Introduction to ISO 55001 and ISO 55002

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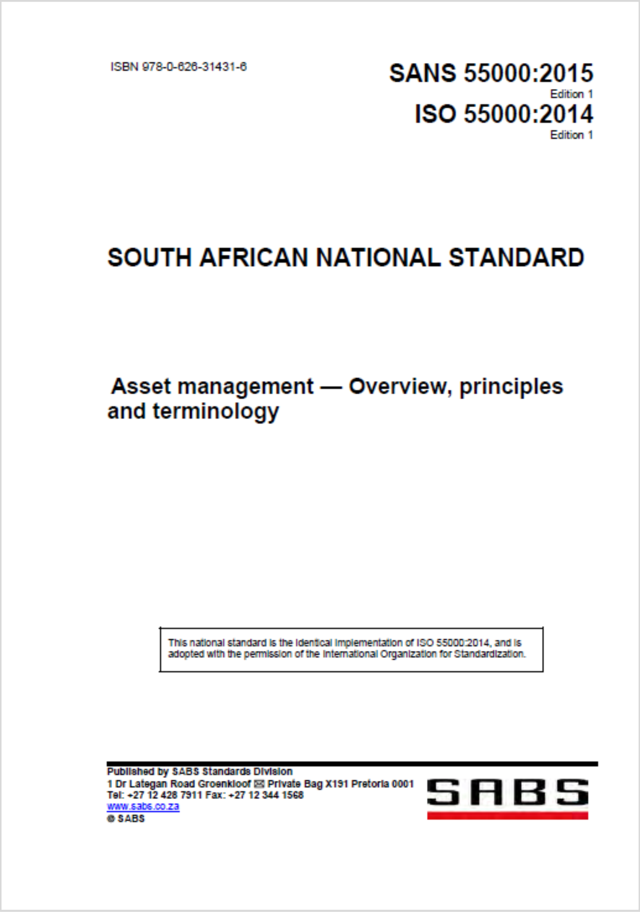
ISO 55000 Series: Exploring 55001 Requirements and 55002 Guidelines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SANS 55000:2015
Edition 1
ISO 55000:2014
Edition 1

SOUTH AFRICAN NATIONAL STANDARD

Asset management — Overview, principles and terminology

This national standard is the identical implementation of ISO 55000:2014, and is adopted with the permission of the International Organization for Standardization.

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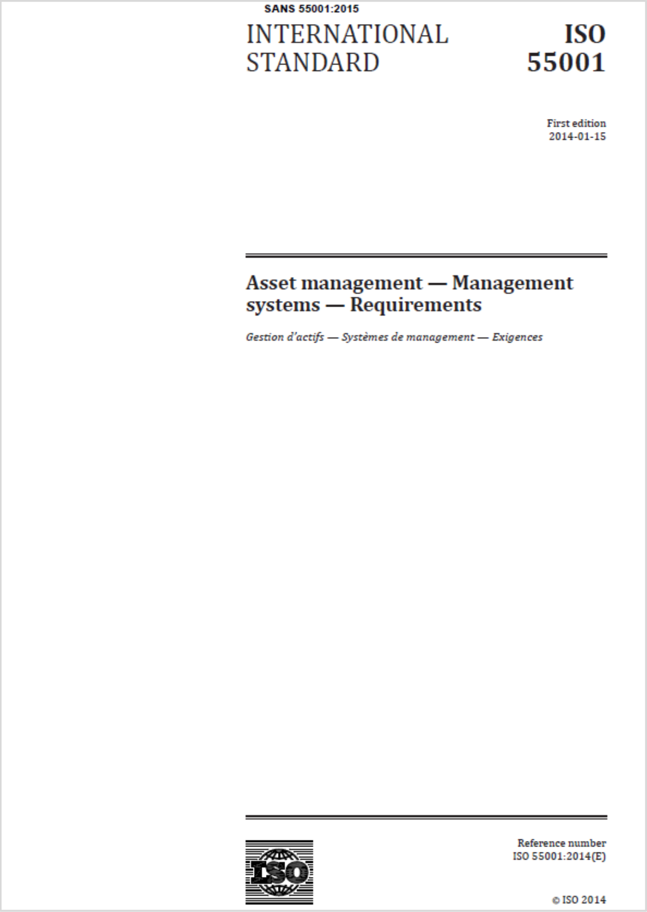
ISO 55000: **WHY**


SANS 55001:2015

INTERNATIONAL STANDARD

ISO 55001

First edition
2014-01-15

Asset management — Management systems — Requirements

Gestion d'actifs — Systèmes de management — Exigences

Reference number
ISO 55001:2014(E)

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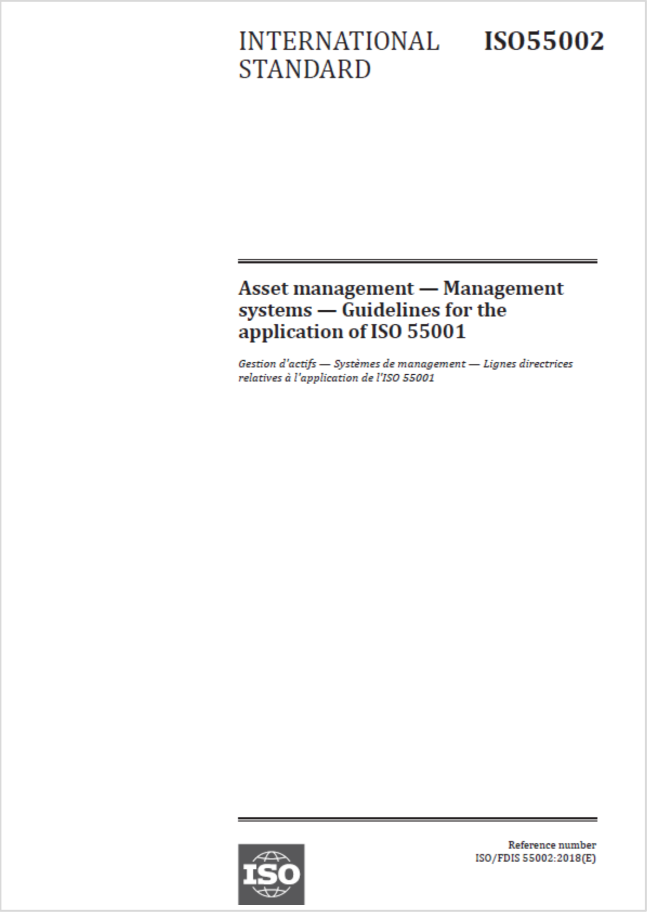
ISO 55001: **WHAT**


