

# A Study on Minimization of Marking Machine Breakdown

Presented to the faculty of the College of Technology

De La Salle University-Dasmariñas

Dasmariñas, Cavite

In Partial Fulfillment

Of the requirements for the Degree

Bachelor of Science in Industrial Technology

**Nicodemus O. Lao**

**Meliondras V. Villanueva**

October 2001

JUN 11 2008

# TABLE OF CONTENTS

	Page
<b>Title page</b> .....	i
<b>Approval sheet</b> .....	ii
<b>Acknowledgements</b> .....	iii
<b>Table of Contents</b> .....	iv
<b>List of tables</b> .....	vi
<b>List of figures</b> .....	vii

## CHAPTER

### I. The Problem and its Background

Introduction .....	1
Problem statement .....	2
Objectives .....	2
Significance of the Study .....	3
Scope and limitations .....	4
Methodology .....	4
Definition of terms .....	5

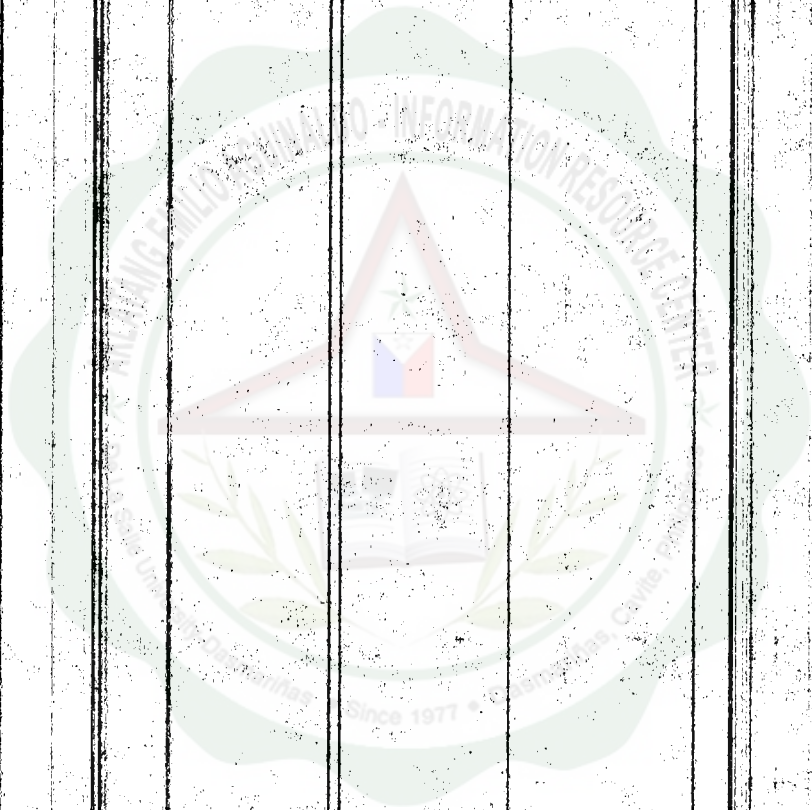
### II. Review of Related Literature

Replacement .....	6
Role of operation and Maintenance Department .....	8
Preventive and Breakdown Maintenance .....	10

	Breakdown programs .....	11
	Goal of maintenance .....	12
<b>III.</b>	<b>Presentation of Data .....</b>	<b>13</b>
	Summary of Data .....	19
<b>IV.</b>	<b>Interpretation of Data .....</b>	<b>20</b>
	Computation Analysis .....	22
	Problem Tree .....	25
	Objective Tree .....	27
<b>V.</b>	<b>Alternative Courses of Actions.....</b>	<b>30</b>
<b>VI.</b>	<b>Conclusion and Recommendations.....</b>	<b>32</b>
	Detailed Plan of Actions Discussions.....	35
	<b>References .....</b>	<b>37</b>
	<b>Appendices</b>	
A.	Waiver .....	39
B.	Letter for Request .....	41
C.	Certificate of completion.....	42
D.	OJT Appraisal form .....	44
E.	OJT Attendance sheet .....	46
F.	Company facts .....	48
G.	DFT must .....	50
H.	Curriculum Vitae .....	51

## LIST OF TABLES

Equipment history and utilization log sheet	14
DFT line hourly output monitoring	15
Levels of equipment problems	16
Cost and Benefit Analysis	33



## LIST OF FIGURES

Pareto Diagram	.....	17
Cause and Effect Diagram	.....	29
Means and Ends Diagram	.....	29
Detailed Plan of Action	.....	35

# CHAPTER I

## Background of the Study

### Introduction:

The study is conducted in Pulse Philippines, based on Cavite Export Processing Zone (EPZA) in Rosario Cavite.

