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资产管理 - 资产管理体系 -要求

Asset management - Asset management system - Requirements

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前　言

国际标准化组织(ISO)是由各国标准化团体(ISO 成员团体)组成的世界性的联合会。制定国际标准工作通常由 ISO 的技术委员会完成。各成员团体若对某技术委员会确定的项目感兴趣，均有权参加该委员会的工作。与 ISO 保持联系的各国际组织(官方的或非官方的)也可参加有关工作。ISO 与国际电工委员会(IEC)在电工技术标准化方面保持密切合作的关系。

制定本标准及其后续标准维护的程序在 ISO/IEC 指引 第 1 部分均有描述。应特别注意用于各不同类别 ISO 文件批准准则。本标准根据 ISO/IEC 导则第 2 部分的规则起草(见 www. iso. org/directives 或 www. iec. ch/members_experts/refdocs) 。

本标准中的某些内容有可能涉及一些专利权问题，对此应引起注意。ISO 不负责识别任何这样的专利权问题。在标准制定期间识别的专利权细节将出现在引言/或收到的 ISO 专利权声明清单中（www.iso.org/patents）。

本标准中使用的任何商品名称仅为方便用户而提供的信息， 并不构成认可。

ISO 与合格评定相关的特定术语和表述含义的解释以及 ISO 遵循的世界贸易组织（WTO）贸易技术壁垒（TBT）原则关信息访问以下 URLL：www.iso.org/iso/foreword.html.。在 IEC 中， 请参见 www. iec. ch/understanding-standards

本标准由 ISO/TC 251 资产管理技术委员会编写。

第二版取消并取代了经过技术修订的第一版（ISO 55001:2014）。

主要变化如下：

——应用《管理体系标准协调结构》，包括在第 3 章中纳入共同核心管理体系术语条目；

——增加了关于资产管理决策、资产管理战略计划和知识的新条款；

——明确运行策划和控制包括生命周期管理；

——明确区分组织应如何应对“″风险”和如何应对“机遇”；

——将“预防性措施”子条款更名为“预测性措施”，并对该子条款的内容进行全面的技术修订（见 10.3）；

——更加重视领导作用及其在支持资产管理体系的启用和成功方面的作用。

有关本标准的任何反馈或问题，请直接向用户的国家标准机构提出。这些机构的完整列表可在 www.iso.org/members.html 上找到。

引　言

本标准规定了建立、实施、运行、保持和改进资产管理体系（简称 "资产管理体系"）的要求。

任何规模和类型的组织均可使用本标准。组织可根据其法律法规和合同要求，确定本标准适用于哪些资产。

本标准适用于所有类型的资产，包括实物资产和非实物资产。

本标准主要供以下人员使用：

——参与建立、实施、运行、保持和改进资产管理体系的人员；

——签订合同或参与提供资产管理活动的人员和服务提供方；

——评估组织满足资产管理体系要求的能力所涉及的内部和外部各方。

本标准中提出要求的顺序并不反映这些要求的重要性，也不代表实施这些要求的顺序。

ISO 55000 提供了有关资产管理的通用信息以及适用于本标准的术语信息。

ISO 55002 提供了有关应用本标准要求的进一步指导。

ISO/TS 55010（财务与非财务职能在资产管理活动中的一致性）、iSO 55012（人员参与和能力）和 ISO 55013（资产数据管理）对本标准规定的资产管理体系的具体内容提供了更多指导。

ISO 55011 提供了关于制定公共政策以促进资产管理的指导。

与资产管理相关的一些重要原则包括：

——价值：资产管理的重点是资产长期为组织提供的价值；

——一致性：资产管理将财务、技术和业务决策与组织目标相协调，促进纵向和横向一致性；

——领导作用：各级领导作用和持续的承诺对于成功的资产管理至关重要。

资产管理的主要成果是实现价值和组织目标：

——保证：资产管理提供更好的组织监督和问责制；

——适应性：资产管理使组织能够更迅速、更有效地适应内部和外部环境的变化；

——可持续性：资产管理提倡长期思维，考虑未来的影响、风险、不确定性和机遇，以实现价值。

本标准采用 ISO 管理体系标准的统一结构（即相同的条款编号、条款标题、文本和通用术语及核心定义）编写，旨在加强管理体系标准之间的一致性，并促进其合并和整合实施。

