HICHER TECHNICAL INSTITUTE MECHANICAL ENGINEERING DEPARTMENT DIPLOMA PROJECT

SAFETY MEASURES AND PROCEDURES IN
AN INDUSTRIAL ENTERPRICE

M / 885

KYPIACOS PANAYI (3MI)

JUNE 2000

HIGHER TECHNICAL INSTITUTE MECHANICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

SAFETY MEASURES AND PROCEDURES IN AN INDUSTRIAL ENTERPRICE

M/885

KYRIACOS PANAYI (3M1)

June 2000

HIGHER PROJECT NO. TECHNICAL INSTITUTE 3173

HIGHER TECHNICAL INSTITUTE

MECHANICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

SAFETY MEASURES AND PROCEDURES IN AN INDUSTRIAL ENTERPRICE

Project Number: M/885

Student: KYRIACOS PANAYI

Supervisor: D.ROUSHAS

HIGHER PROJECT NO. TECHNICAL INSTITUTE 3173

SAFETY MEASURES AND PROCEDURES IN AN INDUSTRIAL ENTERPRICE

By

Kyriacos Panayi

Project Report

Submitted to

The Department of Mechanical Engineering

Of the Higher Technical Institute

Nicosia Cyprus

In partial fulfillment of the requirements

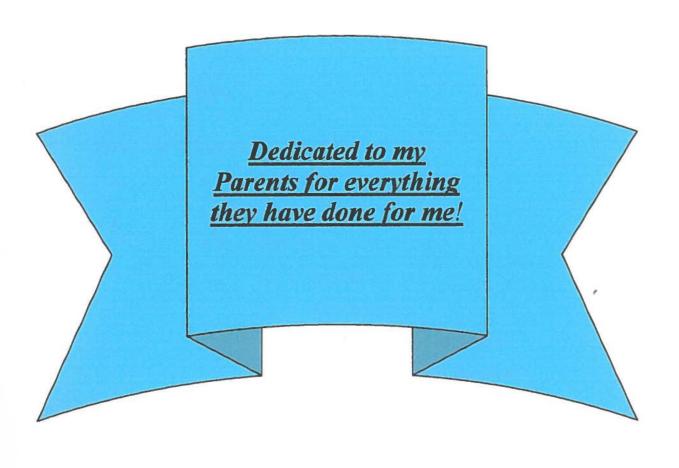
For the diploma of

TECNICIAN ENGINEER

In

MECHANICAL ENGINEERING
JUNE 2000





CONTENT

Page

ACKNOWLEDGMENTS SUMMARY INTRODUCTION

CHAPTER 1: PRODUCTION DEPARTMENT								
	1.	Production Lines						
	1.1	Introdu	Introduction					
	1.2	Line A	Line A					
		1.2.1	Freezer	,	5			
		1.2.2	Conveyor	S	5			
			1.2.2.1	Belt Conveyor	5			
			1.2.2.2	Chain Conveyor	6			
			1.2.2.3	Safe Operating Rules	6			
			1.2.2.4	Guarding	8			
		1.2.3	Piping		9			
			1.2.3.1	Safety Standard	9			
		1.2.4	Robot (PLU)		10			
			1.2.4.1	Moving Parts of Machines	10			
		1.2.5	Packaging	g Machine	10			
			1.2.5.1	Safety Standard	10			
			1.2.5.2	Guard for Packaging	11			
			1.2.5.3	Starting and Stopping devices	12			
		1.2.6	Ice Cream	Cutter	13			
			1.2.6.1	Safety Guards	13			