INTERNATIONAL STANDARD

ISO55002

Asset management — Management systems — Guidelines for the application of ISO 55001

Gestion d'actifs — Systèmes de management — Lignes directrices relatives à l'application de l'ISO 55001

Reference number
ISO/FDIS 55002:2018(E)

ISO 55002: (getting started with) **HOW**

(Updated in 2018)

ISO 55001 (and ISO 55002) System Structure

4 Context of the Organization
4.1 Understanding the context
4.2 Needs and expectations of stakeholders
4.3 Scope of the AMS
4.4 Asset management system

5 Leadership
5.1 Leadership and commitment
5.2 AM Policy
5.3 Organizational roles, responsibilities and authorities

6 Planning
6.1 Risks and opportunities AMS
6.2 AM Objectives and AM Plans

7 Support
7.1 Resources
7.2 Competence
7.3 Awareness
7.4 Communication
7.5 Information requirements
7.6 Documented information

8 Operation
8.1 Operational planning and control
8.2 Management of change
8.3 Outsourcing

9 Performance evaluation
9.1 Monitoring, measurement, analysis and evaluation
9.2 Internal audit
9.3 Management review

10 Improvement
10.1 Nonconformity and corrective action
10.2 Preventive action
10.3 Continual improvement

Examples of Requirements and Guidelines

The first 2 clauses of ISO 55001

ISO 55002: 2018 Guidelines on these clauses

4 Context of the organization

4.1 Understanding the organization and its context

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

Asset management objectives, included in the strategic asset management plan (SAMP), shall be aligned to, and consistent with, the organizational objectives.

4.2 Understanding the needs and expectations of stakeholders

The organization shall determine:

— the stakeholders that are relevant to the asset management system;

— the requirements and expectations of these stakeholders with respect to asset management;

— the criteria for asset management decision making;

— the stakeholder requirements for recording financial and non-financial information relevant to asset management, and for reporting on it both internally and externally.

4 Context of the organization

4.1 Understanding the organization and its context

4.1.1 General

When establishing or reviewing an asset management system, it is important to ensure that its design,

4.1.2 External context

Understanding the organization's external context can include, but is not limited to, consideration of the following:

a) the social and cultural, political, legal, regulatory, financial, technological, economic, competitive and natural environment factors, whether international, national, regional or local;

b) key drivers and trends in factors that are identified as potentially having an impact on the objectives of the organization;

c) relationships with, and perceptions and values of, external stakeholders.

NOTE "Stakeholder" can also be referred to as an "interested party".

4.1.3 Internal context

Understanding the organization's internal context can include, but is not limited to, consideration of the following:

a) governance requirements;

b) policies, objectives and the strategies that are in place to achieve them;

c) the organization's culture and values;

d) organizational structure, roles, accountabilities and authorities;

e) the size and complexity of the organization;

f) capabilities, understood in terms of resources and knowledge (e.g. capital, time, people, systems and technologies);

g) information systems, information flows and decision-making processes (both formal and informal);

h) standards, guidelines and models adopted by the organization;

i) relationships with, and perceptions and values of, internal stakeholders;

j) the form and extent of contractual relationships;

k) the organization's risk management plans including tolerance limits, risk attitude and capacity;

l) asset management practices and other management systems, plans, process(es) and procedure(s);

m) integrity and performance of the assets and asset systems, and the outputs of consequent evaluations or reviews;

n) the size, complexity and criticality of the assets;

o) feedback from the investigation of previous asset and asset system failures, incidents, accidents and emergencies, and any systemic or statistical analyses and evaluations;

p) assessments of the ability of the asset management system to achieve the intended outcomes of the organizational objectives;

q) feedback from previous self-assessments, internal audits, third party and certification reviews.

At the strategic level, tools such as Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis and Political, Economic, Social, Technological, Legal, Environmental (PESTLE) analysis may be used for identification and evaluation of contextual issues. A simpler approach, such as brainstorming, can be useful for organizations, depending on the size and complexity of their operations.

The processes and outputs of processes used for evaluating the organization's context can be considered necessary for the effectiveness of the asset management system, and may, therefore, be maintained as documented information (see ISO 55001:2014, 7.6.1). The triggers and review frequency for conducting these processes should also be defined in documented information.

4.2 Understanding the needs and expectations of stakeholders

4.2.1 General

The organization should identify and review the stakeholders that are relevant to the asset management system, asset management and the assets, and the needs and expectations of these stakeholders. The identification and review of the stakeholders' needs and expectations will enable the identification of the value the stakeholders could receive from the organization's assets (see Annex A for a discussion on the concept of value in asset management).

4.2.2 Internal stakeholders

Internal stakeholders can include the following:

a) employees of the organization;

b) groups within the organization, i.e. functional groups (e.g. engineering, finance, accounting, maintenance, operations, purchasing, receiving, logistics, communications and information management) or other groups (e.g. safety representatives);

c) shareholders, management consortiums, owners.

4.2.3 External stakeholders

External stakeholders can include the following:

a) customers, users;

b) suppliers, service providers and contractors;

c) non-governmental organizations, including civil society organizations, consumer organizations and the media with an interest in issues related to asset management;

d) government organizations, government agencies, regulatory authorities, and politicians at all levels of government;

e) taxpayers;

f) local communities;

g) those in society interested in social, financial, environmental or other forms of sustainability;

h) investors, financial institutions, rating agencies, brokers and insurers;

h) external employee representatives (e.g. an employee of an industry body/union).

4.2.4 Stakeholder needs and expectations

Stakeholders' needs and expectations should be defined in documented information and be communicated. This may be captured in a high-level statement of stakeholder needs within the SAMP, recognizing that more detailed statements will follow in the asset management plans to specifically address the expectations of different stakeholder groups. These statements should reference any mandatory requirements.

The organization should consider a means of tracking how current the information collected is, and the methods involved for its collection. When engaging with stakeholders to determine their needs

and expectations, the organization can use the list of context-related issues given in 4.1 to frame the discussions.

