A Review of Asset Management Standard ISO55000 Series

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- Standards:
  - UK – PAS 55 -1 and 2 (2004, 2008) – "specification"
  - ISO – 55000, 55001 and 55002 (Jan 2014) – "standards"
    - In November 2018 a revised and expanded version ISO 55002:2018 was released
  - ISO/TS 55010 (Sep 2019)

- Other sources of AM Information

  - GFMAM "Landscape"
    - GFMAM is global in scope

  - IAM "Anatomy"
    - UK centric but globally influential
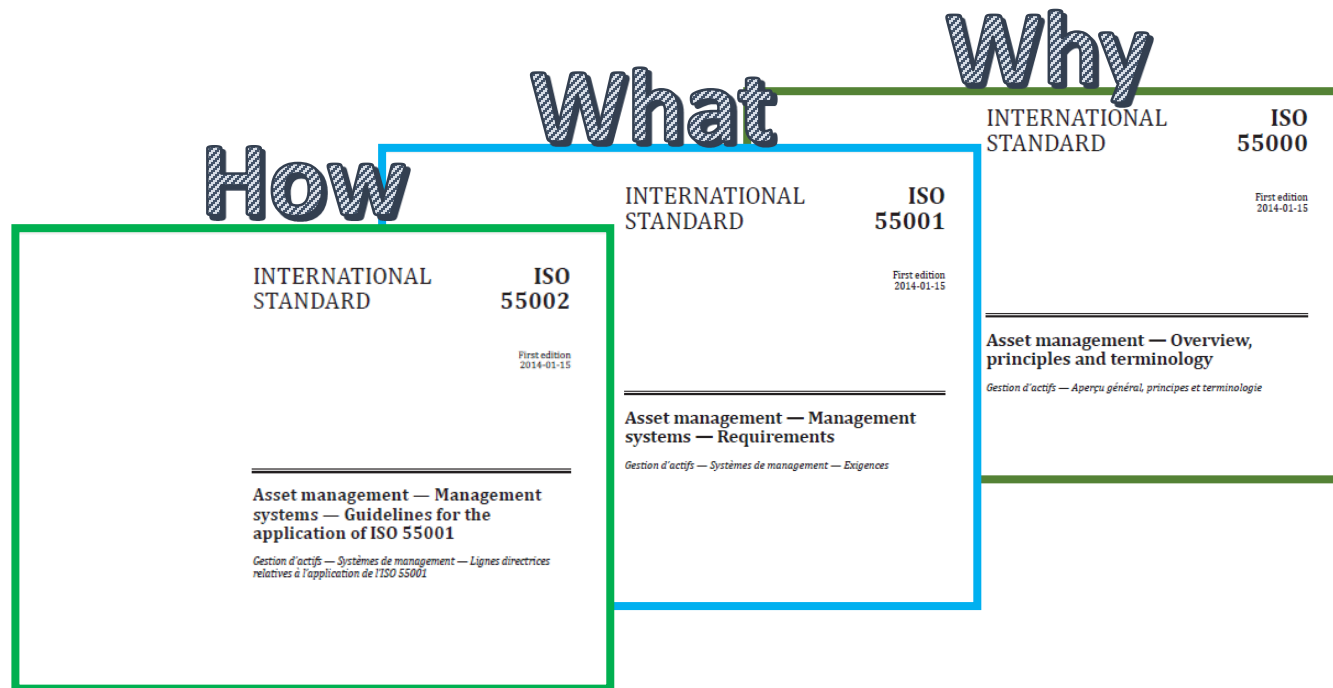

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GFMAM and IAM

- Both have produced very useful documents
- Both align with each other and with ISO 5500x
  - Consistency of message
- Coverage of the topic includes 39 subjects
  - More extensive coverage than ISO 5500x
- ISO 55001 includes 24 clauses with 71 "shall" statements
  - The Landscape and Anatomy documents present information in a way to help foster understanding and consistency
    - The IAM's Anatomy contains more explanation than GFMAM Landscape
  - The ISO 55001 is a standard that specifies requirements for good asset management – it isn't a teaching or "how to" document
    - Some guidance is in ISO 55002
    - Complemented by GFMAM and IAM

