# How to Build Your ISO 55001 Asset Management System Quickly and make ISO 55001 Certification Easy

**Abstract**

*How to Build your ISO 55001 asset management system quickly and make ISO 55001 Certification easy*: Enterprise asset management has an international standard: 55001 Asset management – management systems – requirements. It specifies what an organization's asset management system must contain. Producing an ISO 55001 compliant asset management system leads you into a detailed, disjointed, demanding project. But there is a much simpler solution to design and develop a complying ISO 55001 EAM ready for ISO 55001 certification.
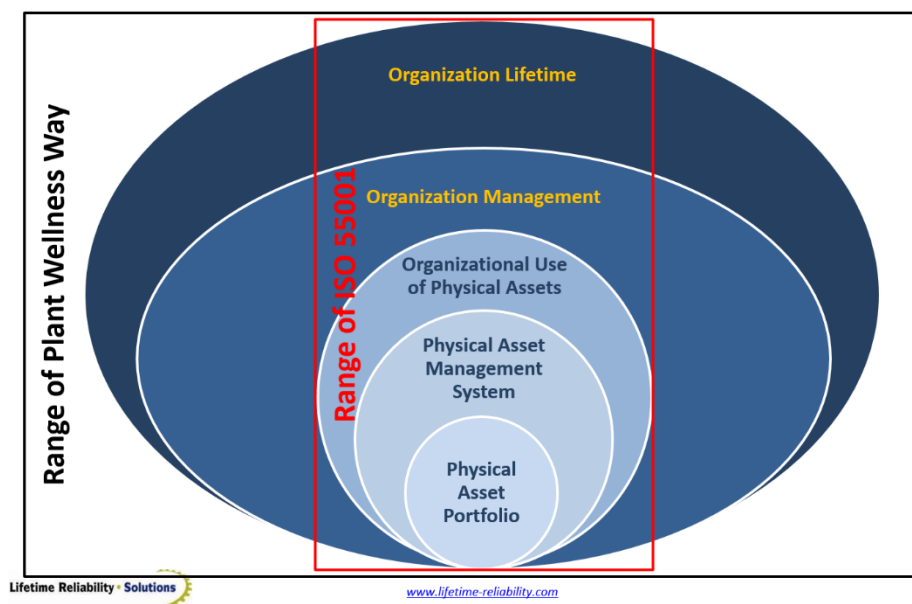
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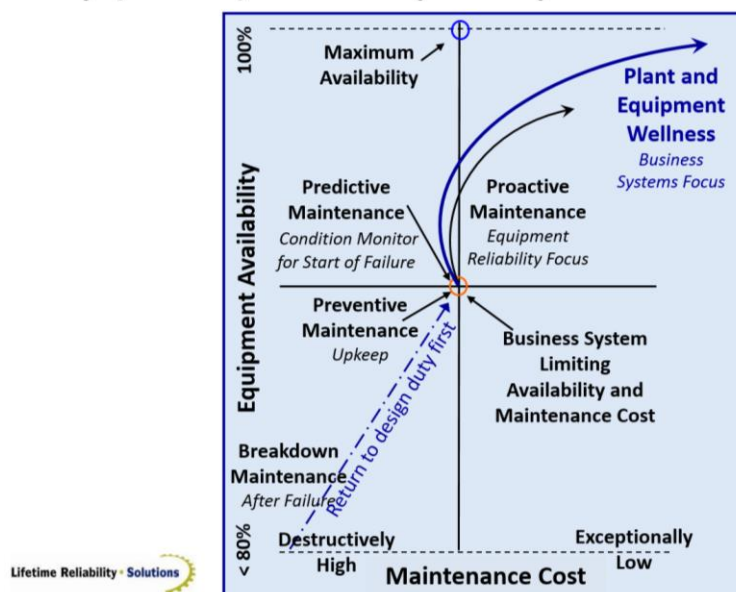
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## ISO 55001 vs. Plant Wellness Way



## PEW SOLUTION: A View of the Plant Wellness Way (PWW) Climb Up to Operational Excellence

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# How to Build Your ISO 55001 Asset Management System Quickly and make ISO 55001 Certification Easy

The ISO 55001 asset management standard provides a universal framework for managing the use of physical assets, such as mobile or fixed operating plant and equipment.

ISO 55001 Asset management – Management systems – Requirements, considers an asset management system ought to address six aspects of an organization: the internal and external environment, its planning processes, its support processes, its operational processes, its performance evaluation processes, and its ongoing improvement processes. The ISO 55001 standard document contains a framework structured to fit these six factors. The chart below shows the ISO 55001 asset management framework and the relationship of its clauses. Throughout ISO 55001 it correctly promotes, and aims to imbed, the key principle of successful enterprise asset management (EAM)—make risk elimination your primary focus to minimise business and operating risk; keep risk control as a distant secondary option. Accompanying the ISO 55001 asset management standard are two explanatory documents, ISO 55000 Asset management – Overview, principles and terminology, and ISO 55002 Asset management – Management systems – Guidelines for the application of ISO 55001. They provide the justification and context for the clauses in ISO 55001.

There are 72 obligatory 'shall' requirements in ISO 55001:2014. In ISO 9001:2008 there are 186 instances of 'shall'. The 'shall' statements in ISO 9001 are mostly requirements to develop suitable documents within existing business processes to control the process outcomes. ISO 9001 does require the creation of six new procedures to implement the standard. Though ISO 55001 has fewer in number than ISO 9001, many of the 'shall' requirements in ISO 55001 are extensive obligations to design, develop, build and support business processes spanning the organization and its lifecycle, including applicable external interactions. The ISO 55001 standard and its explanatory documents, ISO 55000 and ISO 55002, put a massive set of implications and a huge resulting work load onto companies in their pages of requirements.

