

Strategy and Planning

Asset Management Decision-Making

Lifecycle Delivery

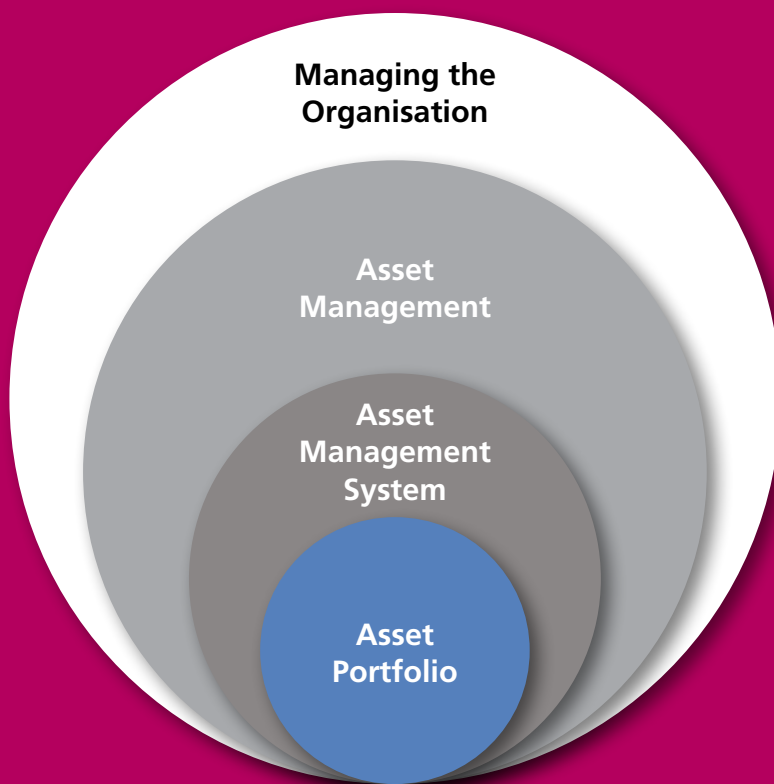
Asset Information

Organisation and People

Risk and Review

Contingency Planning & Resilience Analysis

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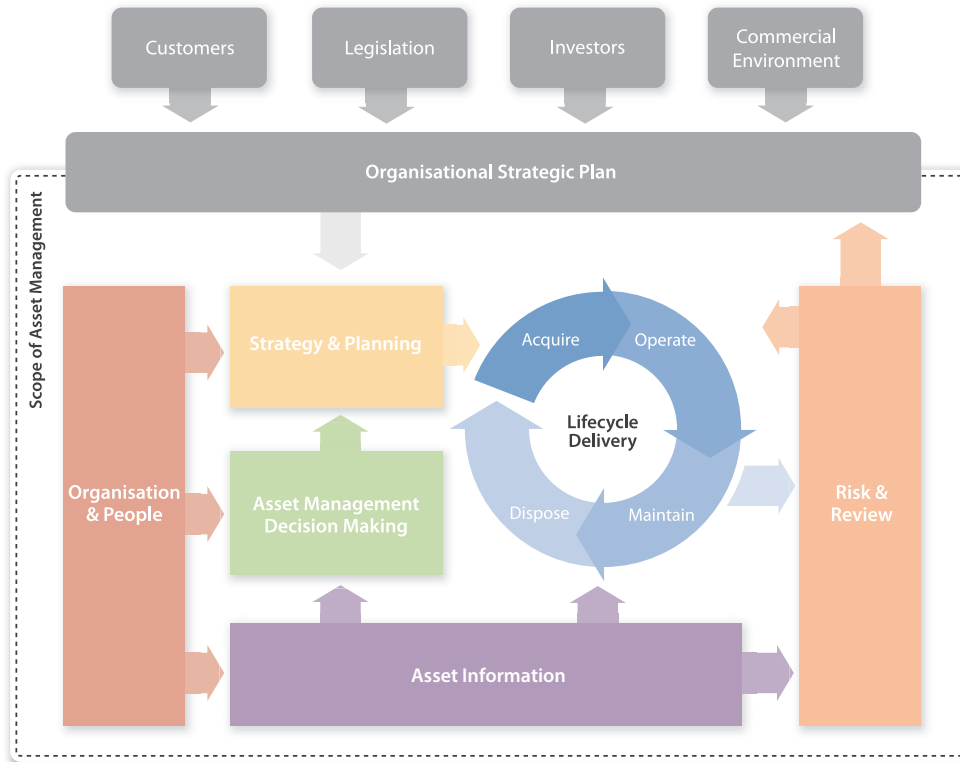
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The scope of Asset Management



