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To Improve the Quality on Rear Cover (Daimler) Component by Applying TPM and TQM

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Abstract : If organizations wish to achieve quality improvement they need to use appropriate selection of lean tools and techniques. In this paper, a review of possibilities of the systematic use of TPM (Total productive maintenance) and TQM (Total Quality Management) is presented. It is shown that TPM and TQM can be used in all process phases, from the beginning of a product development up to management of a production process and delivery. Over a period of time two concepts have emerged which are Total Productive Maintenance (TPM) and Total Quality Management (TQM) along with other concepts to
Achieve World Class manufacturing system. In this paper experience of implementing Total Productive Maintenance is shared and investigated for a company manufacturing automotive component REAR COVER(DAIMLER) This product could not maintain the required quality. Finally to implement the both concepts on the given component will achieve the quality improvement and production improvement.
Keywords – Rear Cover,5-S,Tpm Pillers,Tqm Methods.

I. INTRODUCTION

A. TPM(Total Productive Maintenance)

The quality improvement process assumes and requires that a team of experts together with the company leadership actively use lean tools in their improvement activities and decision-making process. Currently there is a significant number of quality assurance and quality management tools available, so the selection of the most appropriate is not always an easy task. Tools are essential ingredients of a process and basic instruments for the success of a quality program. Many companies have used tools without giving sufficient thought to their selection and have then experienced barriers to progress. Quality Tools cannot remedy every quality problem but they certainly are a means for solving problems.
Nakajima S.[1] done pioneering work and has given basic definition of TPM, its importance, goals of TPM, objectives of TPM, merits and demerits of TPM and steps to be followed while implementing TPM. Also author has described about challenging limits for TPM, method for calculation of OEE, possible areas of wastage of resources which may occur. I. P. S. Ahuja et al.[2] gives in-depth review on TPM literature published. Author has summarized eight pillars for the success of TPM implementation as shown in Fig. 2. F. Ireland et al.[3] given a study of total productive maintenance implementation in three companies. Nakajima's seven steps of autonomous maintenance was the focus for implementation. Ross Kennedy et al.[4] give the concept of TPM^3 means third generation TPM which is having eight pillars instead of seven pillars. TPM^3 is an enhanced Australian approach applying the principles and practices of the Toyota Production System and the Toyota Way - Lean and TPM. F. T. S. Chan et al.[5] implemented the concept of TPM in semiconductor industry. Authors have reported 83% improvement in equipment productivity. Marcelo Rodrigues et al.[6] discussed the reasons of failure of TPM implementation and concluded that the shallow involvement of the people of various levels is the main reason of the failure of TPM. G. Chand et al.[7] reported to implement the concept in cellular manufacturing system having
Forming shop, tool room and product test room.

B. TQM (Total Quality Management)

Total quality management (TQM) is considered as an important quality and business performance improvement tool. The popularity of the concept has led to an outburst of TQM-related literature. Now-a-days deployment of TQM becomes a top management agenda in many organizations in the quest of positive overall business benefits in terms of improved product quality, increased customer satisfaction, enhanced employee satisfaction and reduced quality costs.
Maddulety koilakuntla et al. says that the TQM has to be top down approach i.e. reason the top management involvement getting more improvement, the second step is that all the trained employees are to be involved for effective implementation of TQM in each and every process of business cycle with process approach. It may be the reason that training, employee involvement and process approach to achieve more improvement.

Nurazree Mahmud et al. says This proposed study will deal with how SMEs gain benefits through TQM practices in enhancing the success of organization learning capability, thus having a positive impact on performance. Moreover, findings from this study may also provide better understanding of the effect of mediator on the relationship between TQM and SMEs performance. The need of a mediator for this relationship is because previous studies have a mixed and inconsistent result; thus, many scholars make some conclusion to include other factors as a
mediator to this relationship (TQM-business performance), (Maçães et al., 2007). The mediator variable of this study, namely organization learning, will hopefully serve as a positive indirect relationship between TQM and business performance and at last provide a new theoretical contribution. In fact, several gaps in this research field remain due to few studies performed in such a way that the relative factors of TQM affect SME performance in terms of the organization learning variable. Finally, previous authors in this field recommended that SMEs invest and practice this managerial practice, namely TQM and organization learning. These valuable tools can be a source of competitive advantage which can make SMEs competitive, just like large companies.

In this paper experience of implementing TPM concept in automotive manufacturing company (SKY LINE HOLDINGS, luna nager, Coimbatore) is discussed. All the pillars of TPM are implemented in a phased manner leading to Quality improvement of the company. In the section 2 various pillars and TQM methods are explained and approach taken to implementation is also mentioned. Section 3 discusses the future work of the implementation of the TPM& TQM. Section 4 gives the conclusion of the present work.

II. COMPONENT (REAR COVER) (DAIMLER)

This is our project component. It is named as “REAR COVER” also called as “DAIMLER”. In this product is used in automobiles. Application of this product is load lifting assembly in trucks, Lorries etc.

Fig.1 rear cover

Problems:

A. The given tolerance is cannot be maintained.
B. The machining processes are difficult.
C. The machining cycle time taking is more.
D. Production is slow.
E. Did not achieve the required production level

The above problems are to rectify by applying the methods of TPM and TQM.

III. METHODOLOGY

A. The Traditional TPM Model

The traditional approach to TPM was developed in the 1960s and consists of 5S as a foundation and eight supporting activities (sometimes referred to as pillars).

In this idea required skilled labour and operators involved their own equipments for prevent the breakdowns.

