

WHITEPAPER

| The Anchor of Asset Management



PROMETHEUS GROUP



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Asset management relies on a systematic approach to the care and organization of a company's resources. The basic idea is simple. If an asset remains in production for longer than expected, then the company does not have to replace it as often, saving money over the course of its life. Likewise, if the asset is in use and functioning properly, the company is generating income. Production slams to a halt the moment a critical piece of equipment breaks down. This means forfeiting sales and potentially making customers unhappy. Maintenance typically prolongs the life of an asset, but it comes with its own costs.

Asset management is the science of balancing these measures of performance, risk, and cost over time. There are many factors that contribute to these three measures, as illustrated by the SAMI diagram in Figure 1.

At its core, asset management depends on four main components: work identification and prioritization, planning and scheduling, work execution and review, and materials management. This paper will discuss the significance of building a firm asset management foundation, as well as provide strategies for climbing the pyramid and becoming a best-in-class maintenance organization.

Building a Firm Foundation

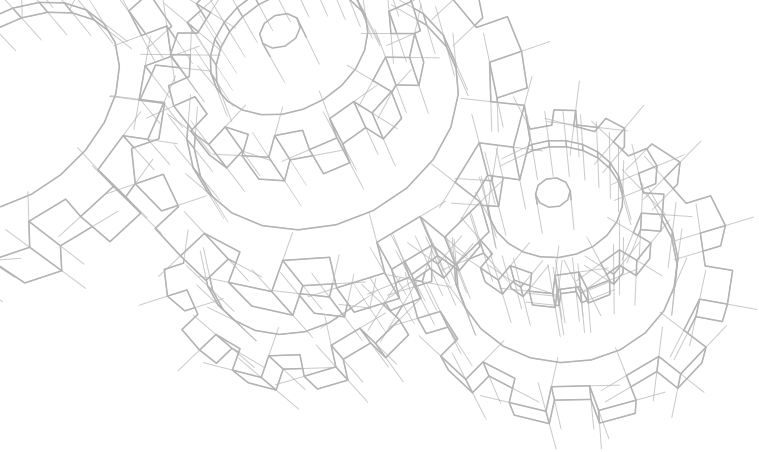
Work Identification and Prioritization

Work identification and prioritization are central elements in gaining control of the work process, yet they are often overlooked because of the erroneous assumption that all work is of equal importance. The difference between a broken pump and a broken pump that leads to a refinery shutdown is that the latter will cost the company significantly more money.

As a rule, any piece of equipment that could result in increased production costs upon failure is considered critical in the process. The solution is to give equipment a criticality rating and set up guidance rules. This will help ensure an appropriate focus for your maintenance and engineering efforts. Check out, "How to Rate the Criticality of your Equipment" for our quick guide to



Figure 1: The SAMI Pyramid of Asset Management



criticality. For more in-depth information, please see our whitepaper on "Equipment Criticality and Prioritization of Work Orders."

Emergency break-in work costs at least three times more, takes three times longer, and is three times more likely to fail than planned work.¹ On average, up to 80 percent of equipment failures cannot be predicted based on age alone². Therefore, developing a comprehensive plant maintenance and risk management strategy is mandatory for any efficient production process. With equipment properly ranked for criticality and vulnerability, schedulers can prioritize and execute maintenance orders with minimal disruption to each of the six steps within the work order life cycle (Figure 2).



Figure 2: The Work Order Life Cycle

Given the cost of downtime, it's understandable why equipment maintenance is a major area of concern. The potential savings of employing planned maintenance practices and reducing reactive work are immense. By properly identifying and prioritizing work, companies can concentrate maintenance efforts to maximize equipment uptime and availability.

Planning and Scheduling

Planning is the "what and how" of work. Planners are responsible for ensuring that all the materials, equipment, permits, and resources are available before a job is scheduled. Scheduling is the "who and when" of work. Schedulers should ensure various trades are available to complete a planned job during the schedule duration. They should also communicate the work plan and any changes across the organization.

To maximize uptime and equipment reliability, planners and schedulers must first focus on getting the most work out of the fewest resources. Next, they must establish practices that will reduce reactive maintenance. Craft time can be wasted during an average day when:

- Materials and tools are not available at the job site
- Safety measures are not taken prior to the start of a job, causing craft personnel to wait around until safety measures are completed
- The schedule is not posted or communicated well
- Break-in work interrupts routine maintenance activity in mid-cycle

A well-executed planning and scheduling process can eliminate these time wasters and provide visibility to all involved personnel. Developing a focused improvement plan may include:

- Improving Bill of Material (BOM) quality
- Enhancing visibility and coordination with production
- Improving the communication of assignments to personnel
- Ensuring materials and tools are available
- Verifying that work package and instructions are readily available

¹ <http://www.reliableplant.com/Read/3740/maintenance-outsourcing-model>

² <http://www.lifetime-reliability.com/training/online-courses/predictive-maintenance-strategy/PdM-course>.

