or more disciplines).

Note 2 to entry: An internal audit is conducted by the *organization* (3.1) itself, or by an external party on its behalf.

Note 3 to entry: "Audit evidence" and "audit criteria" are defined in ISO 19011.

3.21
measurement
process (3.8) to determine a value

Note 1 to entry: In this definition a "value" refers to a numerical value, which is different than value in the context of *stakeholder's* (3.2) value or asset management value.

3.22
monitoring
determining the status of a system, a *process* (3.8) or an activity

Note 1 to entry: To determine the status, there can be a need to check, supervise or critically observe.

Note 2 to entry: For the purposes of asset management, monitoring can also refer to determining the status of an asset. This is typically referred to as "condition monitoring" or "performance monitoring".

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4 Context of the organization

The organization shall determine external and internal issues that are relevant to its purpose and that affect its ability to achieve the intended result(s) of its asset management system.

The organization shall determine whether climate change is a relevant issue.

The organization shall determine:

a) the stakeholders that are relevant to the asset management system;

b) the relevant requirements of these stakeholders;

c) which of these requirements will be addressed through the asset management system;

d) the impacts of assets and asset management activities on stakeholders, as well as their significance to the organizational objectives.

NOTE 1 Such impacts can be positive or negative, financial or non-financial, and can be considered in the determination of value, in decision-making, in prioritization of resources and activities, and in performance monitoring.

NOTE 2 Impacts on stakeholders can include, but are not limited to, cost, risk, performance, safety, capital value revenue, environmental impact, reputation, quality, sustainability and compliance.

NOTE 3 Relevant stakeholders can have requirements related to climate change.

The organization shall determine the boundaries and applicability of the asset management system to establish its scope.

When determining this scope, the organization shall consider:

a) the external and internal issues referred to in 4.1;

b) the requirements referred to in 4.2;

c) the interaction with other management systems.

The organization shall determine the asset portfolio covered by the scope of the asset management system.

The scope shall be available as documented information. The scope shall include details of the asset portfolio covered.

The organization shall establish, implement, maintain and continually improve an asset management system, including the processes needed and their interactions, in accordance with the requirements of this document.

4.5.1 Framework

The organization shall establish and apply a framework for asset management decision-making that is appropriate to the type, size and complexity of the organization.

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The decision-making framework shall be used to:

— define and determine the value that the organization aims to derive from its assets by applying the asset management system;

— define the criteria to be used for asset management decision-making to achieve the determined value.

When establishing and applying the framework, the organization shall take into account:

a) the organization's context, organizational objectives and external and internal issues;

b) stakeholders' requirements;

c) the scope of the asset management system that determines the range of decisions to be made about assets, asset management and the asset management system;

d) risks and opportunities.

4.5.2 Criteria

When defining the criteria to be used for asset management decision-making, the organization shall take into account:

a) the potential impacts of the decisions, including the time period over which such impacts can occur;

b) the complexity of the decisions;

c) the urgency or time available for making the decisions;

d) capabilities appropriate to the above.

NOTE The amount of time, cost and effort to prepare for a decision is proportionate to the items given in a) to d).

4.5.3 Methods, processes and tools

The framework used for making asset management decisions shall be used by the organization to determine and select appropriate methods, processes and tools, considering the necessity to:

a) deal with options to deliver the greatest value over the asset life cycle or other relevant horizons;

b) deal with risks and opportunities and how these can change with time;

c) have confidence in information;

d) support governance for appropriate, timely decision-making.

5 Leadership

Top management shall demonstrate leadership and commitment with respect to the asset management system by:

a) ensuring that the asset management policy, asset management system scope, strategic asset management plan (SAMP) and asset management objectives are established and are compatible with the strategic direction of the organization and its organizational objectives;

b) ensuring the integration of the asset management system requirements into the organization's business processes;

c) ensuring that the resources needed for the asset management system are available;

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d) communicating the importance of effective asset management and of conforming to the asset management system requirements;

e) ensuring that the asset management system achieves its intended result(s);

f) directing, raising awareness of and supporting persons to contribute to the effectiveness of the asset management system;

g) promoting continual improvement;

h) supporting other relevant roles to demonstrate their leadership as it applies to their areas of responsibility;

i) ensuring the asset management decision-making criteria are established and used and are aligned with the organizational objectives;

j) approving the asset management policy, asset management system scope and the SAMP.

