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**THE INFLUENCE OF SAFETY KNOWLEDGE, SAFETY LEADERSHIP, AND  
SAFETY MOTIVATION TOWARD SAFETY BEHAVIOR AMONG OFFSHORE  
OIL AND GAS EMPLOYEES**

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**UUM**  
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**MASTER OF HUMAN RESOURCE MANAGEMENT**

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THE INFLUENCE OF SAFETY KNOWLEDGE, SAFETY KNOWLEDGE, SAFETY  
LEADERSHIP, AND SAFETY MOTIVATION TOWARDS SAFETY BEHAVIOR AMONG  
OFFSHORE OIL AND GAS EMPLOYEES



By  
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UUM  
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Thesis Submitted to  
Othman Yeop Abdullah Graduate School of Business,  
Universiti Utara Malaysia  
In Partial Fulfilment of the Requirement for the  
Master of Human Resource Management



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**in Partial Fulfillment of the Requirement for the Master of Human Resource  
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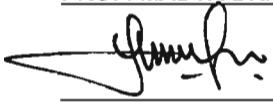
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## ABSTRACT

Safety behavior is vital in reducing injuries and accident in the workplace by identifying the workplace hazard, and to combat them to the minimal accident rate. It has positive influence on both employees and employers behavior towards safety and health. This study explored the relationship between safety knowledge, safety leadership, and safety motivation towards safety behavior among offshore oil and gas workers in Terengganu. The information was collected by questionnaire distribution to offshore oil and gas workers and the total numbers of workers responded was 170 out of 300. The finding of this study revealed that safety leadership with respect to safety policy is positively significant with safety behavior. Besides, safety motivation is proven that it has positive significant relationship with safety behavior. Besides, the relationship between safety knowledge and safety compliance has a positively significant relationship between these two variables. Lastly, the results obtained from this study also revealed that there is a positively significant relationship between safety leadership with respect to safety motivation with safety participation. The findings give an insightful information and guidance for researchers and practitioners to identify solutions that can help to improve safety and health at workplace.

Keywords: safety knowledge, safety leadership, safety motivation, safety compliance and safety participation.



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## ABSTRAK

Tingkah laku keselamatan memainkan peranan yang penting dalam hal mengelakkan kecederaan dan kemalangan serta mengenal pasti bahaya di tempat kerja, serta dapat mengurangkan kepada kadar kemalangan yang paling minima. Dan ia mempunyai pengaruh yang positif ke atas kedua-dua pihak, pekerja dan majikan. Kajian ini meliputi hubungan antara pengetahuan keselamatan, kepimpinan keselamatan, dan motivasi keselamatan ke arah tingkah laku keselamatan di kalangan pekerja minyak dan gas luar pesisir di Terengganu. Maklumat tersebut dikumpulkan oleh pendedaran soal selidik kepada pekerja minyak dan gas luar pesisir dan jumlah bilangan maklumbalas yang diterima sebanyak 170 daripada 300. Hasil kajian ini menunjukkan bahawa kepimpinan keselamatan berkaitan dasar keselamatan adalah positif serta signifikan dengan tingkah laku keselamatan. Sebaliknya, motivasi keselamatan terbukti bahawa ia mempunyai hubungan yang signifikan positif dengan tingkah laku keselamatan. Selain itu, hubungan antara pengetahuan keselamatan dan pematuhan keselamatan mempunyai hubungan positif yang signifikan antara kedua-dua pembolehubah. Akhir sekali, hasil kajian ini menunjukkan bahawa terdapat hubungan positif yang signifikan antara kepimpinan keselamatan berkenaan dengan motivasi keselamatan dengan penyertaan keselamatan. Dapatan hasil maklumat yang mendalam serta petunjuk bagi penyelidik dan pengamal untuk mengenal pasti penyelesaian yang boleh membantu untuk meningkatkan keselamatan dan kesihatan di tempat kerja.

Kata Kunci: keselamatan pengetahuan, keselamatan kepimpinan, motivasi keselamatan, pematuhan keselamatan dan penyertaan keselamatan.



