# THE EFFECT OF SAFETY BEHAVIOR ON THE RELATIONSHIP BETWEEN TEAMWORK AND SAFETY PERFORMANCE IN MALAYSIA MARINE AND HEAVY ENGINEERING SDN. BHD.

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# DEDICATION

*Dedikasi ini khas buat insan – insan yang ku sayangi*

***Teristimewa buat mak tercinta Pn. Nor Rizan,***
*jasa dan pengorbanan mak selama 28 tahun ni tiada galang gantinya….*
*Terima kasih yang tidak terhingga atas penat lelah kesabaran, kasih saying, masa dan tenaga yang telah mak curahkan semata-mata ingin melihat intan berjaya*
*I love u so much forever Mak and this is especially for you (^___*)*

*Juga…*
***Teristimewa buat suami tercinta, Mohd Nor Aziran***
*dan puteri kesayangan ummi, Nur Auni Humaira*
*Terima kasih yang tidak terhingga juga untuk semua pengorbanan yang tidak ternilai yang telah dilakukan untuk ummi semata mata untuk lihat ummi berjaya*
*I love you both so much and forever*

*Buat adik adik kesayangan, Nor Hamizah dan Nor Hanisah Hanim,*
*terima kasih juga atas semua bantuan kalian*
*I love you both so much too*

*Terima kasih semua insan – insan kesayangan atas doa, dorongan, semangat, kasih saying dan bantuan yang tidak putus – putus sepanjang perjalanan untukku mengapai segulung ijazah Sarjana ini*

*Semoga apa yang di usahakan mendapat berkat dan rahmat daripada Allah S.W.T*
*Terima Kasih ya Allah*

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# ABSTRAK

Kajian ini di jalankan bertujuan untuk mengenalpasti kesan tingkah laku keselamatan dalam menyederhanakan hubungan di antara kerjasama berpasukan dan prestasi keselamatan. Seramai 235 pekerja teknikal daripada Malaysia Marine and Heavy Engineering Sdn Bhd, (MMHE) sebuah syarikat industri berat di Pasir Gudang, Johor telah di pilih sebagai responden dalam kajian ini. Satu set borang soal selidik yang terdiri daripada empat bahagian iaitu bahagin A (demografi), bahagian B (kerjasama berpasukan), bahagian C (tingkah laku keselamatan), dan bahagian D (prestasi keselamatan) telah di edarkan untuk mengumpul maklumat bagi kajian ini. Selepas itu, data yang telah di kumpul di analisa menggunakan statistik deskriptif (purata dan peratus) dan analisis inferensi (regresi berganda dan regresi berhierarki). Dapatan kajian mendapati bahawa tahap kerjasama berpasukan, tahap tingkah laku keselamatan dan tahap prestasi keselamatan di MMHE adalah tinggi. Selain itu, dapatan kajian juga menjelaskan bahawa kejelasan peranan adalah dimensi kerja berpasukan yang paling mempengaruhi prestasi keselamatan. Dapatan kajian juga menerangkan bahawa tingkah laku keselamatan tidak menyedehanakan hubungan di antara kerja berpasukan dan prestasi keselamatan. Dalam kajian ini, beberapa cadangan telah di kemukakan untuk organisasi (MMHE), pekerja teknikal di MMHE dan pengkaji akan datang.

## ABSTRACT

The main purpose of this study is to examine the effect of safety behavior as a moderator on the relationship between teamwork and safety performance. The respondents for this study are 235 technical workers from Malaysia Marine and Heavy Engineering Sdn Bhd, a heavy industry company in Pasir Gudang Johor. A set of questionnaire that consists of four sections namely section A (demographic), section B (teamwork), section C (safety behavior) and section D (safety performance) is distributed to collect the data used for this study. After that, the data is analyzed using descriptive analysis (mean and percentage) and inferential analysis (multiple regression and hierarchical regression). The results of the study present that the level of teamwork, safety behavior and safety performance in Malaysia Marine and Heavy Engineering (MMHE) are high. The findings also demonstrate that the most influencing teamwork dimension is role clarity. In addition, the results also reveal that safety behavior does not moderate the relationship between teamwork and safety performance but only as a predictor. Some recommendations are pointed out in this study for the organization (MMHE), technical workers in MMHE and further researchers.

