

SAFETY IMPROVEMENT AT SHIPYARD PRACTICE

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In the Name of Allah, the Beneficent, the Merciful
“To my beloved husband, daughter, parents and siblings”

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In the Name of Allah, the Beneficent, the Merciful

I'm really grateful and thankful to Allah the Almighty for giving me the courage and determination, as well as guidance in conducting this project, despite all difficulties. My full dependency is just on Him.

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ABSTRACT

The main purpose of this study is to identify the major occupational accidents at shipyard. The respondents for this study are 25 technical workers from Malaysia Marine & Heavy Engineering Sdn Bhd, a heavy industry company which is located at Pasir Gudang Johor. A set of questionnaire that consist of three sections namely section A (Demographic), section B (factor to occupational accidents) and section C (compliance of safety precautions). After that, the data is analysed by using descriptive analysis (mean and percentage) and Relative Importance Index (RII). The results of the study present that the major occupational accidents among the workers is identified. Besides, the factor that contribute to the occupational accidents is also identified. Therefore, some recommendations are pointed out in this study to minimizing the occupational accidents among technical workers in MMHE and further researchers.

ABSTRAK

Kajian ini dijalankan bertujuan untuk mengenalpasti kemalangan yang sering terjadi semasa melakukan kerja-kerja. Seramai 25 orang pekerja teknikal daripada Malaysia Marine and Heavy Industry iaitu sebuah syarikat industri berat yang terletak di Pasir Gudang, Johor telah dipilih sebagai responden dalam kajian ini. Satu set borang soal selidik yang terdiri daripada tiga bahagian iaitu bahagian A (Demografi), bahagian B (punca kemalangan di tempat kerja) dan bahagian C (kepatuhan dalam melaksanakan langkah-langkah keselamatan). Selepas itu, data yang dikumpul di analisa menggunakan statistik deskriptif (purata dan peratus), dan kepentingan indeks relatif. Dapatan kajian mendapati bahawa tahap keselamatan dalam kalangan pekerja adalah baik. Selain daripada itu, kajian juga mendapati terdapat beberapa kemalangan telah terjadi semasa pekerja melakukan kerja walaupun pekerja-pekerja telah didedahkan tentang pengetahuan keselamatan dan telah menjalani latihan yang kengkap berkaitan keselamatan. Selain daripada itu, kajian telah mengenalpasti beberapa punca kemalangan. Oleh kerana itu, dalam kajian ini juga, beberapa cadangan telah dikemukakan untuk meminimumkan kadar kemalangan semasa melakukan kerja-kerja dalam kalangan pekerja MMHE dan pengkaji akan datang.

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LIST OF ABBREVIATIONS

MMHE	-	Malaysia Marine and Heavy Engineering
MRBU	-	Marine Repair Business Unit
OBU	-	Offshore Business Unit
OSHA	-	Occupational Safety and Health Act
SPSS	-	Statistical Package for Social Science

LIST OF SYMBOLS

%	-	Percentage
N	-	Frequency
α	-	Alpha

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Shipbuilding is an expensive business which contributes huge positive effects for the country. This industry produces singular product, with long period of construction. Besides, it is an extremely complex business which means quite complicated task has to be done in parallel. This industry also become an attractive and regarded as a backbone industry for many countries in the world. Higher demand in production address in rapid growth of shipyards. In shipyard, mostly all the tasks are heavy duty task. Because of that, a sufficient space must be provided by the shipyard for the storage of the huge amounts of material an equipment. The handling and processing of steel through the production processes requires a great amount of facilities and space in shipyard. After the steel plates have been received by the supplier, they need to inspected and stored, blasted, primed, cut to shape, formed to proper design and welded to going through the assembly process. The assembly procedure is made up of panel fabrication, block assembly, pre-outfitting, grand assembly, pipe routing, air conditioning, electrical cable fitting, surface preparation and coatings (Celebi, 2015).