One objective of asset management is to enable the organization to meet the service needs of the customers and users of its asset(s). The organization should measure the levels of service (see 6.2.1) that its assets deliver, and evaluate these against the needs and expectations of its customers and users. A level of service review process can be a useful approach to understand the expectations of customers and users.

Stakeholders are likely to make judgements about the organization's asset management and its asset management outputs and outcomes based on their perceptions. These can vary due to differences in values, needs, assumptions, concepts and concerns, as they relate to the issues under discussion. Since the views of stakeholders can have a significant impact on the organization's asset-related decisions, it is important that their perceptions are determined, recorded and taken into account in the organization's decision-making process (see also Annex D).

Defining how asset-related decisions are made, and ensuring understanding of the process, are an important part of asset management. The criteria for decision making are influenced by the needs of external and internal stakeholders, by the asset management policy and by the risk attitude of the organization (see Annex D). The external and internal stakeholders' input to establishing decision-making criteria is important for setting priorities and resolving conflicting requirements. Decision-making criteria should be appropriate to the importance and complexity of the decisions being made. These criteria should be used to evaluate competing options to meet asset management objectives and develop asset management plans. The criteria can be expressed in a number of ways, to support quantitative, semi-quantitative or qualitative decisions. The processes to establish the decision-making criteria that guide asset management should be clear and be defined in documented information.

4.2.5 Communication with stakeholders

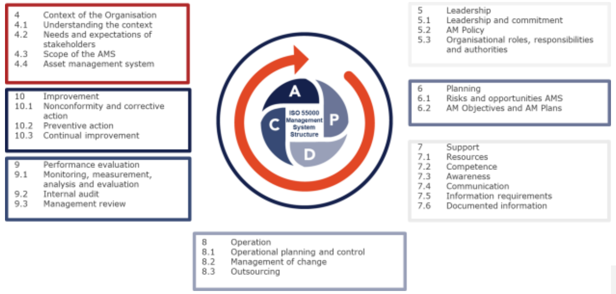
The level of detail needed when reporting to stakeholders will vary from one stakeholder to another, depending on the scope of the organization's activities, the complexity of the assets being managed and the importance of the stakeholder to the organization. The details reported should only disclose proprietary information as appropriate for the stakeholders receiving the information. The organization should be aware that there can be legal and regulatory requirements associated with reporting to specific stakeholders.

Stakeholders generally should be informed about the decisions that can affect them and should provide input into decisions that can have an impact on them. Failure to both communicate and consult in an appropriate way about asset management activities can in itself constitute a risk, because it could later prevent an organization from fulfilling its objectives.

It is important that the terminology used in communicating with stakeholders is consistent and aligned with other functions in the organization; this is particularly necessary when communicating financial information (See Annex F).

Organizations could manage their communication needs through registers or matrices identifying with whom, what, when, how and why they need to communicate.

4 Context: External and Internal Issues (4.1) and Stakeholder Involvement (4.2)



(4.1) … determine external and internal issues that are relevant to its purpose and that affect its ability to achieve the intended outcome(s) of its AMS

(4.2) … determine AMS relevant stakeholders, their needs and expectations, AM decision making criteria and information requirements

	Helpful To achieving the objective	**Harmful** To achieving the objective
Internal origin (attributes of the organisation)	**Strengths**	**Weaknesses**
External origin (attributes of the environment)	**Opportunities**	**Threats**

SWOT (basic ext/internal analysis)

DEMOGRAPHICAL
- Population configuration
- Population density
- Geographical features and differences
- Infrastructure

POLITICAL
- Regulations and compliance
- Subsidy arrangements
- Political climate
- Political plans

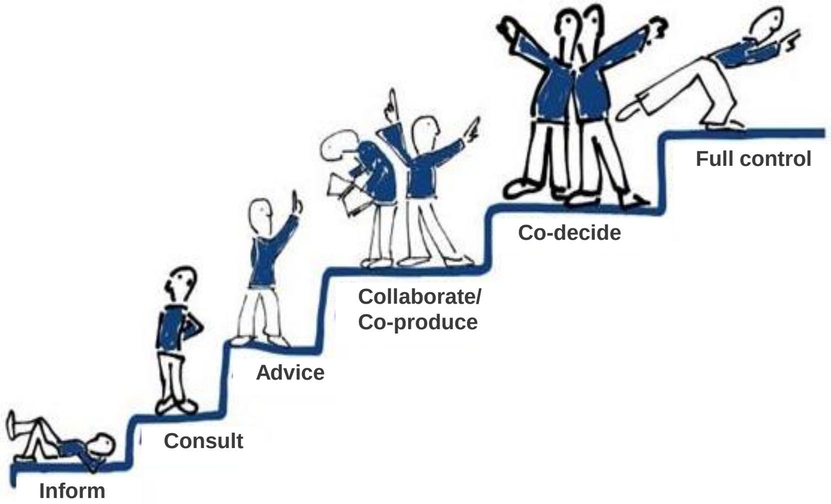
ECOLOGICAL
- Natural resources
- Energy
- Emissions
- Waste
- Safety

ECONOMICAL
- Market features
- Market position
- Financial information
- Economical climate
- Grow perspectives

SOCIAL/CULTURAL
- Beliefs and values
- Communication
- Behaviour
- Life style
- Social trends

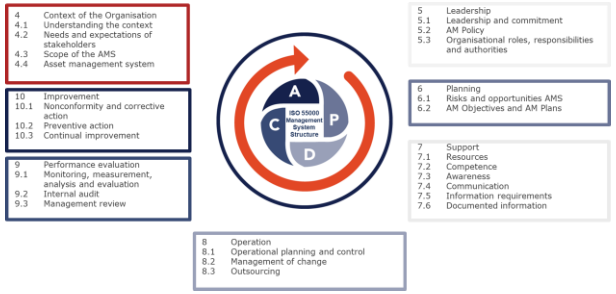
TECHNOLOGICAL
- Know how
- Innovation
- Trends
- New approaches and methods
- New techniques

DESTEP model (advanced external analysis)