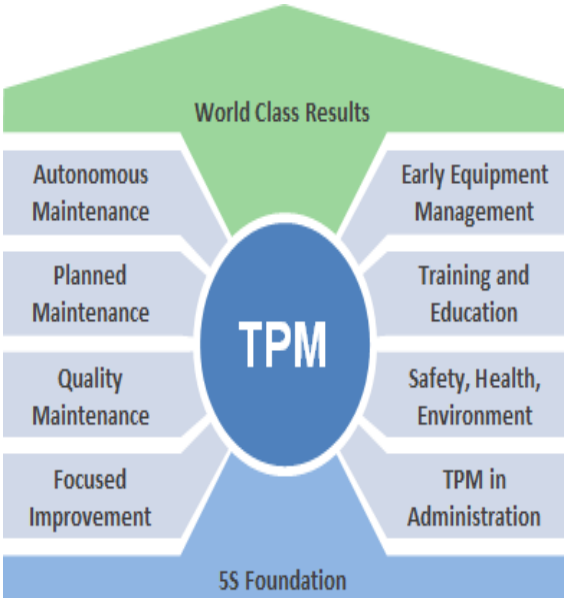

Fig.2 The traditional TPM model consists of a 5S foundation
(Sort, Set in Order, Shine, Standardize, and Sustain) and eight supporting activities

B. The 5S Foundation

The goal of 5S is to create a work environment that is clean and well-organized. It consists of five elements:

A. Sort (eliminate anything that is not truly needed in the work area)
B. Set in Order (organize the remaining items)
C. Shine (clean and inspect the work area)
D. Standardize (create standards for performing the above three activities)
E. Sustain (ensure the standards are regularly applied)

It should be reasonably intuitive how 5S creates a foundation for well-running equipment. For example, in a clean and well-organized work environment, tools and parts are much easier to find, and it is much easier to spot emerging issues such as fluid leaks, material spills, metal shavings from unexpected wear, hairline cracks in mechanisms, etc.

C. The Eight Pillars

The eight pillars of TPM are mostly focused on proactive and preventative techniques for improving equipment reliability.

Pillar	What Is It?	How Does It Help?
Autonomous Maintenance	Places responsibility for routine maintenance, such as cleaning, lubricating, and inspection, in the hands of operators.	▪ Gives operators greater "ownership" of their equipment. ▪ Increases operators' knowledge of their equipment. ▪ Ensures equipment is well-cleaned and lubricated. ▪ Identifies emergent issues before they become failures. ▪ Frees maintenance personnel for higher-level tasks.
Planned Maintenance	Schedules maintenance tasks based on predicted and/or measured failure rates.	▪ Significantly reduces instances of unplanned down time. ▪ Enables most maintenance to be planned for times when equipment is not scheduled for production. ▪ Reduces inventory through better control of wear-prone and failure-prone parts.
Quality Maintenance	Design error detection and prevention into production processes. Apply root cause analysis to eliminate recurring sources of quality defects.	▪ Specifically targets quality issues with improvement projects focused on removing root sources of defects. ▪ Reduces number of defects. ▪ Reduces cost by catching defects early (it is expensive and unreliable to find defects through inspection).
Focused Improvement	Have small groups of employees work together proactively to achieve regular, incremental improvements in equipment operation.	▪ Recurring problems are identified and resolved by cross-functional teams. ▪ Combines the collective talents of a company to create an engine for continuous improvement.
Early Equipment Management	Directs practical knowledge and understanding of manufacturing equipment gained through TPM towards improving the design of new equipment.	▪ New equipment reaches planned performance levels much faster due to fewer start-up issues. ▪ Maintenance is simpler and more robust due to practical review and employee involvement prior to installation.
Training and Education	Fill in knowledge gaps necessary to achieve TPM goals. Applies to operators, maintenance personnel and managers.	▪ Operators develop skills to routinely maintain equipment and identify emerging problems. ▪ Maintenance personnel learn techniques for proactive and preventative maintenance. ▪ Managers are trained on TPM principles as well as on employee coaching and development.
Safety, Health, Environment	Maintain a safe and healthy working environment.	▪ Eliminates potential health and safety risks, resulting in a safer workplace. ▪ Specifically targets the goal of an accident-free workplace.
TPM in Administration	Apply TPM techniques to administrative functions.	▪ Extends TPM benefits beyond the plant floor by addressing waste in administrative functions. ▪ Supports production through improved administrative operations (e.g. order processing, procurement, and scheduling).

D. TQM Methods

Total Quality Management (TQM) is an integrative management philosophy for continuous improvement of the quality of an organization's products and processes in order to meet or exceed customer expectations. There are several TMQ strategies used to improve business management systems. Considering the practices of TQM as discussed in six empirical studies, Cua, McKone, and Schroeder (2001) identified the nine most common TQM practices as:

A. Cross-functional product design
B. Process management
C. Supplier quality management
D. Customer involvement
E. Information and feedback
F. Committed leadership
G. Strategic planning
H. Cross-functional training
I. Employee involvement

The above practices will apply on given the component i.e Rear cover (daimler) to full fill the mentioned above requirements.

IV. FUTURE WORK

The previews authors are considered and implemented the method of TPM and TQM in companies and got the required quality improvement and production improvement. Simultaneously will implement the TQM method and TPM pillers in company will get the better results.

V. CONCLUSION

By applying the method of TPM pillers and TQM on the given component to get the quality improvement and production improvement. The TPM pillers are like 5-s,jishu hozen, planned maintenance, quality maintenance, kaizen, office TPM and safety, Health and Environment. These pillers are will apply the rear cover component to get productive improvement. TQM

methods are like customer focus, planning process, process management, process improvement and total participation are will apply the given component to achieve the quality improvement. Previews authors are said In this both methods are implemented in companies got the positive results. Finally will apply the both concepts in company in future.

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