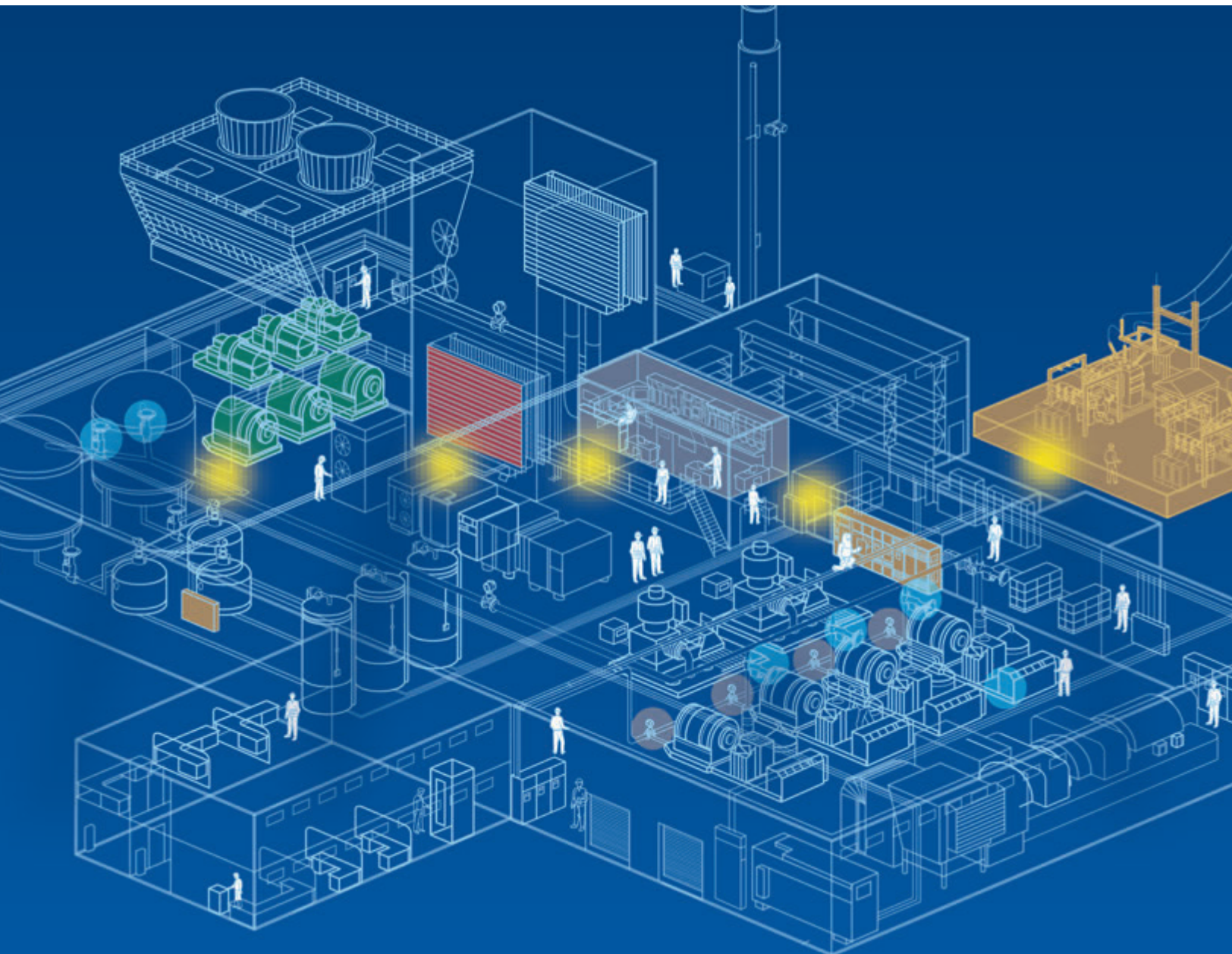


AMS Suite

Improve Reliability and Performance





WITHIN YOUR REACH: MANAGE ASSETS TO ACHIEVE FINANCIAL GOALS

Challenged to maximize profitability? The solution is within your reach: Your assets and processes.

Ultimately, effective management of your assets helps you achieve financial goals. By predicting issues and optimizing operation, you benefit from improved availability and performance.

With Emerson's AMS Suite — a family of best-in-class diagnostic software applications and industry-leading expertise — you can drive your plant toward a more predictive environment that delivers the business benefits you expect.

