Chapter 29
ISO 55000 Series Standards

Abstract The aim of this chapter is to provide a guide to the ISO 55000 series of Asset Management standards, published by the International Standards Association. *Outcomes* Reading this chapter will provide information on the requirements of the ISO 55000 series of standards and give cross-references to the relevant sections in this book and in other publications. This will help you in assessing, developing, and demonstrating the extent to which your organization complies with the standard.

29.1 Introduction

ISO 55000 series standards are standards which describe and specify requirements for the implementation of physical asset management in asset intensive organizations. This chapter provides a guide to the ISO 55000 series of standards. The Global Forum on Maintenance and Asset Management (GFMAM) has a certification scheme under the standard. For more information on this please contact your local asset management society, the web addresses of which are listed under web references in the Bibliography at the end of this book.

The ISO 55000 series of standards, like the ancient kingdom of Gaul, is divided into three parts. The document references are:

ISO 55000 Asset management—Overview, principles, and terminology. ISBN 978 0 580 86467 4
ISO 55001 Asset management. Management systems—Requirements. ISBN 978 0 580 75128 8
ISO 55002 Asset management. Management systems—Guidelines for the application of ISO 55001. ISBN 978 0 580 86468 1.

The roles of the three parts are summarized in Fig. 29.1.

ISO 55000 provides a general overview of asset management, a statement of fundamental principles, and a set of definitions of terms.

Fig. 29.1 The three parts
of the ISO 55000 series of
standards

ISO55000 –Overview, principles and terminology

ISO55001 – Requirements

ISO55002 – Guidelines
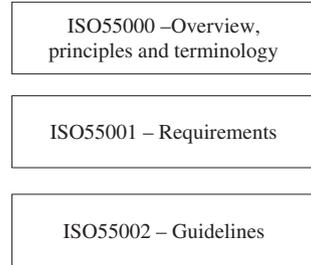
ISO 55001 contains a series of clauses which detail the *requirements* of the standard. There are "shall" clauses, stating what an organization needs to do to comply with the standard.

ISO 55002 contains clauses with the same headings as in ISO 55001. Under each heading it gives *guidelines* as to how the requirements of the corresponding clause of ISO 55001 should be implemented.

These standards provide a general framework for the management of physical assets. The adoption of ISO 55000 can provide:

- A structured view and understanding of asset management;
- Effective relationships between top management, asset management, operations, and maintenance;
- Improvements in asset financial returns;
- Well-informed asset management decisions;
- Insurance, health and safety, regulatory, and risk management benefits;
- Company recognition/marketing; and
- Improvements in training and development.

The ISO 5500 standards do not provide the specific detail of the many techniques involved in asset management. Besides knowing which techniques are relevant to any clause, we need the detail of that technique. This book, and the references and standards listed at the end of this book, present details of asset management techniques and procedures needed to implement an ISO 55000-based asset management system.

29.1.1 ISO 55000 Fundamentals

ISO 55000 lists the fundamentals on which asset management is based. These include an alignment between organizational and asset management objectives, the use of a lifecycle management approach, awareness of stakeholder needs, the use of a risk-based approach to decision making, and the integration of asset management with related functions including finance, human resources, logistics, operations, and information systems. Leadership and the definition of roles and responsibilities are emphasized. Key topics are planning, support, operations, performance evaluation, and continuous improvement.

29.1.2 ISO 55001 and ISO 55002

ISO 55001 Management Systems Requirements, details the requirements of the standard. ISO 55002 Management Systems Guidelines provides guidelines for the application of an asset management system based on ISO 55001. The clause headings in ISO 55001 and ISO 55002 are the same, so that each clause in ISO 55002 gives information about the implementation of the corresponding clause in ISO 55001. The clauses are considered in detail in the next section.

