OCCUPATIONAL SAFETY AND HEALTH MANAGEMENT: POTENTIAL RISK OF ELECTRICAL HAZARD AT CONSTUCTION INDUSTRY

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Submitted in partial fulfilment of the requirements for the Bachelor of Technology Management majoring Innovation (Honours)

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JUNE 2016

APPROVAL

"I/ We admit was read this report and on my view this report is sufficient from scope and quality for purpose the certificate Bachelor of Technology Management majoring Innovation (Honours)"

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DECLARATION OF WORK

I, Siti Amira Binti Abu Bakar (I/C Number: 930715-14-5256)

"I hereby declare that the work of this exercise is mine except for the quotations and summaries that have been duly acknowledged."

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DEDICATION

All the praise to Amighty Allah, for bestowing me with the courage, knowledge, health and wisdom to carry out this research.

To:
Abu Bakar Bin Ismail and Hapsah Binti Omar
For a debt i can never repay

ACKNOWLEDGEMENT

ASSALAMMUALAIKUM W.B.T.

In completing this research, I am in great debt of a number of people. Completion of a study this kind and nature entails more than just my works alone. I wish to express my highest gratitude to everybody who helped me in completing this study.

First and for most, I would like to express my appreciation and gratitude to my supervisor, Encik Mukhiffun Bin Mukapit, for his guidance, support, assistance and understanding throughout in preparing this research. Appreciation is also extended to my panel, DR Haslinda Binti Musa for commitment and cooperation in fulfil this study.

My Gratitude al goes out to all parties that were willing to spend a few times to respond to answer my questionnaires and thank for those who give their guidance to complete this study in construction industry area. I would also to thanks all my friends for their insightful thoughts and support during the preparation of this study

Last but not least, I would like to thank to my family for their guidance, moral support and encouragement in order for me to successfully complete my study. This study would not have been successful if not for the people mentioned above.

ABSTRACT

Electrical hazard are one of construction accidents that occur in the construction industry. Electrical hazard exist in contact with exposed live parts, faults which could cause fire or explosion where an electrical fault is the source of ignition. This study aims to identify the potential risk of electrical hazard in construction industry. This research objective was to analyse the level of implementation of Occupational Safety and health regulation at construction industry, to identify potential risks of electrical hazard that could be occurred in construction industry and to identify the major risk of electrical hazard that will happen during using electrical equipment. The method of data collection for this research was gathered by primary data such as through questionnaires and secondary data through books and journals. This research has been conducted at Kuala Lumpur and Selangor where places that sector in construction industry and respondent of quantitative research are selected among contractor, safety officer, project manager, site supervisor that work at construction industry. This research uses a survey method which involved 100 respondents in answering the questionnaires. The data collected and then analysed using Statistical Package for Social Science (SPSS) for Windows version 20.0. This research also found three risks that are Shock Hazard, Arc-Blast Hazard, Flash Hazard (IV) and Potential Risk of Electrical Hazard in Construction Industry (DV). It is proved by data analysis using correlation and regression that shown the most significant factors was Flash Hazard followed by Arc-blast Hazard and Shock Hazard. Indirectly, this research has also achieved its three main objectives.

Keywords: Occupational Safety and Health, Shock Hazard, Arc-Blast Hazard, Flash Hazard, Electrical Hazard, Construction Industry, Potential Risk

ABSTRAK

Elektrik 'Hazard' adalah salah satu daripada kemalangan pembinaan yang berlaku di dalam industri pembinaan. Elektrik 'Hazard' wujud apabila terdapat dedahan terhadap 'live parts'elektrik, kesalahan yang boleh menyebabkan kebakaran atau letupan di mana kerosakan elektrik adalah sumber bahan letupan. Kajian ini bertujuan untuk mengenal pasti potensi risiko elektrik 'Hazard' dalam industri pembinaan. Objektif kajian adalah menganalisis tahap pelaksanaan Keselamatan dan kesihatan pekerjaan di industri pembinaan, mengenal pasti potensi risiko elektrik 'Hazard' yang akan berlaku dalam industri pembinaan dan mengenal pasti risiko utama elektrik 'Hazard' yang akan berlaku semasa menggunakan peralatan elektrik . Kaedah pengumpulan data bagi kajian ini dikumpulkan oleh data utama melalui soal selidik dan data sekunder melalui buku-buku dan jurnal. Kajian ini telah dijalankan di Kuala Lumpur dan Selangor di mana terdapat sektor industri pembinaan dan responden penyelidikan kuantitatif dipilih di kalangan kontraktor, pegawai keselamatan, pengurus projek, penyelia tapak yang bekerja di industri pembinaan. Kajian ini menggunakan kaedah tinjauan yang melibatkan 100 responden dalam menjawab soal selidik. Data yang dikumpulkan dan kemudian dianalisis dengan menggunakan Pakej Statistik untuk Sains Social (SPSS) versi 20.0. Kajian ini juga mengenal pasti tiga risiko iaitu 'Shock Hazard', 'Arc-Blast Hazard', 'Flash Hazard' (IV) dan 'Risiko Potensi Elektrik 'Hazard' dalam Industri Pembinaan' (DV). Kajian inin telah dibuktikan dengan menggunakan analisis data menggunakan korelasi dan regresi yang menunjukkan faktor-faktor paling ketara ialah 'Flash Hazard' diikuti oleh 'Arc-Blast Hazard' dan 'Shock Hazard'. Secara tidak langsung, kajian ini juga telah mencapai tiga objektif utama.