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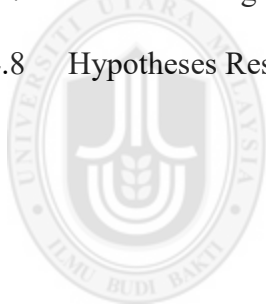
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## LIST OF FIGURE

Figure 2.1 Research Framework



## LIST OF ABBREVIATIONS

OSH	Occupational Safety and Health
OSHA	Occupational Safety and Health 1994
SOSCO	Social Security Organization
SPSS	Statistical Package for The Social Science



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## **LIST OF APPENDIXES**

Appendix 1: Oil and Gas Industry Accidents Reported to the Labor Department & Social Security Organization (SOSCO), 2010-2014



# CHAPTER 1

## INTRODUCTION

### 1.1 Background of the Study

The discovery of oil in Sarawak in the year 1910 marked the beginning of Malaysia's oil and gas industry, an industry that has generated various opportunities for many major oil and gas companies to invest in the upstream and downstream sectors of the industry. This has ultimately provided a wide spectrum of Malaysians ample employment opportunities and skills transfer, thereby altering the economic landscape of the country (Haq, 2014). Along with the progress of Malaysia's Oil and Gas Industry, local companies have had the opportunity to go on to become one of the providers for service which cater the area of exploration as well as production in Malaysia. Moreover, the oil and gas industry in Malaysia also extends their service worldwide. There are much contribution done by Malaysian oil and gas companies based on their competence in giving various services, for instance, process design, electrical instrumentation, oil rigs engineering and much more services. The Malaysian economy is strongly impacted by the oil and gas industry, which has achieved one-fifth of the national GDP over the ten years. The industry is expected to create 52,300 new jobs by 2020 (Matrade, 2016).

Malaysia's oil and gas industry has the second largest ranking for producing the oil and gas in the Association of Southeast Asian Nations (ASEAN), and also one of the world's top LNG (Liquefied natural gas) producers. Being a major contributor to the country's wealth, the Malaysian oil and gas industry has understandably been placed under high scrutiny in the aspect of safety. This makes it an important move to highlight unforeseen

and unnecessary accidents at the workstation, which can hinder the productivity and quality of work and product. Furthermore, it is also the organization's responsibility to ensure that the safety of its workers and that of the working environment be given due importance at all times. However, the organization does not bear the sole weight of this responsibility as workers also need to invest effort to ensure safety and security by complying with all safety regulations and participating in safety programs and activities.

The huge increase in demand of oil and gas is likely to increase world natural oil and gas consumption. This massive increase in demand would eventually lead to a similarly significant increase in offshore and activity of exploration of gas. With the large-scale of offshore oil and gas exploration & exploitation is just as likely to bring with it safety issues and a possibly higher incidence of accidents (Cordner, 2013).

Major accidents in the oil and gas can be defined as those that are of high consequences and they may include major fires, explosions and toxic releases. Thus, sites that contain explosives and toxic items must be placed under high alert and necessary measures to manage accident hazards must be put in place (Aderson, 2005). There is little evidence so far however that all regional government and industry parties are paying sufficient attention to the rising risk to safety and security that increased offshore oil and gas activity generate (Cordner, et., 2013). Moreover, Christ (2015) reports that the rising death toll in the oil and gas industry signifies a higher overall number of fatalities in the industry.

Based on the statistic from the Labour Department and Social Security Organization (SOSCO), accident cases in the industry increased year by year and the claims paid out for temporary disability rose from 45 cases in year 2013 to almost double the figure, 82 cases, in year 2014. Permanent disability cases reported in 2014 were lower at 26 cases compared to temporary disability, indicating an urgency in addressing the risks of overall oil and gas industrial accidents in general and oil and gas industrial accidents causing temporary disability in specific. As such, serious consideration needed for safety issues in the oil and gas industry.

