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Article

Up and Running
A Preventive Maintenance Implementation Program
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The simplest maintenance strategy to execute is called Run to Failure (sometimes called Run to Fail, or Reactive Maintenance.) In this strategy, machine assets are allowed to operate until they break down, at which point maintenance is performed or in the worst case, the asset is replaced. In most cases, no maintenance is performed on the machine until it fails in service. Note that a conscious decision has been made on the part of Management to allow the asset to be operated under a Run to Fail maintenance “schedule.”

This strategy is useful for assets that, when they break down, pose no safety risks and have minimal effect on production. The advantages of Run to Fail include a minimum of planning because no maintenance is scheduled in advance of failure of the asset. This methodology is therefore easy to implement, and easy to understand.

By way of contrast, preventive maintenance (PM) is regularly scheduled maintenance that is performed on machine assets to at least lessen and hopefully eliminate the likelihood of them failing in service. Preventive

maintenance is performed while the equipment is still functioning properly, so that hopefully it does not break down unexpectedly.

While Run to Failure is a perfectly adequate maintenance methodology for certain types of machine assets, unfortunately it is frequently implemented across the board. Consequently, machine assets that would be better served by a preventive maintenance schedule are allowed to fail in service costing the owners dearly in lost production and other associated costs. Due to the inability to predict when an unmaintained machine asset will fail, it's almost a given that this will occur at the worst possible time.

At this point, it's fair to ask, "But wouldn't this be type of maintenance be covered as part of a TPM (Total Productive Maintenance) implementation? Why don't we just do that?" The answer would, of course, be yes. But while preventive maintenance is one of the eight pillars of TPM, what if the organization is not planning to implement a complete TPM system at the present time? Wouldn't the organization still benefit from a preventive maintenance program? Again, the answer is yes in many cases. In fact, it might be that companies can't afford not to have a PM program.

In 2000, Wei Lin Koo and Tracy Van Hoy, P.E., published a paper titled "Determining the Economic Value of Preventive Maintenance." This study evaluated maintenance and equipment replacement costs for approximately one million square feet of plant space involving a variety of industries and was commissioned by the real estate management firm Jones Lang LaSalle. The purpose of the study was to estimate the return on investment (ROI) for preventive maintenance activities. Some of their findings were eye-popping, such as ROIs of 850%, 1,100% and 2,300% for boilers, centrifugal chillers, and centrifugal pumps, respectively. Clearly, there are economic advantages to PM.

With the implementation of a preventive maintenance program comes the need to maintain a staff of skilled persons to perform the work. However, a complaint that is frequently heard is that skilled maintenance personnel can be difficult if not nearly impossible to find in some instances. So even if the company decides to implement preventive maintenance, they are hamstrung by a lack of experienced personnel able to troubleshoot problems and make the necessary repairs on their assets.

To address this issue, many companies have turned to creating their own skilled workforce by training existing employees in various maintenance disciplines. Frequently, employers are looking for employees with basic mechanical skills and comprehension, along with a strong work ethic. Usually, the employee is assigned to a mentor, then given a combination of hands-on and classroom instruction to close their skills gaps.

To assist them, Missouri Enterprise has implemented a program called Up and Running. The goal of Up and Running is to assist our customers in implementing their own preventive maintenance program. An integral element of this program is a baseline skills assessment made by a combination of hands-on skills demonstrations and written tests. If skills augmentation is needed, that need is identified through the assessments beforehand, then provided as needed, but only as needed. That way, the employee's time is not wasted.

Below is a partial list of areas where companies frequently require assistance in bringing their personnel's skills up to the level required by organizational objectives:

- Mechanical / Electrical Skills Assessment
- Troubleshooting
- Electrical (including three phase power)
- Blueprint Reading

- Computer aided drafting
- Fluid Power (hydraulics and pneumatics)
- Programmable Logic Control (PLC)
- Welding (MIG, TIG, and stick)
- Supervisor Training

Implementation of a preventive maintenance program is just one part of a holistic approach to bringing a company up to World Class levels of performance. The image below is what we call the Excellence Pyramid at Missouri Enterprise. It can be seen that in this model, each level attained on the journey to excellence rests solidly on the level below it. You'll notice that asset maintenance is found on the lowest level in this model.



Saying that asset maintenance is a low level activity is not intended to be an insult. In fact, it is the exact opposite. Nothing is more fundamentally

important in manufacturing than keeping the machines running and that is what this program is intended to provide; the solid foundation for future growth in excellence. To put it another way, a manufacturing organization can't aspire to attaining World Class status without some assurance that they can at least keep their machines running and minimize failures. Preventive maintenance provides that assurance.

References:

Determining the Economic Value of Preventive Maintenance, 2000, Wei Lin Koo, Tracy Van Hoy, P.E. – Proxy Portfolio ROI of Equipment Types Industry Benchmark v. No-PM.