LISTEN.
THINK.
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Asset and Plant Optimization in a Connected Enterprise

Maximize return on production assets with effective monitoring, management and optimization services

Allen-Bradley • Rockwell Software

Rockwell Automation

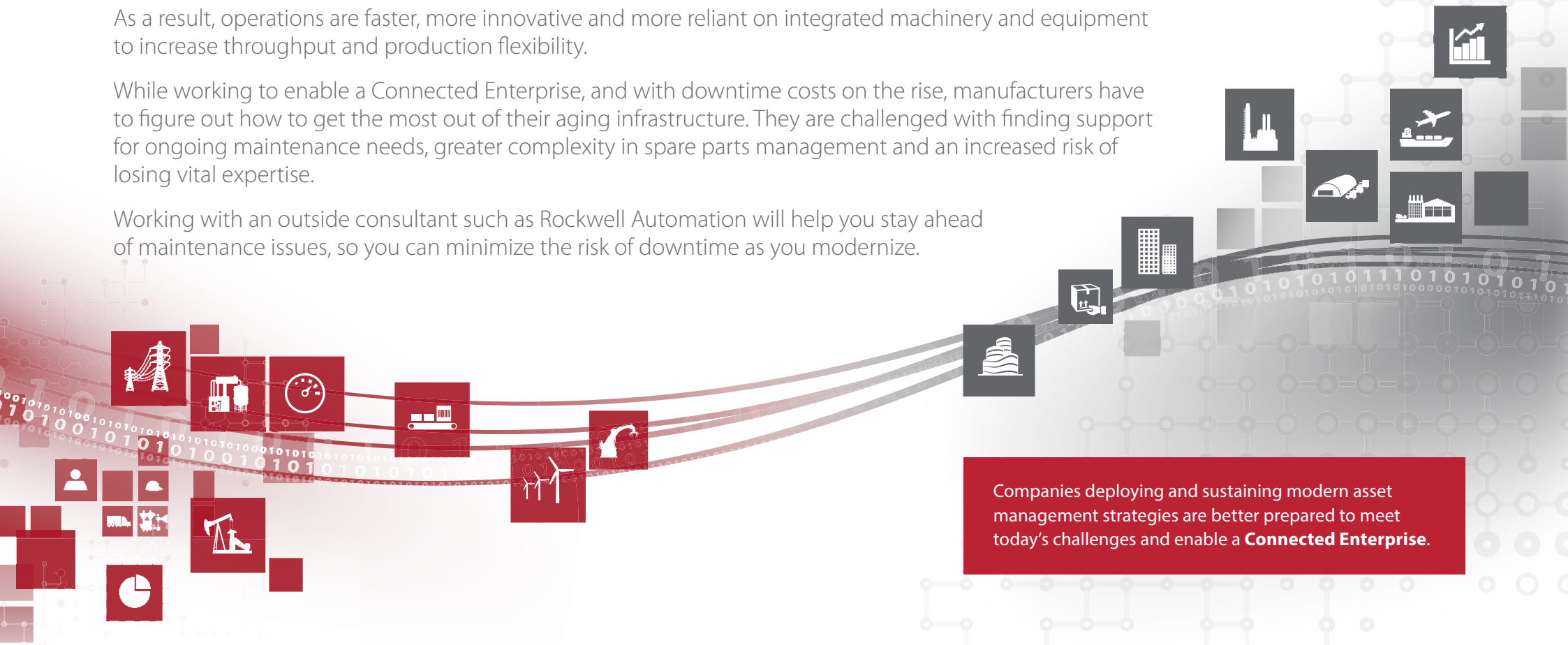
Enabling a Connected Enterprise

As operations move to smart manufacturing, everyone from operators and technicians to corporate executives are using "smart" capabilities to gain new efficiencies, improve product quality and make operations more responsive. Industrial operators are modernizing aspects of their people, processes and plants, converging IT and OT functions to be more productive in an increasingly competitive global environment. Rockwell Automation achieves this through The Connected Enterprise.

