A STUDY ON BASIC HEALTH AND SAFETY KNOWLEDGE THAT INFLUENCE THE SAFETY AT MARITIME 'A CASE STUDY OF DD & I ENGINEERING SDN BHD'

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ABSTRACT

Safety must be considered for all level of employee. The human life depends and responsible on the safety level at work place. Any safety issues are crucial to all established company.This study was conduct in DD & I Engineering Sdn. Bhd., a subcontractor company for Malaysia Marine and Heavy Engineering Sdn. Bhd. (MMHE), which deals with the heavy work focusing on maritime. The company located at Pasir Gudang, Johor and established since 2001. The core business of the company are constructions with its core competencies in marine engineering that include blasting, painting, hydro jetting, power tooling, cleaning, mucking-out sludge, dislodging, disloping, valve, piping, main engines services, boiler, generator, cooling system, pump, navigation, underwater works and repair, maintenance and services of all kind of works pertaining of marine, ship and vessel. This study is to identify the relationship between health and safety knowledge towards the safety at maritime. The researcher chooses five basic health and safety knowledge as independent variable which are fire, manual handling, noise and vibration, safety signs and general health and safety. The questionnaires were distributed to the respondent as a method of data collection. These knowledge generally will influence the safety performance at maritime, but through the survey that have been conducted, it have the different result from the expectation. At the end of this study, the researcher recommends several recommendation in order to improve the safety performance at maritime. Hopefully, this study can be the guideline to maintain the safety level at work place.

Keyword : health, safety, fire, manual handling, noise and vibration, safety signs, general health and safety.

INTRODUCTION

The main objective of the study is to identify the basic health and safety knowledge that influences the safety at maritime.

BACKGROUND OF COMPANY

DD & I ENGINEERING SDN BHD was incorporated on 20th November 2001 as a private limited company with its registered address at 58-B Jalan Kiambang, Off Jalan Besar, 81750 Masai, Johor Bahru, Johor and its place of business is located at 1 & 2 Bazaar Masai, Jalan Bayan, 81750 Masai, Johor Bahru, Johor.The principle activity of

the company related to constructions with its core competencies in marine engineering which includes blasting, painting, hydro jetting, power tooling, cleaning, mucking-out sludge, dislodging, disloping, valve, piping, main engines services, boiler, generator, cooling system, pump, navigation, underwater works and repair, maintenance and services of all kind of works pertaining of marine, ship and vessel. In order to meet the current market demands, the company has expanded its peripheral activities to carry on business of civil and mechanical engineering which includes building, constructing, maintaining, altering, enlarging, managing and controlling any building, bridge, tunnel, highway, ways, tramways, piling, landscaping and others that related to the core business.

DD & I ENGINEERING SDN BHD at the moment is selective key subcontractors through Malaysia Marine & Heavy Engineering Sdn Bhd (MMHE) Pasir Gudang Capability Building Initiative (ñCBIò) program which specialist in blasting and painting services. At DD & I ENGINEERING SDN BHD, our philosophy is to ensure that every work done is always maintained at all levels in order to meet our clientôs requirements. We believes that the quality of work and productivity is via its human assets and to this end, we provide in-house training in updating of skills required for staff to perform their functions effectively.

The service that provided by DD & I ENGINERING SDN BHD engaged in providing civil construction services such as building construction, structural construction, road construction services, piling construction, repair and maintenance of buildings. The works include all the plumbing, landscaping, electrical and other works.

The work is done by our experienced supervisors, plumbers, electrician and masons. With deep work experience and knowledge, we promise to offer the best services to clientôs at the most competitive prices.

BACKGROUND OF STUDY

Workplace health and safety (H&S) is about the physical and mental well-being of people at work (Hughes and Ferret, 2003). In practical terms, it embraces proactive management ï identification, mitigation, removal ï of workplace hazards (HSE, 2003a), as a means of striving to maintain that well-being. Hazards are often conveniently categorized into subjects, some examples of which include: asbestos, fire, confined spaces, manual handling, falls from height, noise, vibration and stress (HSE, 2006a; CITB, 2006a).

The solution need to find out in order to improve the safety level at workplace. The factors that lead to accident must be identify first to become the foundation for further research.

This study cover the aspect of safety at maritime. The area of study only about the basic safety and health knowledge that has been affected the safety level at ship yard. The

rational of this research is to achieve the goal of company which is achieving zero accident at workplace. Itôs to prove that the knowledge about safety and health is important to maintain the safety level at maritime.

The study is focus on the DD & I Engineering Sdn. Bhd. It is to measure the basic safety and health knowledge that effect the safety at maritime that related to this research. This company is one of the shipping companies that work as sub contractor at Malaysia Marine and Heavy Engineering (MMHE) that have doing the heavy and dangerous job. So, the safety is important here more than other place.

SCOPE OF STUDY

Where – where is the place of this study was conducted in order to collect the data. The study was conduct at the DD & I Engineering that located at Pasir Gudang, Johor.
When – when is the duration and period of this study was conducted. This study was conducted in June 2009 to October 2009.
Who – it is refer to the sampling population that may become the respondent of this study. It consists of the employee in the company itself, clients, visitor and other people that related to the company and expose to the risk.
What – is referring to the study that was conducted**.** Focusing on the basic health and safety knowledge that influence the safety at maritime.
How – is the way of this study was conducted. This Survey was using questionnaires.