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Group 1

1. Asset Management Policy
2. Asset Management Strategy & Objectives
3. Demand Analysis
4. Strategic Planning
5. Asset Management Planning

Group 2

6. Capital Investment Decision-Making
7. Operations & Maintenance Decision-Making
8. Lifecycle Value Realisation
9. Resourcing Strategy
10. Shutdowns & Outage Strategy

Group 3

11. Technical Standards & Legislation
12. Asset Creation & Acquisition
13. Systems Engineering
14. Configuration Management
15. Maintenance Delivery
16. Reliability Engineering
17. Asset Operations
18. Resource Management
19. Shutdown & Outage Management
20. Fault & Incident Response
21. Asset Decommissioning & Disposal

Group 4

22. Asset Information Strategy
23. Asset Information Standards
24. Asset Information Systems
25. Data & Information Management

Group 5

26. Procurement & Supply Chain Management
27. Asset Management Leadership
28. Organisational Structure
29. Organisational Culture
30. Competence Management

Group 6

31. Risk Assessment & Management
32. Contingency Planning & Resilience Analysis
33. Sustainable Development
34. Management of Change
35. Assets Performance & Health Management
36. Asset Management System Monitoring
37. Management Review, Audit & Assurance
38. Asset Costing & Valuation
39. Stakeholder Engagement

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1 Introduction

1.1 Purpose of the SSGs

This document provides guidance for good asset management. It is part of a suite of Subject Specific Guidance (SSG) documents that explains the 39 subject areas identified in “Asset Management – an Anatomy”, also published by the Institute of Asset Management. These subject areas are also acknowledged by the Global Forum for Maintenance and Asset Management as the “Asset Management Landscape”.

ISO 55001 (and PAS 55 previously) sets out requirements which describe what is to be done to be competent in asset management, however it doesn't offer advice on how it should be done. The SSGs are intended to develop the next level of detail for each subject in the Anatomy. They should therefore be read as guidance; they are not prescriptive, but rather intended to help organisations by providing a consolidated view of good practice, drawn from experienced practitioners across many sectors.

The SSGs include simple as well as complex solutions, together with real examples from different industries to support the explanatory text because it is understood that industries and organisations differ in scale and sophistication. In addition, they are at different stages of asset management; some may be relatively mature while others are at the beginning of the journey.

Accordingly, there is flexibility for each organisation to adopt their own ‘fit for purpose’ alternative practical approaches and solutions that are economic, viable, understandable and usable. The underlying requirement for continual improvement should drive progress.

ISO 55001 specifies the requirements for those aspects of asset management that can be captured and documented in a management system and as such it is a part of the management systems family of standards. ISO management system standards provide a model to follow when setting up and operating a management system. Like all our standards, they are the result of international, expert consensus and therefore offer the benefit of global management experience and good practice. Many ISO management system standards have the same structure and contain many of the same terms and definitions. This is particularly useful

for those organisations that choose to operate a single (sometimes called “integrated”) management system that can meet the requirements of two or more management system standards simultaneously.

But the discipline of asset management is broader than creating a management framework. It also includes the underlying concepts and philosophy as well as the knowledge and skills needed to support it and these areas are where the Anatomy focuses to place the management system for asset management in the context of the wider discipline.

1.2 The SSGs in context

The SSGs are a core element within the IAM Body of Knowledge and they have been peer reviewed and assessed by the IAM Expert Panel. They align fully with the IAM's values and beliefs that relate to both the development of excellence in the asset management discipline and provision of support to those who seek to achieve that level of excellence.

1.3 SSGs and the issue of Complexity versus Maturity

It is important to understand and contrast these terms. Put simply:

- The complexity of the business will drive the complexity of the solution required; and
- The maturity of the organisation will determine its ability to recognise and implement an appropriate solution.