NOTE Reference to "business" in this document can be interpreted broadly to mean those activities that are core to the purposes of the organization's existence.

Top management shall establish an asset management policy that:

a) is appropriate to the purpose of the organization;

b) provides a framework for setting asset management objectives;

c) includes a commitment to meet applicable requirements;

d) includes a commitment to continual improvement of the asset management system;

e) is consistent with other relevant organizational policies.

The asset management policy shall:

— be available as documented information;

— be communicated within the organization;

— be available to stakeholders, as appropriate.

Top management shall ensure that the responsibilities and authorities for relevant roles are assigned and communicated within the organization.

Top management shall assign the responsibility and authority for:

a) ensuring that the asset management system conforms to the requirements of this document;

b) reporting on the performance of the assets, asset management and the asset management system to top management and relevant stakeholders.

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6 Planning

6.1.1 General

When planning for the asset management system, the organization shall consider the issues referred to in 4.1 and the requirements referred to in 4.2 and determine the risks and opportunities that need to be addressed to:

a) give assurance that assets, asset management and the asset management system can achieve their intended result(s);

b) prevent, or reduce, undesired effects;

c) achieve continual improvement.

6.1.2 Actions to address risk

The organization shall establish processes for the assessment of risks related to assets, asset management and the asset management system, including for:

— the identification of risks;

— the analysis of risks and how they change over time;

— the evaluation of risks;

— determining the criticality of assets in achieving asset management objectives;

— considering alternatives and deciding on preferred options to treat risks.

The organization shall ensure that its risks related to assets, asset management and the asset management system are considered in the organization's risk management approach including contingency planning.

The organization shall plan:

a) actions to address, treat, monitor and communicate risks related to assets, asset management and the asset management system, taking into account how these risks can change with time;

b) how to:

   — integrate and implement the actions into its asset management system processes;

   — evaluate the effectiveness of these actions.

Documented information shall be available on these planned actions and their implementation and evaluation.

6.1.3 Actions to address opportunities

The organization shall establish processes to:

— identify, gather, collect or capture opportunities;

— decide on the opportunities to be addressed to improve performance of the assets, asset management and the asset management system.

NOTE Opportunities can be identified from analysis of issues under 4.1 and stakeholder requirements under 4.2 and deviations from expected intended results, cause analysis, risk analysis, review of unplanned events, innovation, continual improvements, internal or external audit findings or management review.

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The organization shall plan:

a) actions to address the opportunities that have been decided on, taking into account how these opportunities can change with time;

b) how to:

   — integrate and implement the actions into its asset management system processes;

   — evaluate the effectiveness of these actions.

Documented information shall be available on these planned actions and their implementation and evaluation.

6.2.1 Strategic asset management plan (SAMP)

The organization shall develop a SAMP that contains the strategies and approaches for decision-making and the implementation and alignment of asset management activities.

The SAMP shall:

a) be consistent with the asset management policy;

b) include the asset management decision-making framework and require application of the defined and determined value to be achieved;

c) determine the asset management objectives as well as the approach to be used to achieve them;

d) determine the process to identify capabilities needed to achieve the asset management objectives;

e) detail time frames relevant to the achievement of the SAMP;

f) detail contingencies for the achievement of the SAMP and approaches to address them;

g) determine approaches for improving the asset management system, asset management and assets.

The organization shall ensure that the SAMP is aligned with its financial and other resource plans and outlines how that is achieved.

The SAMP shall be made available as documented information and shall be periodically reviewed and updated.

NOTE The SAMP can consist of a combination of different documents.

6.2.2 Asset management objectives

The organization shall establish asset management objectives at relevant functions and levels.

When establishing its asset management objectives, the organization shall consider:

— its current and future internal and external context ;

— risks and opportunities;

— the condition, performance and capabilities of its assets.