As a result, operations are faster, more innovative and more reliant on integrated machinery and equipment to increase throughput and production flexibility.

While working to enable a Connected Enterprise, and with downtime costs on the rise, manufacturers have to figure out how to get the most out of their aging infrastructure. They are challenged with finding support for ongoing maintenance needs, greater complexity in spare parts management and an increased risk of losing vital expertise.

Working with an outside consultant such as Rockwell Automation will help you stay ahead of maintenance issues, so you can minimize the risk of downtime as you modernize.



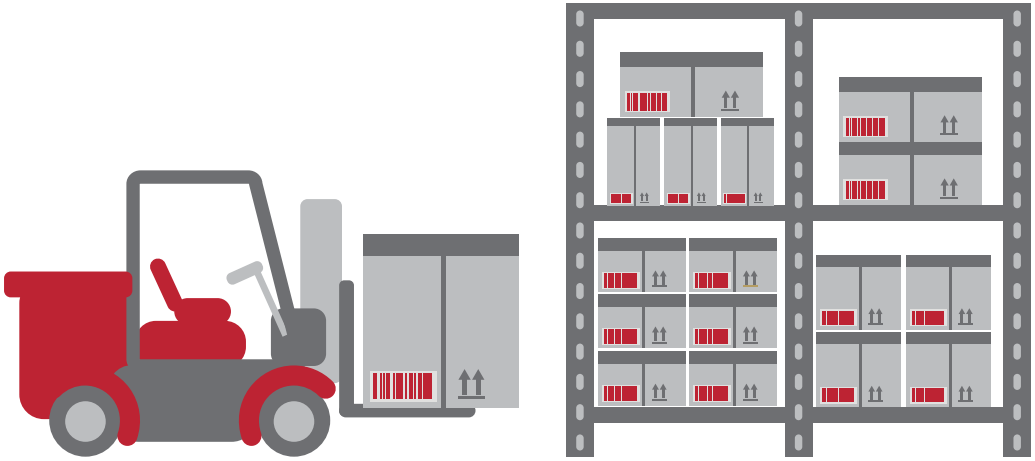
Companies deploying and sustaining modern asset management strategies are better prepared to meet today's challenges and enable a **Connected Enterprise**.

Assessing Your Inventory

The first step in the journey to asset and plant optimization is having reliable spare parts available on your storeroom shelves. This is critical to keeping machines up and running and reducing overall inventory carrying costs.

MRO inventory management services allow end users to work with a service provider to access the spare parts they need. A properly managed inventory can help you:

- **Reduce** Mean Time to Repair (MTTR)
- **Improve** control of inventory assets
- **Reduce** carrying costs that are associated with maintaining inventory
- **Improve** availability of critical spare parts
- **Improve** inventory integrity



To minimize costly downtime, you need to be sure that repairable spare parts are operating to specifications and will perform properly when needed. Vendor testing and recertification services can validate and update spare parts as appropriate. Parts that don't pass testing can be remanufactured by the OEM so that they function as new equipment, but with critical updates applied.

Manufacturers offering services to repair automation equipment can help:

- **Increase** Mean Time Between Failure (MTBF) through use of OEM-specified components (when available)
- **Reduce** procurement administration through vendor consolidation
- **Extend** equipment life by repairing obsolete or hard to find replacement products

Proper storeroom management is critical to optimizing plant production. Excess or deficient amounts of inventory cause inefficiencies and drive costs up.

An integrated storeroom solution can help ensure the correct storeroom personnel, management, standard operating procedures and technologies are available to manage and optimize MRO inventory levels.

Success Through Inventory

Johns Manville (JM), a leading provider of roofing, insulation and engineered products, was struggling to efficiently manage the thousands of parts to service its 45 different locations. When machines shut down for maintenance or emergent repairs, it was often difficult to search the storeroom of open bins to find the correct parts. The team would spend several hours searching for the needed parts, which led to longer downtime while trying to locate those parts.

