

BREAKTHROUGH



Lean Implementation & Training Resource Publication
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TPM (TOTAL PRODUCTIVE MAINTENANCE)

By Harold Chapman

TPM EVENT OUTLINE

In last month's newsletter, we defined TPM, its impact on business metrics and how to measure OEE. In this issue we will dive into the practical application of TPM.

HERE ARE THE STEPS IN A TPM EVENT

Step 1: Initial Inspection and Cleaning

Conduct an initial inspection of the equipment looking for any obvious issues that need to be corrected. Follow this inspection with a "deep" cleaning of the entire piece of equipment. The purpose of cleaning is twofold: to clean the machine to the point where it looks new and to get in those tight spots for a deeper inspection. You will find that most of the inspection findings come during the cleaning process. Remember, "Cleaning is Inspection."

Step 2: Eliminate Sources of Contamination

During the cleaning process, you will clean the machine intensely. It is important to run the machine when the event is completed. This will allow the sources of contamination to re-contaminate, so the team can locate and eliminate those sources.

Step 3: Develop TPM Tasks

TPM tasks are those tasks that are conducted by the operator every shift. There are daily, weekly and monthly tasks; all to ensure the equipment is in operable condition. It is like a pre-flight inspection for a pilot. There are four basic categories for TPM Tasks: Inspection, Cleaning, Lubricating and Adjusting. The focus here is standardizing, visually controlling, and training to these tasks. One-Point Lessons are created to aid in this focus. We will cover one point lessons in step 6 below.

Step 4: Develop World Class Preventative Maintenance (PM)

In addition to the daily, weekly and monthly TPM tasks created, there is also a need to have a preventative maintenance process to support machine availability. We encourage these PM's to be completed as a joint effort between Maintenance Technicians and Operators. This increases all operators' understanding of the equipment. In this step we create a World Class PM Document that is easily executed by someone not familiar with the piece of equipment. We also ensure there is a process for managing the PM scheduling and completion.

Step 5: 5S (Sort, Shine, Straighten, Standardize and Sustain)

Now that the machine is clean and being well maintained, we want to ensure the surrounding area supports the new impression, so we conduct a mini 5S event in the general area of the equipment following the Sort, Shine, Straighten, Standardize and Sustain process. This approach works best if 5S has been performed on the plant level prior to TPM implementation.

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TPM EVENT OUTLINE Cont'd

Step 6: Develop One Point Lessons (OPL)

There are some tasks to be performed that will require more detail. Rather than clutter up the TPM task list with this detail, we create OPL's. The OPL is a document that describes, in great detail, the process to be followed, using pictures where needed, when conducting a specific task. We also brainstorm other areas that will benefit from OPL's as part of the event. Common areas requiring OPL's are machine startup, machine shutdown, further technical understanding and crash recovery. The OPL's are one of the first things to be used when training new operators on a piece of equipment.

Step 7: Develop Fault Trees

Our ultimate goal is to have a machine with zero faults, but we are also realistic in knowing some faults will occur. The Fault Tree serves as a tool to allow standardized recovery from a fault condition. The fault tree is in the form of a flow chart, and it steps the operator through the process of diagnosing and recovering from common faults. We brainstorm, or preferably use historic data if available, to determine the top 5 faults on a machine and create fault trees for each fault. When a Maintenance Technician is called for a fault, their first question becomes "Have you followed the fault tree?" This frees up the Maintenance Technician to focus on true root cause identification on other matters rather than fire fighting. Again, our ultimate goal is to eliminate faults from occurring, so we can't lose sight of these faults.

Stay tuned next month as we cover the final step in the TPM process, which is focused on Continuous Improvement. This is the most crucial step. If we don't sustain our improvements, we will have wasted a lot of time and money.

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Need help with TPM? LMSPI is comprised of a team of veterans that have been leading hands-on implementation for no less than 20 years, including TPM. To demonstrate value-add from day one, we offer to walk through your processes with you, observe opportunities and threats in your operation and present recommendations to you and your team at no-cost for our time. Be proactive and schedule us early in the First Quarter 2010 and learn how we can help.

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Stay tuned!

This is the second issue of a three part series on TPM. To review the entire FREE Online Insider Archive now [just click here](#) or visit www.LMSPI.com today!

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