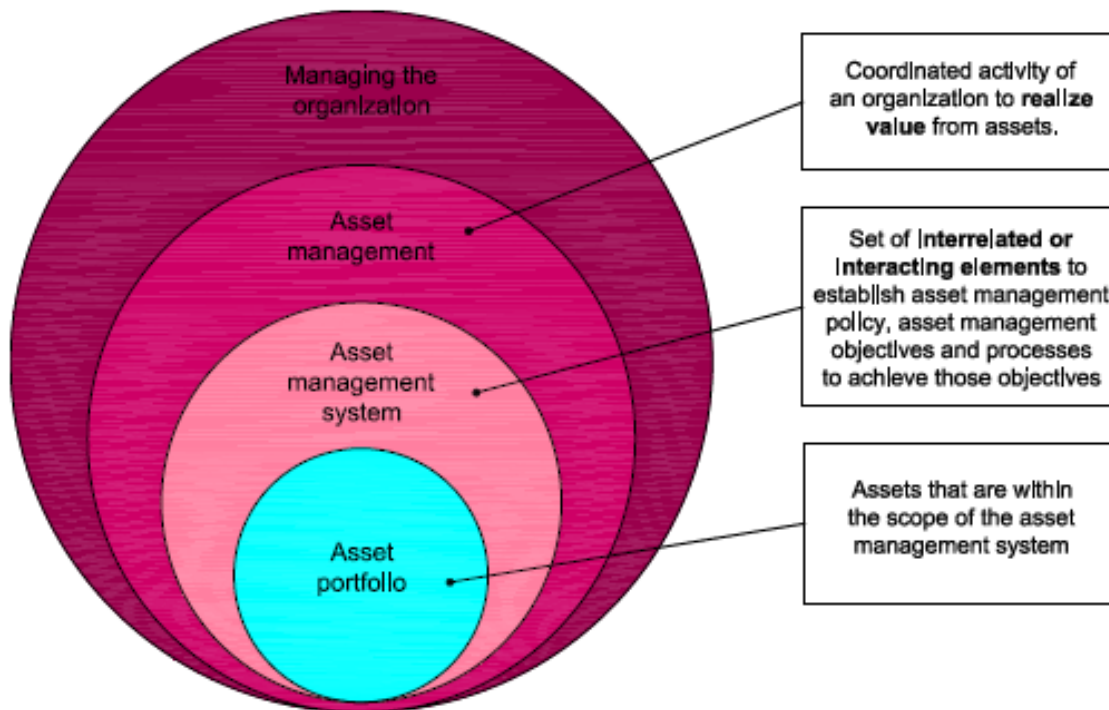www.ipamc.org

ISO 55000: Really 3 Standards

How — INTERNATIONAL STANDARD ISO 55002, First edition 2014-01-15 — 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*

What — INTERNATIONAL STANDARD ISO 55001, First edition 2014-01-15 — Asset management — Management systems — Requirements. *Gestion d'actifs — Systèmes de management — Exigences*

Why — INTERNATIONAL STANDARD ISO 55000, First edition 2014-01-15 — Asset management — Overview, principles and terminology. *Gestion d'actifs — Aperçu général, principes et terminologie*

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Benefits Of The Standards

- International Standard enables an organization to achieve its objectives through the effective and efficient management of its assets. The application of an asset management system provides assurance that those objectives can be achieved consistently and sustainably over time.

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55000

Managing the organization

Asset management

Asset management system

Asset portfolio

Coordinated activity of an organization to **realize value** from assets.

Set of **interrelated or interacting elements** to establish asset management policy, asset management objectives and processes to achieve those objectives

Assets that are within the scope of the asset management system

- why
- Definition
- Asset Management system benefit
- Fundamental of Asset Management
- Asset Management system element

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Contents

55001

Provides the "what"

- Requirements
- This is the standard against which compliance is measured
  - Certification is to ISO 55001
- 7 topics
- 24 clauses
- 72 "shall" statements

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55002 - Guidelines

Ideas on "how"

- 55002 is a set of guidelines and suggestions

- Contains descriptive text, examples, tips and things to consider
  - What you "should do", examples of "how to" do it
  - Considerations and thoughts on how it might impact on what you are doing

Overview Of An Asset Management System

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Standard Group

- context of the organization (ISO 55001:2014, Clause 4);

- leadership (ISO 55001:2014, Clause 5);

- planning (ISO 55001:2014, Clause 6);

- support (ISO 55001:2014, Clause 7);

- operation (ISO 55001:2014, Clause 8);

- performance evaluation (ISO 55001:2014, Clause 9);

- improvement (ISO 55001:2014, Clause 10).

BSI Standards Publication

BS ISO 55001:2014

Asset management
Management systems – Requirements
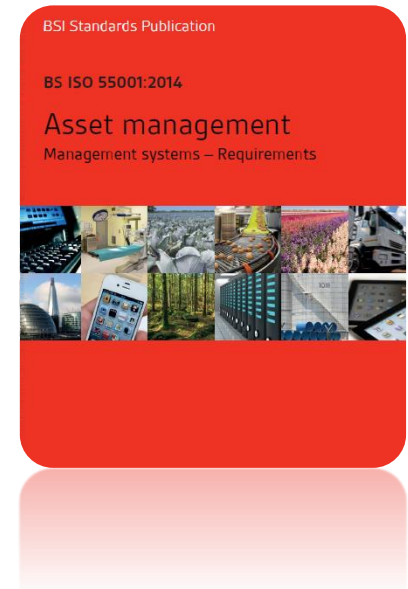
Context Of The Organization

- When establishing or reviewing its asset management system, an organization should take into account its internal and external contexts. The external context includes the social, cultural, economic and physical environments, as well as regulatory, financial and other constraints. The internal context includes organizational culture and environment, as well as the mission, vision and values of the organization.

Seven Elements:

1. Context of the organization
2. Leadership
3. Planning
4. Support
5. Operation
6. Performance evaluation
7. Improvement

Context Of The Organization

- Understanding the organization and its context

- Understanding the needs and expectations of stakeholders

- Determining the scope of the asset management system

- Asset management system

1. Context of the organization
2. Leadership
3. Planning
4. Support
5. Operation
6. Performance evaluation
7. Improvement

Leadership

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- Top management is responsible for developing the asset management policy and asset management objectives and for aligning them with the organizational objectives. Leaders at all levels are involved in the planning, implementation and operation of the asset management system.

Seven Elements:

1. Context of the organization
2. **Leadership**
3. Planning
4. Support
5. Operation
6. Performance evaluation
7. Improvement

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Leadership

- Leadership and commitment
- Policy
- Organizational roles, responsibilities and authorities

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Planning

- The organizational objectives provide the overarching context and direction to the organization's activities, including its asset management activities. The organizational objectives are generally produced from the organization's strategic level planning activities and are documented in an organizational plan.

Seven Elements:

1. Context of the organization
2. Leadership
3. **Planning**
4. Support
5. Operation
6. Performance evaluation
7. Improvement

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Planning

- **Actions to address risks and opportunities for the asset management system**

- **Asset management objectives and planning to achieve them**
  - **Asset management objectives**
  - **Planning to achieve asset management objectives**

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Support

- The asset management system will require collaboration among many parts of the organization. This collaboration often involves the sharing of resources. Coordinating these resources and applying, verifying and improving their use should be objectives of the asset management system. It should also promote awareness of the asset management objectives across the whole organization.