资产管理 - 资产管理体系 - 要求

1 范围

本标准规定了资产管理体系的要求。

本标准适用于所有类型的资产以及所有类型和规模的组织。

根据组织的资产管理方针，资产管理体系的预期结果包括：

——实现资产管理目标，满足相关要求；

——不断改进资产管理、资产管理体系和资产绩效。

本标准并未规定管理特定资产类型的财务、会计或技术要求。

注：在ISO 55000、本标准和ISO 55002中，“资产管理体系”一词指资产管理的管理体系。

2 规范性引用文件

下列文件中的内容通过文中的规范性引用而构成本文件必不可少的条款。其中，注日期的引用文件， 仅注日期对应的版本适用于本文件。

ISO 55000：资产管理 综述、原则和术语

3 术语和定义

ISO 55000界定的术语和定义和下列术语和定义适用于本标准。

ISO和IEC设有用于标准化的术语数据库，地址如下：

——ISO 在线浏览平台：http://www.iso.org/obp

——IEC 电力维基百科：https://www.electropedia.org/

3.1

组织 organization

为实现其**目标**（3.6），由职责、权限和相互关系构成自身功能的一个人或一组人。

注 1：组织的概念包括，但不限于代理商、公司、集团、商行、企事业单位、行政机构、合营公司、协会(3.2.8)、慈善机构或研究机构，或上述组织的部分或组合，无论是否具有法人资格、公有的或私有的。

注 2：如果组织是更大实体的一部分，“组织”"一词仅指资产管理体系（3.4）范围内更大实体的那一部分。

3.2

相关方 interested party; stakeholder

可影响决策或活动、受决策或活动影响，或自认为受决策或活动影响的个人或**组织**(3.1)。

3.3

最高管理者 top management

在最高层指挥和控制**组织**(3.1)的一个人或一组人。

注 1：最高管理者在组织内有授权并提供资源的权力。

注 2：如果**管理体系**(3.4)的范围仅覆盖组织的一部分，在这种情况下，最高管理者是指管理和控制组织的这部分的一个人或一组人。

3.4

管理体系 management system

组织(3.1)建立**方针**(3.5)和**目标**(3.6)以及实现这些目标的过**程**(3.8)的相互关联或相互作用的一组要素。

注 1：一个管理体系可以针对单一的领域或几个领域。

注 2：管理体系要素包括组织的结构、岗位和职责、策划、运行。

3.5

方针 policy

由**最高管理者**(3.1.1)正式发布的**组织**(3.1)的宗旨和方向。

3.6

目标 objective

要实现的结果。

注 1：目标可以是战略性的、战术性的或操作层面的。

注 2：目标可以涉及不同的领域（如：财务的、职业健康与安全的和环境的目标），并可应用于不同的层次（(如：战略的、组织(3.2.1)整体的、项目的、产品和**过程**(3.8)的。

