

## **Implementation of Total Productive Maintenance Approach In A Manufacturing Industry**

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### **ABSTRACT**

The paper discusses the Total Productive Maintenance approach and its implementation in a manufacturing industry. Today, industries are facing the problems of lower productivity. The main reason behind this is improper utilization of available resources. In this paper, a case study has been carried out in a leading organization in the field of scaffolding and frameworks systems. The company was facing the problem of lower productivity and with the systematic implementation of Total Productive Maintenance Approach, its productivity increased and a better working environment was developed in the industry.

Keywords: TPM, Pillars, Productivity

### **INTRODUCTION**

Total Productive Maintenance (TPM) approach originated way back in 1951 when the concept of preventive maintenance was introduced in Japan. Nevertheless, the preventive maintenance term has been adopted from the United States. In 1960, Nippon-denso was the first organization to implement plant wide preventive maintenance. TPM is a management system that includes a new approach of plant and machinery management. The TPM program's aim is to significantly increase productivity while growing employee morale and job satisfaction at the same time.

TPM approach is based on 8-pillars in which eight activities are carried out.

These pillars are :

- 5S
- Jishu Hozen
- Kobetsu Kaizen
- Planned Maintenance
- Quality Maintenance
- Training
- Office TPM
- Safety Health and Environment

Out of these eight activities, first four activities i.e. 5s, Jishu Hozen, Kobetsu Kaizen and Planned Maintenance for increasing production efficiency by establishing the system, fifth activity i.e. Quality Maintenance for designing control system for products and equipments, sixth activity i.e. Training is for improving the worker's efficiency, seventh activity i.e. Office TPM is meant for administration and eighth activity i.e. Safety, Health

and Environment is for control of safety parameters and improvement of working environment.

**IMPLEMENTATION OF FIRST PILLAR**

**PILLAR -1:**

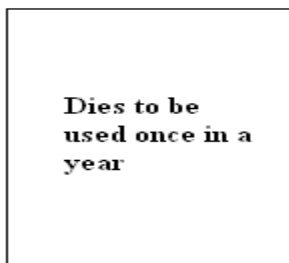
**5S:**

**1. Seiri (Sort):**

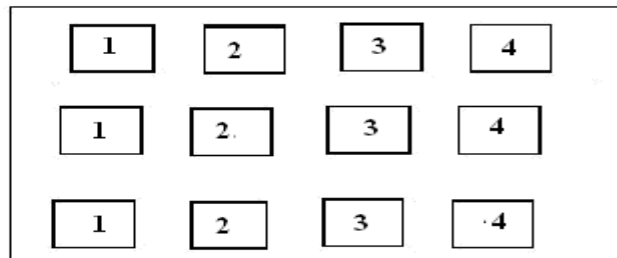
Figure 1 shows all the dies used in the press machines. Here all the dies are placed at the same place. The dies which are used very rarely are placed with the dies which are used frequently. Due to this a lot of time is wasted in searching a particular die and the racks shows very clumsy appearance.



Before Implementation



STORE ROOM



Most commonly used dies should be kept on table

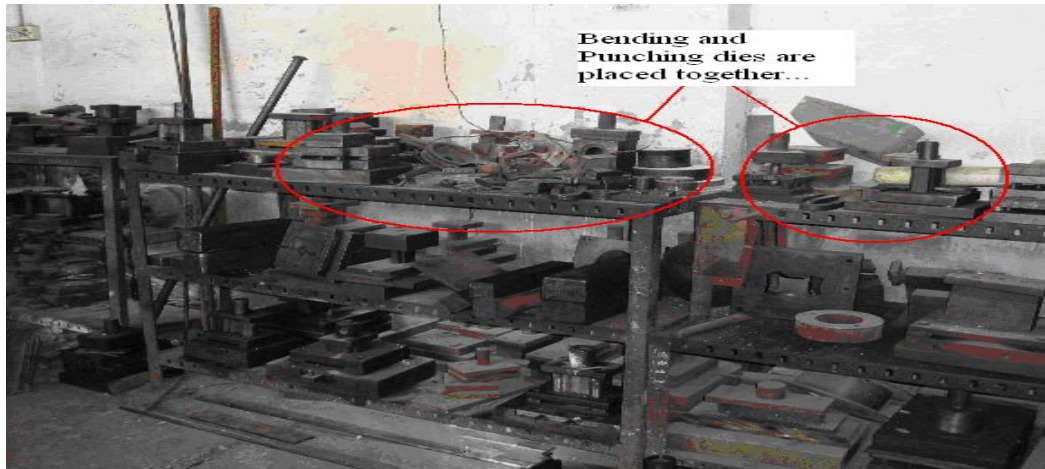
After Implementation

Figure1: Application of Seiri

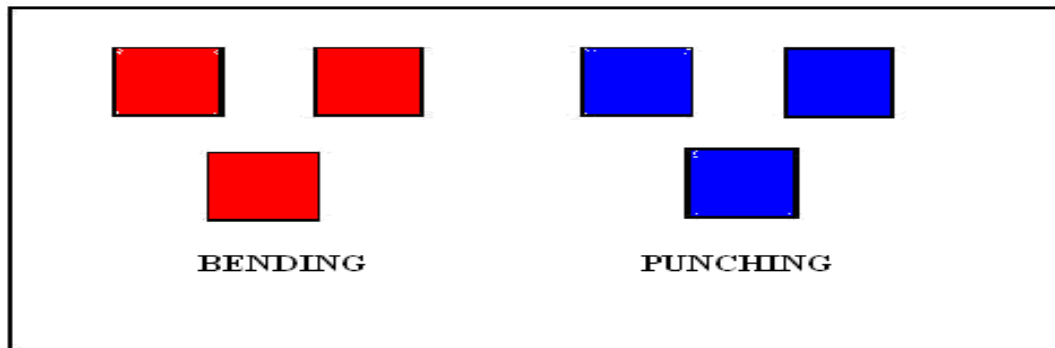
Now, this pillar can be applied by placing the rarely used dies away from the workplace and frequently used dies near the workplace.