The official statistics of the accidents do not solely reflect the degree to which a tragedy affects an employee and their immediate family. The figures also point at a need for a closer look at the social and economic impact of the accidents. Site accidents could carry the social impact that can be defined as the effects that involve the community. In this case, this may include various members of society such as employees, employers, and families among others. The economic impact, on the other hand refers to the effects that relate to the financial aspects of the society. The impact of accidents that is suffered by victims' families can be in terms of reduced family income, reduced standard of living, and reduced educational affordability relating to school-going children. Some families have been reported to have mentioned that as a means of cutting back on family expenditure in the aftermath of an on-site accident involving the breadwinner, they were given no other choice and forced to shift their school-going children to a cheaper education center, where the level of education and school facilities were not that good (Mthalane, Othman, & Pearl, 2000). Instances such as this indicate that families are

forced to forgo some facilities or foods they intake in order to manage with these situations. Apart from that, loss of the breadwinner of the family may cause family depression due to the sudden loss of family income and the fact that sudden availability of financial support at any given time is hard to procure.

From the business point of view, accidents would affect the profitability of the company with far reaching economic impacts that lead to accidents involving direct and indirect costs. A direct cost includes costs covered by the workers compensation insurance. Examples of this are such as costs for hospitalization, insurance premiums for employees, liability and property losses (Kapp, Smith, Loushine, & Hoonakker, 2003). Indirect costs on the other hand, are due to the losses of productivity of the injured worker, fees of transportation to the nearest medical treatment center and time delayed to complete various forms of treatment and rehabilitation related to the injury (Hinze & Appelgate, 1991). Thirdly, the economic impact of accidents in the oil and gas industry may include damages to the plant and equipment, payment for injuries and claims for deaths, costs of repairing equipment, loss of operations income, loss of productivity, increased insurance costs, slowdowns in operations in the process of determining causes of accidents and corrective action and etc. All these may hinder employees' performance in the company which can lead to low productivity.

Last but not least, the company reputation may be tarnished if the industry accidents keep recurring, and the public's perceptions about the industry would deteriorate along with

the industry image and good name. Furthermore, the stakeholders' and customers' dissatisfaction would lead to a decrease in industry investment and shares support.

## **1.2 Problem Statement**

Based on the background of study, there is need for safety issues pertaining to the oil and gas industry to be studied because this industry is considered one that comes with a very high risk factor tied in with a high incidence of workplace fatalities and injuries. Safety issues are gaining importance especially in industries which involve highly hazardous jobs such as manufacturing, transport, storage of petrochemical material. This is directly related most prominently to employees because employees may be exposed to different types of occupational hazards and risks such as fires, explosions, illnesses (Wu, Chang, Shu, Chen, & Wang, 2011). There has been much scholastic focus on the manufacturing industry (O'Toole, 2002); and also on the construction industry on safety-related issues (Siu, Phillips, & Leung, 2004). Most of these studies have been conducted relating to safety management practices on safety behaviour in construction and manufacturing industries, but not in oil and gas industry (Wu, 2001). Some empirical studies have, nevertheless, been carried out on how safety behavior in the oil and gas industry is impacted by safety climate. Based on Mearns, Whitaker, and Flin (2003), safety climate indicates the safety culture in the organization workforce as a whole. A preference is identified in viewing safety management practice as guideline of the safety culture of management at the higher level. It is hoped that with more favorable safety management practices, there will be improvement in safety climate in the organization.

For production installation in oil and gas industry is considered a hazardous task and it is very important for the organization to audit employees and management's safety behavior to ensure safety at workplace. The offshore oil and gas industry is always exposed with different hazardous factors that accidents such as fire, and explosions. Employees who are doing refining oil are always exposed to occupational hazard and other job risks especially fire and explosions (Wu et al., 2011). Considering its level of importance, there is yet a notably limited research aimed at identifying management practices in the offshore industry to minimize the hazard and risk of accidents and incidents. As such, the present researcher has chosen to study safety behavior of oil and gas industry to bring focus to how employees' safety behavior would be influenced by safety leadership, safety knowledge and safety motivation (Mearns et al., 2003).

