

Maintenance 201

Monitoring for high-reliability and high-failure equipment

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- Why monitor rotating equipment?
- Why monitor field devices?
- How does monitoring reduce labor costs?
- Changing maintenance practices for online monitoring

Overview

What can online equipment monitoring do for me?

Online monitoring of equipment condition can increase availability in high-failure-rate components of your process, such as rotating equipment. It can also reduce maintenance costs in highly reliable equipment such as transmitters and valves that are checked frequently but usually don't require maintenance.

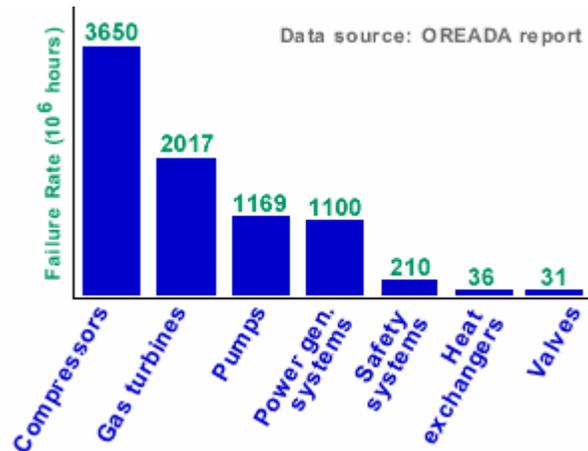
This course outlines how online monitoring can improve your maintenance program in both areas.

Hint: As you go through the topics in this course, watch for answers to these questions:

- *Which equipment most affects plant availability?*
- *Which equipment generates the most maintenance requests?*
- *How can availability and performance be monitored?*

Why monitor rotating equipment?

In most process plants, rotating equipment tends to be the least reliable component.



Because of these high failure rates, monitoring rotating equipment offers the opportunity to significantly improve overall **plant availability**.

The Emerson advantage

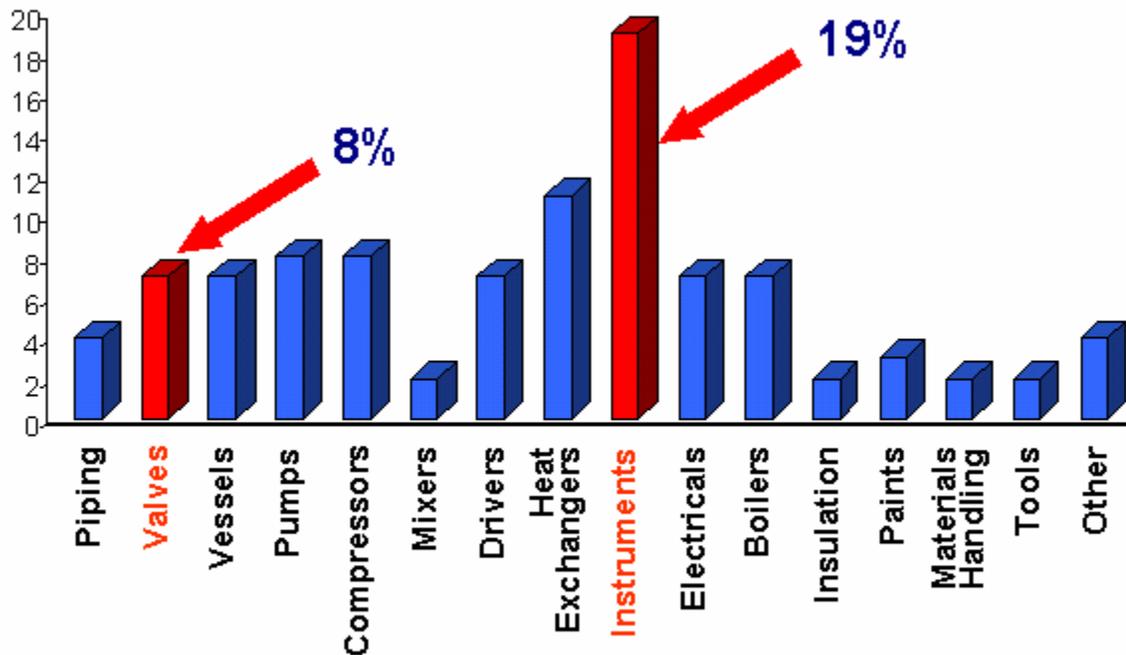
Determining the condition of your mechanical and rotating equipment requires a variety of predictive maintenance techniques. **AMS Suite: Machinery Health Manager** software combines these technologies with comprehensive analysis tools to facilitate monitoring of many plant assets, including rotating machinery. It supports both online and route-based equipment monitoring, data management, data analysis, and reporting of results for predictive maintenance programs.