The asset management objectives shall:

a) be consistent and aligned with the organizational objectives;

b) be determined to realize value;

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c) be consistent with the asset management policy;

d) be measurable (if practicable);

e) take into account applicable requirements (see 4.2);

f) be monitored;

g) be communicated to relevant stakeholders;

h) be reviewed and updated as appropriate;

i) be available as documented information.

6.2.3 Planning to achieve asset management objectives

The organization shall establish and maintain (an) asset management plan(s) to achieve the asset management objectives. Asset management plans shall be aligned with the asset management policy and the SAMP.

The plan(s) shall be:

— aligned and integrated with other organizational planning activities, including financial, human resources and other support functions;

— developed using the decision-making framework;

— made available as documented information.

When planning how to achieve its asset management objectives, the organization shall determine:

a) what will be done;

b) what resources will be required;

c) who will be responsible;

d) when it will be completed, considering appropriate time horizons;

e) how the results will be evaluated;

f) requirements for documented information;

g) the processes and methods to be employed in managing its assets over their life cycles;

h) the financial and non-financial implications of the asset management plan(s);

i) the review period for the asset management plan(s).

When the organization determines the need for changes to the assets, asset management, or asset management system, the changes shall be carried out in a planned manner.

The organization shall assess the risks associated with any planned temporary or permanent changes that can have an impact on achieving the asset management objectives, before the change is implemented.

7 Support

The organization shall determine and provide the resources needed for the establishment, implementation, maintenance and continual improvement of the asset management system.

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The organization shall provide the resources required for meeting the asset management objectives and for implementing the activities specified in the asset management plan(s).

The organization shall:

a) determine the necessary competence of person(s) doing work under its control that affects its asset performance, asset management performance and asset management system performance;

b) ensure that these persons are competent on the basis of appropriate education, training, or experience;

c) where applicable, take actions to acquire the necessary competence, and evaluate the effectiveness of the actions taken;

d) undertake a competence assessment, at appropriate frequency, to validate that the current required competencies are still appropriate and available;

e) periodically review the need to update competency requirements.

Appropriate documented information shall be available as evidence of competence.

NOTE Applicable actions can include, for example: the provision of training to, the mentoring of, or the re-assignment of currently employed persons; or the hiring or contracting of competent persons.

Persons doing work under the organization's control, who can have an impact on the achievement of the asset management objectives, shall be aware of:

a) the asset management policy;

b) their contribution and responsibility to the effectiveness of the asset management system, including the benefits of improved asset management performance;

c) the implications of not conforming to the asset management system requirements;

d) their work activities, the associated risks and opportunities and how they relate to each other.

The organization shall evaluate the effectiveness of the activities used to ensure awareness of asset management.

The organization shall determine the need for internal and external communications and engagement relevant to assets, asset management and the asset management system including:

a) on what it will communicate;

b) when to communicate;

c) with whom to communicate;

d) how to communicate.

The organization shall consult internal and external stakeholders when determining its need for communications, and when evaluating their effectiveness.

Appropriate documented information shall be available as evidence of the communications needed and on their effectiveness.

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7.5.1 General

The organization's asset management system shall include:

a) documented information as required by this document;

b) documented information determined by the organization as being necessary for the effectiveness of the asset management system;

c) documented information for applicable legal and regulatory requirements.

NOTE The extent of the documented information for an asset management system can differ from one organization to another due to:

— the size of organization and its type of activities, processes, products and services;

— the complexity of processes and their interactions;

— the competence of persons;

— the volume, diversity, complexity and criticality of the asset(s) and asset system(s).

The requirements for creation and control of documented information in 7.5.2 and 7.5.3 also apply to documented data and documented knowledge, as needed by the organization.

7.5.2 Creating and updating documented information

When creating and updating documented information the organization shall ensure appropriate:

a) identification and description (e.g. a title, date, author, or reference number);

b) format (e.g. language, software version, graphics) and media (e.g. paper, electronic);

c) review and approval for suitability and adequacy.

7.5.3 Control of documented information

Documented information required by the asset management system and by this document shall be controlled to ensure:

a) it is available and suitable for use, where and when it is needed;

b) it is adequately protected (e.g. from loss of confidentiality, improper use, or loss of integrity).

