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中华人民共和国国家标准

GB/T 33173—2016/ISO 55001:2014

资产管理　管理体系　要求

Asset management—Management systems—Requirements

(ISO 55001:2014,IDT)

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前　言

GB/T 33172、GB/T 33173 和 GB/T 33174 共同构成支撑资产管理体系建立的系列国家标准。

本标准按照 GB/T 1.1—2009 给出的规则起草。

本标准使用翻译法等同采用 ISO 55001:2014《资产管理　管理体系　要求》。

本标准由中国标准化研究院提出并归口。

本标准起草单位：国网北京经济技术研究院、内蒙古蒙牛乳业(集团)股份有限公司、中国质量认证中心、中国标准化研究院、中国信息安全认证中心、中国船级社质量认证公司、中油管道物资装备总公司、中海油安全技术服务有限公司、东电万维科技(北京)有限公司、上海玖道信息科技股份有限公司、上海荣时信息科技有限公司、北京科迪智标信息技术有限公司、北京国金衡信认证有限公司、标新科技(北京)有限公司、东莞市新支点科技服务有限公司、广州市标准化研究院、山东省标准化研究院、湖北省标准化与质量研究院、《中国标准化》杂志社有限公司。

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引　言

本标准具体阐明建立、实施、保持和改进用于资产管理的管理体系(资产管理体系)的要求。

本标准适用于所有组织。由组织决定本标准适用于哪些资产。

本标准的主要应用对象包括：

a)　参与资产管理体系的建立、实施、保持和改进的各方；

b)　实施资产管理活动所涉及的各方与服务供应商；

c)　评估组织满足法律、法规、合同要求以及组织自身要求的内外部机构。

本标准叙述要求的顺序并不反映要求的重要性或预示其实施顺序。

GB/T 33174 中包含进一步应用本标准中所述要求的指南。

GB/T 33172 包含有关资产管理的一般信息与适用于本标准的术语。考虑这些准则有助于组织实施资产管理。

本标准采用了 GB/T 24353—2009 和 ISO 指南 73:2009 中对“风险”的定义。

本标准旨在使得组织的资产管理体系与相关管理体系的要求协调一致并能进行整合。

附录 A 提供了与资产管理活动有关领域的附加信息。

资产管理　管理体系　要求

1　范围

本标准给出了资产管理体系在组织环境下的要求。

本标准适用于所有类型的资产和所有类型及规模的组织。

注 1：本标准旨在管理实物资产，但也可用于其他类型的资产。

注 2：本标准不规定财务、会计或技术方面针对特定类型资产的要求。

注 3：在 GB/T 33172、GB/T 33174 以及本标准中以“资产管理体系”指代用于资产管理的管理体系。

2　规范性引用文件

下列文件对于本文件的应用是必不可少的。凡是注日期的引用文件，仅注日期的版本适用于本文件。凡是不注日期的引用文件，其最新版本(包括所有的修改单)适用于本文件。

GB/T 33172—2016　资产管理　综述、原则和术语(ISO 55000:2014，IDT)

3　术语和定义

GB/T 33172—2016 界定的术语和定义适用于本文件。

4　组织环境

4.1　理解组织及其环境

组织应确定与其目的有关，以及对实现资产管理体系预期结果的能力有影响的内外部事项。

战略资产管理计划(SAMP)中所包含的资产管理目标应与组织目标协调、一致。

4.2　理解相关方的需求与期望

组织应确定：

——与资产管理体系有关的相关方；

——这些相关方在资产管理方面的要求与期望；

——资产管理方面的决策准则；

——相关方对于记录与资产管理有关的财务与非财务信息的要求，以及针对资产管理进行内外部报告的要求。

4.3　确定资产管理体系的范围

组织应通过确定资产管理体系的边界和适用性来建立其范围。范围应与 SAMP 和资产管理方针相协调。确定范围时组织应考虑：

——在 4.1 中涉及的内外部事项；

——在 4.2 中涉及的要求；

——若组织使用了其他管理体系，考虑其与这些管理体系的相互作用。

组织应规定资产管理体系范围内涵盖的资产组合。

该范围应能以文件化信息的形式获取。

4.4 资产管理体系

组织应按照本标准的要求建立、实施、保持和持续改进资产管理体系，包括所需的过程及其相互作用。

组织应开发 SAMP，它包含资产管理体系在支持资产管理目标实现方面的作用的文件。

5 领导力

5.1 领导力与承诺

最高管理者应通过以下方面证实其在资产管理体系的领导力与承诺：

——确保建立资产管理方针、SAMP 和资产管理目标，并与组织的目标一致；

——确保将资产管理体系的要求纳入组织的业务过程；

——确保资产管理体系所需资源是可获取的；

——对于有效的资产管理以及满足资产管理体系要求的重要性进行传达；

——确保资产管理体系实现其预期结果；

——指导并支持员工为资产管理体系的有效性做出贡献；

——促进组织内的跨职能协作；

——促进持续改进；

——支持相关管理者在其职责范围内展示领导力；

——确保资产管理中所使用的风险管理方法与组织的风险管理方法相协调。

注：本标准中所使用的“业务”一词可广义地解释为对组织的生存至关重要的活动。

5.2 方针

最高管理者应建立资产管理方针：

a) 与组织的目标相适应；

b) 为资产管理目标的制定提供框架；

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。

资产管理方针应：

——与组织计划相一致；

——与组织的其他方针相一致；

——适用于组织资产和运营的性质与规模；

——能以文件化信息的形式获取；

——在组织内部进行沟通；

——适当时，使相关方可获取；

——得到实施与定期评审，必要时进行更新。

5.3 组织的角色、职责与权限

最高管理者应确保组织内部相关角色的职责和权限的分配与沟通。

最高管理者应为下述活动分配职责和权限：

a) 建立与更新 SAMP，包括资产管理目标；

b) 确保资产管理体系支持 SAMP 的实施；

c) 确保资产管理体系符合本标准的要求；

d) 确保资产管理体系的适宜性、充分性和有效性；

e) 建立与更新资产管理计划(见 6.2.2)；

f) 向最高管理者报告资产管理体系的绩效。

6 策划

6.1 资产管理体系中应对风险与机遇的措施

在策划资产管理体系时，组织应考虑 4.1 中涉及的事项与 4.2 中涉及的要求，并确定需要应对的风险与机遇，从而实现下述目标：

——确保资产管理体系能够实现其预期结果；

——避免或减少非预期影响；

——实现持续改进。

组织应策划：

a) 应对风险和机遇的措施，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；

——评估这些措施的有效性。

6.2 资产管理目标和实现目标的策划

6.2.1 资产管理目标

组织应在相关的职能和层级上建立资产管理目标。

建立资产管理目标时，组织在资产管理策划过程中应考虑关键相关方的要求及财务的、技术的、法律的、法规的和组织的要求。

资产管理目标应：

——与组织目标相协调、一致；

——与资产管理方针相一致；

——在建立与更新时应用资产管理决策准则(见 4.2)；

——作为 SAMP 的组成部分进行建立与更新；

——可测量(可行时)；

——考虑到适用的要求；

——得到监视；

——与关键相关方沟通；

——适当时进行评审与更新。

组织应保留资产管理目标方面的文件化信息。

6.2.2 实现资产管理目标的策划

组织应将实现资产管理目标的策划纳入到组织其他策划活动中，包括财务、人力资源和其他支持职能等。

组织应建立、形成文件和保持资产管理计划，以实现资产管理目标。资产管理计划应与资产管理方

针和 SAMP 相一致。

组织应确保资产管理计划考虑到资产管理体系以外的相关要求。

在策划如何实现资产管理目标时，组织应确定以下内容并形成文件：

a) 决策方法、决策准则以及各种活动与资源的优先级，以实现资产管理计划和资产管理目标；

b) 在全寿命周期内管理资产所采用的过程和方法；

c) 做什么；

d) 所需资源；

e) 谁来负责；

f) 完成时间；

g) 如何评估结果；

h) 资产管理计划的适当时间范围；

i) 资产管理计划对财务和非财务方面的潜在影响；

j) 资产管理计划的评审周期(见 9.1)；

k) 应对与资产管理有关的风险和机遇的措施，并应考虑到这些风险与机遇如何随时间而变化，这些措施可以通过建立下述过程得以实现：

——识别风险和机遇；

——评估风险和机遇；

——确定资产在实现资产管理目标方面的重要程度；

——对风险和机遇实施适当处理和监视。

组织应确保其风险管理方法(包括应急计划)考虑到资产管理有关的各种风险。

注：欲获取有关风险管理的更多指导，见 GB/T 24353—2009。

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：

——确定受其控制的工作人员所需的能力，这些人员从事的工作影响资产绩效、资产管理绩效和资产管理体系绩效；

——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；

——适当时，采取措施以获得必要的能力，并评估措施的有效性；

——保留适当的文件化信息作为能力的证据；

——定期评审当前和未来对人员能力的需要和要求。

注：例如，适当的措施包括为现有的员工提供培训、指导或岗位调整，或聘用有能力的人员。

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：

——资产管理方针；

——他们对资产管理体系有效性的贡献，包括改善资产管理绩效带来的收益；

——他们的工作活动、相关的风险和机遇及相互关联；

——不符合资产管理体系要求的后果。

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外部沟通的需求，包括：

——沟通内容；

——沟通时机；

——沟通对象；

——沟通方式。

7.5 信息要求

组织应确定用于支持资产、资产管理、资产管理体系以及实现组织目标的信息要求。为实现这一目标：

a) 组织应考虑：

——已识别风险的重要性；

——资产管理的角色和职责；

——资产管理的过程、程序和活动；

——与相关方(包括服务供应商)进行的信息交换；

——信息的质量、可用性和管理对组织决策的影响；

b) 组织应确定：

——已识别信息的属性要求；

——已识别信息的质量要求；

——收集、分析和评价信息的方式和时机；

c) 组织应规定、实施和保持信息管理的过程；

d) 对于整个组织范围内与资产管理有关的财务和非财务术语的一致性，组织应确定要求；

e) 组织应确保财务、技术数据和其他相关非财务数据间的一致性、可追溯性，并且在考虑相关方要求和组织目标的情况下满足法律和法规上的要求。

7.6 文件化信息

7.6.1 总则

组织的资产管理体系应包括：

——本标准所要求的形成文件的信息；

——适用的法律要求和法规要求中的文件化信息；

——组织确定的为保证资产管理体系有效性(见 7.5)所必需的文件化信息。

注：与资产管理体系有关的文件信息范围因组织而异，具体取决于：

——组织的规模和活动、过程、产品和服务的类型；

——过程及其相互作用的复杂程度；

——员工能力；

——资产的复杂程度。

7.6.2 创建与更新

在创建与更新文件化信息时，组织应确保适当的：

——标识和描述(例如标题、日期、作者或索引号等);
——格式(例如语言、软件版本、图片等)和媒介(例如纸质版、电子版等);
——评审和批准,以确保适宜性和充分性。