Seven Elements:

1. Context of the organization
2. Leadership
3. Planning
4. **Support**
5. Operation
6. Performance evaluation
7. Improvement

Support

- **Resources**

- **Competence**

- **Awareness**

- **Communication**

- **Information requirements**

- **Documented information**
  - **General**
  - **Creating and updating**
  - **Control of documented information**

Seven Elements:

1. Context of the organization
2. Leadership
3. Planning
4. **Support**
5. Operation
6. Performance evaluation
7. Improvement

Operation

- The organization's asset management system can enable the directing, implementation and control of its asset management activities, including those that have been outsourced. Functional policies, technical standards, plans and processes for the implementation of the asset management plans should be fed back into the design and operation of the asset management system.

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Operation

- **Operational planning and control**

- **Management of change**

- **Outsourcing**

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Performance evaluation

- The organization should evaluate the performance of its assets, its asset management and its asset management system. Performance measures can be direct or indirect, financial or non-financial. Asset performance evaluation is often indirect and complex. Effective asset data management and the transformation of data to information is a key to measuring asset performance.

Seven Elements:

1. Context of the organization
2. Leadership
3. Planning
4. Support
5. Operation
6. **Performance evaluation**
7. Improvement

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Performance evaluation

- **Monitoring, measurement, analysis and evaluation**

- **Internal audit**

- **Management review**

Seven Elements:

1. Context of the organization
2. Leadership
3. Planning
4. Support
5. Operation
6. **Performance evaluation**
7. Improvement

Improvement

- An organization's asset management system is likely to be complex and continually evolving to match its context, organizational objectives and its changing asset portfolio. Continual improvement is a concept that is applicable to the assets, the asset management activities and the asset management system, including those activities or processes which are outsourced.
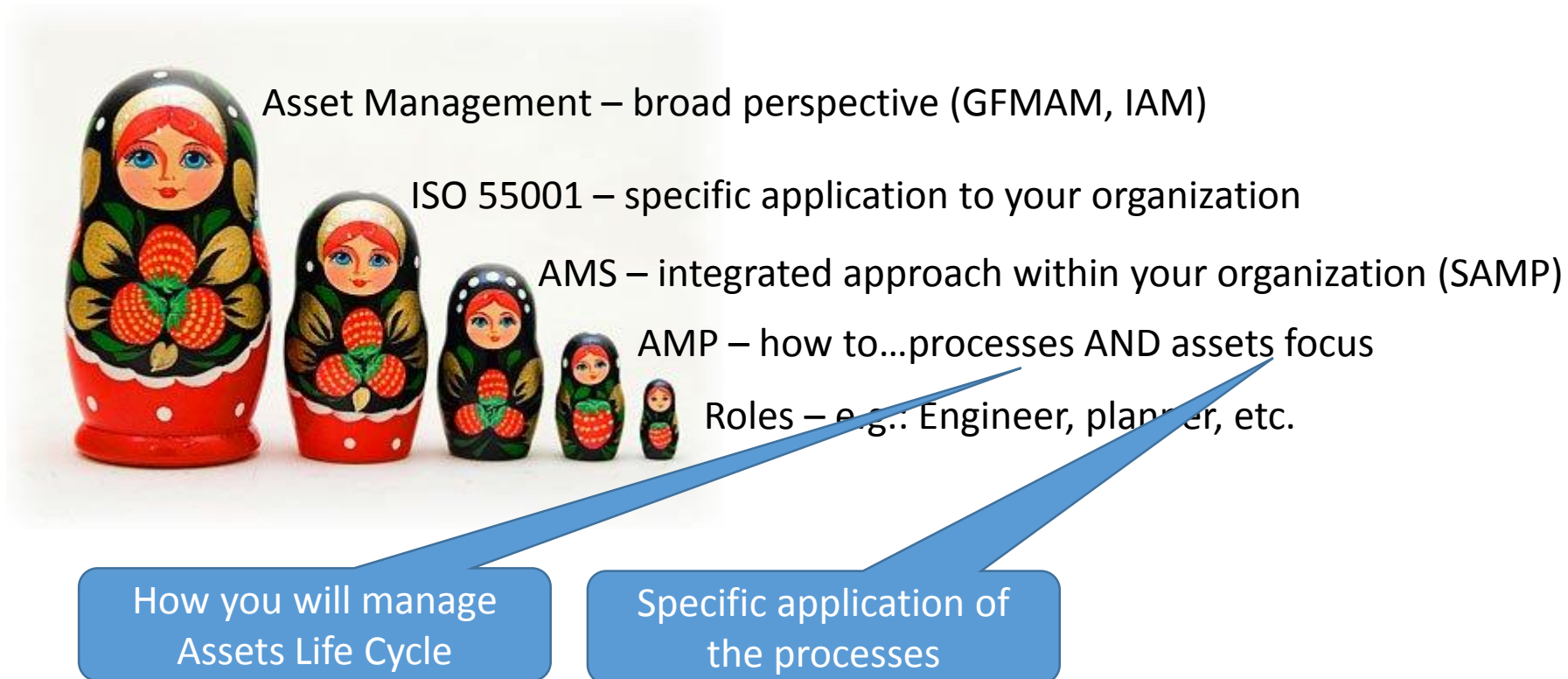
Seven Elements:

