

# Getting the Picture, Plant-Wide

**Innovative asset management tools increase plant reliability, throughput and availability**

Learn how an effective asset management strategy based on innovative tools and services can help managers realize a better return on their investments, remain competitive, and maintain a stable and predictable operating environment.

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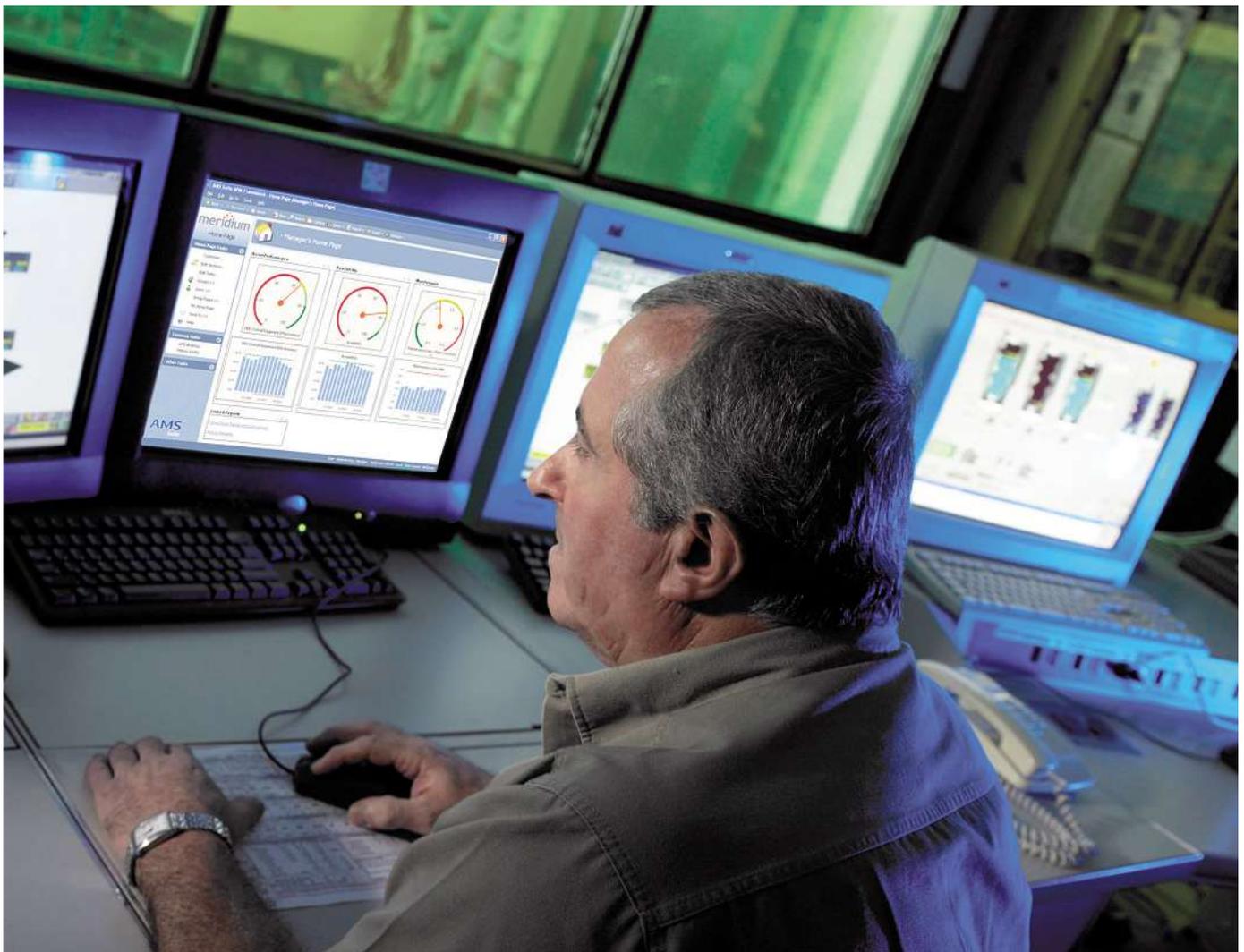
Plant downtime hampers a plant's ability to meet production targets and also places a strain on resources. ARC Advisory Group estimates that globally, process industries lose \$20 billion, or five percent of annual production, from unscheduled downtime, and that 80 percent of these losses are actually preventable.