7.6.3 文件化信息的控制

资产管理体系和本标准所要求的文件化信息应得到控制,以确保:
a) 在所需的场所和时间可获取并适宜;
b) 得到充分的保护(例如避免泄密、不当使用或缺失)。
适当时,组织应采取下述措施对文件化信息进行控制:
——分发、访问、检索和使用;
——存储和保存,并易于辨识;
——变更控制(例如版本控制);
——保留和处置。
组织确定的、策划和运行资产管理体系必需的、外来的文件化信息应予以适当识别与控制。
注:访问可以仅指允许查看文件化信息,或指允许查看和有权变更文件化信息。

8 运行

8.1 运行的策划与控制

组织应策划、实施和控制所需的过程以满足要求,并实施 6.1 所确定的措施、6.2 所确定的资产管理计划和 10.1 与 10.2 所确定的纠正措施和预防措施,具体如下:
——为所需过程建立相应的准则;
——按照准则对过程实施控制;
——保存必要的文件化信息,对过程按计划实施提供相应的证明和依据;
——应用 6.2.2 所描述的方法来处理和监视风险。

8.2 变更管理

任何影响资产管理目标实现的计划内变更,无论其是永久的还是临时的,由此带来的相关风险应在变更实施前进行评估。
组织应确保按照 6.1 和 6.2.2 所述的方式来管理风险。
组织应控制计划内的变更、评审变更所带来的非预期后果,必要时采取措施以减轻不利影响。

8.3 外包

组织将任何对实现其资产管理目标有影响的活动外包时,应评估其风险。组织应确保外包的过程和活动得到控制。
组织应确定并记录这些活动如何得到控制且整合到组织的资产管理体系中。组织应确定:
a) 将被外包的过程和活动(包括被外包的过程和活动的范围和边界,以及与组织自身的过程和活动的接口);
b) 组织内管理外包过程和活动的职责和权限;
c) 组织及其承包服务供应商之间共享知识和信息的过程和范围。
在外包任何活动时,组织应确保:
——被外包的资源满足 7.2、7.3 和 7.6 的要求;
——按照 9.1 的要求监视被外包活动的绩效。

9 绩效评价

9.1 监视、测量、分析与评价

组织应确定：

a) 需要监视和测量的内容；

b) 适用时，监视、测量、分析和评价的方法，以确保结果有效；

c) 何时执行监视和测量；

d) 何时分析和评价监视及测量结果。

组织应针对下述方面进行评价与报告：

——资产绩效；

——资产管理绩效，包括财务和非财务绩效；

——资产管理体系的有效性。

组织应就管理风险和机遇的过程的有效性进行评估与报告。

组织应保留适当的文件化信息作为监视、测量、分析和评价的结果的证据。

组织应确保其监视和测量能使其满足 4.2 的要求。

9.2 内部审核

9.2.1 组织应按策划的时间间隔进行内部审核，以提供信息来辅助确定资产管理体系是否：

a) 符合：

——组织自身对资产管理体系的要求；

——本标准的要求。

b) 得到了有效地实施与保持。

9.2.2 组织应：

a) 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；

b) 确定每次审核的准则和范围；

c) 选择审核员和实施审核，以确保审核过程的客观性和公正性；

d) 确保向相关的管理层汇报审核结果；

e) 保留文件化信息作为审核方案实施的结果和审核结果的证据。

9.3 管理评审

最高管理者应按策划的时间间隔评审组织的资产管理体系，以确保其持续的适宜性、充分性和有效性。

管理评审应考虑：

a) 以往管理评审后所采取措施的状态；

b) 与资产管理体系相关的内部和外部事项的变更；

c) 资产管理绩效方面的信息，包括下述趋势：

——不符合和纠正措施；

——监视和测量结果；

——审核结果；

d) 资产管理活动；

e) 持续改进的机会；

f) 风险和机会方面的变更。

管理评审的输出应包括与持续改进机会有关的决策和对资产管理体系进行变更的任何需求(见8.2)。

组织应保留作为管理评审结果证据的文件化信息。

10 改进

10.1 不符合和纠正措施

当组织的资产、资产管理或资产管理体系发生不符合或事件时,组织应:

a) 适用时,对不符合或事件作出反应:

——采取措施进行控制和纠正;

——处理后果;

b) 评估消除不符合或事件原因的措施的必要性,以确保不符合或事件不再发生或不在他处再发生,通过:

——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) 评审所采用的所有纠正措施的有效性;

e) 必要时,对资产管理体系进行变更(见8.2)。

纠正措施应与不符合或事件的后果相适应。

组织应保留文件化信息作为以下方面的证据:

——不符合或事件的性质和后续所采取的任何措施;

——所有纠正措施的结果。

10.2 预防措施

组织应建立过程,以主动识别资产绩效中的潜在问题并评估采取预防措施的需求。

当潜在问题得到识别时,组织应采用10.1的要求。

10.3 持续改进

组织应持续改进资产管理和资产管理体系的适宜性、充分性和有效性。

附 录 A
（资料性附录）
资产管理活动方面的信息

其他已发表的国际、地区或国家标准中与资产管理有关的领域包括，但不限于：

——数据管理；
——状态监测；
——风险管理；
——质量管理；
——环境管理；
——系统和软件工程；
——寿命周期成本；
——可依赖性（可用性、可靠性、可维护性和维护支持）；
——配置管理；
——维修工艺学；
——可持续发展；
——检验；
——无损检测；
——承压设备；
——财务管理；
——价值管理；
——冲击和振动；
——声学；
——人员资质与评估；
——项目管理；
——财产与财产管理；
——设施管理；
——设备管理；
——调试过程；
——能源管理。

GB/T 33172、GB/T 33174 与本标准的使用者也应在需要时参考这些标准，以便在组织范围内一致地贯彻资产管理。

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Asset management — Guidance on the management of data assets

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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*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

0.1 General

This document gives guidance on the management of data when applying asset management principles or requirements for an asset management system. These principles and requirements are described in ISO 55000 and ISO 55001, respectively. Much of asset management involves decision-making with decisions being reliant on data, particularly for larger and more complex contexts.

This document is intended to facilitate organizations in their management of data in the context of asset management. Effective asset management typically relies on the proper management of data that is pertinent to the assets. Organizations can manage the data as an asset to support their organizational management. This document covers management of data both for supporting the practice of asset management and for handling the data as an asset.

NOTE For the purposes of this document, the term "asset data" is used to refer to data that lists and describes an asset and the term "data asset" is used to refer to collections of asset data that has the properties of an asset.

This document gives guidance for those who:

a) are identifying the usefulness or fitness for purpose of data for achieving the asset management objectives of the organization, including fulfilling its accountability;

b) are involved in the establishment, implementation, maintenance, stewardship and improvement of data in the context of asset management;

c) are involved in the planning, designing, implementation and reviewing of data-based asset management activities along with service providers;

d) are asset owners, asset managers, information managers, service providers, maintainers, partners, auditors, regulators and investors;

e) are the internal and external stakeholders, including internal and external personnel, that affect, or are affected (positively or negatively) by, the management of data in the context of asset management.

Management of data can play a critical role in other management systems as well as in an asset management system. Meanwhile, there can be many benefits for organizations to integrate and implement multiple management systems. The achievement of mutual alignments to other management systems requires an approach based on an appropriate cross-functional data exchange and analysis within the organization.

0.2 Context of this document

Against a background of advances in information technology (IT) and diversifying stakeholder demands, how data should be managed in the context of asset management is now seen as a pressing issue for many organizations. As organizations get larger and tend to become more complex, the need for reliable data to support sound decision-making becomes increasingly important. Data acquisition and maintenance is a cost to an organization, while data's potential value is realized when it is used or can be used in the future. The value of data is diminished if it is unreliable, out of date and/or applied incorrectly.

Accordingly, the role of data is changing from being a resource that supports management activities to a non-physical asset from which value is generated by being managed in a coordinated way, just like any other tangible or intangible asset.