29.2 ISO 55001 Clauses and Book Cross-References

The requirements of the standard are indicated in ISO 55001. This section lists the clauses in ISO 55001, and for each one I quote a short extract in italics which indicates the primary intent of the clause. References are then given to sections of this book, and other documents or techniques, which can provide information to assist in meeting the requirements of the standard. Application guidelines are also provided in ISO 55002 under the same clause numbers.

1. **Scope**
    This clause describes the scope of the standards.

2. **References**
    A bibliography of general standards in the field is given in ISO 55000.

3. **Terms and definitions**
    A list of terms and definitions given in ISO 55000, Clause 3. It is recommended that you use the same definitions. In your documentation, add extra terms and definitions which apply to your application, including abbreviations and acronyms.

4. **Context of the organization**

    4.1 **Understanding the organization and its context**

    The organization shall determine issues … that affect … its asset management system. Asset management objectives … shall be aligned to … organizational objectives.

    Relevant sections of this book are:

    1.5 Asset Management Role
    1.7 What is Asset Management?
    1.8 Aim of Asset Management
    1.9 The Asset Life Cycle
    1.10 Asset Management Basic Questions
    Figure 1.9 Asset management a gray area?
    Figure 1.12 Business activities and asset management.

Notes In the SAMP, give a background statement on external and internal issues that affect the asset management system. State organizational objectives (e.g., maximize profit, provide community service). Describe how asset management objectives are aligned with organizational objectives, quoting committee arrangements, and processes involved in this alignment.

4.2 **Understanding the needs and expectations of stakeholders**

The organization shall determine the stakeholders … the expectations of these stakeholders…

Relevant sections of this book are:

In the SAMP, list stakeholders and outline their expectations.

4.3 **Determining the scope of the asset management system**

The organization shall determine the boundaries of the asset management system…

Relevant sections of this book are:

13.1 Information System Role and Applications
Figure 13.1 Asset management information system

Identify the range of assets to which the system applies. Use maps, diagrams, or Tables.

4.4 Asset management system

The organization shall establish … an asset management system…

In the SAMP, identify the flow charts and organization charts that authorize and define the asset management system. Give references to the main documents used within the system.

Relevant sections of this book are:

Figure 2.1 Asset management in the business context
Figure 2.2 Asset management in the organization
Chapter 2 Structure and Activities
Chapter 3 Asset Management Personnel
Chapter 13 Asset Management Information Systems
Chapter 7 Implementing Development Plans
Chapter 11 Management of In-service Assets
Chapter 12 Capital Planning and Budget
Chapter 19 Maintenance Organization and Budget

The organization shall develop a SAMP…

Check the definition of the SAMP given in ISO 55000, Clause 3.3.2. It might be different from what you expect.

Relevant sections of this book are:

29.4 Strategic Asset Management Plan (SAMP)

5. Leadership

5.1 Leadership and commitment

Top management shall demonstrate leadership and commitment to the asset management system.

Relevant sections of this book are:

Figure 2.2 Asset management in the organization
2.3 Chief Asset Manager Role
Chapter 3 Asset Management Personnel
3.9. Leadership
13.3 Resourcing and Managing the System
Chapter 15 Risk Analysis and Risk Management
18.5 Continuous Improvement
18.6 Improvement Coordinator

Additional reference:

J.R. Lafraia and J. Hardwick, *Living Asset Management*. ISBN 978-1-922107-25-1.

Specific points mentioned in the standard include:

- Establishing consistent organizational and asset management objectives
- Integrating the asset management system into the business process
- Making resources available for asset management
- Promoting continuous improvement
- Managing risk

5.2 **Policy**

Top management shall establish an asset management policy.

An asset management policy statement is required.

