

Maximize Reliability and Reduce Maintenance Costs

Blower and Fan Health Monitoring



Blower or fan failures shutting you down?

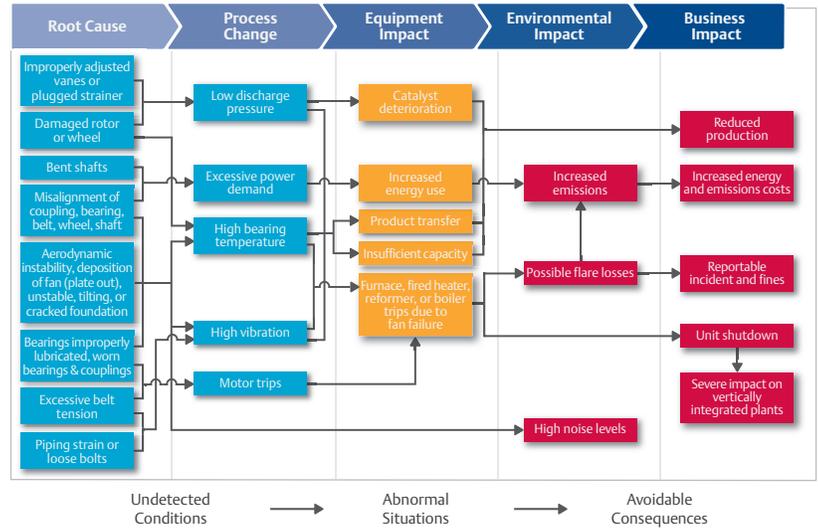
Every year the global process industries lose an estimated five percent of their total production—about \$20 billion—to unexpected slowdowns and shutdowns, often as a result of failed or malfunctioning equipment.

While it's common to monitor critical assets on a continual basis, you might only periodically check blowers and fans. But if, for example, an induced-draft fan on a fired heater, furnace, or reformer develops a problem before the next scheduled inspection, the efficiency of your plant can suffer. The fan could fail unexpectedly, which could lead to a slowdown—or in the worst case—a shutdown.

This “run-to-fail” approach can have far-reaching effects. Studies show that the more reactive a plant’s maintenance program is, the greater its overall maintenance costs are. And on top of expensive repairs, wasted energy, and potential safety and environmental hazards, you’ll also risk missing production targets and letting your customers down.

In the past, automated monitoring was expensive and difficult to implement, but with Emerson’s solutions, monitoring your blowers and fans has never been easier.

Anatomy of Blower and Fan Failure



Common Threats to Blower and Fan Health

HIGH VIBRATION AND BEARING TEMPERATURE

High vibration and bearing temperature increase wear and tear on equipment. It is also a primary warning sign of imminent failure or incidents that cause slowdowns or shutdowns.

BAD INSTALLATION

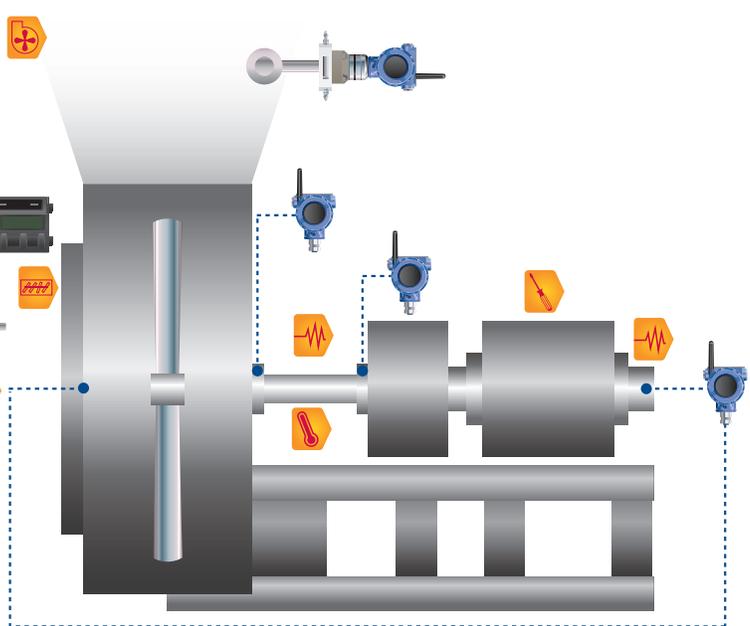
Improper installation can lead to loose bolts, misalignment of belts or couplings, and imbalance that causes excessive vibration and noise, leading to equipment failure.

BLOWER MALFUNCTION

Low discharge pressure indicates a problem with the blower itself. It could be dust buildup on the blades or the fan running at a lower speed than designed. This will lead to low flow and reduced capacity.