Data in the context of asset management has its own characteristics as follows:

a) like physical assets, asset data follows a sequence of life cycle stages; it can be used many times although the usefulness of data can change as they move along their life cycle;

b) data can be stolen if not protected appropriately; such data theft does not bring data loss and can therefore not be immediately evident to an organization yet create sustained negative impacts;

c) data are easy to copy, transport and even corrupt, but they can be difficult or impossible to reproduce if they are lost, destroyed or corrupted;

d) data can be used for multiple purposes: the same data can even be used by multiple people at the same time; similarly, many people and processes can be adding or updating data simultaneously;

e) data can generate new value when combined with other assets;

f) many uses of data often lead to more data to handle as a result; most organizations manage increasing volumes of data and the relationships between data sets;

g) data and information are essential in conducting business within an organization and/or between two functions or divisions; most business decisions from the strategic to the operational level generally involve the sharing of data.

While some of these characteristics are similar to other assets, as a whole, they differ in nature from those of other asset types. This requires different approaches to ensure that the management of data supports its objectives in the context of asset management.

Different data sets may be treated as assets which can be critical to the success of the organization. In such situations, organizations may treat such collections of data as data assets. The principles of asset management described in ISO 55000 should be applied to the management of data assets.

0.3 Relationship to ISO 55000 and ISO 55001

ISO 55000 is the foundation for implementing asset management, and therefore the prerequisite to understand this document.

ISO 55001 can be applied by organizations to establish and implement an asset management system. This also applies to an asset management system for data assets. On the other hand, since an organization's asset management system is supported by decision-making based on information or data and its analysis, the process of determining decision-making criteria in an asset management system that meets the requirements of ISO 55001 generally includes the process of managing data. As such, this document facilitates organizations to include data assets within their asset management system.

Asset management — Guidance on the management of data assets

1 Scope

This document gives guidance on managing data to support an organization in meeting its asset management objectives and by extension its organizational objectives.

This document is applicable to any organization, regardless of its type or size.

This document does not provide methodologies to derive or appraise value for data assets.

This document does not provide methodologies to derive financial values for data assets.

This document does not provide direction to organizations on the need (or not) for calculating financial values for asset data.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 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
asset data
data that lists and describes an asset

Note 1 to entry: Asset data can exist in a number of formats such as structured data, documented information, sensor data, etc. requiring different approaches to their management.

Note 2 to entry: Data supporting asset management decision-making can be considered as asset data.

3.2
data asset
data that has the properties of an asset

Note 1 to entry: Data assets can be managed as an asset in accordance with ISO 55001.

Note 2 to entry: *Asset data* (3.1) can be part of more than one data asset. Data assets can have relationships between each other.

3.3
type
data type
named category of data characterized by a set of values, a syntax for denoting these values, and a set of operations that interpret, manipulate or store the values

[SOURCE: ISO/IEC 1539-1:2023, 3.144, modified — "or store" added.]

3.4
metadata
data that defines and describes other data

[SOURCE: ISO 24531:2013, 4.32]

3.5
data quality
degree to which a set of inherent characteristics of data fulfils requirements

[SOURCE: ISO 8000-2:2022, 3.8.1, modified — Note to entry deleted.]

3.6
interoperability
capability of two or more entities to exchange items in accordance with a set of rules and mechanisms implemented by an interface in each entity, in order to perform their specified tasks

Note 1 to entry: Examples of entities include devices, equipment, machines, people, processes, applications, computer firmware and application software units, data exchange systems and enterprises.

Note 2 to entry: Examples of items include services, information, material in standards, design documents and drawings, improvement projects, energy reduction programs, control activities, asset description and ideas.

Note 3 to entry: In this context, entities provide items to, and accept items from, other entities, and they use the items exchanged in this way to enable them to operate effectively together.

[SOURCE: ISO 18435-1:2009, 3.12, modified — "specified" replaced "respective" in the definition. Notes 1 and 2 to entry expanded. Note 3 to entry added.]

3.7
governing function
function responsible for the strategic guidance of the data governance programme

Note 1 to entry: The governing function is responsible for the prioritization of data governance projects and initiatives, and the approval of organization-wide data policies and standards, as well as enabling ongoing support, understanding and awareness of the data governance programme.

Note 2 to entry: Depending on the culture of the organization, a governing body can be known by other names such as the data governance committee, data governance steering council/committee/group, data governance advisory council/committee/group, data stewardship council/committee, data owners' council/committee.

4 Managing asset data

4.1 General

Asset management enables an organization to realize value from its assets in the achievement of its asset management objectives and by extension its organizational objectives. What constitutes value depends on these objectives, the nature and purpose of the organization, and the needs and expectations of its stakeholders (see ISO 55000).

Many asset management activities rely on effective decision-making which in turn relies on data and documented information. The asset data used by an organization to inform decision-making in turn requires effective management to ensure usefulness to the organization within the required timescales. Suitable accountability and management of these asset data is required to ensure and maintain usefulness.

Asset data can be created, acquired or generated at all stages of the asset life cycle. Asset data supporting asset management activities is generally required for at least as long as the asset itself exists. Asset data that conformed with the requirements of the organization at the time it was acquired does not necessarily conform to current organizational requirements.

The configuration or nature of the asset can constrain or prevent data acquisition activities and also make it difficult to check or improve incorrect or missing asset data. Asset interventions occur at a discrete period; therefore, subsequent checking or improvement of asset data arising from these interventions requires additional data sources.

4.2 Asset data

4.2.1 Data requirements

The organization should determine its data requirements and manage its data across its life cycle to support the scope of its asset management system to achieve both its asset management and organizational objectives (see ISO 55001:2024, 7.6, which also deals with requirements related both to the data themselves and to their alignment across the organization's functions).

In addition, the organization should determine the following:

a) Legal requirements: The legal requirements of holding, managing and transferring asset data.

b) Data dictionaries: Data specifications and requirements by the organization's management system to enable consistent definition of attributes, units of measurement, criticality, quality and source for the different types of asset data.

c) Data frequency: The frequency for updating data. While some asset data can remain static across all life cycle stages, others can be updated in pre-defined intervals of time.

d) Data volume: The volume of data can determine which tools and storage environments are most appropriate to be used.

e) Data security: Ensuring that data are protected from inappropriate access (e.g. from loss of confidentiality, improper use or improper modification including improper additions, alterations and deletions).

f) Data availability: Ensuring the availability of data at critical times is defined and it is accessible by the asset management team when required.

g) Data responsibility: Determining roles and responsibilities related to the management of asset data.

Where it is not possible for the organization to achieve these data requirements, it is important for the organization to provide direction as appropriate.

Before data can be published or used to make asset management decisions, its quality should be understood. Making decision-makers aware of what data are available and how their quality enables informed decision-making, mitigates risks related to confidence in the accuracy and effectiveness of the decisions being made.

By deriving meaning from data and by managing data to ensure that they are of sufficient quality to meet asset management objectives, they increase in usefulness to the organization.

Quality requirements for asset data closely relate to asset data requirements. Quality requirements are determined and managed alongside the data requirements to ensure an adequate balance of cost, risk and performance. Data quality can be assessed using a confidence scale similar to that of the condition scale of the underlying asset.

NOTE The ISO 8000 series provides guidance on assessing and managing data quality.

The identification of data requirements and associated quality requirements ensures that data are fit for purpose and provides support to decision-making processes as expected.

4.2.2 Processes for collection, analysis and evaluation

Changes to assets and the acquisition or disposal of assets generates asset data requiring collection and storage for future use and decision-making. Defined processes covering such situations supports the consistent collection and analysis of asset data.

4.2.3 Processes for management

Changes to assets, software technologies, processes and organizational configurations will generally lead to related changes to asset data. Defining and running processes for all aspects of the asset data life cycle ensure that asset data continues to support asset management decision-making.

The processes for the management of asset data should include a consideration of ongoing maintenance from the decision to collect data. Without processes for maintaining data quality, the results of the initial data collection exercise can quickly lose value. As soon as data are collected, data quality management should become part of the normal business processes.

NOTE ISO 8000-61 describes a process reference model for data quality management.

4.2.4 Alignment of terminology

Different organizational contexts, technical disciplines, software technologies and territories can lead to differences in the terminology relating to assets. Data dictionaries can be useful to explain synonyms and different terminology and to clearly identify preferred terms.

4.2.5 Consistency and traceability

Asset data supporting the asset management objectives of an organization can arise from many sources and processes, potentially leading to inconsistent approaches to collection and storage. Asset data can be transferred between data stores, potentially multiple times, with each transfer activity potentially being a source of inconsistency or quality issues.

Management processes to monitor the consistency of asset data helps identify activities leading to inconsistent data. Asset-owning organizations typically have data about assets stored in more than one data store. Where this is the case, one data store should be identified as the master data source that is updated first and is referred to by other data stores. Understanding how data are transferred into, across and out of an organization ensures that master data sources are understood and that changes to master data are correctly applied across the organization.

4.3 Documented information

4.3.1 General

Documented information can fulfil many purposes within an organization, including recording and explaining the asset management system, providing narrative descriptions of how to maintain an asset and providing test certificates. Like asset data, documented information can experience many similar problems and requires active management.

4.3.2 Identification and description

Organizations typically acquire and store large quantities of documented information. Documented information can support ongoing processes and decision-making or can require safe storage for future usage, for example, during asset disposal.

Defined and relevant approaches to the identification and description of documented information ensure that people can find the correct documented information without undue effort.

4.3.3 Format

Documented information may have many different arrangements and formats of the content within them and may be stored using different file formats. Organizations that specify allowable content and file formats help ensure that users of the documented information can effectively do so for as long as the information is needed to support asset management decision-making.

4.3.4 Suitability and adequacy

Documented information may be created in many different written styles, use varied content structures and can have very different quantities of text, to meet the needs of different use(s) and users. Assessing the suitability of documented information against these use(s) and users helps ensure that asset decision-making is effectively supported and ensures documented information meets organizational requirements. Assessments of the adequacy of documented information against the use(s) and users identifies where revisions and changes to the documented information are required.

