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## AN OVERVIEW OF ISO 55000 - STANDARDIZING ASSET MANAGEMENT

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# AN OVERVIEW OF ISO 55000 - STANDARDIZING ASSET MANAGEMENT

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## INTRODUCTION

Maximizing return on investment of physical assets, while at the same time operating safely and in an environmentally responsible manner is now more critical than ever for organizations within the heavy process industries. While many facilities can successfully achieve these goals individually, oftentimes the efforts to maintain uptime, improve safety, and ensure compliance lack alignment with each other. As a result, facilities can waste precious time, funds and resources accomplishing each effort individually.

By aligning these efforts under a common, comprehensive asset management system as outlined in the International Organization for Standardization (ISO) 55000, facilities can experience greater return on asset investment. This article provides an overview of the new ISO 55000 family of standards and the requirements facilities must follow to meet this standard's criteria.

## EVOLUTION OF ISO 55000

In 2004, the British Standards Institute (BSI), together with the Institute of Asset Management (IAM), released Publicly Available Specification 55 (PAS 55). This specification was very successful, with widespread adoption in the energy, transport, mining, process, and manufacturing industries.

In 2008, 50 organizations from 15 industry sectors in 10 countries worked together to release the latest update to PAS 55, known as PAS 55: 2008. It contained two parts:

1. PAS 55-1: Specification for the Optimized Management of Physical Assets, and
2. PAS 55-2: Guidelines for the Application of PAS 55-1

The new update provided clear definitions and a 28-point requirements specification for establishing and verifying an aligned, optimized, and whole-life management system for all types of physical assets. In late July 2009, BSI, supported by IAM, submitted a proposal to form a "Project Committee" to develop an International Standard. This ISO Standard would be based upon the good work already captured in PAS 55, and include input from other industries and learned societies located worldwide.

Thus, in January 2014, under the umbrella of the International Organization for Standardization, the ISO 55000 family of standards for asset management was published.

## THE ISO 55000 FAMILY OF STANDARDS

Generally referred to as "ISO 55000," this standard includes three key chapters:

1. ISO 55000 – Asset Management – Overview, principles

and terminology

2. ISO 55001 – Asset Management – Management systems – Requirements
3. ISO 55002 – Asset Management – Management systems – Guidelines for the application of ISO 55001

According to the IAM, "These three international standards are important not only for their content, but because they represent a global consensus on what asset management is and what it can do to increase value generated by all organizations."

In addition to outlining the definition and terminology of asset management, ISO 55000 standards can integrate with other major management system's standards. These include, ISO 9001 for quality management, ISO 14001 for environmental management, OHSAS 18000 for occupational health and safety, and ISO 31000 for risk management.

The ISO 55000 family is also the first management system standard to implement the new ISO Annex SL, which establishes a consistent basis for all management systems, enabling better integration and coordinated monitoring, audit, and certification. To align with this new template, other management system standards will be updated to meet these criteria.

## MANAGEMENT STANDARD

While the fundamental organization of ISO management system standard families start with 000 (e.g. ISO 9000), the actual requirements for compliance are typically in the 001 standard for each family (e.g. ISO 9001:2008), against which compliance is audited and certified. This is the case with the ISO 55000 family. Thus, ISO 55001: 2014 (ISO 55001) establishes the requirements facilities must meet to be ISO certified.

In order to describe the fundamentals of ISO 55001, it is useful to first explain what it is not. ISO 55001 does not dictate what to do to manage physical assets. Rather, ISO 55001 provides requirements for how to operate the system within which activities are defined, organized, and managed. As with most other ISO management standards, there is a great deal of flexibility in what the user actually does. The emphasis of requirements is instead placed on assurances that what the user says they will do, is actually done consistently, verifiably, and in a manner where nonconformance and proactive opportunities can be recognized and acted upon to achieve continuous improvement.

## ELEMENTS OF ISO 55001

ISO 55001 contains seven areas of compliance (per the publically available table of contents):

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

**Figure 1** depicts these seven elements, along with the sub-elements under each section. For clarity, the elements can be further divided into two general categories:

- I. Discreet system steps and requirements
  - a. Context of the organization
  - b. Planning
  - c. Operation
  - d. Performance evaluation
  - e. Improvement
- II. Overarching elements
  - a. Leadership
  - b. Support

The following provides a high level overview of the elements by general category.

### DISCREET SYSTEM STEPS AND REQUIREMENTS

**Context of the Organization** – The initial step in implementing ISO 55001 is to clearly identify and define organizational objectives and requirements of stakeholders, which can generally be referred to as business objectives. Step one is a key element of the standard, because the system is designed such that all actions should focus on maximizing the likelihood that these objectives will be met. Included in this element is also the clear definition of the scope of the asset management system, or in other words, what assets will help achieve the business objectives. In essence, these are the boundaries of the ISO 55001 system.

