

A STUDY OF: TPM IMPLEMENTATION IN AUTOMOBILE INDUSTRIES

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ABSTRACT

TPM is an assertive technique focuses on improving the function & design of the production equipment. TPM objective is to increase the effectiveness of existing instruments in a given situation, through the effort of minimum input (improving and maintaining instruments at optimal level to minimize its life cycle cost) & the investment in human resources, which results in better hardware utilization. Total productive maintenance are a synergistic relationship among all organizational functions, particularly & production and maintenance. This objective for continuous improve the product quality, as well as operational efficiency and capacity assurance. The efficient TPM depends on both production & maintenance activities.

Keyword - TPM, 5S, 5D (delays, defects, dissatisfied customers, declining profits, and demoralized)

TPM IMPLEMENTATION IN AUTOMOBILE INDUSTRIES

INTRODUCTION: TOTAL PRODUCTIVE MAINTENANCE (TPM)

Today's global economy, the existence of the companies depends on their ability to gradually innovate and improve. As per the result, an increasing search is on for methods & processes that drive improvements in the quality, cost & productivity. Today's rapid changing marketplace, slow-going, continuously improvement in production operations will not the guarantee of profitability. Industries must enhance at a rapid rate than their competition if they want to become or exist leader in their field.

TPM is a plant improvements methodology which enables steady & fast improvement of the manufacturing operation through the utilization of the man power involvement, man power empowerment & closed looped observation of result. Total Productive Maintenance (TPM) is a well-explained & time-tested principle for maintain the plants and instruments. TPM may be considering as the science of apparatus health.

OBJECTIVES OF TPM

- 1) To maximize Overall Equipment Effectiveness (OEE) through total employee involvement.
- 2) To improve the equipment reliability and maintainability, this will improve quality and productivity.
- 3) To make sure the maximum economy of instruments & management for the entire life of the instruments.
- 4) To cultivate the equipment-related expertise among operators and skills among operators.

NEED OF THE TPM

TPM harnesses the participation of all the employees to improve production, equipment's availability, performance, quality, reliability, and safety. TPM venture to tap the hidden capacity of unreliable & ineffective instruments. TPM capitalizes on proactive & aggressive maintenance technology & call upon the knowledge and cooperation of operator, instruments vendor, engineering field, & supportive personnel to conclude the machine performances, there by resulting in reducing the elimination of break down, reduction of unscheduled and scheduled downtime, improved utilization, higher throughput, and better product quality. The principal accent of TPM is the pursuits of economic efficiency or profitability, maintenance stave off, improving maintainability, the use of preventive maintenance, & total participation of all employees. The following outlook necessitates implementing TPM in the contemporary manufacturing scenario:-

- 1) To become world class, satisfy global customers and achieve sustained organizational growth.
- 2) To improve productivity and quality.
- 3) To improve organization's work culture and mindset.
- 1) Ensuring more effective use of human resources, supporting personal growth and garnering of human resource competencies through adequate training and multi-skilling.
- 2) Need to critically monitor and regulate work-in-process (WIP) out of "Lean" production processes owing to synchronization of manufacturing processes.

ROLE OF THE TPM IN INDUSTRY

There are three main reasons why TPM has spread so rapidly throughout Japanese Company & why companies outside Japan are becoming interested. There are assuring dramatic results visibly transform the work place & raise the level of knowledge & art in production & maintenance workers. Companies practicing TPM invariably achieve startling results, particularly in reducing instruments breakdowns, less idling and minor stoppages & lessening quality defects & claims boost in productivity, trimming labor costs, shrinking inventory, cutting accidents & promoting employee's morale. TPM help operators understand their instruments & widen the range of maintenance & other tasks they may handle. It enables them to make new research, acquire fresh knowledge & enjoy new idea. It strengthens motivation, engenders interest in their work & concern for instrument & fosters the desire to maintain instruments in top peak condition.

5S of in TPM

TPM beginning with 5S. This is a systematic process of housekeeping to accomplish a serene environment in the work place involving the employees with a agreement to sincerely implement & practice housekeeping. Problems may not be clearly seen when the work place is unorganized. Cleaning & organizing the workplace helps the team to uncover problems. 5S is a foundation program before the execution of TPM. If this 5S is not taken up sincerely, then it leads to 5D (delays, defects, dissatisfied customers, declining profits, & demoralized employees).

Japanese Term	English Translation	Equivalent 'S' term
Seiri	Organization	Sort
Seiton	Tidiness	Organize
Seisio	Cleaning	Sweep
Sieketsu	Standardization	Standardize
Shitsuke	Discipline	Self-Discipline

CALCULATION OF OEE

OEE = Availability x Performance x Quality

Thus OEE is = $A \times PE \times Q \times 100\%$

Observation: - Takes into consideration any Speed Losses

- 1) Performance Losses are events not requiring maintenance
- 2) Machine Stops
- 3) Machine Reduced Speeds

Quality: - Consideration any Quality Loss

- 1) Quality Loss is reject occurring during initial start-up & full industries runs
- 2) Machinery Start-up Bad Products
- 3) Machinery Production Bad Products.