LOUVER OR VANE MECHANICAL DEFECTS

Faulty position of dampers can result in incorrect amount of flow, leading to inefficient operation. Loose dampers can also lead to excessive vibration.



RESTRICTION

Low suction pressure is a sign of restriction in the inlet air ducts due to dirt, plugged strainer, or faulty louver/vane positions. It will lead to reduced blower/fan capacity, which can cause equipment trips that lead to unit shutdowns, increased energy costs, reduced throughput, and environmental issues.

What if you could...?

Emerson offers a flexible, cost-effective monitoring solution that can alert your operators to abnormal conditions in real-time, allowing you to address mechanical issues before they impact throughput and your bottom line.

Reduce unplanned shutdowns

Minimize unplanned shutdowns and slowdowns by using Emerson's monitoring solutions to automatically detect abnormal process conditions. Personnel can make intelligent decisions about developing situations and take action before they become more serious.

Get more from your maintenance budget

With predictive diagnostics and up-to-date, online health information on your blowers and fans, you can streamline your maintenance schedule, track alert data to analyze "bad actors," and determine root causes of failure to improve asset reliability and maximize availability.

Protect your people and lower environmental risks

Emerson's monitoring solutions can reduce risk by minimizing the time personnel spend in hazardous areas and by providing timely information on impending problems. This real-time asset health data can help to prevent equipment failure and the potential safety issues that may lead to emergency shutdowns.

Protecting your profit

Industry experts suggest that blower/fan failure and shutdowns are responsible for 0.34% of lost production capacity. Care to get that back?

INPUT

a. Plant capacity in tons per day	1,700
b. Plant net margin per ton	\$200
c. Operating time in days per year	365
d. Capacity utilization	0.93
e. Plant total annual maintenance spend (excluding turnarounds)	\$40,000,000
f. % of production capacity lost due to process blower/fan failure	0.34%
g. % of plant total annual maintenance attributable to process blowers/fans	0.06%
h. Process blowers/fans not currently monitored	4

OPERATIONAL BENEFITS

i. % reduction in lost production with blower/fan monitoring	30%
Annual Net Profit Improvement (=a x b x c x d x f x i)	\$117,721

MAINTENANCE BENEFITS

j. % anticipated reduction in process blower/fan maintenance cost with diagnostics	30%
k. Annual maintenance budget per blower/fan (=e x g/h)	\$6,000
Annual Maintenance Savings (=h x j x k)	\$7,200

TOTAL ANNUAL PROFIT IMPROVEMENT	\$124,921
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Notes
This is an example for an olefin plant.

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Blower and Fan Solution

Emerson's blower and fan integrated monitoring solution allows you to avoid unit slowdowns, shutdowns, and potential safety incidents by giving you the ability to wirelessly monitor and detect deteriorating conditions before a trip occurs. Automated, online measurements and alerts provide you with confidence that changes will not be missed, as they can with infrequent or periodic manual readings. Wireless deployment saves time and money spent on wiring diagrams and complex installations, and reduces costs from engineering, labor, trenching, and scaffolding.



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Emerson's Blower and Fan Monitoring Products

SOFTWARE INTERFACE



AMS SUITE: ASSET GRAPHICS FOR OPERATIONS

Provides real-time graphical displays that indicate abnormal operation, including low differential pressure, resonance frequency detection, louver defects, plugged suction filter, and overall blower health. A pre-engineered algorithm delivers diagnostic information for alarms, process analysis, trending, historization, and key performance indicators.



NETWORK INTERFACE



SMART WIRELESS GATEWAY

Connects IEC 62591 (*WirelessHART*[®]) self-organizing networks with any host system.

DEVICES



CSI WIRELESS VIBRATION TRANSMITTER

Provides early warning of excessive vibration in blowers. Helps determine root cause and corrective action. Optional functionality can identify premature bearing wear and predict failure.

ADDITIONAL OPTIONS



FISHER WIRELESS POSITION MONITOR

Indicates equipment position with a percent of span plus on/off indication. Monitors louver position for mechanical defect detection.



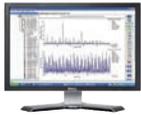
ROSEMOUNT WIRELESS PRESSURE TRANSMITTER

Enables pressure measurements to monitor blower suction pressure and discharge pressure. Provides early warning of impending plugged suction filter.



ROSEMOUNT WIRELESS DP FLOWMETER

Provides high performance flow measurements to give valuable insight into blower operation. Restrictions on inlet ducts can decrease gas flow.



AMS SUITE FOR MAINTENANCE

Aids early identification of asset problems using predictive diagnostics, allowing Maintenance to schedule repairs while reducing cost and downtime.



ROSEMOUNT WIRELESS TEMPERATURE TRANSMITTER

Enables temperature measurements to monitor blower suction and discharge temperature limits, and optimize blower performance.

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