

SAFETY IMPROVEMENT ON ARM FORCES CONSTRUCTION SITE

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DEDICATION

To My Parents, Abah & Emak

Thank you for your unconditional support with my studies

Thank you for giving me a chance to prove

And

Improve myself through all my walks of life

To My Family

Papa

Dennis Aqil Hazim

Nur Farrah Que Aqilah

Muhammad Aqil Hakimi

Thank you for believing in me

For allowing me to further my studies

Please do not ever doubt my dedication and love for you

Thank you forever for standing by me

I love and appreciate you forever.

ACKNOWLEDGEMENT

In the Name of Allah, the Beneficent, the Merciful

I'm really grateful and thankful to God the Almighty for giving me the courage and determination, as well as guidance in conducting this research study, despite all difficulties

I wish to extend my heartfelt gratitude to my supervisor, AP Aziruddin Ressang. You made me believe that I had so much strength and courage even when I felt lost. You were very tolerant and determined to see me through.

Finally, I thank all those who assisted, encouraged and supported me during this research, be assured that Allah will bless you all for the contributions you made.

Thanks again to all. Only God can repay the kindness of you.

ABSTRACT

There are many accidents on construction sites. This research is to study hazards on construction site and to propose methods to mitigate them. The research was carried out by reviewing journals and accident data from Department of Safety and Health (DOSH) and Social Security Organization (SOCSO). Questionnaires were formulated and distributed to 50 respondents which are safety and health officer, project manager, engineer and clerk of work. The answers from respondents were analysed using Cronbach's Alpha for their reliability and Likert Scale, Hazard Identification, Risk Assessment and Risk Control (HIRARC) to determine the risk level. Relative Important Index (RII) was used to determine the complying and effectiveness of safety management programs. Based on the results it is found that using hand tools is the highest risk followed by repetitive work and hazardous housekeeping. To reduce the hazards on construction site it is proposed behaviour control, administrative control, engineering control and introduce PPE. The complying and effectiveness of safety management programs are only at level effective and comply.

ABSTRAK

Terdapat banyak kemalangan di tapak pembinaan. Kajian ini adalah untuk mengkaji bahaya di tapak pembinaan dan mencadangkan kaedah untuk mengurangkannya. Kajian ini dijalankan dengan mengkaji jurnal dan data kemalangan dari Jabatan Keselamatan dan Kesihatan Pekerjaan (JKKP) dan Pertubuhan Keselamatan Sosial (PERKESO). Borang soal selidik telah disediakan dan diedarkan kepada 50 responden yang terdiri daripada pegawai keselamatan dan kesihatan, pengurus projek, jurutera dan kerani kerja. Jawapan daripada responden dianalisis dengan menggunakan Alpha Cronbach untuk kebolehpercayaan dan Skala Likert, Pengenalpastian Bahaya, Penilaian Risiko dan Kawalan Risiko (HIRARC) untuk menentukan tahap risiko. Relatif Indeks Penting (RII) telah digunakan untuk menentukan pematuhan dan keberkesanan program pengurusan keselamatan. Berdasarkan keputusan didapati dengan menggunakan peralatan tangan adalah risiko yang paling tinggi diikuti dengan kerja-kerja yang berulang-ulang dan pengemasan berbahaya. Untuk mengurangkan bahaya di tapak pembinaan adalah dicadangkan kawalan tingkah laku, kawalan pentadbiran, kawalan kejuruteraan dan memperkenalkan PPE. Pematuhan dan keberkesanan program pengurusan keselamatan hanya pada aras berkesan dan mematuhi.

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LIST OF ABBREVIATIONS

ABBREVIATIONS	FULLNAME
JKKP	Jabatan Keselamatan dan Kesihatan Pekerjaan
PERKESO	Pertubuhan Keselamatan Sosial
CIMP	Construction Industry Master Plan
CIDB	Construction Industry Development Board
DOSH	Department of Safety and Health
SOCISO	Social Security Organization
HIRARC	Hazard Identification, Risk Assessment and Risk Control
RII	Relative Importance Index
MD	Munition Debris
MEC	Munition and Explosive of Concern
UXO	Unexplode Ordnance
PPE	Personal Protective Equipment
OSHA	Occupational Safety and Health Administration