PROBLEM STATEMENT

Safety is important in the all organization. All parties have the responsibilities towards the safety at their place. Safety not only at the work place but also include at the home, road, playground, shopping complex and soon. The entire places have the risk to accident happen.

The shipyard is the place where heavy job are done. It means that the more heavy the job, large risk has been faced up. Through the proper safety management and knowledge, safety at maritime can be improve. The number of accident happen also can be reducing. There have many factors that contribute to the accident happen. The important factor should be identified first before the action can be taken. The relation between the factors towards the accident will be study by using the research tool.

In this study there have five basic health and safety knowledge that need to be study which are fire, manual handling, noise and vibration, safety signs and general health and safety. The solution will help the organization to maintain their reputation and also can save the human life.

The question is what the basic knowledge that lead to the accident happen in the maritime. This study has recently focused on the identification of basic health and safety knowledge that will effect to the safety of maritime. In this organization itself, knowledge about the safety is become the ticket to enter the organization.

Safety at maritime is different from safety at other place. There have the special safety rules and regulation for maritime. Knowledge about safety is important among the worker that working at ship yard. Without the good knowledge, it will cause the accident and death soon. Even the employees have the knowledge about safety, accident still happen in the organization. From the observation for three month, there have 3 minor accidents that occur in the organization (June, July, and August 2009). Study is to identify the basic safety and health knowledge that have influence the safety at maritime.

RESEARCH OBJECTIVES

- To identify the influence of fire towards safety at the maritime.
- To identify the influence of manual handling towards the safety at maritime.
- To identify the influence of noise and vibration towards the safety at maritime.
- To identify the influence of safety sign towards the safety at maritime.
- To identify the influence of General H&S towards the safety at maritime.

RESEARCH QUESTIONS

- Is there any relationship between fire towards the safety at maritime.
- Is there any relationship between the manual handling with the safety at maritime.
- Is there any relationship between noise and vibration towards the safety at maritime.
- Is there any significant between the safety sign with safety at maritime.
- Is there any relationship between The General H&S with safety at maritime.

SIGNIFICANT OF STUDY

Upon completing this research, it highlights a few significance of the study and they are as follows:

- Safety at the maritime
  In this study, several consideration will be examine in order to improve the safety at maritime. Safety is important in order to protect the people around there from the hazard that may happen. Through this research, proper action will be taken too safe the human life. Itôs to maintain the reputation of the company and achieve their mission. The mission of safety is to avoid accident from happen.

- People welfare
  With this study, it will help to improve the people welfare. People here mean the employers, employees, clients, visitor, and other people at the place. Itôs important to take care of their welfare because they are the key person that contributes to the company profit. It also to ensure that they no accidents happen that leads to direct and indirect cost that burden to the company and the person it.

LIMITATION OF RESEARCH

Suitable for heavy engineering only
This research is suitable for the maritime only. The data that have been collected are based on the safety at maritime. This research not suitable to applies at the retail industry, medical industry and other industry that not related with the heavy engineering.

Time Constraint
The finding can be change as change of the situation. The result of this study is suitable for the duration June until December. The finding has been change due to the improvement make by the organization. The consideration take by the management will influence the result in this study.

Information
The finding of this study only can be applies in the heavy engineering industry only. The information cannot distribute to other industry because is information only limit within the maritime. The finding is not same if the study conduct in different industry or field.

EXPECTED CONTRIBUTION

To the individual
This research enables the individual to gain the knowledge and at the same also help the other people. Beside that it also helps the individual to take the right action when the emergency happens. This research also gives the basic foundation to the individual to have the responsibility to take care of it and other people around them.

To the organization
This research will help the organization to improve their performance better than before. It also can maintain their reputation with zero accident. Then, the organization indirectly will attract the customer to receive their service at the best level.

To the nation

This research can give the benefit for the nation. It will help the nation to maintain the safety level at the highest level and main the nation image. Through the good level of safety, the investor from other country confidence to invest in our nation.

DEFINITION OF TERMS

- Safety
  - Is absent of danger (Sariwati, 2007).
- Danger
  - Exposure to a hazard (Sariwati, 2007).
- Hazards
  ï Anything with the potential to cause harm or damage. A sources or a situation with a potential harm in terms of human injury or ill health, damage to property, damage to the environment or a combination (Sariwati, 2007).
- Risk
  ï The chance or probability of harm would like to occur (Sariwati, 2007).
- Health
  ï The state of physical, socially, mentally well being of worker or an employee (Sariwati, 2007).
- Accident
  ï Something that is unplanned, uncontrolled and undesirable (Sariwati, 2007).

- Fire
  ï Is the visible heat energy being release from rapid oxidation of a fuel. Fire is the chemical reaction between flammable or combustible substance and oxygen (Sariwati, 2007).