A very mature organisation may choose a simple solution where a naive organisation may think that a complex solution will solve all its problems. In truth, there is no universal best practice in Asset Management – only good practice that is appropriate for the operating context of any particular organisation. What is good practice for one organisation may not be good practice for another.

For example, an organisation that is responsible for managing 100 assets, all in the same location, could use a spreadsheet-based solution for an Asset Register and work management system. This is arguably good practice for that organisation.

However, for a utility business with thousands of distributed assets, this is unlikely to represent a good practice solution. When reading the SSGs, the reader should have a view of the complexity and maturity of the organisation and interpret the guidance that is offered in that context.

1.4 The Anatomy

This Subject Specific Guidance (SSG) is part of the suite of documents designed to expand and enrich the description of the Asset Management discipline as summarised in the IAM's document 'Asset Management – an Anatomy' (referred to throughout this document as 'the Anatomy').

The Anatomy provides a starting point for development and understanding of an Asset Management capability and the SSGs follow on to support that further. However, the opportunity doesn't end there; the IAM provides a range of expert and general opinion and knowledge which is easily accessed by members through the IAM website.

ISO 55001/2/3 are the formal standards for the implementation of an Asset Management System, setting out the minimal requirements an organisation would need to meet to gain accreditation to that specification or standard. For any organisation or individual wanting to master the discipline, knowledge of ISO 5500x is not the whole picture. As well as the standard and management system aspects, they need to understand the full breadth and depth of the component parts that make up the landscape of Asset Management and this is supported through the SSGs.

Standards could therefore be regarded as 'what' is required for an Asset Management System. This SSG, as one of many being developed by the IAM, supports the 'how' to deliver the component parts and in its development has tried to cover the range of industry sectors currently associated with the IAM and recognise that differences in levels of maturity and operating contexts exist within those sectors and the organisations within them. To provide additional context this SSG provides case study examples from different sectors to demonstrate the key points of guidance. However, any document generic enough to be applied to multiple industry sectors must be at a relatively high level of detail.

Those familiar with ISO 55002 will be aware that this specification itemises 25 requirements areas for organisations seeking to demonstrate good Asset Management practices. These requirements are a clear foundation for implementing and operating an Asset Management System. They are, however, distinct from the capabilities such organisations need – these are the 39 Subjects described in the Anatomy.

The Asset Management Anatomy has been built around 6 Subject Groups and 39 subjects and now provides a stable platform on which the IAM can develop SSGs. These six subject groups and 39 subjects are also aligned with The Asset Management Landscape (published by The Global Forum on Maintenance and Asset Management) to facilitate the exchange and alignment of maintenance and asset management knowledge and practices. *The SSGs cover the 39 Subjects in The Anatomy directly as a 'one to one' (where a subject is very broad) or grouped (where subjects are very closely related).*

The six Subject Groups are:

- Strategy and Planning.
- Asset Management Decision-Making.
- Lifecycle Delivery.
- Asset Information.
- Organisation and People.
- Risk & Review.

2 The purpose, intended use, and intended audience of this SSG

This SSG specifically pertains to the Contingency Planning & Resilience Analysis subject area of the Asset Management Subject Groups, specifically Section 6.6.2 of the Asset Management Anatomy (Version 3). It will become part of the full series of SSGs covering all 39 Subjects and a smaller series of Sector Specific Guidelines (where these are desired by a particular sector).

The reader should note that the Anatomy and the SSGs are reference documents which discuss critical elements of the educational process to provide an understanding of the scope of Asset Management, while the ISO standards provide a consistent way to approach implementation and a method of measurement of an organisation's level of achievement in putting their understanding into practice. These SSGs are not designed as text books or course material, but as reference documents for professionals working in or requiring guidance in this field. We would expect everybody involved in asset management to have a working knowledge of the 39 Subjects, but the degree to which they might need deep or specialist knowledge will depend on the job or task they perform.