If you want certification to the ISO 55001 asset management standard your enterprise asset management system must comply fully with the internationally accepted framework specified in the ISO 55001 standard. Which is not the same as saying you are getting a highly successful management system for your assets. ISO 55001 does not promise successful asset management—only that you are using a certified asset management system. ISO 55001 certification is not a guarantee of good asset performance—like a certified ISO 9001 quality system is not a guarantee of an excellent product, but a product built to a price. You can get your EAM system ISO 55001 certification and still have lousy reliability and uptime.

Unfortunately, ISO 55001 and its companion documents mostly contain 'what you must have' advice. You will need to invent the 'how to' build an enterprise asset management system yourself—be it successful or not. (An EAM system is a set of business processes and procedures. A computerized enterprise asset management system is a suite of software.)

**How to Build a World Class Enterprise Asset Management System to ISO55001 Standard**

Is there a solution for how to quickly design and build a good and successful enterprise asset management system that will also get ISO55001 certification? Yes, there is. Before explaining what it is and how it works there is some background information you need to know on the history of enterprise asset management.

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# ISO 55001-2014 Asset Management System Requirements Framework

## Organisational Environment



ISO 55001-2014 Asset Management System Requirements Framework diagram showing the following elements:

**Organisational Environment:**
- Understanding needs and expectations of stakeholder 4.2
- Policy 5.2
- Understanding the organisation and its context 4.1
- Determining the scope of the asset management system (portfolio) 4.3
- Asset management objectives 6.2.1
- Leadership and commitment 5.1

**Planning Processes:**
- Actions to address risks & opportunities for asset management system 6.1
- Planning to achieve asset management objectives (SAMP) 6.2.2
- Management of change 8.2

**Support Processes:**
- Organisational roles, responsibilities and authorities 5.3
- Resources 7.1
- Competence, 7.2
- Awareness 7.3
- Communication 7.4
- Information requirements 7.5
- Documented Information – General 7.6.1
- Control of documented information 7.6.3
- Creating and updating 7.6.2

**Operation Processes:**
- Operational planning and control 8.1
- Outsourcing 8.3

**Evaluation Processes:**
- Monitoring, measurement, analysis & evaluation 9.1
- Internal audit 9.2.1 & 9.2.2
- Management review 9.3

**Improvement Processes:**
- Continual improvement 10.3
- Nonconformity and corrective action 10.1
- Preventive action 10.2

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For a long time, certainly since the early 1980's, you have been able to use good individual techniques and process methodologies to develop and run enterprise asset management systems. Classic analysis techniques like FMEA (Failure Mode Effects Analysis), Equipment Criticality Analysis, HAZOP (Hazard and Operability Study), Job Risk Analysis, Reliability Centered Maintenance (RCM)—a more complete list is tabled below—have been used for decades. Useful processes like Maintenance Planning and Scheduling, Preventive Maintenance, Predictive Maintenance, and Operational Discipline have been effectively applied to deliver good physical asset performance. With good fortune and management persistence some companies occasionally wove the methodologies and processes together to create and build a successful operation with excellent physical asset management results. However they were random successes not replicable across the Globe, not even in their own industry, often not even at other sites in their own company. Up until recently there was no enterprise asset management methodology which when used was guaranteed to create a world class enterprise asset management system. I think it was the intention of the Project Committee for the ISO55001 Standard to develop such an enterprise asset management methodology. That is the impression you get when you read ISO55000, though it is not the outcome you will get by only satisfying the ISO 55001 certification requirements. To get your enterprise asset management system performing so you get world class asset management success you need more than what the ISO 55001 standard, the ISO 55000 overview and the ISO 55002 guide ask for you to build.

| Consequence of Failure Reduction Strategies<br>Strategies presume failure event occurs and act to minimise consequent losses | Opportunity to Fail Reduction Strategies<br>Strategies prevent opportunities for a failure event arising | Chance to Fail Reduction Strategies<br>Strategies reduce probability of failure initiation if failure opportunity present |
|---|---|---|
| Preventive Maintenance<br>Shutdown Maintenance<br>Predictive Maintenance<br>Non-Destructive Testing<br>Vibration Analysis<br>Oil Analysis<br>Thermography<br>Motor Current Analysis<br>Total Productive Maintenance (TPM)<br>Prognostic Analysis<br>Criticality Analysis<br>Emergency Management<br>Computerized Maintenance Management System (CMMS)<br>Key Performance Indicators (KPI)<br>Risk Based Inspection (RBI)<br>Operator Watch-keeping<br>Value Contribution Mapping<br>(Process step activity based costing)<br>Logistics, stores and warehouses<br>Maintenance Engineering | Engineering / Maintenance Standards<br>Statistical Process Control<br>Degradation Management<br>Lubrication Management<br>Hazard and Operability Study (HAZOP)<br>Hazard Identification (HAZID)<br>Failure Design-out Maintenance<br>Failure Mode Effects Analysis (FMEA)<br>Hazard and Operability Study (HAZOP)<br>Root Cause Failure Analysis (RCFA)<br>Precision Maintenance<br>Training and Up-skilling<br>Quality Management Systems<br>Planning and Scheduling<br>Continuous Improvement<br>Supply Chain Management<br>Standard Operating Procedures (SOPs)<br>Reliability Engineering | Training and Up-skilling<br>Oversize / De-rate Equipment<br>Hardier Materials of Construction<br>Personal Protective Equipment (PPE )<br>Segregation / Separation<br>Controlled Atmosphere Environment e.g. +ve / -ve pressures; explosion proof atmosphere |

In the following pages is a review of the ISO 55000 documents and ISO 55001 standard. You learn some important considerations for ISO 55001 certification and how to maximize the value of ISO 55001 to you. At the end you are introduced to a structured methodology to most easily address the massive requirements in the ISO 55001 standard. While you design and develop a complying ISO 55001 asset management system you also build-in world class asset performance.