There are several empirical studies that have been conducted to examine the impact of safety leadership on safety behavior (Mearns, Flin, Fleming, & Gordon, 1997; Neal & Griffin, 2006). The present researcher believes that safety leadership is a very important independent variable to explain how workers will react towards issues pertaining to their safety in the industry; because leader able to articulate achievable vision of future safety performance; demonstrating personal commitment to safety symbolically; engaging everyone with relevant experience in decision-making; and being clear and transparent when dealing with safety issues. Therefore safety leadership is identified as one of the independent variables to be studied in the context of this research. Admittedly previous researchers have recognized that leaders are important in establishing an atmosphere in which workers feel motivated to act safely in their workplace to ensure workplace safety,

but there has been insufficient scholastic focus given to the role of leadership in the complete in elimination accidents.

Apart from safety leadership, the researcher finds that there are another two independent variables to be included in this study because they are two factors that may have influence on safety behavior at the workplace. Apart from safety leadership, safety motivation and safety knowledge also have their own effects on safety behavior because employees need to be well-equipped with safety knowledge by for instance attending trainings on how to operate their task in high risk environments and education on safety rule and regulation as well as the Personal Protection Equipment (PPE) to be worn all the time while duties are conducted. For safety motivation variable, it able to increases the awareness, interest and willingness of the employees for better safety behaviour.

In an effort to understand the influence of safety knowledge and safety motivation on workers' safety behavior, this study is aimed at studying the effects of safety leadership, safety knowledge and safety motivation on safety behavior, the investigation is developed based on the fundamental of Social Exchange Theory. This study has been carried out to garner more knowledge on how employees perceive their employer safety leadership, and to assess the impact it has in order to motivate them to participate in safety program as well as comply with safety rules and regulation. Moreover, this study also looks at how employees' safety knowledge and safety motivation influence their safety behavior in the



organization and most importantly their safety behavior in the organization that can lead to a safer workplace to work with.

### **1.3 Research Objectives**

- 1) To examine the relationship between safety leadership namely safety policy, safety concern, safety motivation and safety behavior among oil and gas offshore employees in Terengganu.
- 2) To investigate the relationship between safety knowledge and safety behavior among oil and gas offshore employees Terengganu.
- 3) To determine the relationship between safety motivation and safety behavior among oil and gas offshore employees Terengganu.

### **1.4 Research Questions**

- 1) Is there any relationship between safety leadership namely safety policy, safety concern, safety motivation and safety behavior among oil and gas offshore employee Terengganu?
- 2) What is the relationship between safety knowledge and safety behavior among oil and gas offshore employees in Terengganu.
- 3) Is there any relationship between safety motivation and safety behavior among oil and gas offshore employees in Terengganu?

### **1.5 Significance of the Study**

Safety behavior is an extremely important aspect for industries to understand. This is because of the level of employees' commitment in his or her safe behavior at workplace commits to the organization's goals and purpose. Nowadays, with organizations being expected to increase productivity within a limited amount of time, it is very important for them to ensure their workers' safety is not compromised just to achieve their profitability. Hence, this study may contribute towards better understanding into the importance of safety behavior at the workplace.

In Malaysia, there are limited studies on employees' safety in oil and gas offshore industries with respect to factors affecting their safety. This may be due to the limited channels that are available that provide direct access to the oil and gas offshore platform. Apart from physical safety, researchers also need to focus on the antecedents of behaviors. The significance of this study would contribute, theoretically and practically, to various parties. It is hoped that by using theoretical and empirical research in trying to identify factors affecting employees' safety behavior, this paper will thereby lay the theoretical foundation for the practice that may hopefully be a step in the direction of future research factors affecting employees' safety behavior.

The people are the main resource for any organization (Kristensen, 1992). Therefore, employees' safety is important especially those employees who attach to high hazardous industries. Based on Christ (2015), the cases that reported were mostly involved death in

the oil and gas industry and it might be higher than any other industry and the high rate of oil and gas offshore employees involved in accident should be addressed. This study seeks to investigate the factors affecting employee safety behavior, and it is hoped that this can assist companies in developing effective action plans to minimize risky behavior at workstations and to prioritise employees' safety as being much more important than any other aspect of work because it involves risking a human life in such a hazardous industry.

