The Institute of Asset Management

Strategy and Planning

Asset Management Decision-Making

Shutdown and Outages Strategy and Management

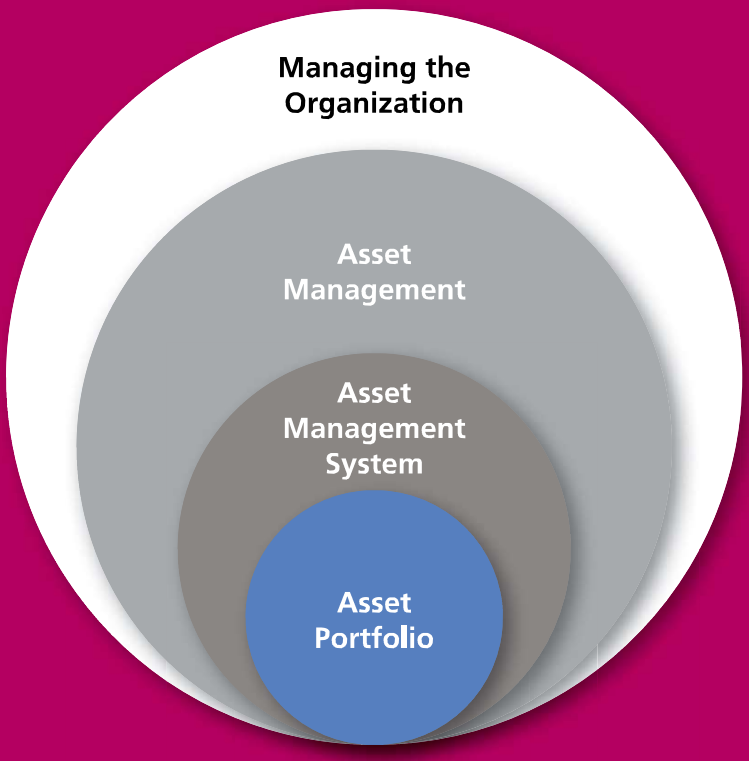
Life Cycle Delivery

Asset Information

Organization and People

Risk and Review

Version 1 July 2022



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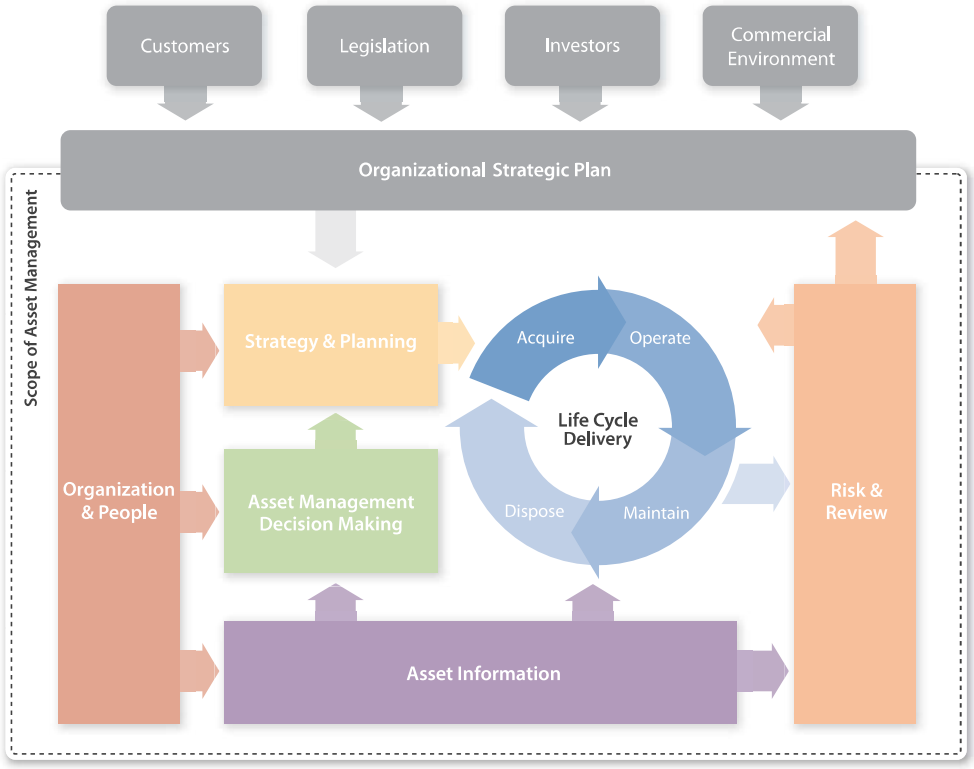
The Scope of Asset Management



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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. Life Cycle Value Realization
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. Organizational Structure
29. Organizational 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

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

1.1 Purpose of the SSGs

This document provides guidance for good practice asset management. It is part of a suite of Subject Specific Guidelines 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".