Pulse is the industry leader in designing and manufacturing passive magnetic components, has the most complete selection of inductors, transformers, chokes and filter modules for Data Networking, Power, Telecom and Broadband Applications.

Pulse serves the international market place from corporate headquarters in San Diego, California; North European headquarters in the United Kingdom, South European Headquarters in Orgelet France, South Asian headquarters in Singapore and North Asian headquarters in Taipei, Hsien, Taiwan. State of the art manufacturing facilities are located in China, the Philippines, Thailand, Malaysia and France.

The study focused in the production area located at the building A of Pulse Philippines. The company use Demand Flow Technology (DFT) production line and the researcher chosen DFT A8 production line (see definition of terms) as the focused of the study.

In the second quarter of year 2000, Pulse Philippines had begun to reduce the number of their operators, supervisors and mostly technicians. Because of the occurrence of financial crisis, which affects mostly the electronics industry. Since then, the company incurred different problems regarding productions systems. The researchers are assigned in building A, DFT A8 production line. This line experience frequents machine breakdowns, specifically the marking machine (see definition of terms). Unpredictable breakdowns and irregular mechanical failure contributes negative effects in the

production line, like downtimes (idle time between machine and operator), output variance and delays. This is due to lack of technicians to monitor equipment performance and lack of cadet technicians familiarity in the production area. These reasons affect the overall equipment effectiveness. The researchers tried to find some appropriate information and data to at least to determine what possible alternative actions to be done for the improvement or success of this study.

### **Problem Statement**

The problem identified as *frequent machine breakdown*, "Marking machine", with an average of 2 hours per downtime (idle time between operator and machine) per day.

Two (2) hours of downtime per day is equal to almost half a million (peso value) profit loss within the area. See computation analysis C3.1 for details.

### **Objectives**

#### General Objective:

- To increase the overall equipment effectiveness (marking machine), this includes availability, performance efficiency and rate of quality products done by equipment.  
(see computation analysis)

#### Specific Objective's:

- To minimize downtime (idle time) in DFT A8 production line.
- To improve the maintenance skills of technicians.
- To eliminate the output variance.
- To lengthen equipment's life.

## Significance of the Study

The completion of the study enables to give benefits and advantages to the following:

- To the Researchers:
  - This study has helped the researchers to identify the proper application of the theories they had learned as Industrial Technology student. To determine the value of on the Job Training for experiencing real responsibilities and strengthen their knowledge and patience to this work.
- To the Students:
  - The students will be provided additional references, which they can use in their future research work. The success of the study will be tangible to understand some factors on how to manage the maintenance and control of overall equipment effectiveness.
- To the Company:
  - The management of Pulse Philippines could use this research as reference for developing improvement or as guide to determine factors and inputs for the cause (origin) of equipment breakdown.
- To the Workers:
  - The significance of the study is to motivate the workers to properly use the equipment.



## **Scope and Limitations**

The study focused in the production area specifically in DFT A8 production line. Involve analysis on equipment failures of marking machine due to frequent and unpredictable breakdowns. These failures contribute production delays or profit loss. Computations of equipment failure and causes are also included in this study.

Observation is limited on the daily performance of marking machine. In relation to the ability of operators and technicians.

## **Methodology**

This contains the detail procedure the researcher had followed for the completion of the study.

### Procedure:

The study has been conducted through interviews from supervisors, engineers and operators. The supervisors provided the details about the daily performance of marking machine and its present condition. Engineers provided with the researchers technical information about the mechanical abstract of marking machine and utilization of equipment failure. The workers provided some information about the actual situation and condition of the marking machine.

### Instrumentation:

The researchers formulated different data and ideas using of stopwatch, different chart or/ tables available in the company. The stopwatch served as tools for measuring the cycle time of the marking machine.

## **Definition of Terms:**

### ***Broadband***

- Designed for use over a wide range of frequencies.

### ***Demand Flow Technology (DFT)***

- American version of Just in Time (JIT).
- A manufacturing technology that based upon a production flow process that uses kanbans  to pull material into and through the process as material is consumed.

### ***DFT A8 Production line***

- One of the production lines in Pulse Philippines, located at building A. Makers of broadband access products. With standard operations like winding, solder dipping, assembly, marking, inspection and so on.

### ***Filter Magnetic Transformer (FMT)***

- An electronic device use to filter the noise from communication devices like telephone, cell phones and other communication devices.

### ***Inductor(s)***

- Tiny coil of wire which transfers current from one stage to another. Choke coil.

### ***Marking equipment***

- An electropneumatic device that embosses the brand name, product name, week and year it produces or manufacture. The equipment stands about 4.5 feet, with a length of 4 feet and 3.5 of width.