	1.3	Lines B			13
		1.3.1	Feed Presses		14
			1.3.1.1	Safety in Press Operation	14
			1.3.1.2	Requirement for press Install.	16
			1.3.1.3	Fundamentals Principles	16
			1.3.1.4	Safe Guarding	17
			1.3.1.5	Proposed Safe Guard	18
	1.4	Line C			19
	1.5	Mix Ro	oom		20
		1.5.1	Mixing Va	ats	20
			1.5.1.1	Safety Precaution and Guard	20
		1.5.2	Cooler		21
			1.5.2.1	Operating Precautions	22
CHAPTER II:	MAIN	ΓENAN	CE DEPA	RTMENT	
	2. Maintenance Department				
	2.1	Drilling	illing		
		2.1.1	Safety Instruction		25
		2.1.2	Before Sta	rting Work;	27
		2.1.3	Using Ma	chine	28
		2.1.4			30
		2.1.5			31
	2.2	Weldin			33
		2.2.1			33
			2.2.1.1	Health Hazards	33
			2.2.1.2	Safety Precautions	34
		2.2.2	Arc Weldi	ng	37
			2.2.2.1	Safety Precautions	37

	2.3	Automated Saw			41
		2.3.1	Safety Precautions		42
		2.3.2	Guarding		43
	2.4	Plumbi	ng		44
		2.4.1	Plumbing Tools		44
		2.4.2	Job Safety	,	44
		2.4.3	Hand Too	ls	46
		2.4.4	Sheet Met	al Work	47
			2.4.4.1	Tools and Machinery	47
			2.4.4.2	Safety on Soldering	50
		2.4.5	Guarding		51
		2.4.6	Safety on Sheet Metal Work		52
	2.5	Grindin	ıg	,	53
		2.5.1	Principal I	Hazards of Grinding	53
		2.5.2	Safety Pre	cautions	54
		2.5.3	Guarding		55
			2.5.3.1	Contact with the Weel	55
			2.5.3.2	Proposed Safe Guard	57
CHAPTER III:	HEAL	TH AN	D HYGIE	NE	
	3.	Health and Hygiene			
	3.1	Sterilization			59
	3.2	Safe Use of Chemicals			62
		3.2.1	3.2.1 Assess the Risks		
		3.2.2	Safety Pre	cautions	63
		3.2.3	Don't Get	Poisoned	64
		3.2.4	4 Storage		

CHAPTER IV: GENERAL WORKING ENVIROMENT						
	4.	General Working Environment			67	
	4.1	Floors and Gangways				
	4.2	Locatio	Vorkplaces	68		
	4.3	A Safe	Place t	o Work	69	
	4.4	Layout	of Wo	kplaces	71	
	4.5	A Safe	ty Colo	ur Code for Industry	71	
			4.5.1	Piping Identification	76	
	4.6	Transp	ort by N	Means of a Forklift	76	
	4.7	Layout	and Ar	rangement; Purchasing	78	
			for Saf	îety ety		
			4.7.1	Layout and Arrangement	78	
			4.7.2	Flow Sheets	78	
			4.7.3	The Factors that Influence Plant	79	
				Layout		
			4.7.4	Proposed Layout	79	
CHAPTER V	PROT	ECTIVE	E CLOT	TH AND EQUIPMENT		
	5.	Protective Clothing and Equipment			82	
	5.1	Choosing and using Equipment			82	
		5.1.1	Eyes		83	
		5.1.2	Head a	and Neck	83	
		5.1.3	Hands	and Arms	84	
		5.1.4	Feet ar	nd Legs	85	
		5.1.5	Respir	atory Protection	85	
		5.1.6	Mainte	enance Preparatory	87	

CHAPTER VI: ELECTRICAL HAZARDS						
	6.	Electrical Hazards				
	6.1	Electricity			89	
		6.1.1	Switches and Conduit			
		6.1.2	Damage			
		6.1.3	Sockets			
		6.1.4	.4 Environment			
		6.1.5	Plugs			
		6.1.6	1.6 Cable Joints			
	6.2	Checks That				
CHAPTER VII: SAFETY OFFICER						
	7.	Procedures and Responsibilities				
	7.1	A Reasonable Objective				
	7.2	Duties and Responsibilities				
	7.3	Procedures for a Safety officer				
		7.3.1	7.3.1 safety inspections			
		7.3.2	Safety A	udits	100	
		7.3.3	Safety Sa	mpling	100	
			7.3.2.1	Specimen Of Safety Audit	101	
			7.3.3.1	Safety Sampling Example	106	
		7.3.4	Successful Communication Issues		106	
		7.3.4	Prepare y	our Safety Plan	109	
CHAPTER VIII: EGRGONOMICS						
	8.	Ergonomics				
	8.1	Anthropometrics			111	
	8.2	Interface Design			113	

