



Treating Maintenance as an Asset, not an Expense

Devising a Comprehensive Asset-Management Strategy
to Boost Your Bottom Line

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While some manufacturers have seen signs of an economic recovery, many share the sense of uncertainty that has restrained business growth in the U.S. and beyond. The lessons learned from the recent recession will likely last long after the recovery arrives: Manufacturers must maintain lower operating budgets while increasing efficiency, and they need to optimize their operations to stay on the path to sustainable success.

One way to address operational challenges is investing in a comprehensive asset-management strategy. By executing a well-planned, comprehensive approach, manufacturers can actually transform maintenance from an expense into a strategic, competitive asset

Focusing on an asset-management strategy can positively affect a wide range of operational metrics, such as overall equipment effectiveness (OEE) and return on net assets (RONA). In turn, these metrics contribute to aggressive productivity targets, including various forms of risk mitigation, data-driven decision making, workforce empowerment and predictable expenditures.

“The difficult economy can drive broad cuts in maintenance,” said Ralph Rio, ARC Advisory Group in the 2010 Mobility for Asset Management Worldwide Outlook report. “This causes expensive reactive activities to displace preventive tasks at an increasing rate, leading to a downward spiral in capability. Instead, [manufacturers should] optimize without compromising capability.”



Maintenance is Central to Operations

Economic uncertainties have kept many manufacturers from investing in newer equipment. In a 2010 study of process automation users, ARC Advisory Group reported that 88 percent use their automation systems beyond the manufacturer's obsolescence date, and 42 percent of users acknowledge having no lifecycle plan.

Given that equipment maintenance is one of the largest single controllable expenditures in a plant, it must be included in a lifecycle plan. In addition, it should be an integral part of any reliability improvement program because it is critical to machine throughput, availability and essential spare-parts stock.

Once your storeroom is organized and your repair strategy is in place, you can optimize spare-parts inventory and reduce the number of unnecessary parts. Furthermore, data gathered and analyzed as part of the process can be used to implement future improvements, such as developing a roadmap for managing the obsolescence and migration of aging equipment.

To justify capital expenditure projects, maintenance needs to be seen as central to productivity. Your storeroom is the starting point for strategic maintenance improvement practices, such as minimizing equipment lifecycle cost and maximizing production equipment performance.

Comprehensive Approach Yields Multiple Benefits

Many manufacturers struggle to prioritize the time and investment necessary to put a comprehensive asset-management strategy in place, simply because so many other expenses compete for their limited budgets. But trends in manufacturing employment and other factors are converging to make asset management a major priority.

An asset-management strategy is simple to initiate if manufacturers rely on existing partnerships to cost-effectively develop customized, scalable solutions

Case in point: Plant Services magazine estimates that only three to seven new employees replace every 10 retiring maintenance workers. That creates a significant intelligence gap, considering 42 percent of corporate knowledge resides with employees, compared to 26 percent documented on paper and 20 percent in electronic form, according to Stratify's Knowledge Management Research Center. Although these statistics appear daunting, an asset-management strategy is relatively simple to initiate. Especially if manufacturers rely on existing relationships with components distributors and vendors to cost-effectively develop customized, scalable solutions.

Among the benefits of comprehensive asset management are:

- **OEE:** Driving uptime is key to a smart asset-management strategy because it is focused on assuring the people, parts and processes are optimized to support the equipment. It also provides trend data visibility into asset performance by both machine and shift, which helps drive continuous improvement priorities.
- **RONA:** Reducing inventory, maintenance costs and the number of downtime events raises productivity, while driving financial performance and predictability.
- **Empowered and engaged employees:** With a dwindling number of maintenance workers, those who remain need the right tools to make good decisions about driving plant performance.

Getting Started

Evolving asset management into a proactive, strategic component of better-managed manufacturing facilities can be done in phases, following these steps:

Step 1 Evaluate

Step 1: Evaluate Needs, Set Goals

The first step in any asset-management strategy is examining your current situation while keeping in mind your business priorities, such as process validation over uptime or environmental impact over rate.

To establish a baseline for improvement, first, understand your operation's process hierarchy to determine equipment priority and thus risk. Second, understand your equipment's serviceable components and their lifecycle status. For example, are the components new, available, repairable, replaceable or obsolete? Finally, understand your storeroom content and identify all other locations holding spare parts in support of your operations.

