



Optimizing Asset Management

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Many companies are looking at their maintenance efforts in terms of asset management. Here's how asset management fits in with all those other maintenance strategies you've heard about.

In today's business environment, terms such as best practices, benchmarking, and world class, continuously bombard us. Another term to recently emerge is asset management. What is asset management, and what importance does it have for today's managers?

One definition of "asset management"--the one used here--is "the management of a company's assets based on maximizing those assets' return on investment (ROI)," i.e., based on getting the maximum benefit from assets based on cost. What will help readers understand asset management is the realization that it encompasses the philosophies contained in many of the more popular maintenance techniques currently in use.

What initiatives might fall under an asset management program? The list includes (but is not limited to) preventive maintenance (PM), optimized maintenance work-flow and control, computerized maintenance management, predictive maintenance (PDM), reliability centered maintenance (RCM), total productive maintenance (TPM), financial optimization, and continuous improvement.

Each of these initiatives is a building block in the asset management process. An examination of each will show its importance to asset management.

Preventive Maintenance

A PM program is the key to any successful asset management program. It reduces the amount of reactive maintenance to a level that allows the other initiatives in an asset management process to be effective. However, most companies in the U.S. have problems keeping a PM program focused. In fact, several surveys show that only 20% of companies in the United States believe their PM programs are effective.

From a financial perspective, reactive maintenance, due to its inherent inefficiencies, typically costs 2 to 4 times more than proactive maintenance, negatively impacting in a significant way the ROI of assets.

Effective preventive maintenance activities should enable a company to achieve a ratio of at least 80% proactive maintenance to 20% (or less) reactive maintenance. Once the ratio is at such levels, the other initiatives in an asset management process become more effective.





Maintenance Work Flow and Control

As a company reduces the amount of reactive maintenance it performs, it also should turn its attention to documenting and tracking maintenance work. This involves the use of a work order system to initiate, track, and record all maintenance and engineering activities.

Unless the data are tracked from work request through completion, the data are fragmented and useless. So, planning and scheduling require someone to perform the following activities:

- Review the work submitted,
- Approve the work,
- Plan the work activities,
- Schedule the work activities,
- Record the completed work activities.

Unless a disciplined process is followed for these steps, increases in productivity and reduced equipment downtime never get recorded, leaving the perception that maintenance planning is a clerical function.

CMMS Use

In most companies, there are sufficient data accumulated by the maintenance and engineering functions to require the computerization of data flow in order to facilitate the collection, processing, and analysis of the data. The tools that supports these functions are computerized maintenance management systems (CMMS).

CMMS have been used for more than a decade with mixed results. A recent survey in the U.S. conducted by and published in Engineer's Digest (May 1992) showed that the majority of companies using CMMS are using less than 50% of their systems' capabilities. What does this mean for those companies?

It means that the data they collect is incomplete and probably inaccurate. Unless this under utilization of CMMS is corrected, these companies will never be able to achieve true asset management, since there will be no method of tracking asset costs and calculating ROI.

Predictive Maintenance

With PM at a high level and work flow tracked and controlled, resources should be freed up to focus on the predictive technologies that apply to the assets. For example, rotating equipment is a natural fit for vibration analysis, electrical equipment for thermography, and so on. In some cases, the devices monitoring the asset may be networked to a building automation system, a distributed control system, or a PLC system, and the monitoring may occur in real time.

The best approach here is to purchase only technology that solves or mitigates chronic problems associated with particular assets. Predictive inspections should be planned and scheduled using the same techniques that are used to schedule the preventive tasks. All data should be recorded in or interfaced to



the CMMS.

Reliability Centered Maintenance

When an organization has the capability to record relevant data, then RCM may be applied to maintenance efforts. The idea behind RCM is the determination of the maintenance requirements of each physical asset in its operating environment.

For example, if a particular asset is critical to operations, environmental compliance, or plant and community safety, then the highest level of preventive (PM) or predictive (PDM) techniques is called for. If an asset has the potential to restrict or impact the production or operational capacity of the company, then another level of PM/PDM activities is applied with a cost ceiling in mind. If the asset was allowed to fail and the cost to rebuild or replace it would be expensive, then another level of PM/PDM activities would be in order. There is always the possibility that it is more economical to allow some assets to run to failure, and this option, too, is considered in RCM.

RCM tools require data to be reliable, and it is for this reason that the RCM process is used after an organization has attained a level of maturity that ensures accurate and complete asset data.

Total Productive Maintenance

TPM is an operational philosophy. In TPM, everyone in the company understands that in some way his or her job performance affects the performance of the asset. Under TPM, operations understand the true capacity and capability of an asset and does not run it beyond design specifications, thus creating unnecessary breakdowns. Similarly, the purchasing department does not try to save small amounts by buying spare parts to incorrect specifications and, thereby, creating breakdowns because the parts didn't last as long as they should.

TPM is like total quality management. The only difference is that instead of companies focusing on their products, they focus on their assets. All of the tools and techniques used to implement, sustain, and improve the total quality effort come into play in TPM.

Financial Optimization

Financial optimization is a statistical technique that combines all of the relevant data about an asset:

- Downtime cost,
- Maintenance cost,
- Lost efficiency cost,
- Quality costs, etc.

Financial optimization also balances out financially optimized decisions:





- When to take the asset off line for maintenance,
- Whether to repair or replace an asset,
- How many critical spare parts to carry,
- What the max-min levels on routine spare parts should be.

Financial optimization, too, requires accurate data, since making these types of decisions incorrectly could have a devastating effect on a company's competitive position.

Continuous Improvement

When a company reaches the point where it has sufficient accurate data to allow it to focus on managing its assets using TPM and financial optimization strategies, it is approaching the pinnacle of the asset management pyramid. All that is left is the continuous improvement loop of self-evaluation and benchmarking.

Continuous improvement in asset care is an ongoing program of evaluation, constantly looking for the "little things" that can make a company more competitive. One of the key tools for continuous improvement is benchmarking.

There are several types of benchmarking, but one of the most successful is process benchmarking. Process benchmarking examines specific processes in maintenance, compares the processes to companies who have mastered those processes, and maps changes to improve the specific process.

The key to benchmarking is self-evaluation. A company must know its current status before it tries to benchmark using other companies' processes. Without self-knowledge, it is impossible to get an accurate comparison of the benchmarked process.

Many companies are attempting to do asset management. The question all must ask is, "Will we continue doing what we have always done, or will we strive to achieve best practices in asset management and become more competitive?"

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