Stakeholder involvement ladder

4 Context: Scope of the AMS (4.3) and Asset Management System (4.4)

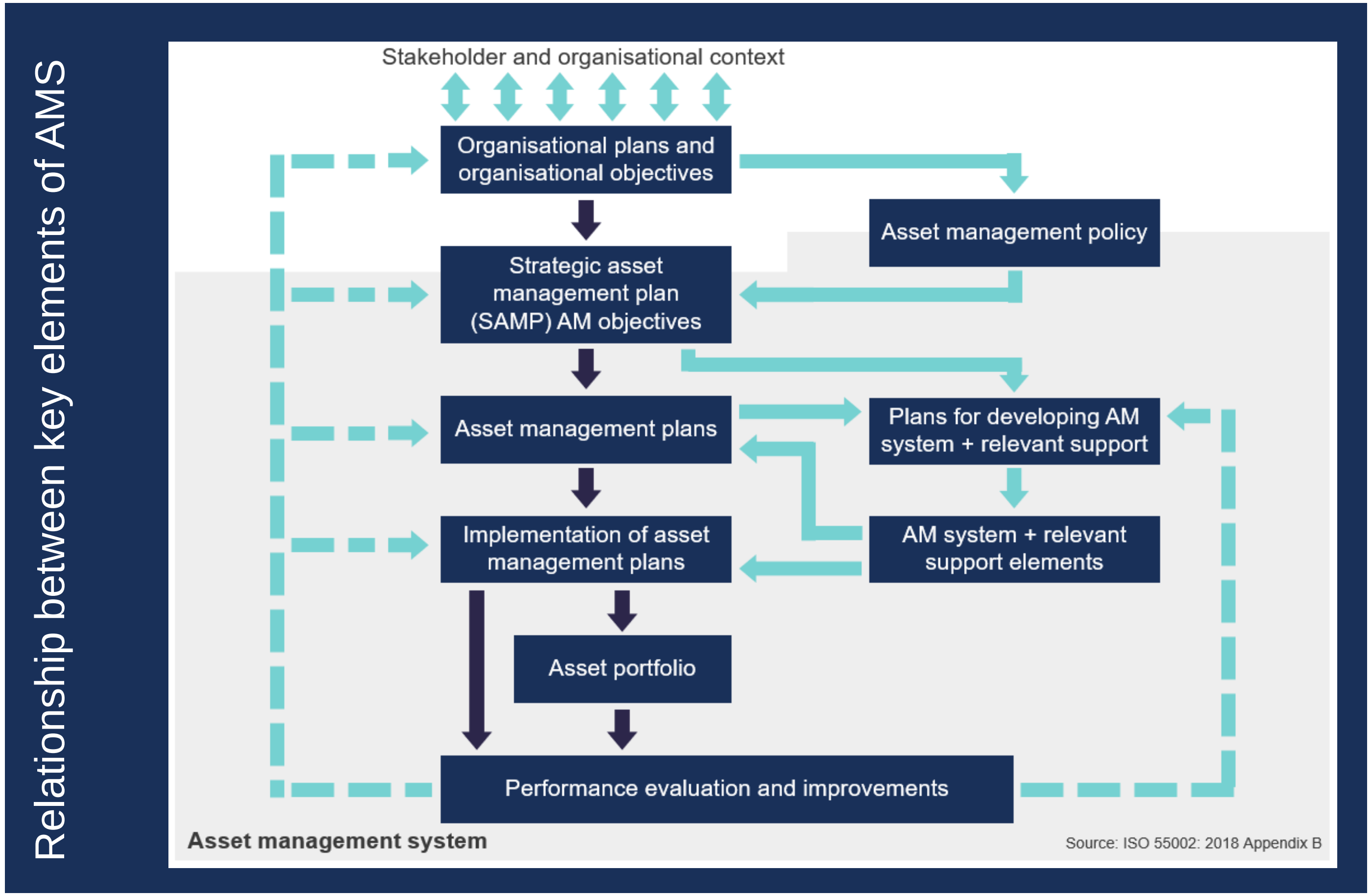


(4.3) … determine the boundaries and applicability of the AMS to establish its scope

(4.4) … establish, implement, maintain and continually improve an AMS, including the processes needed and their interactions, in accordance with the requirements of ISO 55001

Aspects of scope determination:

- Alignment with SAMP and AM Policy
- Consider context issues
- Consider stakeholder requirements
- Consider interactions with other MS
- Define the asset portfolio



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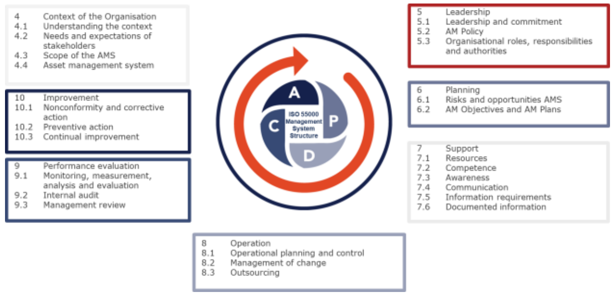
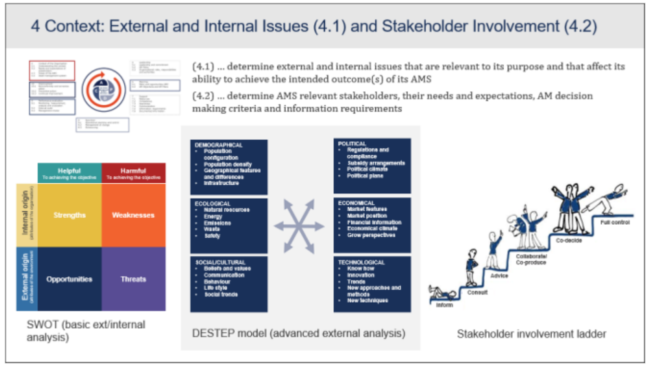
Planning: Actions to address risks and opportunities for the AMS (6.1)



(6.1) When planning for the AMS, 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

Risks and opportunities

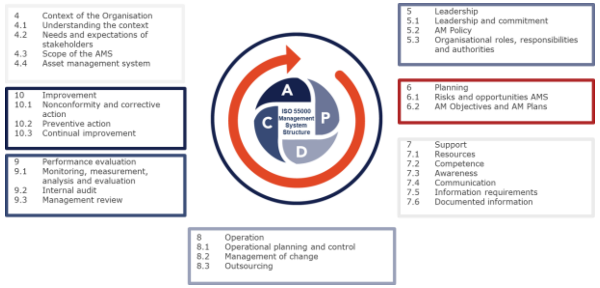


Consider context issues and stakeholder requirements (2 slides back)

Risk management process

(ISO 31000 Risk management)