NOTE Where organizations operate in multiple countries or use different languages, the language used can be an additional factor relating to suitability.

4.3.5 Ensuring availability

Many factors can restrict the availability and suitability of documented information, including:

a) changes to technology platforms increasing or decreasing the availability of documented information (e.g. changes in the capability and effectiveness of search functionality);

b) changes to software licensing, which can restrict user access to required documented information;

c) changes to the user base within the organization, such as when expanding into new territories, which can necessitate the translation of documented information into different languages;

d) changes to the competence of users within the organization (e.g. which can necessitate the redrafting of documented information into simpler formats for users with lower competency levels).

4.3.6 Protection of documented information

Documented information can be required over the whole life of the assets that they represent. Factors that inform the level of protection required include the following:

a) Protection from deletion: Application of user-level permissions to restrict who may delete documented information. The deletion may also include logical deletion prior to ultimate physical deletion.

b) Protection from alteration: Application of user-level permissions to restrict who may edit and alter documented information. The retention of superseded versions of documented information allows organizations to view and restore previous versions of the documented information.

c) Protection of unauthorized access: Application of security permissions to restrict access to documented information to approved users within the organization accessing, sharing or printing restricted information. Security permissions and restrictions on document sharing can protect documented information from unauthorized users outside the organization.

d) Protection from technology failure: Application of data backup processes to maintain off-line and off-site copies of documented information that may be used to restore documented information in situations of catastrophic hardware and/or software failure. Testing of backup restoration processes ensures that backups are being correctly taken and that there are the skills and tools to restore this documented information.

4.4 Data life cycle stages

4.4.1 General

The accountability for data and its use ultimately rests with the governance function of the organization, and is usually delegated to those responsible for the operation of the asset management system. These life cycle stages may be applied in a different order, and depending on the organizational context, can have different relationships to each other.

NOTE Annex A provides supplementary information/explanation on data life cycles.

4.4.2 Define

The define activity includes provision of explicit guidance of the form, structure and meaning of asset data required by the organization. The combined set of data definitions for an organization may be described as a "data dictionary", "organizational information requirements" (OIR) or "asset information requirements" (AIR).

The overall collection of data definitions for an organization changes over time. The organization's change management processes should ensure that changes are agreed before implementation.

4.4.3 Collect

The collect activity includes the data acquisition, gathering and creation process, learning from previous decisions made, and additional context extracted from other data sets (internal or external).

Data exists in many forms and can be created and collected for managing by individuals in the organization in a number of different ways, including the following.

a) Data entry: Data entry is achieved using applications either within the organization (e.g. in an enterprise resource planning, enterprise resource planning (ERP), system or email application) or externally via a website, mobile application or similar application.

b) Transactions from other systems: Data entry or updating done on other systems can flow through to the organization's system through electronic data interchange (EDI), or other interfacing processes.

c) Sensors: An increasing amount of data are ingested into the organization through machine systems such as sensors. Sensors cover a wide range of data acquisition devices including website logs, social media sources and so-called "internet of things" devices which include everyday devices from simple temperature sensors to TVs, cars, traffic lights and buildings. Data from sensors can also include potentially urgent signals such as alerts and alarms.

d) New context: Data from reports can be combined with other data sources, such as from supplementary models, to provide additional information, which is itself fed back into the data of the organization. In many cases, this additional data gives new context to the original data and should be treated differently from the original data. New contextual data may come from decisions which can give relevance or value to existing data.

e) Subscription: Data may be made available to the organization through a subscription to a data feed or virtual data store.

f) Time sensitivity: Live data can encounter an expiry date, or data collected at any given time can be required and useful only at certain times. Therefore, the time frame of the data collection and the relevance of the data for that moment in time should be considered during this life cycle stage.

4.4.4 Store

The store activity includes locating the data where it can be retrieved. This includes data stored on devices owned and operated by the organization, devices external to the organization and also virtual stores, such as data feeds where the data are only collated when needed. In each case, the stored data may be retained for reporting purposes pending a decision to dispose.

As data are collected through the above actions, it is ingested into a data store where it should be secured, managed and possibly archived. The amount of data that organizations control is increasing rapidly due to new technologies. Many of these new technologies run in public cloud computing environments where the economies of scale enable large storage and processing capabilities at much lower cost.

In some cases, the organization may use a data store that is outside its location. Traditionally, this has been through offsite hosting operations where the storage is outsourced. Cloud computing takes this to the next stage where the operation of the store is not visible to the client organization. Furthermore, the organization may use a virtual store, where data are provided only as a data feed which can flow directly into reports or analysis.

Even though the organization controls the data in its store, it does not necessarily own that data because of intellectual property rights (such as copyright) or other legal issues (including personal or health information handling laws). Special care may also be necessary where the storage and use of data cross jurisdictional boundaries. In any case, the stewardship of the data remains with the governance function.

NOTE ISO/IEC 27040 provides guidance on data storage security.

4.4.5 Reporting

The reporting activity includes the manual or automated extraction and analysis of data to support decision-making, distribution or disposal. It is important to note that the reporting and deciding activities can be interchangeable in their order, as they have a bidirectional relationship.

An important capability of an information system is to extract data from the data store in the form of a data feed. The data feed, a structured system to provide updated data regularly, should have associated properties such as quality and currency of the data so that the organization can determine its usefulness to the reports they produce from that data.

During the extraction and reporting process, many data feeds may be used and these can come from a data store within the organization or may come from a virtual data store outside the organization. The combination of these data feeds can give a new context to the data. This new context is in itself new data and this should be fed back into the data creation and collection process, where the normal collection process occurs.

Applications can also produce reports as well as update the existing data and again, this new data follows the creation process.

Reports may also be used to filter data to increase its usefulness, or to enable distribution and disposal. For example, data from sensors can be aggregated to extract trends, removing personally identifiable information may be achieved through techniques such as anonymization and pseudonymization. The original data can then be similarly extracted and disposed of.

4.4.6 Decide

The decide activity occurs when a decision is made based on the report evaluation. The decisions may be made by people within the organization or by automated means. Suitable agreement is required before automated decision-making takes place; it is important that the decisions and outcomes are monitored.

The main reason for asset data is to support decisions, and the value of data is how they improve the decisions that are made. Reports (including on screen reporting) are examined to provide information upon which decisions are made.

Through a process of delegation, the governing function can ensure that the decisions made are appropriate for the level of responsibility of those decisions. This is of particular importance when decisions are made automatically through simple or complex data flow processes. In any case, the governing function remains accountable for all decisions and should ensure that they have the appropriate controls and, where necessary, apply human intervention to deal with any biases, discrimination or profiling in the decision-making process.

Because the asset management decision-making process values the data, that information may be fed back into the data collection and creation process. By creating this data maintenance and feedback loop, it is

possible to fine tune the reports that are created, the data feeds that are used and ultimately, the data that is fed into the system. Together, this loop increases the value of the decisions made and that in turn can improve the organization's performance.

4.4.7 Distribute

The distribute activity involves extraction or copying of data via the reporting activity for circulation to external parties.

Data may be extracted from the store and distributed outside the organization. This can occur for several reasons, such as:

a) external reporting is required (e.g. to a government authority);

b) it is part of a business-to-business (B2B) data exchange, customer use or similar activity;

c) the data are being sold (e.g. to an advertising agency or survey company);

d) the data are part of the publishing business of the organization (e.g. business data, i.e. the data are the product);

e) the distribution was not authorized, in which case this would be classified as a data breach.

4.4.8 Dispose/archiving

The dispose activity usually involves identifying data for disposal via the report activity and then permanently removing that data and any duplicates from the data store. In the case of a data feed, this would be the permanent disconnection to that feed.

The increasing sophistication of data analysis, mining and learning tools increases the value of existing data because more information can be extracted from more data. This fact, combined with the reduced cost of keeping data, reduces the necessity to dispose of data.

There are a number of reasons why some data should be extracted from the store (via the reporting activity) and securely disposed of, for example:

a) to reduce the risk of data leakage; if the data no longer exists, it cannot be inappropriately distributed or used;

b) to remove irrelevant or incorrect data; although older data may be used for trend analysis, its relevance and correctness should also be considered;

c) to comply with contractual arrangements with customers or suppliers;

d) to comply with legal or regulatory requirements.

Moving data to off-line storage, perhaps using removable recording media, allows the data to potentially be retrieved and re-used in the future. For archiving to be effective, it is a deliberate activity with appropriate labelling and metadata added to support identification and retrieval of archived data.

5 Delivering value from asset data

5.1 Asset data's role in decision-making

In the management of physical assets, asset data relates to attributes such as cost, risk, performance and service levels. These attributes are integral to the effective and efficient management of the life cycle of physical assets. The data collected on the physical assets are only useful to the organization in as much as enabling the effective and efficient management of the assets to produce a product or deliver a service. Asset data (data on the assets themselves, as well as their cost, risk, performance, condition and service levels) are not usually bought or sold in open markets or in direct transactions.

Asset data can inform decisions in various aspects related to the management of an asset, with improved quality data enabling better decisions to be made during an asset's life cycle. Asset management decision-making includes whole life planning, reliability analysis, risk analysis, work management optimization, demand analysis and sustainability assessment.

The decision-making process drives:

a) the need for and importance of data to support a decision-making process;

b) the importance of good quality data to support the decision;

c) the timeliness and time sensitivity of data to ensure it remains relevant to the decision;

d) the accessibility of asset data to the asset management team.

