# IDENTIFICATION AND ANALYSIS OF THE EXISTING MANUFACTURING WASTES AT NETWORK TRADING PHILIPPINE INCORPORATED LINTERNATIONAL INCORPORATED.

THESIS

CHARMAINE ANGEL M. DITANGAN WELLA C. LOPEZ

College of Engineering and Information Technology

CAVITE STATE UNIVERSITY

Indang, Cavite

## DENTIFICATION AND ANALYSIS OF THE EXISTING MANUFACTURING WASTES AT NETWORK TRADING PHILIPPINE INCORPORATED - INTERNATIONAL INCORPORATED

Undergraduate Thesis
Submitted to the Faculty of the
College of Engineering and Information Technology
Cavite State University
Indang, Cavite

In partial fulfillment of the requirements for the degree Bachelor of Science in Industrial Engineering



Identification and analysis of the existing manufacturing wastes at Network 670.685 D63 2014 T-5305

CHARMAINE ANGEL M. DIFFANGAN WELLA C. LOPEZ April 2014

#### **ABSTRACT**

DITANGAN, CHARMAINE ANGEL M. and LOPEZ, WELLA C., Identification and Analysis of the Existing Manufacturing Wastes at Network Trading Philippine Incorporated — International Incorporated. Undergraduate Thesis. Bachelor of Science in Industrial Engineering. Cavite State University, Indang, Cavite. March 2014. Adviser: Engr. Willie C. Buclatin

The study was conducted to identify and analyze the manufacturing wastes existing in the production of the conveying system at Network Trading Philippine Incorporated- International Incorporated. Manufacturing wastes present in the company could mean additional cost for the company thus reduction and elimination of these wastes is essential.

The actual set-up inside the production area was utilized as the primary sources of data in this study. All the activities involved in the operation in manufacturing the product had been the basis of this study. The flows of the works, materials, worker's tasks, the equipment, and machines were investigated and all of the findings were recorded. The utilization of Fishbone Diagram helped identify the origin of the existing wastes in the company.

Industrial Engineering theories and tools such as Flow Process Chart, Control Chart, Activity Relationship Diagram and Time Study helped identify the unseen wastes existing in the company pertaining to employee waste, defective products, inventory, transportation, motion and waiting. It is found out that these elements had been considered as wastes due to the cost it incurred and the time it consumed which may be utilized for other productive processes.

With the proposed manufacturing methods that facilitate the reduction of these wastes, benefit on the part of the company and the worker ascended. The new method promotes increased in production per day and at the same time helped reduce the number of working days and reduce cost incurred in the wage of the worker. Also, the reduction of theses wastes helped reduce stress or fatigue on the part of the worker. In this matter, it is recommended that the proposed manufacturing method be implemented in the company for a more efficient working process.

#### **TABLE OF CONTENTS**

	Page
BIOGRAPHICAL DATA	iii
ACKNOWLEDGMENT	v
ABSTRACT	vii
LIST OF TABLES	xi
LIST OF FIGURES	xiii
LIST OF APPENDICES	xiv
LIST OF APPENDIX TABLES	xv
LIST OF APPENDIX FIGURES	xvi
INTRODUCTION	1
Statement of the Problem	3
Objectives of the Study	3
Importance of the Study	4
Time and Place of the Study	4
Scope and Limitations of the Study	5
Definition of Terms	5
Conceptual Framework	7
REVIEW OF RELATED LITERATURE	8
METHODOLOGY	20
Research Design	20
Sources of Data	20
Data Gathering Procedure	20

Data Analysis	21
Research Instrument	22
RESULTS AND DISCUSSION	23
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	73
Summary	73
Conclusions	75
Recommendations	75
REFERENCES	77
APPENDICES	78

#### LIST OF TABLES

Table		Page
1	Welding of process of rollers (present)	32
2	Welding of process of rollers (proposed)	34
3	Distance and time incurred in hub processing	42
4	Standard distance and time in hub processing	42
5	Comparison of distance travelled of hub processing (distance in feet)	43
6	Comparison of time incurred (min) in the hub processing relative to distance travelled (ft)	44
7	Comparison of output produced in hub processing	44
8	Distance and time incurred in pipe processing	46
9	Standard distance and time in pipe processing	46
10	Comparison of distance travelled of pipe processing (distance in feet)	47
11	Comparison of time incurred in (min) the pipe processing relative to distance travelled(ft)	47
12	Comparison of output produced in the pipe processing	48
13	Distance and time incurred in shaft processing	50
14	Standard distance and time in shaft processing	50
15	Comparison of distance travelled of shaft processing (distance in feet)	51
16	Comparison of time incurred (min) in the shaft processing relative to distance travelled (ft)	51
17	Comparison of output produced in the shaft processing	52
18	Distance and time incurred in finishing the rollers	52