This data will inform future decisions and allow immediate inventory optimization. It also will enable risk mitigation on the most critical equipment, and provide the basis for all future management of your plant assets, including preventive maintenance program optimization, storeroom optimization, machine-builder changes and warranty capture. This data collection and intelligence-gathering step can be accomplished by those within your organization, or by involving your spare-part equipment manufacturer.

Once you have completed data collection, assess critical areas of concern, outline needs for improvement, and define your objectives so you can build an attainable asset management plan. Often, engaging a strategic maintenance consultant is the easiest way to get going.

Step 2 Design

Step 2: Design an Asset-Management Strategy

Your goal-setting activities will yield the building blocks for your asset-management strategy design, which likely will include these elements:

- Storeroom management redesign
- MRO process management redesign
- Reporting and dashboard creation
- Excess spare parts burn, selloff, and/or vendor-managed agreement
- Preventive maintenance activity changes

Storeroom management redesign: Start by examining your existing storeroom layout and parts-management tools, including existing software, labeling and tracking solutions. Determine a layout that gives workers quick and easy access to those parts frequently required in the facility.

Consider implementing a stock keeping unit (SKU) rationalization assessment, defined by AMR Research as, "An analytical process used to determine the merits of adding, retaining or deleting items from a company's inventory." Don't fall victim to the costly "stock-up syndrome" by purchasing parts for your system, regardless of their importance to maintaining uptime. A SKU rationalization process can help create a successful part numbering scheme – allowing for easier tracking and less inventory.

MRO process management redesign: Once your inventory is optimized, the next critical step in a comprehensive asset-management strategy is establishing best practices for part repair or replacement. Minimizing your stock, optimizing your repair process and building an actionable

reporting structure is the most sustainable way to maximize your automation investment. Reliability improvement uses a process risk assessment to track and understand the consequences of process and equipment failures, and recommend priority actions.

Optimizing your repair process involves keeping track of where each individual component is in its lifecycle. When a component on the line fails, you document where, when and why it failed, and determine if it is under warranty. To keep track of warranty detail and ease the process, the labeling system in your storeroom should include warranty information for each part to track its eligibility. Effectively managing your organization's warranty recovery can significantly contribute to the operation's bottom line.

Parts also should be tracked when sent for repair. One of your existing vendors may be able to provide an on-site specialist to manage your repair process and provide a clear, concise usage and failure analysis. This analysis is critical to drive continuous improvement and to make informative, important decisions. For example, if one part continually requires repair or an obsolete part fails, it is a prime candidate for migration or perhaps a machine adjustment.

Typical savings categories for effectively managing MRO repair include: repair price vs. new, warranty recovery, inventory and carrying cost reduction, administration, new purchase and repair reduction, and increased production uptime. Having a person electronically track this data can help identify opportunities for system and process simplification or improvement.

Reporting and dashboard creation: This phase can come in many forms and be accomplished in many ways. You may decide during the evaluation and goal-setting stages that an OEE information system is a necessary investment to create dashboards showing uptime, production rate and quality. The MRO process management redesign mentioned earlier also can provide significant information to be built into a usable and actionable reporting tool.

Excess spare-parts burn, selloff, and/or vendor managed agreement: Inventory reduction is a popular productivity target because it frees up budget for other assets. Remove or burn-off excess or inactive inventory while filling in critical gaps you've found during the assessment.

Remember that you may have resources to help with your storeroom goal. For example, your local distributor may be able to help supply half of your needed parts from its available stock, leaving you to identify a plan for the remaining half. Additionally, your equipment vendor could implement an on-site parts management agreement, allowing you to avoid purchasing the remainder of the spare parts until they are needed.

Preventive maintenance activity change: The more aware you become of your facility's needs and challenges, the more fine-tuned and efficient your preventive maintenance (PM) activities will become. You may choose to use vendor specialists with the resources to develop and sustain a PM program through scheduled service visits, fully warranted replacement parts, and 24/7 remote troubleshooting – thus freeing up your personnel to operate the equipment and manufacture products.