5.2 Usefulness of asset data

When determining the usefulness of its asset data, the organization should consider:

a) the usefulness of the asset data to its business;

b) the changes over time to the nature and usefulness of asset data;

c) organizational culture and individual behaviours that can change the usefulness of asset data;

d) the prioritization of activities to increase the usefulness of asset data.

Asset data are useful if they support organizational objectives. The usefulness of asset data can be improved by data management and governance processes. Degradation of usefulness can be a direct result of actions taken or through failing to act in response to changing circumstances.

Insufficient management controls through improper governance and lack of business processes are factors that can contribute to degradation of the usefulness of asset data.

Human and behavioural factors can contribute to degradation of the usefulness of asset data including the unauthorized use of asset data, theft or espionage.

The asset data of an organization and the processes for managing and utilizing them are complex. It is unlikely that an organization has all the asset data it requires to the right quality and to have certainty about these factors, therefore allowance should be made for the likely levels of uncertainty relating to asset data.

Changing organizational contexts also impacts the above factors.

5.3 Align with prevailing data standards

Embracing the principles of relevant industry data standards can enhance the utility of asset data. This improvement comes through implementing best practice approaches that align with and support the objectives of asset management.

5.4 Acquisition, storage and disposal of asset data

A clear definition of asset data's useful life, along with clear guidelines for retention timelines and for the disposal of asset data, can contribute to the usefulness of asset data.

5.5 Costs and benefits of the usefulness of asset data

Trade-off in the usefulness of asset data can be affected by the cost versus the respective benefits of the management of the asset portfolio. In relation to the variability of costs and benefits on decisions around retention and disposal in relation to time, the organization should consider and recognize that:

a) the benefits provided can change over time, and some benefits mainly arise at key life cycle stages, such as asset decommissioning, while they can change drastically on unexpected incidents or opportunities, such as disasters or price escalation;

b) the costs of data acquisition and management can change over time as technologies, legislation and situations change, which impacts the life cycle costs of asset data over time;

c) the life cycle costs of asset data, particularly for future asset life cycle phases, should be considered when deciding the approaches required for the organization's asset data.

6 Identifying data assets

6.1 General

An asset is often represented by various data sets. The effective management of these data sets is crucial for the ongoing management of the assets they represent. Managing these data sets separately can lead to changes that undermine their support for the organization's asset management objectives.

Treating such collections of data sets as a data asset can help an organization achieve its asset management objectives requiring additional controls to align with and support these asset management objectives. These data assets may be considered as assets in their own right, and managed accordingly in the asset management system of the organization.

NOTE Annex B provides examples of data assets.

6.2 Key considerations for recognizing data assets

Each organization is different, so decisions about the identification of data assets are different for each organization.

Factors that suggest collections of data sets are treated as a data asset include:

a) high value/risk assets requiring effective ongoing management;

b) data purchased or acquired from external sources;

c) the use of multiple software/technology platforms storing the asset data that may be changed at different timescales;

d) the need for accurate cross-referencing of information across different asset data sets;

e) asset lives that are considerably longer than the lives of the technology (software and hardware) used to store the asset data;

f) the likelihood of regulatory and legislative changes requiring coordinated changes across asset data sets;

g) many overlapping processes using different asset data sets, increasing the risk of data inconsistencies;

h) obsolescence of the formats used to store asset data;

i) the impact of structural organizational changes (reorganization, mergers and demergers) that increase the risk that asset data no longer support asset management objectives.

Each organization will consider these factors differently to identify their data assets; however, not all organizations identify data assets.

7 Managing data assets

7.1 General

7.1.1 Benefits provided by management of data assets

Careful and effective management of data assets supports and enables effective asset management. Organizations should apply ISO 55001 to their data assets in support of effective and efficient management of their asset portfolio. This can include the development of a suitable asset management plan (AMP) for data assets within the strategic asset management plan (SAMP) for the organization.

Data assets can assist organizations to achieve their business objectives. Data asset management objectives and strategies should be aligned with organizational strategies and objectives.

Alignment between data assets and organizational objectives and strategies can lead to the following benefits:

a) identify opportunities, threats and competitive environment;

b) identify stakeholders and their expectations properly;

c) adequately plan and forecast future demands and expectations;

d) select effective strategies;

e) set suitable objectives;

f) make accurate decisions;

g) develop realistic and executable plans;

h) gain visibility into behaviours, cultures and patterns;

i) identify necessary resources and manage them effectively;

j) execute plans efficiently;

k) identify nonconformities and to address them appropriately;

l) manage risks appropriately;

m) gain a better understanding of the levels of service in the services delivered and/or products produced.

7.1.2 Support for organizational objectives

Activities to align data assets to organizational objectives include:

a) identify the data required to support delivery of organizational objectives, services, products and strategies;

b) determine the availability and usability of data assets to meet these requirements and assess whether the data are internal or external to the organization;

c) apply the requirements of asset management standards to data assets;

d) periodically review the alignment of the data assets with the organizational objectives.

7.2 Identify data related to each organizational objective and strategy

The achievement of objectives relies on selecting and then executing strategies and plans which in turn relies on the availability of resources and appropriate data. The availability of current and future resources can depend on effective decision-making, which also relies on having access to appropriate data. Identification

of relevant data assets to each organizational objective and strategy determines the data to be identified, collected, stored, used in decision-making, reported and distributed to assist the organization to achieve its objectives.

Effective governance of the organization ensures that data-informed decision-making achieves its objectives aligned to the risk appetite of the organization.

Understanding the planning and decision-making processes used to develop strategies and objectives enables the data requirements to be identified. Assessing the cost of acquiring, storing and managing data, against the risks incurred by not having that data, allows determination of appropriate data requirements.

NOTE The ISO 19650 series explains the use of organizational information requirements (OIR), asset information requirements (AIR), project information requirements (PIR) and exchange information requirements (EIR) to support better information management.

7.3 Assess data availability

Although organizations typically have large volumes of data, the data needed to support strategies and objectives are not always readily available. Data asset availability can be assessed as:

a) readily available, either internally or externally to the organization;

b) available after internal development (e.g. by processing or combining existing data);

c) available for procurement or after data gathering activities;

d) not available.

Data are not always accessible (for security, organizational or other reasons) to all stakeholders in the organization. Data that exists but is not accessible to the asset management function is considered as "not available".

The achievement of objectives that have not been pursued before, or the analysis of new operating contexts, can need input data from additional sources: internal or external. These additional sources should be identified, risk assessed, quality assessed, cost assessed and prioritized accordingly. The data governance function sets the criteria and constraints for the selection of external data sources. Data management activities design proposals and plans, and then execute appropriately.

Different parts of the organization are usually involved in acquiring, processing and storing data assets. The implementation of an effective data management approach reduces the risk of duplication, inconsistency, poor data or inefficient processing.

7.4 Applying asset management to data assets

Data assets support the achievement of the organizational objectives when they are managed effectively. An organization's context and stakeholders' requirements should be reviewed and determined (see ISO 55001:2024, Clause 4) and its asset management policy, strategies, objectives and plans related to data assets should be developed. Understanding future data asset requirements enables data assets strategies and objectives to be developed and agreed.

Strategies, objectives and plans for different life cycle stages of data assets (covering the define, collect, store, report, decide, distribute and dispose activities) support the achievement of organizational objectives. Strategies for supporting infrastructure (such as hardware, networks, databases and external data resources) also support the sustained usefulness of data assets.

As the organization sets new objectives, and changes or discontinues previous objectives, or its operating context changes, reviews of its data assets can maintain the organization in alignment with its objectives. Changes in objectives can lead to the organization identifying new data assets, changing existing data assets or deleting data assets.

7.5 Interoperability of the data asset

Interoperability should consider processes, functions, software and data to enable complete interoperability. The data aspects of interoperability are an important enabler to achieve complete interoperability.

Data assets support many of an organization's activities and objectives, as well as enabling work across different organizations. The interoperability of a data asset is a key factor in how efficiently and effectively intra-organizational and interorganizational objectives are achieved.

Interoperability of data assets involves an understanding and management of data formats and quality, enabling organizational objectives to be achieved using data assets from multiple sources in combination. Beyond that, interoperability is also concerned with the data semantics. Semantic data interoperability ensures that data are interpreted in the same way by different entities. Semantic data interoperability can be supported by common vocabularies or ontologies. The use of appropriate identifiers ensures that asset data from different sources is correctly associated with the same asset.

Comparable data specifications and structures support the use of multiple data sets in an efficient and effective manner.

Data asset management activities can support the understanding of existing data structures and encourage common approaches across data assets and integration of asset data activities.

7.6 Digital preservation

Technology changes on an ongoing basis, which results in older hardware and software gradually becoming obsolete, potentially leading to a complete inability to access information stored either due to physical media obsolescence or format obsolescence. The usefulness of the data asset is lost or reduced if it is no longer possible to access these data.

Data asset management activities support the development of approaches to ensure that the usefulness of the data asset is available for as long as is required. There are some strategies that can be used in regard to digital preservation, including:

a) assess the consequences of digital data loss;

b) assess the likelihood of data loss based on the storage device technology, data storage format, damage to the hardware, etc.;

c) calculate the risk of digital data loss and prioritize data preservation accordingly;

d) determine available preservation strategies, such as placing the data storage in a secured place, controlling data using structured metadata, regular maintenance of digital data storage, selecting appropriate access tools in case of a technology change, etc.;

e) identify the costs associated with available preservation strategies;

f) select the most appropriate digital preservation strategy based on risk and costs.

7.7 Culture

The organization should promote culture and behaviours relating to the management and usage of asset data and data assets.

