The Impact of Breakdown Reduction through Lean-TPM Methodologies and Energy Consumption in a Manufacturing Industry

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Abstract

At Company X, Nairobi an effort was made to implement Total Productive Maintenance. It is a Production management method and company's ultimate goal in introducing TPM was a means to achieve leaner production and a calming of the material flow. In Total Productive Maintenance, reliability and availability are the ultimate goals and the way to accomplish the goals is through elimination of major losses. These losses are only due to mechanical nature and visualized by the key figure; Overall Equipment Effectiveness. The main Key performance indicators for this research were; Mean Time Before Failure (MTBF), Mean Time To Repair (MTTR), Breakdown Percentage and Energy Usage. Through literature studies, a training workshop with TPM consultancy firm EfesoTM and a visit to an exemplary TPM implementing company Unilever, the tasks to be performed were set and a master plan of execution developed. In order to visualize production losses, a sheet for recording production progress in a timely manner was developed, a database for data storage was set up, together with a computer aided analysis, and the a program to compute reports written. This research accomplished a reduction in breakdowns from 12.5% to 5.5% on PK machine. In doing so, OEE increased, and subsequently energy consumption per unit SSU reduced from 0.021KWH/SSU to 0.012KWH/SSU. The gains in productivity or effectiveness were achieved only through measures in TPM, mainly the Preventive Maintenance (PM) pillar, and not harder labor. The tools used in achieving these goals included; Autonomous maintenance, Continuous improvement, Root cause analysis for failure, Preventive maintenance among others.