# CHAPTER 1

# INTRODUCTION

## 1.1 Introduction

Teamwork has been known to have a strong relationship with safety. The same for safety behavior, which has been given the credit of bringing success to safety performance in the organization. However, lack of research has been done to coordinate the relationship between teamwork and safety with safety behavior as the moderator. For that reason, the purpose of this research is to examine the role of teamwork on safety performance in Heavy Industry Company. In this chapter, the background of the study, as well as the problem statement will be discussed. Other than that, the objectives of the study and the importance of the study to organizations and future research were also discussed.

## 1.2 Background of the study

The worldwide phenomenon of modernization and globalization that has spread throughout the world has triggered the growth of the organization in all aspects

especially in science and technology. Organization management teams have rapidly made changes to their workers, facilities and increased the profit so that their organization is in line with the current globalization requirements. According to Shah Rollah (2011), intense global competition and technology pressure has given huge changes in workplace safety. However, in the effort to change, safety has always been neglected thus resulting in higher accidents in the workplace (Aisyahmona, 2011). Broadly speaking, accidents at the workplace are a serious concern among management teams, researchers and safety practitioners. It has been supported by data from International Labor Organization (ILO) each year, stating that about 337 million accidents occur in the workplace and about 2.3 million die on the job annually (Sanchez *et al*, 2011). Furthermore, in Europe, almost 7 million workers had faced workplace accidents and more than 5700 workers had died annually which cost €55 billion a year. Previous studies from Marcoulaki *et al* (2012) and Sanchez *et al* (2011) has proven that workplace accidents affect employers, employees, organizations and society negatively and cause them economic burden. Employers and organizations need to compensate the workers, and employees will lose out on their working days. According to Marcoulaki *et al* (2012), in Europe, about 146 million workdays were lost due to workplace accidents. In addition, it has been supported by Sanchez *et al* (2011: 3539), who stated that:

‘4% from annual global Gross Domestic Product or US$1.25 trillion, is siphoned off by direct and indirect costs of occupational accidents and diseases such as lost working time, workers’ compensation, the interruption of production and medical expenses’

In Malaysia, accidents at the workplace are also serious matter that should be considered seriously by the government. According to Aisyahmona (2011) who cited from International Labor Office (2001), workplace accidents in Malaysia contributed to about 1,273 accidents which are 5% from the overall 26,272 Asia workplace accidents at the workplace. Furthermore, according to statistics by the Department of Occupational Safety and Health Malaysia (DOSHM), in the year 2005, lost workdays in Malaysia due to accidents at the workplace is about 1.2 million days and have increased by 0.5 million days during the next five years, which is in year 2010 (1.7 million). Due to the serious

safety factor in workplace, the government has established Occupational Safety and Health Act 1994. The Act has been triggered by the major incident 'Bright Sparkles' in Sungai Buloh in year 1991. The purpose of the Act is to provide safety, health and welfare to all employees in all industries in Malaysia. Besides, the Act had also been enacted in order to give guidelines to employers and employees about their responsibility towards safety so that a safe and healthy work environment can be created (Hapriza, 2004).

Safety and health at work is not only related when both employer and employee collaborate together but the employees themselves must work closely together to ensure that their daily task and work environment are safe. Here is where teamwork plays an important role as it enhances safety in the team thus helps to reduce accidents. Rousseau *et al* (2006) claims that in many organizations, the team of workers that work together to achieve tasks is a basic unit in organization rather than individual. On the other hand, according to McGrath *et al* (2008:5);

'Teamwork is how the industry can share best practice and harness the energy of working together for safety'.

Therefore, teamwork is necessary to be practiced in the organization as previous research has found that teamwork and safety is closely associated (Thomas *et al*, 2003; Yule *et al*, 2004; Siassakos *et al*, 2011). According to Yule *et al* (2004) teamwork is known in healthcare industry as an essential factor in reducing error thus increasing safety. This is because when everybody in the team knows their role towards safety, what to do and when to help coworkers, and can adapt in all safety situations, work becomes easier and accidents can be prevented (Xyrichis and Ream, 2007). Moreover, the leader of the team plays a vital role in promoting safe work culture. Good team leadership will give positive impact to the workers as the leader will set, explain and guide the workers towards clear safety goal to be achieved and the workers are able to face the risks when they get full support from the leader (Baker *et al*, 2006). Besides

that, clear communication between the leader and the workers will also help to maintain safety at the workplace.