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The most important industry to grow up our economy was construction industry. The construction industry plays a big role in development process of a country where successful development would contribute towards the economic growth generating additional demands for construction activities (Dayang Nainul and Gloria, 2011). Construction industry is a very active and booming industry towards worldwide proceeding as one of the highest contributing industries towards the country's economy (Dayang Nainul and Gloria, 2011). However, such achievements have also contributed much towards the safety issues where statistics showed that this industry has earned the reputation of being a highly hazardous industry due to its fatality rates (Dayang Nainul and Gloria, 2011). Despite the contributions to economic development, construction industry has always been blamed for the high rate of accidents and fatalities; this matter has placed the construction industry among the industries with unreasonable rate of accidents, disabilities and fatalities (Abdul Rahim Abdul Hamid et al., 2003).

The Government had launched the Construction Industry Master Plan 2006-2015 (CIMP) initiated by the Construction Industry Development Board (CIDB) Malaysia. Launched with the purpose of gearing up the Malaysian construction industry towards globalization and competitiveness, the CIMP constitutes seven strategic thrusts which encompass the construction value chain.

One of the strategies, strategic thrust 3, emphasizes on striving for the highest standard of quality, occupational safety, and health and environmental practices. To keep abreast with development, particularly in relation to the issue of occupational safety and health, construction players should play their roles in consolidating the industry to reach greater heights. Safety in construction must be a priority during pre-construction, construction and post construction. A holistic approach of safety must be introduced to the construction industry as a strategic way for construction stakeholders to move up to the greater height in future (Mohd Khairolden Ghani et al., 2008).

1.2 Problem Statement

Base on the statistic from Department of Safety and Health (DOSH) until March 2015 at Figure 1.1, construction industry seat on third ranks of occupational accidents after manufacturing sector and agriculture, forestry, logging and fishing. The numbers of accidents in construction sector were 52 accidents compare with manufacturing 440 accidents and 115 accidents. Table 1.1 shown that from 52 accidents, 17 deaths, 32 non-permanent disables and 3 permanent disables. The numbers of death in construction sector higher than others sector event the numbers of accidents just 52 cases. This can conclude that construction sector most hazardous sector to the employee.

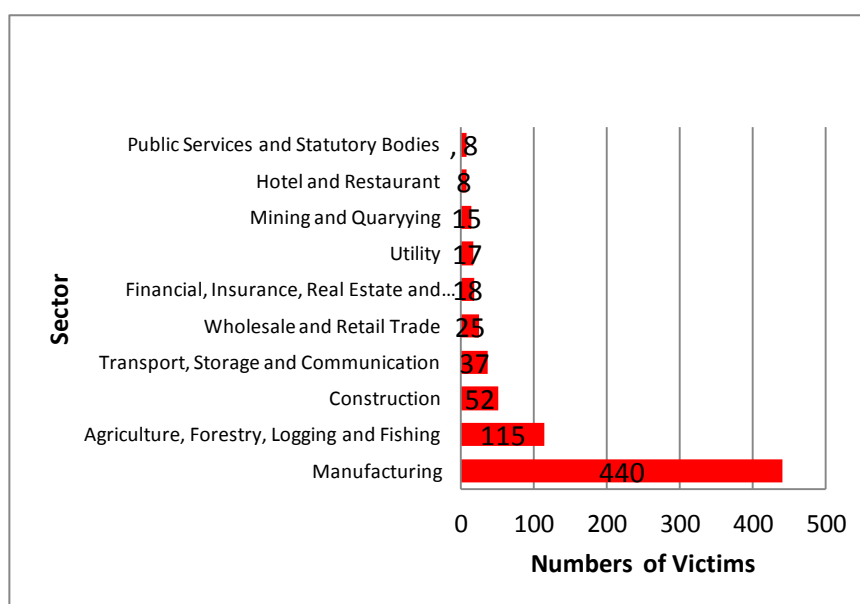


Figure 1.1: Occupational Accidents Statistics by Sector until March 2015
(Source: Department of Safety and Health, 2015)

Table 1.1: Occupational Accidents Statistics by Sector until March 2015
(Source: Department of Safety and Health, 2015)