In a practical perspective, the findings collected via this study will be beneficial to industrial practitioners to provide understanding into the influencing factors towards safety behavior (e.g. safety compliance and safety participation), especially among the offshore employees from oil and gas companies in Malaysia. Besides, the findings of the this study could also motivate oil and gas offshore companies to become more alert and vigilant in reducing unwanted incidents, accidents and fatalities at the workplace.

The results of this study can also be used as a guideline for management teams dealing with safety related issues in oil and gas offshore companies. It may prove handy to the management in their efforts to develop new safety policies, design training programs such as safety workshops, additional safety procedures or work instructions. It can also serve as a guideline for conducting specific tasks associated with offshore and even for rewarding those who show compliance with safety procedures in the course of related work.

Moreover, this study would bring an important message to respondents from oil and gas offshore companies on what factors can really influence them in order to have safety behavior in them while carrying out their duty. With this study, they are able to identify the dominant factors that influence them in acting safely in carrying out their task.

Finally, findings from this study may contribute certain informative ideas to our county, Malaysia. Government agencies might then be able to recognize safety leadership which consists of (safety concern, safety motivation and safety policy), safety motivation, and safety knowledge that influence safety behaviour among employees in the oil and gas offshore company and make sure oil and gas sector in Malaysia will continue to progress without affecting or taking toll of workers' safety and health.

### **1.6 Scope of Study**

This study is conducted solely targeting on offshore oil and gas company, Petronas Carigali in Terengganu and those workers involved in this study most are from senior level such as technicians, engineers and so on. It looks at how safety leadership, safety knowledge and safety motivation affect offshore employees' safety behavior and so doing, is able to address the perceived limited studies carried out in this field. Oil and gas industry is considered one of the major industry in Malaysia and the number of employees that attach to this industry is very huge, therefore oil and gas industry has be selected to explore the safety issues to prevent and minimize accidents in the industry.

## 1.7 Operational Definition

In present study, those variables that will be discussed and elaborated thoroughly in the next chapter are safety leadership (safety policy, safety concern, and safety motivation), safety knowledge, safety motivation, and safety behaviour.

Safety leadership namely safety policy is defined as the extent to which a senior manager creates a clear mission, responsibility, and goal in order to set standards of behaviour for employees (Lu & Yang, 2010). Whereas, safety concern is refers to the extent to which a senior manager is a role model to employees and emphasizes the importance of safety (Lu et al., 2010). Safety leadership namely safety motivation can be described as the extent to which a senior manager creates a motivation systems to encourage workers' safety behaviour (Lu & et al., 2010).

On the other hand, safety knowledge can be elaborated as the knowledge that employees have with sufficient training provided by the company to act safely during carrying out duty (Hofmann, Jacobs, & Landy, 1995). Safety motivation is refers to an individual's willingness to act safely (Neal & Griffin, 2006). And lastly safety behaviour is defined as the behaviour that supports safety practices and activities such as providing safety training. *Safety compliance* explains the core activities that need to be carried by employees according to occupational, safety and health requirements to prevent workplace accidents. *Safety participation* is defined as behaviours that do not directly contribute to an individual's personal safety but individual will work towards a safety environment that supports safety (Neal & Griffin, 2002)

## **1.8 Organization of the Thesis**

Chapter 1 details the overall necessity for this study, while providing a background of the study, problem statement, research objectives as well as research questions, the significance of study, and limitation of this study. Chapter 2 then seeks to offer the general literature review on safety leadership, safety knowledge and safety motivation and past empirical findings on factors that might influence safety behaviour of employees in the oil and gas industry. Chapter 3 subsequently describes the methods incorporated into the study, namely the research design and procedure. This chapter also tells the sample and sampling technique, and how the questionnaire was developed and ends with a short discussion on procedures used to analyze data collected from the survey.