JM partnered with Rockwell Automation to conduct lead-time analysis, usage analysis, ABC analysis and a theoretical optimum-inventory analysis. This enabled the team to determine the ideal amount of on-hand inventory, order frequency and quantity. This information allowed JM to assess the requirements of a new storeroom and to design a better layout.

Upon completion, about **8,000 parts were moved into two adjoining storerooms**. The storeroom's improved organization, use of cabinets and removal of no longer needed parts **cut its part-storage footprint by 40 percent** and drastically simplified maintenance tasks throughout the facility. In total, the design allowed for the **removal of 3,000 excess and obsolete SKUs, and $1.3 million in inventory** from the storeroom for future disposition.

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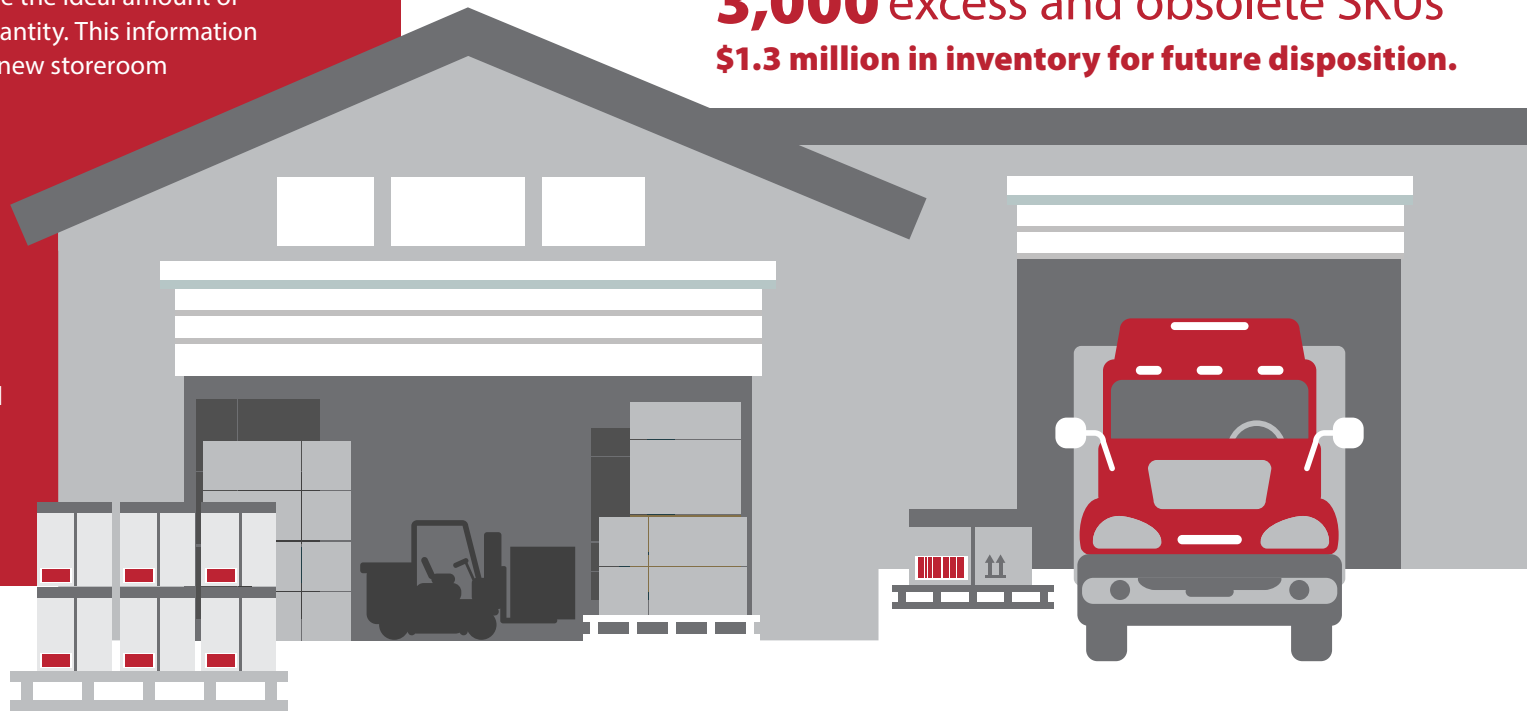
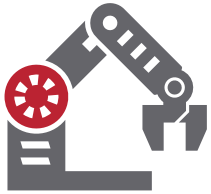