Examples of good asset information culture include:

a) data inherent in the management system;

b) communications (e.g. video) explaining value of data to organizational objectives;

c) weekly meetings to visualize data entered and outcomes of data activities;

d) visible and accessible reporting of data and related key performance indicators (KPIs);

e) recognition and incentives for good data activities;

f) mobile working to encourage data entry at the asset/on site;

g) regular meetings between different data users;

h) asset data governance group.

8 Governance

Good governance of asset data and data assets helps meet organizational objectives and deliver responses to changing situations. Governance ensures that there is suitable oversight of the data asset and asset data related activities. Governance of asset data and data assets can be considered from an asset management and/or a data governance perspective.

Organizations governing data and data assets effectively develop and operate approaches that are relevant to their context and management objectives. Approaches to governance often follow the evaluate, direct, monitor (EDM) model, as follows:

a) Evaluate: The governance function evaluates proposals and plans for the implementation and evaluation of data asset management activities to fulfil the asset management objectives of the organization.

b) Direct: The governance function formulates data strategies and policies for the governance of data and assigns responsibilities and accountabilities to build the governance structure.

c) Monitor: The governance body monitors the performance and conformance of asset data and data asset management activities against the set directions.

NOTE ISO/IEC 38505-1 and ISO/IEC TR 38505-2 define approaches to data governance.

Annex A
(informative)

Data activities

A.1 General

NOTE This annex deals mostly with data in general and applies equally to asset data and data assets.

The ability to create, collect, store, maintain, transfer, process and present data to support business processes in a timely and cost-effective manner requires both an understanding of the characteristics of the data that determine its quality, and an ability to measure, manage and report on data quality (see ISO 8000-1).

Most organizations already support their business processes on existing data and information even knowing that there are some uncertainties regarding their quality. One of the first actions an organization should take is to assess its current data and to plan how to improve them.

A.2 Assessing data

There can be many reasons why data degrades, for example:

a) not being kept up to date;

b) not being sufficiently accurate or complete (when updated);

c) data on the same asset in different systems being referenced differently or becoming inconsistent over time;

d) minor or gross errors that are or are not obvious, including the right data entered into the wrong place;

e) inconsistent terminology or descriptions leading to loss or incomplete reports when searching or aggregating data;

f) degradation of storage media;

g) failures of software or interfaces to deal correctly with all types and orderings of data-change life cycles;

h) poorly executed data migrations when new software applications are implemented;

i) business or technology changes that render the information or data difficult to access or create disconnects between new and legacy software and data formats.

A.3 Improving data

There are a range of possible approaches to improving data quality within an organization. These can include step change initiatives to achieve data quality objectives over a defined period and changes to business processes or corporate systems to achieve the organizational objectives over a longer term. Development of an overall strategy is likely to integrate initiatives across this spectrum to improve the quality of data being collected or to provide additional system functionality. Such approaches should seek to demonstrate their success by embedding data quality improvement into sustainable business-as-usual processes.

Improvements to data quality should have clear objectives so that the end point is understood by all participants. Data quality within an organization can change both as a result of activities within a data improvement plan and through day-to-day business activities.

A.4 Storing data

The nature of the asset (whether it is static or mobile, surface or buried, of long or short life, stand-alone or connected with a system) determines the nature of its information life cycle and the system platform(s) best suited to storing aspects of asset information. While there are many variables across asset information, some fundamental features are common:

a) some information attributes are static with low levels of change (e.g. location, date created) or dynamic;

b) information may represent different levels or types of asset (e.g. sites, systems, components) and should align to such agreed levels across the organization;

c) a process model can represent flows of data using updates (on status, condition) from live systems on a regular basis;

d) specification of attributes within the data model should be clear, so that it is applied appropriately with documented assumptions, and to enable the design of data platforms to account for the life cycle of the various attributes held;

e) information about the data (the currency of data held, its accuracy level and reliability), which is often termed "metadata", determines how confidently the information can be applied;

f) modern data stores enable data sets to be interrelated across business units and can display assets spatially in context with other information to provide powerful platforms for decision-support, but are more complex to maintain even for larger enterprises;

g) a range of specialists may be involved in supporting asset information, each with their own skills and perceptions that an asset manager has to command to achieve the benefit from holding and applying asset information.

A.5 Utilizing data

The utilize data phase of the data life cycle should receive a lot of attention as this is where users come into contact with data, but often this attention is misplaced. Poor data requirement definition can result in data being collected and stored because it is perceived to be useful, without full consideration being given to how they are used.

A.6 Acquiring new data

Asset information most often is acquired on asset commissioning, but also can be as a result of surveys or be derived by transfer from other business units, as a result of changes in the organization.

All acquisition processes require a clear understanding of data specifications, the process for acquiring data and where the data are stored.

A.7 Archiving data

Data archiving forms an important part of the asset information life cycle and is often overlooked. There are many different types of data sets that hold asset information and each has their own unique requirements. Questions that should be considered when deciding upon archival requirements include:

a) what should be archived and why;

b) for how long should documented information be retained;

c) what are the obligations, legal or otherwise, for retaining documented information (these can include regulatory, statutory and legal obligations as well as internal business requirements);

d) where there are obligations related to data retention, who is responsible for ensuring these obligations are met;

e) what are the risks associated with not being able to retrieve documented information;

f) how should archived documented information be accessed and how quickly should archived documented information be able to be retrieved;

g) who should be able to access archived documented information;

h) what security controls are needed to ensure archived documented information has not been changed;

i) what metadata should accompany the documented information to reconstruct timelines and prove validity in the event of a dispute;

j) what long-term storage media should be used;

k) what value is there in retaining documented information and how does this value change over time.

A.8 Deleting data

The final, permanent part of data disposition, deleting data, is often considered even less than archiving data. In many cases there is a natural resistance to deleting data as people like the comfort of having the ability to refer to archived data if they ever have a need to. In addition, this behaviour is often not discouraged as the rate at which storage capacities have increased and associated costs have decreased has not provided enough of an incentive to counter the perceived benefit of holding archived data. There are also time (and related cost) issues that act as a disincentive to sorting and deleting data.

The organization should establish a data archive strategy that specifies a retention period, after which the data should be deleted. There should be a process that is followed in order to delete data which includes obtaining authorization from the relevant parties, including those with responsibility for ensuring obligations are met. It can be necessary to consider the security requirements surrounding the deletion of data and question what disposal method is appropriate to employ.

Annex B
(informative)

Data asset examples

B.1 Asset register

For many organizations, the asset register is central to the effective management of assets. An asset register can be a single data store or a number of linked and related data stores, depending on the organization and the nature of their assets. Typically, an asset register is linked to a number of other data sets that together support the effective management of assets and other business objectives. Asset attributes in an asset register tend to remain static over time.

An asset register may be computer-, card-file- or paper-based and may contain data relating to one or more functions and/or categories such as service delivery functions, physical properties, technical data, financial information, property title details, key operational data, maintenance data and performance records (see Figure B.1).

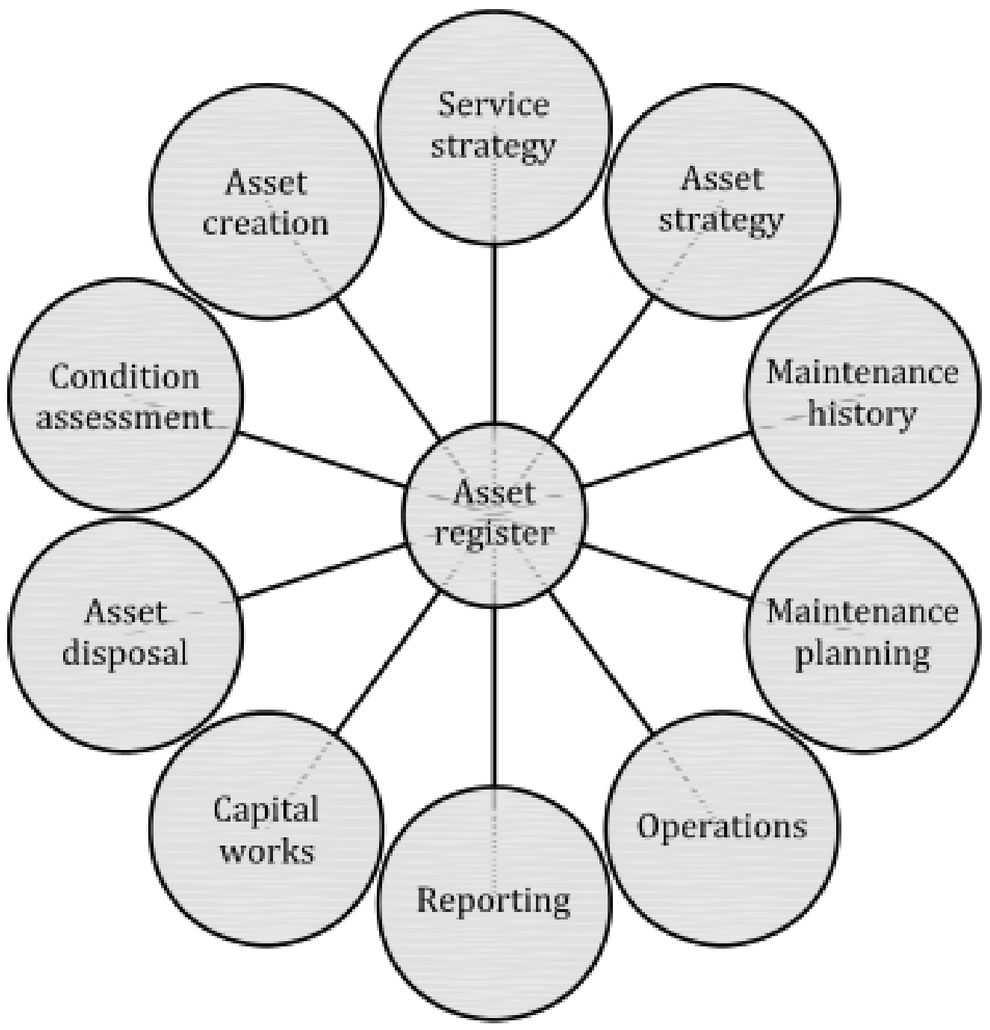

Figure B.1 — Asset register

In asset management systems that carry specific data sets in separate organizational (or external) registers, data alignment across those registers is crucial to facilitate the reporting of information from them. For further clarification, refer to ISO/TS 55010.