The final two chapters report the results and their interpretation for the study respectively. The chapters will include reports of the descriptive statistical analysis, regressions analysis and so on. To facilitate the interpretation of the results reported in this chapter, the results are summarized in tables form. The research findings are interpreted in Chapter 4. The findings are compared with past research as reviewed in Chapter 2. The chapter concludes with a discussion on the limitations of the study, their implications, and some suggestions for future research to relevant parties

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter will begin with some factors that may bear impact on safety behavior at the workplace, followed by a literature review of the various variables (safety leadership, safety knowledge, and safety motivation) toward safety behavior. In summary, this chapter provides an empirical overview of the role of safety leadership, safety knowledge, safety motivation toward safety behavior among oil and gas offshore employees.

#### **2.2 An Overview of Relevant Legislation**

Occupational Safety and Health (1994) and Machinery Act (1967) govern the industrial safety and health in Malaysia. At early days, those industries such as manufacturing, mining, and construction industries were covered under the Factory and Machinery Act (1967). There is many industries' safety and health is not given much attention. Therefore, the new legislation on Occupational Safety and Health later came in to provide cover industrial sectors that had not been under Factory and Machinery Act (1967).

The purpose of Occupational Safety and Health (1994) was to create safety and health awareness among employees, and to also assist organizations outline and abide by effective safety and health measures. Moreover, this Act also listed the responsibility of various parties such as employees, employers, exporters, importers, designers,

manufacturers and so on. The three main principles that had been used to formulate this Occupational Safety and Health Act (1997) were self-regulation, consultation and co-operation. The self-regulation principle required employers to develop an effective management system with a safety and health policy formation, and to ensure that efforts were made to carry it out. Secondly, the principle of consultation expected employers, employees and the government to come together to reach a consensus on how to address and resolve issues stemming from safety and health related at the workplace. Cooperation between employers and employees to work hand in hand to take care of, and to ensure that workplace safety and health quality is maintained at certain standard, without which, there will be no improvement of the occupational safety at health at workplace.

### **2.3 Factors Affecting Safety Behavior**

The dynamic and fast pace at which industries are growing has raised issues pertaining to safety and health at the workplace, particularly for industries that typically involve highly hazardous operations. The phenomenon of safety has as a result become one that is increasingly complex to comprehend let alone address. Therefore, concerted efforts are needed to explain the various factors that may affect safety behavior at the workplace. Those factors are human factors, organizational factors, and technological factors.

#### **2.3.1 Human Factors**

According to Gordon (1998), many major disasters are spawned from human factors. Boschee (2014) later stated that the human factor is the main cause of accidents and



incidents in 60% to 80% respectively, whereby causal factor in another 50% to 60% of all mishaps across many industries. Although these studies have identified the human factor as the main factor that causes most industrial accidents, attempts made to improve safety behavior has been still to no avail. Thus, the human factor is a worthwhile aspect to be addressed in this context of study in order to obtain better insight into minimizing the accident rate at the workplace especially for high risk industries. Human factors are described as things a person did or did not do during workplace accidents (Vogel & Bester, 2005) such as did not wear Personal Protective Equipment (PPE) while carrying out their tasks, employees did not follow the safety rules and regulations.

The human factor is an important dimension to consider in looking at safety behavior because it is directly related to personal welfare, and it deals with life. If employees can give priority to safety related issues at the workplace then accident rates could be minimized. This entails an understanding that the responsibility of improving safety conditions at the workplace is not held solely by the management. The employees themselves are responsible to ensure safe behavior at workplace. Particularly, if the figure of workers in the oil and gas industry is large, then it is even less of an ideal approach to if management is completely relied on to direct the employees to safety (Subramanian, 2004).

### **2.3.2 Technological Factors**

Some studies have commented that technology may also be a factor that contributes to industrial incidents and accidents. Based on Meshkati (2006), there are several varieties of technological systems failures and the implications of these failures may lead to serious accidents at the workplace. As many technological devices still depend on human intelligence and maintenance to operate and monitor them, and also because the technological system itself has the potential of failure, there is a considerably high risk of accidents particularly on employees who are directly involved with maintenance and operation of machinery. The risk of accidents pertaining to technological system is significant, particularly if the technological system operated by human intervention has been conducted unsuccessfully.