Relevant sections in this book:

2.9 Asset Management Policy

Figure 2.7 An asset management policy statement

5.3 **Organizational roles, responsibilities, and authorities**

Top management shall assign the responsibility and authority for…

- Establishing the SAMP
- Meeting the requirements of the ISO 55000 series standard
- Ensuring the effectiveness of the asset management system
- Establishing asset management plans
- Reporting on asset management performance

Relevant sections in this book are:

Chapter 2 Structure and Activities

2.2 Asset Management in the Organization

Figure 2.2 Asset management in the organization

2.3 Chief Asset Manager Role

2.5 Asset Management Groups

3.5 Roles, Responsibilities and Authorities

3.6 Engineering and Maintenance Roles

7.10 Assigning Responsibilities

Figure 7.5 RACI chart

Chapter 28 Performance, Audit and Review

28.4 Audit of the Asset Management System

28.5 Management Review

29.4 Strategic Asset management Plan (SAMP)

6.   **Planning**

6.1 **Actions to address risks and opportunities**

The organization shall plan actions to address risks and opportunities…

Relevant sections in this book are:

Chapter 15 Risk Analysis and Risk Management
22.2.2 Risk-Based Inspection
The following are references to risk related techniques.

- ISO 31000 and ISO 31010. Risk analysis and risk management:
- IEC 60300-3-9. Risk analysis of technological systems:.
- IEC 61882:2002. Risk analysis in chemical plants and other high risk environments:
- IEC 61882 HAZOP—Hazard and Operability Studies. Standard: Hazard and Operability Studies Application Guide.
- API 580 and API 581 Risk-Based Inspection. Oil and gas industries.

Opportunities: Relevant sections in this book are:

1.9 The Asset Life Cycle
2.1 Business Strategy and Asset Management
2.8 Asset Management Activities
2.13.3 Holiday Resort Exercise
4.1 Project Initiation
6.3 Business Case Outline
Figure 11.3 In-service asset management, planning, and budgeting.
12.9 Capital Budgeting Cycle
13.1 Information System Role and Applications
14.6 Lost Opportunity Cost

6.2 **Asset management objectives and planning to achieve them**

6.2.1 **Asset management objectives**

The organization shall establish asset management objectives…

Relevant sections in this book are:

28.1 Key Performance Indicators
2.9 Asset Management Policy
5.4 Asset Investment Criteria
Chapter 14 Cost–Benefit Analysis
Chapter 23 Profit, Depreciation and Tax
Chapter 21 Reliability, Availability, and Maintainability
Chapter 22 Safety

6.2.2 **Planning to achieve asset management objectives**

The organization shall integrate planning to achieve asset management objectives with other … planning activities…

Relevant sections in this book are:

2.10 Asset Management Plans
Chapter 4 From Concept to Project Approval
4.3 Business Development Planning
4.5 Capability Requirements Planning
4.5.2 Demand Analysis and Forecasting
4.12 Considerations in Development Planning
Chapter 5 Financial Methods
Chapter 6 Developing a Business Case
Chapter 7 Implementing Development Plans
Chapter 8 Life Cycle Costing
Chapter 10 Asset Continuity Planning
Chapter 11 Management of In-service Assets
Figure 11.3 In-service asset management, planning and budgeting.
Chapter 12 Capital Planning and Budget
Chapter 19 Maintenance Organization and Budget
Chapter 16 Outsourcing
Chapter 23 Profit Depreciation and Tax
Chapter 14 Cost–Benefit Analysis
Chapter 26 Equipment Replacement Decisions

The organization shall establish … asset management plans…

Asset management plans are required.

Relevant sections in this book are:

4.3 Business Development Planning
4.5 Capability Requirements Planning
4.5.2 Demand Analysis and Forecasting
4.12 Considerations in Development Planning
Chapter 6 Developing a Business Case
Chapter 7 Implementing Development Plans
Chapter 8 Life Cycle Costing
Chapter 10 Asset Continuity Planning
Chapter 11 Management of In-service Assets
Chapter 12 Capital Planning and Budget
Chapter 19 Maintenance Organization and Budget
Chapter 14 Cost–Benefit Analysis
Chapter 17 Logistic Support
Chapter 26 Equipment Replacement Decisions

The organization shall ensure that … risks are considered … including contingency planning.