For asset-intensive organizations, with large asset portfolios managed throughout different lifespans and life cycles, the use of a shared digital representation of a built asset can be considered to facilitate design, construction and operation processes to form a reliable basis for decisions. For the built environment sector, the building information modelling (BIM) approach is increasingly more mature.

NOTE The ISO 19650 series defines approaches to BIM supporting asset management objectives.

B.2 Asset history

Key information surrounds the creation, operation, maintenance and disposal of an asset, along with the activities undertaken. This information tends to change over time, so a time and date recording of its history is important. Examples of such information include:

a) design information, including design models and drawings, design calculations and data models;

b) operating manuals;

c) metadata;

d) documented information, e.g. reports (digital and printed);

e) images and multimedia;

f) work orders.

B.3 Market data

e-Commerce corporations regularly trade databases to help them fine-tune marketing and sales campaigns. Such databases typically contain data about the population numbers in specified geographical zones such as:

a) age ranges;

b) socio-economic strata;

c) income ranges;

d) gender;

e) profession.

B.4 Customer data

Organizations such as large retailers may develop intelligence to improve their sales by utilizing browser cookies. These are used to track each customer's preferences and associated online activity. The data recorded in cookies can be used to improve content and advertisements addressed to each user based on their browsing and purchasing history.

NOTE Clauses B.1 and B.2 are usually part of the asset management system of an organization and can be managed as data assets. Whereas Clauses B.3 and B.4 are not automatically part of the asset management system, allowing the organization to include them in the asset management system and manage as a data asset.

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资产管理　管理体系　要求

Asset management—Management systems—Requirements

(ISO 55001:2014,IDT)

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目　　次

前　言

GB/T 33172、GB/T 33173 和 GB/T 33174 共同构成支撑资产管理体系建立的系列国家标准。

本标准按照 GB/T 1.1—2009 给出的规则起草。

本标准使用翻译法等同采用 ISO 55001:2014《资产管理　管理体系　要求》。

本标准由中国标准化研究院提出并归口。

本标准起草单位：国网北京经济技术研究院、内蒙古蒙牛乳业(集团)股份有限公司、中国质量认证中心、中国标准化研究院、中国信息安全认证中心、中国船级社质量认证公司、中油管道物资装备总公司、中海油安全技术服务有限公司、东电万维科技(北京)有限公司、上海玖道信息科技股份有限公司、上海荣时信息科技有限公司、北京科迪智标信息技术有限公司、北京国金衡信认证有限公司、标新科技(北京)有限公司、东莞市新支点科技服务有限公司、广州市标准化研究院、山东省标准化研究院、湖北省标准化与质量研究院、《中国标准化》杂志社有限公司。

本标准主要起草人：高昂、齐立忠、魏军、卫军峰、齐化锋、潘英、咸奎桐、张瑜、周凌、黄刚、司马俊、董树林、张昊昱、蔡国平、张礼立、周鼎、陈国清、李希峰、王凤娇、闫立新、张斌、李春宇、林晓川、孙广芝、朱虹、程越、刘东华、李毅、刘丽、杨晓峰、王曙光、梁薇、刘翠翠、王晶、曾繁仰。

引　言

本标准具体阐明建立、实施、保持和改进用于资产管理的管理体系(资产管理体系)的要求。

本标准适用于所有组织。由组织决定本标准适用于哪些资产。

本标准的主要应用对象包括：

a)　参与资产管理体系的建立、实施、保持和改进的各方；

b)　实施资产管理活动所涉及的各方与服务供应商；

c)　评估组织满足法律、法规、合同要求以及组织自身要求的内外部机构。

本标准叙述要求的顺序并不反映要求的重要性或预示其实施顺序。

GB/T 33174 中包含进一步应用本标准中所述要求的指南。

GB/T 33172 包含有关资产管理的一般信息与适用于本标准的术语。考虑这些准则有助于组织实施资产管理。

本标准采用了 GB/T 24353—2009 和 ISO 指南 73:2009 中对“风险”的定义。

本标准旨在使得组织的资产管理体系与相关管理体系的要求协调一致并能进行整合。

附录 A 提供了与资产管理活动有关领域的附加信息。

资产管理　管理体系　要求

1　范围

本标准给出了资产管理体系在组织环境下的要求。

本标准适用于所有类型的资产和所有类型及规模的组织。

注 1：本标准旨在管理实物资产，但也可用于其他类型的资产。

注 2：本标准不规定财务、会计或技术方面针对特定类型资产的要求。

注 3：在 GB/T 33172、GB/T 33174 以及本标准中以“资产管理体系”指代用于资产管理的管理体系。

2　规范性引用文件

下列文件对于本文件的应用是必不可少的。凡是注日期的引用文件，仅注日期的版本适用于本文件。凡是不注日期的引用文件，其最新版本(包括所有的修改单)适用于本文件。

GB/T 33172—2016　资产管理　综述、原则和术语(ISO 55000:2014，IDT)