On the other hand, Meshkati et al., (2006) has claimed that usually the high record of accidents rate reported were came from petrochemical and nuclear power plants, which are usually caused by equipment malfunction, operator error, process disruption and so on based on a number of factors which comprise of human, organizational, and safety factors within the system.

### **2.3.3 Organizational Factor**

The term organizational factors can be defined as the factors that could cause accidents at the workplace. Several past empirical studies have found that organizational factors have influence on workers safety behavior and safety outcomes such as injuries, incidents and accidents (Neal, et al., 2000; Zacharatos, Barling, & Iverson, 2005; Hunag, Smith, &

Chen, 2006; Hsu, Lee, Wu, & Takano, 2008; Siu, Phillip, & Leung, 2004; Varonen, & Mattila, 2000).

An organization has a certain level of contribution towards minimizing industrial incidents and accidents. There are many organizational factors that are considered to have an impact on employees' safety (Anderson et., 2005). For example, front line personnel failed in performing their task maybe due to poor training strategies, low maintenance priorities, lack of supervision, ineffective hazard identification method or insufficient auditing. These underlying factors remain dormant or unidentified in the organization until some conditions combine that cause a major incident. However, organizations effort to explore and learn from past incidents and show some commitment is not sufficient because they need to understand and identify how organizational issues are related to the mechanism that lead to major accident. The participation of organization in the managing of safety can lead to high value of safety behavior in the organization. Based on Fraley and Roberts (2005) every organization has the ability to handle risk to prevent accidents and injuries at workplace; this can be done if the organization can manage the safety behavior properly by identifying the management and organizational factors that may influence employees' safety behaviors.

With the stiff competition in the industries, many organizations are undergoing merging, acquisition, restructuring outsourcing and downsizing. All these would bring changes to the organization management practices and procedures, with all these changes can result

in loss of in-house expertise, standard deviant, changes in risk tolerance and eventually lead to the changes in the process safety management philosophy. All these factors may contribute to an increase in incidents and accidents at workplace (Khdair, Shamsudin, & Subramaniam, 2011).


## **2.4 Safety Behavior**

Behavior is defined as action by individuals that can be observed and measured (Vijayakumar, 2007). Safety behavior relates to behavior that promotes safety practices and activities such as the provision of safety education and, and efforts to explain main activities that need to be conducted by employees based on occupational, safety and health requirements to avoid or minimize workplace accidents (Mahmood, 2010). Safety behavior helps reduce the injuries at the workplace and indirectly influences the outcomes of the event before injuries or accidents occur (Johnson, 2003).

Safety behavior can be defined as employees' desire to perform their duty safely at the workplace while abiding by organizations' safety procedures and rules to prevent workplace accidents. Several previous studies have identified specific predictors towards creating a safe working behavior at the workplace. Lu et al., (2010) researched on the safety leadership towards safety behavior in Taiwan. The study involved employees from container terminal operations, and concluded that safety leadership is an essential factor in influencing safe behavior at the workplace and that it must be given full attention by

management in order to minimize risky behavior or human errors in container terminal operations.

Safety behavior can be explained in two different terms which are safety compliance and safety participation. Safety compliance defined as those main activities individuals need to carry out to ensure safety at the workplace, which typically include adherence to standard work procedure and wearing personal protective equipment. Safety participation is defined as behaviors that do not directly contribute to an individual's personal safety but individual will work towards a safer environment that supports safety (Neal & Griffin, 2002).



The main factors that cause incidents and accidents are non-compliance with safety requirements in industries. That is why the OSHA 1994 acts as a regulatory body to ensure industries comply with safety regulations. Compliance with safety requirements enables the work to be carried out in an efficient and safe manner (Hassan, Basha, & Hanafi, 2007). Thus, the concerted efforts from both employers and employees to comply with safety requirements would bring improvement towards safety compliance at the workplace. Based on Sulastre and Faridah (2010), management plays an important role in molding employees' safety compliance. It would be the employer's responsibility to encourage employees' compliance with organizational occupational safety and health requirements. Their paper also comments that many researchers have agreed that when employers place high impetus on the need for safety behavior, there is continuous

improvement in safety compliance and safety performance in the organization. In order to improve the safety compliance with safety requirements, there is need for cooperation between employers and employees in the organization. Active involvement by both parties in terms of behavioral safety compliance will produce greater influence among employees, which in turn is expected to improve safety behavior.

