Written by Timothy H. Trout, C.P.M.M., MRO Software, Inc.
Saturday, 01 April 2006 23:09

Whether it's performed on you in a doctor's office, or on the assets in your plant or facility, the appropriate type of preventive maintenance can offer tremendous payback, not to mention real peace of mind.

Preventive maintenance is the single most efficient and cost-reducing method available to a maintenance organization within any company. Period. But, not just any "preventive maintenance" will do. It must be logical, appropriate and inclusive of all the proper components.

What does that mean?

As a starting point, the proper elements to include in any preventive maintenance (PM) program, would be any asset or component that is critical to the mission of the company or organization. To determine what those are, you must first answer several questions:

- *What is the mission of your company or organization?*
- *What value do you bring to your customer?*
- *Do you deliver a product or service?*
- *If you deliver a product, what assets and/or components are absolutely necessary to deliver it?*
- *If you provide a service, what assets and/or components are absolutely necessary to deliver it?*

Whatever assets and/or components are necessary for the delivery of your product or service make up the foundation of your PM program. This must be stated unequivocally. The purpose

of maintenance is to preserve an asset or component from failure or decline. As an asset or component is used, it has a need for inspection and cleaning to verify its state of condition. There may be additional requirements to ensure that the asset or component is in its optimal state of condition. If preventive maintenance is not being applied to the assets and components necessary to deliver the product or service of an organization, that organization will experience failure. Such failure may equate to lost production and/or lost opportunity to provide product or service in a timely fashion. In turn, that means the stated mission of the organization is not adequately being met.

Asset priority

It should be understood that not all assets are equal. One of the first steps you should take is to invest the time and effort to clearly identify which assets are more important and have the highest priority in your operations, and what other priorities to assign to the remaining, lesser important assets. Make no mistake, any assets that are a part of any process, whether directly contributing to the delivery of the product or service your company provides, or supporting other related processes in that delivery, have some importance to your company. Otherwise, you would not invest in them. Correct? But, by agreeing that not all assets are equal then you would agree that not all maintenance is equal. And the maintenance required on some assets is non-existent– like those assets that you've identified are acceptable to run to failure.

The assignment of a priority to the assets or components found within your company is a valuable exercise. Prioritization allows you to identify which assets require maintenance and the level of maintenance you should apply. It also enables the maintenance department to identify which work may have a more significant impact on the organization's mission, whether the work is assigned by a supervisor or the technician picks the work order upon which to focus their attention.

Asset classification (catalog)

What about the naming conventions that are used to identify the assets or components within your operation? Seldom do we find these naming conventions to be consistent. Using common and consistent names to identify assets leads to easier identification of the asset upon which inspection or maintenance is to be performed.

Additionally, consistent naming conventions enable comparison between like assets, whether they are within the same area or located elsewhere within the organization. It is important toidentify what maintenance differences may exist between like assets, which assets are performing more reliably than others,what maintenance expense is being incurred and,

potentially, what could be done differently to reduce the maintenance expenses on like assets.

Failure analysis

Having a class of failure associated with the assets or components provides an often overlooked Reliability Centered Maintenance capability of Failure Mode and Effects Analysis (FMEA). This is an easy-to-use and powerful proactive maintenance technique that helps you identify and counter frail or fragile points in products and/or processes. The structured approach of FMEA allows for the use of associated Assembly/Cause/Remedy and proves to be a valuable tool by defining the root cause of any failure that an asset or component may incur. Without using FMEA, any analysis becomes inconsistent and subjective. FMEA allows for an objective analysis of the maintenance performed on an asset–and helps the analyzer eliminate potential reasons for the related failure, which drives toward the identification of the true reason for failure and, as a subset, what maintenance tasks may be necessary to reduce or eliminate the failure.

Appropriate preventive maintenance

Performing PM tasks in a timely manner that reduces or eliminates failure could be the proper level of–or appropriate–maintenance required. Achieving the proper harmony or balance of maintenance, however, may be difficult to accomplish. The primary factor to consider is the risk associated with the failure of the asset being maintained.

Companies have a tendency to over-invest in an asset's maintenance when the impact on the mission is significantly affected by the failure of the asset. The decision regarding the appropriate level of preventive maintenance to perform on any asset should, therefore, be a subject for discussion between the operations and maintenance organizations within

each company. Having an accurate and dependable history of the asset's performance, however, and the level of maintenance that has been applied to it will certainly facilitate the decision-making process.

The maintenance history should include the PM performed, any follow-on work orders that may have been generated from execution of the PM tasks, the inspections made and their frequency, any corrective maintenance that may have resulted from those inspections, and the level of effort that has been expended in all activities, including the spare parts and/or consumable material required. Numerous decisions can be made using this subset of the asset life-cycle cost information.

One short side note is in order, here.A large number of companies are using standing work orders for recording brief durations of maintenance applied to assets.While recording activities in this manner allows a technician to account for all of his or her time, it skews the true maintenance cost that may be associated with an individual asset. That is because the standing work orders are assigned at too high a level to actually post the time spent to the specific asset requiring the maintenance. Thus, this is not the best method for capturing true asset life-cycle cost.

It also should be noted that, when performing maintenance inspection, if you've inspected 12 times and have not generated a corrective maintenance work order, you've inspected at least 11 times too many. The purpose of an inspection is to identify potential required maintenance in advance of any failure. If you are not finding any potential maintenance, you could be wasting maintenance dollars (in time and effort) performing unnecessary inspection tasks.

This is not to encourage delaying any inspection. Rather you should consider the results of past inspections and adjust the intervals of future ones so that the time and effort heretofore devoted to unnecessary inspection can be reapplied to more productive maintenance tasks.

Logical preventive maintenance

Having already identified the elements that should be included in your PM program and relating the appropriate level of maintenance to apply, what, then, is logical preventive maintenance?

Logical maintenance depends upon the age and the status of the asset. To illustrate: a newer asset may be under a manufacturer's warranty with the expectation that a certain level of maintenance will be applied to validate the warranty. Typically, a manufacturer's recommended maintenance may specify tasks that go above and beyond necessary maintenance.

Again, assets that are older may require additional maintenance to preserve them in their optimal operating condition. The challenge here is to identify what the additional maintenance may be and to apply those added tasks at the proper time to any like assets as they age.

Logically applying maintenance routines to complex assets requires breaking them down into their basic function. Machinery is comprised of mechanical, electrical, hydraulic or pneumatic elements. Identify which element requires what maintenance task, then assemble those tasks into the maintenance routine required to achieve the desired result.

Once you develop the maintenance routine for each asset, whether the asset is simple or complex, you have the foundation for your PM program. You should then monitor this program, to ensure that it is helping meet the mission of your company, and expand it to include other assets that you identify as requiring repetitive maintenance tasks.

Summary

Again for emphasis. . . preventive maintenance is the single most efficient and cost-reducing method available to a maintenance organization within any company.You can liken it to your own health. A visit to the doctor for a routine check-up or procedure (preventive maintenance) can uncover and lead to the elimination of a potentially catastrophic failure.

The expectation is the same regarding PM–be it performed on you in a doctor's office or on assets and/or components within your operations. It's all about reducing or eliminating failure. **MT**

Tim Trout has held a number of positions within MRO Software, and currently serves as program manager, Center of Excellence. He has considerable experience in maintenance management, including involvement with all aspects of material handling, from managing storerooms to managing procurement departments. E-mail: Tim.Trout@mro.com ; Telephone: (208) 232-3929