In this chapter, a brief understanding is formed in order to highlight the purpose of this research and as well as the significant of the research. The degree of necessity of this research is highlighted through problem statements, which in ability demonstrate the important of this research. We can clearly understand the problem about the safety that has been ignored by most people.

LITERATURE REVIEW

The research has five independent which is fire, manual handling, noise and vibration, safety signs, and general H&S. this literature review are to find the proof about the relationship between independent variable towards the dependent variable.

SAFETY AT MARITIME

According to Wang (2000), as the public concern regarding offshore safety increases and the cost and complexity of offshore installations increase, more and more effort has been directed to offshore safety studies. This may encourage offshore safety analysts to develop and employ novel safety assessment and decision-making approaches, and to make more efforts to deal with offshore safety problems. A top-down safety assessment of an offshore system starts with the identification of the top events which may be obtained from previous accidents and incident reports of similar systems. Once the top events required to be studied further are determined, the causes leading to them can be identified deductively in an increasing detail until all the causes are identified at the required level of resolution.

Based on M. Goulielmos and A. Goulielmos (2005), the captain is responsible for the safety of the ship and of every one on board.

Goulielmos and Tzannatos(1997) said that all these problems became critical from a shipping safety point of view because the technologically achieved accumulation of many shipboard tasks in a crew-depleted bridge established the operator-bridge interface as the most important factor of operational safety, i.e. the most dominant aspect of shipping safety. Taking into account the dominance of the human factor in shipping accidents, the success of the tasks which are critical from a shipping safety point of view depends on the operatorôs ability to respond with competence and confidence where and when it is required. In terms of shipping safety, long-term decision making is compatible with the management of risks in shipping operations, where technological, economic, environmental and sociopolitical factors must be considered.

Refer to the Zekos (2000), the competent authorities must be informed of any deficiency potentially dangerous to the safety of shipping and to the marine environment. The Council reaffirms its intention to improve maritime safety and to contribute to the prevention of maritime pollution in the seas surrounding the community through the development and implementation of international standards concerning ships, personnel and navigation procedures and through the development of navigation infrastructures and emergency facilities.

FIRE

According to Edwards and Holt (2008), fire is a particular hazard associated with hot works such as built-up felt roofing, asphalt membranes and soldered plumbing installations; Refer to the Cooper and Cotton (2000), to train firefighters to understand and experience various aspects of fire behavior, necessarily involves exposing trainees and their instructors to a degree of danger. Technological development, is the use of specialized training facilities that allow firefighters to experience the very dangerous fire behavior phenomenon known as ``flashoverôô Highly flammable ``slugs" of liquid petroleum gas (a propane and butane mixture) can be injected into compartment fires - housed within specially constructed training facilities - to recreate flashover conditions.

Fire fighters must be able to work safely at heights. It is reasonably practicable (and highly desirable in most other situations) when working at heights to provide edge protection, perhaps in the form of a handrail.

Typical hazards include a reduction in the stability of the storage vessel, a fire in the offshore platform, loss of safety refuge in the platform (Wang, 2000).
Adebiyi, Jekayinfa, and Charles-Owaba (2005) have been stated that, the common causes of accidents are identified as: disobeying safety rules, inexperience of personnel, faulty equipment, fire outbreak, risky operation, cutting corners, malfunctioning equipment, human error and skid. Accident prevention activities being practiced are good manufacturing practice, standard operating procedure, good house keeping, fire/smoke detector, on-the-job training on safety, fighting team, guarding and provision of safety handbook and policy.

Beard and Santos-Reyes (1999) said that, a fire safety management system (FSMS) for an oil and gas organization has been created based on a systemic approach. The approach adopted has assumed the existence of a necessary and sufficient systemic set of five inter-related systems, which should enable an oil and gas organization to maintain an acceptable level of fire risk throughout its life cycle. The FSMS that has been presented here elucidates an alternative way of managing fire safety offshore. The general approach may be applied in a similar way to safety in general and to any organization.

Based on Subramaniam (2004), he stated that, availability of fire fighting resources, fire policies and having the required skills in fire fighting would enhance self-protective behavior. The third important element is the knowledge about fire safety. This knowledge will enable them to understand the characteristics of fire, the components of fire, the preferred condition, and the consequences of a fire outbreak situation and the correct method of extinguishing the fire.

MANUAL HANDLING

According to the Edwards and Holt (2008), they have mention that manual handling is characteristic of the industryôs inherent physical nature. Manual handling is including loads, lifting, carrying, placing and handling aids. Both these sub-samples demonstrated greatest knowledge in ñgeneral H&Sò and least knowledge in ñmanual handlingò; so the above discussion on this observed relationship equally applies here. Worth mention here also, is the fact that avoidance of injury from manual handling and minimal exposure to either noise and/or vibration in formative working years, can significantly reduce the probability of ill-health from these hazards in later life.

Refer to Goulielmos and Tzannatos (1997), they stated that, as shipping and associated operation activities increase in complexity and size, the need for efficient handling and transfer of information likewise increases for all the operations performed at and between ship and shore, owners and authorities.