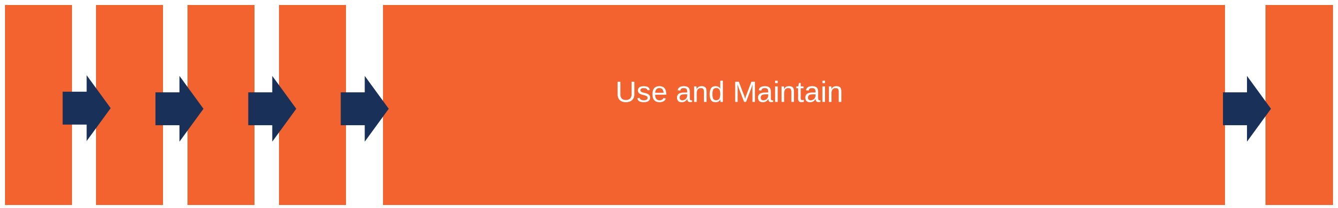
Planning: Relevant Time Horizons for AM Objectives (6.2.1) and AM Plans (6.2.2)



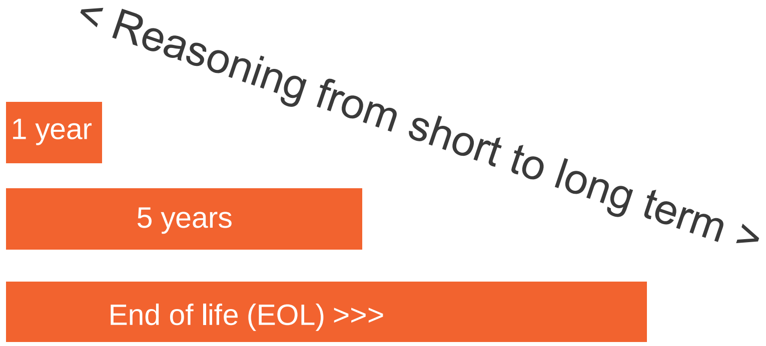
(6.2.1)… establish asset management objectives at relevant functions and levels

(6.2.2)… establish, document and maintain asset management plan(s) to achieve the asset management objectives

Asset life cycle phases as a concept

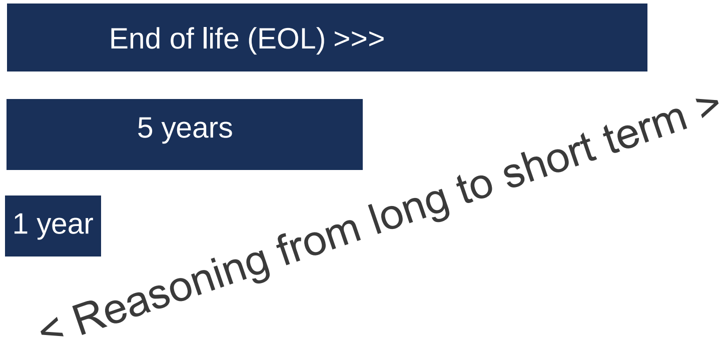


Asset life cycle phases in reality

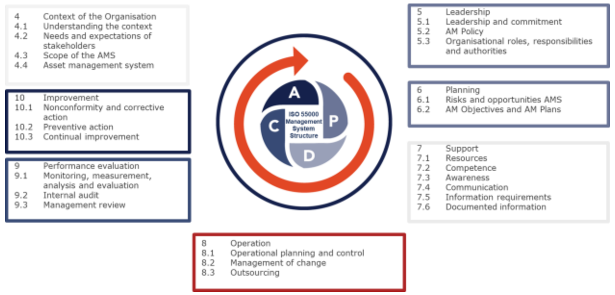


Time horizon(s) of AM Objectives and Plans

↑Classical approach ↓ AM Principles/ ISO 55k

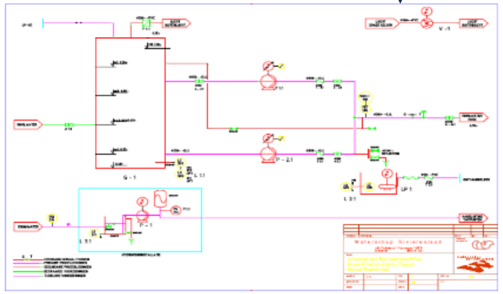


Operation: Control of Asset Life Cycle Activities (8.1)



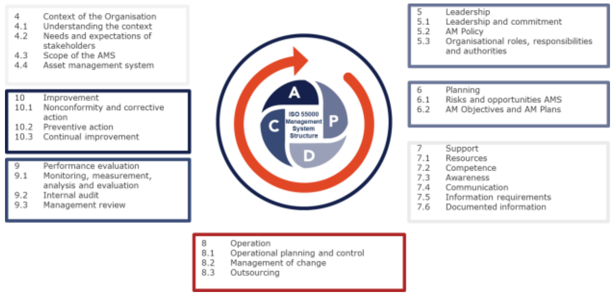
(8.1) … shall plan, implement and control the processes needed to meet requirements, and to implement the actions determined in 6.1, the asset management plan(s) determined in 6.2, and the corrective and preventive actions determined in 10.1 and 10.2

Determine need → Specify need → Design → Realize → Use and Maintain → Remove → (Partial) Re-use



