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WASTE ELIMINATION AND PRODUCTIVITY IMPROVEMENT IN NUT & BOLT MANUFACTURING INDUSTRY IN SRI LANKA



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This thesis was submitted to the Department of Mechanical Engineering of the University of Moratuwa in partial fulfilment of the requirements for the Degree of Master of Engineering in Manufacturing Systems Engineering

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DECLARATION

This Dissertation paper contains no material which has been accepted for the award of any other degree or diploma in any University or equivalent institution in Sri Lanka or abroad, and that to the best of my knowledge and belief, contains no material previously published or written by any other person, except where due reference is made in the text of this Dissertation.

I carried out the work described in this Dissertation under the supervision of Dr. S.M. Piyasena

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Abstract

This Project provides the possible ways to sustain the Hexagonal Nut and Bolt manufacturing Industry in Sri Lanka.

When the London Metal Exchange figures and graphs are analyzed it is clearly shown that the steel prices are in a hike. And also China and India are trying to acquire Sri Lankan market. Hence, the steel manufacturers have been facing many difficulties with the price competition and the rising costs. Therefore, waste elimination and productivity improvement methods needed to be introduced to the Hexagonal Nut and Bolt manufacturing Industries in Sri Lanka. This report contains a successful case study carried out at Company X Ltd which represents this industry and shows how to apply these methods to other factories for their future protection.

This also contains a literature survey carried out regarding waste elimination, productivity improvement and Nut and Bolts and their manufacturing.

Interviews were carried out at Company X Ltd and found out the major problems to the organization which relevant to the industry. Then wastes and losses were found out with the support of Cleaner production Techniques. After that made a suitable questionnaire and got the details from the other companies. Then found the most important problems to be solved and solutions given with the technical knowledge and with the help of external expertise.

Appreciable results were obtained as an overall improvement of 33% while reducing the damaging the cold forging dies of the heading machine by 33%;reducing the rework at lubrication process by 60%; reducing the water consumption at the lubrication process by 50%; reducing the electricity consumption in the lubrication process by 25%; reducing the scrap iron collection by 20%; reducing the consumption of chaser dies by 33%; reducing the buffer stocks in the process by 10% and reducing the labour idling by 30%

As the other Hexagonal Nut and Bolt manufacturing companies in Sri Lanka showed the similar issues in their processes they can use this methodology to solve their issues and face the critical situation successfully.

With the success of this Hexagonal Nut and bolt manufacturing industries, all hardware manufacturing industries and also industries other than hardware manufacturing can follow this with the necessary further studies

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Notation

ASTM	-	American Society for Testing Materials
°C	-	Degree Celsius
CEB	-	Ceylon Electricity Board
CP	-	Cleaner Production
Fig	-	Figure
LECO	-	Lanka Electricity Company Limited
LME	-	London Metal Exchange
MEng	-	Master of engineering
MT	-	Metric Ton
NaNO ₂	-	Sodium Nitrite
NCPC	-	National Cleaner Production Center
PG	-	Post Graduate
SLR	-	Sri Lankan Rupees
SLT	-	Sri Lanka Telecom
TPM	-	Total Productive Maintenance
TQM	-	Total Quality Management
UNEP	-	United Nation's Environment Programme
UNIDO	-	United Nations Industrial Development Organization
USD	-	Dollar of United States America
Zn	-	Zinc



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