Sector	Death (D)	Non Permanent Disability (NPD)	Permanent Disability (PD)
Manufacturing	7	411	22
Mining and Quarrying	1	13	1
Construction	17	32	3
Agriculture, Forestry, Logging and Fishing	4	109	2
Utility	3	13	1
Transport, Storage and Communication	10	25	2
Wholesale and Retail Trade	1	24	0
Hotel and Restaurant	0	8	0
Financial, Insurance, Real Estate and Business Services	2	16	0
Public Services and Statutory Bodies	0	8	0

According to the statistic in Annual Report 2000 to 2013, Social Security Organization (SOCSO), the numbers of accident in construction industry keep increasing. It was increase from 4,873 to 5,908. The statistic shown at Table 1.2 and Figure 1.2. Although DOSH and SOCSO enforce through the Regulations and introduce HIRARC, the accident still increased. Reducing number of accidents and fatalities is the ultimate aim of construction safety and health management in order to improve the overall performance of construction activities. By reducing of accidents, it also will reduce the risks of delay, cost, quality, labour turnover, and inefficiency.

Table 1.2: Number of Accidents in Construction Industry
(Source: Social Security Organization, 2000 – 2013)

Year	Male	Female	Total
2000	4456	417	4873
2001	4189	404	4593
2002	4588	427	5015
2003	4263	391	4654
2004	4048	397	4445
2005	4048	397	4445
2006	3390	296	3686
2007	3360	343	3703
2008	3374	364	3738
2009	3643	465	4108
2010	4076	589	4665
2011	4330	607	4937
2012	4536	641	5177
2013	5068	840	5908

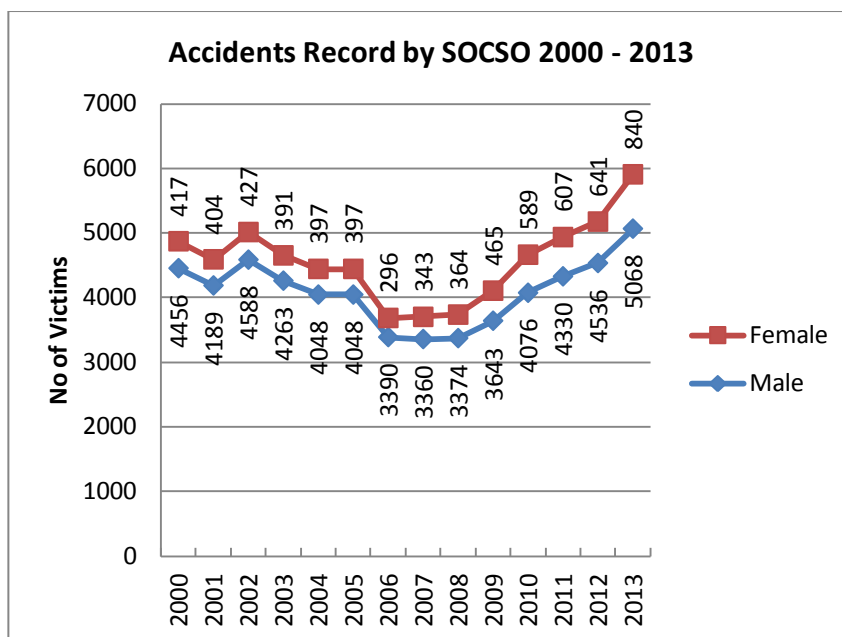


Figure 1.2: Number of Accidents in Construction Industry
(Source: Social Security Organization, 2000 – 2013)

To avoid this from continually happen, the safety at construction site must be improved to mitigate this problem. In order to improve safety and give a conducive working condition on construction site, procedures likes identifying the hazards, assessing the risks and controlling the risks should be carried out.

1.3 Aim and Objectives of Study

The aim of this study is to propose method to improve safety at Arm Forces construction site. To meet this aim, the following objectives have been identified:

- i. To study the hazard on construction site.
- ii. To identify safety management programs on construction site.
- iii. To propose procedure for safety improvement at Arm Forces construction site.

1.4 Scope

This study is focuses on hazards and safety management programs on Arm Forces construction site. For data collections, it based on questionnaire survey. The questionnaire distributed to the respondents likes client representative, contractor, architect, engineer, safety officer and project manager.

1.5 Significant of Study

The significance of this study will indirectly assist in reducing the number of accidents by eliminate the hazards. Besides, this study also will provide an enhancement regarding on the safety management programs on construction site.