In addition to that, the time between order and delivery of the product must be strict in time. So, all the above mentioned tasks should be performed in a smooth manner. Besides, in Malaysia's shipyards, some parts of the work are being subcontracted on almost all projects. Therefore, most of the workers at each shipyard come from several different vendors and companies. As the result, the organization

problem more complicated, and if these resulting problems cannot be solved, the safety of work and health may be affected negatively.

Carelessness of the workers, insufficient safety training and lack of education, unawareness of cost of accidents, erroneous series of human operation, and inadequate work site environment remain the roots for occupational accidents. This occupational accidents are followed by cost; namely, injury, fatality, material or environmental damages. Common causes of occupational accidents are high elevation, toxic, flammable and explosive materials, fire, moving machinery, dangerous gases, work on close to haphazard established heavy structure, misuse or failure equipment, poor ergonomics, untidiness, poor illumination , exposure to general hazards including electricity, and inadequate protective clothing (Celebi, 2015). Therefore, safety in shipyard is a very important aspect of the entire job profile of shipyard workers in order to achieve the best possible safety not only to the subcontractors, but should be share with all parties.

1.2 Problem Statement

Malaysia Marine and Heavy Engineering Sdn. Bhd (MMHE) is a leading company in marine and heavy engineering services in Malaysia which focuses on engineering and construction, marine repair and marine conversion (www.mhb.com.my). Established in 1973 under its original name, Malaysia Shipyard and Engineering Sdn. Bhd (MSE), MMHE started its first ship repair business in 1976. After two years, MMHE strengthen their business which involved in engineering and construction when MMHE first fabricated oil and gas structure and built their first ship in 1980. Throughout the years, many projects related to ship repair, ship conversion and ship building has been done by this company.

MMHE is located at Pasir Gudang industrial area in the state of Johor. In MMHE, there are two main businesses in MMHE which are Offshore Business Unit (OBU) which includes Engineering and Construction and Marine Repair Business Unit (MRBU) which includes marine repair and marine conversion. The OBU is

related to building new buildings and offshore facilities which include engineering design and procurement to construction, installation, hook up and commissioning. Usually, the engineering and construction division will collaborate in long term project which might take more than a month to complete. On the other hand, MRBU focus more on short term projects which involve ship repairing and ship converting. For the time being, MMHE has about 2210 permanent manpower from both divisions.

Regarding safety, MMHE has employed a slogan to the safety department which is '*Hand in hand, nobody gets hurt*'. It has been set up to increase practice of safety commitment and compliance and subsequently to prevent dangerous occurrence and injury within MMHE operations. In addition, it also encourage all the workers in achieving the quality of work. It shows that safety is important to the company in order to achieve the goal as they emphasized it to all their employees through the slogan.

Safety is a major concern to this company where company's mission is '*we conduct all our activities in a manner that safeguards health, safety and the environment*'. As far as safety is concerned, accidents still happen. For example, on January 2012, one ship (KD Mutiara) located at MMHE shipyard for repair is burnt and the ship is totally lost. Even though there are no injuries reported but it has given bad reputation to the level of safety in MMHE. Earlier, in 2001, there was one major accident that killed 9 MMHE employees due to flash fire on ship when they were doing piping work. It was concluded that the accidents was triggered by human mistakes. The factor is the employee did not comply with the safety procedure when doing hot work (Bernama, 2001). These findings show that probably there was low level of safety behaviour in MMHE. It is supported by Williams (2005) , who cited that most of the workplace accidents are caused by the behaviour of the employees and currently safety behaviour is found to be new way to reduce workplace accidents (Montante, 2008). Therefore, it is necessary to examine whether the employees in MMHE comply and participate with the safety to enhance the level of safety behaviour in their workplace.