1. Context of the organization
2. Leadership
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4. Support
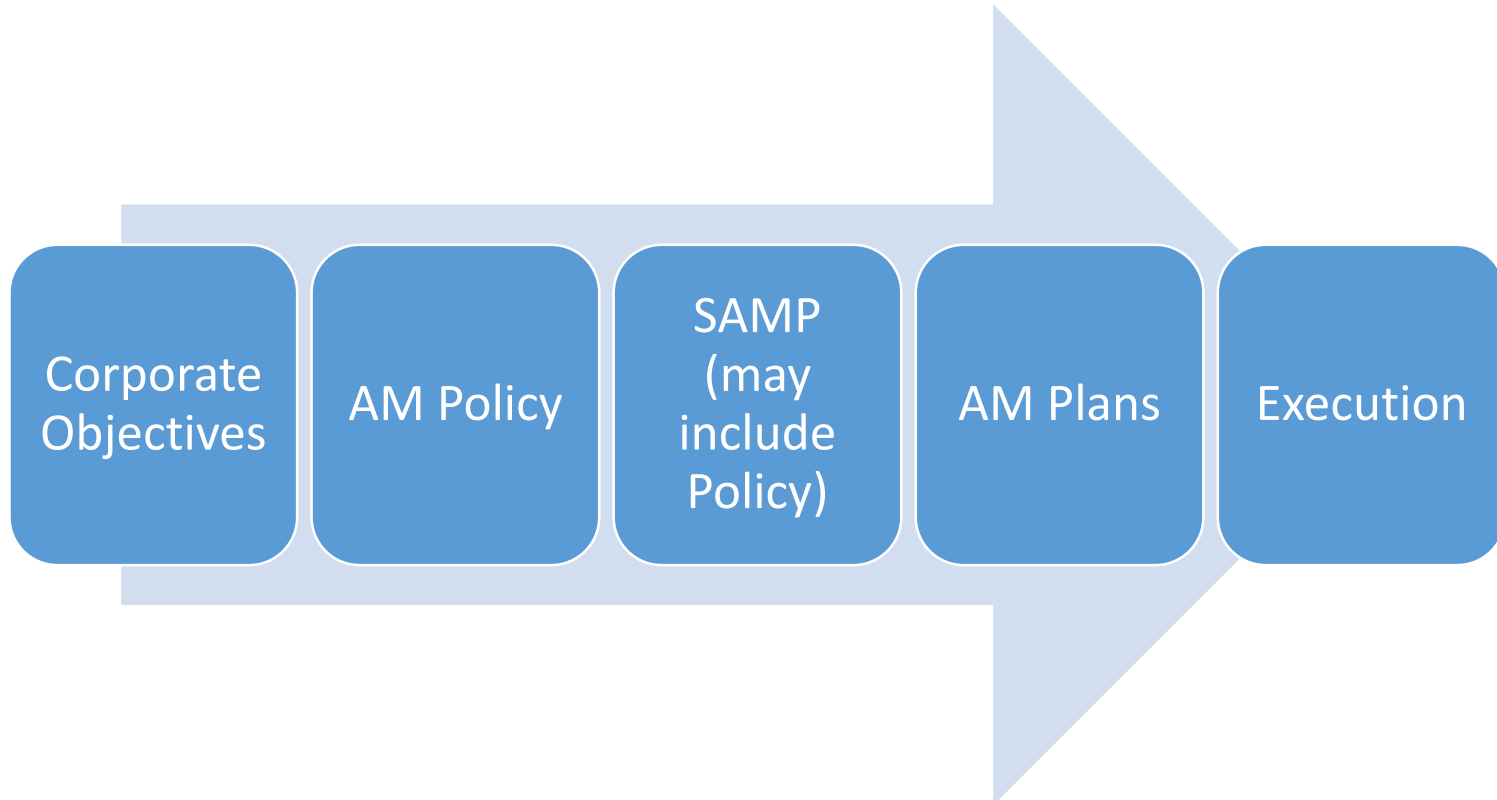5. Operation
6. Performance evaluation
7. **Improvement**

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Improvement

- Nonconformity and corrective action

- Preventive action

- Continual improvement

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Nesting of asset management concepts

Asset Management – broad perspective (GFMAM, IAM)

ISO 55001 – specific application to your organization

AMS – integrated approach within your organization (SAMP)

AMP – how to…processes AND assets focus

Roles – e.g.: Engineer, planner, etc.

How you will manage Assets Life Cycle

Specific application of the processes

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Linking corporate objectives to execution

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AM Policy Content

- Introduction
- Purpose
- Principles
- Scope
- Compliance
- Roles and responsibilities
- Reporting
- Approval

ASSET MANAGEMENT POLICY
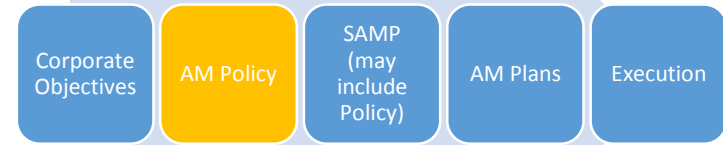
Asset Management Systems | SwainSmith

Rev. No.: 01
Rev. Date: 11-Jan-2019
Reference No.: E1-01-01

We at [Company Name] are committed to (a) managing and investing in our physical assets to create wealth for our shareholders, employees, and other stakeholders and (b) developing a sustainable business focused on health, safety, and environmental compliance.

We shall achieve these goals by establishing, documenting, implementing, maintaining, and continually improving the [Asset Management System (AMS)]. [AMS] is a systematic set of interconnected processes that is designed to improve asset performance, reduce risk, and minimize costs. [AMS] will govern how we plan, invest in, install, operate, maintain, and dispose of our assets, and will direct the management of our equipment and infrastructure for optimal value and sustainability.

This asset management policy, organized around six key business drivers, provides the directive by which we will manage our assets. We at [Company] shall:
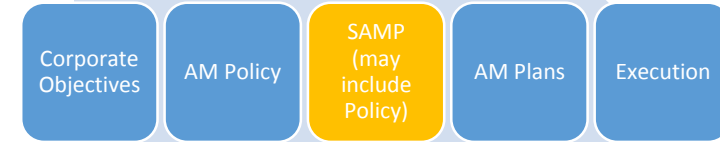
Safety
- Continue to drive towards zero injuries.
- Achieve industry recognition for safety performance.

Environmental
- Achieve excellence in stewardship of our environment.
- Eliminate non-compliant violations.
- Meet regulatory performance targets.
- Incorporate sustainability into our managerial decision-making process.