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**Review of the ISO 55000 Asset Management Standard Overview**

ISO 55000 Asset management – Overview, principles and terminology, is a high level summary (at the '40,000 foot' level) introduction to the intention, inter-relationships and use of the ISO 55001 asset management standard in an organization. It describes the benefits integrated asset management can bring to organizations. It defines important words used in the management of assets and the asset management system. It gives a brief introduction of the six elements into which ISO 55001 divides asset management systems: Context of the organization, Leadership, Support, Operation, Performance evaluation, and Improvement. It states what the Project Committee considered are the four 'fundamentals' on which asset management is based:

- Bringing Value for the organization and all its stakeholders from the use of its assets;
- Promoting Alignment across the organization to achieve organizational goals;
- Managerial Leadership with commitment, along with an empowerment culture;
- Achieving Assurance of producing required asset performance.

However, the four 'fundamentals' are not principles of successful enterprise asset management, they are outcomes of successful asset management. When you establish a universal methodology to build a world class EAM system it needs to incorporate all the core principles that cause endless EAM success. There are six underpinning concepts driving asset management outcomes:

1. A physical asset is made of assemblies of individual components working as a system,
2. An organization is a system for doing the work valued by its owners through using knowledge and supporting processes,
3. Organizational processes and activities are series arrangements of sequential steps where successful outcomes are quality dependent,
4. Mistakes and errors in processes must be eliminated to get maximum value,
5. Probability and uncertainty exists everywhere to cause variation and create risk.
6. A business aims to survive and profit, so short-term, long-term and lifecycle asset strategies must protect the business **and** also make it flourish.

Harnessing these six principles are foundational to the successful use of physical assets and must be at the heart of all enterprise asset management system design, creation and sustainability. There is no acknowledgement in the ISO 55000 series that assets are made of systems of parts. There is recognition of the asset life cycle. There is strong promotion of integration between departments. Nothing is said about preventing errors and defects. The influence of probability is noted for risk but not mentioned anywhere in respect to organizational process outcomes. There is no appreciation of the driving need for both business survival and financial success. To my way of thinking ISO 55001 is far short of incorporating all the important principles needed for world class enterprise asset management performance.

It is vital you see the shortcomings in ISO 55001. It is equally vital you know how to correct the limitations of ISO55001 so your company does not waste its time, money and resources building a dud EAM solution. You measure asset management system success by the success its use brings to your organization. When you adopt the ISO 55001 standard it is not an asset management framework that your organization wants, but a sure way to build a successful physical asset management system. Foremost you want an enterprise asset management system that delivers world class physical asset performance, which also complies with the ISO 55001 asset management standard. Satisfying the ISO55001 standard should be of secondary importance to

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building an EAM system that greatly contributes to the success of your company and its survival. Companies that build their EAM system to comply with the ISO 55001 standard have got the wrong focus and purpose of EAM.  As useful as ISO55001 is to standardize asset management practices, you will need a better solution to become world class.

**Contents of the ISO 55001 Standard Reviewed**

**1 Scope,  2 Normative reference,  3 Terms and definitions**

The Scope specifies ISO 55001 is intended for assets in organizations; it is principally for physical assets; it is really a standard for 'a management system for asset management'.  ISO 55000 and ISO 55002 are companion documents, ISO55001 contains definitions, while ISO55002 has guidance on the application of ISO 55001.

**4 Context of the Organization**

This means the internal and external environments, jurisdiction laws and regulations, the stakeholders within and without the organization, and the organization's purpose(s) and goals. These factors influence and coalesce into an asset management policy with asset management objectives.  A strategic asset management plan (SAMP) is developed to deliver the objectives. Achievement of the SAMP is disseminated across the organization through individual asset's management plans and finally sets the activities undertaken in the workplace, which when done correctly should deliver the asset management objectives and hence the organization's goals.

Nothing is said of creating a successful business.  The lack of focus on active production of business success in ISO 55001 curtails its strategic business value.  It makes your asset management system principally a means to provide information and record events, get control over doing work, and chart asset performance.  That's useful, but it's not the focus you need.

**4.1 Understanding the organization and its context**

All external and internal issues that affect **both** the achievement of the organizational goals **and** the asset management system are to be identified.  ISO 55002 lists the sorts of issues to appraise. No advice is given of the methodology to use to do the comprehensive review required.  An appropriate methodology you can apply is a Business Environmental Scan.

How do you get the "shall be aligned to, and consistent with" between the asset management objectives and organizational objectives required in ISO 55001?  I suggest you document a clear progression from organizational objectives to asset management objectives, from asset management objectives to SAMP, and from SAMP to your individual assets' management plans.

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

You need to identify all internal and external stakeholders who impact the asset management system.  Find out what they want from doing asset management and what they need to know about the assets being managed.  Their needs and expectation are to be documented and taken into account when developing the asset management policy.  ISO 55002 provides lists of typical stakeholders in asset management.  One approach to address these ISO 55001 subclauses is to compile a matrix showing all stakeholders and all their needs and expectations, including the ways each need and expectation is preferably addressed.  You also need to set criteria to help decide priorities and resolve conflicts between stakeholders.  Criteria are the principles or standards by

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which to judge or decide a thing.  The real aim of this requirement is to ensure proactive consultation and communication occurs between relevant parties.  It will be necessary to develop a Communication Plan explaining which stakeholders are involved and how they are to interact about specific issues, events or circumstances.

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

This clause sets the boundary on the assets in the asset management system and the coverage of your asset management system—the resulting document is called the 'Scope' in ISO 55001.  It requires you have an asset register listing all the assets covered by the asset management system—called the asset portfolio.  All other assets not in the register are outside the 'scope'.