Accidents and injuries at the workplace can be reduced if employer and employee work together. Employer must play their important role in order to set up and provide and maintain safe workplace and system of work to the employees. Khairul Fadzri (2015) said, employees must reasonable care for safety and health of him and others too. Besides, employees must be cooperating with employer and superior to make sure all condition are safe to do works and operations. Occupational Safety and Health Administration (OSHA) has stated that it is the responsibility of an employer to provide employees with a workplace that is reasonably safe and pleasant and implored and ask employees to take action against employers who expose them to unsafe environment or condition.

According to Hapriza (2004), accidents cases are improved and safety concerns have been one of the major agenda in many organizations. As far as the accident is concerned, the management of MMHE always plans to organize and conduct safety activities at the shipyard (Fauzi, 2009). However, the question now is how far the safety activities can help to improve the level of safety performance in the workplace.

1.3 Aim and Objectives of Study

The aim of this study is to propose recommendation procedures to improve safety at shipyard. To meet this aim, the following objectives have been identified:

- i. To identify the major accidents on shipyard
- ii. To identify the factors of the major accidents on shipyard
- iii. To propose recommendations procedures to improve safety at shipyard

1.4 Scope of Project

This research highlights in safety behavior towards safety performance in a heavy engineering sector. The scope of research focused on workers in Malaysia Marine and Heavy Engineering, a company that has been rapidly growing for the past two years (The Star, 2010). Besides, this study focused on technical workers as respondents because they are highly involved with the high risk job (Mearns, Whitaker, & Flin, 2003) in order to identify the major occupational accidents occurred at their workplace based on their experience.

In addition, the scope of this project include of identifying the factors which contribute to the accident and give recommendations procedures for safety improvement. It is the company decision to or not to implement the proposed improvements. For data collections, it based on questionnaire survey.

1.5 Limitation of the Study

Although the term 'shipyard' generally includes both shipbuilding companies and ship repair companies, this study restricted to shipbuilding companies, and further, to those shipbuilding companies that can build large and oceangoing ships. Ship repair may share some of the same facilities, and personnel as shipbuilding field, but the production process is very different. In this research, there were few limitations to be considered. Firstly, this research was conducted only in one company and one industry. Therefore, the results may not be generalized to other companies or industries. Secondly, there are limited past research about safety improvement in heavy industries that the researcher can refer to. Lastly, this study employed quantitative method where the respondents will answer the questionnaire on their own and send back to the researcher. Therefore, honesty and cooperation from respondents in giving feedback and answering the survey is also another limitations. In addition, the outcome of this research is relevant to the present but cannot justified in the future. However, the outcome of the research can be used by others for new research.

1.6 Significant of Study

The benefits from this research are hoped to contribute to organizational, employees and academic arena includes for future research.

This research can be used as an additional scholarly resource that will give benefit to everyone in academic arena. It is hope that it can give extra information to the future researchers in strengthen their knowledge. Furthermore, this research also can be used as reference to help students, academicians, and other researchers to do research about safety improvement in related industry since there is not much research has been done in this field especially in our country, Malaysia. Moreover, this study will indirectly assist in reducing the number of accidents by recommend safety procedures to safety improvement at shipyard.

1.7 Methodology of Study

To achieve an objective that has been mention, some research process will be highlight to bring the important element hence; the research can be done smoothly. 5 phases needed to complete this research, which are preliminary study, literature review, data collection, data analysis & results and conclusion & recommendation as flow chart shown in Figure 1.1.

1.7.1 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.

1.7.2 Literature Review

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

1.7.3 Data Collection and Analysis

In addition to information gathered in previous phase, during the third phase, objectives of the research were studied through distribution of questionnaire form and pilot study. A total number of 25 respondents which is technical workers who working in shipyard. Distribution and collection of questionnaire was done manually but only 25 questionnaires were returned. After the data obtained, the result computed with percentages and represent in graphs and tables and Statistical Packages for Social Science (SPSS) were chosen as a tool to interpret gained data.