Predict and Optimize

Whether you are looking at mechanical assets or instruments, are in operations or maintenance, AMS Suite delivers the right information to detect equipment problems before they occur.

Armed with insight, people in your organization can collaborate to optimize equipment operation. How? Real-time predictive diagnostics are shared seamlessly throughout your enterprise.

Analyze and Quantify

To create a predictive environment where equipment breakdowns are avoided and maintenance is planned, partner with Emerson. Our experience in a wide variety of industries and applications translates into an unmatched ability to help you implement a predictive asset management strategy.

What are your biggest challenges?

- Improve reliability
- Meet your performance targets
- Reduce maintenance and operations costs
- Deal with rising fuel costs



FINANCIAL GOALS.

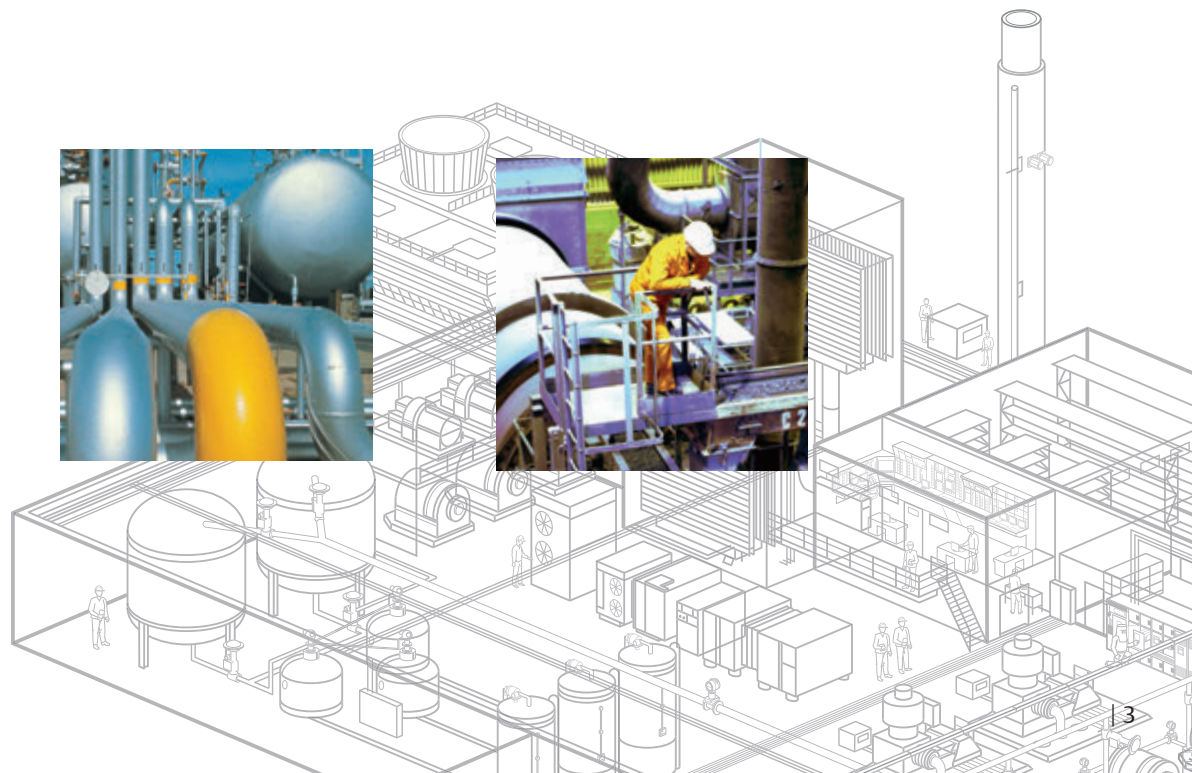
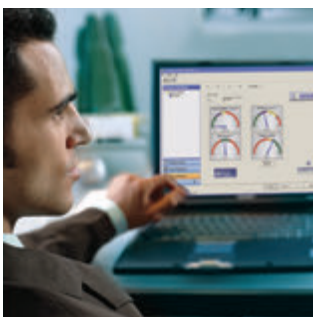
Emerson's experts assess your situation, identify where your greatest opportunities lie, and provide an ROI you can take to management. We work with you to develop a prioritized list of assets that becomes part of a larger roadmap to achieve goals. Roadmap in hand, you can identify tools that will help drive change.