Asset Modernization



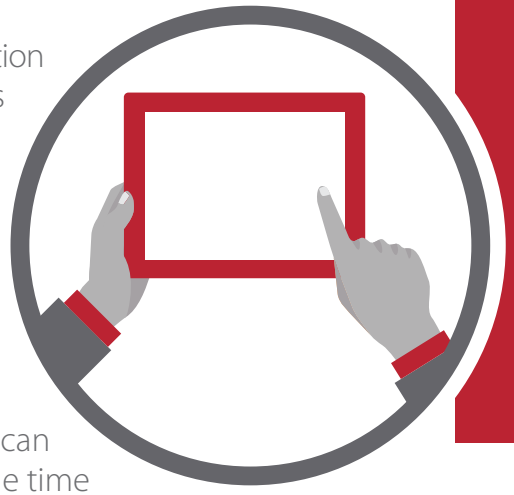
Managing aging equipment is often an overlooked component of maintenance programs. An estimated

$65 BILLION **worth of legacy assets are nearing the end of their useful life.**[1]

This issue is being amplified as operations move toward a Connected Enterprise and look to leverage cloud computing, mobility, big data and more, while trying to get the most out of their automation investments.

Operating legacy equipment beyond its obsolescence will always carry a degree of risk. But by identifying and quantifying this risk, production facilities can determine whether it makes the most business sense to mitigate it through maintenance and support, or help eliminate it by modernizing systems.

While most facilities agree that better management of automation lifecycles is becoming critical, few have dedicated the resources to creating an effective program. One reason is most facilities don't have the personnel for it. In most cases, there isn't a role specifically responsible for creating, monitoring and updating a database, which results in these tasks being overlooked.



But just because the resources don't exist, it doesn't have to be neglected as part of maintenance plans. Enlisting the help and expertise of asset modernization service providers can double the benefits of risk mitigation – saving companies the time and money necessary to train their own personnel, and preventing these resources from being wasted on unnecessary downtime.

[1] *https://www.arcweb.com/blog/justification-modernizing-automation*

A phased approach can help ensure obsolescence risk is effectively and efficiently addressed:

1. **Identify.** Define the goals and scope of the obsolescence plan, and develop a strategy to safely connect information from all legacy equipment. Dedicating qualified resources to creating the plan generally nets the best results.
2. **Research.** Collect product lifecycle status information by reviewing manufacturer websites and notifications, publications, and distributor and reseller information. Identify inventory gaps and orphans by comparing MRO spares to the installed base, and by comparing repair and replace activities.
3. **Quantify and Prioritize.** Aggregate data to highlight areas of greatest obsolescence concern. Using that information, design a plan to accept, mitigate and help eliminate obsolescence risk. Next, develop a process for gathering ongoing lifecycle status changes for all installed products.

Addressing Your Legacy Equipment

If you're not able to modernize all at once, consider an inventory of your legacy equipment and your degree of obsolescence risk. A comprehensive hardware or software evaluation will assess product maturity and can help you create a modernization plan. Attempting to do this in-house can be a time-consuming, laborious process. **Services available through outside consultants, such as the Rockwell Automation Installed Base Evaluation™ (IBE), can help ease this process. The results of the evaluation include:**

- Identifying your most critical assets to facilitate investment decisions
- Reducing obsolescence risks
- Roadmapping efficient corporate storeroom and spare parts initiatives
- Verifying all assets have up-to-date bills of material

These evaluations gather essential data for creating a strategic maintenance plan and can act as a roadmap for migration or modernization plans.

