**Asset Management and Design for Maintainability and Reliability**

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1. **Introduction:**

An asset isa useful or valuable thing or person. In other words, it is an entity or possessions possessed by an individual or enterprise. It is regarded as having value. It is available to meet arrears, commitments, or legacies. In financial accounting, an asset is an economic resource. It can be anything that is Physical or tangible or immaterial or intangible. It produces a value can be owned or controlled. It is held by a company to produce positive economic value is an asset. Assets is simply defines or signify value of ownership convertible into cash. Assets can be categorized as tangible assets and intangible assets as described below.

* A tangible asset includes current belongings or assets and immovable assets. Inventory is current assets, while buildings and equipment are examples of fixed assets.
* Intangible belongings or assets are nonphysical resources. These are valuable and advantageous to the firm. An intangible asset includes goodwill, trademarks, copyrights and computer programs.

Asset administration is generally any system that monitors and maintains things that are valuable to an entity or a group. It is applicable to both assets. It is an organized and cost-effective process of developing, functioning, maintaining, improvement, and marshaling of assets.

Asset management is mostly used in the financial sector. It describes people and companies who manage investments. An example of Asset Management is an investment manager who manages pension fund asset.

In the engineering environment is:

* It is the practice of dealing assets in order to achieve the greatest returns. Here it is useful for industrial assets such as plant and equipment.
* It is the process used to monitor and maintain services systems. The objective is to provide the best possible and effective services to users in all dimensions.

Effective asset management systems allow organizations to manage their assets in ways that create optimal value for the end user.

Reliability emphasizes on the ability of an asset. It controls and checks to perform assets projected function to support manufacturing a product (Item or Consumption) or providing a service. Unreliability means Assets fails to perform its intended function. It can results in high cost and ultimately loss to the organization.

Maintenance is a continuous act of sustaining, or keeping the work asset in proper working and operational conditions. It is a significant action and it performs maintenance assessment and repair. It keeps assets operating and functioning in a safe manner. Therefore maintenance keeps assets in an acceptable and tolerable working condition so as to prevent failure. Even if they fail, it brings them back to their operational and desirable level, efficiently and as quickly as required.

The Reliability must be “designed and planned in” and is a tactical mission. Maintenance is to keep assets working and functioning up to a desired level and is a planned task. The reliability & maintainability should be designed and planned into the asset to reduce maintenance needs. It could be done by using reliable constituents that are easier to examine and replace.

The objective of maintenance & reliability in an organization is to make sure that the assets are available and accessible, when required, in a cost effective manner. Reliability is a design characteristic, is a general term that emphases and focuses on asset’s ability to perform its planned and intended function. Maintainability is also a design attribute which directly relates to reliability. Maintainability ensures that maintenance jobs can be implemented easily and successfully.

1. **Needs and expectations of stakeholders from maintenance of specific Assets:**

The international standard Asset Management, ISO 55000, describes the benefits of Asset Management as enabling organizations to realize value from the use of assets in achieving of their organizational objectives. What constitute value will depend on these objectives, the nature and purpose of the organization, and the need and expectations of its stakeholder (investors, shareholders and sponsors).

The organization must recognize and classify stakeholders. It must also understand their respective requirements. It must Optimize relations with stakeholder and sometimes include difficult trade-offs. These trade-offs must be revisited regularly and recalibrated over time. This is essential to reflect changing circumstances.

The organizations have the challenge of delivering successful projects in uncertain environment. It should guarantee that stakeholders are least affected by any change and uncertainty.

The engagement of Stakeholder can time consuming. Stakeholders whose information meet their needs, as well as the organization needs should be considered.

1. **Scope of Maintenance Organization to meet Expectations:**

The success of the Maintenance organizations depends on the effective communications among all functions within the organization. It must establish strong associations among organization‘s key functions. Maintenance Planners plan and schedule a success. Communication obstacles and increased down time should be avoided.

Proper planning and scheduling avoids delay and interruptions. Maintenance Planner role is to improve and increase work force productivity quality. They must anticipate and exclude potential delays by careful planning and synchronization, Maintenance Planner ensures and guarantee or extend expected life of the equipment. Their support results in reduction of maintenance cost and increased output.

Maintenance Planners must interact and communicate regularly with Operations and Maintenance.

1. **Level of documented system for maintenance department:**

The documentation System for the Maintenance department can be:

It can be any record, catalog, manual, drawing or computer file. It is information. This information facilitates and simplifies maintenance work.

Maintenance-related information is required in efficient planning and execution. It is essential for each of the units in the inventory, the most important of this being:

* Technical data ,
* List Of Spares,
* Records Of Drawing,
* Manual containing Maintenance instruction,
* Catalog,
* Life plan Of Asset,
* Information to Operate instructions and safety,

1. **Commitment and support from leadership for risk based maintenance management:**

Maintenance resources are ranked by Risk-based maintenance (RBM). Assets having the most risks are ranked. It determines maintenance resources with most economical usage. The optimization of maintenance effort across a facility is required. It minimizes risk of a failure to ensure smooth workflow.

RBM is an appropriate approach for planning maintenance. It offers a systematic tactic to discover suitable asset maintenance plans. If effectively implemented it minimizes the risk of asset failure.

