RIZING

PERK UP YOUR PM PROGRAM

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A good preventive maintenance (PM) program will incorporate a variety of types of preventive maintenance. Which types should be emphasized will vary from industry to industry and facility to facility. The following list of kinds of PM can also be viewed as a progressive, step-by-step method of implementing a comprehensive PM program:

1. Routines, Lubrication, Cleaning, Inspections

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This type of PM is the front-line defense against equipment problems. It is also one of the most critical in the development of a PM program. These tasks require few materials and few tools.

Routines are small inspections and adjustments. They are performed each day prior to equipment start up or at shut down. Included in routines is the task of tightening. Tightening prevents looseness of any parts and, in turn, prevents vibration and accelerated wear.

Lubrication need not be performed by maintenance personnel; it can done by operators. In either case, a reliable method is to color code lubrication points and the lubricant so there can be no mistake about which lubricant goes to which point. It is also necessary to specify how much lubricant goes in each point. In many cases, too much is as bad or worse than too little.

Cleaning is one of the most beneficial tasks to be performed on a piece of equipment. While wiping off equipment, personnel will spot many small problems before they develop into larger problems. The person cleaning the equipment can then write a work request for maintenance to correct the problem before it becomes a major one.

Inspection of equipment is closely related to cleaning. Inspections of equipment can occur during any one of the previously mentioned activities. When a problem is detected, a request can be made to maintenance to make repairs before any reduction or loss of capacity occurs.

2. Proactive Replacement/Refurbishing.

Proactive replacement is a term used to cover shutdowns, outages, rebuilds, etc. These activities involve taking a piece of equipment or unit off line and overhauling it, then replacing all worn or suspect components and putting the equipment back on line. It should then operate for a specified time period with little or no maintenance related downtime. Proactive replacement targets equipment components that are approaching the end of their life cycles. That they are approaching this point can only be determined by using predictive techniques. If these techniques are not used, then the cost effectiveness of the program will be seriously affected. If the cost of parts is too high due to replacing unworn components, then the program will lose the support of management.

3. Predictive Maintenance.

Predictive maintenance measures physical parameters against a known engineering limit in order to detect, analyze, and correct equipment problems before capacity reductions or losses occur. Predictive maintenance entails servicing equipment when the equipment requires servicing.

The key to the predictive method is finding a physical parameter that will trend the degradation of the equipment. The trend then can be used to predict the failure. Once the parameter has been found, it should have an upper and lower limit similar to the upper and lower control limits in a quality-control program. With the limits set, readings taken and recorded on a maintenance route keep track of the equipment's condition by monitoring the parameter. When the condition exceeds the upper control limit, then the required service is scheduled and performed. All of these actions take place before a failure occurs.

The following are some of the major parameters used to monitor equipment condition:

Vibration analysis monitors the frequency of vibration in rotating equipment. By knowing the proper frequency, one can monitor and evaluate all components in rotating equipment. Degradation of a component's condition can be trended and evaluated. Unusual wear can be detected and repaired before a failure occurs.

Shock-pulse detects the mechanical shock caused as equipment rotates. As equipment deteriorates, the level of shock impulse increases. The level of shock can be monitored, and as it starts to reach a critical level, the equipment can be taken down and the defective component replaced before failure.

Temperature may be monitored by thermometers, thermographic cameras, or infrared scanners. As the temperature of a unit changes, maintenance technicians are alerted to hot spots. Hot spots, particularly in electrical equipment, indicate a potential problem, and technicians can make adjustments or corrections before a failure occurs.

Oil analysis of both oil and wear particles can be used on any system that contains oil, such as mechanical drives or fluid power units. The analysis can check the condition of the oil itself, insuring that it has all of its original properties. The analysis can also check the wear particles found in the fluid. The wear particles indicate that bearings, gears, pump rotors, etc. are experiencing wear. Then, corrective action can be taken before a complete failure occurs.

Resistance tests check the condition of key electrical components to ensure that they are not shorted out or otherwise damaged. These tests will pinpoint developing problems in motor coils and other resistive components. Then, those components can be isolated and replaced before failure.

4. Condition-Based Maintenance

Condition-based maintenance is very similar to predictive maintenance, except that sensors mounted permanently on the equipment replace hand-held devices for taking field measurements. Signals from the monitors are transmitted to a control room, where readings are remotely checked, monitored, or perhaps integrated into a control system or a computerized maintenance management system.

A good PM program uses all four of these kinds of tools and techniques. Concentrating too extensively on one technique will produce a program that is not cost effective.

For more information on perking up your PM program, contact us today!