

Preventive Maintenance: Pay Now or Pay Later

By: Randy Stiver

During these tough economic times when money is tight, some may think that cutting preventive maintenance is the best option. Before taking that approach, let's be sure we have a good understanding of the role and function of maintenance and where they fit within the organization.

The typical organization divides responsibilities among three groups: Management, Production-Operations, and Maintenance.

Management possesses the business "vision" and is responsible for explaining the "vision" to the rest of the organization. Management monitors business conditions to provide warnings of change in performance or conditions to minimize the impact. Management determines what changes are needed and through their support, or lack of, they determine which changes becomes the next "program of the year".

Production and operations determine in what condition to operate the equipment (factory new or to run the machines to destruction).

Production and operations determine when to schedule shut downs for overhaul and refurbishing the equipment.

Maintenance is responsible for supporting production. Core functions include: design, construct, install, maintain, modify, and modernize all equipment and physical facility assets.

Another maintenance responsibility is to keep the utilities (the lifeblood of the facility) flowing. Utilities can be

Maintenance Categories		
Reactive	Preventive	Predictive
Unplanned	Planned	Planned
Emergency Corrective Based	Time Based	Condition Based
Production Slowed or Stopped Quality Unacceptable Losses Significant	Five Senses	Extended Senses
Unplanned Downtime Lost Margin Unutilized Direct & Indirect Labor Unabsorbed Overhead Most Expensive Repair Costs	Check Adjust Inspect Clean Lubricate	Infrared Thermography Ultrasonic Detectors Vibration Analysis Oil Analysis Task and Failure Analysis

Table 1 - Maintenance Categories

divided into internal or externally produced. External providers bring electricity, gas, water, phone, internet, sewage, and waste disposal to our doorstep using “high reliability” equipment, procedures, and qualified personnel.

Maintenance operates and maintains the in-house equipment to generate internal utilities such as: hot water, tempered water, water softener, waste water treatment, steam, compressed air, heating ventilation and air conditioning (HVAC), chemicals, security, and fire protection. Additionally, maintenance may be involved with the IT network and maintaining mission critical programmed data, passwords, and program keys.

Beyond the utilities, there is production equipment to keep running. The skill set needed to keep the equipment turning can range from basic mechanical drives to highly technical computer networked control systems with electronic feedback.

Finding, hiring and retaining skilled maintenance personnel is difficult and most plants don't have a fully skilled maintenance workforce. Most recurring equipment problems are a direct result of skill deficiencies. 20% of the equipment can cause 80% of the problems. The true cost of recurring equipment problems to an organization can be staggering.

Training can overcome skill deficiencies. When some ask, “What if we train them and they leave?” I ask, “What if you don't and they stay?” Training keeps people from becoming frustrated and stressed when they don't know the proper way to do a specific task. A person who feels competent is a better worker and is more easily motivated.

An indication of management's commitment to improvement and employee development with “pay now or pay later” consequences is the annual number of training days per maintenance craftsman that aren't mandatory or required. What percentage of payroll dollars are budgeted for training?

Maintenance tasks fit into three general categories: Reactive, Preventive (PM), and Predictive (PdM). (See Table 1)

The main question is whether maintenance is planned or unplanned. Unplanned maintenance is the most

expensive type of maintenance and upsets production. This is bad!

Reactive Maintenance can be described as breakdown or emergency corrective. There is a problem with quality, production has slowed, or worse stopped! It's an emergency, quick correct the problem!

Preventive Maintenance is time based and performs tasks on a scheduled basis (daily, weekly, monthly, quarterly, or annually) to “prevent” reactive maintenance. Preventive maintenance looks for warning signs of condition changes using our five senses in looking for, listening for, touching and trying to sniff out problems before the “vision” is affected.

Unfortunately most failures are not time based. So, instead of time based tasks, Predictive Maintenance performs “needed” maintenance based on the “condition” of the equipment and process. Reliability and maintenance personnel use technology to extend their senses for the earliest warning of condition changes before serious damage occurs.

Predictive Maintenance analyzes which PM time based tasks are actually “needed” and what is the correct maintenance interval for each situation. They often find that 20% or more of time based tasks are ineffective, wasteful, and can introduce more problems than they prevent.

Reliability professionals use technology such as infrared imaging to “see” heat. Ultrasonic detectors “hear” friction and turbulence. And vibration analyzers “touch” machinery vibrations to determine which problems are caused by mass imbalance, misalignment, or bearing faults.

As an example, oil analysis “smells” and “tastes” lubricant condition to schedule when replacement is “needed” and can analyze particles for internal parts wear. One case in point is a hydraulic press in a tunnel system that requires 65 gallons of oil for system replacement. The equipment manufacturer recommends changing on an annual basis. Oil analysis may reveal that three years is a suitable replacement interval.

The return on investment in savings and increased reliability from a proactive rather than reactive maintenance approach has been proven time and time

again. Whether you are a commercial industrial laundry or an on-premise laundry (OPL), a PM program can keep equipment running efficiently and thereby reduce unnecessary utilities and costs.

The time spent on planned versus unplanned maintenance is a key indicator of “pay now or pay later”. We can continue to run the machines to failure and keep expecting a different result. Or we can view maintenance and reliability as a process that requires attention to detail and continual improvement of the process.

Maintenance is an investment in an organization’s ability to produce a product or service and can be thought of as an on-premise risk management and insurance provider for keeping the “vision” alive and well.

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