TPM helps organize maintenance activities by apply the following points:-

- 1) Cultivate a sense of ownership in the operator by introduce autonomous maintenance – the operator takes own responsibility for the main care of plant.
- 2) Use cross-operation teams consisting of operators, maintainers, engineers and managers to improve the individual employee and instruments activity.
- 3) Establish an excellent schedule of clean-up & PM to extend the plant's lifespan & maximize its uptime

LITERATURE REVIEW

This TPM is designed to maximize the overall instruments effectiveness. It involves all departments that plan, use & maintain instruments, involves whole employees from upper management to lower line employee. This concept of TPM was developed in automobile sector, A tier one automotive supplier in the Toyota group of suppliers, during 1960s and 70s in Japan. The central thrust of the program was the complete elimination of the “six major instruments losses”. To study the whole tangible & intangible benefits gain after TPM apply in Automobile.

To prepare this case study on detailed apply of one of the most important TPM pillar namely focused improvement pillar in automobile company. To study the impact of KK pillar implementation on the whole performance of the TPM implementation

METHOD: Total Productive Maintenance (TPM) is a maintenance program which involves new defined ideas for maintaining plants & instruments. This goal of the TPM is to markedly improve the production while at the same time increasing employee morale & job satisfaction. TPM brings maintenance in to focus as necessary & vitally important part of the business. TPM is a business process to improvement method development from the perspective of maintenance management. TPM main concentrates on productivity improvement primary by the way of maximum the availability of the instruments. The word ‘total’ in TPM signifies total organization or total participation from upper management to lower shop floor. Each and every in the organization at all stage & across all function plays an active role in TPM including contract & part time employees. This means total effective, judged by maximizing the Overall instruments Effectiveness (OEE) performance measure.

3 DISCUSSION:

Automobile company focuses on enabling people to raise through solution that power mobility, drive rural prosperity, increase urban lifestyle and increase the business strategy. A USD 15.9 billion Multinational group based in Mumbai, automobile company employs more than 155,000 people in all hundred countries. Automobile company enjoys a strong presence in the agribusiness, aerospace, components, consulting services, defense, energy, industrial instruments, steel & two wheeler industries.

4 ANALYSIS: IMPLEMENTATION OF TPM

- 5 This implementation of over all eight pillars played main role to improve the overall equipment effectiveness (OEE) of a plant & thus implement the TPM successfully in the automobile industry. These pillars also support to reduce the losses like downtime losses, Idling & minor stoppages losses, speed losses, yield losses etc.
- 6 This implementation of all these eight pillars is important to find the desired results of TPM. Kobetsu Kaizen (KK) pillar named as main focused improvement is the most powerful TPM pillar which may rectify 70 to 80% of the shop floor problems in the company. Thus, the implementation of KK pillar in Automobile industries discussed here in detail.
 1. Jishu Hozen (Autonomous maintenance)
 2. Kobetsu Kaizen (Focused maintenance)
 3. Planned maintenance
 4. Hinshitsu Hozen (Quality maintenance)
 5. Education & Training
 6. Office TPM
 7. Tool Management
 8. Safety Health & Environment

DISCOVERY : Attentive Improvement/ Kobetsu Kaizen (KK) pillar of TPM involve all activities that enhance the overall effectiveness of instruments, this process & plant through uncompromising elimination of many more types of losses & boost of performance.

The team provides & design activities to minimize the many types of losses, which are carefully measure & evaluate.

The main focused improvement pillar activity includes:

- Define & understanding of the many types of losses
- Formulation of a structured approach for minimize those losses
- Technique for calculating OEE
- Preparation of all types Loss tree & loss-cost matrix.

RESULT: TPM kick-off in automobile industries plant. After implementation off the TPM company has gained the extra-ordinary results in terms of Productivity, Quality, Cost, Delivery, Safety, and Morale. The main automobile company has also achieved tangible intangible profits after implementation -off the TPM.

CONCLUSION:

The implementation of main focused improvement pillar in automobile company remained very successfully & the whole result achieved after focused improvement pillar in terms of P, Q, C, D, S, M.

Productivity

- 1) OEE more than 85%

Quality

- 1) Quality improves by achieving minimum losses and defects.
- 2) Nominal Rework

Cost

- 1) Production cost minimizes.

Delivery

- 1) Faster delivery of the components by minimize the lead time
- 2) Reduction of product changeover time by 10 minutes only.

Safety

- 1) Achievements up to 95 percentages.

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