- Protecting maintenance time by creating an emergency break-in team
- Scheduling resources to 90 percent capacity

Effective planning and scheduling are essential to a successful maintenance organization. You can become more specific with asset planning and measuring reliability once you have effective planning and scheduling. This process will help increase worker productivity, ensure knowledge transfer between the experienced workforce and new hires, and enable cross-functional collaboration. By following these best practices, planners and schedulers can concentrate on the ultimate goal, improving production time, and in effect, generating greater profits for the business.

Work Execution and Review

Formulating a strategy is only the beginning. The real challenge lies in implementation. First, make sure every department is actively using a single CMMS, such as SAP. Then, eliminate any third-party software that requires removing data from the central system. This is vital because all aspects of the plant maintenance process (contractors, operational status, relationships, BOMs, etc.) build on one another. Forfeiting visibility of any aspect of the process makes it nearly impossible to

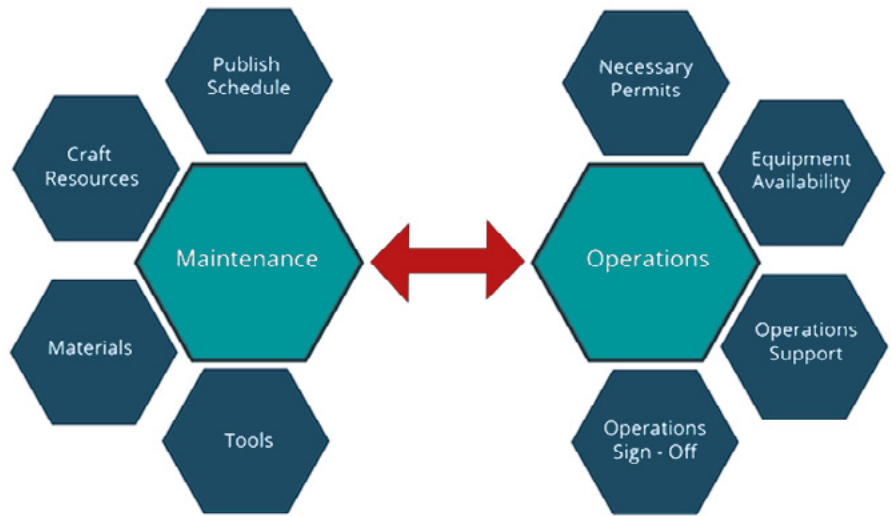


Figure 3: Alignment of Maintenance and Operations

align the organization, track work and resources, and measure successes and failures.

Competing priorities across different departments can be a challenge. To remedy this, work together with various units in your organization to define your overall goal (Figure 3). Likely, this goal will demand that both maintenance and operations take equal responsibility for creating the product in the most economical manner possible. To improve efficiency, there must be cross-functional coordination with common goals and objectives, and this must be a top-down initiative.

Finally, change your way of thinking, and encourage others in leadership roles to do the same. After achieving goal alignment, it's important to shift focus from "who is responsible for interrupted or slowed



³ <http://www.idcon.com/resource-library/articles/operations-and-maintenance/517-operations-maintenance-1.html>



production” to “why did this happen.” Nothing dissolves teamwork faster than providing a catalyst for blaming others. Instead, keep track of critical problems (i.e. problems that jeopardize safety, increase cost, or stop production) and then prioritize. Assign a person or a team of people to each problem, and record and share the solution after it’s resolved.³ This approach doesn’t waste time pointing fingers. It solves problems and creates a framework for handling future issues. Aligning goals, processes, and tasks, and streamlining your CMMS will pay dividends throughout your implementation of a successful asset strategy.

Materials Management

Material or inventory management is about ensuring items are in the right place at the right time. It sounds basic, but this is a major and costly struggle for asset intensive organizations, and the problem compounds as the organization expands.

A study by the Society of Petroleum Engineers indicates that on average, maintenance, repair, and operations (MRO) storehouses and supply chains are lacking critical equipment spares and are overstocked by 20 percent.⁴ This data indicates critical parts may not be available when a failure occurs, further extending downtime and forcing crafts to wait around until parts and materials become available. Companies may pay taxes while that inventory sits idle, and cash tied up in inventory is cash they cannot touch.