Goulielmos and Anastasakos (2005) mentioned that the communication underlined the fact that the European Unionôs maritime logistics system ï including sea-borne freight transport, ports and port handling services ï contributed to over two thirds of the total trade between the Community and the rest of the world. It is therefore important that maritime transport security should be enhanced, and its ñcompetitivenessò maintained, while facilitating trade.

This statement mentioned by Zekos (2000), any vessel in advance of entering should give general information on the nature and quantity of cargo and where chemicals are being transported information on whether or not the vessel is in possession of a certificate stating that it is a new vessel under the terms of the IMCO Code for the construction and equipment of ships carrying dangerous chemicals in bulk. The whole process which has to be followed is described in the directive as well which does not mean that it will be followed harmoniously by its implementation within the national legal systems of the member states. Important fact is that any member state should take whether measures are appropriate to inform another member state concerned when it has been informed of facts which involve or increase the risk for this member state of a hazard being posed to certain maritime and coastal zones.

It based on Omogoroye and Oke (2007), some important consideration includes the wearing of helmets and proper handling of tools. Also, the procedures for production of crude oil have to be strictly adhered to. The maintenance of facilities also has procedures that should be followed.

According to Paixao and marlow (2003), Ports have been defined as areas made up of infra and superstructures capable of receiving ships and other modes of transport, handling their cargo from ship to shore and vice-versa and capable of providing logistics services that create value-added. Ports can develop several value-adding roles such as transport consolidation, product mixing, or cross-docking activities alongside their basic operations of cargo handling and storage. It is the capacity that port equipment has in handling different types of cargo, which, in some cases is difficult because of the overspecialization of ships taking place during recent years.
The storage and handling of all products at the division's depots and during transport of products from depot to customer were controlled by strict rule-based compliance requirements using competent drivers, who were trained to deal with routine and emergency situations that could arise both on and off public roads (Fuller, 1999).

Based on Fairbrother (1996), these injuries happened in the course of work in this area, often from material handling but also from the processes of work. This was illustrated by the safety officer with reference to handling consignments of waste, the procedures for which were written by the safety officer when approached by the relevant supervisor.

NOISE AND VIBRATION

Edwards and Holt (2008) have mentioned that exposure to noise and vibration is commonplace for users of mobile plant and/or hand-held mechanical equipment; knowledge of noise and vibration was greatest in the older age group. So again, maybe these subjects too are perceived as more important as workers grow older and they typically incur an increased incidence of hearing difficulties such as tinnitus; and health problems from exposure to vibration.

Ergonomic aspects: physical optimization of the bridge environment, i.e. illumination, temperature, vibration, odours and noise (Goulielmos and Tzannatos, 1997). Further limitations may be provided by various ñship factorsò, such as shipôs movements, power fluctuations and failures, extremities of environmental conditions, vibration and electronic noise (Goulielmos and Tzannatos, 1997).
The same is further related to environmental issues and fear of local air pollution, noise, congestion, etc (Roso, 2008).

According to Fairbrother (1996), one of the features of discussions about health and safety at work is that there is a tendency to focus on the obvious and immediately identifiable issues and problems: injuries, noise, dust, and housekeeping, the technology of production, information technology, and layout. However, it remained an area of noise and clutter, where there was also the inherent danger of working near or with molten metal. The cutting and guillotining areas comprised cutting machines, metal sheets, swarf and other metal filings, creating noise and an atmosphere heavily laden with the glittering metallic dust typical of such areas. It was the same in noisy areas, such as sections of the foundry and the press shop area, where workers frequently mentioned noise (according to the safety officer). Again, the safety officer commented that ear protectors were available but one of the difficulties was to encourage their use.

SAFETY SIGNS

Based on Edwards and Holt (2008), safety signs include warning, prohibition, mandatory, emergency, first aid, and fire signs.
According to Cheng, Li, Fang and Xie (2004), inadequate setting of safety level: Projects setting a lower safety level are more susceptible to accidents. A high safety level assures effective safety activities such as enough safety inspections, good record of equipment maintenance, sufficient emergency schemes, safety issues in change intervention, and so on.

Tsui and Chow (2004) have mention that likelihood of the occurrence of an accidental fire and its consequential loss will depend on the standard of precaution measures and whether appropriate emergency actions have been taken. The emergency action sub-plan includes informing the fire brigade, assembling occupants and moving them to a place of safety, attempting to control the fire if staff has had adequate training on the use of fire fighting equipment, and assisting the fire brigade once they arrive at the scene.

Marchant (2000) stated that the emergency warning systems is to overcome that part of the ambient acoustic environment that cannot be reduced automatically through any building management system. Learning the meaning of the sound should be carried out prior to the fire emergency. The quantity of illumination will dictate the degree of perception and the decrement in lighting levels that occur when there is a change from normal lighting to emergency lighting and such a decrement can cause a delay in accurate perception ï the dark adaptation time. The proper selection and location of ``exit'' signs is an important feature of the design of the internal environment. Such signs should be visible and legible at any time during an emergency in the building. Warning systems can be integrated with public and/or staff addresses systems.

GENERAL H&S

General H&S include the legislation, duties, PPE, and organizational procedures (Edwards and Holt, 2008).