The Scope covers the whole organization's total involvement, resources and interactions related to asset management in the widest sense.  As well as covering internal processes and functions it includes interfacing with outside suppliers, sub-contracted services, Regulators, and national and international considerations.  It includes geographic locations and timescales of organizational involvement.  The asset management system Scope is likely to be a written document with relevant sub-headed sections.  Otherwise use a spread sheet with columns and rows titled by appropriate subheadings. A useful concept is to consider 'scope' as being a detailed scope-of-work for a massive capital project, but it's really a massive asset management project.

### 4.4 Asset management system

You need to establish, use and improve your asset management system.  A business system is a set of processes.  Every process used in asset management will need to be defined and specified.  It requires flow charting every process with all its interactions, and putting into place procedures of how to correctly do each phase and step of a process.  You need to develop a suite of documents covering all aspects of your asset management system and your SAMP.  The SAMP needs to be a stand-alone document that can be distributed.

### 5 Leadership

The Top Management are the leaders of asset management in an organization.  They are the people at the highest level in an organization.  Just as Top Management is ultimately responsible for Quality and Safety, so too are they responsible for successful asset management.  Top Management set the vision and objectives.  They align the organization and provide the resources to achieve the goals.  They put people into leadership roles in the organisation and provide them with guidance and support to operate the required processes.  They bring the people in the organization along with them and help them embrace the vision and make it reality.  You need to define and specify how all that will be done.

### 5.1 Leadership and commitment

The list of ten bullet points in this major ISO 55001 clause must be done and evidence provided that each one is satisfied.  Document the asset management Policy, SAMP, Objectives; show you have integrated business processes that are collaborative, resourced, communicated and are effective; prove the established outcomes are achieved; you are continually improving; you practice risk management consistently.

### 5.2 Policy

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The asset management policy justifies asset management as an organisational imperative and contains a set of principles for usage of asset management in the organization. Your asset management policy document must satisfy every clause and bullet point in this section of ISO 55001. ISO 55002 provides examples of asset management policy principles.

### 5.3 Organizational roles, responsibilities and authorities

The internal and outsourced roles needed to disseminate asset management in an organization and achieve the SAMP have to be allocated. All incumbents need to be competent for the role they fill. All responsibilities and authorities for each role are to be clearly specified so persons within and without the organization understand who is responsible for an activity. ISO 55001 is very particular to ensure responsibility and authority is provided for the proper planning, functioning, performance and upkeep of the asset management system. Typically this clause is addressed with an organizational chart and the use of Position Descriptions in which responsibilities and authorities of a role are clearly stated. It can also be addressed by specifying responsibilities and authorities in procedures and work instructions. A matrix of roles listing responsibilities and authorities is a useful way to show this information globally.

### 6 Planning

How to achieve the organization's asset management goals (the achievement of which aids in delivering the organisation's objectives), address stakeholders' needs and requirements, and address the risks and opportunities that occur to the asset, the asset's management, and the asset management system is the scale of planning that needs to be undertaken.

### 6.1 Actions to address risks and opportunities for the asset management system

ISO 55002 states about this clause, "The overall purpose is to understand the cause, effect and likelihood of adverse events occurring, to manage such risks to an acceptable level, and to provide an audit trail for the management of risks. The intent is for the organization to ensure that the asset management system achieves its objectives, prevents or reduces undesired effects, identifies opportunities, and achieves continual improvement."

Start with the SAMP, which explains how the asset management objectives are to be achieved. The SAMP cascades down to the plans for individual assets and the needed activities to be done to address and control the risks. Your planning will need to identify the processes used, the roles, the actions and the addressed risks of an asset's management plan. The same applies, i.e. process through to actions, for the asset's management, and for the effective use the asset management system. As part of planning you also need to specify how the plans, the activities, the asset's performance and the asset management system's performance will be monitored and reported.

The most applicable methodology to use to comply with this clause of ISO 55001 is to apply Risk Assessment and Management to each asset, the asset's management, and the asset management system. It would be reasonable to apply RCM (Reliability Centered Maintenance) on your assets, as RCM requires you to do FMEA (Failure Mode Effects Analysis) and assess and mitigate asset risks with appropriate maintenance strategy and activities. To identify the risks to an asset's management, and also to the asset management system, you could use PFMEA (Process Failure Mode Effects Analysis) coupled with Risk Management to identify and select appropriate risk abatements.

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## 6.2 Asset management objectives and planning to achieve them

ISO 55000 defines 'objectives' as the results to be achieved and 'asset management' as coordinated activity of an organization to realize value from assets. The asset management objectives are the specific results required from assets. Since achieving the organisational objectives is the purpose of the asset management objectives there is natural alignment between the organization's objectives and its asset management objectives.

The asset management objectives require planned actions to achieve them. These are called the asset management plan(s). The asset management plans require defined activities to be done on assets, including setting specific and measurable objectives, such as timeframes, the resources to use, their costs, and the work quality to be performed to ensure asset risk management.

### 6.2.1 Asset management objectives

The asset management objectives must be allocated as the responsibility of roles and functions throughout the organization. The planned activities to achieve the objectives need to be derived and turned into jobs and tasks to be done. Which is the best function for the responsibility? At what level in the organization to allocate the objective? Answers to these questions depends on issues like the objective's importance, the risks for the organization, the effect on stakeholders, the difficulty involved, its information and knowledge needs, and the resourcing requirements.

ISO 55001 lists nine specific criteria an asset management objective must satisfy. The selection of an objective requires assessment and consideration about the extent of risks, its consistency to organizational objectives, the means of achievement, the monitoring and measurement, its dissemination to whom must know, and reviewing and updating. The output from planning and setting the asset management objects will be a tabular listing recording SMART (specific, measurable, achievable, realistic and time-bound) objectives and how each the nine criterion is satisfied.