Relevant sections in this book are:

Chapter 15 Risk Analysis and Risk Management

7. **Support**

7.1 **Resources**

The organization shall determine and provide the resources needed for … the asset management system.

Relevant sections in this book are:

Chapter 2 Structure and Activities
Chapter 3 Asset Management Personnel
Chapter 12 Capital Planning and Budget
Chapter 19 Maintenance Organization and Budget

7.2 **Competence**

The organization shall determine the necessary competence … ensure … persons are competent…

Relevant sections in this book are:

3.2 Competence
3.3 Required Areas of Competence
Figure 3.4 Spider diagram for competency analysis
Chapter 3 Asset Management Personnel
3.5. 3.6 Roles, Responsibilities, and Authorities
3.7 Personnel Development System
3.8 Competency Assessment
3.9 Leadership
7.14.2 Training
7.15 Change Management

7.3 **Awareness**

Persons … shall be aware of … policies … benefits … risks…

Relevant sections in this book are:

2.9 Asset Management Policy
Chapter 9 Know Your Assets
Chapter 15 Risk Analysis and Risk Management
Chapter 22 Safety

7.4 **Communication**

The organization shall determine the need for … communications … what … when … with whom …how.

Relevant sections in this book are:

3.9.1 Communication and Response

7.5 Information requirements

The organization shall determine its information requirements…
The organization shall … implement … processes for managing its information.

Relevant sections in this book are:

Chapter 13 Asset Management Information Systems
13.1 Information System Role and Applications
Figure 13.1 Asset management information system
11.8 Configuration Management

The organization shall determine the requirements for alignment with financial … terminology…

The organization shall ensure there is consistency … between financial and technical data…

Relevant sections in this book are:

1.5 An Accountant's View of Assets
Chapter 5 Financial Methods
Chapter 6 Developing a Business Case
Chapter 23 Profit, Depreciation, and Tax
Chapter 27 Further Financial Topics
Chapter 14 Cost–Benefit Analysis
Chapter 24 Asset Decision Examples
Chapter 25 Economic Life

7.6 Documented information

7.6.1 General

The organization's asset management system shall include … documented information…

Relevant sections in this book are:

Chapter 13 Asset Management Information Systems
13.1 Information System Role and Applications
Figure 13.1 Asset management information system
Traceable records to demonstrate conformance to the requirements of the asset management system include:
Asset register
Fault and failure records.
Maintenance action and cost records.
Asset history records.
Records of statutory compliance, e.g., pressure vessel tests.
Training records
Calibration records

7.6.2 **[Documented information] Creating and Updating**

…the organization shall ensure … identification … format …approval…

Relevant sections in this book are:

Chapter 13: Asset Management Information Systems
13.3 Resourcing and Managing the System
13.5 Document Control
13.6 Implementing Changes

7.6.3 Control of documented information

Documented information … shall be controlled…

Relevant sections in this book are:

Chapter 13 Asset Management Information Systems
13.3 Resourcing and Managing the System
13.5 Document Control
13.6 Implementing Changes

8. **Operation**

8.1 **Operational planning and control**

The organization shall … implement processes … to implement the … asset management plans…

Relevant sections in this book are:

Chapter 4 From Concept to Project Approval
Chapter 10 Asset Continuity Planning
Chapter 11 Management of In-service Assets
Chapter 16 Outsourcing
Chapter 17 Logistic Support
Chapter 18 Asset Basic Care
Chapter 19 Maintenance Organization and Budget
Chapter 20 Stock Control
Chapter 26 Equipment Replacement Decisions
Chapter 24 Asset Decision Examples

8.2 **Management of change**

Risks associated with any planned … change shall be assessed… The organization shall ensure that such risks are managed…

Relevant sections in this book are:

Chapter 7 Implementing Development plans
7.15 Change Management

8.3   **Outsourcing**

The organization shall ensure that outsourcing processes and activities are controlled.