RBM based thinking allows to recognize and pinpoint opportunities. It can have a positive and constructive side of risk. An Example is of crossing the road directly. It allows reaching the other side quickly, but increases risk of injury from heavy traffic. One using a footbridge results in delay. The opportunity of using a footbridge avoids injury. Opportunity is always related to the objectives.

*ISO 9001:2015 sub clause 5.1.1— as General leadership and commitment*

“Quality Management System requires Top management to demonstrate leadership and commitment. Risk-based thinking should be promoted;”

ISO 9001:2015 The planning for QMS requires that, the top management must implement and promote a culture of risk-based thinking completely for the organization. QMS achieves its objective to determine and address the risks and opportunities.

*ISO 9001:2015 sub clause 5.1.2 for focus of Customer.*

“The customer focus should be the main target of the top level management. They shall exhibit leadership and commitment with respect to it. This ensures that the risks and opportunities can affect conformity of products and services. Customer satisfaction is the highest and the foremost requirement;”

1. **How Life Cycle Costing is used in maintenance decision making in organization:**

Assets Managers uses Life Cycle Costing Tool in assessment process and for decision making purpose. It provides systematic valuation of selected assets and its life cycle.

The Owners, users and managers take decisions on the acquirement and ongoing use different assets. This includes items or equipment. It also includes housing facilities. One should clearly define the initial capital expense cost. The choice of asset is often effective key factor. It provides different alternatives to select.

Life Cycle Costing (LCC) is the process of recognizing and recording all the costs of asset lifetime.

The Life Cycle Costing process is simply as a table of annual expected costs. It can be a complex (computerized) model. This model creates future cost drivers scenarios based on various assumptions. The complexity and scope of the cost analysis of the life cycle should normally mirror the complexity of the assets being analyzed. It forecast future costs and the importance of upcoming costs.

1. **Any Gaps identified in current practice when compared with good practices/ international standard:**

**A Gap Analysis:**

* It compares and matches current conditions and practices in order to identify gaps and zones in need of improvement with regards to compliance to the applicable standards.
* It formally identifies and corrects gaps of preferred levels over actual levels and stages of performance.
* It enables organizations to analyze certain processes of any division of their company or the organization.

1. **Conclusions with opportunities for improvement:**

The evaluation results in understanding and clarifying how the design and delivery of workforce development interventions work to advance the skills and care ethics. The account development strains on a range of evidence. It is including from diverse public service contexts, specifically policing and teaching.

The Performance enhancements in the maintenance and preservation activities of assets are measured by accessibility and operational reliability. It should obtained maximum quality and safety levels and decreasing the costs.

Today’s world is full of competitiveness. Therefore enhancement efforts are vital to reach high levels of effectiveness and proficiency in company’s or organization’s production or functioning department. The objective is to have competitive advantage (in products or offered services). It is based on diverse hard-to-copy aspects, i.e. know-how.

In conclusion, this type of investigation is relevant in the area of continuous technological improvement, where today’s experimental technology could be tomorrow’s competitive advantage guaranteeing the optimal level in reliability and availability with the lowest possible cost.

**Appendix:**

**Accrual Accounting** **–>** It Recognizes assets, commitments, equity, revenue and overheads as they are experienced.

**Asset Management (AM) –** It is the orderly and coordinated undertakings and practices of a business. It optimizes and sustains provide objectives through the cost-effective life cycle for managing assets.

**Asset Management Plan (AMP) –** A Long-term that summarize the program asset activities. For each service area and resources it defines a level of service in the most cost-effective way.

**Asset Management Policy –** A manuscript that is outlining principles for AM task in a logical and coordinated way in the enterprise. It is consistent with the business’s premeditated plan. It provides the framework for the AM strategy and AM Plan.

**Stakeholder –** It can be person or an organization that affects the business.

**REFERENCES**

Bourne, L. (2010). Stakeholder Relationship Management and the Stakeholder Circle. Saarbrücken, Germany, LAP - Lambert Academic Publishing.

Bourne, L. (2009). Stakeholder Relationship Management: a Maturity Model for Organisational Implementation. Farnham, Surrey, UK, Gower.

Bourne, L. (2008). SRMM: Stakeholder Relationship Management Maturity. PMI Global Congress, EMEA. Malta.

Bourne, L. and D. H. T. Walker (2008). "Project relationship management and the Stakeholder Circle."

International Journal of Managing Project in Business 1(1): 125 - 130.

Crane, A. (2010). Rethinking Construction and Making Change Happen. CIOB Global Construction Summit. Shanghai, China.

Deming, W. E. (1982). Out of the Crisis. Melbourne, Australia, Cambridge University Press.

Egan, J. (1998). Rethinking Construction. London, HMSO, Dept of Trade and Industry.

Arunraj, N.S. & Maiti, J., 2007. Risk-based maintenance—Techniques and applications. Journal of Hazardous Materials, 142(3), pp.653–661.

Khan, F.I. & Haddara, M.M., 2003. Risk-based maintenance (RBM): a quantitative approach for maintenance/inspection scheduling and planning. Journal of Loss Prevention in the Process Industries, 16(6), pp.561–573.

Sakai, S., 2010. Risk-Based Maintenance. JR East Technical Review, 17, pp.1–4.

Tixier, J. et al., 2002. Review of 62 risk analysis methodologies of industrial plants. Journal of Loss Prevention in the Process Industries, 15(4), pp.291–303.