注 3：可以采用其他的方式表述目标，例如：采用预期的结果、活动的目的或运行准则作为资产管理目标，或使用其它有类似含意的词(如：目的、终点或标的)。

注 4：在资产**管理体系**（3.4）中，**组织**(3.1)制定的资产管理目标与资产**管理方针**（3.5）保持一致，以实现特定的结果。

3.7

风险 risk

不确定性对**目标**（3.6）的影响。

注 1：影响是指偏离预期，可以是正面的或负面的。

注 2：不确定性是一种对某个事件，或是事件的局部的结果或可能性缺少理解或知识方面的**信息**(3.8.2)的情形。

注 3：通常，风险是通过有关事件(ISO 31073 中的定义)和后果(ISO 31073 中的定义)，或两者的组合来描述其特性的。

注 4：通常，风险是以某个事件的后果（包括情况的变化）及其发生的可能性(ISO 31073 中的定义)的组合来表述的。

3.8

过程 process

利用输入实现预期结果的相互关联或相互作用的一组活动。

注 1：过程的“预期结果”称为输出，还是称为产品)或服务，随相关语境而定。

3.9

能力 competence

应用知识和技能实现预期结果的本领。

3.10

成文信息 documented information

组织(3.1)需要控制并保持的信息及其载体。

注 1：成文信息可以任何格式和载体存在，并可来自任何来源。

注 2：成文信息可涉及：

—— **管理体系**(3.4)，包括相关**过程**(3.8)；

—— 为组织运行而产生的信息（一组文件)；

—— 实现结果的证据（**记录**)。

3.11

绩效 performance

可测量的结果。

注 1：绩效可能涉及定量的或定性的结果。

注 2：绩效可能涉及活动、**过程**(3.8)、产品、服务、体系或组织的管理。

注 3：就资产管理而言，绩效可涉及资产满足**要求**（3.14）或实现**目标**（3.6）的能力，从而涉及资产实现价值的能力。

3.12

持续改进 continual improvement

提高**绩效**(3.11)的循环活动。

3.13

有效性 effectiveness

完成策划的活动并得到策划的结果的程度。

3.14

要求 requirement

明示的、通常隐含的或必须履行的需求或期望。

注 1： “通常隐含”是指**组织**(3.1)和**相关方**(3.2)**的**惯例或一般做法，所考虑的需求或期望是不言而喻的。

注 2： 规定要求是经明示的要求，如：在**成文信息**(3.10)中阐明。

3.15

符合 conformity

满足**要求**(3.14) 。

3.16

不符合 nonconformity

未满足**要求**(3.14) 。

注：不符合可能是对资产**管理体系**(3.4)要求、相关工作标准、惯例、程序或法律要求等的任何偏离，，也可以是任何资产不符合规格或绩效不达标的情况。

3.17

纠正措施 corrective action

为消除**不符合**(3.16)的原因并防止再发生所采取的措施。

3.18

预防措施 preventive action

为消除潜在不符合(3.16)或其他潜在不期望情况的原因所采取的措施。

注 1：一个潜在不符合(3.1.11)可有若干个原因。

注 2：采取预防措施是为了防止不符合发生并维持资产的功能，而采取纠正措施(3.17)是为了防止不符合再次发生。

注 3：通常在资产的功能可正常运转时或在功能故障发生之前实施预防措施。

注 4：预防措施包括补充功能性要求所需的消耗品。

[来源：ISO 55000:2024,3.3.20]

3.19

事件 incident

非预期事件或发生的事情。

[来源：ISO 55000:2024,3.3.22]