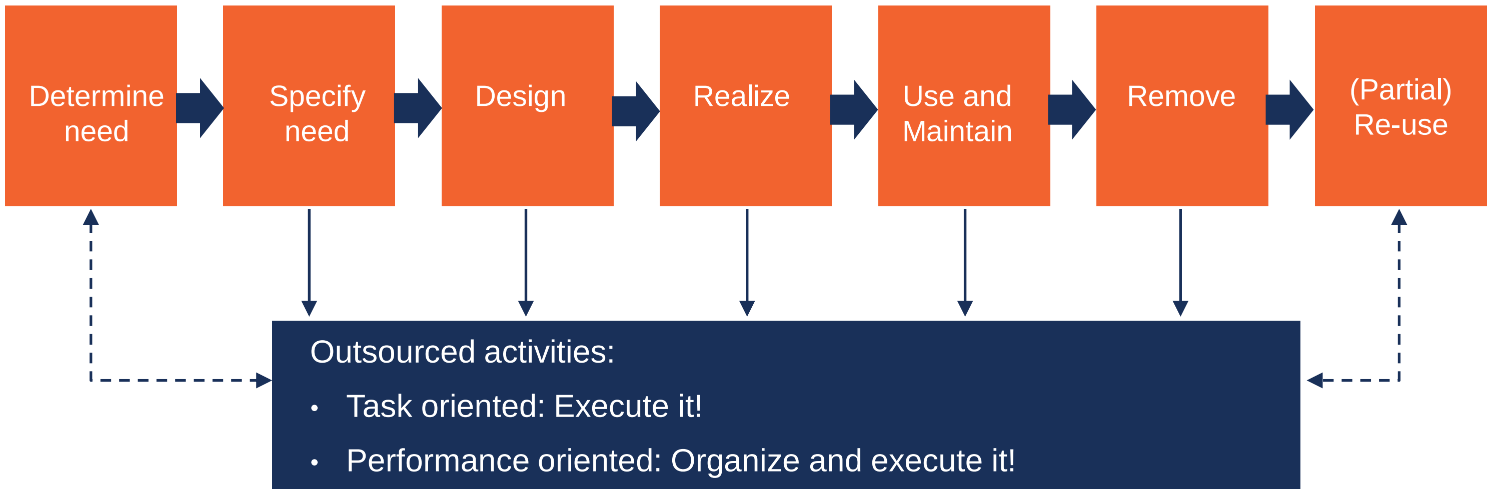
To be controlled asset life cycle (phase) activities

Operation: Management of Change (8.2) and Outsourcing (8.3)

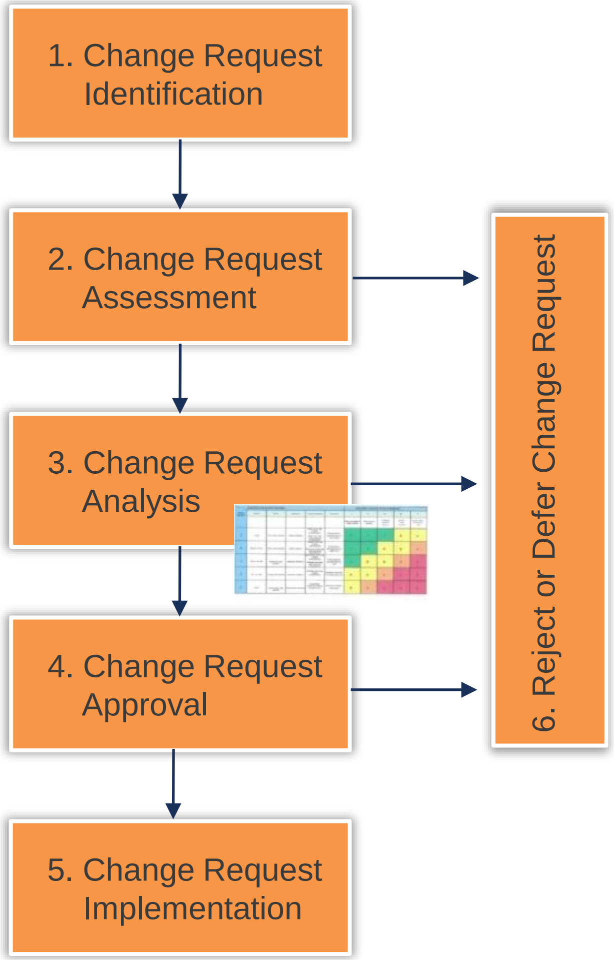


(8.2) Risks associated with any planned change, permanent or temporary that can have an impact on achieving the asset management objectives, shall be assessed before the change is implemented

(8.3) When the organization outsources any activities that can have an impact on the achievement of its asset management objectives, it shall assess the associated risks. The organization shall ensure that outsourced processes and activities are controlled