Reliability
- Reduce equipment failures.
- Ensure critical asset reliability.
- Use the latest technologies to continually improve predictive maintenance and condition-based monitoring techniques.
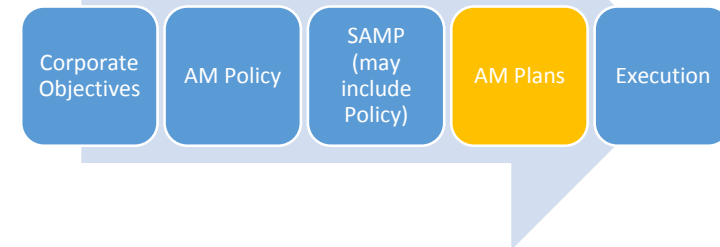
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SAMP Contents

Contents

- **Purpose of the document**
    - **Role of the SAMP and linkages to other relevant documents / functional areas**

- **Strategic purpose and context – what goals do you intend to achieve**
    - **What is the context for the plan (e.g.: current and future mandate, growth in services and assets …)**

- **Overview of scope of the Asset Management System / Framework**
    - **Can be included in SAMP or separate document**
    - **What's included and how it interacts with the rest of the organization**
        - **Ideally this covers the entire life cycle of assets, not just part of it**
            - **spending and opportunity to influence spending are not well aligned**
        - **How the AM System processes will interact with other business processes**

- **List of objectives (aligned with Corporate objectives)**
    - **These are the measurable steps required to achieve your goals**
    - **Objectives will be achieved through AM Plans**

- **Scope of AM coverage (portfolio) and criticality of assets (analysis results)**
    - **E.g.: fleets, guideways, dedicated transit rights of way, signals, stations, etc.**

- **Systems support (technology enablement)**

- **Initiatives (e.g.: EAM implementation)**

- **Change management approach (building capabilities, training, communication, etc.)**

- **Timeline for implementation of the plan**

- **Organizational Overview – Roles and responsibilities**

- **Performance monitoring and measurement – targets, audit / review and reporting**

- **How often the document will be updated**

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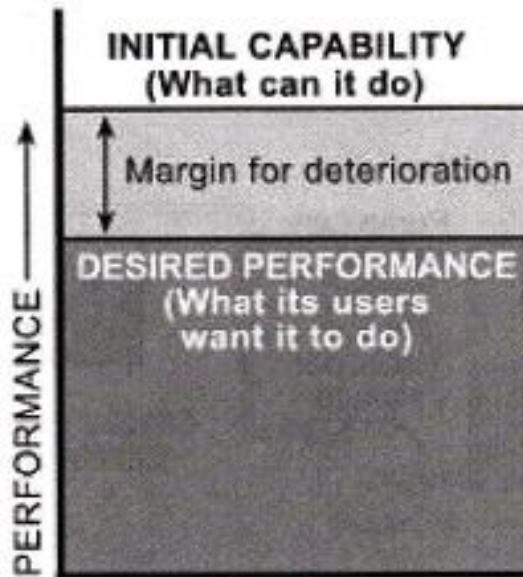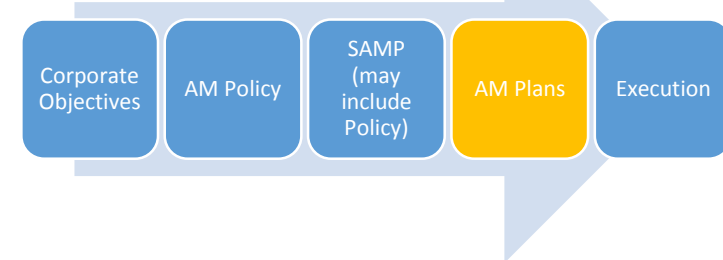
AMP

- Describes
  - Context, governance, scope and range of activities to achieve objectives defined in the SAMP
    - Covers AM Processes
      - E.g.: investment decision making (application of LCC), systems engineering, design, acquisition, project management, outsourcing, risk management, maintenance work management, failure management policy selection (RCM), reliability management … and their interfaces with other business processes like procurement, finance, operations, LCC analysis, etc.
    - Covers Asset Specific Strategies (for assets "in scope")
      - E.g.: engineering, maintenance and disposal requirements and strategies for specific assets / asset classes; service level expectations for outsourced services and operations
  - Continuous improvement, compliance and review activities
  - May include details of how specific asset classes are managed
    - E.g.: fleet maintenance management organization and roles

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Let's look at a few processes Maintenance

- Maintenance sustains capability
  - Keeps asset doing what you want it to do
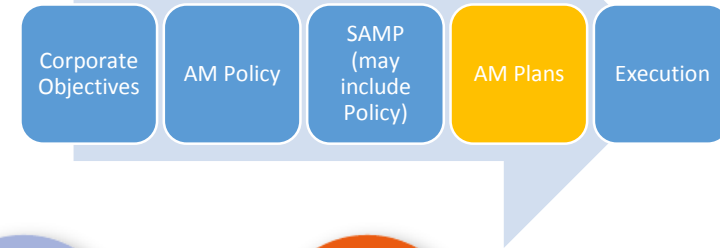 - Doesn't define it, doesn't create it