PAS55 and ISO 55001 set out requirements which describe ***what*** is to be done to be competent in asset management, however they don'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 organizations 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 organizations 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 organizations 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.

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 organization will determine its ability to recognize and implement an appropriate solution.

A very mature organization may choose a simple solution where a developing organization 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 organization. What is good practice for one organization may not be good practice for another.

For example, an organization that is responsible for managing 100 assets, all in the same location, could use a spread sheet-based solution for an Asset Register and work management system. This is arguably good practice for that organization. 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 organizations and interpret the guidance that is offered in that context.

1.4 Further Reading

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.

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2 Applicability and Scope of this SSG

2.1 Purpose of this SSG

This SSG has been developed in recognition that the most significant cost across the life cycle of an asset occurs through the maintain and operate phase. To ensure assets continue to maintain their function the optimum maintenance and inspection strategy must be selected. Often these strategies require the asset to be taken out of service or configured in such a way that service is impaired to execute maintenance, replace or upgrade. The requirements will be business and industry specific and driven by the relevant value drivers for the organization at the point in time. The default position would be to identify an asset management strategy that can be deployed that does not require a shutdown/outage, however due to a range of possible constraints this may not be economically or technically feasible. Furthermore, failure of an asset or identification of a potential failure may result in a decision to force a shutdown or shutdown/outage earlier than originally intended or an additional shutdown/outage to implement corrective solution. Thus, an organization must ensure processes for identification, planning, scheduling, delivery and control of work related to shutdowns or shutdown/outages are in place and identify risks and any contingency plans needed. These include policies and processes for the implementation of the shutdown and outage ***strategy*** to ensure the effective ***management*** of shutdowns and outages, and to drive a culture of continuous improvement to optimize performance.

The complexity of a shutdown/outage will be increased when maintenance and inspection activities are combined with capital engineering activities for new/upgraded assets. This will require greater attention to coordination of resources and integration of overall preparation, planning, scheduling and execution activities.

This SSG has been created to provide guidance to organizations which require shutdowns/outages. This document covers both strategic and tactical elements of shutdown management. It is intended to mesh with other SSGs, e.g., 'Reliability Engineering,' and is meant to provide guidance, but is not exhaustive.

2.2 ISO 55001 and the AM Landscape

Applying the International standards for Asset Management represents a good path for organizations interested in improving their asset management practices following a recognized and structured framework.

ISO 55000 describes the four fundamentals, and these are considered in writing this SSG.

Value: Assets exist to provide value to the organization and its stakeholders

Alignment: Asset management translates the organizational objectives into technical and financial decisions, plans and activities

Leadership: Leadership and workplace culture are determinants of realization of value

Assurance: Asset management gives assurance that assets will fulfil their required purpose.

ISO 55001 is the formal standard for the development, implementation and maintenance of an Asset Management System, setting out the minimal requirements an organization would need to meet to gain accreditation to that standard. For any organization or individual wanting to master the discipline, knowledge of ISO 55001 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.

The authors have also considered in this SSG the key components of ISO 55001 which are leadership, stakeholder management, planning and performance evaluation, and establishing the required support systems.

Standards could, therefore, be regarded as 'what' is required for an Asset Management System. These SSGs 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 recognize that differences in levels of

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maturity and operating contexts exist within those sectors and the organizations within them. To provide additional context these SSGs provide 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 55001:2014 will be aware that this standard itemizes the 71 'Shall' Statements and 24 requirements for organizations seeking to demonstrate good Aasset management practices. These requirements are a clear foundation for implementing and operating an Asset Management System. They are, however, distinct from the capabilities such organizations need. The Anatomy has been built around six subject groups and 39 subjects (see figure 1) and provide a stable platform on which the IAM can develop Subject Specific Guidance documents.

These six subject groups and 39 subjects are also aligned with The Asset Management Landscape 4 (published by The Global Forum on Maintenance and Asset Management) to facilitate the exchange and alignment of maintenance and asset management knowledge and practices.

This SSG specifically pertains to shutdown and outage strategy and management which sit, respectively, within the asset management decision-making (Group 2) and life cycle delivery activities (Group3) areas of the asset management subject groups. It is part of a full series of SSGs covering all 39 subjects.

These are not designed as textbooks or course material but as reference documents for professionals working in or requiring guidance in this field. They provide guidance in reviewing current organizational policies, practices and work management processes to drive consistency.

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.

Figure 1: Figure 1: Asset Management - an anatomy - six subject groups, 39 subjects

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2.3 The Asset Management Life Cycle

The shutdown and outage methodology spans the entire life cycle of an asset and the key phases are illustrated in Figure 2. The red curve illustrating how costs and risks are incurred, the green curve representing asset health and benefits derived from asset utilization.