### 6.2.2 Planning to achieve asset management objectives

This clause in ISO 55001 contains several repeated requirements that were already needed to satisfy earlier clauses. Along with broadly encompassing statements to comply with, there are eleven bullet points and four sub-points to be addressed in the clause. It stipulates specific requisites for doing asset management planning, such as:

- Asset management planning must be integrated with the rest of organization's planning;
- The output of an asset's management planning is the full scope-of-work addressing all the asset's risks during its use over the whole of the asset's lifetime. The asset's management plan contains all subsequent risk mitigations and risk preventions, including identifying internal and external resources, and any special tools or equipment required;
- Changing risk as the asset ages, or if there are changes in asset use, are contingencies that need to be factored into the asset's management plan;
- Risks with assets are to be considered as risks to the organization and addressed in organizational plans and contingencies.

This is another large document, or a set of documents, to develop that ought to be a tabular listing. These ISO 55001 clause statements, bullet points and sub-bullet points need to be individually identified and addressed for each asset. Asset risk identification across its lifetime and the risk abatements to be implemented will require using a risk assessment and risk management

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methodology.  Equipment Criticality analysis is a suitable method to initially identify the full range of internal and external business risk implications from the ownership or use of an asset. Your asset's management planning analysis can be done by asset type or class of asset if you have many of the much the same design of asset used in similar ways on similar products, e.g. power distribution lines, pipelines, storage tanks, pressure vessels, identical vehicle fleet.

The ISO 55002 guidebook provides a structured approach to follow for your risk review and the identifying, analysing, classifying and eliminating of risk to your organization's assets, asset management and asset management system.  It also advocates Lifecycle Costing to identify the long term financial implications of an asset's use.

## 7 Support

For an asset management system to function correctly you need to provide the processes, infrastructure, financing, knowledge, skills, information management, service delivery and cultural environment that produces the intended asset performance for the organization.

## 7.1 Resources

All resources needed to deliver the SAMP and the asset management plans are to be identified. This clause in ISO 55001 aims to address the lifetime of an asset and get you to recognise what commitments are needed across your organization, and throughout the asset's life cycle, in order to get the performance from the asset desired by the organization.  You need to identify and address all financial support, safety, human, equipment, tools, capital expenditure, e.g. replacement, refurbishment, etc., and internal and external resources.  ISO 55002 suggests to use Resourcing Gap Analysis to identify the resource gaps between an organization's capabilities and the requirements needed to achieve its asset management plans.  Where there are constraints the organization will need to prioritise its actions and the use of resources, as well as consider going outside of the organization to get needed competences.  It seems logical that the identification of resources to implement asset management plans be done at the same time as an asset's management plan is being developed.  The required resources for asset management can then be accumulated and input into a Resourcing Gap Analysis.

## 7.2 Competence

Only competent people are to be used in all asset management related roles, functions and duties, including your external suppliers, providers and subcontractors.  You must prove they have the values and attitudes, awareness, knowledge, understanding, skills and experience needed to correctly do the jobs you give to them to do so they deliver all necessary outcomes. (A person or organization who are competent consistently produces the desired outcome to specification unsupervised.)  You need to identify and document all the competencies, i.e. values and attitudes, awareness, knowledge, understanding, skills and experience, needed for each position or function involved in an organization's asset management.  Proof of current competencies is required.  Also ongoing proof to confirm incumbents remain competent, or have developed appropriate new competence, is necessary.  Typically a Training Needs and Gap Analysis in done to confirm role incumbents are competent.  For those that need further training and development the short-falls in capability become their short term training plan.  Typically this clause of ISO 55001 is administered by a Human Resources Group.  ISO 55001 wants to make clear that delivering the asset management objectives requires integration and cooperation of able and competent people within and without the organization who understand all what needs to be done and work together effectively to achieve them.

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## 7.3 Awareness

There is no definition for 'awareness' in ISO 55000 Asset management – overview, principles and terminology.  The 'awareness' stated in the ISO 55001 standard is very much about the extent that a role incumbent (or a stakeholder) knows of an organization's asset management system and their impacts and opportunities when working to deliver the asset management plan.  In ISO 55002 Asset management – Management systems – Guidelines for the application of ISO 55001, 'awareness' is implied to be far greater than a personal level of awareness; it is more about taking a business owner's perspective of risks, opportunities and service delivery quality.

The Oxford dictionary says being 'aware' is to have knowledge or perception of a situation or fact. To measure 'awareness' you would interview people using a targeted question set covering their understanding of asset management policy, how to effectively contribute to asset management success, how they view their contribution to achievement of the organization's asset management goals, and what more they can do to make a positive difference.

## 7.4 Communication

There needs to be a strategy with plans and communication vehicles to get the right information to the right people, inside and outside the organization, at the right time.  The ISO 55000 guide recommends the use of a Communication Plan that addresses all the requirements of this clause in ISO 55001.  Your communication plan will cover lifetime exchange for information required by internal and external parties on individual assets, your assets' management, and the asset management system.  All communication requirements related to the relevant assets, asset management and the asset management system are to be identified and addressed, including transfer and exchange of knowledge and intelligence for planning, execution, improvement, and monitoring the resulting performance.

## 7.5 Information requirements

All information requirements related to the relevant assets, asset management, the asset management system and the achievement of the organizational objectives are to be identified and addressed.  The type of information to keep will depend on its purpose.  To assist you ISO 55002 lists a range of asset information requirements common to asset management and asset management systems.  ISO 55001 needs you to prove you made consideration for information regarding risks, roles, processes, stakeholders, and the content and worth of the information for decision making.  You need to address information collection, retention, management, consistency of terminology, and information traceability.  This clause in ISO 55001 again leads itself to a systematic tabular listing of requirements documenting your analysis and decisions.

## 7.6 Documented information

Documented information is defined in ISO 55000 as, 'information required to be controlled and maintained by an organization, and the medium on which it is contained'.  The ISO 55001 clause covers all mediums, every process in the asset management system, and all records of evidence.

### 7.6.1 General

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The documents you must have are those required by ISO 55001; those set by statute; documents that form evidence, usually known as records; those internal and external documents used for the assets during their life; and documents for running and improving the asset management system.