				1	
	8.3	Temperature, Lighting and Ventilation			
		8.3.1	Temperature		114
		8.3.2	Lighting		116
		8.3.3	Ventilation		117
	8.4	Handli	ng Techniques		117
CHAPTER IX: COST ESTIMATION					
	9.	Cost Estimation			
	9.1	Feed C	Guard For Power Presses		120
	9.2	Fixed Transparent Guard for a Grinder			
	9.3	Safety	Colour Code		121
				,	
CONCLUSIONS					
REFERENCES					
DR A WINGS					

ACKNOWLEDGMENTS

As the author of the project, I strongly feel the need to thank:

Mr Damiano Rousha as my supervisor and Mr Cristodoulou for their valuable advice throughout the development of the project.

To the management and personnel of **REGIS** Industry for all their valuable help.

And finally my family and my friends that provided me the psychological support for the development of the project.

Created by Kyriacos Panayi

Title: Safety Measures and Procedures in an Industrial Enterprise

SUMMARY

This project provides comprehensive and up-to-date information of the

practice of health and safety at "REGIS" Industry in CYPRUS. It a source

of information and guidance, not only for health and safety practitioners,

but also for personnel manager and engineers of the industry.

The first two chapters of the project covers the two main departments of the

industry:

1. Production department and

2. Maintenance department

The other parts of the project outlines regulations, practical considerations

and management systems dealing with the workplace, work equipment,

personal protective equipment, health conditions and ergonomics,

necessary for ensuring a safe and healthy workplace in the industry, with

specific reference to world standards, books and various leaflets.

Finally, this book devotes a chapter to the new emphasis on the procedures

and responsibilities of a safety officer by providing treatment of record

keeping and proper checklists.

INTRODUCTION

Every one wants a safe and helpful workplace, but what each person is willing to do to achieve this worthwhile objective.

Accidents have always been with us and have been caused by unsafe conditions and unsafe acts. Quite apart from the suffering of the workers and their families, the cost to business is huge. For employers, controlling accidents and ill health means less compensation to pay, lower repair bills and less lost production. It is profitable to reduce accidents, damage and the minor losses, which can easily turn into major losses.

Workplace accidents can be prevented-and you don't have to turn your place upside down or spend a lot of money to do so. You only need to use good business sense ant to follow well-recognized principles.

But you need a commitment to do so things properly so that safety becomes as much part of every job as production, quality or cost.

Some employers deny this responsibility and attempt to leave the decision to employees. This strategy seems to square with hallowed principles of personal freedom and individual responsibility. But such a denial of responsibility by employers results a decision by default, and usually the result is a low level of safety and health in the workplace. Furthermore, it has been proven that the attitude of the worker is the most important determinant for his or her safety, but attitude alone cannot make a dangerous job safe.

The purpose of this book is to study and provide tools and guidelines for safety and health to a particular Industrial Enterprise called REGIS Industry. REGIS is an ice-cream industry, which I believe, needs guides to the important parts of the standards. Frequently standards should receive prime attention from safety officers because they indicate areas in which an

industry is having difficulty to find and give a great deal of attention. Also, the term "safety officer" envisions the enlarged scope of responsibility, which includes analysis of hazards and compliance with standards.

Like everything else in business, safety does not just happen – you have to make it happen.

Description of the plant

The Regis industry is separated in two main departments. At first stage, in the production department the prescription for the individual ice cream is carried out in the mix room, second the product can follow a variety of processing which can lead to different kinds of ice creams.

The last stage is the storage at low temperature condition for the future promotion of the product.

The maintenance department is used for preventing maintenance work – repairing or cleaning the machines of the industry.