Shutdowns and outages are likely to be required in each of the phases of the asset's life cycle

- Creation and acquisition including identification of need – business developing shutdown / outage strategy and objectives, and outage for new asset installation or upgrade
- Utilize & maintain – upgrade/update/reconfigure/ manage failure
- Dispose and or replace – renew/recycle/replace

The approach to shutdowns and outages will vary across industries but fundamentally the core stages will be similar. The group developing this SSG considers life cycle as a central component of this document, and this document is based on the assumption that most people who read this SSG will be people who have existing assets, or are in the process of creating or acquiring assets, and are looking at better ways to manage the shutdown and outage associated with them. For this reason, this SSG focuses on the "utilization and maintenance" phase of the asset life cycle. However, the decisions made at the creation/acquisition phase of the life cycle will influence the need for and frequency of shutdowns/outages. Likewise, the decisions on asset replacement and/or renewal will influence shutdown work scopes and timing.

Shutdowns/outages typically are costly to execute and require large numbers of skilled (and often scarce) resources working within a tight timeframe to complete the work scope. A shutdown /outage ***strategy*** will focus on establishing the strategic approaches to managing key elements and determine the optimal shutdown work scope and frequency. This will lead on to developing processes for ***managing*** the work activities effectively, efficiently and safely within the available shutdown/ outage window and require considerable planning and enabling works.

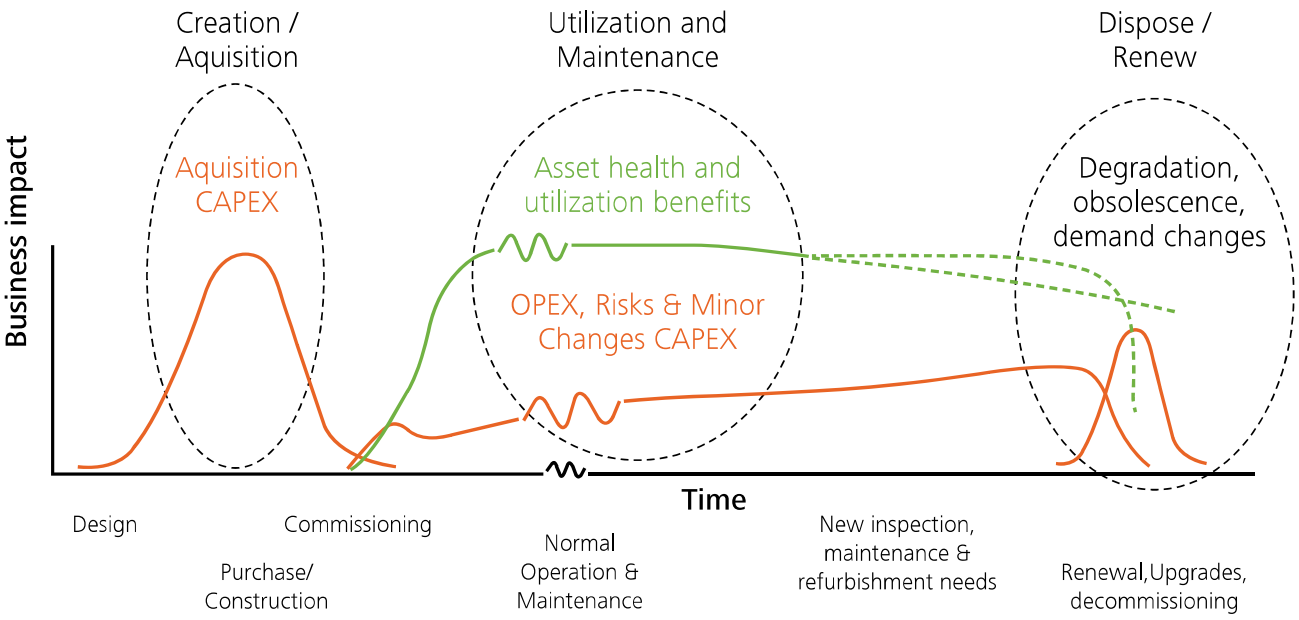

Figure 2: Life cycle of an asset

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2.4 Navigating and using this document

Introduction and application of SSG (Sections 1-2)	Purpose of the SSG and how it relates to ISO 55000/55001 and Asset Management Landscape
What is a Shutdown/Outage? (Section 3)	Definitions, scope and overview of management and strategy for shutdowns and outages
Concepts, Principles and Key Factors (Section 4)	High level summary of the important considerations, concepts, principles, classification of shutdown/outage and optimization with strategy and management and phases. Overview of key phases considered as a cycle.
Detail by Phases (Sections 5-9)	Highlights practices and tools to manage through the phases, this is not exhaustive, and competencies may apply across phases. Emphasizes the importance of managing and measuring performance and driving a culture of continuous improvement and indicative KPI's.
New and leading Technology (Section 10)	Some insights into latest approaches to management of outages and digital technologies
Case Studies (Section 11)	Industry examples where management and strategic thinking have delivered improved performance

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