Step 3 Implement

Step 3: Implement Your Unique Solution

After establishing the right baseline of your facility and designing a plan that supports your business needs and mitigates your risk priorities, your asset-management investment will be pointed, graduated and impactful.

The structure of your plan determines the implementation path. For example, you may be able to use your existing staff and processes to implement simple, immediate point solutions such as inventory disposition or burn-off. But when it comes to more complicated process implementations or redesigns, such as a storeroom or MRO process redesign, seeking an external specialist to design and execute the right implementation plan and assist with the organizational

Step 4
Measure &
Optimize

change-management process can help save time and effort. Asset-management specialists can recommend tools and processes that make the most sense for your organization and are setup for continuous improvement in order to drive the most value from your investment.

Step 4: Measure and Continuously Optimize the Process

The most successful asset-management strategies evolve as equipment, process and people change. Therefore, be sure to keep a working document listing critical plant assets and equipment

changes. Before the equipment is purchased or the retrofit done, make every effort to use components you already stock, reducing your need to purchase additional inventory and reducing the technology variability on your floor.

After equipment purchases or retrofits, update the master list and adjust inventory accordingly. This effort provides measurable data you can turn into actionable information to help inform future decisions to achieve continuous productivity gains.

Reaffirming the Value of a Reliability Solutions Specialist

When production is lagging, unplanned downtime is mounting, maintenance budgets are shrinking and plant staff is overburdened, an asset-management evaluation may be the best investment to help you chart a course for regaining your competitive edge and achieving your business goals.

With fresh eyes and extensive experience, an outside expert can provide guidance you've never had the chance to hear, encompassing everything from inventory management, to employee training and workforce development, to plantwide optimization.

With any Rockwell Automation assessment or consulting engagement, you get a subject-matter specialist – third-party accredited and certified – to perform a detailed analysis of your current state. By understanding your environment, the consultant can help compare it to applicable industry standards and specifications, such as ANSI, TIA, ODVA, NIST, ISO, IEC, CE, OSHA, NERC-CIP, Energy Star, and DOE. From there, Rockwell Automation professionals provide recommendations for remediation and improvements to address any gaps, hazards and cost-savings opportunities, as well as the applicable cost-benefit analysis.

In the case of a strategic maintenance-consulting engagement, an asset-management professional will start with a detailed evaluation of your current operation to understand your business priorities and companywide goals, and to identify any potential inhibitors to your plant's success. Once those fundamental issues are identified, Rockwell Automation reliability solution architects can work with you to address those problems and develop a risk-mitigation plan to help you increase production output while reducing costs through improvements to equipment and process reliability.

Often, a comprehensive mitigation plan includes safety improvements and reduced environmental impact – plusses in the eyes of your shareholders. For instance, when evaluating downtime during a risk assessment, an asset-management professional analyzes any potential fallout from such an event. If downtime endangers the environment or worker safety, the incident can pose far greater concerns to a company's public image.

By delivering these benefits and others to manufacturers across the globe, Rockwell Automation is reaffirming the value of a reliability solution relationship by helping manufacturers worldwide implement comprehensive asset-management strategies that transform maintenance from an expense into a strategic, competitive asset.

Improved Uptime and Peace of Mind

A successful asset-management strategy helps manufacturers to maximize uptime and minimize unnecessary costs, allowing them to focus on what they do best – producing quality products and keeping their customers happy.

This is precisely the experience of a leading heavy equipment manufacturer that previously struggled with a lack of clear metrics and inefficient inventory-management practices at its transmission manufacturing plant. Its inventory growth and stock inaccuracies were leading to higher carrying costs and frequently putting its Midwest plant at risk for incurring substantial downtime.

By relying on asset-management tools from Rockwell Automation for its inventory management, the manufacturer realized an overall inventory reduction valued at \$1.9 million. The storeroom assessment identified more than 41,000 specific line items, showing the plant was carrying about 20,000 more parts than managers realized.

Since its implementation, on-site support from Rockwell Automation has helped the company improve its inventory accuracy from 68 percent to 98.6 percent by following the steps outlined above, beginning with a detailed analysis of the storeroom and all other spare parts locations. By ensuring critical spares were on hand when needed, the company improved on-time delivery and significantly reduced downtime.

The manufacturer also was able to concentrate on producing more high-quality transmissions and meeting delivery deadlines with improved productivity, pushing more profit to the bottom line.