Relevant sections in this book are:

Chapter 16 Outsourcing

9.   Pe**rformance evaluation**

9.1   **Monitoring, measurement, analysis and evaluation**

The organization shall determine … shall evaluate and report on … shall retain information … meets the requirements of… [stakeholders].

Relevant sections in this book are:

28.1 Key Performance Indicators
18.4 Performance Recording
Chapter 21 Reliability, Availability, and Maintainability
21.8 Failure Reporting and Corrective Action System
21.11 Root Cause Analysis
Chapter 22 Safety
22.2.8 Record Keeping

9.2   **Internal audit**

The organization shall conduct internal audits…

Relevant sections in this book are:

28.4 Audit of the Asset Management System
Auditors and Procedures are to be Established
Audit Records are to be Maintained
Audit Follow-up Action Procedures are to be Established.
Actions Taken are to be Recorded

9.3   **Management Review**

Top management shall review the organization's asset management system at … intervals…

Relevant sections in this book are:

28.5 Management Review
18.6 Improvement Coordinator

10. **Improvement**

   10.1 **Nonconformity and corrective action**

   When a nonconformity or incident occurs … the organization shall … react … take action … review … make changes if necessary…

   21.8 Failure Reporting and Corrective Action System (FRACAS)
   9.5 Expert teams
   Figure 9.6 Expert Team
   Figure 18.3 Continuous improvement cycle
   18.6 Improvement Coordinator
   Figure 18.5 Workplace problem report
   Chapter 21 Reliability, Availability, and Maintainability
   21.3.1 Mean Time Between Failures
   21.9 Pareto Analysis
   21.10 Failure Mode and Effects Analysis (FMEA).
   21.11 Root Cause Analysis
   21.13 Reliability Centered Maintenance (RCM)
   21.14 Maintenance Policy Review
   21.20 Maintainability
   Chapter 22 Safety
   22.2.8 Record Keeping

   10.2 **Preventive action**

   The organization shall establish processes to … identify potential failures…

   21.12 Condition Monitoring
   21.10 Failure Mode and Effects Analysis (FMEA).
   21.13 Reliability Centered Maintenance (RCM)
   22.2.2 Risk-Based Inspection (RBI)
   9.4.1 Expert Teams
   Figure 9.6 Expert team
   21.11 Root Cause Analysis

   10.3 **Continual improvement**

   The organization shall continually improve…

   18.5 Continuous Improvement
   18.6 Improvement Coordinator
   Figure 18.3 Continuous improvement cycle
   Figure 18.4 Fishbone diagram
   Figure 18.5 Workplace problem report

29.3 ISO 55001 Clauses and Figures

Table 29.1 gives a list of ISO 55001 clauses and Figures or Tables in this book which are relevant to each clause. This provides a simple visual insight into the main thrust of the clauses.

Table 29.1 ISO 55001 cross-reference summary

Clause	Topic	Related figures or tables
4.1	Understanding the organization and its context	Figure 1.12 Business activities and asset management
		Figure 2.1 Asset management in the business context
4.2	Understanding the needs and expectations of stakeholders	Figure 4.11 Stakeholder groups
		Figure 3.1Asset management a matrix activity
4.3	Determining the scope of the asset management system	Table 2.1 Asset management knowledge
		Table 2.2 Asset management activities
		Figure 9.1 Mine site assets
		Figure 9.2 A railway asset summary
4.4	Asset management system	Figure 2.1 Asset management in the business context
		Figure 2.2 Asset management in the organization
5.1	Leadership and commitment	Figure 3.2 Areas of competence in asset management
		Figure 2.4 Asset management group structure
5.2	Policy	Figure 2.7 An asset management policy statement
5.3	Organizational roles, responsibilities, and authorities	Figures 2.2 and 2.3 Asset management in the organization
		Figure 7.5 RACI chart fro acquisition project
6.1	Actions to address risks and opportunities for the asset management system	Figure 15.1 Risk management outline
		Figure 15.9 Water supply risk documents
6.2.1	Asset management objectives	Figure 1.7, Chap. 28
6.2.2	Planning to achieve asset management objectives	Figure 4.3 Capability requirements planning
		Figure 11.3 In-service asset management planning and budgeting
		Figure 4.14 Steps in the asset management process
7.1	Resources	Figure 2.4 Asset management group structure
		Figure 3.2 Areas of competence in asset management
7.2	Competence	Figure 3.4 Spider diagram for competency analysis
7.3	Awareness	Table 2.1 Asset management knowledge
7.4	Communication	Figure 3.1 Asset management a matrix activity
7.5	Information requirements	Figure 13.1 Asset management information system
7.6	Documented information	Figure 19.7 Job planners check list
8.1	Operational planning and control	Figure 19.4 Data flows in the maintenance management application
8.2	Management of Change	Chapter 7, Sect. 7.15 Change management
8.3	Outsourcing	Chapter 16 Outsourcing
9	Performance evaluation	Chapter 28 Sect. 28.1 Key performance indicators