Idle inventory may be the result of an inadequate process. For example, procurement uses outdated information and orders a part that is not needed.

The part ends up sitting in inventory year after year. Perhaps materials are purchased in bulk for a project and only a few are used. Unused materials continue to pile up because of a lack of visibility into material availability and job requirements. This goes together with poor communication throughout the organization and — especially in the case of material management — depletes the company’s coffers.

Companies that have complete visibility into material assets make smarter decisions regarding how much inventory to purchase and when to retire materials and equipment. Users will have information available about where materials are located, who needs them, and when. Furthermore, visibility of in-house inventory enables the reallocation of materials and tools from previous work orders to future work orders. This is a huge time saver for planners. Knowledge is power, and control over these variables will allow companies to curb downtime by protecting maintenance time and keeping craft personnel productive.

Rounding out the Foundation

Once planning and scheduling best practices are in progress, teams can implement the “90-10” rule for planned maintenance.⁵ This is 90 percent planned work with 10 percent contingency built in. As with safety, this level of planned and scheduled work requires a zero-tolerance policy. To reach the pinnacle of asset management and become a best-in-class maintenance organization, maintenance time must be protected.

The managing system should encompass the planning and feedback system. This cycle follows the simple path of plan, perform, measure, review, adjust, and begin again. The key is having data from each step in the cycle easily accessible in a single system so that it may be harnessed as needed throughout the work process. Such intelligence around alignment will allow your organization to support the goals and strategies required to meet or exceed performance targets.

To round out the foundation, user adoption of the system should become standard across the organization, with the average user entering and