Smart companies like this one know that successful asset-management programs maximize uptime and offer other bottom-line benefits. With the right asset-management strategy in place, manufacturers can achieve sustained growth and competitiveness.

¹American National Standards Institute (ANSI); Telecommunications Industry Association (TIA); Open Devicenet Vendors Association (ODVA); National Institute of Standards & Technology (NIST); International Organization for Standardization (ISO); International Electrotechnical Commission (IEC); Conformité Européenne (CE); Occupational Safety and Health Administration (OSHA); North American Reliability Corp - Common Industrial Protocol (NERC-CIP); Department of Energy (DOE)

Rockwell Automation Asset-Management Solutions

Rockwell Automation has more than 100 years of experience helping its customers address their manufacturing and maintenance challenges. Based on work with thousands of manufacturers around the world, the company offers comprehensive, scalable asset-optimization solutions tailored to each customer's needs. Maintenance solutions are designed to help customers reduce assets, maximize uptime and focus on what they do best – producing quality goods at the lowest possible cost.

To prioritize, plan and implement an effective asset-management program, a **Rockwell Automation Installed Base Evaluation™** helps you understand the current state of your parts strategy. Once that baseline is established, Rockwell Automation can recommend solutions based on the biggest challenges and most important priorities discovered during the assessment. This critical step allows you to make educated decisions on where to initiate improvements and how to implement an effective asset-management strategy.

Storeroom Services from Rockwell Automation can help design your storeroom to maximize asset utilization and overall productivity. Rockwell Automation combines its extensive plant-floor knowledge with proven storeroom-management processes, advanced technologies and comprehensive assessments to create the most efficient and cost-effective operations for you.

Through a **Parts Management Agreement (PMA)**, Rockwell Automation owns and manages your spare-parts inventory, eliminating the large, capital outlays that are often required to purchase spare inventory. A PMA can help track the availability of spare parts and stabilize your maintenance budget. This can allow maintenance of critical inventory on-site at each facility or shared across multiple facilities for immediate availability during emergency breakdown situations.

The **Rockwell Automation® Asset Management Program™** provides a proven methodology to repair assets, recover all warranty, optimize inventory and simplify transactions by offering a single point of contact for all repairs.

An on-site, asset-management professional integrates with your maintenance and production teams, and can provide services such as warranty and asset tracking, as well as comprehensive asset and online reliability reports. The Rockwell Automation® Asset Management Program has documented over \$20 million in combined annual cost savings for customers.

When a repair is necessary, **Rockwell Automation Remanufacturing™ and Repair Services** can help restore equipment to its original operating condition for optimum functionality. There are 18 ISO-certified Rockwell Automation Remanufacturing and repair facilities globally – each using the same high-quality parts, standards and specifications as the original manufacturing process. This means a remanufactured part is returned quickly, having undergone installation of applicable updates and enhancements, replacement of failed or aged components, parametric testing and cleaning, and cosmetic restoration. This same proven remanufacturing process and quality standard is applied to the repair of thousands of types and brands of electronic and electromechanical products, allowing Rockwell Automation to be your trusted source for the repair and remanufacturing of your critical repairable assets anywhere in the world, no matter who manufactured them.

Lifecycle Management Services from Rockwell Automation help you identify, mitigate and minimize the risks of automation obsolescence. As products approach the end of their expected life, the availability of parts and resources become more difficult to obtain, until the point at which one or both are exhausted. The **Lifecycle and Criticality Analysis** provided as part of an Installed Base Evaluation, provides you with a better understanding of the risks your facility may experience and the ability to pinpoint automation obsolescence risk by site, area, line, machine and panel. This allows you to immediately migrate critical production products to newer technology. You also can establish a service bridge for your plant via a **Lifecycle Service Agreement** to help you avoid the costs associated with unplanned downtime, parts and repair, and unplanned costs to upgrade equipment for those pieces of equipment that cannot be immediately migrated.

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Rockwell Automation, Inc. (NYSE: ROK), the world's largest company dedicated to industrial automation and information, makes its customers more productive and the world more sustainable. Headquartered in Milwaukee, Wis., Rockwell Automation employs about 21,000 people serving customers in more than 80 countries.

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