According to Neal and Griffin (2002), safety is a serious and major concern in every organization. Therefore, working in a safe condition in order to avoid losses and guarantee success of the organization is an important aspect to be considered seriously. Safety in the workplace means a hazard free environment, which is essential for the success of the organization. Even though more effort has been put in the organization to reduce accidents, workplace accidents continue to occur every day (Hildebrandt and Wilt, 2008). A study by Fleming and Lardner (1999) claims that 80% – 90% of all industrial accidents is caused by human factors when the workers ignore the correct procedure in doing their job. This means that, behavior of the workers towards safety is an important aspect that will lead to good management of safety and health as well as prevent accidents. According to Khairiah (2008), since employees know their work best, it is felt that the workers themselves are the most qualified people to make decisions about safety and job improvements. The behavior of the workers towards safety is the main element in increasing safety at work thus enhances safety performance. Therefore, behavior towards safety or safety behavior is an important aspect to be considered about

This has been supported by Hildebrandt and Wilt (2008) who stated that focusing on safety behavior is one of the precautions that had been made to reduce the risk of the accidents. This is because safety behavior is found to be the new approach to minimize the accidents (Myers *et al*, 2010) and the management should focus more on people based approach rather than engineering approach due to the fact that workplace accidents are usually caused by human error (Shah Rollah, 2011). Workers should cooperate and work together with their coworkers and employers in creating and maintaining a positive safety culture at the workplace. Furthermore, workers should also avoid hazardous behavior in doing their work to stay away from accidents. When

workers and employers maintain positive safety behavior by having clear safety goals, do their jobs by following the right procedure without neglecting safety and do not abandon safety even though they are in a rush to finish their work, zero workplace accidents can be achieved. These are the good and positive behaviors that workers should implement when they are completing their tasks.

In Malaysia, current safety performance is quite terrifying due to the DOSHM's statistics of accidents that occur in different sectors. The department stated that the manufacturing industry is the highest contributor for workplace accidents in Malaysia (see Table 1.1).

**Table 1.1:** Number of Accident Cases from 2008 to 2011

| **Industry** | **Total Accident Cases** | | | |
|---|---|---|---|---|
| | 2008 | 2009 | 2010 | 2011 |
| **Manufacturing** | 1471 | 1572 | 1101 | 1649 |
| **Mining and Quarrying** | 10 | 6 | 2 | 23 |
| **Construction** | 114 | 115 | 100 | 99 |
| **Agriculture, Forestry and Fishery** | 561 | 492 | 313 | 408 |
| **Infrastructure** | 97 | 146 | 46 | 53 |
| **Transportation** | 27 | 39 | 23 | 56 |
| **Trading** | 2 | 8 | 0 | 17 |
| **Hotels and Restaurants** | 15 | 18 | 8 | 10 |
| **Financial Institution and Insurance** | 6 | 1 | 12 | 37 |
| **Public Service** | 6 | 1 | 26 | 67 |

Source: DOSHM (2012a), DOSHM (2012b), DOSHM (2012c), DOSHM (2012d), DOSHM (2012e), DOSHM (2012f), DOSHM (2012g), DOSHM (2012h), DOSHM (2012i) and DOSHM (2012j)

Shah Rollah (2011) claims that manufacturing industry is at risk when the industry reports an increase of one hundred times higher of accidents and injuries at the work place. Referring to Table 1.1, workplace accidents in the manufacturing industry

has the highest number of accident cases from the year 2008 to 2011 as compared to other industries. This is a very serious problem to be considered since heavy industry is a subsector in manufacturing industry where total accidents cases increase annually. Even though in 2010, the total accident cases decreased from the year before (2009), one year later (2011) more accident cases were recorded which documented the highest number of accidents so far. Shah Rollah (2011) criticizes that in Malaysia, most workplace accidents are caused by unsafe behavior of the workers and lack of management support towards safety.

In order to determine the level of safety in the workplace, safety performance is measured. Safety performance is known as workers' behaviors that are intended to promote safety in personal, management, organizational and work environment (Shah Rollah, 2011). Safety performance measurement always uses statistical approach where the numbers of recorded accidents, near miss accidents, lost time injuries and lost workdays can always be counted and analyzed to get the information about safety performance (Jafri *et al*, 2005). However, safety condition in the organization including management, material, equipment, manpower and work environment are more valuable dimensions to be considered about when examining safety performance (Wu *et al*, 2008).

As a conclusion, globalization and changes in the today's sophisticated world that occur in the organization has given negative effect to safety level. Even though many works has been done to overcome it, accidents still occur. Management and employees cooperation are crucial in increasing safety performance. Here is where teamwork attitudes need to be employed in the team to make sure safety in their workplace. Accidents are caused by unsafe acts committed by human beings or unsafe conditions at work place. For that reason, good interaction and relation between employee and employer together with positive safety behavior of the employee will produce high quality work environment, hence reduces accidents in the workplace and enhances safety performance.