Meaning

Contingency Planning & Resilience Analysis is the processes¹ and systems to ensure an organisation² can continue to operate its assets to deliver the required level of service³ in the event of an adverse impact or maintain the safety and integrity of the assets (whether or not they operate). [IAM Anatomy Version 3, 3.1.6 Group 6]

Contingency Planning & Resilience Analysis covers the processes and systems put in place by an organisation to ensure that it is either able to maintain the services delivered by its assets⁴ despite serious events⁵, incidents⁶ or disasters, or is able to recover these services within

an acceptable period. Responding to failures and incidents is addressed within Fault & incident response (see 6.3.10).

Resilience is the ability of a system or organisation to withstand and recover from adversity. The resilience of assets and asset systems is initially established during asset creation, through the use of systems engineering (see 6.3.3) and reliability engineering (see 6.3.6).

Intended Audience

The environment within which an organisation and its assets operate may well change over time, so to maintain acceptable levels of resilience, it is essential that a full awareness of the critical points of an organisation and its assets is captured. The audience for this SSG is all personnel concerned with maintaining and recovering these critical services over time. An understanding of the minimum requirements⁷, to ensure the organisation or asset can operate, must be developed and an assessment of all potential threats completed. These threats may include natural occurrences (such as flooding, storms, or extreme temperatures) and accidental or deliberate events. If this is your responsibility, you meet the criteria for the intended audience for this SSG.

Intended Use

Once this understanding is achieved and a detailed risk⁸ assessment is complete, contingency planning can be introduced to deal with the majority of the threats faced. Adopting a consistent methodology can ensure that all threats and vulnerabilities are captured, and effectively risk assessed, that responses, other mitigations and contingency plans are developed, tested and exercised and a review process introduced. This approach to business continuity⁹ typically contains the following steps:

1. ISO 22301:2012 3.40 set of interrelated or interacting activities which transforms inputs into outputs.
2. ISO 22301:2012 3.33 person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its objectives.
3. ISO 55000:2014 3.1.8 parameters, or combination of parameters, which reflect social, political, environmental and economic outcomes that the organisation delivers.
4. ISO 55000:2014 3.2.1 Item, thing or entity that has potential or actual value to an organisation.
5. ISO 22301:2012 3.17 occurrence or change of a particular set of circumstances.
6. ISO 55000:2014 3.1.8 unplanned event or occurrence resulting in damage or other loss; ISO 22301:2012 3.19 situation that might be, or could lead to, a disruption, loss, emergency or crisis.
7. ISO 22301:2012 3.46 need or expectation that is stated, generally implied or obligatory.
8. ISO Guide 73:2009 1.1 effect of uncertainty on objectives, also ISO 22301:2012 3.48
9. ISO 22301:2012 3.3 capability of the organisation to continue delivery of products or services at acceptable predefined levels following disruptive incident.

- Complete a threat and vulnerability study (sometimes referred to as a business impact analysis¹⁰), by considering the criticality of assets¹¹ against all potential threats faced. This is linked to the relevant risk assessment¹² and management processes to identify the key areas of vulnerability that need to be addressed.
- Determine and select strategies to protect, resume and recover the activities delivered by the assets.
- Develop and implement the response, introducing identified mitigations where required including detailed contingency plans.
- Regularly test^{13/14} exercise, maintain and review the mitigations and plans to ensure that the responses remain fit for purpose and feed out comes into the continual review process.

More information can be found in ISO 22301:2012, “Societal security – Business continuity management systems – Requirements”.



10. ISO 2201:2012 3.8 process of analysing activities and the effect that a business disruption might have upon them.

11. ISO 55000:2014 3.2.8 Asset having potential to significantly impact on the achievement of the organization’s objectives.

12. ISO 22301:2012 3.50 overall process of risk identification, risk analysis, and risk evaluation.

13. ISO 22301:2012 3.52 testing: procedure for evaluation; a means of determining the presence, quality, or veracity of something.

14. ISO 22301:2012 3.18 process to train for, assess, practice, and improve performance in an organisation.

3 Concepts, Principles, Key Factors & Definitions

3.1 Principles

The key principle behind Contingency Planning and Resilience Analysis is to continue operation of an organisation and the services and/or products it provides when faced with a significant disruption.

An organisation needs to consider the possibility of disruption and resultant damage to, or loss of, operational continuity. If an organisation is resilient, the risk of disruption, damage or loss to operations is lessened.

