

Maintenance Methods

MAINT

Every facility that produces a consumer product has some requirement for maintenance or upkeep of their machinery. Depending upon the product and, to some extent, the size of the facility, this maintenance activity may be continuous in nature or periodic. Some maintenance activities may consume a significant portion of the facility expenses and manpower.

Facility maintenance activities generally fall into three categories: breakdown, preventive, and predictive. Each category has particular costs associated and specific benefits.

BREAKDOWN MAINTENANCE

This method has no continuous activity associated with it. Essentially, no maintenance activity is performed on machinery until it fails or produces unacceptable product. At first impression this method seems the most cost effective because the manpower and their associated costs are minimal.

But closer examination shows that when the machinery fails, considerable expense is required to allocate manpower on an emergency basis, repair/replacement parts, and lost revenues due to non-production can mount rapidly depending upon the manufacturing process or product. Clearly, this method has the highest associated cost and maintenance is unpredictable at best. In addition, an unexpected failure can be dangerous to personnel and the facility.

PREVENTIVE MAINTENANCE

An advancement on a breakdown maintenance program is a preventive program. This periodic approach to maintenance has little continuous activity associated with it. It involves scheduling a regular outage, usually on an annual basis, where the entire machine train or plant is shutdown, or removed from production, for careful inspection and routine replacement of specific parts.

This method has the highest cost for replacement parts because the facility may have a separate program or department with the sole purpose of maintaining an inventory of spare parts and scheduling outage activity. Maintenance costs are reduced because the "annual outage" or "turn around" is usually scheduled for a period when the product demand is

low. Additional cost savings are realized because manpower and any heavy equipment are scheduled.

PREDICTIVE MAINTENANCE

Throughout the decade of the 1980s many facilities began to seek solutions to high maintenance costs and spare parts inventories. By adopting a continuous approach to facility maintenance these reductions can be realized. Supporting this approach was the profusion of portable data collectors and database software. As an extension or enhancement to a portable data collector system, which can have an elevated associated manpower cost, is a permanently installed monitoring system. Many of these systems can be interfaced to advance software systems that can assist with signal analysis. The key to this enhanced system is having the sensors installed which are available for signal acquisition continuously.

Using these systems, and the appropriate training necessary for signal interpretation, a facility can implement a predictive maintenance program. This method relies on the data collected, either on a continuous basis or on a routine, periodic basis, to dictate the required maintenance procedure and when to schedule the maintenance activity. Granted, the scheduling is a subjective topic controlled by spare parts inventory, manpower availability, and product demand. By evaluating all these parameters a scheduled outage can be determined and all associated costs can be reduced.

Maintenance Method Checklist

1. Breakdown Maintenance
2. Preventive Maintenance
3. Predictive Maintenance