Organizations such as ARC also report that typical process plants underperform by as much as 20 percent in areas such as reliability, throughput and availability, with little change over the last 10–15 years. So why, despite serious investment in new asset monitoring technology and improved equip-

ment, has there been no significant improvement?

The most likely reason for underperforming assets is that maintenance personnel and management are so deeply involved in "fire fighting" incidents that looking into the future is a luxury they can ill afford. But to see progress, plants must break free from reactive maintenance. They need asset management strategies which include preventive and predictive maintenance.

Studies have shown that predictive maintenance is far less expensive than time-based (preventive) maintenance. Typical benefits reported by users include:



Pictures: Emerson Process Management

Despite the widespread adoption of advanced automation and asset management technology, research shows that many process plants are still underperforming in key areas such as reliability, throughput and availability. To address these issues, plant managers need to improve their understanding of maintenance and overall plant performance.

- maintenance savings of €10 million within a year of implementation related to the identification of badly performing assets;
- reductions in reactive maintenance by 40 percent in less than a year; and
- improvements in availability totaling €3–5 million per plant per year.

Over the years, plants have made considerable investments in predictive diagnostics, including monitoring systems, smart instrumentation and valves, asset management systems, portable vibration monitoring, and more recently wireless monitoring devices. By identifying poorly performing assets in real time, these tools enable the development of strategies based on current asset health and operational priorities.

With so many kinds of critical production assets, asset management strategies can take a variety of forms. These include technology to monitor mechanical equipment, advanced instruments and control valves to improve process operation, and improved work practices to take advantage of existing and new technology. An integrated asset strategy incorporating all these elements is needed to bring maximum return.

The chosen strategy should ensure “bottom to top” compliance with rules and policies, make full use of diagnostics, and act according to measured asset health rather than relying on original equipment manufacturer (OEM) maintenance guidelines. The relatively recent PAS 55 guidelines may improve performance by helping organizations develop and deploy asset management strategies. The importance of corporate governance will force change over time, but fundamental changes on how data is retrieved and correlated will still be required. The importance of demonstrating both historical stability and predictive trends will be crucial if a company wishes to meet the forthcoming ISO 55000 standard for asset management, due to appear in the next few years.

Most organizations do not have a fully trained and qualified asset manager, however, and even if they did, how should asset managers formulate strategies to provide lasting results? Fundamental questions include:

- Is maintenance focusing on the right assets?
- Is the organization recouping its investment in predictive maintenance tools?
- Is the maintenance budget being spent effectively?
- Which assets fail most often and what are the associated direct costs?
- Which assets represent the greatest risk to safety and plant availability?

Many managers “know” the answers to these questions, but supporting this knowledge with statistics can be difficult because asset-related data is often spread across the business within various systems and data “silos”. Drawing reliable conclusions from a mass of potentially conflicting data can also be difficult. The challenge is therefore to deliver asset management information that is easy to understand and supports improved decision-making. In addition, managers choosing between different asset management strategies need to know the likely consequences of each.

### The Need to Change

In today’s competitive global market, an organization can truly differentiate itself from others by installing a “boardroom-to-shop-floor” asset management strategy which can not only direct day-to-day activity but also provide a plan for the years ahead. The organization and its stakeholders need to develop a vision for tracking performance.

Most organizations monitor their businesses through “silo data centers”. Metrics are obtained from individual departments or systems and this information is correlated to help understand how the business is performing against its own objectives. The introduction of plant-wide Enterprise Asset Management (EAM) systems has brought slight improvements in performance, but these mainly have resulted from cost accounting identification of department spends or asset failures. The information is therefore predominantly retrospective.