1.6 Methodology of Study

To achieve an objective that has mention, some research procedure will be highlight to bring the important elements hence; the research can be done with smoothly. In this research process involves a 5 phases; preliminary study, literature review, data collection, data analysis & results and conclusion & recommendation as per flow chart in Figure 1.3.

1.6.1 Preliminary Study

The area of research, research topic, aim and objectives and also scope of the research were defined during the first phase of the research methodology.

1.6.2 Literature Review

Literature review was carried out to enhance the overall understanding of the research to obtain clear informations on selected objectives. References for further understanding of the research comprised of books, journals, articles in journals, paper of conferences and others.

1.6.3 Data Collection

In addition to information gathered in previous phase, during the third phase objectives of the research were studied through distribution of questionnaires and interviews. A total number of 50 questionnaires were distributed to the respondents which is construction workers who working in construction sites. Distribution and collection of questionnaires was done manually but only 35 questionnaires were returned.

1.6.4 Data Analysis & Results

After the data was obtained, they were analyzed using Statistical Packages for Social Science (SPSS), Risk Matrix (HIRARC) and Relative Importance Index (RII).

1.6.5 Conclusion & Recommendation

Based on analysis of data and discussion of results, conclusion and recommendation were established. The conclusion made is a summary of the objective that has been discussed. It covers the entire matter obtained from the research.

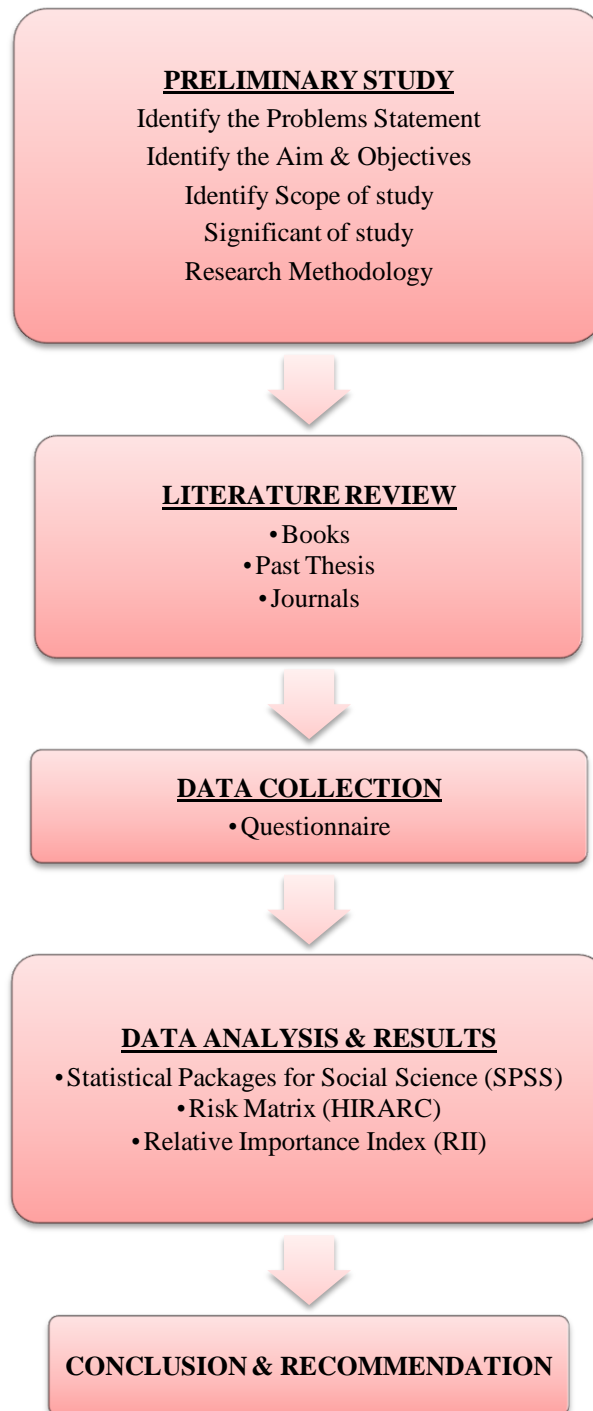


Figure 1.3: Flow Chart of Research Methodology

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