Today, world-class competitiveness is a must for the manufacturing firms. The unavoidable global competition, characterized by both a technology push and a market pull, and the rapid technological development and increased customer requirements put forward a lot of challenges for management to provide quality product at the competitive prices. These challenges can be met ensuring availability of equipment for maximum possible time and fullest use of them. The goals of maintenance operations are improvement of system availability and reliability, reduction of unplanned downtime and frequency of failures, as well as increment of system operating efficiency. Total Productive Maintenance (TPM) activities which are performed under its eight pillars are designed to create a corporate structure that enables development in accordance with changes in the economic environment, technological progress, upgrading & upkeep of equipment to ensure their availability and reliability and skill up-gradation of executives and workmen.

The production staff / workmen must have acquired inherent technology, control technology, and management capability necessary to run and maintain their equipment efficiently. The effective exercise of education and training pillar of TPM is of utmost importance in developing operational and maintenance skill of workmen and it also helps in exercising other activities under TPM. Hence, it is important to measure and verify the effectiveness of such an important pillar. In this thesis case studies of two different sectors are presented to verify the effectiveness of education and training pillar of TPM.

Chapter 1 describes role of education & training pillar of Total Productive Maintenance (TPM) in improving manufacturing performance. Meaning of skill, various levels of skills and operational and maintenance skills expected from operators and maintenance persons are also described.

A detailed review of literature is presented in the chapter 2 which includes role of TPM and other maintenance strategies in improvement of manufacturing performance. The various philosophies and pillars of TPM, concepts of 5 S, four phases of implementation of TPM and OEE as one of the performance measurement metric are also described. The research gaps and problem statement are presented at the end of the chapter.
Performance measurement metrics (PMM) like, Mean time between failure (MTBF), Mean time to repair (MTTR), Availability rate, Performance rate, Quality rate, Overall equipment effectiveness (OEE), Overall line effectiveness (OLE), Kaizen, Safety, health & environment events and process capability indices Cp & Cpk are identified to measure the effectiveness of education and training pillar of TPM in chapter 3.

Chapter 4 provides the basis for selection of various processes of two different sectors and sizes of industries for study. A complete methodology of the study is presented which includes, identification of operational and maintenance skill attributes for various processes, finalization of desired skill levels, skill mapping and training needs identification for the workmen. Spider charts are also prepared to present the skill gaps.

Chapter 5 describes development of detailed curriculum for operational and maintenance skill development of workmen. The modes of training used are on-the job training, off-the job training and one point lessons. The procedure of training and resource persons for training are also presented in this chapter. After completion of training, skill mapping was done and a comparison between skill gaps before training and after training was done, is also presented which shows improvement in skill levels of the workmen. Observations for various PMM were also made during and after training, as applicable and presented in the form of tables and figures.

Chapter 6 presents the results of education and training exercise conducted to develop the operational and maintenance skills of the workmen. Improvements in PMM after training are also discussed in detail.

Chapter 7 concludes that the education and training exercise has positive impacts on performance of all the eight processes. It is equally effective in both the sectors and size of the industries. It could be applied to other sectors also with customized frameworks suitable for those sectors and the same results are expected. Hence, the effectiveness of education and training pillar of TPM is verified. The limitations of the study and the future scopes are also discussed in the end.

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