## 1.3 Statement of Problem

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. Two years later, MMHE strengthened their engineering and constructions business when MMHE first fabricated oil and gas structure and built its first ship in 1980. Throughout the years, many projects related to ship repair, ship conversion and ship building has been done by the company.

MMHE is located at the Pasir Gudang industrial area in the state of Johor. There are two main businesses in MMHE which are Offshore Business Unit (OBU) that includes Engineering and Construction and Marine Repair Business Unit (MRBU) that 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 projects that will 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 teamwork, MMHE has employed a slogan to the organization which is '*Teamwork is our strength, quality is our goal'*. It has been set up to increase the practice of teamwork in order to encourage the workers in achieving the quality of work. It shows that teamwork is important to the company in order to achieve the goal as they emphasized it to all their employees through the slogan. Previous research has also proven the importance of teamwork in organizations such as healthcare (Yule *et al*, 2004; Hall, 2005; Manser, 2009; Moe *et al* 2010) and education (Beng, 2005; Zalina *et al*, 2011). Although teamwork is emphasized by all parties (for examples management

of MMHE) sometimes, employees tend to neglect it (Flin *et al*, 2003). Not all employees can work in a team. If this happens, it will cause serious problems not only to the management but also to the leader and coworkers. Manser (2009) also points out that good perception towards teamwork will give better action in maintaining safety. As a result, it is necessary to know the level of teamwork in the company.

Besides teamwork, safety is also a major concern to the management of MMHE where the 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. 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 accident was triggered by human mistakes. 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 behavior in MMHE. It is supported by Williams (2005), who cited that most of the workplace accidents are caused by the behavior of the employees and currently safety behavior is found to be the 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 behavior in their workplace. It is also necessary to investigate whether safety behavior act as a moderator to the relationship between teamwork and safety performance.

According to Hapriza (2004), accident cases are improved and safety concerns have been one of the major agenda in many organizations. Management responsibilities are very important to support the employees in determining safety in the workplace (Khairiah, 2008). However, who is the most responsible party in maintaining safety? Do the management in the organization responsible about the safety solely or the employees personally or both the management and the employees need to cooperate together? In line with that, Ramsauer (2001) highlighted that both management and

employees are crucial in creating and maintaining workplace safety. 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, one main question is how far the safety activities can help to improve the level of safety performance in the workplace.

## 1.4 Purpose of the Research.

The main purpose of this research is to examine whether safety behavior moderates the relationship between teamwork and safety performance at Malaysia Marine and Heavy Engineering (MMHE) Pasir Gudang.

## 1.5 Research Question

1.5.1 What is the level of teamwork in Malaysia Marine and Heavy Engineering?

1.5.2 What is the level of safety behavior in Malaysia Marine and Heavy Engineering?

1.5.3 What is the level of safety performance in Malaysia Marine and Heavy Engineering?

1.5.4 What is the most influencing teamwork dimension that affects safety performance in Malaysia Marine and Heavy Engineering?

1.5.5 Does the safety behavior moderate the relationship between teamwork and safety performance?

## 1.6 Research Objective

1.6.1 To determine the level of teamwork in Malaysia Marine and Heavy Engineering.

1.6.2 To examine the level of safety behavior in Malaysia Marine and Heavy Engineering.

1.6.3 To determine the level of safety performance in Malaysia Marine and Heavy Engineering according to the perception of respondents.

1.6.4 To identify the most influencing teamwork dimension that affects safety performance in Malaysia Marine and Heavy Engineering.

1.6.5 To examine the effect of safety behavior as a moderator in the relationship between teamwork and safety performance

## 1.7 **Scope of the Research**

This research highlights on teamwork and safety behavior towards safety performance in a heavy engineering sector. The scope of the 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). This study focused on permanent technical workers as they are highly involved with the high risk job (Mearns *et al*, 2003).

Furthermore, the researcher focused on workers who are highly involved with safety in Marine Repair Business Unit in MMHE as the respondents in order to identify their perception about teamwork to increase safety. For the level of teamworking, the dimensions are communication, leadership, coordination, assertiveness, clear goal and role clarity. With regards to safety behavior, the dimensions are safety compliance and safety participation while for safety performance the dimensions are safety outcome and safety activity. This study employed cross sectional survey.

## 1.8 Significance of the Research

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

### 1.8.1 Academic

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 researchers in enhancing their knowledge regarding teamwork, safety performance and safety behavior. Furthermore, this research can also be used as reference to help students, academicians, and other researchers to do a research about teamwork, safety behavior and safety performance since not much research has been done in this area. Moreover, it is hoped that this research will lead to another quality and effective research that is appropriate with human resource development in the future.