Kata Kunci: Keselamatan dan Kesihatan Pekerjaaan, „Shock hazard", „Arc-Blast Hazard", „Flash Hazard" , Elektrik „Hazard", Industri Pembinaan, Potensi Risiko

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CHAPTER 1

INTRODUCTION

1.1 Background of the study

Occupational Safety and Health (OSH) is concerned with preserving and protecting human and facility resources in the workplace (Friend and Khon, 2007). The field of OSH has undergone significant change over the past two decades. Some of these reasons are technological changes that have introduced new hazards in the workplace; proliferation of safety and health legislation and corresponding regulation; increased pressure for regulatory agencies; realisation by executives that workers in a safe and healthy workplace more productive; increased pressure from environmental groups; corporate social responsibility and increased pressure form labour organisations and employees in general (Goetsch, 2010, Reese, 2009).

Occupational Safety and Health (OSH) in Malaysia perspective is OSH provides encouraging environment to workers. Working environment must be safe and comfort for all workers to work. A safety working environment is the workplace has been assessed for hazards and the hazards are eliminated or controls have been implemented so that the company is able to operate safely (Sanjeev, 2005).

In construction industry, every construction organization should have a clear policy for the management of health and safety do that everybody associated with the organization is aware of its health and safety aims objectives. For a policy to be effective, it must be honoured in spirit as well as the letter. A good health and safety

policy will also enhance the performance of the organization in areas other than health and safety. It is important that each construction site throughout the organization is aware of the policy (Richard J. Coble, 1996).

The construction industry plays a big role in the development process of a country where successful development would contribute towards the economic growth generating additional demands for construction activities. It is undeniable that the construction industry is a very active and booming industry worldwide proceeding as one of the highest contributing industries towards the country‟s economy. 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 (A.Bakri, R.M. Zin, M.S. Misnan, A.H. Mohammed, 2006)

A hazard is source or potential source of human injury, ill health or disease (Comcare, 2005). Hazard also can be defined such as any source of potential damage, harm or adverse health effects on something or someone under certain condition at work. Basically, a hazard can cause harm or adverse effect to individual as health effect or to organizations as property or equipment losses.

Safety and health management system are designed with the purpose of ensuring the safety, health and welfare of workers at workplace and gives protection to workers from hazards. According to Social Security Organization (SOCSO) showing that Malaysia recorded a worrying increasing in the number of accidents at construction industry from year 1996 until 2008. In construction industry, there are big four hazards which is fall, Electrocution, Caught-in and Struck-by.

1.2 Problem Statement

According to Occupational Safety and Health Administration (OSHA) Electrocution is one of the greatest hazards on construction sites. Electrical accidents are proportionately severe and costly. Electrical hazards exist in contact with exposed live parts, faults which could cause fire or explosions where an electrical fault is the source of ignition. The dangers work using electricity equipment also is an accident hazards for example contact with overhead power lines and live circuit or poorly maintained extension cords.

Electrical injuries represent a serious workplace health and safety issue. Data from the Energy Commission indicate that there were nearly 264 fatal electrical injuries to workers in the Malaysia between 2002 and 2010. Energy Commission data also indicates that there were 318 non-fatal electrical injuries from 2002 through 2010, the most recent 8-year period for which data is available.

Researcher found out that this research is important to study the potential risk of electrical hazard that may occur at construction industry. Thus, in this study researcher had been recognize the type of major potential risk of electrical hazard that may occur at construction industry.

1.3 Research Question

It is found that there are many questions and problem related to the research title need to be answer. In fact, nowadays electrocution is one of the greatest hazards on the construction industry. Electrical hazards exist in contact with exposed live parts, faults which could cause fire or explosion where an electrical fault is the source of ignition. Although there are safety and health requirement and protection had been provided to all construction industry, however there are accidents reported that happen in construction industry. With this problem, a few questions have been made to solve the issues.

i. What is the level of implementation of Occupational Safety and Health (OSH) regulation at construction industry?
ii. What is the potential risk of electrical hazard that could be occurred in construction industry?
iii. What are the major risks of electrical hazard that will happen during using electrical equipment?

