ABSTRACT

This thesis presents the methodology of linking Total Productive Maintenance (TPM) and Quality Function Deployment (QFD). The Synergic power of TPM and QFD led to the formation of a new maintenance model named Maintenance Quality Function Deployment (MQFD). This model was found so powerful that, it could overcome the drawbacks of TPM, by taking care of customer voices. Those voices of customers are used to develop the house of quality. The outputs of house of quality, which are in the form of technical languages, are submitted to the top management for making strategic decisions. The technical languages, which are concerned with enhancing maintenance quality, are strategically directed by the top management towards their adoption of eight TPM pillars. The TPM characteristics developed through the development of eight pillars are fed into the production system, where their implementation is focused towards increasing the values of the maintenance quality parameters, namely overall equipment efficiency (OEE), mean time between failures (MTBF), mean time to repair (MTTR), performance quality, availability and mean down time (MDT). The outputs from production system are required to be reflected in the form of business values namely improved maintenance quality, increased profit, upgraded core competence, and enhanced goodwill. A unique feature of the MQFD model is that it is not necessary to change or dismantle the existing process of developing house of quality and TPM projects, which may already be under practice in the company concerned. Thus, the MQFD model enables the tactical marriage between QFD and TPM.

First, the literature was reviewed. The results of this review indicated that no activities had so far been reported on integrating QFD in TPM and vice versa. During the second phase, a survey was conducted in six companies in which TPM had been implemented. The objective of this survey was to locate any traces of QFD implementation in TPM programme being implemented in these companies. This survey results indicated that no effort on integrating QFD in TPM had been made in these companies. After completing these two phases of activities, the MQFD model was designed. The details of this work are presented in this research work. Followed by this, the explorative studies on implementing this MQFD model in real time environments were conducted. In addition to that, an empirical study was carried out to examine the receptivity of MQFD model among the practitioners and multifarious organizational cultures. Finally, a sensitivity analysis was conducted to find the hierarchy of various factors influencing MQFD in a company. Throughout the research work, the theory and practice of MQFD were juxtaposed by presenting and publishing papers among scholarly communities and conducting case studies in real time scenario.

Keywords: TPM, QFD, MQFD, Receptivity