Engineering defines / provides
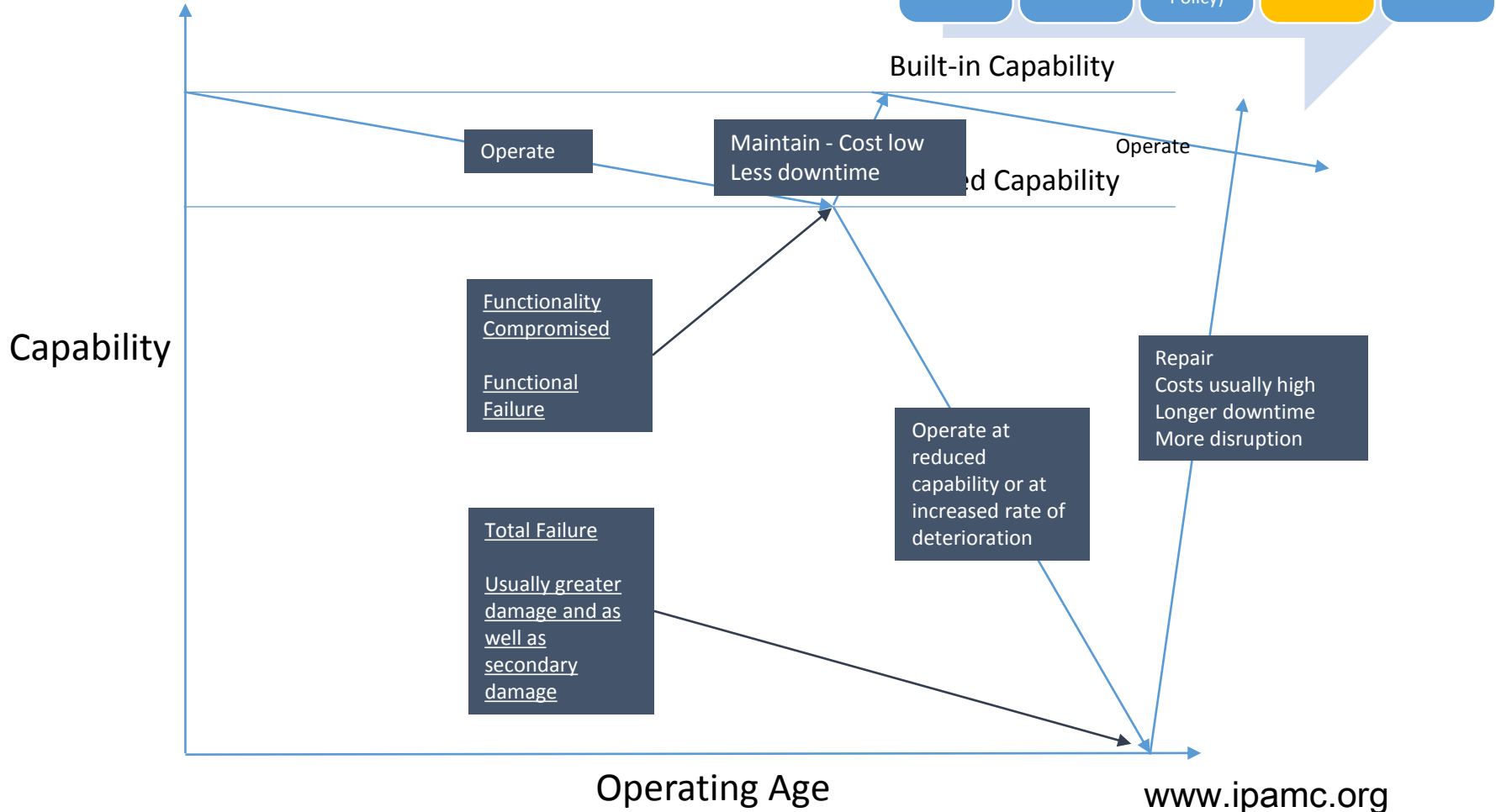
Maintenance sustains

Operations defines

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Operators and customers want availability

Corporate Objectives → AM Policy → SAMP (may include Policy) → AM Plans → Execution

Actual Time to Fix **+** Time to Site **+** Plant, Spares & Permits **+** Time to Gain Access **=** MTTR

- Av = MTBF / (MTBF + MTTR); i.e.: Uptime / Total Time

- Maximize MTBF
  - Good design, reliable components, correct operation, the right maintenance at the right time
    - Engineering, Operations, Maintenance and RCM

- Minimize MTTR
  - Maintainable asset and easy access, available spares, the right spares, good quality spares, rapid response to trouble, planned work, excellent work quality
    - Engineering, Maintenance, Operations, Spares and Procurement Management
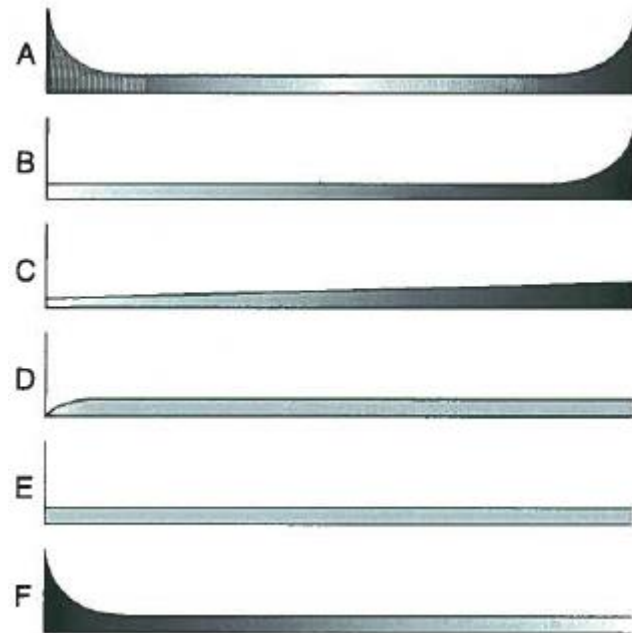
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The operate and maintain cycle