19	Standard distance and time in finishing rollers	53
20	Comparison of distance travelled in the finishing process of rollers (distance in feet)	53
21	Comparison of time incurred (min) in the finishing process relative to distance travelled (ft)	54
22	Distance and time incurred in frame processing	56
23	Standard distance and time in frame processing	56
24	Comparison of distance travelled of frame processing (distance in feet)	57
25	Comparison of time incurred (min) in the frame processing relative to distance travelled (ft)	58
26	Comparison of output produced in the frame processing	58
27	Summary of distance travelled (ft) in the whole process	59
28	Summary of time incurred (min) in the finished products relative to distance travelled (ft)	59
29	Present process of hub manufacturing	62
30	Present process of pipe manufacturing	62
31	Present process of shaft manufacturing	63
32	Proposed process of hub manufacturing	66
33	Proposed process of pipe manufacturing	66
34	Proposed process of shaft manufacturing	67
35	Comparison of waiting time incurred in roller manufacturing.	69
36	Comparison of the cycle time and waiting time	69
37	Comparison of present and proposed method (output)	70
38	Comparison of present and proposed method (savings)	71

#### **LIST OF FIGURES**

Figure		Page
1	Conceptual framework of the identification and analysis of the manufacturing wastes at NTPI International Incorporated	7
2	Process diagram of gathering data	21
3	Production process at NTPI International Inc.	25
4	Fishbone diagram for excessive manufacturing wastes in the production	26
5	Control chart for rollers (measured in length (mm))	29
6	Present layout of production area	36
7	Activity relationship diagram	37
8	Proposed layout of the production area	39
9	Comparison of present and proposed flow diagram in hub processing	41
10	Comparison of present and proposed flow diagram in pipe processing	45
11	Comparison of present and proposed flow diagram in shaft processing	49
12	Comparison of present and proposed flow diagram in frame processing	55
13	Present processing and waiting time of roller assembly	64
14	Proposed processing and waiting time of roller assembly	68

#### LIST OF APPENDICES

Appendix		Page
1	Computation of normal time and standard time (hub)	79
2	Computation of normal time and standard time (pipe)	81
3	Computation of normal time and standard time (shaft)	82
4	Computation of normal time and standard time (frame)	84

#### LIST OF APPENDIX TABLES

Appendix Table		Page
1	Stock on hands for rollers as of January 16, 2014	87
2	Results of time study	89
3	ILO allowances for standard time	92

#### LIST OF APPENDIX FIGURES

Appendix Figure		Page
1	Flow process chart of material  – roller manufacturing (present)	95
2	Flow process chart of material  – frame manufacturing (present)	96
3	Flow process chart of material  – finishing of rollers (present)	97
4	Flow process chart of material  - roller manufacturing (proposed)	98
5	Flow process chart of material  - frame manufacturing (proposed)	99
6	Flow process chart of material  – finishing of rollers (proposed)	100
7	Flow process chart of worker  – welding process (present)	101
8	Flow process chart of worker  – welding process (proposed)	102

### IDENTIFICATION AND ANALYSIS OF THE EXISTING MANUFACTURING WASTES AT NETWORK TRADING PHILIPPINE INCORPORATED – INTERNATIONAL INCORPORATED

#### Charmaine Angel M. Ditangan Wella C. Lopez

An undergraduate thesis submitted to the faculty of the Department of Industrial Engineering and Technology, College of Engineering and Information Technology, Cavite State University, Indang, Cavite in partial fulfilment of the requirements for the degree of Bachelor of Science in Industrial Engineering. Contribution Number 2012 - 14 - 006. Prepared under the supervision of Engr. Willie C. Buclatin

#### INTRODUCTION

In the manufacturing industry, most of the companies are running their operations efficiently enough and may not need to reduce wastes on the production. Yet, there may be some unseen non-value added activities that possibly add production's cost. Value added activities are the modification of products that enhances its productivity. In contrast, non-value added activities are the costs that must become the focus to be reduced or eliminated.

The first thing to consider in reducing waste is to identify or address what is waste and what is not. Typically, there are eight deadly wastes that every facility must be given attention. The wastes pertaining to are the activities that consume resources but create no value for the customer. The eight deadly wastes that may exist in a production are