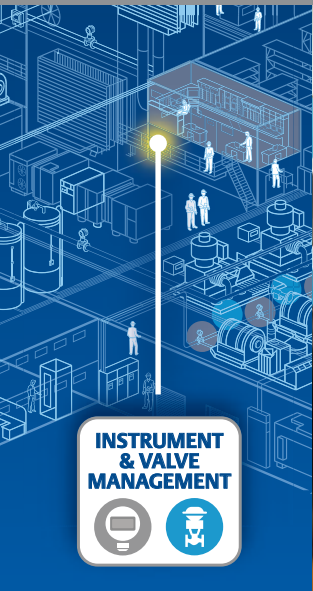
Take Steps Toward Positive Change

Wherever you are in the plant life cycle, Emerson can help you seize opportunities.

We provide the combination of technology and services that will get your plant to the next level. Our process is proven, leading to real change for sustainable benefits.

- Streamline **device management** to optimize production
- Assess **machinery health** to improve reliability
- Optimize throughput by managing **equipment performance**
- Move toward full solutions with **enterprise-wide diagnostics**





AMS Device Manager enables users to commission and configure wired and wireless devices, monitor status and alerts, troubleshoot from the control room, perform advanced diagnostics, manage calibration, and automatically document all of those activities.

STREAMLINE DEVICE MANAGEMENT TO OPTIMIZE PRO

You suspect some of the thousands of valves in your facility are operating suboptimally. The issue is not so severe that it threatens to stop production, but throughput isn't what it should be. Where is the problem?

Repeated Struggles:

- Consistently reacting to unexpected issues
- Difficult to manage thousands of devices in plant
- Operations has no efficient visibility to maintenance activities

Improve maintenance effectiveness and productivity

When your team continually reacts to problems, less time can be spent finding and correcting the root cause of issues. AMS Suite: Intelligent Device Manager provides access to device-based diagnostic information, helping you detect and predict potential issues before they become serious problems.

Using intelligent field-device data in real-time, you can respond rapidly and make informed decisions on whether to maintain or replace field devices. Ultimately, the predictive maintenance made possible by AMS Device Manager helps avoid unplanned shutdowns and inefficient practices that eat away at profits.

Extend reach of predictive maintenance by efficiently managing wired and wireless devices

Using a single application to manage wired and wireless devices extends the power of predictive maintenance to all areas of your plant.

For example, by managing and automatically documenting calibration remotely, you not only meet compliance requirements but also streamline maintenance tasks and significantly impact the bottom line. Even more: staff is safer because their visits to hazardous locations are fewer.





DUCTION

Improve problem solving through integration with digital automation systems

Without compromising production, device data is available to operations via a host system, including DeltaV™ and Ovation™ digital automation systems.

Operators can remotely view the process variables, monitor device status, and detect alert events. Maintenance and operations joint goals — better use of devices and more consistent operations — can be fully realized.

CHEVRON ORONITE

Results:

- Critical valve availability increased to 99%
- Turnaround time reduced by 60%

Challenge:

Chevron Oronite was experiencing an increase in maintenance costs due to the amount of reactive maintenance performed. With more than 20,000 instruments, this approach was no longer effective. The plant wanted to make a change to a more predictive approach to maintenance.

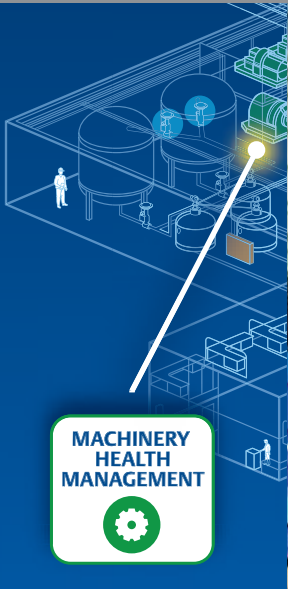
Solution:

Chevron Oronite initially focused on the critical valves in their H2S unit and implemented AMS Device Manager. Using AMS Device Manager with the unit valves, availability has increased by almost 5% — greatly improving the plant's productivity. AMS Device Manager has already been expanded to 5 units and the plant has reduced its turnaround time for valve maintenance by 60%.

“Before, equipment would break down and then we would act. Since the installation of AMS Device Manager, no device issue has affected the production of the factory.”

– Franck Flourey,
Maintenance Supervisor

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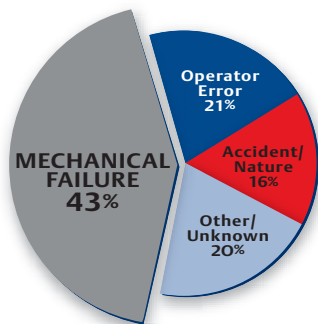
AMS Machinery Manager determines the health of mechanical and rotating machinery by integrating data from multiple predictive maintenance technologies.