### 7.6.2 Creating and updating

You must have a structured and consistent way to develop, approve and maintain documents.

### 7.6.3 Control of documented information

The documents you select to use in your organization are considered to be controlled documents and become part of your document management system. They need to be identified, approved, available were needed, stored and preserved, change-controlled, and the archival and disposition practices specified. This entire clause of ISO 55001 is well satisfied by the document management requirements of ISO 9001 quality management systems. Instead of creating asset management specific solutions for this clause, simply incorporate asset information management into your existing ISO 9001 quality system, or adopt the ISO 9001 requirements to manage your asset management system documented information.

## 8 Operation

This major clause of ISO 55001 covers use of the asset management system so that it delivers the outcomes it is meant to produce.

### 8.1 Operational planning and control

You need to do the actions selected during your asset, asset management, and the asset management system planning. All processes, from their beginning to the end, have to be put into use and ought to operate as intended. Effective delivery of the actions is what you want. That means what you do is exactly as planned and it produces the very results you wanted from your planning. The closer the actual results are to the planned results, the more effective is your asset management system.

The methodology to use for this clause is Process Mapping. As you map the asset management processes you identify how to address the bullet points in this ISO 55001 clause covering criteria for process management (ISO 55002 suggests typical criteria to consider). You need to recognise the risks in your processes and use appropriate risk controls, specify records of evidence from the process, and the performance measurements you will make in your processes.

### 8.2 Management of Change

Internal or external changes, whether permanent or temporary, are first to be evaluated, suitable risk mitigations selected and approved before implementing any change. ISO 55002 provides a list of typical considerations to review when undertaking a change. ISO 55001 makes clear changes are to be risk assessed with consideration of the impacts across the organization, including reviewing unintended consequences (like what happened at Flixborough), adequate abatements are to be selected, and the implementation is to be thoroughly planned. Only after going through the whole change management process are the specified changes to be done.

You will need to develop and implement a comprehensive Change Management process and procedure and communicate it to all parties concerned.

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## 8.3 Outsourcing

An outsourced process or function, ISO 55000 advises, is when you "make an arrangement where an external organization performs part of an organization's function or process." The outsourcing of activities does not absolve you of their ownership. All work sent off-site or services subcontracted are still totally your responsibility and you are accountable for the successful completion of their work. This necessitates identifying the risks arising from outsourcing and proactively putting suitable controls and monitoring into place.

ISO 55001 requires a formal, documented process for outsourcing. Typically, legal contracts are first put into place between the organization and service provider. ISO 55001 dictates you need to decide how to interact with the service provider, going as far as to ask for evidence of competence, awareness, establishing the processes for managing and monitoring the outsourced work so it achieves all that is required, and the processes for information exchange and document control. It is necessary to develop a documented process and procedures explaining how outsourcing is done and taking into account the complexity of the work and the risks it causes to the organisation. You would expect that this process has a means of escalating the organization's response and risk controls commensurate with the scope, complications and risks of the outsourced work.

## 9 Performance evaluation

Monitoring and evaluating the performance of assets, asset management and the asset management system against their respective objectives is necessary to ensure the desired outcomes are being achieved effectively. This provided confirmation of satisfactory or unsatisfactory performance, along with highlighting opportunities for improvement.

## 9.1 Monitoring, measurement, analysis and evaluation

The information collected by monitoring, measurement, analysis and evaluation is for the purpose of improving the effectiveness of the processes used in the organisation and ultimately to improve the organization's performance at meeting its owner's and stakeholder needs.

To monitor it is necessary to adopt measures and to evaluate it is necessary to do analysis. ISO 55001 requires you to pick the performance of your assets, asset management and asset management system to monitor, what data and/or measures are to be taken, the methods to use to monitor, measure, analyse and evaluate, when to observe and check the process or procedure, when to report the findings and interpretations, and whom to report to. ISO 55002 provides a substantial list of the range of factors that can be observed through performance monitoring. In ISO 55002 further advises, "A set of performance indicators should be developed to measure the asset management activity and its outcomes. Measurements can be either quantitative or qualitative, financial and non-financial. Indicators should provide useful information to determine both successes and areas requiring corrective action or improvement." It also makes the important point that asset management is actually about 'asset risk management' and so gauging the level of risk remaining to the organization is an important measure of asset management success.

The collecting of recorded evidence and its analysis, evaluation and reporting constitutes 'documented information' and must be controlled.

## 9.2 Internal audit

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On a regular basis the organisation is to examine and report on its own asset management system effectiveness, the operation of its processes, the resulting performance against the respective standards it has set itself, and its compliance to the ISO 55001 standard. The methodology to be used is Internal Auditing and a suitable internal auditing process complying with all the requirements of this clause in ISO 55001 must be used.

### 9.3 Management review

The ISO 9000 quality management system standard defines a 'review' as 'activity undertaken to determine the suitability, adequacy and effectiveness of the subject matter to achieve established objectives'. So a Management Review, as required by this clause of ISO 55001, is a review of the suitability, adequacy and effectiveness of the management of asset management, i.e. the successfulness of the asset management system at delivering its objectives. In ISO 55001 is listed a series of subclauses that must be addressed as part of doing a Management Review. The simplest way to do that is to make them all meeting agenda items to be reported on in the meeting and insure a record to that effect is made in the meeting minutes. The Management Review is a great opportunity for Top Management to get a '40,000 foot high' perspective of their organization's use and benefits from the asset management system. They ought to ensure the reports provided to them explore the full scope of the asset management system. Of great worth is to ask for analysis of the organization's processes to identify ways to help them perform more effectively.

### 10 Improvement

It is expected that the design and use of the asset management system is improved. When there are problems they become opportunities to learn what more can be done to enhance the system. The best organisations are proactive at identifying potential risks and eliminating them and/or putting in place contingencies to mitigate opportunities to occur or that minimize the effects.