Table 29.1 (continued)

Clause	Topic	Related figures or tables
9.1	Monitoring, measurement, analysis, and evaluation	Figure 21.8 Condition monitoring interval and delay time
9.2	Internal audit	Chapter 28, Sect. 28.4
9.3	Management review	Chapter 28, Sect. 28.5
10.1	Nonconformity and corrective action	Figure 21.1 In-service reliability management
		Figure 9.6 Expert team
10.2	Preventive action	Figure 19.1 Maintenance organization
		Figure 21.7 Condition monitoring techniques and medical parallels
10.3	Continual improvement	Figure 18.3 Continuous improvement cycle
		18.6 Improvement coordinator
		Figure 18.4 Fishbone diagram
		Figure 18.5 Workplace problem report

29.4 Strategic Asset Management Plan (SAMP)

ISO 55001 at Clause 4.4 states that:

> The organization shall develop a Strategic Asset Management Plan…

ISO 55000 at Clause 3.3.2 defines a Strategic Asset Management Plan, as follows:

> Documented information that specifies how organizational objectives are to be converted into asset management objectives, the approach for developing asset management plans, and the role of the asset management system in supporting the achievement of asset management objectives.

The SAMP forms a basis for documenting compliance with ISO 55000.

- Indicates the organizational systems which address the requirements of the ISO 55000 standard.
- For accreditation under the standard, the clauses in the standard should be demonstrably addressed in practice. The process will be assisted if the SAMP follows the structure of the standard.

As a "strategic" document, the SAMP will normally refer to more detailed documents in specific areas, rather than containing all the information itself. However, it should provide an adequate indication of where the necessary features are detailed.

Note that ISO 55000, Clause 3.3.2 defines the SAMP is in a way which *entirely different* from its definition of "asset management plan" which is given in ISO 55000, Clause 3.3.3. Asset management plans in the definition of Clause 3.3.3 are considered in Chapter 9. The SAMP contains "how to" information on the asset management processes as a whole. However, the extent to which the SAMP and Asset Management Plans have material in common, or are merged or linked into a single document, is at the discretion of the organization.

29.5 SAMP Outline Contents

The following is a suggested outline of the contents of the SAMP. The first three sections form an introduction. Sections 29.4 to 29.10 follow the same as the headings and subheadings as in the ISO 55001 standard.

For a guide to the development of these sections, refer to the corresponding ISO 55001 clause numbers in this chapter at Sect. 29.5 and in ISO 55001/2 itself. The details under each clause should be expanded to provide information from your organization. References and a list of definitions and abbreviations are to be given in appendices.