ASSESS MACHINERY HEALTH TO IMPROVE RELIABILITY

Unplanned downtime is the largest source of lost revenue. In fact, mechanical equipment failure is the single greatest cause of process interruption.*

Repeated Struggles:

- Machinery fails without warning
- Difficult to determine root cause from data
- Maintenance performed based on schedules rather than need



* Marsh & McLennan Protection Consultants

Avoid Unexpected Shutdowns

AMS Suite: Machinery Health Manager delivers the data you need to predict equipment problems and make informed decisions. Your team can choose confidently and accurately when — or if — they need to bring down the line for repairs or maintenance.

In addition, data can be shared electronically across groups. By sharing machinery information between maintenance and operations, repairs can be anticipated and production schedules can be adjusted accordingly.

Machinery health data can include:

- Vibration analysis
- Oil analysis
- Infrared readings
- Alignment and balancing
- Electric motor diagnostics

Protect Critical Machinery by Tapping into a Comprehensive View

Not only does AMS Machinery Manager enable prediction of problems, it provides tools to diagnose them. Current and historical data in hand, you can perform analysis that helps improve machinery operation, the overall process, and your returns.



ITY

Access to tools, real-time data, and historical information can be shared throughout the enterprise, whether they are in control automation or business systems. Each group has visibility to the actions that are required for improvements.

Reduce Maintenance Costs with Efficient Processes.

With predictive diagnostics at your fingertips, maintenance work is done more efficiently.

Analysis performed using AMS Machinery Manager enable maintenance teams to create efficient processes because they know the history of the machinery. With that knowledge, they can reduce the number of visits to the field and schedule maintenance for when it's needed.

OMAN INDIA FERTILISER COMPANY (OMIFCO)

Results:

- Saved probable extensive production losses
- Prevented catastrophic pump-turbine breakdown
- Improved plant uptime and overall reliability

Challenge:

Two critically important turbine-driven pumps had a history of thrust bearing problems. Even though casing vibration checks were routine and proximity and RTD monitoring were continuous, maintenance was unable to detect emerging problems in time to prevent sudden failures.

Solution:

OMIFCO began using the CSI 2130 and AMS Machinery Manager to gather and analyze vibration data. Using PeakVue technology for analysis in AMS Machinery Manager, technicians could view high frequency vibration data – enabling them to detect bearing defects earlier.

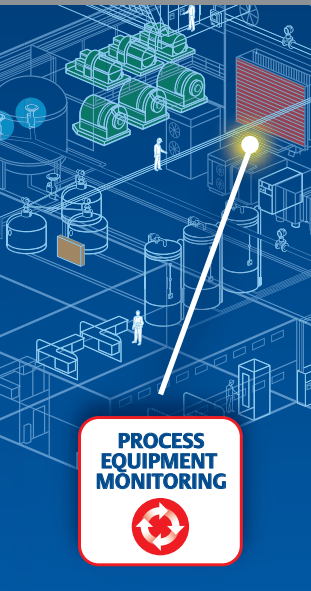
OMIFCO technicians identified a potential thrust bearing issue. When PeakVue levels increased significantly, the machine was taken out of service and the bearings were found to be severely damaged. The overall vibration level had only increased slightly at this time.

Technicians were able to replace the bearings and quickly return the machine to service – before severe damage had occurred.

“Using the PeakVue technology, we saved a critical machine and avoided production downtime.”

– Ali Al Siyabi, Inspection Manager

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AMS Suite performance monitoring applications combine key performance indicators with clear graphical tools to show current equipment operation versus expected or design conditions.

OPTIMIZE THROUGHPUT BY MANAGING EQUIPMENT PE

Process equipment is a source of ongoing deterioration and sudden upset. As the performance of the equipment deteriorates, efficiency decreases; throughput declines; operating costs rise; and profits fall.

Repeated Struggles:

- Throughput is down, but not sure why
- Not meeting operating cost requirements
- Worried about potential unsafe breakdowns

Improve availability and throughput

You can improve throughput without major capital investment. Using AMS Suite performance applications, identify and correct equipment that is performing below its full capability.

In addition, the tools help you consider valuable interrelationships between process parameters and machinery health.

For example, by combining information from online machinery monitors, machinery performance monitoring, and process control, AMS Asset Graphics becomes the real-time operator screen for the maintenance department.