3.20

审核

为获得审核证据并对其进行客观的评价，以确定满足审核准则的程度所进行的系统的、独立的并形成文件的过程（3.8）。

注 1：审核可指内部审核(第一方审核)或外部审核(第二方审核或第三方审核),也可指联合审核或结合审核(结合两个或两个以上的领域)。

注 2：内部审核由组织（3.1）自身进行，或由外部机构代表组织进行。

注 3：“审核证据”与“审核准则”的定义见 ISO 19011。

3.21

测量 measurement

确定数值的过程(3.8)。

注：在本定义中，“数值”指不同于相关方价值（3.2）或资产管理价值。

3.22

监视 monitoring

体系、过程(3.8)或活动的状态的确定。

注 1：确定状态时可能需要进行检查、监督或严格观察。

注 2：出于资产管理的目的，监视也可指确定资产的状态。这通常称作“状态监测”或“绩效监视”。

4 组织环境

4.1 理解组织及其环境

组织应确定与其宗旨相关并影响其实现资产管理体系预期结果能力的外部和内部因素。

组织应确定气候变化是否是一个相关因素。

4.2 理解相关方的需求和期望

组织应确定：

a)与资产管理体系有关的相关方；

b)这些相关方的相关要求；

c)其中哪些要求将通过资产管理体系加以解决；

d)资产和资产管理活动对相关方的影响，及其对组织目标的重要性。

注 1：这些影响可能是积极的，也可能是消极的，可能是财务影响，也可能是非财务影响，在确定价值、决策、确定资源和活动的优先次序以及绩效监视时都可以加以考虑。

注 2：对相关方的影响可能包括但不限于成本、风险、绩效、安全、资本价值、收入、环境影响、声誉、质量、可持续性和合规性。

注 3：有关相关方可能有与气候变化有关的要求。

4.3 确定资产管理体系的范围

组织应界定资产管理体系的边界和适用性，以确定其范围。

在确定这一范围时，组织应考虑：

a)4.1 中提及的外部和内部因素；

b)4.2 中提及的要求；

c)与其他管理体系的相互作用。

组织应确定资产管理体系范围所涵盖的资产组合。范围应包括所涵盖资产组合的详细信息。

4.4 资产管理体系

组织应根据本标准的要求，建立、实施、保持并不断改进资产管理体系，包括所需的过程及其相互作用。

4.5 资产管理决策

4.5.1 框架

组织应建立并应用与组织类型、规模和复杂程度相适应的资产管理决策框架。

决策框架应用于

——定义和确定组织通过应用资产管理体系从其资产中获取的价值；

——确定用于资产管理决策的标准，以实现确定的价值。

在建立和应用该框架时，组织应考虑以下因素：

a)组织环境、组织目标以及外部和内部因素；

b)相关方的要求；

c)资产管理体系的范围，它决定了资产、资产管理和资产管理体系的决策范围；

d)风险和机遇。

4.5.2 准则

在确定用于资产管理决策的准则时，组织应考虑以下因素：

a)决定的潜在影响，包括可能产生影响的时间区间；

b)决策的复杂程度；

c)做出决定的紧迫性或可用时间；

d)与上述情况相适应的能力。

注：准备决策所需的时间、成本和精力与a)和d)中的内容相适应。

4.5.3 方法、过程和工具

组织应利用资产管理决策框架来确定和选择适当的方法、过程和工具，同时考虑到以下方面的必要性：

a)处理在资产生命周期或其他相关期限内实现最大价值的选择方案；

b)应对风险和机遇，以及这些风险和机遇如何随着时间的推移而变化；

c)对信息有信心；

d)支持治理工作，以便做出适当、及时的决策。

5 领导作用

5.1 领导作用和承诺

最高管理者应通过以下方式证实其对资产管理体系的领导作用和承诺：

a)确保建立资产管理方针、资产管理体系范围、战略资产管理计划（SAMP）和资产管理目标，并与组织的战略方向和组织目标相一致；

b)确保将资产管理体系的要求纳入组织的业务过程；

c)确保资产管理体系所需资源是可获取的；

d)沟通有效的资产管理和符合资产管理体系要求的重要性；

e)确保资产管理体系实现其预期结果；

f)指导、提高人员的意识并支持他们为资产管理体系的有效性做出贡献。

g)促进持续改进；

h)支持其他相关岗位在其职责范围内发挥领导作用；

i)确保制定和使用资产管理决策准则，并与组织目标保持一致；

j)批准资产管理方针、资产管理体系范围和战略资产管理计划。

注：本标准使用的“业务”一词可广义地理解为涉及组织存在目的的核心活动。

5.2 资产管理方针

最高管理者应制定资产管理方针，以：

a)与组织的宗旨相适应；

b)为制定资产管理目标提供框架；

c)包括满足适用要求的承诺；

d)包括对持续改进资产管理体系的承诺；

e)与组织的其他方针相一致。

资产管理方针应：

——可获取并保持成文信息；

——在组织内部进行沟通；

——适宜时，可为有关相关方所获取。

5.3 岗位、职责和权限

最高管理者应确保组织相关岗位的职责、权限得到分配和沟通。

最高管理者应为下述活动分配职责和权限：

a)确保资产管理体系符合本标准的要求；

b)向最高管理者和相关方报告资产、资产管理和资产管理体系的绩效。

6 策划

6.1 应对风险和机遇的措施

6.1.1 总则

在策划资产管理体系时，组织应考虑4.1中提及的因素和4.2中提及的要求，并确定需要应对的风险和机遇：

a)确保资产、资产管理和资产管理体系能够实现预期结果；

b)预防或减少不利影响；

c)实现持续改进。

6.1.2 应对风险的措施

组织应建立与资产、资产管理和资产管理体系相关的风险评估过程，包括：

——识别风险；

——分析风险及其如何随时间变化；

——评价风险；

——确定资产在实现资产管理目标方面的重要性；

——考虑替代方案并决定应对风险的首选方案。

组织应确保在组织的风险管理方法（包括应急计划）中考虑到与资产、资产管理和资产管理体系有关的风险。

组织应策划：

a)采取措施，处理、应对、监视和沟通与资产、资产管理和资产管理体系有关的风险，并应考虑到这些风险与机遇如何随时间而变化；

b)如何：

——在资产管理体系过程中整合并实施这些措施;