### 10.1 Nonconformity and corrective action

In ISO 55001 are stated requirements that must be implemented in the non-conformance management process used by your organization. Each incident is to be immediately addressed to rectify the problem and control its effects, then analysed to decide whether to eliminate the cause. Such analysis is called Root Cause Failure Analysis (RCFA). When changes are recommended they enter the Management of Change process. The effectiveness of actions undertaken to address or prevent a problem need to be checked at appropriate times in future to confirm they actually worked. Further improvements are made if a solution was not effective.

Typically this clause is satisfied by developing a Non-conformance Management and Corrective Action Procedure and communicating its requirement and its proper use to all parties concerned.

### 10.2 Preventive action

ISO 55002 tells us, 'Preventive actions, which may include predictive actions, are those taken to address the root cause(s) of potential failures or incidents, as a proactive measure, before such incidents occur. The organization should establish, implement and maintain process(es) for initiating preventive or predictive action(s).'

You will need to establish and maintain a preventive action process and procedure. ISO 55002 also provides a list what to consider when developing a Preventive Action Procedure.

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## 10.3 Continual improvement

It is an imperative that your asset management system and its operation be continually improved through identifying opportunities to make it simpler, reduce its cost, do things faster, and deliver top quality results so as to become more effective and efficient. By actively making the organization's assets, asset management, and asset management system perform better all stakeholders benefit.

To comply with this ISO 55001 clause you need a clear methodology that delivers continual improvement through its use in the organization. ISO 55002 provides a list of the issues to include in your considerations for what can be done to encourage continual improvement of your assets, asset management, and asset management system.

### Conclusion to ISO 55001 Asset management – Management systems – Requirements Review

There is much to commend in ISO 55001 Asset management – Management systems – Requirements, ISO 55000 Asset management – Overview, principles and terminology, and ISO 55002 Asset management – Management systems – Guidelines for the application of ISO 55001. They:

- Provide a standard framework for an enterprise asset management system
- They connect the use of EAM with more effective achievement of organisational goals
- Give a common understanding of what is enterprise asset management (EAM)
- Espouse a risk management philosophy for the use and care of assets
- Form a body-of-knowledge to guide practitioners
- Set a minimum standard of what is in an EAM system
- Permit debate on EAM and an eventual consensus in organizations
- Assemble a means to measure and benchmark enterprise asset management performance
- Focus practitioners on what is important when doing EAM

There are some concerns I have with ISO 55001, ISO 55000 and ISO 55002. The first is, if you do as they say to design and build your EAM system, they are monsters that devour massive amounts of resources and time. Though, perhaps that too is a good thing to understand—setting up a comprehensive enterprise asset management system is a substantial undertaking.

The second issue is: How exactly do you design solutions for the clauses in ISO 55001? What methodologies deliver compliant outcomes to the dictates in the ISO 55001 standard clauses?

Third, and probably the most vitally important issue: There is no guarantee that you will build a successful asset management system if you use ISO 55001, ISO 55000 and ISO 55002. You have one chance to get your EAM system right. If you build a bad EAM system you will be continually fixing problems. You face the great danger when using ISO 55001, ISO 55000 and ISO 55002 that in the end you build a monster you have to live with. You and everyone else in the organization will forevermore try and tame a monster set loose in your organization because of a bad initial EAM system design.

There is an alternative to using ISO 55002 for building an ISO 55001 asset management system that meets all ISO 55001 certification requirements. It gives you a far greater chance of designing

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a world class enterprise asset management system for your company from the start, while fully complying with the ISO 55001 standard and getting you ISO 55001 certified most quickly.

**How to get ISO 55001 Certification AND a World Class Asset Management System**

Don't do what ISO 55000 and ISO 55002 tell you to do to build a compliant ISO 55001 asset management system. You can too easily create a monster that terrifies your organization for years, even decades, to come. **You are only required to have an EAM system that complies to ISO 55001 Asset management – Management systems – Requirements**. You do not need to follow the ISO Project Committee's suggestion noted in ISO 55002 Asset management – Management systems – Guidelines for the application of ISO 55001.

Once you realise that only the final 'product' will be audited for ISO 55001 certification and certified as complying to the ISO 55001 standard, you can forget about following ISO 55002 Asset management – Management systems – Guidelines for the application of ISO 55001, and look at alternate EAM system design and development solutions for your EAM system 'product' which benefits your company the most.

There is a simpler and greatly certain way to design and build a highly successful and fully complying ISO 55001 asset management system than following what is suggested in ISO 55002. It is called the Plant and Equipment Wellness Way.

**Easy and Successful Plant & Equipment Asset Management System Complying to ISO55001**

Your alternative for designing and developing your enterprise asset management system is called the Plant and Equipment Wellness Way— also called the Plant Wellness Way. It is a simpler, a quicker, and a more-sure-of-first-time-success solution than using ISO 55002 Asset management – Management systems – Guidelines for the application of ISO 55001.

You can find an extensive overview of the Plant Wellness Way online at LRS Consultants Global webpage: Plant and Equipment Wellness.

You can compare the simplicity of using the Plant Wellness Way with using ISO 55002 to develop a ISO 55001 compliant EAM system in our free spreadsheet download from webpage: ISO 55001 success the Plant Wellness Way.

**How the Plant Wellness Way Develops World Class ISO 55001 Asset Management Systems**

Below are 'snap shots' of how the Plant Wellness Way works to design and develop world class asset management systems fully complying with the ISO 55001 standard. Unlike 55002 Asset management – Management systems – Guidelines for the application of ISO 55001, which promotes a top-down asset management system design, the Plant Wellness Way is a bottom-up methodology. It's far more certain to identify all your operating and business risks and let you build the simplest and most ideal EAM system to address them. It is a business success focused solution so your organization profits greatly from the EAM system you design.