Optimize operating performance

Equipment performance monitoring applications from Emerson provide comprehensive insight into your assets. With these tools, you know the efficiency of your key assets so you can adjust your operating parameters or your maintenance schedule to deliver optimal benefits.

Proper data analysis presents endless opportunities for optimization. For instance, you can evaluate process and asset performance to determine how to maximize power generation from gas turbines, select extraction or admission flows from steam turbines, or reduce fuel costs from boilers.

AMS Performance Monitor adds a service component where Emerson experts analyze the data and present you a complete report with recommended actions.

- **AMS Asset Graphics: predictive and diagnostic data in graphical form**
- **AMS Performance Advisor: data and tools for design improvements**
- **AMS Performance Monitor: improvements designed by Emerson services experts**



PERFORMANCE

Protect critical assets and personnel

By combining performance monitoring with online protection and prediction, you ensure the health and safety of both your equipment and personnel.

Predictive tools also allow you to control losses and protect your investment in critical process equipment.

Performance monitoring makes predictive data accessible, so you don't need to rely on intuition to know when to schedule maintenance. You have the data you need to decide when to wash compressors, change air filters on gas turbines, perform soot blowing on boilers, or clean fouling from heat exchangers.

ENERGY CORPORATION

Results:

- 66% reduction in ramping time of boiler
- \$950,000 fuel cost savings from minimum loading within 8 months
- \$240,000 in savings from repair to the air heater, following identification

Challenge:

The Little Gypsy plant is part of Entergy's five core utility businesses that produce and distribute electricity to 2.6 million customers. Entergy required a tool to help determine the cause of slow load changes and measure future load changes.

Solution:

AMS Performance Monitor provided operational cost savings by diagnosing which equipment was at fault as well as determining the effects of performance changes in operation.

"AMS Performance Monitor has provided the information to minimize the effect of loading on each steam boiler. This has reaped rich savings in fuel costs."

- Craig Hopkins,
Maintenance Manager

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AMS Suite interfaces with Meridium's APM framework to securely collect, consolidate, and distribute valuable real-time asset information for all the intelligent assets in the plant or across multiple plants.

MOVE TOWARD FULL SOLUTIONS WITH ENTERPRISE-WI

As you survey your facility, do you know where the greatest threats to your processes lie? Plants make money when their assets operate properly, so information on how well critical assets are performing is essential.

Repeated Struggles:

- Critical maintenance jobs are stuck in work order backlog
- Maintenance jobs overlap profitable production runs
- Unexpected issues take the process down

Empower enterprise-wide team resources and improve operations

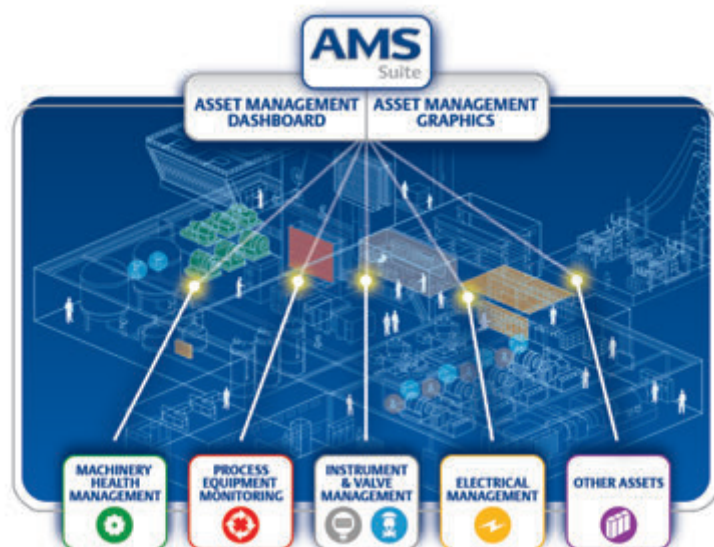
When groups across the facility can see documented and proven requirements of equipment, work flow progresses more smoothly.

For example, AMS Suite with Meridium's APM software, allows you to streamline your maintenance process by automatically generating work notifications for your most critical assets. Define alerts and events to trigger tasks directly in your enterprise asset management system.

Increase production and reduce costs

Strengthen your process by empowering people with the diagnostic information they need, no matter where they are.

Using AMS Suite and APM, your entire team will have real-time data to set priorities and solve the right problems at the right time — collaboratively.