1.4 Research Objective

Three specific objectives have been simplified of this study. There are:

i. To analyse the level of implementation of Occupational Safety and Health (OSH) regulation at construction industry
ii. To identify potential risks of electrical hazard that could be occurred in construction industry
iii. To identify the major risk of electrical hazard that will happen during using electrical equipment.

1.5 Scope

The scope of the research is focused on potential risk of electrical hazards in construction industry which is researcher had make observation and collects data to verify their claim on the potential risks. The researcher also had analysed which potential risk that could be occurred.

1.6 Limitation

In the course of this study, there are several difficulties and problems faced by the researcher. Some problems could be solve and while some not. Yet, researcher needs to be patient and bold to get through all the difficulties and come out with this study. The limitations include:

1.6.1 Time Constraints

As of time constraints, the researcher could not give full concentration and could not explore more to get extensive and in depth information. Even if the researcher was given sufficient time, due to other obligation, some aspect that should have be position in this study were excluded.

1.6.2 Financial Problem

Money is undeniably crucial. Thus, in order to have a good research project, the researcher had been investing some money to the project. This is due that in conducting a research, certain allocation of money need to be use in order to travel for data gathering process.

1.7 Flow of research

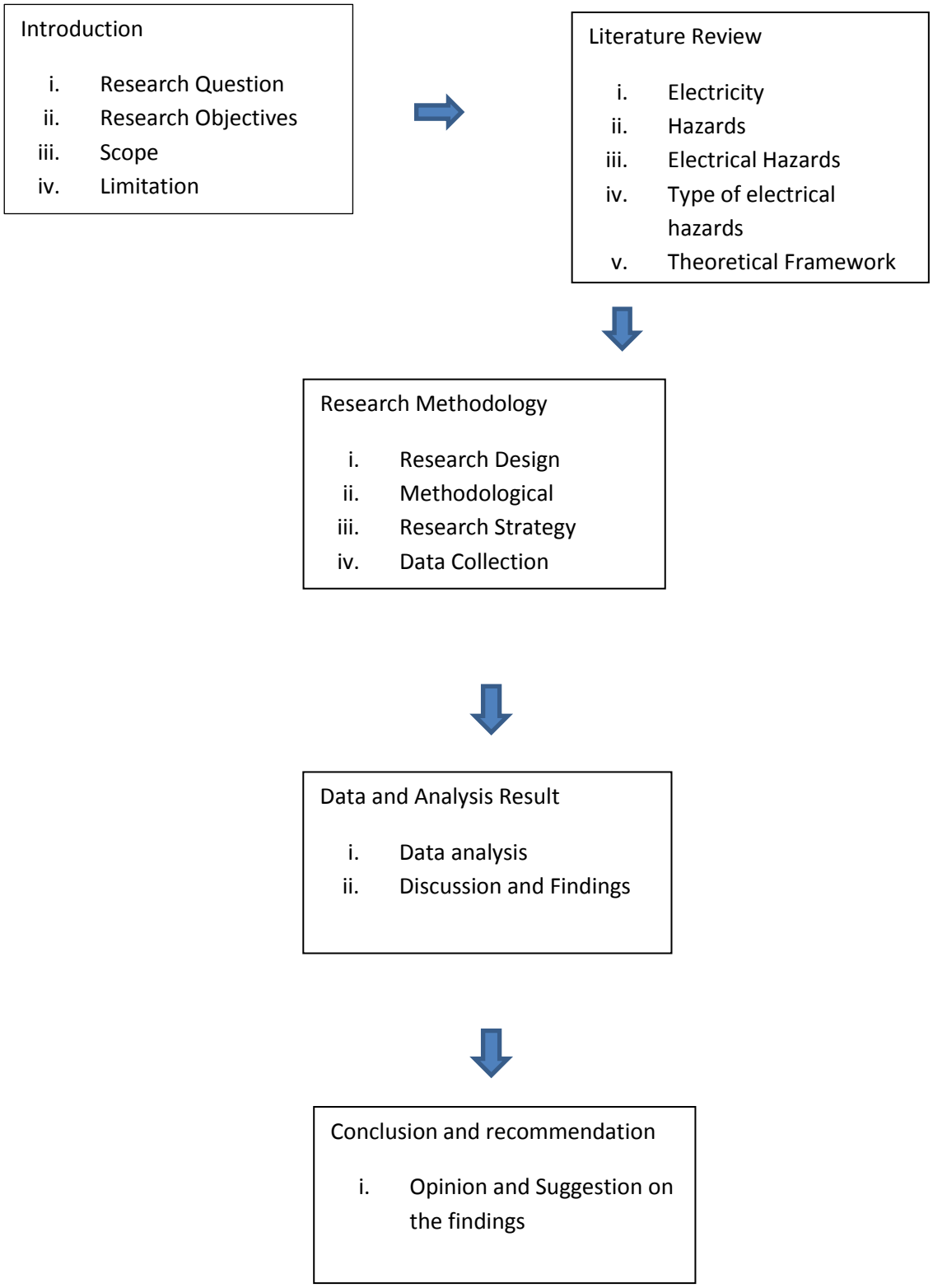

Figure 1.1 Flow of Research

1.8 Summary

In conclusion, this chapter provides the background research of the Occupational safety and health and potential risk of electrical hazard in construction industry. This had facilitated researcher to pursue and more focused during the process of the research study. On the other hand, this chapter describe the objectives, scope and importance of the study to receive prerequisites of this research. To find out Occupational safety and health and potential risk of electrical hazard in construction industry, it will be reported in the following chapter.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter discussed about the literature review use throughout the research. The researcher begins this chapter by reviewing some journals, books and articles as well as gathered internet sources. At the end of this chapter, the researcher would be able to construct a theoretical framework which containing the summarization of this chapter.

2.2 Occupational Safety and Health

According to DOSH (2006), Occupational safety and Health Act (OSHA) were enforced in Malaysia on 25th February 1994 with the intent to ensure safety, health and welfare of all persons at all places of work. The Act also provides for consultative process at the policy level with establishment of Nation Council for Occupational Safety and Health.

Occupational Safety and Health is traditional way to deal with legislation, regulation, standards, safety guidelines, accident investigations and safety inspections which provide information on causes of accidents amongst particular groups of employees (Tatiya, 2011).