Built-in Capability

Operate

Maintain - Cost low
Less downtime

...ed Capability

Operate

Capability

Functionality Compromised

Functional Failure

Repair
Costs usually high
Longer downtime
More disruption

Operate at reduced capability or at increased rate of deterioration

Total Failure

Usually greater damage and as well as secondary damage

Operating Age

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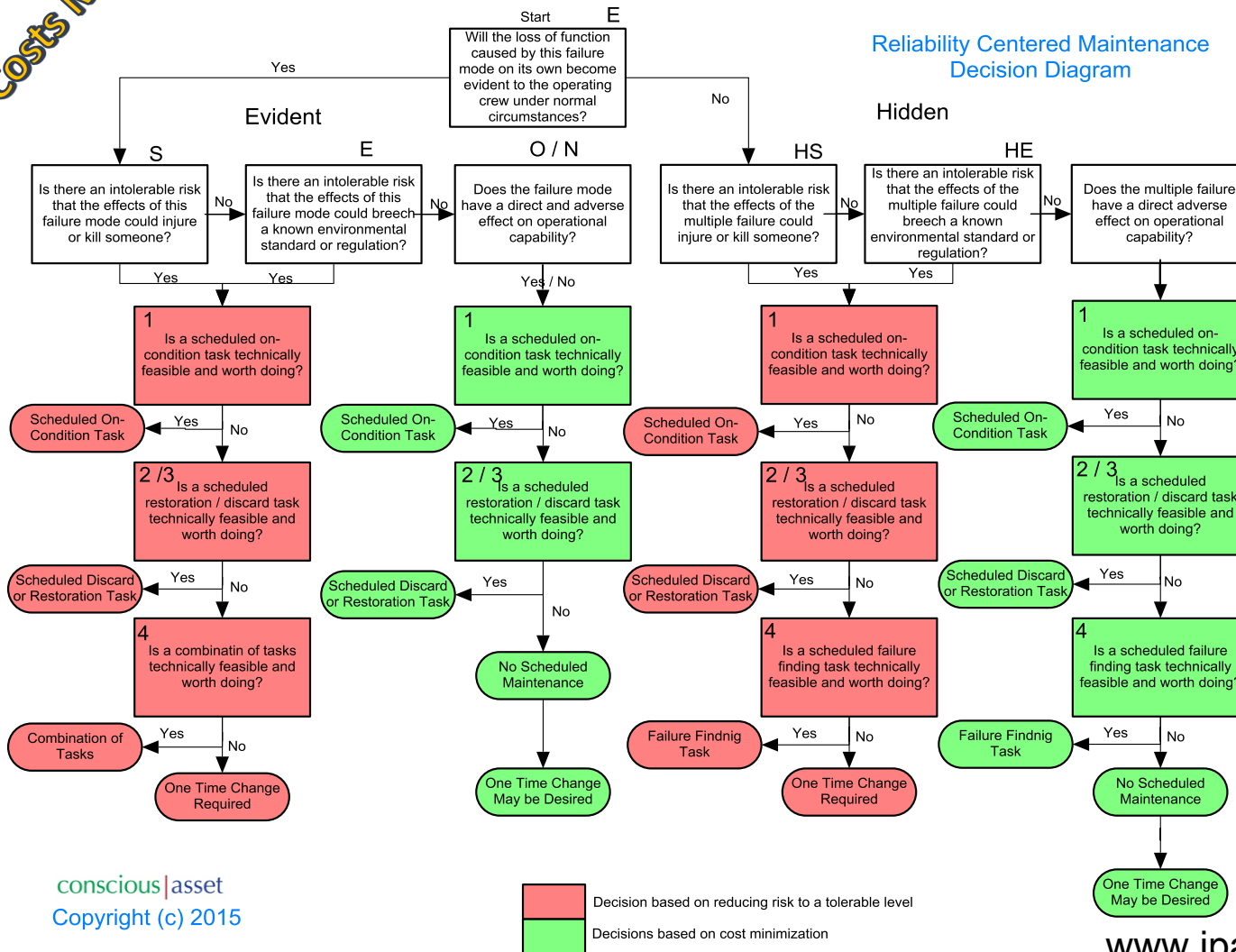
Defining Failure Management Strategies (RCM)

- Assets fail in different ways

- RCM predicts how assets can fail, matches each failure to an action (tactic) appropriate to its failure type, then confirms it is "worth
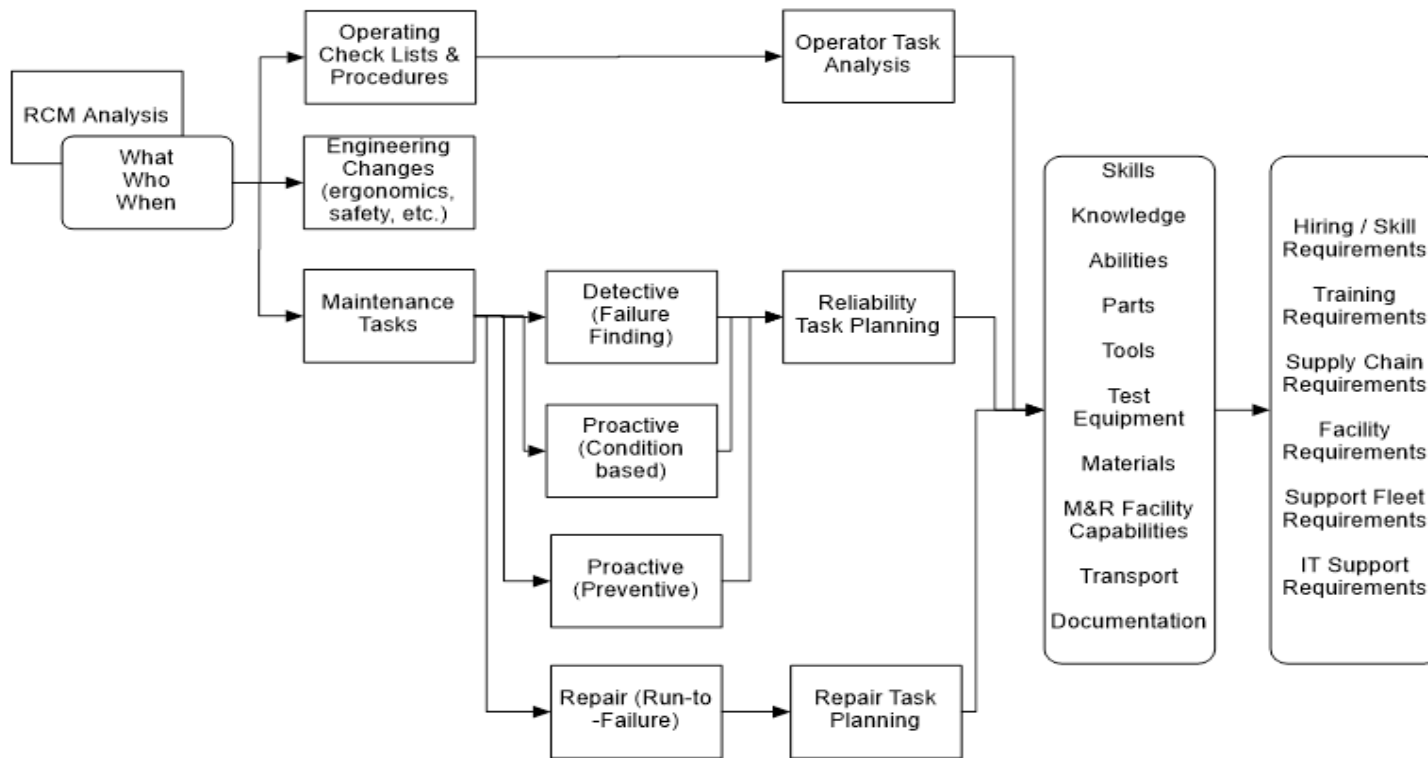

