



"EVALUATION OF TOTAL PRODUCTIVE MAINTENANCE (GLOBAL MANAGERIAL PRACTICE) A CASE STUDY OF AMOLI ORGANICS PVT. LTD.."



Introduction:

In today's global manufacturing scenario huge losses occur in the operations in the shop floor. Various wastes are due to operators, maintenance personal, process, tooling problems and non-availability of components in time etc. Other wastes are in terms of idling of machines, idle manpower, break down machine, rejected parts etc . With this certain circumstances, a revolutionary concept of TPM has been adopted in many industries across the world to solve the above said problems.

Total productive maintenance is a program which involves a nearly defined concept for maintaining plant and equipment in good condition. Objectives of the TPM system is to markedly increase production while, at the same time, increasing employee morale and job satisfaction. TPM has basically 3 objectives - Zero Product Defects, Zero Equipment unplanned failures and zero accidents. It realizes these goals by Gap Analysis of previous historical records of Product Defects, Equipment Failures and Accidents. Dhanashree Industries is the supplier of auto components of the major automobile industries.

They have implemented Total Productive Maintenance previously but not getting results according to that.

So Study focuses on evaluating the present system with respect to TPM parameters. So that problem in it can be identified.

Review of literature:

F.T.S Chan(2005) studied the effectiveness and implementation of the TPM system for an electronics manufacturing company. Through a this example of execution of TPM in an electronics manufacturing company, the practical features in inner and beyond basic TPM theory, complexities in the adoption of TPM and the hurdles encountered during the implementation are framed and analysed.

C.J Bamber(1999) framed suggestions to improve the TPM development and implementation plan of the case study organisation. Further development of the research has resulted in a sequencewise program or generic directions for UK SMEs which is proposed as a model for the implementation or rejuvenation of an organisation's TPM program.

F.Ireland(2001) focuses on a study of total

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productive maintenance (TPM) in three companies. The companies implemented TPM because of the business hurdles they faced. In all three companies senior management had supported TPM and set up suitable organisational structures to facilitate its implementation.

Ranteshwar Singh(2012)shared experience of implementing Total Productive Maintenance and examined for a company manufacturing automobile component. Concept is implemented in the machine shop having Computer integrated manufacturing system with different capacity. Overall machine Effectiveness is used as the measure of success of TPM implementation.

Thavaraj(2015) found that good progress in operations output and also found the lead time progress due to TPM implementation on sewing machines as well as interaction effect with kaizen technique is also exist with respect to product lead time reduction.

K . P R a v i k u m a r (2 0 1 3) a n a l y z e d implementation of kaizen techniques in TPM. Focus of his study was specifically on procedures & post kaizen scenario in TPM.

Pophaley (2010) argued that the nature of the trade-offs among manufacturing capabilities is more difficult than has been assumed. So, the study aims to prepare a new model and suggests its analysis for measuring the TPM implementation effectiveness as per the original definition of TPM.

Digalwar(2014) aims to know the utilization of Total Productive Maintenance (TPM) tools and proportion of its implementation in manufacturing industry. The paper reviews in detail the different cases of implementation of TPM through the existing literature. The techniques used for the implementation of TPM are selected from literature.

Objectives of the Study:

1. To study present TPM system.
2. To evaluate the system for TPM.
3. To find out problems in TPM system.

Scope of the Study:

The scope of the study is as follows:

1. The geographical scope of the study is limited up to the Production department in Dhanashree Industries in Satara.

2. The conceptual scope of the study includes all the parameter of TPM.

3. The analytical scope is confined to the comparative study of present system with respect to TPM parameters.

Importance of Study:

1. From this study management can evaluate present system with respect to TPM method in organization.

2. From this study organization can know effectiveness of TPM activity.

3. By knowing the gaps in TPM the organization can take corrective measures on it.

4. Thus end result of this study will lead to maintain standard TPM system.

Research Methodology:-

The type of this Research is Descriptive research.

Data Required:-

Discussion & observation with respect to all the parameters of the TPM system. Also

Secondary data required for this study such as concept of total productive maintenance, 5S, and information about all the parameters of the TPM.

Data Sources:-

Primary data is collected through discussion & observation with all departmental heads.

Secondary data is collected from organizations records, Maintenance Schedule list, various departmental manuals & registers, Book's, Internet etc.

Data Analysis:

Data analysis is done by doing comparative study of the present system with standard TPM system.

Table No-1 TPM system in Autonomous Maintenance

The following table shows that comparison of actual performance of organization with Respect to parameters of Autonomous Maintenance.