3　术语和定义

GB/T 33172—2016 界定的术语和定义适用于本文件。

4　组织环境

4.1　理解组织及其环境

组织应确定与其目的有关，以及对实现资产管理体系预期结果的能力有影响的内外部事项。

战略资产管理计划(SAMP)中所包含的资产管理目标应与组织目标协调、一致。

4.2　理解相关方的需求与期望

组织应确定：

——与资产管理体系有关的相关方；

——这些相关方在资产管理方面的要求与期望；

——资产管理方面的决策准则；

——相关方对于记录与资产管理有关的财务与非财务信息的要求，以及针对资产管理进行内外部报告的要求。

4.3　确定资产管理体系的范围

组织应通过确定资产管理体系的边界和适用性来建立其范围。范围应与 SAMP 和资产管理方针相协调。确定范围时组织应考虑：

——在 4.1 中涉及的内外部事项；

——在 4.2 中涉及的要求；

——若组织使用了其他管理体系，考虑其与这些管理体系的相互作用。

组织应规定资产管理体系范围内涵盖的资产组合。

该范围应能以文件化信息的形式获取。

4.4 资产管理体系

组织应按照本标准的要求建立、实施、保持和持续改进资产管理体系，包括所需的过程及其相互作用。

组织应开发 SAMP，它包含资产管理体系在支持资产管理目标实现方面的作用的文件。

5 领导力

5.1 领导力与承诺

最高管理者应通过以下方面证实其在资产管理体系的领导力与承诺：

——确保建立资产管理方针、SAMP 和资产管理目标，并与组织的目标一致；

——确保将资产管理体系的要求纳入组织的业务过程；

——确保资产管理体系所需资源是可获取的；

——对于有效的资产管理以及满足资产管理体系要求的重要性进行传达；

——确保资产管理体系实现其预期结果；

——指导并支持员工为资产管理体系的有效性做出贡献；

——促进组织内的跨职能协作；

——促进持续改进；

——支持相关管理者在其职责范围内展示领导力；

——确保资产管理中所使用的风险管理方法与组织的风险管理方法相协调。

注：本标准中所使用的“业务”一词可广义地解释为对组织的生存至关重要的活动。

5.2 方针

最高管理者应建立资产管理方针：

a) 与组织的目标相适应；

b) 为资产管理目标的制定提供框架；

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。

资产管理方针应：

——与组织计划相一致；

——与组织的其他方针相一致；

——适用于组织资产和运营的性质与规模；

——能以文件化信息的形式获取；

——在组织内部进行沟通；

——适当时，使相关方可获取；

——得到实施与定期评审，必要时进行更新。

5.3 组织的角色、职责与权限

最高管理者应确保组织内部相关角色的职责和权限的分配与沟通。

最高管理者应为下述活动分配职责和权限：

a) 建立与更新 SAMP，包括资产管理目标；

b) 确保资产管理体系支持 SAMP 的实施；

c) 确保资产管理体系符合本标准的要求；

d) 确保资产管理体系的适宜性、充分性和有效性；

e) 建立与更新资产管理计划(见 6.2.2)；

f) 向最高管理者报告资产管理体系的绩效。

6 策划

6.1 资产管理体系中应对风险与机遇的措施

在策划资产管理体系时，组织应考虑 4.1 中涉及的事项与 4.2 中涉及的要求，并确定需要应对的风险与机遇，从而实现下述目标：

——确保资产管理体系能够实现其预期结果；

——避免或减少非预期影响；

——实现持续改进。

组织应策划：

a) 应对风险和机遇的措施，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；

——评估这些措施的有效性。

6.2 资产管理目标和实现目标的策划

6.2.1 资产管理目标

组织应在相关的职能和层级上建立资产管理目标。

建立资产管理目标时，组织在资产管理策划过程中应考虑关键相关方的要求及财务的、技术的、法律的、法规的和组织的要求。

资产管理目标应：

——与组织目标相协调、一致；

——与资产管理方针相一致；

——在建立与更新时应用资产管理决策准则(见 4.2)；

——作为 SAMP 的组成部分进行建立与更新；

——可测量(可行时)；

——考虑到适用的要求；

——得到监视；

——与关键相关方沟通；

——适当时进行评审与更新。

组织应保留资产管理目标方面的文件化信息。

6.2.2 实现资产管理目标的策划

组织应将实现资产管理目标的策划纳入到组织其他策划活动中，包括财务、人力资源和其他支持职能等。

组织应建立、形成文件和保持资产管理计划，以实现资产管理目标。资产管理计划应与资产管理方

针和 SAMP 相一致。

组织应确保资产管理计划考虑到资产管理体系以外的相关要求。

在策划如何实现资产管理目标时，组织应确定以下内容并形成文件：

a) 决策方法、决策准则以及各种活动与资源的优先级，以实现资产管理计划和资产管理目标；

b) 在全寿命周期内管理资产所采用的过程和方法；

c) 做什么；

d) 所需资源；

e) 谁来负责；

f) 完成时间；

g) 如何评估结果；

h) 资产管理计划的适当时间范围；

i) 资产管理计划对财务和非财务方面的潜在影响；

j) 资产管理计划的评审周期(见 9.1)；

k) 应对与资产管理有关的风险和机遇的措施，并应考虑到这些风险与机遇如何随时间而变化，这些措施可以通过建立下述过程得以实现：

——识别风险和机遇；

——评估风险和机遇；

——确定资产在实现资产管理目标方面的重要程度；

——对风险和机遇实施适当处理和监视。

组织应确保其风险管理方法(包括应急计划)考虑到资产管理有关的各种风险。

注：欲获取有关风险管理的更多指导，见 GB/T 24353—2009。

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：

——确定受其控制的工作人员所需的能力，这些人员从事的工作影响资产绩效、资产管理绩效和资产管理体系绩效；

——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；

——适当时，采取措施以获得必要的能力，并评估措施的有效性；

——保留适当的文件化信息作为能力的证据；

——定期评审当前和未来对人员能力的需要和要求。

注：例如，适当的措施包括为现有的员工提供培训、指导或岗位调整，或聘用有能力的人员。

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：

——资产管理方针；

——他们对资产管理体系有效性的贡献，包括改善资产管理绩效带来的收益；

——他们的工作活动、相关的风险和机遇及相互关联；

——不符合资产管理体系要求的后果。

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外部沟通的需求，包括：

——沟通内容；

——沟通时机；

——沟通对象；

——沟通方式。

7.5 信息要求

组织应确定用于支持资产、资产管理、资产管理体系以及实现组织目标的信息要求。为实现这一目标：

a) 组织应考虑：

——已识别风险的重要性；

——资产管理的角色和职责；

——资产管理的过程、程序和活动；

——与相关方(包括服务供应商)进行的信息交换；

——信息的质量、可用性和管理对组织决策的影响；

b) 组织应确定：

——已识别信息的属性要求；

——已识别信息的质量要求；

——收集、分析和评价信息的方式和时机；

c) 组织应规定、实施和保持信息管理的过程；

d) 对于整个组织范围内与资产管理有关的财务和非财务术语的一致性，组织应确定要求；

e) 组织应确保财务、技术数据和其他相关非财务数据间的一致性、可追溯性，并且在考虑相关方要求和组织目标的情况下满足法律和法规上的要求。

7.6 文件化信息

7.6.1 总则

组织的资产管理体系应包括：

——本标准所要求的形成文件的信息；

——适用的法律要求和法规要求中的文件化信息；

——组织确定的为保证资产管理体系有效性(见 7.5)所必需的文件化信息。

注：与资产管理体系有关的文件信息范围因组织而异，具体取决于：

——组织的规模和活动、过程、产品和服务的类型；

——过程及其相互作用的复杂程度；

——员工能力；

——资产的复杂程度。

7.6.2 创建与更新

在创建与更新文件化信息时，组织应确保适当的：

——标识和描述(例如标题、日期、作者或索引号等);
——格式(例如语言、软件版本、图片等)和媒介(例如纸质版、电子版等);
——评审和批准,以确保适宜性和充分性。

7.6.3 文件化信息的控制

资产管理体系和本标准所要求的文件化信息应得到控制,以确保:
a) 在所需的场所和时间可获取并适宜;
b) 得到充分的保护(例如避免泄密、不当使用或缺失)。
适当时,组织应采取下述措施对文件化信息进行控制:
——分发、访问、检索和使用;
——存储和保存,并易于辨识;
——变更控制(例如版本控制);
——保留和处置。
组织确定的、策划和运行资产管理体系必需的、外来的文件化信息应予以适当识别与控制。
注:访问可以仅指允许查看文件化信息,或指允许查看和有权变更文件化信息。

8 运行

8.1 运行的策划与控制

组织应策划、实施和控制所需的过程以满足要求,并实施 6.1 所确定的措施、6.2 所确定的资产管理计划和 10.1 与 10.2 所确定的纠正措施和预防措施,具体如下:
——为所需过程建立相应的准则;
——按照准则对过程实施控制;
——保存必要的文件化信息,对过程按计划实施提供相应的证明和依据;
——应用 6.2.2 所描述的方法来处理和监视风险。

8.2 变更管理

任何影响资产管理目标实现的计划内变更,无论其是永久的还是临时的,由此带来的相关风险应在变更实施前进行评估。
组织应确保按照 6.1 和 6.2.2 所述的方式来管理风险。
组织应控制计划内的变更、评审变更所带来的非预期后果,必要时采取措施以减轻不利影响。

8.3 外包

组织将任何对实现其资产管理目标有影响的活动外包时,应评估其风险。组织应确保外包的过程和活动得到控制。
组织应确定并记录这些活动如何得到控制且整合到组织的资产管理体系中。组织应确定:
a) 将被外包的过程和活动(包括被外包的过程和活动的范围和边界,以及与组织自身的过程和活动的接口);
b) 组织内管理外包过程和活动的职责和权限;
c) 组织及其承包服务供应商之间共享知识和信息的过程和范围。
在外包任何活动时,组织应确保:
——被外包的资源满足 7.2、7.3 和 7.6 的要求;
——按照 9.1 的要求监视被外包活动的绩效。

9 绩效评价

9.1 监视、测量、分析与评价

组织应确定：

a) 需要监视和测量的内容；

b) 适用时，监视、测量、分析和评价的方法，以确保结果有效；

c) 何时执行监视和测量；

d) 何时分析和评价监视及测量结果。

组织应针对下述方面进行评价与报告：

——资产绩效；

——资产管理绩效，包括财务和非财务绩效；

——资产管理体系的有效性。

组织应就管理风险和机遇的过程的有效性进行评估与报告。

组织应保留适当的文件化信息作为监视、测量、分析和评价的结果的证据。

组织应确保其监视和测量能使其满足 4.2 的要求。

9.2 内部审核

9.2.1 组织应按策划的时间间隔进行内部审核，以提供信息来辅助确定资产管理体系是否：

a) 符合：

——组织自身对资产管理体系的要求；

——本标准的要求。

b) 得到了有效地实施与保持。

9.2.2 组织应：

a) 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；

b) 确定每次审核的准则和范围；

c) 选择审核员和实施审核，以确保审核过程的客观性和公正性；

d) 确保向相关的管理层汇报审核结果；

e) 保留文件化信息作为审核方案实施的结果和审核结果的证据。

9.3 管理评审

最高管理者应按策划的时间间隔评审组织的资产管理体系，以确保其持续的适宜性、充分性和有效性。

管理评审应考虑：

a) 以往管理评审后所采取措施的状态；

b) 与资产管理体系相关的内部和外部事项的变更；

c) 资产管理绩效方面的信息，包括下述趋势：

——不符合和纠正措施；

——监视和测量结果；

——审核结果；

d) 资产管理活动；

e) 持续改进的机会；

f) 风险和机会方面的变更。

管理评审的输出应包括与持续改进机会有关的决策和对资产管理体系进行变更的任何需求(见8.2)。

组织应保留作为管理评审结果证据的文件化信息。

10 改进

10.1 不符合和纠正措施

当组织的资产、资产管理或资产管理体系发生不符合或事件时,组织应:

a) 适用时,对不符合或事件作出反应:

——采取措施进行控制和纠正;

——处理后果;

b) 评估消除不符合或事件原因的措施的必要性,以确保不符合或事件不再发生或不在他处再发生,通过:

——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) 评审所采用的所有纠正措施的有效性;

e) 必要时,对资产管理体系进行变更(见8.2)。

纠正措施应与不符合或事件的后果相适应。

组织应保留文件化信息作为以下方面的证据:

——不符合或事件的性质和后续所采取的任何措施;

——所有纠正措施的结果。

10.2 预防措施

组织应建立过程,以主动识别资产绩效中的潜在问题并评估采取预防措施的需求。

当潜在问题得到识别时,组织应采用10.1的要求。

10.3 持续改进

组织应持续改进资产管理和资产管理体系的适宜性、充分性和有效性。

附 录 A
（资料性附录）
资产管理活动方面的信息

其他已发表的国际、地区或国家标准中与资产管理有关的领域包括，但不限于：

——数据管理；
——状态监测；
——风险管理；
——质量管理；
——环境管理；
——系统和软件工程；
——寿命周期成本；
——可依赖性（可用性、可靠性、可维护性和维护支持）；
——配置管理；
——维修工艺学；
——可持续发展；
——检验；
——无损检测；
——承压设备；
——财务管理；
——价值管理；
——冲击和振动；
——声学；
——人员资质与评估；
——项目管理；
——财产与财产管理；
——设施管理；
——设备管理；
——调试过程；
——能源管理。

GB/T 33172、GB/T 33174 与本标准的使用者也应在需要时参考这些标准，以便在组织范围内一致地贯彻资产管理。

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