An asset management strategy must be developed to tie together the business objectives and asset scope into the fundamental approach the organization employs to achieve the desired objectives.

**Planning** – In the planning element, the organization develops a set of asset management objectives that align with the asset management strategy. These objectives should be measurable, monitored, communicated, and updated as necessary during the business lifecycle.

A crucial aspect of planning is identifying and assessing the risks to achieving objectives associated with each asset, and the appropriate risk mitigation actions that should be taken. The specific requirement of risk assessment and management is a critical part of ISO 55001.

|                                    |   |
|------------------------------------|---|
| <b>CONTEXT OF THE ORGANIZATION</b> | <ul style="list-style-type: none"> <li>• Organizational Objectives</li> <li>• Stakeholder Requirements</li> <li>• Asset Management System Scope</li> <li>• Asset Management Strategy</li> </ul> |
| <b>LEADERSHIP</b>                  | <ul style="list-style-type: none"> <li>• Leadership Commitment</li> <li>• Asset Management</li> <li>• Roles, Responsibilities &amp; Authorities</li> </ul>                                      |
| <b>PLANNING</b>                    | <ul style="list-style-type: none"> <li>• Risks &amp; Opportunities</li> </ul>   |
| <b>SUPPORT</b>                     | <ul style="list-style-type: none"> <li>• Resources</li> <li>• Competence</li> <li>• Awareness</li> <li>• Information Requirements</li> <li>• Documentation</li> </ul>                           |
| <b>OPERATION</b>                   | <ul style="list-style-type: none"> <li>• Planning, Implementation &amp; Control</li> <li>• Management of Change</li> <li>• Outsourcing</li> </ul>   |
| <b>PERFORMANCE EVALUATION</b>      | <ul style="list-style-type: none"> <li>• Monitoring, Measurement, Analysis &amp; Evaluation</li> <li>• Internal Audit</li> <li>• Management review</li> </ul>                                   |
| <b>IMPROVEMENT</b>                 | <ul style="list-style-type: none"> <li>• Nonconformity &amp; Corrective Action</li> <li>• Preventative Action</li> <li>• Continual Improvement</li> </ul>                                       |

**Figure 1.** ISO 55001 elements with corresponding sub-elements

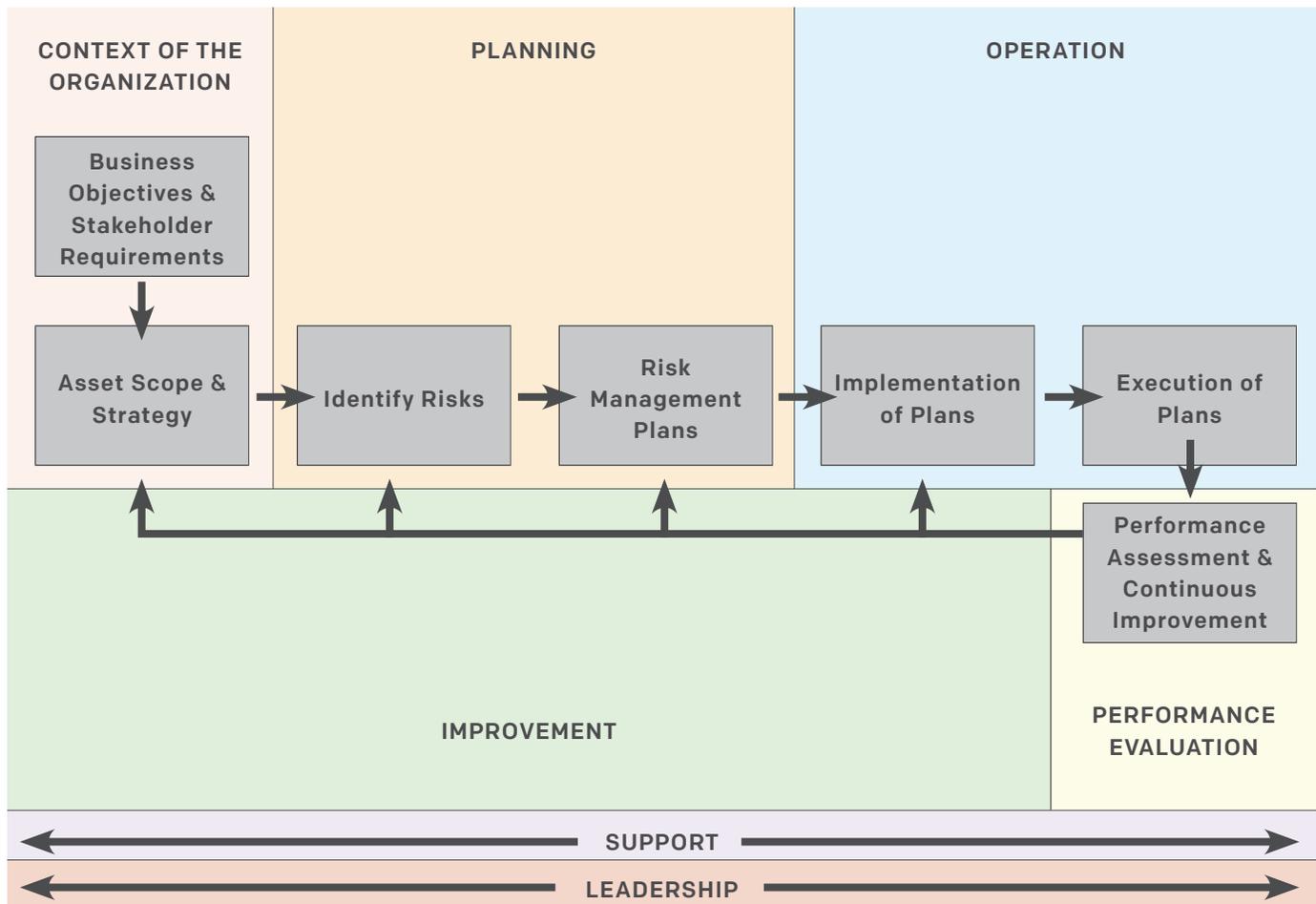
**Operation** – Essentially, the operation element represents the execution of asset management plans. This includes documenting evidence that plans are carried out, and that the facility is continuing to evaluate and control ongoing risks.