**2. Seiton (Organize):**

Figure 2 shows the place where the dies are placed. Here all the dies are placed in a random order. In searching a particular die a lot of time is consumed. This pillar is applied by placing similar dies at the same place and having different colour schemes. This will reduce the time required for searching a particular die to a large extent.



Before Implementation



After Implementation

Figure 2: Application of Seiton

This pillar is applied by arranging the dies according to their category and also coloring them separately. It saves our time required for searching a particular die.

**3. Seiso(Cleaning):**

The floor of industry was very dirty and unwanted material was placed on the track. Cylinders, which were used during welding process were not having any fixed place. The empty cylinders were left anywhere in the workshop which made the workshop untidy, dirty and risky.

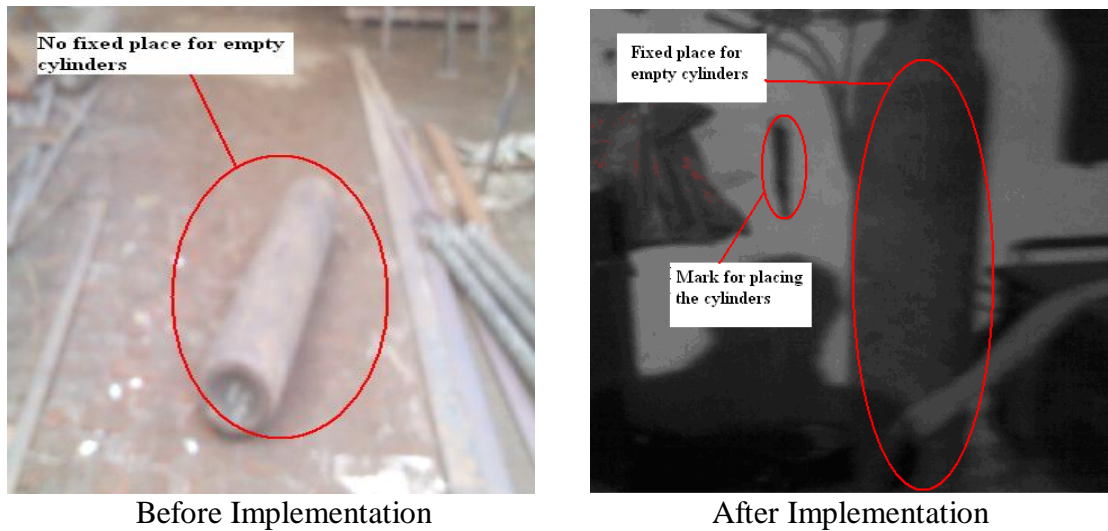


Figure 3: Application of Seiso

After applying TPM, a place was prefixed for the empty cylinders and for the new cylinders and these were placed on some rack rather than on floor. This made the workplace more organized and cleaned the working area.

#### **4. Shiketsu (Standardize):**

All the activities which were completed previously, proper monitoring of those activities was done. This result in massive improvement.

#### **5. Shitsuke (Discipline):**

This pillar was applied by maintaining a proper attendance register in which the timings were also noted at which the worker entered and left the workshop. The weekly attendance records were checked by the supervisors and the names of the defaulters were reported to the management. The workers were also encouraged to wear the proper dresses and safety shoes while working in the workshop.

### **RESULTS AND DISCUSSIONS**

Significant benefits were experienced by implementing TPM. Some of these were measurable, others were difficult to quantify. Some benefits which were identified are shown below:

- Improvement the working area layout.
- Reduction in searching time of dies/tools etc.
- Development good working environment.
- Operator's satisfaction
- Improvement in worker efficiency and which ultimately led to improved productivity .

**CONCLUSIONS**

Following improvements were observed after implementation of 1<sup>st</sup> pillar of TQM:

After applying pillar's 1<sup>st</sup> 's' -

1. The workshop become clean and well organized.
2. Searching time of dies reduced. (3 min. to zero)
3. layout improved and extra space found.

After applying pillar's 2<sup>nd</sup> 's' -

1. Prefixed the location of each dies.
2. Searching time reduced.(5 min. to zero)
3. Identified the dies with different colours for easy searching.
4. Also displayed the name of dies just below the location of dies.
5. Dies were arranged as per requirement i.e in proper sequence.

After applying pillar's 3<sup>rd</sup> 's' -

1. Working area become neat and clean.
2. Reduced the chances of risk.

After applying pillar's 4<sup>th</sup> 's' -

1. The system was standardized.
2. Monitoring continued for maintaining the system.

After applying pillar's 5<sup>th</sup> 's' -

1. Discipline maintained at the working area.
2. Workers were motivated to do their duty.

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