



**NATIONAL TECHNICAL UNIVERSITY COLLEGE OF
MALAYSIA**

**Developing a System to Enhance Safety
Awareness in Working Area – A Case Study in
Fabrication Worksyop and Machinesyop At
Faculty of Manufacturing Engineering
Laboratories, Kolej Universiti Teknikal
Kebangsaan Malaysia**

Thesis submitted in accordance with the requirements of the
National Technical University College of Malaysia for the Degree of
Bachelor of Engineering (Honours) Manufacturing (Process)

By

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KOLEJ UNIVERSITI TEKNIKAL KEBANGSAAN MALAYSIA
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JUDUL: Developing a System to Enhance Safety Awareness in Working Area - A Case Study in Fabrication Worksyop and Machine Worksyop at Faculty of Manufacturing Engineering Laboratories, Kolej Universiti Teknikal Kebangsaan Malaysia

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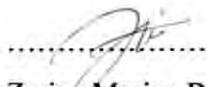
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ABSTRACT

Safety and the personal protection equipment (PPE) theory is fairly simple, however, to implement it in actual workplace is more complicated as there are various factors that need to be considered especially for a PPE application. This paper presented a study of safety awareness among the users at Faculty of Manufacturing Engineering (FKP) laboratories, which is focusing on Fabricationsyop and machinesyop by doing a pre-liminary study. The pre-liminary study was conducted to determine the current status of safety in FKP laboratories. From the pre-liminary study, there is some improvement ideas base on the current status was developed to be implemented in the FKP laboratories. The implementation ideas such as provided suitable PPE selection, proposed a safety guideline (booklet), provided laboratory general rules (signboard), provided a proper documentation for PPE usage checklist, first aid kit validation checklist, and accident record and summary accident record. Provide proper PPE storage and PPE maintenance guideline and finally additional necessary safety signage. This study are refer to the objective of this study which is to study safety awareness at the laboratories to achieving minimum OSH Act requirements such as; application of PPE and roles of employer and employees, also to create a safety and health working environment and provide a standard guideline on safety and health implementation in laboratories.

ABSTRAK

Kertas kerja ini menunjukkan kajian mengenai kesedaran keselamatan di kalangan pengguna makmal Fakulti Kejuruteraan Pembuatan (FKP), yang mana menfokuskan kepada makmal fabrikasi dan makmal mesin dengan melakukan kajian terdahulu. Kajian terdahulu dilakukan untuk mengenalpasti status semasa keselamatan di makmal FKP. Hasil daripada kajian terdahulu terdapat beberapa idea untuk meningkatkan keselamatan di makmal telah dilaksanakan. Pelaksanaan idea seperti menyediakan pemilihan peralatan perlindungan peribadi, mencadangkan buku panduan keselamatan, menyediakan papan tanda panduan keselamatan menyediakan borang penggunaan peralatan pelindungan peribadi, borang luput kotak kecemasan, laporan kemalangan dan laporan ringkasan kemalangan yang baik. Tempat menyimpan peralatan perlindungan peribadi dan panduan penyelenggaraan peralatan perlindungan peribadi dan akhir sekali menambah tanda keselamatan. Kajian ini adalah untuk memenuhi objektif kajian dimana mengkaji kesedaran keselamatan di makmal bagi mencapai keperluan minimum Akta OSH seperti penggunaan peralatan perlindungan peribadi, peraturan majikan dan pekerja, juga menyediakan persekitaran kerja yang sihat dan selamat dan menyediakan panduan piawai kepada keselamatan dan kesihatan di makmal.

DEDICATION

Specially dedicated to;
My beloved Father, Ridzwan B Abdul Aziz
and My Mother, Ma'ani Bt Mohd Yusoff,
who are very concern, understanding, patient and supporting.
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To My Sister, Brothers and All My Family,
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A time to remember family and friends, too;
A time reminisces, and says;
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LIST OF ABBREVIATIONS

Terms	Title of Terms
PPE	Personal Protective Equipment
OSHA	Occupational Safety and Health Act
FKP	Fakulti Kejuruteraan Pembuatan
DOP	Degree of Protector
ISO	International Standard Organization
PEL	Permissible Expose Limit
PARP	Powered Air Purifying Respirator
SCBA	Self Contained Breathing Apparatus
FMA Act	Financial Management and Accountability Act
ANSI	American National Standards Institute
CFR	Code of Federal Regulations
NIOSH	National Institute Of Safety and Health
MDC	Malaysia Developers Control
BOMBA	<i>'Badan Operasi Menyelamat Bahan Api dan Bencana Alam'</i>

CHAPTER 1

Introduction

Accident whether minor or major is still occurs even the sign for safety or wearing PPE is provided. As a result, an organization or company will loose the effective operation time due to these accidents. Therefore, OSH Act was establish to encourage employees to reduce workplace hazard, implement or improve safety and health programs and finally it was establish the right employers and employees for improving workplace safety and health.

