SUDAN UNIVERSITY
OF SCIENCE AND TECHNOLOGY
COLLEGE OF GRADUATE STUDIES

PRODUCTIVITY IMPROVEMENT AT ALSHEGARA FACTORYBY USING LEAN SIX SIGMA

(تحسين الانتاجيه في مصنع الشجره باستخدام منهجية تقليل الهدر (LEAN SIX SIGMA)

A Thesis Submitted in Partial Fulfillment of the Degree of M.S.c in Mechanical Engineer(PRODUCTION)

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الآيه

قال تعالى :

لَا يُكَلِّفُ ٱللَّهُ نَفْسًا إِلَّا وُسْعَهَا ۚ لَهَا مَا كَسَبَتْ وَعَلَيْهَا
مَا ٱكْتَسَبَتْ ۗ رَبَّنَا لَا تُؤَاخِذْنَآ إِن نَّسِينَآ أَوْ أَخْطَأْنَا ۚ رَبَّنَا
وَلَا تَحْمِلْ عَلَيْنَآ إِصْرًا كَمَا حَمَلْتَهُۥ عَلَى ٱلَّذِينَ مِن قَبْلِنَا ۚ
رَبَّنَا وَلَا تُحَمِّلْنَا مَا لَا طَاقَةَ لَنَا بِهِۦ ۖ وَٱعْفُ عَنَّا وَٱغْفِرْ لَنَا وَٱرْحَمْنَآ ۚ
أَنتَ مَوْلَىٰنَا فَٱنصُرْنَا عَلَى ٱلْقَوْمِ ٱلْكَٰفِرِينَ ﴿٢٨٦﴾

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dedication

This thesis is dedicated to my parent .

for their endless love, support and encouragement

Acknowledgement

I would like to thank Allah first for help me to complete this graduation project, and then my supervisors, Dr. Widatalla Alamin for their close supervisory, guidance, and support during this course of study.

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List of symbols

DMAIC: **D**efine, **M**easure, **A**nalysis, **I**mprove, **C**ontrol

CTQ: Critical To Quality

TOC: Theory Of Constraints

TPM : Total Production Maintenance

CPQ: Cost of Poor Quality

FTY: first time yield

RTY: Rolled Throughput Yield

TDPU: Total Defect Per Unit

DPMU: Defect Per Million Opportunity

KPIV: Key Process Input Variables

KPOV: Key Process Output Variables

CE : Cause and Effect diagram

RPN: Risk Priority Number

Abstract

In This research lean six sigma method was used to improve the productivity of bullet case caliber 7.6 54mm in Alshegara factory. The research presents a number of tools used to reduce reject and re-work , the study has been conducted from (January to September) 2015 to calculate the total cost of production and cost of poor quality .

The information of this research depend on the voice of business and the voice of process.

The research addressed both internal and external factors affecting the rate of rejects and re-work , current process in manufacturing and possibility of the development of performance for existing process without increasing in expenditure was investigated. . After modifications and check sheets and recommendations and taken action , the production is expected to improve.

التجريده

استخدمت طريقة ال 6سيجما لزياده الانتاجيه لخط انتاج العيار 54 حيث تم استخدام عدد من الادوات لتقليل التالف والراجع في الخط وايضا لتقليل زمن التوقف والذي يؤثر تاثيرا كبيرا في انتاجية الخط حيث تم اجراء الدراسه بناء علي تقارير وبيانات الانتاج للعام 2015 وذلك لحساب تكلفة الانتاج الكليه وتكلفة التالف واهتم البحث بدراسة الوضع الراهن للانتاج في الخط ومناقشة امكانية تطوير الاداء دون زياده في التكاليف