Sr. no	Standard	Actual
1.	Organization should form TPM team.	Organization form the TPM team with proper representation.
2.	Leader should distribute the different areas of equipment among different team members.	Leader distributes the different areas of equipment among different team members.
3.	Clean the most contaminated area first.	Cleaning the most contaminated area is priority for the organization.
4.	Each member must participate in cleaning and finding out abnormalities in their area.	Each member participates in cleaning but does not properly find out abnormalities in their area.
5.	Leader should rectify white tags abnormalities.	White tags abnormalities are rectified by organization.
6.	Red tags for the abnormalities where experts support is needed should be arranged.	Red tags for the abnormalities were attached to machines but frequently not schedule for red tag removal plan.

Interpretation:- The above table shows that organization is following the Autonomous Maintenance with respect to most of the parameters, but there are loopholes with regard to properly finding out abnormalities, not maintaining schedule for red tags removal plan.etc.

Table No-2 TPM system in Planned Maintenance

The following table shows that comparison of actual performance of organization with Respect to parameters of Planned Maintenance.

Sr. no	Standard	Actual
1.	The organization should evaluate and record the present equipment status.	The organization evaluates and records the present equipment status and follow up the necessary changes of that equipment.
2.	The Organization should control deterioration and improve weakness.	The Organization taken measures on deterioration and working on improve weaknesses.
3.	The Organization should Build up information management system regarding Maintenance.	The Organization is Building up integrated information system.
4.	The organization should improve reliability and maintainability of machines.	The organization is improving reliability and maintainability of machines with assuring right suppliers for it.
5.	The Organization should implement predictive maintenance system.	The Organization does not implement predictive maintenance system.

Interpretation :- The above table shows that organization is following the Planned Maintenance with respect to all parameters

Table No-3 TPM system in Focused Improvement

The following table shows that comparison of actual performance of organization with Respect to parameters of Focused Improvement.

Sr no.	Standard	Actual
1.	Organization should assure that problems are identified and resolved by cross -functional teams.	Organization is not assuring problems are identified and resolved by cross -functional teams.
2.	Organization should combines the collective talents of a company to create an engine for continuous improvement.	Organization combines the collective talents of a company to create an engine for continuous improvement.

Interpretation :- The above table shows that organization is following the Focused Improvement with respect to most of the parameters, but there is loophole with regard to identification and resolution of problems by cross-functional teams.

Table No -4 TPM system in Quality Maintenance

The following table shows that comparison of actual performance of organization with Respect to parameters of Quality Maintenance.

Sr. no	Standard	Actual
1.	The organization should do Effective implementation of operator quality assurance.	The organization is doing Effective implementation of operator quality assurance by using the various quality assurance charts on the machine.
2.	The Organization should Focus on prevention of defects at source .	The Organization Focus on prevention of defects at sources with assurance of human error free process.
3.	The Organization should achieve and sustain customer complaints at zero level.	The Organization achieves customer satisfaction with. highest parameters of the quality.
4.	The organization should improve reliability and maintainability of machines.	The organization struggled to improve reliability and maintainability of machines.
5.	The organization should set standard conditions of the sub - process.	The organization provide process flow diagrams for the standard conditions of the sub -process but not mentions schedules.

Interpretation :- The above table shows that organization is following the Quality Maintenance with respect to most of the parameters, but there are loopholes with regard to struggling to improve reliability and maintainability of machines.

Table No -5 TPM system in Early/equipment management

The following table shows that comparison of actual performance of organization with Respect to parameters of Early/equipment management.

Sr. no	Standard	Actual
1.	The Organization should Continuously Maintain equipment conditions,(i.e. Cleaning, Lubrication, Inspection & Tightening)	Organization maintains equipment conditions with proper Cleaning, Lubrication, Inspection & Tightening.
2.	The organization should arrange regular inspection of machine	Organization does arrange regular inspection of machine . One time inspection in month is done.
3.	The organization should provide places for all tools, jigs.	Allocation area for tools, jigs near to the machine & cleaning of jig & tool done properly.
4.	Plan for Enhancing Equipment Reliability & Maintainability.	Enhancing Equipment 's Reliability & Maintainability is not implemented fully as per plan.

Interpretation :- The above table shows that organization is following the equipment management with respect to most of the parameters, but there are loopholes with regard to equipment's reliability & maintainability.

Table No -6 TPM system in Education and Training

The following table shows that comparison of actual performance of organization with Respect to parameters of Education and Training.

Sr. no	Standard	Actual
1	The organization should Set policies, priorities and checking present status of education and training.	The organization Set policies, priorities and checking present status and training officer build skill matrix for it.
2	The organization should Establish the training system for operation and maintenance of skill up gradation.	The organization Establish the training system for operation and maintenance by using skill matrix chart updation are necessary to include in training.
3	The organization should provide Training program to employees for all TPM work.	The organization provides Training program to all employees and separate training on TPM work updation are necessary to include in training.
4	The organization should Prepare training calendars.	The organization Prepare training calendars as per the each operator skill level.