——评价这些措施的有效性。

应提供有关策划、实施和评价这些措施的成文信息。

6.1.3 应对机遇的措施

组织应建立过程，以便

——识别、收集、汇集或抓住机遇；

——决定应抓住哪些机遇来提高资产、资产管理和资产管理体系的绩效。

注：可通过分析4.1中的因素、4.2中相关方的要求、预期结果偏差、原因分析、风险分析、非预期事件评审、创新、持续改进、内部或外部审核结果或管理评审来确定机遇。

组织应策划：

a)采取措施，应对已确定的机遇，并应考虑到这些风险与机遇如何随时间而变化；

b)如何：

——在资产管理体系过程中整合并实施这些措施；

——评价这些措施的有效性。

应提供有关策划、实施和评价这些措施的成文信息。

6.2 资产管理目标及其实现的策划

6.2.1 战略资产管理计划（SAMP）

组织应制定战略资产管理计划，其中包括决策、实施和调整资产管理活动的战略和方法。

战略资产管理计划应：

a)与资产管理方针相一致；

b)包括资产管理决策框架，并要求应用所定义和确定的价值来实现；

c)确定资产管理目标以及实现这些目标的方法；

d)确定实现资产管理目标所需能力的过程；

e)详细说明与实现战略资产管理计划有关的时间期限；

f)详细说明实现战略资产管理计划的突发事件以及解决这些问题的办法；

g)确定改进资产管理体系、资产管理和资产的方法。

组织应确保战略资产管理计划与其财务和其他资源计划相一致，并概述如何实现这一点。

战略资产管理计划应作为成文信息可获取，并应定期评审和更新。

注：战略资产管理计划可由不同文件组合而成。

6.2.2 资产管理目标

组织应制定相关职能和层次的资产管理目标。在制定资产管理目标时，组织应考虑以下因素：

——风险和机遇；

——资产的状况、绩效和能力。

资产管理目标应：

a)与组织目标相协调、一致；

b)确定实现价值；

c)与资产管理方针相一致；

d)可测量（若可行）；

e)考虑到适用的要求（见 4.2）；

f)予以监视；

g)与相关方沟通；

h)适当时进行评审与更新；

i)作为成文信息可获取。

6.2.3 实现资产管理目标的策划

组织应建立并保持资产管理计划，以实现资产管理目标。资产管理计划应与资产管理方针和战略资产管理计划保持一致。

计划应：

——与组织其他策划（包括财务、人力资源和其他支持职能）相协调和整合。

——利用决策框架制定；

——作为成文信息可获取。

在策划如何实现资产管理目标时，组织应确定：

a)要做什么；

b)需要什么资源；

c)由谁负责；

d)何时完成，考虑适当的时间范围；

e)如何评价结果；

f)对成文信息的要求；

g)资产管理计划对财务和非财务方面的潜在影响；

h)资产管理计划的评审周期。

6.3 变更策划

当组织确定需要对资产、资产管理或资产管理体系进行变更时，变更应按所策划的方式实施。

组织应在实施任何可能对实现资产管理目标产生影响的计划性临时或永久变更之前，评估与之相关的风险。

7 支持

7.1 资源

组织应确定并提供建立、实施、保持和持续改进资产管理体系所需的资源。

组织应提供所需资源,以实现资产管理目标和实施资产管理计划中规定的活动。

7.2 能力

组织应：

a)确定在其控制下从事影响资产绩效、资产管理绩效和资产管理体系绩效工作的人员所需具备的能力；

b)确保这些员工在适当的教育、培训或经验的基础上能够胜任；

c)适当时,采取措施以获得必要的能力,并评估措施的有效性；

d)以适当的频率进行能力评估，以验证当前所需的能力是否仍然适当和可用；

e)定期评审更新能力要求的需求。

应保留适当的成文信息，作为人员能力的证据。

注：适用措施可包括对在职人员进行培训、辅导或重新分配工作，或者聘用、外包胜任的人员。

7.3 意识

在组织管理下进行工作,并对实现资产管理目标产生影响的员工都应意识到：

a)资产管理方针；

b)他们对资产管理体系有效性的贡献和职责，包括改进资产管理绩效的益处；

c)不符合资产管理体系要求的后果；

d)他们的工作活动、相关的风险和机遇及相互关联。

组织应评价用于确保资产管理意识的活动的有效性。

7.4 沟通

组织应确定与资产、资产管理和资产管理体系有关的内部和外部沟通与参与的需求，包括：

a)沟通什么；

b)何时沟通；

c)与谁沟通；

d)如何沟通。

组织在确定沟通需求和评价沟通有效性时，应与内部和外部相关方的进行协商。

应保留适当的成文信息，作为所需沟通及其有效性的证据。

7.5 成文信息

7.5.1 总则

组织的资产管理体系应包括：

a)本标准要求的成文信息；

b)组织所确定的、为确保资产管理体系有效性所需的成文信息；