Another definition of “ occupational safety and health (OSH)” in respect of a “ place of work” or “ person at work” is , the “ state of being safe “ or “ the absence of factors that could lead to accidents, injuries or interruptions to work” Occupational Safety and Health Act (OSHA) is an act to make further provisions for securing the safety, health and welfare of persons at work, for protecting others against risks to safety or health in connection with the activities of persons at work, to establish the National Council for Occupational Safety and Health, and for matters connected therewith (Alwi, 2011).

2.3 Electricity

Electricity is essential to modern life, both at home and on the job workplace. Working with electricity can be dangerous. Engineers, electricians, and other professionals work with electricity directly, including working on overhead lines, cable harnesses, and circuit assemblies. Others, such as office workers and sales people, work with electricity indirectly and may also be exposed to electrical hazards (Reese. Charles M, 2008).

According to Canada Centre of Occupational Safety and Health (2015), electricity can be either "static" or "dynamic." Dynamic electricity is the uniform motion of electrons through a conductor and this is known as electric current. Conductors are materials that allow the movement of electricity through it. Most metals are conductors. The human body is also a conductor. Static electricity is accumulation of charge on surfaces as a result of contact and friction with another surface. This contact or friction causes an accumulation of electrons on one surface, and a deficiency of electrons on the other surface. All electrical systems have the potential to cause harm (Jaya Chandran, 2015).

Electricity has long been recognized as a serious workplace hazard, exposing employees to electric shock, electrocution, burns, fires and explosions (Reese. Charles M, 2008). According to Energy Commission, 273 workers died from electrocution at workplace cases had been report in between 2002 – 2010. In 2012,

According to Department of Occupational Safety and Health (DOSH) state that statistic from the department in Sabah showed that two construction workers deaths reported had been killed while at work involved accidents by electrocution (Borneopost, 2013).

2.4 Hazard

According to National Safety Council (Abdelhamid & Howell, 2005), a hazard is an unsafe condition or activity that, if left uncontrolled, can contribute to an accident. Hazards that are not identified during the evaluation process may not have adequate controls in place; this may pose severe threat to both safety of workers and the environment. Thus, it is critical to execute an organized effort to identify and evaluate processes and activities for potential hazards. Such informal and formal methods provide valuable information to improve safety and manage operational risks (Albert, Hallowell, Kleiner, 2014)

Potential hazards are identified based on the knowledge of operations and past experience with similar work tasks. In addition, management is to provide workers with adequate training to recognize hazards in the workplace, thus allowing them to behave safely and make safety-conscious decisions Although such formalized hazard recognition methods are commonly employed in other industries (Abdelgawad & Faye, 2012), they are generally unsuitable for construction because of the lack of standardization of tasks and the inherent dynamic nature of construction projects (Spellman, 1998).

In the construction industry, a severe hazard management process usually involves the review of project scope documents, schedules and other relevant documentation to define construction tasks. Then, potential hazards related to the individual tasks and associated behaviours are identified and a risk assessment is conducted (MacCollum, 2006).