DE DIAGNOSTICS

Drive operational excellence

Unexpected equipment failures are reduced because AMS Suite with APM provides your team with a deep understanding of the health of all your assets and the process.

Data gathered with AMS Suite can be configured on a dashboard that presents the real-time operational status of the highest priority assets — a comprehensive view of machinery health, devices, and process equipment. Such information can be shared on the company network, allowing management and operating teams to share their analyses.

With Emerson, you can ensure your maintenance resources are focused on the highest priority assets, making it possible for your staff to be better prepared and more effective.

The results are robust production and reduced costs.

EDF ENERGY

Results:

- Lower maintenance costs
- Greater operator efficiency
- Safer work practices

Challenge:

A full trip in a combined cycle gas turbine power station can cost up to 1 million euros in the first hour. It can take hours to restart the plant and significantly reduces the operating life of a turbine. Finding a way to avoid unexpected plant shutdowns was a high priority during the planning stage for a new EDF Energy station near West Burton.

Solution:

EDF Energy used AMS Suite with Meridium's APM framework to accumulate and manage huge amounts of isolated information from their assets and provide a single point of data entry to the SAP enterprise asset management system. They also prioritized equipment according to its importance in keeping the plant operational. Critical assets whose failure could result in plant downtime receive extra maintenance.

The overall solution integrates with the Ovation digital automation system and SAP to drive the plant's predictive maintenance strategy.

"Everything is automated, so our technicians don't go out and look for trouble unless there's an indication."

– Jason Bryant

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WORLD-CLASS ORGANIZATIONS RECOGNIZE THAT ASSETS ARE CRITICAL TO MAXIMIZING FINANCIAL RESULTS.



"If you have the latest instrument technology and AMS Suite to monitor them, you don't even need preventive maintenance."

**– Jerry Thompson,
Lyondell Chemical**



"AMS Suite is being used to determine the events that cause a loss of performance across each of the trains, allowing us to push our operating boundaries to generate greater throughput."

**– Kevin Harper,
Atlantic LNG**



"With AMS Suite, automatic data synchronization alone saved the \$150,000 per year that it would have cost to hire a person (at this remote location) to perform this function."

**– Russ Ritchie,
Laricina Energy**



“AMS Suite is an important tool in providing information about the condition of rotating equipment throughout the plant, enabling us to effectively reduce costs through predictive maintenance.”

**– Ahmed M. Ibrahim,
Arabian Cement Co.**



“Using AMS Suite and CSI technologies to identify developing problems with key production assets can be worth literally millions of dollars to any company.”

**– Alexandre Augusto
Da Silva, Braskem S.A.**



“AMS Suite predictive maintenance software has dramatically reduced the time required to identify and rectify a wide range of faults. Efficiencies have improved and unplanned shutdowns have been reduced by 10%.”

**– Peter Montforts,
Akzo Chemical**



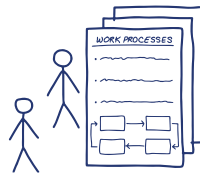
EFFECTIVELY MANAGE ASSETS, ACHIEVE FINANCIAL G

Realize the true potential of your plant assets.

Turn to Emerson as your technology and expertise partner to:

- Identify the health and performance of your assets
- Develop a blueprint so you know where to invest your resources

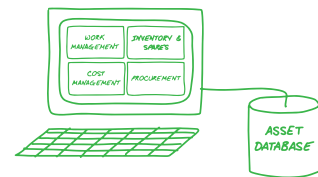
WORK PROCESSES



Know which assets cause downtime this month and cost you availability.



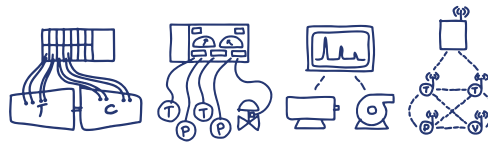
CMMS



Identify the highest priority assets that have degraded health, based on failure modes and effects.



See where you are spending your maintenance budget.



PREDICTIVE DIAGNOSTICS



GOALS.

Success is within your reach.

Equipped with Emerson applications and expertise, experience the benefits of a more predictive environment:

- Meeting production targets
- Selecting the most economic fuels and equipment
- Evaluating the impact of process changes on total performance

- Minimizing energy costs
- Diagnosing the root cause of performance degradation
- Streamlining maintenance tasks

You get increased availability, lower maintenance and operating costs, and better plant performance. You realize the potential of your

assets to keep you profitable.

Move beyond what you think is possible. Call your local Emerson Process Management sales representative or visit us at www.assetweb.com.



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