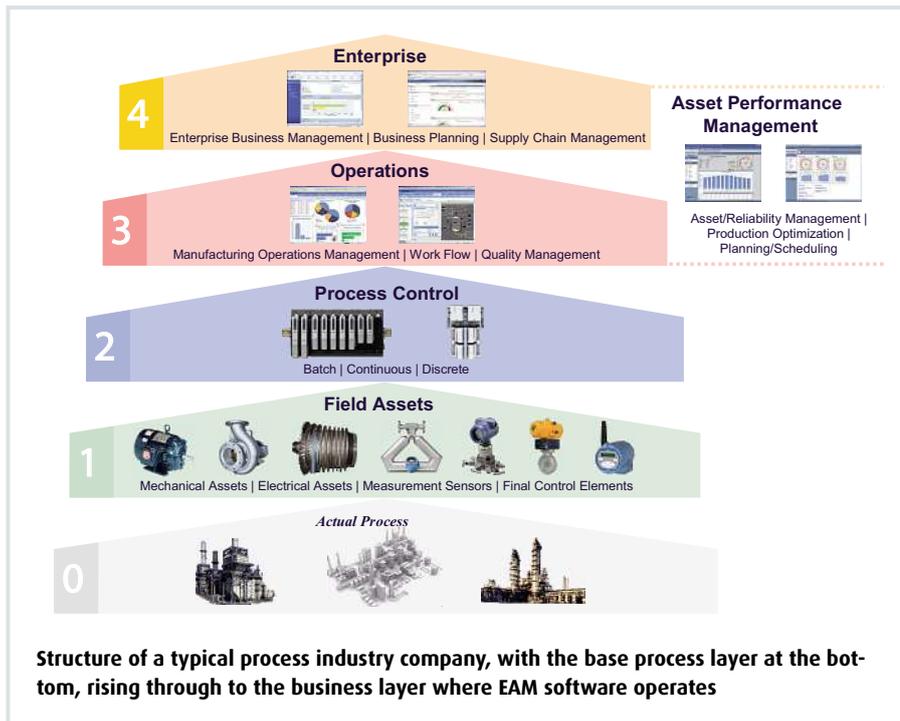
The figure on page 52 shows the structure of a typical process industry company, with the base process layer at the bottom, rising through to the business layer where EAM software operates. Even in the most efficient organizations, the challenge of retrieving and acting on data throughout these levels is difficult and requires multiple interfaces.

## PROCESS PLUS

**Magazine** ● In PROCESS Worldwide 1-2012, page 30, you can read how level switches with built-in diagnostics reduce maintenance costs.

**Online** ● Further information about this article you will find at [process-worldwide.com](http://process-worldwide.com) via InfoClick 3331016.

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**Connectivity is Critical**

Asset management systems typically collect information on the health of critical plant assets. Real-time data on both health and process variables is distributed to maintenance and operations staff, giving early warning of asset degradation. The resulting alerts and recommended actions are directed automatically to the right people, who can act quickly to prevent issues from developing to the point where they cause downtime or lack of safety.

An EAM system can include modules for maintenance management, materials management, procurement/purchasing, human resources, and financial management. The EAM is an enabler for the maintenance process. Whereas an asset management system

is event-based, scanning assets for alerts, an EAM is transaction-based, typically generating work orders, scheduling maintenance and checking spare parts inventories.

Automated communication between the real-time asset management system and the EAM means that islands of asset information are integrated to give a holistic asset view that helps plant staff make the best decisions for improved asset performance and plant reliability.

**Reveal the Cause, Arrange a Cure**

In a typical scenario, an email generated by the asset management system alerts operators to the fact that the plant is not running as efficiently as it should. The email shows a dip in key performance indicators for

overall equipment effectiveness in one of the process units.

A link in the email directs the user to a personalized intranet page carrying more information. Here it is clear that a critical valve has triggered several travel deviation alerts and caused problems with downstream fluid levels. Another link points to recommendations, including a historical record of actions taken when this issue happened previously. A work order is created, with recommendations attached, and sent to the EAM/CMMS system for immediate attention by maintenance. Progress of the work order can then be monitored throughout the day to ensure that the issue is resolved. Status updates can even be emailed to key people in the organization.

New integrated asset management software solutions allow information to be organized for the first time in ways that are most helpful to each user, whether he or she is a technician or maintenance manager. Information can now be sorted by location, asset type, description, health index or significance to plant reliability, with the highest priorities presented on a single dashboard. This provides users with a broader view of the current operating conditions of the mechanical and process equipment, as well as field instruments and valves throughout the plant.

**From Raw Data to Increased Profits**

Having a huge amount of data at your fingertips is not a recent phenomenon; what is new is the ability to call on real-time asset information from multiple sources to create a holistic view of the plant. With this information, key decision-makers can start to address issues—both those that are immediate and those likely to occur in the future—with a high degree of certainty.

The result is fact-based decisions that improve the bottom line. The figure on the left shows maintenance costs for a typical refinery over a six-month period and the cost improvement made by moving to an optimized maintenance strategy.

Many organizations competing in a global marketplace struggle to change how they view their assets and, in particular, plant performance. With the introduction of enterprise-wide asset management solutions, the opportunity to change is in the grasp of most progressive organizations. Those businesses willing to embrace the connectivity of their critical production assets will realize a return on their investments in a relatively short time, remain competitive, and maintain a stable and predictable operating environment.

