**MES – Redefine Success**

Just imagine that you are getting all the information necessary to benchmark your plant’s performance. The data that you collect on the shop floor is authentic and you are sure of the Overall Equipment Effectiveness (OEE) of all critical assets or machines, and are in a position to justify the value that your plant generates. Your Production teams are fine-tuning and not fire-fighting in daily operations and the machine operators are not feeling insecure when you conduct improvement measures. You are applying Asset Optimization principles in the best possible manner and can easily draw out plans of future investments pertaining to planned expansions ....

... Such a scenario if achieved could really be fantastic!

**A Pragmatic approach towards TPM**

It may seem like an idealistic scenario at the moment but it surely can be achieved with ample ease using Werardt’s Productivity tools like **MES** (Manufacturing Execution System) and **FTM** (Fault Tree Maintenance).

**FTM** concentrates on improving your Maintenance activities with a world class approach in management covering all aspects of Plant Engineering and Maintenance, whereas **MES** helps improve your entire production process with a human angle. It makes use of TPM principles to succeed like never before. MES applies a pragmatic approach to shop-floor data collection; it’s not a perfectionist, but a practical approach towards Productivity improvement.

This document highlights the use and applicability of **MES** to your Productivity enhancement requirements using the guidelines laid down by the **TPM** philosophy.
The True measurement of OEE

The MES system offered by Werardt is a simple tool to monitor your machine’s or plant’s Productivity, enhance it through Improvements and apply Processes that sustain these efforts. So, let’s start with the 3 factors that contribute to your bottom-line!

**P** Productivity

This information regarding Production could cover ideal capacity v/s actual produced or even you could record planned v/s actual produced (yield), this provides information on the Rate of Production which indicates the Performance Rate of the machine. It can also be the rate of production per operation which may be required in case of re-work jobs where only single or limited operations that may have to be performed.

**DATA**

What to record: This will be the number of pieces produced on that machine or line, date-wise & shift-wise, for the product or job under production. There is also a possibility of a product changeover midway during a shift and multiple run-no’s for a single product, against a Production Order. These too have to be recorded.

How to record: Now this can be recorded manually in a register by the operator or in case of Machines that have an automatic reliable output, this signal can be tapped electronically or collected from the machines computer, and then stored into the MES program. One need’s to realize that the simpler it is the more usable it is.

When to record: This should be recorded in a register, as and when production is taking place by the operator and then at the end of every shift this can be keyed into the MES program OR at the beginning of the General shift key in all of the previous days 3 shifts data into the MES program.
Quality

Now even if we record the produced quantity it is necessary to record the acceptable quantity against quality benchmarks, since that is what actually is accounted as finished or deliverable. This is the information on Rejections & Re-work and is the Rate of Quality

DATA

What to record: This will again be recorded date-wise shift-wise for the product that is under production after the Production entry is made. This will be against the Rejections that have taken place as per your quality specifications to know how much was acceptable out of the produced lot.

How to record: Now this can be recorded in the production register itself manually by the operator or in case of Machines that have an automatic reliable output, this signal can be tapped and stored. Normally in case of assembly lines such automatic mechanisms are available at the end of the line

When to record: This should be recorded in a register, as and when production is taking place by the operator and then at the end of every shift this can be keyed into the MES program OR at the beginning of the General shift key in all of the previous days 3 shifts data into the MES program

Availability

Last but not the least, the measure on which you have seemingly less control and which could be the main culprit is the actual time that was utilized for production against the available time for production. This is what we refer as the Availability which records the Downtime losses or Stoppages on the machine.

DATA

What to record: Again, this will also be recorded date-wise & shift-wise for the Machine that is being used for production. But here you will have to define certain stoppage codes like, Setup delay, Breakdown, Waiting for Inspection, Lunch break, Absenteeism, No Power, Shift handover, etc. as prepared by you. And as per TPM these could be around 16 types which can be used by you.

How to record: Manually by the operator against the Stoppage Codes and the time gone on this, or in case of CNC Machines this could be provided from a PLC output that considers all aspects of the machines operations to decide the Stoppage. This signal then can be stored but the operator will anyway have to enter the respective Stoppage code against it, and if the codes are not entered, then the system could atleast provide the total loss in production.

When to record: As and when a Stoppage takes place and then at the end of every shift this can be keyed into the MES program OR at the beginning of the General shift key in all of the previous days 3 shifts data into the MES program. But in case of Automatic recording as mentioned above this will be an Online collection of data which can be used appropriately by management to track outputs.
Pre-requisites
This involves the preparation of basic masters like machine master, product master, Machine-product capacity master or even operations wise Machine-product capacity master, Stoppage code master, Rejection reasons master, and so on

Autonomation
Apply the principle of Autonomation. This is a term drawn from the Japanese term “Jikoda” which means “Automation with a human element”. They say that you cannot have automation without a human touch … because it won’t work as effectively. Hence go step by step to achieve the success you desire.

Possible Scenarios
1. **Capacity data**: Data on Capacity or Speed not accurately available. Here we are talking about the Machine-Product combination, i.e. how many pieces of a particular product can be produced on a particular machine in an hour or shit, etc. In this case it is best left to the production personnel to compute an average based on past available history, and later use the system to refine this figure on a quarterly basis
   **Conclusion**: Hence rely on history till the systems settles in and then tune it up

2. **Production Register**: You have all the necessary information on the Products or Jobs and also record the production that takes place but you probably need to refine or modify the daily production register to accommodate information on Acceptable quantity and Production Stoppages along with the real time information. Only then can someone enter it into the system
   **Conclusion**: Just modify the register on the machine to accommodate these inputs

3. **Automation**: Though you may be having CNC machines, each one is different and may require an independent specific logic to record an actual stoppage condition. So initially start by performing this task manually and then one by one shift over to an automated online recording of stoppage. In any case the operator has to be taken into consideration at that point
   **Conclusion**: Phase out automation, apply TPM with a human angle as prescribed. It may take a maximum of 4 to 5 months to reach your set objectives, so be it.

4. **Phase it out**: The best way to achieve your goals is to break it down in smaller measurable and manageable steps. Start with one machine that bothers you a lot and then shift over to the rest after approval and inputs from your operators move on to the rest!
   **Conclusion**: Teamwork in a phased out manner will help you achieve the most.