⁴ http://www.spe.org/ogf/print/subscribers/2013/06/07_IRM.pdf

⁵ <http://www.plant-maintenance.com/articles/PathForward.pdf>

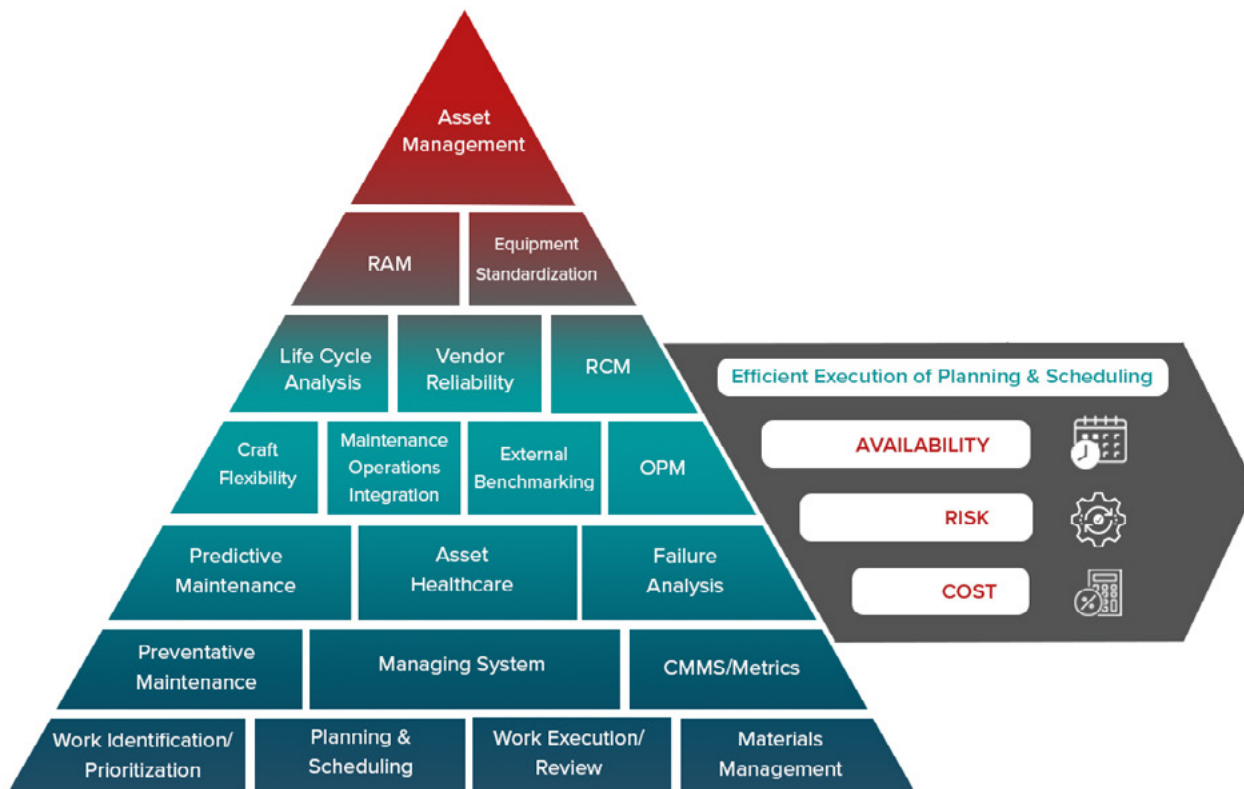


Figure 4: The efficient execution of planning and scheduling impacts availability, risk, and cost.

extracting data as needed. Training on navigation and how to schedule work, track materials, and utilize task lists and BOMs must be implemented. Additionally, data should be collected and examined to track progress and determine where improvements can be made.

Climbing the Pyramid

Work identification, planning and scheduling, work execution, and materials management cast the foundation for a controlled, yet progressive, asset-intensive infrastructure. In fact, improvements at this level can lead to staggering results.

A study by SamiCorp found that advancements in these four areas account for a 50 to 100 percent improvement in work efficiency.⁶ As companies evolve, leaders can shift their focus to developing strategies that encourage effective leadership and allow for greater control over equipment and resources. These strategies promote organizational excellence, proactive maintenance, and reliability.

Exceptional organizations have several factors in common⁷:

- Leadership that encourages open communication and establishes clear goals and processes for achievement
- A work force dedicated to productivity and further knowledge attainment
- Skill-based performance is rewarded with career progression and success
- Performance results benefit stakeholders and employees alike

Proactive maintenance incorporates intelligence around equipment condition. In addition to performing regular maintenance on equipment, proactive maintenance narrows the focus by identifying defects and correcting them before they become major problems.

Engineered reliability uses data on equipment dependability, standardization, and vendor quality to justify the cost of maintaining equipment and develop life cycle goals and plans prior to purchasing new equipment. The goal of engineered reliability is to achieve a state of equipment maintainability and standardization.

⁶ & ⁷ http://www.samicorp.com/index.php?option=com_content&view=article&id=57&Itemid=108

The Pinnacle of Asset Management

Above all, a best-in-class maintenance organization is one that has created a cooperative work environment where the priority is communication and alignment among operations, maintenance, and management. Achieving the pinnacle of asset management means the entire organization is working towards the common goal of optimizing the process in a way that creates value. At this level, at least 80 percent of work is planned, and safety and discipline drive performance.

Reaching the pinnacle is possible. Many organizations have already achieved this level of efficiency or are taking the steps to do so with the help of Prometheus Group's solutions. Prometheus enables companies to execute on their asset strategy by helping them build a rock solid foundation and providing tools that allow businesses to focus on asset planning and execution.

Prometheus solutions impact these key areas (Figure 4):

- Improved availability – Customers have seen a 1 to 3 percent improvement in availability through reduced downtime and increased production capacity
- Reduced risk – The more mature a company's planning and scheduling process, the safer the operation; backlog reduction indicates that work is completed as planned

- Minimized cost – Improved wrench time leads to reduced overtime and outsourced labor

Prometheus Group's solutions offer seamless integration with your ERP, CMMS, or EAM, so there is never a need to export data. Planners and schedulers can focus on managing commitment dates to production, building accurate BOMs to better manage inventory, and implementing programs to improve downtime and wrench time. By ensuring accurate data, reports can be easily generated in real time. This means companies can focus on aligning the organization and taking steps to reach the pinnacle of asset management.

Prometheus solutions deliver improved data, visibility across functional groups, reduced downtime, improved reactive work, and safer operations. The result is a simpler, faster, and more cost-effective maintenance operation.

Learn more about how Prometheus Group can help your organization today.

LEARN MORE

About Prometheus Group

Prometheus Group is a leading global provider of comprehensive and intuitive enterprise asset management software solutions that work within ERP systems and span the full work management life cycle for both maintenance and operations. Developed jointly with end users, Prometheus software enhances the customer experience for planning, scheduling, and executing work for both routine maintenance and shutdowns and turnarounds, all while protecting the workforce with safety solutions and electronic permit to work. Our straight-forward functionality, graphical visualization, and simple processes enable customers to increase productivity, reduce costs, and improve reporting. For more information, please visit www.prometheusgroup.com.