

Maintenance Control - from Zero to Hero

Six Giant Steps to Effective Maintenance Management

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You can just see the eyes of many maintenance managers in many small companies glaze over at the mention of CMMS, RCM, TPM, FMEA and the other maintenance related acronyms that are often introduced in discussions on maintenance and facilities management. Big companies often employ some of these initiatives in their maintenance organisations because they can afford to do so. The reality for many cash-strapped, smaller businesses is quite different. Most of their maintenance is reactive. Plant and equipment problems only get dealt with as they arise and this is usually when it is too late to avoid the resulting disruption to their production or processes.

Even when a company has both the will *and* the money to spend, it is difficult to know where to start when considering the implementation of maintenance management systems. Probably the majority of smaller companies are still at this stage, which effectively means the majority of maintenance people. The prospect of developing suitable maintenance control strategies and policies from a standing start is daunting. There are many questions such as how much will it cost, where will the resources come from and how will we cope?

Well, here's a surprise, the truth is that there is not really a lot to it and I would suggest the following simplified, non-scientific approach. I won't show you any pie charts or fancy graphs and there will be no more three letter acronyms but it is a realistic, effective plan and its low cost puts it within the reach of all small companies.

Step one - Select a low-cost CMMS

This will involve spending some money because your CMMS, (Computerised Maintenance Management System), with its equipment register will arguably be the most important component in this process. The good news is that low cost, Access based systems are now available from a couple of hundred pounds/dollars upwards. If you have \$1,000 or £600 to spend you should be able to find a single user system that will more than meet your requirements. If you need information on CMMS selection you will find all you need to know on the Internet. Just search for something like "CMMS" or "CMMS software selection" and you will get many results.

Step two - Develop your equipment register

Maintaining an equipment register - a list of all of your maintainable equipment - is a necessity. At the lowest level this may only hold details of your equipment and its location but most CMMS applications provide space to store all sorts of equipment details. These may include make, model, serial number, equipment history, linked spares, linked drawings, etc. You can decide for yourself what information you want to record. If you are lucky you may already have this on a spreadsheet or database.

If you have lots of equipment you may want to consider developing a user friendly asset numbering system. These are not hard to create, e.g. FAPACK03 could represent the final assembly area (FA), packaging machine (PACK) number three. You can develop this to meet your needs.

Step three - develop your first Planned Maintenance (PM) schedule

Clearly PM schedules are best when they are based on equipment history but you probably won't have any history available. If you don't have it your past experience should be able to let you determine which equipment really must be on your PM schedule. The initial schedule will therefore be based on your familiarity with your own equipment but the PM frequencies that you choose initially should be considered to be no more than an educated guess. Where practical, you may also want to consider the use of metered maintenance that is based on runtime or cycle time as opposed to a fixed time period.

Step four - Put a good, ad hoc work reporting system in place

Maintenance can be broadly classified as planned or unplanned where unplanned is breakdown or reactive work. Before a proper maintenance plan is in place the ratio of unplanned maintenance versus planned maintenance will be high, perhaps as much as 95% to 5% or even more. Your aim must be to reduce this ratio to a more satisfactory level. To do this you must introduce an effective work request system that captures the details of all ad hoc work that is being done. One way to do this is to refuse to accept any work requests unless they are formally requested through the CMMS. The details of these jobs will then be captured and included in your equipment history.

Step five - Use the maintenance history to fine tune the Schedule

As time passes and equipment history starts to be collected in the CMMS system you can use it to identify the equipment whose performance is causing disruption and downtime. You can then optimise the PM work that is taking place in an effort to minimise this. The CMMS must be capable of producing the specific reports that can identify your improvement areas. For example, if you are in a production environment and reduction of downtime is a problem a downtime "top ten" report will be important.

Step six - Move from PM routines to planned inspections.

One of the dangers of introducing PM routines is that after some time it can become generally accepted that they absolutely must be done within the chosen period. This period was probably chosen by the guesstimate method mentioned in step three above and it may not be the optimum interval. For example a monthly maintenance routine can often be scheduled on plant or machinery that may only have been used for a week or two during the previous month. PM periodicity is therefore something that must be reviewed regularly.

You can use your developing equipment history to analyse the PM work that is taking place and ask yourself what it is achieving. Look at the likely failures that could occur on the equipment and try to put in place inspection routines to monitor equipment condition

With more time, and a greater understanding of the problems that are occurring, you should be able to drop many of your PM routines in favour of planned maintenance inspections. These will give you an indication of when a routine really **needs** to be carried out as opposed to doing it blindly, on a calendar based basis.

The advantage of inspections is that many of them can be done quickly, while the equipment is still running (subject of course to normal safety regulations.) This is basic *condition monitoring* or *condition based maintenance** and even at this grass roots level it can be very effective. It can be further developed with the use of low-cost, portable condition monitoring tools such as temperature and vibration measuring equipment.

What does all this cost?

The above scenario is within the reach of almost all maintenance departments. At this stage there is no need to throw money at the problem. You can do it for as little as £1K but if you can afford £5K you could get yourself a pretty useful CMMS system. All you really need is the time and the motivation. If you do it right you will end up with more time on your hands for analysis and prediction of problems as opposed to reacting to them. If you follow the above rules your returns will be much greater than your investment.

How long does all this take?

It cannot be done overnight. There is a significant amount of work involved and it depends on the resources that you can allocate to it. That said, a small company could put a CMMS in place in a couple of weeks and if you already have an equipment register and maintenance procedures this will make it easier.

Gathering equipment history is a different story and it will be a few months before you have any significant data available. One year down the line you should be able to measure significant performance improvements.

* **Condition Monitoring (CM)** - a maintenance process where the condition of equipment is monitored for early signs of impending failure including overheating and changes in vibration patterns. Equipment can be monitored using sophisticated instrumentation or the human senses. Where instrumentation is used actual limits can be imposed to trigger maintenance activity. Condition Monitoring (CM), Predictive Maintenance (PdM) and Condition Based Maintenance (CBM) are other terms used to describe this process.

(Definition by Bryan Weir of Perspective CMMS)

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