For the control of documented information, the organization shall address the following activities, as applicable:

— distribution, access, retrieval and use;

— storage and preservation, including preservation of legibility;

— control of changes (e.g. version control);

— retention and disposition.

Documented information of external origin determined by the organization to be necessary for the planning and operation of the asset management system shall be identified, as appropriate, and controlled.

NOTE Access can imply a decision regarding the permission to view the documented information only, or the permission and authority to view and change the documented information.

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The organization shall:

a) determine the data and information needed to support asset management;

NOTE 1 Asset management activities for which data and information can be relevant, include decision-making, risk management, meeting legal, regulatory and other stakeholders' requirements, life cycle management and performance reporting.

b) establish data and information specifications that include attributes, units of measurement, quality, and source;

c) develop a plan for the collection, integration, quality improvement, and sharing of data and information;

The organization shall determine and implement the requirements for:

— processes for data and information management;

NOTE 2 Processes can include acquisition, transformation, storage, control, sharing, archival and deletion of information over the life cycle stages of an asset.

— sharing information with stakeholders;

— alignment, consistency and traceability of information and terminology between the financial and non-financial functions within the organization; where differences are necessary this shall be made available as documented information and communicated.

The organization shall determine the knowledge needed to operate the asset management system.

The organization shall put in place processes for:

— utilizing available knowledge;

— ensuring that knowledge is readily accessible at the time of decision-making;

— retaining existing knowledge;

— acquiring new knowledge; and

— handling outdated knowledge.

When addressing changing requirements and trends, the organization shall consider its current knowledge and determine how to update, develop, acquire, or access any necessary additional knowledge.

8 Operation

The organization shall plan, implement and control the processes including life cycle processes, needed to meet requirements, and to implement the actions determined in Clause 6, the asset management plan(s) determined in 6.2, and actions determined in Clause 10 by:

a) establishing criteria for the required processes;

b) implementing the control of the processes, in accordance with the criteria;

NOTE 1 Life cycle processes can include the creation, acquisition, utilization, maintenance, improvement, renewal, and disposal of assets.

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NOTE 2 Acquisition can be either purchase, lease or design, build, installation or commissioning or other asset based capability provisioning, such as public-private-partnership or build-own-operate.

NOTE 3 Disposal includes extinguishment of liability from owning, managing or operating the asset.

NOTE 4 Improvement can include re-purpose of assets as well as modification.

NOTE 5 Life cycle activities can include or be based on predictions of the asset state in any life cycle stage.

c) monitoring and treating risks using the approach specified in 6.1.2;

d) monitoring and implementing opportunities using the approach specified in 6.1.3;

e) ensuring that the opportunities, risks, costs, and performance are managed to realize value across the asset life cycle within the organization's period of responsibility.

NOTE 6 Where an organization's period of responsibility is shorter than the asset life cycle (or in case of service providers, the client's period of responsibility), it can be necessary to take the required state of the asset into account.

Documented information shall be available to the extent necessary to have confidence that the processes have been carried out as planned.

The organization shall control planned changes and review the unintended consequences of changes, taking action to mitigate any adverse effects, as necessary.

The organization shall ensure that externally provided processes, technologies, products, services or activities, that are relevant to the asset management system are controlled, taking into account the associated risks and opportunities and are integrated into the organization's asset management system.

The organization shall determine:

a) the processes, technologies, products, services or activities that are externally provided, including the scope and boundaries of these, as well as their interfaces with the organization's own processes, technologies, products, services or activities;

b) the responsibilities and authorities within the organization for managing the externally provided processes, technologies, products, services or activities;

c) the processes and scope for the sharing of knowledge and information between the organization and its external provider(s).

The organization shall ensure that externally provided processes, technologies, products, services or activities:

— meet the relevant requirements of Clauses 7 and 8;

— are monitored in accordance with 9.1;

— are aligned with the SAMP and the asset management plans in 6.2.

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9 Performance evaluation

The organization shall determine:

a) what needs to be monitored and measured related to meeting stakeholder requirements and the performance of the assets, asset management and the asset management system;

b) the methods for monitoring, measurement, analysis and evaluation, as applicable, to ensure valid results;

c) when the monitoring and measuring shall be performed;

d) when the results from monitoring and measurement shall be analysed and evaluated.