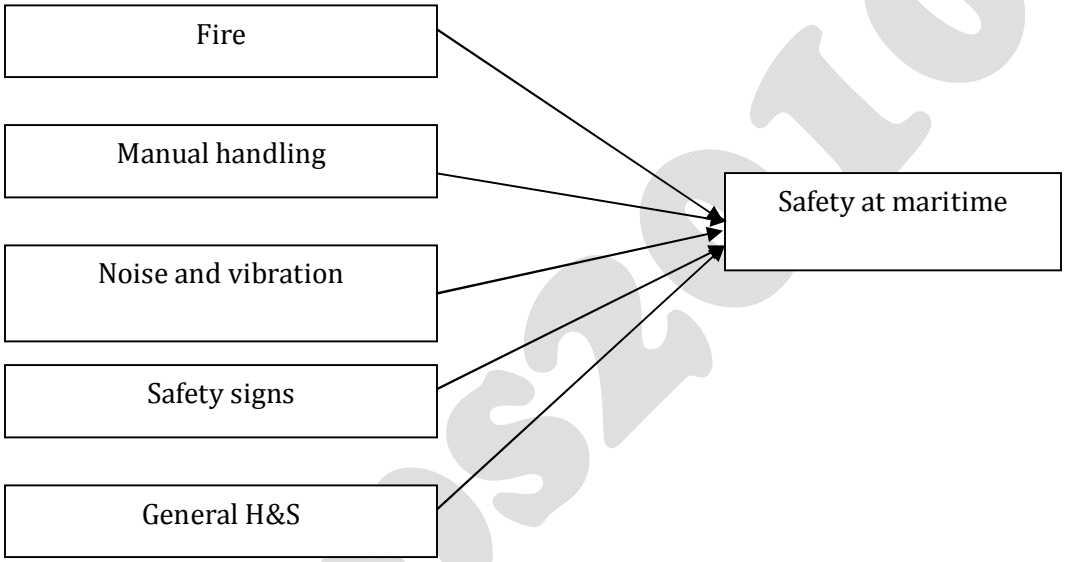
According to Cooper (1998), linking the effectiveness of health and safety training to these statistics is oversimplifying the role of training in the complexities of accident causation. There are certain cases where the law gives direction about the type of health and safety training necessary to meet legal obligations. In these cases, employers only need concern themselves with identifying the broad area of training required and selecting an appropriate but approved supplier of the training. Probably the most important aspect of health and safety training is low risk situations. This is as a risk control measure. Recent changes in health and safety law have also placed new duties on employers to assess the risks associated with their activities. One of the options for controlling the identified risks is through training. The generality of health and safety law is given highlighting the fact that employers have a duty to provide a safe place of work for their employees. They also have a duty to provide adequate training.

Refer to the Walters (1998), the second aspect of regulation is the legislation itself. In the UK the legislative support for worker representation on health and safety has been complicated by the introduction of new provisions in 1996 which supplement rather than replace the previous ones. In order to examine the significance of the present legislative position for health and safety representation in small workplaces, it is therefore necessary to briefly consider its overall development. The introduction of the Health and Safety (Consultation of Employees) (HSCE) Regulations 1996 means that employers are required to consult with their employees over matters affecting their health and safety and give them the opportunity to elect health and safety representatives in enterprises where the existing SRSC Regulations do not apply. This means that, in theory, there will be legislative support for the participative management of health and safety in small and non-unionized establishments.

Fairbrother (1997) have mentioned that, in this respect, the personnel manager and the support team worked with and to operational management and supervision, promoting a unified approach to health and safety, so as to comply with the requirements

of health and safety legislation and regulations and with the aim of gradually improving health and safety at the factory. It soon became apparent, despite an initial naive belief in some quarters that legislation would ensure management-worker co-operation on these questions, that health and safety would remain the subject of negotiation and occasionally conflict. In this respect, both employers and trade unionists were in positions to utilize legislation to support their own case.

THEORETICAL FRAMEWORK



Independent variable Dependent variable

Source: adopted by Edwards and Holt (2008).

HYPOTHESIS

Fire

Ho: there no relationship between fire and safety at maritime.
HA: there have the relationship between fire and safety at maritime.

Manual handling

Ho: there no relationship between manual handling and safety at maritime.
HA: there have the relationship between manual handling and safety at maritime.

Noise and vibration

Ho: there no relationship between noise and vibration and safety at maritime.
HA: there have the relationship between noise and vibration and safety at maritime.

Safety signs

Ho: there is no relationship between safety signs and safety at maritime.

HA: there have the relationship between safety signs and safety at maritime.

General H&S

Ho: there is no relationship between general health and safety with the safety at maritime.

HA: there have the relationship between general health and safety with the safety at maritime.

Through the literature review that was found out, the researcher was get clear picture about this research. It also will help the researcher to further this research in order to get the finding. The finding will help the heavy industries like DD & I Engineering Sdn Bhd to maintain the safety issues and reduce the rate of accident at workplace. From the above, the proven are finding through the research and development.

METHODOLOGY

In this chapter, sampling procedures and data collection will be mention and explain clearly. The proposal analysis whish is important to researcher also include in chapter 3. Finally, all the sub topic in this chapter will be conclude in the summary.