The operation element also requires assessment or re-assessment of risks associated with changes. This is essentially the role of asset management in the organization's management of change (MOC) process, and vice-versa.

The operation element also defines requirements for identifying, assessing, and managing risks when activities are outsourced. This ensures that outsourced resources meet the same fundamental requirements as those within the organization itself.

**Performance Evaluation** – This element defines requirements for the on-going monitoring, auditing, and evaluation of asset performance, and the asset management system itself. Specific descriptions are required when defining performance evaluation, including what, how, and when performance is evaluated, as well as the auditable retention of the evaluation documentation. Overall system compliance is assessed via internal audits and periodic management reviews.

**Improvement** – The improvement element, which is similar



**Figure 2.** Typical comprehensive asset management process depicting ISO 55001 elements

to other ISO management system's requirements, necessitates that an organization identifies nonconformity and corrective action, and implements such tasks to correct these areas. This also includes appropriate documentation, implementation, and management of a system to identify, evaluate, and act on preventive and proactive opportunities to improve, such that non-conformance can be avoided. Finally, an organization is required to continually assess and improve the effectiveness of the asset management system itself.

#### OVERARCHING ELEMENTS

**Leadership** – In this element, the way in which an organization's leadership supports the asset management system is defined. This includes active sponsorship and ownership of the system, the establishment of an asset management policy, and the assignment of roles, responsibilities, and authorities for its ongoing management.

**Support** – This element defines the requirements for organization-wide support of the asset management system. This includes the provision of appropriate resources, and the assurance of competency of those resources. Also defined are the requirements for developing organizational awareness of the asset management system and each individual's role, including requirements for

communication. The information necessary to implement and manage the system is defined, as well as the required documentation to manage, verify compliance, and demonstrate effectiveness of the system.

**Figure 2** depicts a typical comprehensive asset management process, and how the fundamental elements of ISO 55001 are aligned.

#### FUTURE OF ISO 55001

Although the degree to which compliance to this standard will be a requirement is yet to be seen, the potential performance improvement opportunities associated with the implementation of a common asset management system is creating a compelling business case for the implementation of ISO 55001 at facilities worldwide.

Those who can leverage current good practices and existing risk management programs such as RBI, RCM, RAM, PHA, and RCA, into a seamless, integrated asset management system within the ISO 55001 framework will surely achieve the earliest, greatest, and most enduring ROI. ■

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### **WALT SANFORD**

As president, Walt Sanford oversees the growth of Pinnacle's offerings to the Reliability Centered Maintenance (RCM) market and the development, oversight and growth of all company products and services in process, manufacturing, power and facilities industries. With over 20 years of experience in RCM, system reliability improvement and management, technical work process improvement, asset management technologies, operations, maintenance management and software development, he developed the most widely used Reliability Centered Maintenance methodology and software within the Oil & Gas and Petrochemical industries. He has also managed numerous full-scale RCM implementation projects for Fortune 500 companies. Walt received his BS in Physics with a minor in mathematics from Mansfield University of Pennsylvania.

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