



Failure Prevention Associates
1346 The Alameda, 7-181
San Jose, CA 95126

voice (408) 891-5830
fax (888) 219-4715
email: info@failureprevention.net

*Authorized Reseller for Datastick Vibration Analyzers, SDT Ultrasound,
 PdMA Electric Motor Testing, ICI Infrared, CTC Vibration Sensors & Laser Shaft & Belt
 Alignment*

IT IS SIMPLY ABOUT THE DOWNTIME.

If unplanned downtime is not a serious concern for your bottom line and equipment, then forget it. You do not need it.

Condition based monitoring (CBM), Predictive Maintenance (PdM) are the same label for an activity of monitoring and trending the condition of critical assets. This differs from Preventative Maintenance, which is time based. Using CBM/PdM one can avoid unplanned downtime by knowing the state of your equipment. That level of knowledge places you in control over your equipment.

But again, the key here is downtime. Or more precisely, what does unplanned downtime cost you?

Knowing which parts are wearing out helps your engineers determine which replacement parts should be used and which ones to be avoided. Knowing in advance what work needs to be done, allows you to order the parts, put a kit together for the repair and plan the entire process. Emergency repairs usually take longer, have rush charges and can involve more than one machine.

Return on Investment

Is it worth the time effort and money to move to a proactive system?

Consider this example, which shows, by comparison, the cost savings of using predictive maintenance with vibration analysis:

Net income per hour from production, critical process, etc.
Number of annual unplanned downtime events.
Example: (two pump/motor system failures)
Number of downtime hours to resolve these events?

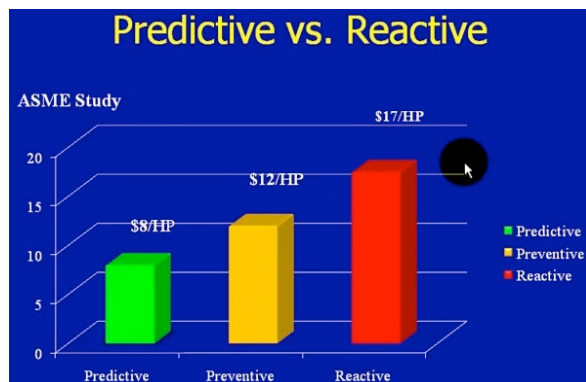
Per Hour Net Income – \$20,000.00
 Failed Pumps – 2 per year
 Emergency work hrs/event = 5 hrs
 \$20,000 loss x 5 hours x 2 assets =
 \$200,000 production loss.

Just from production losses alone, you could invest \$200,000.00 a year in a proactive maintenance program and still have a 100% ROI, (ROI = (return on investment - initial investment)/investment * (100)).

The payback of 1 year does not take into account the savings on maintenance costs: labor, parts, repair or overhaul costs and overtime.

Using advanced technology devices to measure and analyze the function of a machine, PdM technology can alert when a non-optimum condition is present or developing. PdM saves time and money by ensuring an asset can continue to operate beyond an arbitrary time frame.

Lower cost maintenance actions can be employed to ensure the lowest possible life cycle costs and minimize downtime. A repair to a failing part is less expensive than an emergency replacement due to catastrophic failure.



Unplanned downtime is extremely costly.

Reliability Centered Maintenance (RCM) is a process of maximizing all facets of a focused work control process. Thus ensuring maintenance actions, engineering planning and equipment purchasing are coordinated to improve

synergy and results.

Using a PdM system within an RCM protocol, provides the knowledge of how healthy or ill your machines are. Placing you in control over planning when the best time to repair or replace components. Buying top quality parts, with enough lead time delivers the best prices.

Just like a doctor checks your blood pressure, temperature, lung sounds, etc. PdM tools can collect valuable information about the health of your machines.

Repairs take less time and money compared to replacement of failed equipment. When or what to fix is where Failure Prevention Associates helps.

By having the correct PdM assessment tools, this will allow you to begin or expand your program of condition based monitoring.

PdM Tool Choices

There are many complimentary tools to help you assess and understand the condition of your equipment.

Vibration Spectrum Analysis - Best Practice for monitoring Rotating Equipment (cooling towers, gear boxes, pumps electric motors, blowers, turbines, etc.). Acceptance testing for new equipment installations (building floors, piping, rotating equipment). If vibration monitoring is crucial to your facility, we can test it for you.

Field Balancing - On-site balancing is the faster and least expensive option to ensure rotating equipment, like fans, drums, draw works, brush cutters, work as designed. Anywhere in the world, we come to you.

Thermography - Best Practice for monitoring electrical systems, switch, transformers, etc.

Electric Motor Evaluation - Best Practice for monitoring electric motor/generators (stator windings, rotor, air gap, insulation, power quality and power circuit)

Ultrasound Detection - Best Practice for finding compressed air/gas leaks, vacuum leak, electrical faults (arcing, tracking & destructive corona), Slow-speed bearings

Precision Laser Alignment - Best Practice for alignment of motor shafts or belts. Done properly during installation or after a repair, laser alignment helps eliminate increased energy consumption and bearing wear.

Oil Analysis - Best practice to detect when transformer components need repair. Also an excellent detection method for early gearbox wear.

Understanding using each of these technologies has proven over and over again NOT to be enough! If maximizing machinery reliability is the goal, processes must be in place not only to detect problems, but also to analyze them, determine the root cause of the problem, correct the root cause, and verify the problem has indeed been corrected.

A bad bearing might be a victim of resonance, improper application, etc. Using only vibration analysis to tell you when the bearing is going bad is missing the point of a PdM program. Correcting the root cause would take a bearing lasting 1-2 years and extend it to the full life span it was designed for.