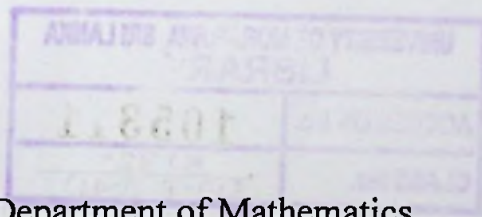


PREVENTIVE MAINTENANCE MODEL FOR AUTOMATED FILLING MACHINE

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Degree of Master of Science



Department of Mathematics

University of Moratuwa

Sri Lanka

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**Thesis/Dissertation submitted in partial fulfillment of the requirements for the Degree
of Master of Science in Operational Research**

Department of Mathematics

University of Moratuwa

Sri Lanka

December 2012

Declaration of the Candidate and Supervisor

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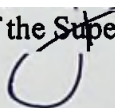
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Abstract

Maintenance, repair, and operations are very crucial factors for both manufacturing and service industries. Methodologies like Preventive Maintenance (PM), Planned Maintenance, and Predictive Maintenance deal well with the issues of maintenance all over the world. Preventive maintenance is a schedule of planned maintenance actions aimed at the prevention of breakdown and failures. The principle of PM is identified as "prevention is better than cure". Sri Lankan industries too have identified the importance of preventive maintenance. This research is carried out to develop a preventive maintenance model for an automated filling machine for a well-known yoghurt manufacturing company in Sri Lanka. Trouble choosing areas were production output delays due to machine breakdowns and due to other various reasons such as poor maintenance planning and inefficiency in money spending on maintenance activities etc. This report evaluates the maintenance policy that has been applied in the company. Theory of Weibull and Dodson's tabular solution were used to build a preventive maintenance models and to find optimum time between PM actions for critical components. New PM schedule was implemented after determine the optimum time for PM actions. The importance of a maintenance policy for a company and the benefits of keeping past maintenance records are highlighted in this report. Further new method of implementing PM model and PM schedule was also introduced. Moreover, these models will be beneficial to all other departments of a company other than maintenance department.

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LIST OF ABBREVIATIONS

AFM	Automated Filling Machine
CDF	Cumulative Density Function
CEO	Chief Executive Officer
C_f	Cost of Corrective Maintenance
CM	Corrective Maintenance
C_p	Cost of Preventive Maintenance
C_T	Cost at Optimum time T
CV	Critical Values
K-S	Kolmogorov Smirnov
MTTF	Mean time to failure
PDF	Probability Density Function
PM	Preventive Maintenance
Q1	First Quartile
Q3	Third Quartile
St Dev	Standard Deviation
T	Optimum Time between PM actions
TPM	Total Productive Maintenance/ Total Participation Maintenance

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