

HIGHER TECHNICAL INSTITUTE
MECHANICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

**IMPLEMENTATION OF QUALITY CONTROL
PROCEDURE IN A FOOD INDUSTRY**

by

MARIOS ALEXANDROU (M/728)

JUNE 1995

IMPLEMENTATION OF QUALITY CONTROL PROCEDURE
IN A FOOD INDUSTRY

BY

MARIOS ALEXANDROY

PROJECT REPORT

SUBMITTED TO

THE DEPARTMENT OF MECHANICAL ENGINEERING
OF THE HIGHER TECHNICAL INSTITUTE

NICOSIA, CYPRUS

IN PARTIA FULFILLMENT OF THE REQUIREMENTS
FOR THE DIPLOMA OF

TECHNICAL ENGINEER

IN

MECHANICAL ENGINEERING

JUNE 1995

HIGHER TECHNICAL INSTITUTE	PROJECT NO 2486
----------------------------------	--------------------

DEDICATION

Dedicated to my parents
and to my friends

CONTENTS

Page

Acknowledgement	
Abstract	

CHAPTER 1

1. Introduction to quality control	
1.1 Meanings of "Quality"	
1.2 Meanings of "Control"	
1.3 Meanings of "Quality Control"	
1.4 The object of Quality Control	
1.5 Responsibility of quality	
-1.6 Total Quality Managements (TQM)	
-1.7 Deming's 14 points for implementing quality improvement	

CHAPTER 2

-2.1 Introduction to SPC	
-2.2 Control Charts	
-2.3 Tools/Techniques for quality improvement..	
-2.3.1 Cause and effect diagram	
-2.3.2 Flow charts	
-2.3.3 Pareto charts	
-2.3.4 Run Charts	
-2.3.5 Histograms	
-2.3.6 Scatter diagrams	
-2.3.7 Control Charts	

CHAPTER 3

-3.1 The industry selected	
-3.2 Processes involved throughout the manufacturing operation in Regis Industry	
-3.3 Milk Reception	
-3.4 Pasteurization	
-3.5 Cooling	
-3.6 Homogenization	
-3.7 The storage of Raw milk in Refrigeration Tanks	
-3.8 Freezing effect	
-3.9 Filling	
-3.10 Refrigerator stores	

CHAPTER 4

4. Incoming inspection	
4.1 The role of inspection	
4.1.1 How much and how often to inspect	
4.1.2 When and where to inspect	
4.2 Inspection and testing for Quality Control	
4.2.1 Screening	
4.2.2 Lot-by-lot inspection	

4.3	Acceptance sampling	
4.3.1	Single sampling	
4.3.2	Double sampling	
4.3.3	Sequential sampling	
4.3.4	Operating characteristic (OC) curves ...	
4.3.5	Producer's and consumer's Risk	
4.4	Incoming inspection in Regis Industry	
4.4.1	Milk as the raw material	
4.4.2	Cyprus specifications for fresh milk ...	
-4.4.3	Methods for thesting and inspections ...	
-4.4.3.1	Titratable acidity of milk	
-4.4.3.2	Determination of total solid of milk .	
-4.4.3.3	Determination of fat of milk	
-4.4.3.4	Anti-biotic Test (Delvotest)	
-4.4.3.5	Adulteration of milk	
4.5	Flow chart of incoming inspection in Regis Industry	

CHAPTER 5

5.	Process Inspection	
5.1	Process inspection with control charts ...	
5.1.1	Purpose of control charts	
5.1.2	Control charts for variables	
5.1.2.1	How to prepare and alalyse \bar{R} and \bar{X} charts	
5.1.2.2	Setting \bar{X} -chart limits	
5.1.2.3	Setting Range chart limits	
5.1.3	Control charts for attributes	
5.1.3.1	P-Charts	
5.1.3.2	C-Charts	
5.1.4	Process capability	
5.2	Process inspection in Regis Industry	
5.3	Flow chart of process inspection in Regis Industry	

CHAPTER 6

6.1	Final Inspection	
6.2	Inspection of Regis Industry	
6.2.1	Overrun inspection	
6.2.2	Microbiological Inspection	
6.2.2.1	Determination of colform Bacteria	
6.2.2.2	Determination of total count	
6.2.3	Organoleptic Inspection	
6.2.4	Hardening and storage temperature inspection	
6.3	Flow chart of final inspection in Regis Industry	

CHAPTER 7

-	C&E diagram showing how a defective product could be produced	
---	--	--

\ Pareto Analysis	
\ Pareto Analysis of Mega Ice-cream	
Suggestions for improving existing	
Quality Control	

CHAPTER 8

\ 8. Data charting and analysis	
\ 8.1 Point 1	
\ 8.2 Point 2	
\ 8.3 Point 3	

CHAPTER 9

9.1 Quality costing	
9.2 Product cost	
Production cost per unit	
Quality costing	

CHAPTER 10

10.1 Personal Benefits	
10.2 The companies beniffits	
10.3 The importance of the project	

REFERENCES	
------------------	--

ACKNOWLEDGEMENTS

I would like to express my thanks to my project supervisor Mr. Rousias Damianos who gladly accepted the supervision of my work, for his constructive, criticism and comments.

Also my most thanks to Mr. Angeli I. Ioannis for his help and guidance to my whole work.

I wish also to thank Mr. Staurinides for his helpful information in REGIS industry.

ABSTRACT

The objectives of this project are to study Q.C tools and techniques, investigate the existing Q.C procedures and methods in a food industry. Also to select products and suggest methods of improvement of the existing quality control practices and to carry out sampling measurements in order to test the effectiveness of the suggested techniques. Furthermore to measure the process capability of the process by variable and Attribute data. Finally to carry out an economic comparison between the existing and proposed quality control procedures and techniques.

The employment of SPC is highly requested by the author since this would give monitoring of the processes and future prediction could be made. A collective work would reduce the limits and variation of the processes to minimum and defective to Zero. Thus there will be an industry of perfect efficiency and performance.