1.7.4 Conclusion and 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.

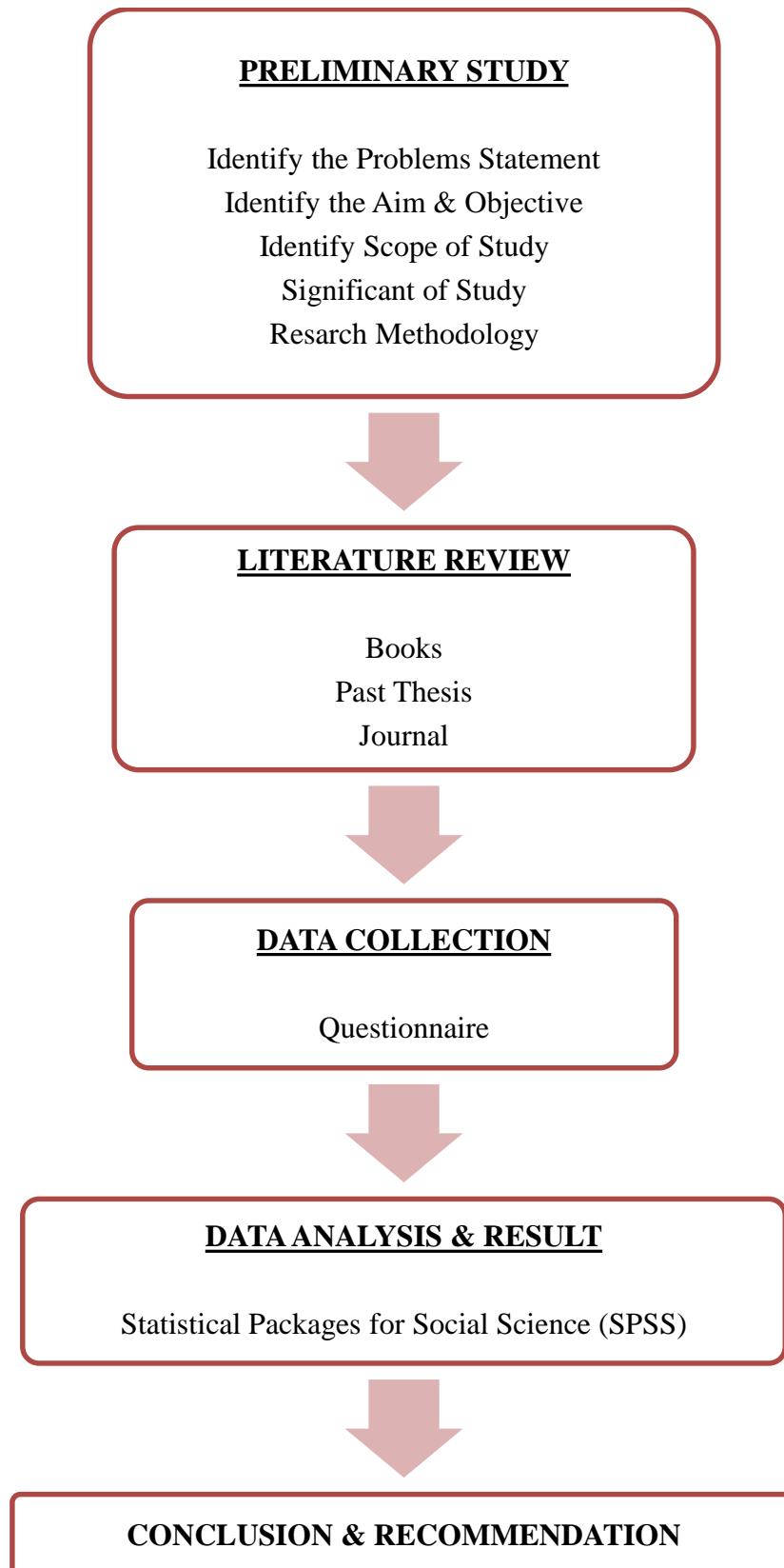


Figure 1.1: Flow Chart of Research Methodology

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