c)有关适用法律法规管要求的成文信息。

注：对于不同组织，资产管理体系成文信息的多少与详略程度可以不同，取决于：

——组织的规模，以及活动、过程、产品和服务的类型；

——过程及其相互作用的复杂程度；

——人员的能力；

——资产和资产系统的数量、多样性、复杂程度和重要性。

7.5.2和7.5.3中关于创建和控制成文信息的要求也适用于成文数据和成文知识（视组织需要而定）。

7.5.2 成文信息的创建和更新

在创建和更新成文信息时，组织应确保适当的：

a)标识和说明（如标题、日期、作者、索引编号）；

b)形式（如语言、软件版本、图表）和载体（如纸质的、电子的）；

c)评审和批准，以保持适宜性和充分性。

7.5.3 成文信息的控制

应控制资产管理体系和本标准所要求的成文信息，以确保：

a)在需要的场合和时机，均可获得并适用；

b)予以妥善保护（如：防止泄密、不当使用或缺失）。

为控制成文信息，适用时，组织应进行下列活动：

——分发、访问、检索和使用；

——存储和防护，包括保持可读性；

——更改控制（如版本控制）；

——保留和处置。

对于组织所确定的策划和运行资产管理体系所必需的来自外部的成文信息，组织应进行适当识别，并予以控制。

注：对于成文信息的“访问”可能意味着仅允许查阅或者意味着允许查阅和并授权修改。

7.6 数据和信息

组织应：

a)确定支持资产管理所需的数据和信息；

注 1：与数据和信息相关的资产管理活动包括决策、风险管理、满足法律法规和其他相关方的要求、生命周期管理和绩效报告。

b)制定数据和信息规范，包括属性、测量单位、质量和来源；

c)制定数据和信息的收集、整合、质量改进和共享计划；

组织应确定并实施以下要求：

——数据和信息管理过程；

注 2：过程可包括资产生命周期各阶段信息的获取、转换、存储、控制、共享、存档和删除。

——与相关方共享信息；

——组织内财务职能部门与非财务职能部门之间的信息和术语应保持一致、连贯和可追溯性；如有必要存在差异，差异作为成文信息予以记录和沟通。

7.7 知识

组织应确定运行资产管理体系所需的知识。组织应建立过程以：

——利用现有知识；

——确保在决策时可随时获取知识；

——保持现有知识；

——获得新知识；

——处理过时知识。

为应对不断变化的需求和发展趋势，组织应审视其现有的知识，并确定如何更新、开发、获取或或接触更多必要的知识。

8 运行

8.1 运行策划和控制（包括生命周期管理）

组织应策划、实施和控制满足要求所需的过程（包括生命周期过程），并通过以下方式实施第6章确定的措施、6.2确定的资产管理计划和第10章确定的措施：

a)为所需过程建立相应的准则；

b)按照准则对过程实施控制；

注 1：生命周期过程可包括资产的创建、购置、使用、维护、改进、更新和处置。

注 2：购置可以是购买、租赁或设计、建造、安装或试运行，也可以是其他基于资产的能力提供，如公私合作伙伴关系或建设-拥有-运营。

注 3：处置包括消除拥有、管理或运营资产所产生的责任。

注 4：改造可包括资产的重新使用和改装。

注 5：生命周期活动可包括或基于对任何生命周期阶段资产状态的预测。

c)使用 6.1.2 规定的方法监视和应对风险；

d)利用 6.1.3 中规定的方法监视和落实各种机遇；

e)确保对机遇、风险、成本和绩效进行管理，以在组织职责期内实现整个资产生命周期的价值。

注 6：如果组织的职责期短于资产的生命周期（或对于服务提供方而言，客户的职责期），则有必要将资产的必要状态考虑在内。

在必要的范围和程度上，提供成文信息，以确信过程已经按策划进行。

8.2 控制变更

组织应控制策划的变更，评审非预期变更的后果，必要时，采取措施减轻不利影响。

8.3 外部提供的过程、产品、技术和服务

组织应确保对外部提供的与资产管理体系相关的过程、技术、产品、服务或活动进行控制，同时考虑到相关的风险和机遇，并将其纳入组织的资产管理体系。

组织应确定：

a)外部提供的过程、技术、产品、服务或活动，包括这些过程、技术、产品、服务或活动的范围和边界，以及它们与组织自身过程、技术、产品、服务或活动的接口；

b)组织内部管理外部提供的过程、技术、产品、服务或活动的职责和权限；

c)组织与其外部提供方共享知识和信息的程序和范围。

组织应确保外部提供的过程、技术、产品、服务或活动：

——符合第 7 章和第 8 章的相关要求；

——按照 9.1 的要求进行监视；

——6.2 中的“战略资产管理计划”和“资产管理计划”保持一致。

9 绩效评价

9.1 监视、测量、分析和评价