Interpretation :- The above table shows that organization is following the training system with respect most of parameters but there is loophole that training regarding updates in the TPM system is not assured by the company.

Table No-7 TPM system in Safety Health Environment

The following table shows that comparison of actual performance of organization with Respect to parameters of Safety Health Environment.

Sr. no	Standard	Actual
1	The organization should Provide induction on safety, training and clear safety rules in the workplace.	The organization Provide i nduction on safety, training and clear safety rules in the workplace.
2	The Organization should provide safety equipment necessary to perform specific activities.	The Organization provides safety equipment necessary to perform specific activities by cate gory wise. Quality of safety is not assured.
3	All workers should use safety equipment and follow workplace policies.	All workers use safety equipment and follow any workplace policies.
4	The Organization should Keep work area tidy and remove an hazards.	The Organization Keep work area tidy and remove any hazards.
5	The Organization should removes waste material as soon as from work areas.	The Organization remove s waste but not segregated that waste material not disposed from work areas.

Interpretation :- The above table shows that organization is following the Safety, Health and Environment system with respect to most of the parameters, but there are loopholes with regard to quality of safety equipments is not assured.

Table No -8 TPM system in Administrative and Support departments

The following table shows that comparison of actual performance of organization with Respect to parameters of Administrative and Support departments.

Sr. no	Standard	Actual
1	The organization should Provide awareness about office TPM to all support departments.	The organization provides awareness programs about office TPM to all support departments updation awareness is not assured.
2	The Organization should identify P, Q, C, D, S, &M. in each function in relation to plant performance.	The Organization identifies P, Q, C, D, S, and M in each function in relation to plant performance.
3	The Organization should Reduce administrative costs, inventory carrying cost by proper inventory control system.	The Organization Reduces administrative costs but failed to reduce inventory carrying cost by proper inventory control technique.
4	The organization should Clean and maintain pleasant work environment.	The organization developed new office Clean all areas and maintain pleasant work environment.
5	The Organization should Reduce breakdown of office equipment, Reduction of customer complaints due to logistics &Reduction in number of files.	The Organization used backup system to reduce breakdown of office equipment, Reduction of customer complaints due to good quality of product and service & all files are computerized.

Interpretation :- The above table shows that organization is following the Office TPM system with respect to most of the parameters, but there are loopholes with regard to, implementation of proper inventory control technique to reduce inventory carrying cost and updation awareness is not assured.

Findings:

1) Clause for Autonomous maintenance:-

Organization is following the Autonomous Maintenance with respect to most of the parameters, but there are loopholes with regard to properly finding out abnormalities, not maintaining schedule for red tags removal plan etc. (Table No.4.2.1)

2) Clause for Planned Maintenance:-

Organization is following the Planned Maintenance with respect to all parameters.(Table No.4.2.2)

3) Clause for Focused Improvement:-

Organization is following the Focused Improvement with respect to most of the parameters, but there is loophole with regard to identification and resolution of problems by cross-functional teams. (Table No.4.2.3)

4) Clause for Quality Maintenance:-

Organization is following the Quality Maintenance with respect to most of the parameters, but there are loopholes with respect to most of the parameters, but there are loopholes with regard to struggling to improve reliability and maintainability of machines. (Table No.4.2.4)

5) Clause for Early/equipment management:-

Organization is following the equipment management with respect to most of the parameters, but there are loopholes with regard to equipment's reliability & maintainability. (Table No.4.2.5)

6) Education and Training :-

Organization is following the training system with respect to most of the parameters, but there are loopholes that training regarding updates in the TPM system is not assured by the company. (Table No.4.2.6)

7) Clause for Safety, Health and Environment:-

The above table shows that organization is following the Safety, Health and Environment system with respect to most of the parameters, but there are loopholes with regard to quality of safety equipments is not assured. (Table No.4.2.7)

8) Clause for Administrative and Support

departments:-

Organization is following the Office TPM system with respect to most of the parameters, but there are loopholes with regard to, implementation of proper inventory control technique to reduce inventory carrying cost and updation awareness is not assured.

(Table No.4.2.8)

Suggestions:

1. Organization should maintain schedule for red tag removal and display it.
2. Organization should design cross-functional teams for identified and resolved of problems.
3. Organization should improve reliability and maintainability of machines by procuring it from right supplier and assuring right maintenance.
4. Organization should assure training of TPM with all updates.
5. Organization should assure quality safety equipments in the organization
6. Organization should assure optimized inventory control techniques.

Conclusion:

Research study was focused on evaluating the present systems for TPM organization is following the TPM for most of the parameters. Problems exists with regard to sorting, color coding, reliability, maintainability, predictive maintenance, inventory control technique etc. If the organization takes corrective measures as suggested standard TPM can be implemented and it will be competitive advantage to the organization.

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