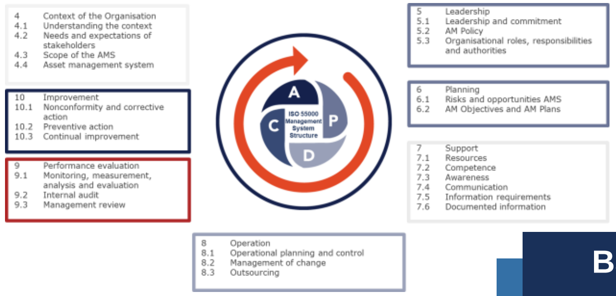


To be controlled outsourced asset life cycle (phase) activities

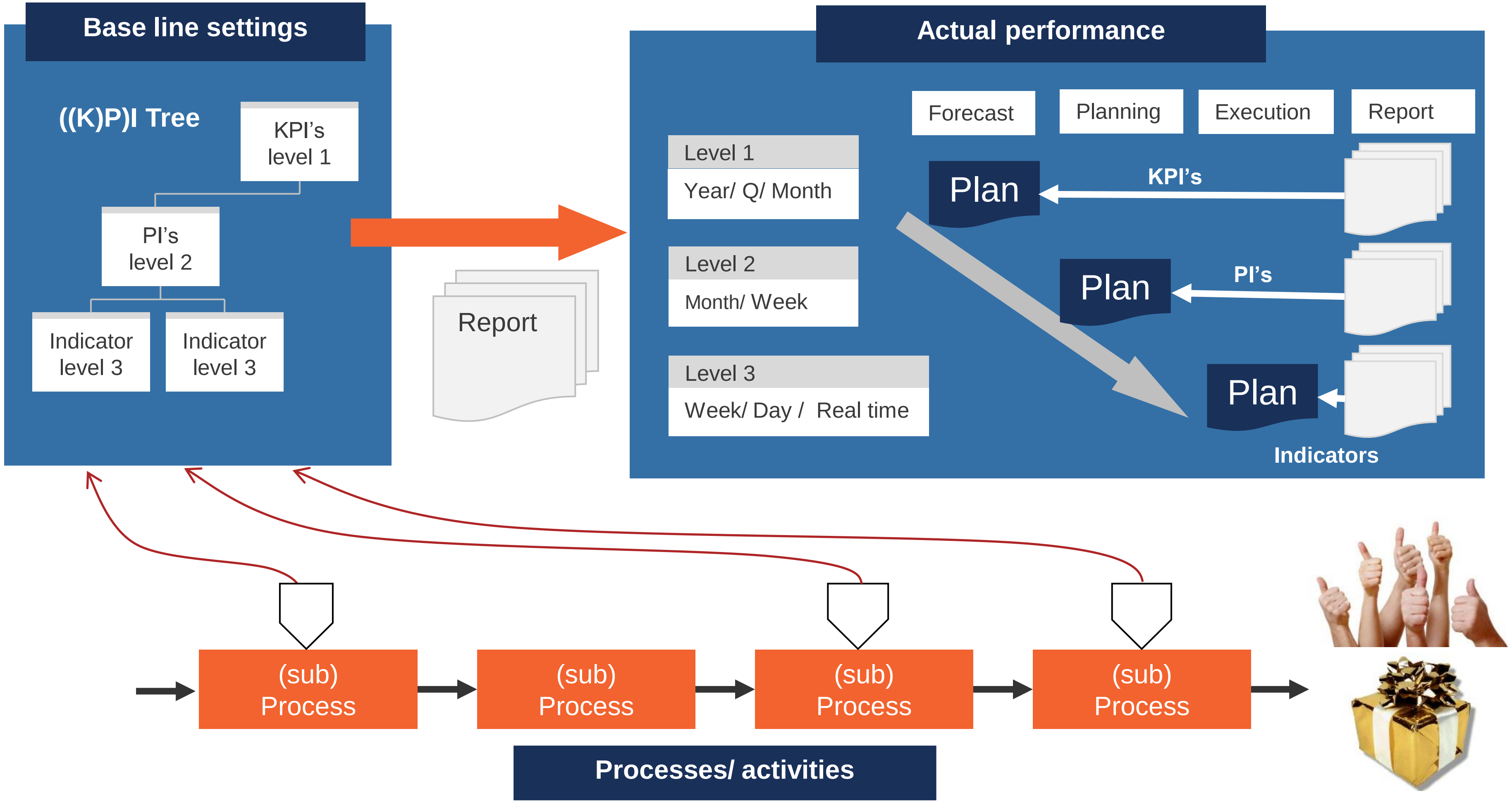


Standard MOC process (NASA)

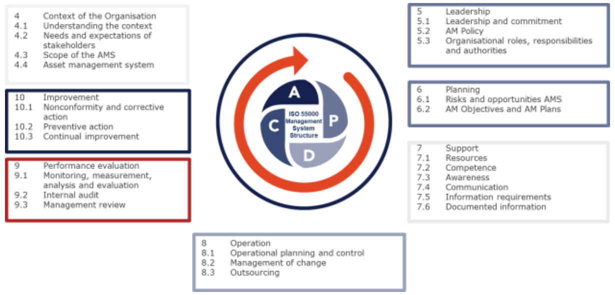
Performance Evaluation: Monitoring, Measurement, Analysis and Evaluation (9.1)



(9.1) … monitor, measure, analyse, evaluate and report on the asset performance, the asset management performance and the effectiveness of the AMS



Performance Evaluation: Internal Audit (9.2) and Management Review (9.3)



(9.2)… conduct internal audits at planned intervals

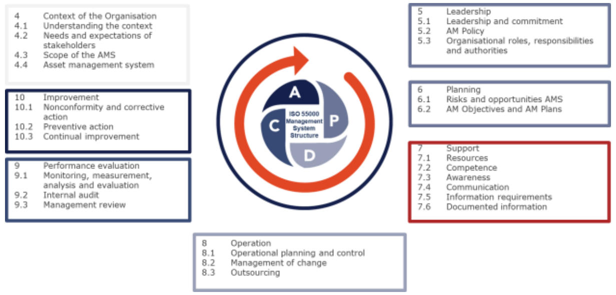
(9.3) <u>Top management</u> shall review the organisation's AMS, at planned intervals, to ensure its continuing suitability, adequacy and effectiveness

Audit: Systematic collection and review of evidence in fulfilment of requirements.
Findings: Conformities and Non-conformities

Sources	Input	Process	Output
Check & Act on Functioning assets and Working Organization (AM and AMS)	Actions MR former year (Changes in) AMS relevant issues and risk and opportunity profile Opportunities for continuous improvement Performance/ Results of: - Assets - AM(S) - Audits	Review	Decisions and actions on improvement and therefore required changes Available as documented information

ISO 55001 inspired process for management review

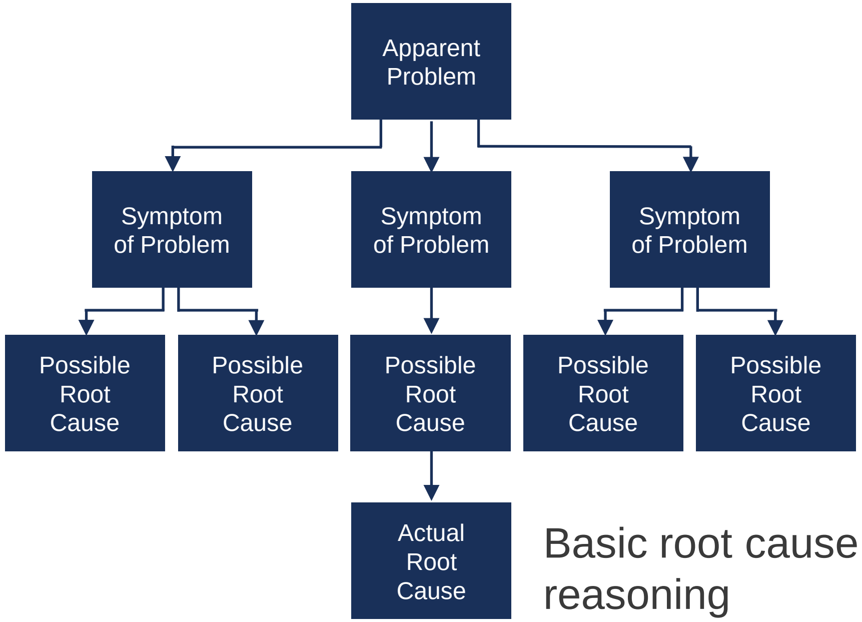
Improvement: Corrective (10.1) and Preventive (10.2) Actions and Improvement (10.3)



