Matt Hermans
Rockwell Automation

Still feel as if you’re just putting out fires in your maintenance efforts? This article offers some helpful tips for moving out of the reactive mode.

Unplanned events are a fact of life, but no one wants to start their day expecting an emergency to occur. Unfortunately, that mindset has become commonplace when it comes to plant maintenance for many companies. They’ve fallen into a “run it until it breaks” routine that leaves maintenance managers constantly scrambling to put out fires.
There's no single culprit to blame for the proliferation of reactive maintenance cultures among industrial companies. Reduced budgets and staffs have strained maintenance effectiveness in recent years. And remaining staff members find themselves adjusting to shifting priorities, many of which focus resources on enterprise resource planning (ERP) systems at the expense of strategic maintenance.

Given these constraints, the growing reliance on reactive maintenance makes sense. But over time this approach has an increasingly negative impact on plant performance and the bottom line. Moreover, companies dependent on reactive maintenance often experience a data disconnect when it comes to maintenance costs and their relationship with production and the storeroom. They lack the granular information needed to pinpoint failures and make meaningful changes. A strategic asset-management program that considers maintenance improvements, storeroom management, networked devices and system convergence can help drive sitewide reliability improvements and optimization while preparing an organization to take full advantage of technology advancements.

**Strategic asset management in the spotlight**

Strategic asset management has become an increasing area of focus for many plant maintenance departments recently. According to a 2013 Aberdeen Group research study conducted with 150 manufacturing plant managers, economic uncertainty puts more pressure on plant maintenance departments to maximize their Return on Assets (RoA) and extend the benefits of their existing asset base. [Ref. 1] Internal and external pressures—reduced operational and capital budgets, rising material costs and aging assets—are driving the need to make improvements. Implementing a strategic asset-management program can help address these challenges in several ways:

- Improved utilization and performance of assets
- Reduced capital costs and asset-related operating costs
- Extended asset life
- Improved RoA

Organizations focused on strategic asset management ultimately aim to manage their assets across the value stream, from purchasing to storeroom, maintenance, engineering, production and finance. To achieve this level of convergence, organizations must selectively implement strategies that will help contribute to a high-performing, asset-management program and lay the groundwork for maintenance success in the future.

**Strategy 1: Implement criticality-based maintenance**

Reliability is key to effective asset management, and its benefits extend far beyond simply having equipment and processes that run when needed. Reliable equipment and processes cost less to maintain and operate, improve product quality, increase energy efficiency and result in fewer health and environmental incidents.

Focusing on reliability and identifying equipment criticality is vital for effective maintenance. Half of all planned maintenance activities are considered unnecessary, according to a study conducted by the ARC Advisory Group. [Ref. 2] Defining equipment criticality and risk can help reverse this trend. For example, the ability to identify critical equipment allows maintenance to better prioritize which spare parts need to always be available to minimize downtime, and which could be ordered when needed.

A criticality-based approach aims to create a maintenance strategy that maximizes equipment performance by applying the right activity to the right asset at the right stage in its life cycle. Defining criticality is a question of economics. To determine which equipment is critical, consider the financial impact of downtime on production, such as costs associated with lost data, lost product and loss of visualization. Also consider the impact of replacing or repairing equipment and the potential hazards associated with downtime.

Determining the criticality of equipment is key to improving return on investment. In addition to protecting critical assets, implementing a criticality-based strategy and focusing on reliability can help eliminate collateral damage, reduce maintenance overtime and parts expediting, reduce spare parts and minimize unplanned equipment failures.

**Strategy 2: Get your storerooms in order**

A reliability program can’t be effective without a storeroom configured to properly support it. As a result, storeroom management is a critical component of an effective, strategic asset-management program. The problem facing many storerooms is twofold: The right spares are unavailable when needed, and the spares that are in stock aren’t necessary. In fact, according to Rockwell Automation customer data, 50% of downtime can be attributed to insufficient spares, while more than 60% of spares are classified as inactive, excess or obsolete. In more organizations, maintenance, repair and operations (MRO) spares range from 15–25% of carrying costs, so stocking inactive, excessive or obsolete spares creates unnecessary costs for maintenance departments.

This problem stems partly from where responsibility for the storeroom falls along the value stream. Historically, the storeroom has been a cost center managed by the purchasing personnel, whose principal goal is to reduce inventory. Too often, their goal is achieved by neglecting to add the correct inventory items, writing off old inventory and not adding needed spares for critical equipment. Such actions (or inactions) contribute to an imbalanced storeroom.

That imbalance has a ripple effect across the value chain—i.e., spares for critical equipment aren’t available when needed and must be rush-ordered, causing downtime to lengthen and...
PROCESS IMPROVEMENTS

**Profitability to suffer.** The result is a constant firefight to maintain uptime. Not only does this impact a maintenance department’s ability to focus on larger trends like resource retirements, it ultimately erodes profit margins.