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Leverage RCM - Full LC Support Definition

Definition of Life Cycle Support Requirements

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Forecasting costs

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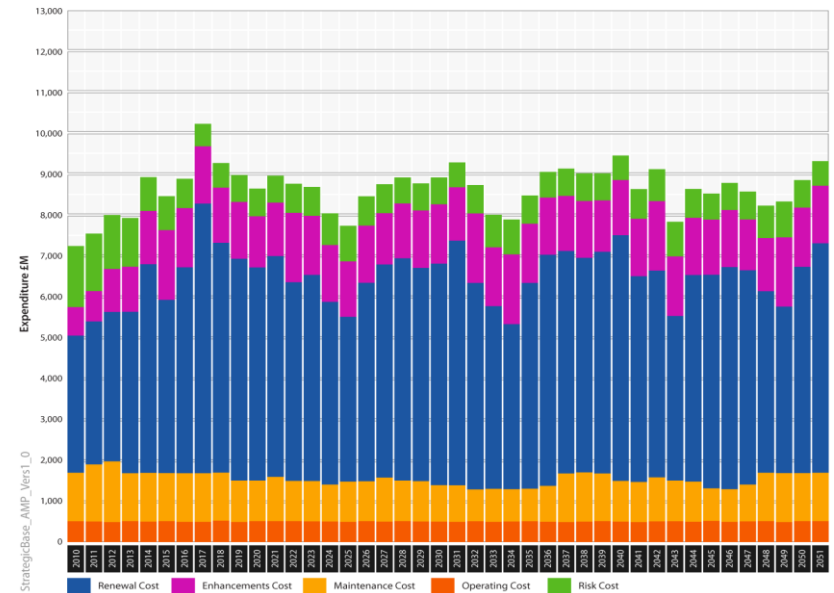
Asset Investment Planning

Base Case　　　　　**Not enough funding**

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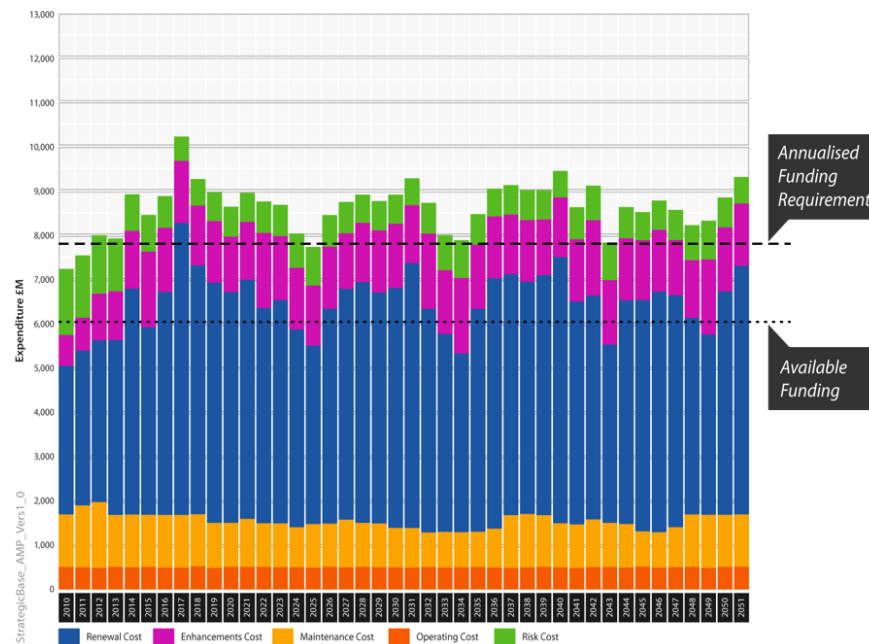
AM in your organization today

- You probably have many elements in place already

- They may not be integrated in a cohesive plan linked to overall corporate strategy

- May need refinement, coordination, collaboration and some glue to hold it all together in order the achieve compliance

- However, despite all the chaos, you may be closer than you think

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Are you there yet?
Self Assessment Exercise

- Determine which description fits best
  - Level 0, 1, 2, 3 or beyond ISO
  - Level 3 is full compliance to ISO 55001

- If you think you are doing what ISO says,
  - Do you have the process documented?
  - Is there evidence (records) to show that the process is followed?
  - Would you be able to satisfy an auditor of compliance to the process?
  - Can you show it is being followed consistently?

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Thanks for Your Attention

Any Question?