RESEARCH DESIGN

In this study, the descriptive research is uses because it is more formal and structure compare to exploratory research. Descriptive research describes the up-date and detail characteristic of a population or phenomenon. Such characteristic which is related to this research are the employee position, health history, and experience in working in the heavy sector. In this study, the type of investigation that use by the researcher is correlation study. It is because, in this study, the researcher wants to identify the relationship between dependent variable and independent variable. The study setting is use field study because this study is done in the organization.

Unit of analysis

This research work is focusing on safety at maritime. Safety needs involvement from all parties. This mean the area of study of this research paper covers the employee, employer, client, user and also the visitor. It is because, the entire people are having a risk in workplace and possibilities to accident happen.

Timeframe

The cross sectional study involved sample and data collection for the period of 20 weeks starting from the date of June 2009 till October 2009. The short period of study is done for the purpose to fulfill the academic requirement

MEASUREMENT AND SCALE

In order to have significant and reliable information that appropriate with the fieldwork study, certain proper scaling technique must be adopted. Therefore, questionnaires should include the appropriate scaling. There have two sections in the questionnaire that use two types of scaling techniques. Section A use nominal scale (multiple choice). Section B use likert scale .The questionnaire was adapted from the one main journal that use by researcher as a main reference. Section A are self construct and section B are adapted from Mearns, Whitaker, Flin, Gordon, and O,Connor (2003).

SAMPLING PROCEDURES

The sampling technique the researcher use in this study is non-probability sampling which is convenience sampling will be used.

Sampling Method

The researcher used the probability sampling called simple random sampling techniques in order to select the respondent.

Population And Sampling Size

For this research, 100 respondents will be selected from the total population who are being asked to fill up the questionnaire. The 100 respondents are selected to ensure the results that will get are satisfactory and relevant

DATA COLLECTION

Primary Data

In this study, the researcher choose questionnaire in order to get the satisfactory result. The questionnaires are chosen because of the time constraint in order to obtain the personal interview.

QUESTIONNAIRES

There are 42 questions that consist of two sections in the questionnaire which is section A, and section B. Section A have 6 questions and section B have 36 questions. The questions divide by six categories which are safety at maritime, fire, manual handling, noise and vibration, safety signs and general H&S. Each category consists of 6 questions that use likert scale.

SECONDARY DATA

- **Books**

The notes that get from attend the seminar about the safety are use in order to get clear picture about the safety. Another book that becomes the references is text book that use during the study period.

- **Printed Media And Periodicals**

The magazines and articles about the safety and accident that was happen in the past will give an idea to make the research.

- **Internet**

This is where current information of the company, journals, safety, shipping, and maritime.

DATA ANALYSIS

In this study, it will elaborate using SSPS to find the result of the analyses. To measure the reliability of study several data analysis will be used which are frequency distribution for several of the measures, and hypothesis testing include pearson correlation analysis.

FINDINGS

This chapter was explaining about the data that have been collected through questionnaire. The data were analyzed by using SPSS system to ensure the accuracy of the data. All the data that was enter in the program are based on the true answer from the respondent that honest in answering the questions. This chapter also measures the reliability of the each variable, the frequencies distribution, and hypothesis testing. Which factor that have more contribute to the safety and have strong relationship was find out and identified clearly.

RELIABILITY ANALYSIS

The purpose of reliability is to measure the variable is reliable or not to the study. The result that below 0.6 is considered not reliable and the study cannot go further. Another way to further the study is by find out another variable that related to the study.

Table 1: Reliability Statistics of Safety at Maritime

Cronbach's Alpha	N of Items
.613	6

Based on the table above, the result for variable for fire is 0.613. Refer to the reliability table, this result fall in acceptable categories. It means that the element in the questionnaire can be use to conduct the research. Number of item are 6 refer to the number question in each variable.

Table 2: Reliability Statistics for Fire

Reliability Statistics

Cronbach's Alpha	N of Items
.613	6

Refer to the table above, the cronbachôs alpha showed 0.613. Based on the reliability table, this result means that the variable is acceptable in this study. The researcher can use this variable to further research. The number of item means the number of question under this variable.

Table 3: Reliability Statistics of Manual Handling

Reliability Statistics

Cronbach's Alpha	N of Items
.660	6

Refer to the table above, the result for this variable is 0.660. It means that the variable is acceptable in this study. The variables that have been use in this research is reliable and can go further. The 6 number of item means the number of question for the manual handling.

Table 4: Reliability Statistics of Noise and Vibration

Reliability Statistics

Cronbach's Alpha	N of Items
.779	6

Based on the table above, the result after all data key in on the system is 0.779. Refer to the reliability table; this result was fall in good categories. So, this variable is reliable and can be use in this study. The number of item is 6 refer to the number of question under this variable.

Table 5: Reliability Statistics of Safety Signs

Reliability Statistics

Cronbach's Alpha	N of Items
.691	6

The table above shows the result for reliability. The result is 0.691 that fall in acceptable categories. This result means that the variable is reliable and can be use in this study. The number of question under this variable is 6.