While migration involves a one-for-one upgrade of older equipment for newer models and can help mitigate the risk of obsolescence, modernization can add additional value by taking advantage of technology to further improve operations.

Once an evaluation takes place, Rockwell Automation offers additional resources, lifecycle management and modernization initiatives to help maximize investment in automation systems.

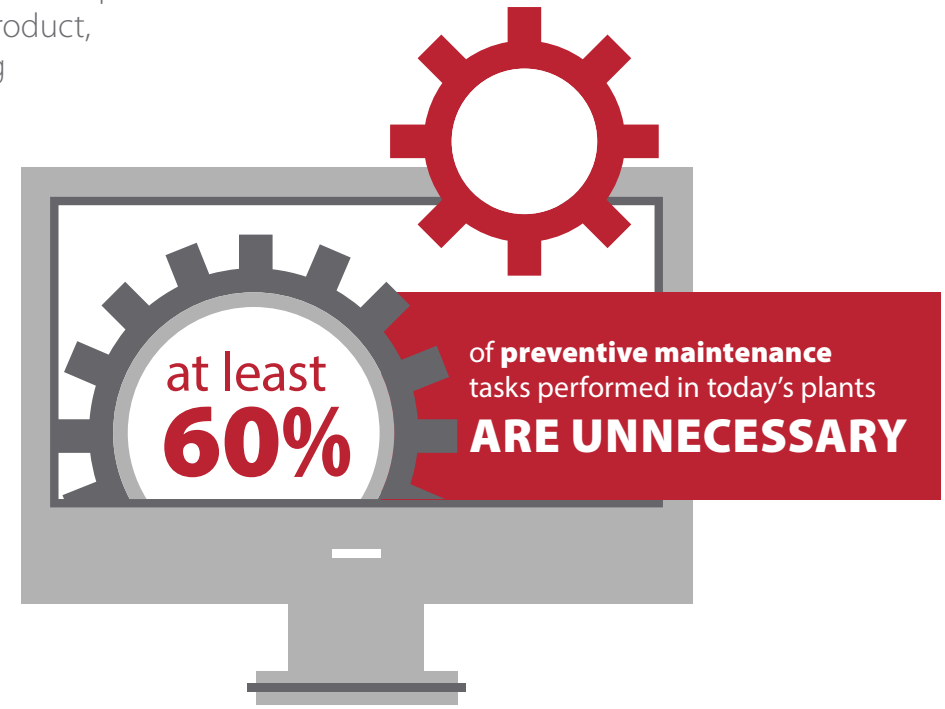
- **Technical Staff Support** – on-site support staff can help troubleshoot equipment and software issues as they arise.
- **Legacy Remote Support** – specialists can provide input and support for legacy and discontinued products.
- **Legacy Spare Part Support** – specialists can help repair or install discontinued legacy products.
- **Conversion Services** – specialists can create a customized upgrade solution including hardware, software conversion engineering and start-up services.

Preventive Maintenance Planning and Management

At least 60 percent of preventive maintenance tasks performed in today's plants are considered unnecessary.[2] A reliability-centered approach that aims to maximize equipment performance by applying the right task to the right asset at the right stage in its lifecycle can reverse this trend.

Defining equipment criticality and understanding the facility's installed base, including the full scope of obsolescence risk, is the best start towards taking control of a facility's assets and improving equipment reliability.