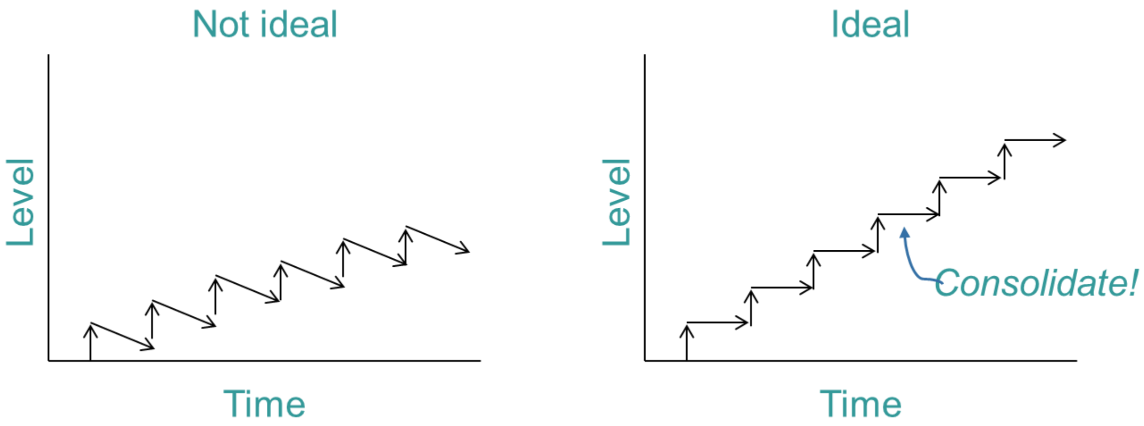
(10.1)… react to non-conformity or incident, evaluate need for action to eliminate causes, implement actions and evaluate their effectiveness

(10.2)… establish processes to proactively identify potential failures in asset performance and evaluate the need for preventive action

(10.3)… continually improve the suitability, adequacy and effectiveness of its asset management and the AMS

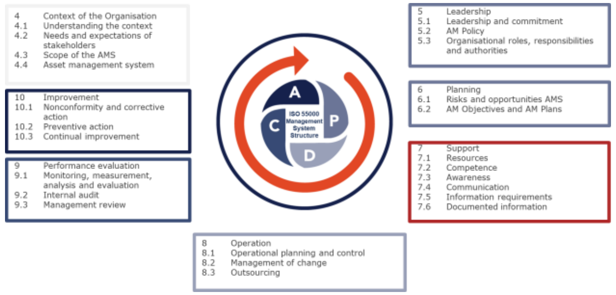


Basic root cause reasoning



Improvement requires consolidation

Support: Resources, Competence, Awareness and Communication



(7.1)… determine and provide the resources needed for 'PDCA-ing' the AMS, meeting AM objectives and executing AM plan(s)

(7.2)… (1)determine the necessary competence of person(s) doing work under its control, (2) ensure that these persons are competent, (3) take and evaluate actions to acquire the necessary competence, (4) periodically review current and future competency needs and requirements

(7.3)Persons doing work under the organization's control, who can have an impact on the achievement of the AMS, shall be aware of the AM Policy, their link to AM objectives, risks and opportunities related to their work and non-conformity (to ISO 55001)

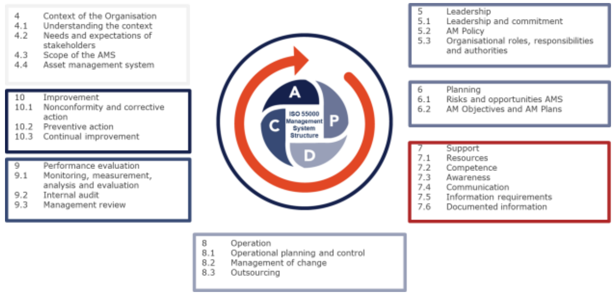
(7.4)…The organization shall determine the need for internal and external communications relevant to assets, AM and the AMS: what, when, who and how

Integrated resource stacking

Resource building: Competent and aware personnel

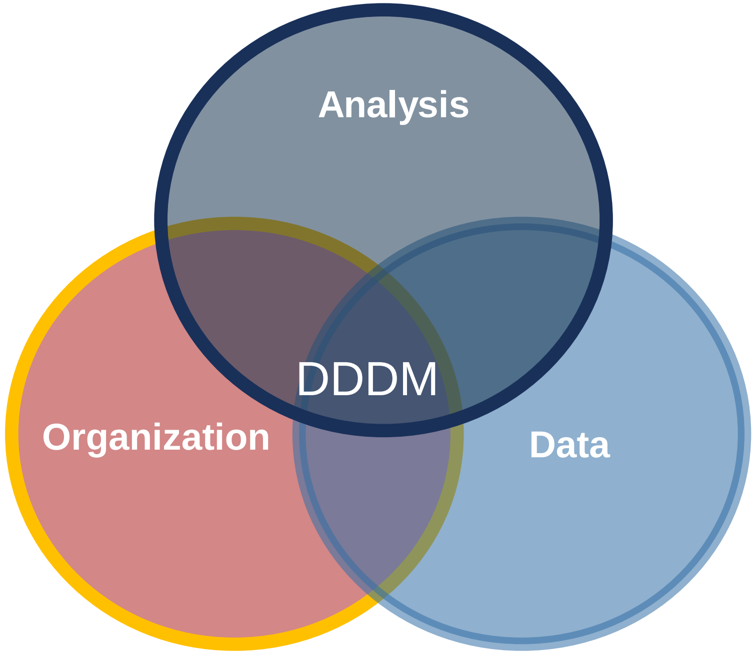
Communicating = Connecting

Support: Information Requirements (7.5) and Documented Information (7.6)



(7.5)… determine its information requirements to support its assets, AM, AMS and the achievement of its organizational objectives

(7.6) Documented information required by the asset management system and by this International Standard shall be controlled



Data Driven Decision Making (DDDM)

Sorts of documented information:

- Paper
- Magnetic
- Eectronic or optical computer disc
- Photograph
- Master sample

Registrations in databases are also considered as documented information

Examples of documented information:

- Organization charts
- Process maps, process flow charts and/or process descriptions
- Procedures
- Work and/or test instructions
- Specifications
- Documents containing internal communications
- Production schedules
- Approved supplier lists
- Test and inspection plans
- Quality plans
- Manuals
- Strategic plans
- Forms

ISO 55001 (and ISO 55002) PDCA and ISO 55002 Annexes

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8.2 Management of change
8.3 Outsourcing

Thank you

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