Documented information shall be available as evidence of the results of monitoring, measurement, analysis and evaluation.

The organization shall evaluate the performance of the assets and asset management, and the effectiveness of the asset management system and their contributions to achievement of organizational objectives.

The organization shall report this to relevant stakeholders.

The organization shall evaluate and report on the effectiveness of the processes for managing risks and opportunities.

9.2.1 General

The organization shall conduct internal audits at planned intervals to provide information to assist in the determination on whether the asset management system:

a) conforms to:

   — the organization's own requirements for its asset management system;

   — the requirements of this document;

b) is effectively implemented and maintained.

9.2.2 Internal audit programme

The organization shall plan, establish, implement and maintain (an) audit programme(s), including the frequency, methods, responsibilities, planning requirements and reporting.

When establishing the internal audit programme(s), the organization shall consider the importance of the processes concerned and the results of previous audits.

The organization shall:

a) define the audit criteria and scope for each audit;

b) select auditors and conduct audits to ensure objectivity and the impartiality of the audit process;

c) ensure that the results of the audits are reported to relevant management;

d) ensure that the findings of audits are implemented as appropriate.

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Documented information shall be available as evidence of the results of the implementation of the audit programme and the audit results.

NOTE ISO 19011 provides guidelines for auditing management systems.

9.3.1 General

Top management shall review the organization's asset management system, at planned intervals, to ensure its continuing suitability, adequacy and effectiveness.

9.3.2 Management review inputs

The management review shall include:

a) the status of actions from previous management reviews;

b) changes in external and internal issues that are relevant to the asset management system;

c) changes in stakeholders and in needs and expectations of stakeholders that are relevant to the asset management system;

d) information on the asset management performance, including trends in:

   — nonconformities and corrective actions;

   — monitoring and measurement results;

   — audit results;

e) changes in the profile of risks and opportunities;

f) evaluation of the effectiveness of the decision-making framework in enabling the achievement of the asset management objectives;

g) opportunities for continual improvement, and changes in the potential of improvement opportunities.

9.3.3 Management review results

The results of the management review shall include decisions related to continual improvement opportunities, the adequacy of resources and any need for changes to the assets, asset management and asset management system.

Documented information shall be available as evidence of the results of management reviews.

10 Improvement

The organization shall continually improve the suitability, adequacy and effectiveness of the assets, asset management and asset management system in providing value to the organization.

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When a nonconformity or incident occurs in its assets, asset management or asset management system, the organization shall:

a) react to the nonconformity or incident, and as applicable:

   — take action to control and correct it;

   — deal with the consequences;

b) evaluate the need for action and available options to eliminate the cause(s) of the nonconformity or incident, in order that it does not recur or occur elsewhere, by:

   — reviewing the nonconformity or incident;

   — determining the causes of nonconformity or incident;

   — determining if similar nonconformities exist, or can potentially occur;

c) implement any action needed;

d) review the effectiveness of any corrective or preventive action taken;

e) make changes to the assets, asset management and asset management system, if necessary.

Corrective or preventive actions shall be appropriate to the effects of the (potential) nonconformities or incidents encountered.

Documented information shall be available as evidence of:

— the nature of the nonconformities or incidents and any subsequent actions taken;

— the results of any corrective action or prevention action.

The organization shall establish processes to predict the need for decisions relating to assets, asset management and the asset management system. In establishing these processes, the organization shall consider the need to:

a) determine the occurrences and impacts of both non-conformities in, and opportunities for improvement of assets, asset management and the asset management system;

b) determine the optimal intervention points, e.g. for maintenance, renewal, replacement and disposal of assets;

c) identify the inputs needed to:

   — determine the relationship of asset condition to performance, opportunity, risk and cost;

   — determine asset depreciation and financial value.

When a potential nonconformity or opportunity is determined, the organization shall apply the requirements in 10.2 and integrate these actions in its asset management planning.

The organization shall report to relevant stakeholders on the long-term effect from decisions made based on predictive actions on assets and asset management performance.

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