IMPROVING MACHINE AVAILABILITY IN ALUMINIUM EXTRUSION INDUSTRY THROUGH PREVENTIVE MAINTENANCE

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Abstract

Today most of the processes in the aluminum extrusion industry are being significantly changed according to modern technology and competition is increased dramatically. Therefore most of the companies are focusing their efforts on improving quality and productivity. Part of these efforts included the examination of the activities of the maintenance function. Implementation of preventive maintenance (PM) methodology is very critical to many operations.

A PM strategy was developed considering several maintenance strategies to cater for the aluminium extrusion industry. The key features of the developed PM strategy were improvement of MTBF, MTTR and Rework. This was followed by the implementation of the PM strategy in a local aluminium extrusion plant where methodology of implementation, difficulties in the adoption of PM and the problems encountered during implementation, method of analysis and the effectiveness of the PM strategy were evaluated.

This strategy is beneficial to managers, engineers and technical officers who are especially involved in maintenance as well as production activities. Although the strategy was developed focusing on the aluminium extrusion industry, this methodology may be adopted to be used in other industries as well. Evaluation criteria will also have a direct impact on the people engaged in maintenance activities.

Though aluminium industry covers several areas such as melting, surface technology, aircraft industry, the developed strategy focuses mostly on the aluminium extrusion industry. This thesis mostly focuses on the development and implementation methodology of the PM strategy. Further research is suggested to study the feasibility of the developed PM strategy in industries that use complicated machinery as in the case of the aluminium extrusion industry.

Key words: Preventive Maintenance, Quality, Productivity, Efficiency

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LIST OF ABBREVIATIONS

Abbreviation	Description
CBM	Condition Based Maintenance
CEA	Central Environmental Authority
CI	Continuous Improvement
CMMS	Computerised Maintenance Managements Systems
EAM	Enterprise Asset Management
FEMA	Failure Mode Effects Analysis
LCC	Life Cycle Cost
MRO	Material Requirement Order
MTBF	Mean Time between Failures
MTTR	Mean Time to Repair
NHPP	Non-Homogeneous Poisson Process
OEE	Overall Equipment Efficiency
OEM	Original Equipment Manufacturer
PDM	Predictive Maintenance
PM	Preventive Maintenance
RCM	Reliability Centered Maintenance
ROA	Return on Assets
ROCOF	Rate of Occurrence of Failures
ROI	Return on Investment
RTF	Return to Failure
TPM	Total Productive Maintenance
VBM	Vibration Based Maintenance

LIST OF APPENDICES