The biggest benefits of using the Plant Wellness Way over ISO 55002 for developing your ISO 55001 compliant asset management system, is speed and simplicity. Following ISO 55002 requires you to address each clause and subclause one by one; that is time consuming and complex. Instead PWW addresses ISO 55001 holistically and the methodology more quickly and simply delivers compliance to ISO55001 as an outcome.

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# ISO 55001 the Plant Wellness Way:
## For a Business-Wide, Life-Cycle Long System of Asset, Operations and Maintenance Management Excellence



INPUTS            OUTPUTS

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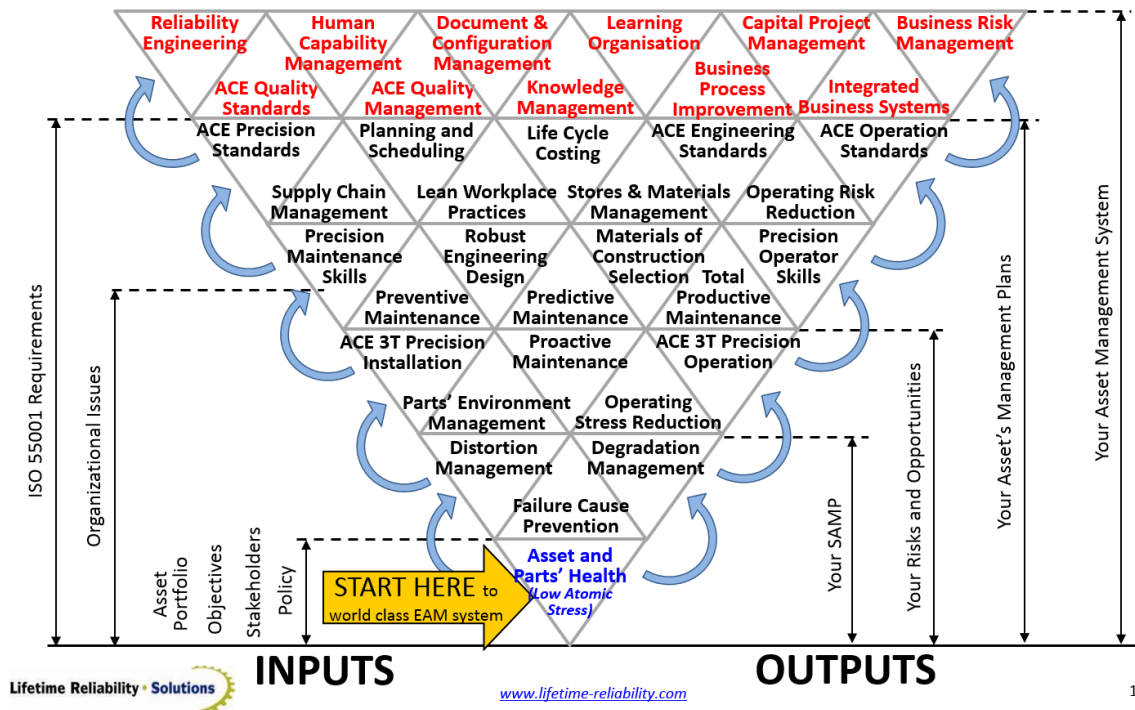
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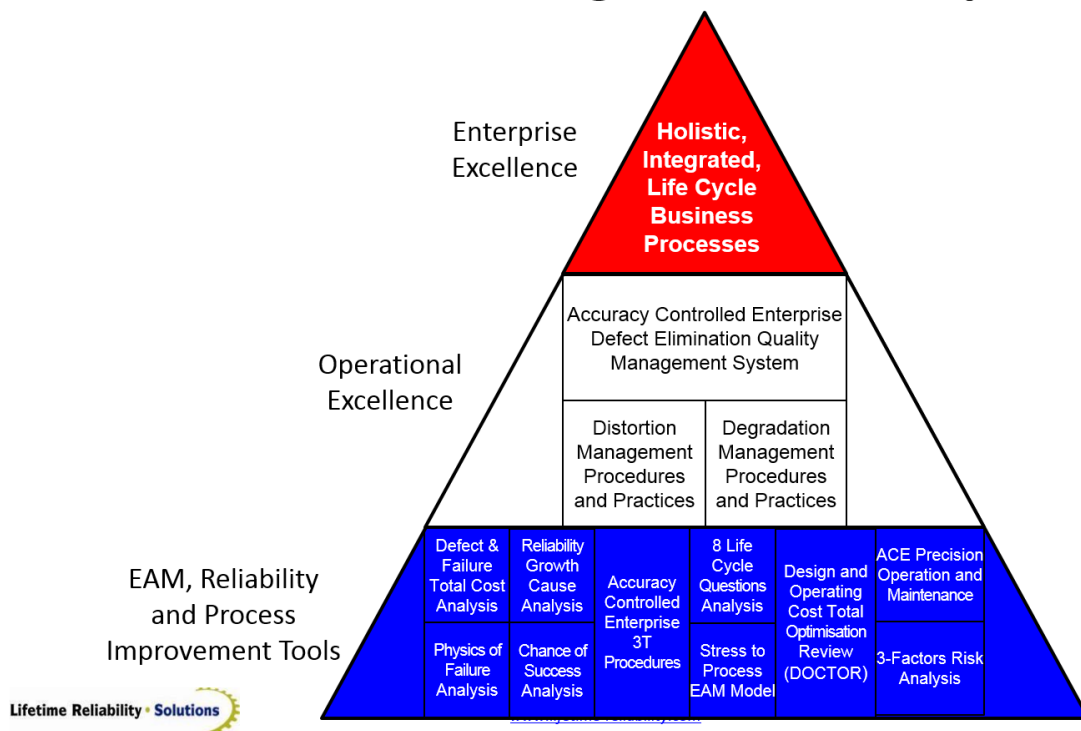


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