组织应确定

a)在满足相关方的要求以及资产、资产管理和资产管理体系的绩效方面，需要对哪些方面进行监视和测量；

b)适用时,需要用什么方法进行监视、测量、分析和评价，以确保结果有效；

c)何时实施监视和测量；

d)何时对监视和测量的结果进行分析和评价。

组织应保留适当的成文信息，作为监视、测量、分析和评价结果的证据。

组织应评价资产和资产管理的绩效、资产管理体系的有效性及其对实现组织目标的贡献。

组织应向有关相关方报告。

组织应评价和报告风险与机遇管理过程的有效性。

9.2 内部审核

9.2.1 总则

9.2.2 组织应按照策划的时间间隔进行内部审核，以提供有关资产管理体系的下列信息：

a) 是否符合：

1) 组织自身的资产管理体系要求；

2) 本标准的要求。

b) 是否得到有效的实施和保持。

9.2.3 内部审核方案

组织应策划、建立、实施和保持审核方案，包括频次、方法、职责、策划要求和报告等。

审核方案应考虑到相关过程的重要性和以往的审核结果。

组织应：

a) 确定每次审核的审核准则和范围；

b) 选择审核员实施审核，以确保审核过程客观公正；

c) 确保将审核结果报告给相关管理者；

d) 确保审核结果得到适当落实。

应保留成文信息，作为实施审核方案以及审核结果的证据。

注：相关管理体系指南参见ISO 19011。

9.3 管理评审

9.3.1 总则

最高管理者应按照策划的时间间隔对组织的资产管理体系进行评审，以确保其持续的适宜性、充分性和有效性。

9.3.2 管理评审输入

管理评审应包括：

a) 以往管理评审所采取措施的状况；

b) 与资产管理体系相关的内外部因素的变化；

c) 与资产管理体系有关的相关方及其需求和期望的变化；

d) 下列有关资产管理绩效方面的信息，包括其趋势：

——不符合和纠正措施；

——监视和测量结果；

——审核结果。

e) 风险和机遇的变化；

f) 评价决策框架在实现资产管理目标方面的有效性；

g) 持续改进的机会，以及潜在改进机会的变化。

9.3.3 管理评审结果

管理评审的结果应包括与持续改进机会、资源是否充足以及是否需要对资产、资产管理和资产管理体系进行变更有关的决定。

组织应提供成文信息，作为管理评审结果的证据。

10 改进

10.1 持续改进

组织应不断提高资产、资产管理和资产管理体系在为组织提供价值方面的适宜性、充分性和有效性。

10.2 不符合和纠正措施

当资产、资产管理或资产管理体系出现不符合或事件时，组织应

a)对不符合或事件做出应对，并在适用时：

——采取措施加以控制和纠正；

——处置后果。

b)通过以下方式，评价采取措施消除不符合或事件原因的必要性和可选方案，以避免不符合或事件再次发生或在其他地方发生：

——评审不符合或事件；

——确定不符合或事件的原因；

——确定是否存在或可能发生类似的不符合；

c)实施所需的措施；

d)评审所采取的纠正或预防措施的有效性；

e)必要时,对资产、资产管理和资产管理体系进行变更。

纠正或预防措施应与所遇到的（潜在）不符合或事件的影响相适应。

应保留成文信息，作为下列事项的证据：

——不符合或事件的性质以及随后所采取的措施；

——纠正措施或预防措施的结果。

10.3 预测措施

在建立这些过程时，组织应考虑到以下需求：

a)确定资产、资产管理和资产管理体系中不符合要求的情况和影响，以及改进的机会；

b)确定最佳干预点，如资产的维护、更新、替换和处置；

c)确定所需输入，以便：

——确定资产状况与绩效、机遇、风险和成本之间的关系；

——确定资产折旧和财务价值。

当确定存在潜在不符合或机遇时，组织应执行10.2中的要求，并将这些措施纳入其资产管理计划。

组织应向有关相关方报告基于资产和资产管理绩效预测措施所做决策的长期影响。

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International Standard

ISO 55001

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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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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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