1. Foreword
2. Executive summary
3. Vision and mission statements
4. Context of the organization

    4.1 Understanding the organization and its context
    4.2 Understanding the needs and expectations of stakeholders
    4.3 Determining the scope of the asset management system
    4.4 Asset management system

5.   Leadership

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

6. Planning

    6.1   Actions to address risks and opportunities for the asset management system
    6.1.1 Asset management objectives
    6.1.2 Planning to achieve asset management objectives

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

11. Appendices

    11.1 Definitions
    11.2 Abbreviations and acronyms
    11.3 References

29.6 Functional Gap Analysis

An organization can check its status in relation to the standard, by comparing its systems with those indicated by the clauses of ISO 55001. The organization is likely to have in place many of the wide range of systems and techniques in recognized use for physical asset management. The aim of this table is to assist companies to assess their competence in relation to ISO 55001.

In Table 29.2, the first column gives the ISO 55001 clause numbers and clause heading, and the second column gives a brief description. As an example, consider

Table 29.2   ISO 55000 functional gap analysis template

ISO 55001 Clauses	Related techniques, activities, competencies	Target	Actual	Gap
4.1 Understanding the organization and its context	External and internal issues that affect the asset management system. Organizational objectives. How asset management objectives are aligned with organizational objectives. Reference the documents and processes involved in this alignment			
4.2 Understanding the needs and expectations of stakeholders	Identify stakeholders and their expectations			
4.3 Determining the scope of the asset management system	Identify the range of assets to which the asset management system applies			
4.4 Asset management system	Main documents, flowcharts, and organization charts that authorize and define the asset management system. Give the relevant documentary references and approvals			

Table 29.2 (continued)

ISO 55001 Clauses	Related techniques, activities, competencies	Target	Actual	Gap
5.1 Leadership and commitment	Top management commitment to: Establishing consistent organizational and asset management objectives Integrating the asset management system into the business process Making resources available for asset management promoting continuous improvement managing risk			
5.2 Asset management policy	Policy stated, visibly endorsed by top management, communicated within the organization and available to stakeholders			
5.3 Organizational roles, responsibilities and authorities	Responsibility and authority assigned for a range of items including the following: Establishing the SAMP meeting the requirements of this standard ensuring the effectiveness of the asset management system establishing asset management plans reporting on asset management performance			
6.1 Actions to address risks and opportunities	Risk management methods established and applied. Asset development methods established and applied			
6.2.1 Asset management objectives	The objectives are documented in the SAMP and communicated to stakeholders			
6.2.2 Planning to achieve asset management objectives	Integrated planning to achieve asset management objectives aligned with other planning activities and business objectives			
7.1 Resources	Determination of resources needed. Provision of the resources needed for the asset management system			
7.2 Competence	Competence requirements determined for asset management jobs. Competence of appointees. Training requirements analysis. Training provision training budget			
7.3 Awareness	Personnel degree of awareness of policies and their benefits risks implications. Asset knowledge. Technical regulation awareness regulation compliance for: High risk plant environment; Health and safety. Legal support for acquisitions and contracting			
7.4 Communication	Appropriateness and effectiveness of communications employee communication systems, e.g., newsletters, meetings. Stakeholder groups creation, planning, and implementation			
7.5 Information requirements	Asset management information system in operation. Resourcing. Asset register, coding, maintenance policies, and procedures in system. Data quality Real-time use. History. Configuration management organization for the security and access to documentation. Data coordinator data custodian to check and approve. Procedures for the revision of documents alignment between technical and financial data			

Table 29.2 (continued)