The first step in reviving an ailing storeroom is to understand the current environment. Assess what processes are currently in place, and seek answers to the following types of questions:

- **What spares and equipment are actually in the storeroom?**
- **Do I have too much inventory?**
- **Are the right parts available at the right time?**
- **Is the storeroom run efficiently?**
- **Is it tough finding parts?**
- **Are parts easily identifiable?**

After a detailed review of the current storeroom, assess how other operations support equipment, storeroom and maintenance throughout the value stream. Finally, identify gaps and opportunities for system and process improvements and projects that can close the gaps in an ineffective program and create a bridge to a more effective one. A good storeroom-management program should reduce inventory levels, stockouts and MRO and storeroom costs, while improving maintenance decisions and MRO management.

**Strategy 3: Tap into networked devices**

Connecting intelligent machines on common Internet protocol (CIP) networks will be an essential step in moving toward a converged value stream, especially as it relates to connecting production, maintenance and the storeroom. Smart devices help optimize maintenance by providing contextual information that allows maintenance managers to operate more strategically, focusing the right activities on the right equipment. Effectively tying this information into the storeroom is critical to perform these activities efficiently.

In the near future, production equipment will operate much like a self-driving car, thanks to intelligent devices on the plant floor. Smart machines will communicate with each other and continually monitor thousands of data points, filtering and translating them into actionable information. They will proactively provide notifications when maintenance or troubleshooting is needed, automatically generating work orders, scheduling work to be performed, and tracking maintenance costs and tying them back to specific equipment. Consider an individual smart drive: It could be configured to assess operating hours and trigger an alert and work order when it has reached its recommended preventive-maintenance schedule or an event based on critical conditions occurs. Eventually, this capability could eliminate the need for certain calendar-based maintenance schedules that have little impact on preventing downtime.

Meanwhile, maintenance departments can start by considering how networked devices can be incorporated into their strategic asset-management programs. The best place to start is by evaluating and mapping the steps to proactively manage these devices. Decide what level of physical assets will be defined with questions, such as:

- **How is asset data tracked, and are critical subcomponents covered?**
- **Will replacement parts meet specification requirements?**
- **How much downtime is caused by parts issues?**

**Strategy 4: Converge your data systems**

A main cause of gaps between production, maintenance and storerooms is lack of data continuity. Many companies have implemented ERP systems, often eliminating legacy production, storeroom management and maintenance systems in the process. By sun-setting legacy systems, the intention was to replace them with systems native to the ERP. Unfortunately, that type of conversion has not always worked according to plan, and maintenance departments
have struggled to use these systems to tie their activities to the appropriate cost centers. As a result, departments have reverted to using basic spreadsheets for tracking or not tracking at all.

Converging ERP and production systems helps ensure high productivity by tying known data from the plant floor—i.e., diagnostics, reliability, control data, asset management, etc.—to maintenance and storerooms, and linking up through the value chain. Manufacturers must track a granular level of data to derive meaning from production information and identify where equipment is failing. Even seemingly basic activities, such as tracking spares and tying the data to specific maintenance actions, can have a huge impact on the department’s ability to accurately understand where and how its budget is being spent.

Making an effective connection...

Companies looking for a more effective connection between ERP and production systems should first make sure a few foundational items are in place:

■ Material masters are current to the critical subcomponent level.

■ Lead times for indirect materials are updated.

■ Equipment records are accurately maintained.

For effective results, the ERP system should be used to manage data for all critical assets. Converging technologies will grant systemwide visibility to data such as device health, diagnostics, alarming, configuration and change management, all of which can be used to enhance preventive- and predictive-maintenance capabilities.

Regardless of where a company stands with regard to the convergence of its production, maintenance and storeroom, the best place to begin is by understanding the current landscape and defining what should be achieved. From there, projects and process improvements can be identified and prioritized. If the process seems daunting, best-practice resources can provide a knowledge base and help articulate the business case for improvements. MT

References


Matt Hermans is Global Manager of Reliability Services for Rockwell Automation.

Working With Third-Party Providers

A 2013 study conducted by the ARC Advisory Group found the top drivers influencing companies to implement a strategic asset-management program were support from management and IT; a business case for justification; and supplier technology support. [Ref. 3]

Many organizations do not have the internal knowledge or bandwidth to conduct a comprehensive assessment and develop a successful business case for implementation on their own. But best-in-class, third-party providers have the resources and expertise to help.

Use this checklist to help ensure that your selected vendor delivers value for your organization:

■ Offers comprehensive services. In addition to consulting and providing a recommendations report, the vendor can assist with implementation, if needed.

■ Provides detailed knowledge of plant-floor applications to ensure recommendations are technologically feasible.

■ Outlines the benefits of an effective asset-management program that are tailored to the company.

■ Collaborates with its customers to develop a multi-year roadmap that drives toward the overall business goals and needs of the company.