Table 6: Reliability Statistics of General Health and Safety

Reliability Statistics

Cronbach's Alpha	N of Items
.626	6

The above table was show about the result of reliability for general health and safety. The result is 0.626 that have been fall in acceptable categories. It means that the variable is reliable and acceptable to be use in this research. The number of questions is 6, same with another variable.

Table7: Overall Reliability Test

Reliability Statistics

Cronbach's Alpha	N of Items
.774	36

Table above showed the reliability for the all variable. There have 36 variables that refer to the questions in the questionnaire. The result is 0.774 that fall in good categories based on the reliability table. As a conclusion, the variable in the questionnaire are reliable and suitable to be use in this study.

Table 8: Total Mean Score

Independent variable	Total mean score
Fire	3.8762
Manual handling	3.9567
Noise and vibration	3.8717
Safety signs	3.7850
General health and safety	3.8017

Table 9: Hypothesis Testing

TOTAL SCORE GENERAL	Pearson Correlation	.355**	.479**	.436**	.595**	1	-.081
	Sig. (2-tailed)	.000	.000	.000	.000		.423
	N	100	100	100	100	100	100
TOTAL SCORE FIRE	Pearson Correlation	.026	-.204*	-.078	-.116	-.081	1
	Sig. (2-tailed)	.795	.041	.439	.251	.423	
	N	100	100	100	100	100	100
**. Correlation is significant at the 0.01 level (2-tailed).							
*. Correlation is significant at the 0.05 level (2-tailed).							
TOTAL SCORE MANUAL HANDLING	Pearson Correlation	.585**	1	.525**	.605**	.479**	-.204*
	Sig. (2-tailed)	.000		.000	.000	.000	.041
	N	100	100	100	100	100	100
TOTAL SCORE NOISE	Pearson Correlation	.563**	.525**	1	.522**	.436**	-.078
	Sig. (2-tailed)	.000	.000		.000	.000	.439
	N	100	100	100	100	100	100
TOTAL SCORE SAFETY	Pearson Correlation	.470**	.605**	.522**	1	.595**	-.116
	Sig. (2-tailed)	.000	.000	.000		.000	.251
	N	100	100	100	100	100	100

Pearson Correlation

Based on the table correlation above, the hypothesis can be analysis and followed by the conclusion for each hypothesis. Correlation analysis was be used in order to identify the relationship between independent variable and dependent variable. Each there any relationship or not. To identify which variable have the correlation between them, look at the value that have 2 star that means the correlation is significant at the 0.01 level. The significant value at the bottom of pearson correlation must show the value below than 0.005 to identify the significant of this study.

Fire

The value at the table above has showed is 0.26 for the Pearson Correlation between the fire and safety at maritime. There not have the star sign that means that there is no correlation between them because they not have the star sign. At the bottom of Pearson correlation, there have stated the significant of this study. The significant is 0.795 and it means the independent variable is not significant with dependent variable. The hypothesis is not substantiated. The answer for research question is there has no relationship between fire and safety at maritime. For the research objective, the answer is fire not influence the safety at maritime because they not have any correlation.

Manual handling

The table above has showed the value of 0.585 for the Pearson correlation and it has the 2 star sign. It means that the correlation is significant at 0.01 l the significant of this level. At the bottom of Pearson correlation they have stated the significant of this study. The significant value is 0.000 and it means there have significant between manual handling and safety at maritime. The alternate hypothesis was acceptance and null hypothesis was rejected. The answer for the research question is there have relationship between manual handling and safety at maritime. For the research objective, the manual handling will influence the safety at maritime.

Noise and vibration

For the row noise and vibration, the value is 0.563 for Pearson correlation and there have the two star sign. This sign mean that there has the correlation at 0.01 level of significant. The significant value is 0.000 means that noise and vibration have a significant with the safety at maritime. The alternate hypothesis is accepted and null hypothesis are rejected. The answer for research question is there have the relationship between noise and vibration with the safety at maritime. The answer for research objective is the noise and vibration can influence the safety at maritime.

Safety signs

The value for Pearson correlation is 0.470 and it has the two star sign. It means that the correlation is significant at 0.01 levels. The significant showed the value of 0.000 and means that the safety signs are significant with the safety at maritime. The alternate hypothesis was accepted and null hypothesis is rejected. The answer for the research question is there have the relationship between safety signs between safety at maritime. Meanwhile for the research objective, the safety signs can influence the safety at maritime.

General health and safety

The table above showed about the correlation between dependent variable and independent variable. For the Pearson correlation, the value is 0.355 and it has two star signs. The star means that the correlation is significant at 0.01 levels. The significant value is 0.000 and it means the general health and safety is significant in this study. The alternate hypothesis was accepted and null hypothesis was rejected. The answer for the research question is there have the relationship between general health and safety with the safety at maritime. The answer for research objective is the general health and safety can influence the safety at maritime.

From the data that collect through the distribution of questionnaire, hypothesis were be made. The data that have been analysis was describe clearly for each variable. The further recommendation can be made after all the data have been analysis.

CONCLUSION

In this chapter, conclusion about this study will be made. From the data analysis in chapter 4, conclusion was made.