ISO 55001 Clauses	Related techniques, activities, competencies	Target	Actual	Gap
7.6 Documented information	Production records. Fault and failure records. Maintenance action and cost records. Asset history records. Records of statutory compliance, e.g., pressure vessel tests. Training records calibration records			
8.1 Operational planning and control	Asset continuity planning management of in-service assets			
8.2 Management of change	Management of change systems in place and applied			
8.3 Outsourcing	Establishment and management of outsourcing			
9.1 Performance monitoring, measurement, analysis and evaluation	Key Performance indicators established as required. Performance monitoring, procedures, standards, implementation, and response. Reliability standards and performance monitoring			
9.2 Internal audit	Auditors and procedures established audit records maintained audit follow-up action procedures established. Actions recorded			
9.3 Management review	Reviews of the asset management system occurring. Resources adequate. Systems responding to changes in asset types or needs. Improvement co-coordinator role and responsibilities. Suggestion, review, and feedback systems			
10.1 Nonconformity and corrective action	Incident reporting systems. Incident management systems and practices. Failure reporting and Corrective Action Systems (FRACAS). Suggestion, response, and feedback systems. Root Cause Analysis. Failure Mode and Effects Analysis (FMEA). Reliability analysis, MTBF, failure rate trends Maintainability analysis and improvement			
10.2 Preventive action	Preventive maintenance established and applied. Condition monitoring techniques used where appropriate. Condition monitoring economics, methods, targets, effectiveness. Condition monitoring personnel, training, procedures, and response systems. Engineering design review. External technical support where required			
10.3 Continual improvement	Plan, do, check, and act. Improvement co-coordinator role and responsibilities. Suggestion, review, and feedback systems			
	Totals			
	% Actual/Target			
Notes—scoring				
5 = Very good				
4 = Good				

Table 29.2 (continued)

ISO 55001 Clauses	Related techniques, activities, competencies	Target	Actual	Gap
3 = Moderate				
2 = Developing				
1 = Initial				
0 = None				

Clause 7.5 Information Requirements. The requirement for an asset management information system will typically be met by having a computerized asset management information system. Thus Table 29.2 shows "asset information management system in operation" as the first listed requirement relevant to this clause. The three right-hand columns of the table provide for the user to assess the level of competency targeted and achieved, and whether the targeted level has been attained.

Table 29.3 ISO 55000 Buzz-word generator

Achieve	Regulatory	Alignment
Align	Demonstrated	Compliance
Authorize	Tangible	Context
Contribute	Communicated	Expectations
Demonstrate	Effective	Culture
Enable	Normative	Decisions
Enhance	Sustainable	Governance
Ensure	Workplace	Objectives
Implement	Operating	Outputs
Integrate	Stakeholder	Performance
Lead	Informed	Policy
Manage	Risk-based	Processes
Outsource	Organizational	Responsibilities
Realize	Managed	Risk
Specify	Responsible	Scope
Communicate	Continuous	Systems
Sustain	Cross-functional	Stakeholders
Transform	Continual	Sustainability
Undertake	Improved	Values
Evaluate	Relevant	Awareness
Support	Legislative	Commitments
Leverage	Intangible	Benefits
Control	Environmental	Opportunities
Influence	Asset-related	Factors
Monitor	Strategic	Improvement
Assess	Empowered	Resources
Create	Information-driven	Competence
Develop	Policy-driven	Strategy
Promote	Compatible	Interaction

The company's level of competency in relation to any clause is judged by reference to five levels which are listed at the end of Table 29.2. These are Mastery (score 5), Professional (4), Foundation (3), Developing (2), Initial (1), and None (0). The fourth column in Table 29.2, headed Target, is for the user to select a target level which the company wishes to achieve in relation to a particular technique. While Mastery (5) would be ideal for every competency, not all companies will require the same level of competency in every technique or every clause.

As an example, again consider clause 7.5 Information Requirements. The second competency under this clause is "Resourcing." The target set by the company for this competency might be Professional (4), that is, we wish to have adequate, well-trained, and professionally competent staff to support our asset management information system. If the company has in fact minimal resources in this area, possibly also with system training yet to be completed, then its actual level of attainment might be assessed as Initial (1) or Developing (2). The Attained column would then contain the entry "0" since the target level of competence has not been reached.

Assessment of the company's competence in relation to the target levels can be continued across all clauses of ISO 55001, with Actual and Attained levels being entered in the Table. Finally, a total score can be calculated in terms of both percentage of Actual to Target and of the number of competencies attained.

29.7 Buzz-Word Generator

Have fun while developing your ISO 55000 documentation. Select one word at random from each column to make your own ISO 55000 buzz-word.