1.1 Occupational Safety and Health Act (OSHA)

The Occupational Safety and Health Act (OSHA) is an Act, which provides the legislative framework to secure the safety, health and welfare among all Malaysian workforce and to protect others against risks to safety or health in connection with the activities of persons at work. This Act was gazetted on 24th February 1994 and may be cited as the Occupational Safety and Health Act 1994. This Act is a practical tool superimposed on existing safety and health legislation. The aims of this Act are to secure the safety, health and welfare of persons at work against risks to safety or health arising out of the activities of person at work. To protect person at a place of work other than persons at work against risks to safety or health arising out of the activities of persons at work. To promote an occupational environment for persons at work which is adapted to their physiological and psychological needs and to provide the means whereby the associated occupational safety and health legislation may be progressively replaced by a system of regulations and approved industry codes of practice operating in combination with the provisions of this Act designed to maintain or improve the standards of safety and health.

1.2 Personal Protective Equipment (PPE)

The personal protective equipment (PPE) at work regulations 1992, which came into force on 1 January 1993, are part of a series of Health and Safety regulations implementing EC Directives. They replace number of old and often excessively detailed laws. The purpose of the PPE at work regulations is to ensure that certain basic duties governing the position and use of PPE apply to all situations where PPE is required, and they follow sound principles for the effective and economical use of PPE, which all employers should follow.

PPE is defined in the Regulations as 'all equipment (including clothing affording protection against the weather) which is intended to be worn or held by a person at work and which protects him against one or more risks to his health and safety' (Graham R. 1999).

It is also can be define as any equipment which is intended to be worn or held by a person at work and which protects him against one or more risks to his health of safety and any additional accessory designed to meet that objective (David L. 2002).

By refer to OSH Act as a guideline, this study is mainly focused on developing a system to enhance safety awareness in working area such as, fabrication worksyop and machinesyop at Faculty of Manufacturing Engineering.

1.3 Background Problems

The data recorded from the worksyop (*Borang Laporan Kejadian Kemalangan Di Makmal*), shown that there are three major accidents have been happen since 2002 until now. From the record, the accidents were cause by improper function of the machine and because of human error. Two of the accidents happen because of damage machine device, where one of them do not had any injury (technician) and another accident were occurred a stomach and leg injuries. For the human error accident, it was happen in lathe machine, where the student does not lock out the tool properly and using the wrong technique of tool lock and it was occurred a hand injury.

Even thought, it is no accident occurs because of the PPE, but there is minor accident happen in laboratories and the biggest cause of PPE this is refers to the technician information. Because of this reason, the safety awareness and PPE application must be enhanced in order to archive zero accident at fabricationsyop and machinesyop

1.4 Objectives of Study

The objectives of this study are;

- i. To study safety awareness for all users in fabricationsyop and machinesyop at Faculty of Manufacturing Engineering by achieving minimum OSH Act requirement such as; Application of PPE and roles of employer and employee.
- ii. To create a safety and health working environment.
- iii. To provide a standard guideline on safety and health implementation.

1.5 Scope of Study

The scope of this study is cover to Act 514, Occupational Safety and Health Act 1994, which is narrow down to Part IV, General Duties of Employers and Self-Employed Persons, under Section 15 and Section 16 and Part VI, General Duties of Employees at Work, under Section 24 and Section 25. These sections are explaining the minimum requirement of employer and employees responsibility in safety and health issues. Therefore, this study investigate the implementation status of the OSH Act 514 at FKP Laboratories (Machinesyop and Fabricationsyop)

1.6 The Important of Study

Fabrication¹ worksyop and Machinesyop² are mainly used for teaching and learning purpose especially for first year students. There was a number of minor accidents had occurred among these student caused by lack of safety awareness among the students. Therefore, it is important to develop a safety working environment in order to reduce accidents at workplace to zero accident.

¹ refer to appendix A Fabrication worksyop layout

² refer to appendix B Machinesyop layout

CHAPTER 2

Literature Review

This study was connected how to manage the worksyop safety and safety awareness. Before this project has been started, there should have the completely data. The data were collected from the survey (questionnaire), interviewing and observation. This project also has to know the certain things like safety in the worksyop, risk of safety and health in worksyop, PPE usage, safety awareness, and the act related to the safety in worksyop.

2.1 Safety in Worksyop

Safety, it is generally recognized that there is no machine or industrial or consumer product that cannot somehow be involved in an accident or injury (Furr, 2002). Safety may be defined as a judgment of the acceptability of danger, where danger is the combination of hazard and risk. Thus, the safety of a machine or workplace depends on the hazard and involved with machine operation. Hazard is defined as an injury producer while risk is defined as the like-lihood (probability) that an injury will occur (Goetsch, 2002).

The worksyop safety even under this restrictive definition is still an extremely wide field. At one end of the spectrum it deals with cognitive processes and human behavior and at the other end with the fluid mechanic of reactive flow. Clearly in any discussion of plant safety one has to be selective, with the selection being influenced by the types of accidents and problems encountered recently in the industry (Banerjee, 2003). The Safety Strategy Workshop applies a business-like approach to managing safety. It incorporates the same performance management principles applied to other key result areas: i.e. prioritizing initiatives, assign responsibilities, target dates and performance measures (Barling & Frone, 2004).