FIRE

Based on the chapter 4, the conclusion can be made for the fire is there is no relationship between fire and safety at maritime. It not means that the organization can ignore about the fire hazard, however, the organization still need to care about it. Even though that there are no relation between them, fire also can be one of the hazards that leads to the major losses and injuries. As we know, maritime is the big work place that deal with the big equipment and machinery, if the fire hazards occur, it definitely dangerous to that organization that involve in this business.

MANUAL HANDLING

After the data about manual handling was analyzed, the conclusion that can be made is there have the relationship between manual handling with safety at maritime. It means that, the organization should give the attention to this factor. The solution and

action should be taken in order to reduce the accident rate and maintain the working environment at safety condition. Manual handling is important in the maritime because many big item that need load, shift and also to carrying. During the process of loading, shift lifting and carrying, the safety matter must be care by the responsible party or individual. The hidden cost that incur when accident happen is large than the cost that can be see. The knowledge about manual handling should be improved by the employee in order to maintain the safety level at maritime and also reduce the number of accident.

NOISE AND VIBRATION

The conclusion that can be made for the noise and vibration after the data was analyzed is there have the relationship between noise and vibration with safety at maritime. The organization must take a look to this factor because noise and vibration can influence the safety at maritime. If the organization ignoring this factor, it will lead to the accident occur, losses and may contribute to the minor or major injuries. Fatality also may happen. Based on the survey that was made, the employee also agree that this knowledge will give impact to the safety at maritime. Based on the backward regression analysis, noise and vibration are the knowledge that can make the big influence towards the safety at maritime compare to another factor. The knowledge about noise and vibration is important among the worker because they are expose to the noise and vibration since enter to the organization. The knowledge about it will help the employee to choose the right personal protective equipment and worn it.

SAFETY SIGNS

Based on the data collected, there have the relation ship between safety signs and safety at maritime. The safety signs cannot be ignore by the organization because the employee life in the hand of organization. The proper safety signs are important at the working place. Safety signs are like the reminder for the employee to do the right things. The safety signs should be place at the right place, so that the employee can see the signs and at the same time can remind them to work safely. The safety signs not only draw on the board but include the alarm if emergency happen. The employee should know about the sound of alarm that have different between alarm for accident and fire hazards. The knowledge about safety signs will help the employee to get save when emergency occur.

GENERAL HEALTH AND SAFETY

Based on the survey that has been made, the conclusion for this factor is there have the relationship between general health and safety with safety at maritime. So, the top management has the responsibility about the employee safety. They must provide the enough training in doing the job that have the greater risk. The good decision must be made by the top management to ensure that employee welfare is care by the management. General health and safety include the training, rules and regulation, personal protective equipment and the welfare of employees. Safety at maritime will affected by the general health and safety because there have the close relationship. They employee should know about the rules and regulation that related in the industry, so, they will aware and care

about the safety of herself and other people around them. As a result, they accident will be reduce because all the people care about other people.

CONCLUSION

As a conclusion, there have four factors that have relationship with safety at maritime. There are manual handling, noise and vibration, safety signs and general health and safety. There have no relationship between fire and safety at maritime. Alternate hypothesis for manual handling, noise and vibration, safety signs and general health and safety was accepted and the null hypothesis was rejected. For fire, null hypothesis was accepted and alternate hypothesis was rejected.

RECOMMENDATIONS

This chapter is about the solution and recommendation in order to overcome the problems that occur with safety at maritime. The solution is important because the each accident that happen in work place are costly. By the solution and recommendation that was found out, the welfare of employee can be maintained and the cost of accident occurs can be reducing.

SOLUTIONS FOR THE ORGANIZATION

Awareness Program

The solution that was found out after the conclusion was made. The awareness program is on of the solution that can be used and apply in the organization to maintain the safety of employee. The awareness programs include the safety campaign, the safety competition, banner, information about the accident in the past and other program that related. The awareness program can be applies on weekly basis or monthly basis. The morning assembly also can be an awareness program when the safety talk was take place.

Training

Training is another solution for the problem of safety at maritime. Through the appropriate training, the employee will know the safest way in doing the job. Beside that, they also will know how to act in the emergency situation. Without the training, the employee not has an idea how to run the work with the safe way. The training not only for the purpose of learning skill, but, the main things is to ensure that the employee know the use the machine and equipment that have the risk.

Personal Protective Equipment

The solution that has been drawn up is based on the response of respondent towards the questionnaires. Based on the survey, personal protective equipment is

important for the worker at every level of job. The management should provide the personal protective equipment with the quality that has set up by the factory and machinery act. The management not only provide the personal protective equipment, but must make sure the entire employee worn it and also take care of it.

Punishment And Penalties

Punishment and penalties also one of the solutions that can be applies in the organization. The punishment can be through the notice, reduce the salary or suspend. Normally, the employees are care about the salary, so if their salary were cut down due to safety mistake, next time they will follow the rules. The notice will give to the employee that make mistake for the first time. Punishment gives to the employee not as a burden, but because of the organization caring with their welfare.

As a conclusion, there have many solution can be use by the organization in order to make the safe working environment. The solution can be adapted in the organization because through the safety it leads to the quality and profit.

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