- **Define criticality.** Criticality is a question of economics. It weighs the financial impact of downtime on production, such as costs associated with lost data and product, and loss of visualization. It also considers the impact of replacing or repairing equipment, and the potential hazards associated with downtime.
- **Assess risk.** A reliability-centered approach defines both asset hierarchy and the associated risk of failure. The first step is to perform a Failure Mode Effects Analysis (FMEA) to determine possible failure modes. This is a necessary investment to put true reliability-centered maintenance processes in place. Risk mitigation is an important part of preventive maintenance. It should be completed across an entire enterprise, even for less critical equipment that has just as much potential to disrupt productivity. Once risk is determined, assets that carry a higher risk of failure become subject to a more stringent maintenance plan than those assets with a lower risk.



[2] *Reducing the Cost of Preventive Maintenance, Plant Maintenance Resource Center (www.plant-maintenance.com/articles/PMCostReduction.pdf)*

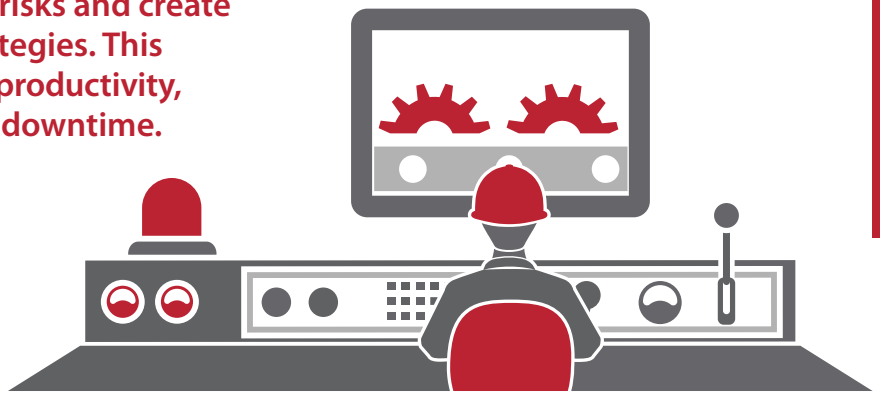
Asset Performance

Once your assets - whether specific devices or whole applications or equipment sets - have either been migrated or modernized, and the proper inventory management program is in place, you need to ensure your operations are maintaining optimum productivity. A key way to monitor this is by evaluating asset performance and reliability.

Asset monitoring systems can collect information from your assets and make it globally available across your organization. Reliability consultants can help you assess the reliability of assets which enables you to drive proactive maintenance to help reduce risk and maximize productivity. You'll want to consider the operational condition as compared to designed, maintenance strategies applied, cost of parts and resources, support parts, service response impact and risks of known and unknown conditions. This can help determine what equipment is most critical to operations and create prioritized maintenance plans. It can even help optimize an existing computerized maintenance management system to facilitate these activities.

Smart MRO Increases Throughput

Using a connected, data-driven approach to maintenance repair and operations can help streamline maintenance and storeroom activities, reduce reliability risks and create proactive maintenance strategies. This approach supports greater productivity, improved OEE and reduced downtime.



Asset Monitoring and Predictive Analytics

As more devices are added to the network as part of a Connected Enterprise, manufacturers will need flexible, scalable monitoring solutions that securely connect to critical assets. Collecting, organizing and assessing real-time data across production assets can provide deep insights through powerful visualization, analytic and dashboard tools across a broad range of devices.

1. **Get connected:** The Connected Enterprise paves the way to get remote connectivity to critical assets for maintenance, troubleshooting, collaboration and remote monitoring.
2. **Get informed:** Once devices are connected, you have access to asset performance data, machine health and device health data.
3. **Get ahead:** Access to in-depth information on machinery and other assets can help you be more proactive to situations that may impact the performance of your operations.

What stage is your organization in the journey toward Plant & Asset Optimization? Whether you need help with an equipment or risk assessment, or have key metrics you need to improve in your maintenance repair and operations, working with an outside consultant like Rockwell Automation can provide the expertise, analytics and visibility you need to boost your asset performance.

Resources

Rockwell Automation has a wide range of solutions, services and expertise to help optimize your assets and operations.

For more information about the Rockwell Automation portfolio of Services, visit ***rok.auto/services***

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