### 1.8.2 Organizational

This research is important to the organization as a guideline in creating safe working environment in the workplace. The behavior of the employees in giving full cooperation to ensure safety can give some view to the management about the importance of teamwork and safety behavior in their organization. It can also help the management to have more information about teamwork dimensions because this study elaborates the six teamwork dimensions and which dimension that has higher contribution to safety performance. Besides, the study also gives information about the level of safety performance through safety activities. Therefore, it can give idea to the management on how to plan and promote safety activities that will increase safety performance.

## 1.9 Limitation of the study

In this research, there were few limitations. 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 teamwork and safety performance 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 researcher. Therefore, honesty and cooperation from respondents in answering the survey is also another limitation. In addition, the outcome of this research is relevant to the present but cannot be justified in the future. However, the outcome of the research can be used by others for new research.

## 1.10 Conceptual and Operational Definitions

### 1.10.1 Teamwork

Teamwork is defined as how the team adjusts with one another using team inputs through team processes to get the team outcomes in order to achieve the same goal (Baker *et al*, 2003). Nowadays, teamwork in the workplace is a common phenomenon as it is proven that teamwork can lead to positive outcomes. Furthermore, according to Xyrichis and Ream (2007), teamwork is a dynamic process that involves two or more members with different backgrounds and capabilities who share the same goal and work together to accomplish it. Therefore, it can be seen that teamwork is necessary in an organization as it can increase performance. In this study, teamwork refers to a team of technical workers in MMHE at Marine Repair Business (MRB) Unit who work together to complete their project. The dimensions for teamwork are communication, leadership, coordination, assertiveness, role clarity and clear goal.

### 1.10.2 Safety Behavior

According to Fugas *et al* (2012), safety behavior refers to employee compliance with behavioral safety routines. In addition, Tomas *et al* (1999) in their study defined safety behavior as the existence and rate of recurrence of safe and unsafe acts at the workplace. Moreover, safety behavior can also be referred as the workers' positive or negative behavior towards safety. It is very important to maintain positive behavior at the workplace as it is found to give positive impact to safety performance. Neal and Griffin (2006) and Neal *et al* (2000) have agreed that safety behavior has strong relationship with safety performance as the components of performance describe the actual behavior at work. In this study, safety behavior refers to the behavior of technical workers in maintaining safety in MMHE. The dimensions are safety compliance and safety participation.

### 1.10.3 Safety Performance

Safety performance can be defined as the overall performance of the safety management system in safety operation (Wu *et al*, 2008). Besides that, safety performance also can be referred to as employee safety control and self reported rate of accidents and workplace accidents (Siu *et al*, 2004). In addition, Yang *et al* (2009) has stated that safety performance is a safety process evaluation at both the organizational and individual level. Safety is essential for the success of the company and it is vital to specific safety performance measurement. In measuring safety performance, accidents rate, lost time injuries, days away from work and compensation by the company, have always been used in previous research (Ng *et al*, 2005; Berube, 2005; Jafri *et al*, 2005). In this study, safety performance refers to the safety level at MMHE according to the perception of the respondents. Safety performance was measured using two dimensions which are safety outcome and safety activity.

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# TABLE OF CONTENTS

**4 DATA ANALYSIS**

# LIST OF TABLES

# LIST OF FIGURE

# LIST OF ABBREVIATIONS

| | | |
|---|---|---|
| ANNOVA | - | Analysis of Variance |
| DOSHM | - | Department of Occupational Safety and Health Malaysia |
| FR | - | Frequency Rate |
| HSE | - | Health and Safety in Employment |
| ILO | - | International Labor Organization |
| MMHE | - | Malaysia Marine and Heavy Engineering |
| MRBU | - | Marine Repair Business unit |
| OBU | - | Offshore Business unit |
| OECD | - | Organization for Economic Co-Operation and Development |
| OSHA | - | Occupational Safety and Health Act |
| SAS | - | Safety Attitude Score |
| SPL | - | Safety Performance Level |
| SPSS | - | Statistical Package for Social Science |
| TNB KT | - | Tenaga Nasional Berhad, Kuala Terengganu |
| UKM | - | Universiti Kebangsaan Malaysia |

# LIST OF SYMBOLS

| | | |
|---|---|---|
| % | - | Percentage |
| N | - | Frequency |
| α | - | Alpha Cronbach |
| β | - | Beta |

# LIST OF APPENDICES