Emerson also provides remote equipment monitoring services with **AMS Suite: Equipment Performance Monitor**. By detecting performance degradation, these services help ensure your equipment operates at optimum efficiency.

Why monitor field devices?

Rotating equipment has the largest impact on plant availability, but not on **maintenance cost**. The highest maintenance spending is on the most reliable field equipment: the process sensors

and transmitters. As this chart shows, in the hydrocarbon processing industry over one-fourth of maintenance costs are related to instruments and valves.



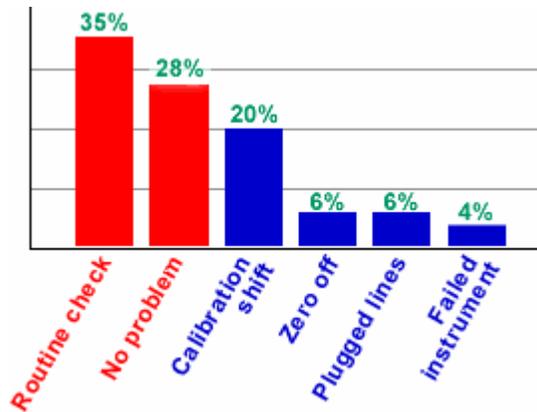
Source: HPI Market Data 1997

This relatively high level of spending on high-reliability equipment makes field devices a prime target for cost reduction through online monitoring.

How does monitoring reduce labor costs?

Many maintenance checks on field devices are unnecessary or unproductive. For example, because transmitters are typically the primary sensors being read into the control system, they are the first "suspect" when a problem occurs. In most cases, the actual problem lies elsewhere.

In one large chemical plant, 35% of the field checks conducted as part of a preventive maintenance strategy found no problems. Another 28% of the field checks were based on reactive strategies, but the instrument was not the problem. The problem was with some other equipment or with the process itself.



Control valves can also be the subject of unproductive maintenance activities. In one study, almost 75% of the valves pulled from a process line for maintenance didn't actually need it.

At an average cost of \$300 for a maintenance technician's trip into the field, considerable savings could be achieved by knowing the health of the instrument before making the field call. Online monitoring of instruments and valves can provide this information and eliminate most scheduled and reactive maintenance checks.

Changing maintenance practices for online monitoring

Manual monitoring usually involves a technician using portable monitoring tools at the equipment's location in the plant. Online monitoring, on the other hand, can be done remotely through a control-system host, or through a separate data acquisition or multiplexer system that accesses the digital information in the field devices.

With either form of online monitoring, the payback period is typically only 6 - 12 months. To achieve these savings, maintenance practices must change.

Changes include:

- Performing routine device checks from a PC or workstation instead of at the device in the field.
- Tracking the performance of devices at routine intervals and extending maintenance intervals for equipment that is functioning within specification.
- For field devices, monitoring for high temperature, overpressure conditions, and other exception conditions that could cause a zero or span shift or reduce sensor or electronics life.

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The PlantWeb advantage

AMS Suite: Intelligent Device Manager software provides online monitoring for over 200 different field device types from more than 40 different manufacturers.



AMS Suite: Machinery Health Manager software provides online monitoring for almost any piece of mechanical equipment to which you can attach an accelerometer or tachometer.

You can complement the mechanical equipment data from AMS Machinery Health Manager with data from **AMS Suite: Equipment Performance Monitor** for a more complete diagnostic view of each asset.

These comprehensive capabilities help maximize your coverage and minimize routine checks and other unproductive maintenance activities for plant assets.