For any organisation, there will be a range of credible potential threats and/or events, however remote, which could cause disruption, damage or loss. These events, which may come from internal or external sources, may impact on assets, people and/or the environment associated with the organisation.

If an organisation has Contingency Plans in place covering a range of eventualities, the risk of disruption, damage or loss can be significantly reduced (through the implementation of mitigations), and its resilience will be increased. Therefore, a business with sufficient Contingency Planning in place to cover reasonably foreseeable eventualities and to allow it to be adaptive to *all* eventualities will be highly resilient.

A checklist for doing a Contingency Plan and Resilience Analysis can be found in Appendix D.

3.2 Key Principles and Concepts

The following, derived from 6.6.2 of the Anatomy, represents the key concepts behind Contingency Planning & Resilience Analysis. The following sections describe each of these concepts in more detail.



Figure 1: Key Concepts behind Contingency Planning and Resilience Analysis

3.3 Organisational Context and Strategy

Contingency Planning & Resilience Analysis includes the processes and systems put in place by an organisation to ensure that it is both:

- a) Able to maintain the services delivered by its assets despite serious events, incidents or disasters, and
- b) Able to recover these services within an “acceptable” timeframe.

The organisation must determine and select strategies to protect, resume and recover the activities delivered by the assets. Stakeholders within the organisation will have differing perspectives, interests and values, such as:

- Corporate values;
- Reputation;
- Operations values;
- Ability to produce;
- Environmental values (a small carbon footprint), clean air and water;
- Safety values (a safe work environment, fewer accidents and injuries, etc.);
- Quality values fewer rejections or flaws;
- Customers value reliable service;
- Financial values revenue.

Loss of function (value) may impact any of these areas but in different ways so resilience analysis

needs to consider restoration of all of these different impacts and what constitutes an acceptable level of “recovery”. Each value system may have a different scale for the same threat because value is perceived by the stakeholder. The likelihood of a threat occurring and the impact on the organisation as a result of the said threat occurring will help the organisation determine the best approach to prevent the occurrence or minimise any adverse effect should the threat become realised.

Within the organisation there will always be priorities and it is up to each organisation to determine the order and priority of recovery in alignment with their values and stakeholders, as well as determining ways to normalise the priority/threat level scores so that an optimal approach is selected.

Organisations are comprised of people, so organisational resilience is also a factor of the ability of the people to recover from major setbacks, disappointment etc. This covers several aspects such as making sure internal communications are effective (both peer to peer and up and down the management structure), making sure staff are well equipped to do their jobs, and making sure staff are mentally prepared. Personal resilience can thus be developed and improved by training.

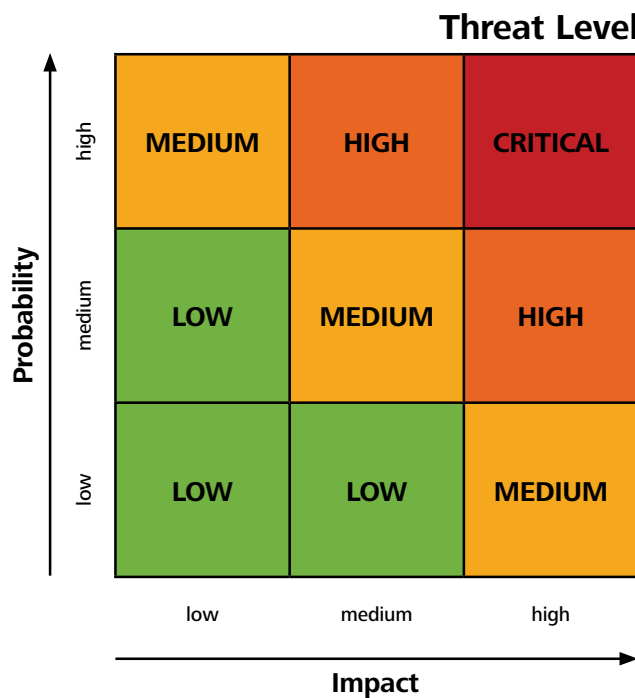


Figure 2: Example of a Simple Matrix to help determine the approach to take base on a threat level