According to Jiang et al., (2016), leaders always prioritize safety issues and exhibit idealized behavior, which tends to enhance safety awareness among subordinates and instills in them the safety goals. Subsequently, the influence of employers toward employees would make employees exhibit safety participation. On the other hand, a transformational leader inspires and motivates their subordinates to voice their concerns, identifying new ideas and think of new way to combat safety issues. Transformational leadership is always expected to influence employees on the safety knowledge, safety motivation, and safety participation because this type of leaders will encourage their followers to use their safety knowledge to help others, and motivate employees to move a step forward for a safer workplace.

Managers who perceive that employees' involvement in the decision making can create a harmonious management would in effect encourage long-term career commitment, provide disability plans and so on, which will lead to minimal loss time injuries. Immediate superior should play their role to show the safety importance in daily routine

task in order for them to promote the importance of safety for a safer work environment (Simard & Marchand, 1994; DePasquale & Geller, 1999).

If a leader is able to instill safety vision to the subordinates, at the same time they also will be able to encourage employees to act in a safe manner by showing them as a role model to make sure employees' goals are achieved. With all these, subordinates with sufficient safety knowledge and safety motivation most likely will follow leaders' steps by showing more voluntary safety behaviours.

Based on the study conducted by Vinodkumar et al., (2010), the six management safety practices are the predictors of safety behavior at workplace. Apart from that, Jiang and Probst (2016) found that there is a positive relationship between safety knowledge as well as safety motivation in safety participation.

## **2.5 Safety Leadership**

Safety leadership is a process whereby leaders and followers interact and enables leaders to use their power to influence followers to achieve organizational safety goals (Wu, Chen, & Li, 2007). Safety leadership motivates team members to work harder, more efficiently, and in a way that accepts ownership of responsibility for safety performance (O'Dea & Flin, 2001).

Based on Minna (2010) safety leadership can be defined as one's role in showing a direction and helping people to grow. This can be achieved by focusing on the steps to handle serious incidents and proper resource allocation, while also serving as a role model with effective teaching, rewarding, and recruitment systems (Schein, 2004). Effective leadership is reported to be essential in building team performance and safety, which can be achieved mainly through team, environmental and personal categories.

According to Barling, Loughlin, and Kelloway (2002) supervisors who engage in transformational leadership would have positive influence on employee safety behavior in the hospitality sector because employees understand that transformational leadership is important in determining their self-reported safety behavior. Leaders who are equipped with strong leadership always have noticeable group cohesion that able to positively influence the organization safety climate. Conversely, low quality leadership reacts negatively with climate strength. Specifically, leaders with low quality leadership can negatively influence an organization's safety behaviour, while leaders who own positive attitudes, and good interpersonal skills to generate safe and effective task performance (Crichton, 2005).

Leaders have the power to influence other individuals (Tappen, Weiss, & Whitehead, 2004) and to stimulate for achieving common goals (Richardson & Storr, 2010). Transformational leadership takes place when leaders maximize the awareness of their associates regarding what is right, heighten their motivational maturity and generate an



ability in their associates to focus on the organization and society interest as a whole for the sake of the group.

Literature shows the importance of leadership as an agent that creates a safer work environment in the organization. Leape and Berwick (2000) stated that the realization of safety in the organization is depends on the leadership role, and that without it, fragmented and uncoordinated efforts will be produced that will barely make a difference.

### **2.5.1 Safety Leadership with respect to Safety Policy**

Based on Aswathappa (2004), organizational safety policy has to do with identifying the safety goals in the organization and giving the responsibilities and authority for their accomplishments. Efficient safety leadership with respect to safety policy in an organization allows it to minimize the incidents and accidents, reduce the safety hazards at the workplace, and also curb costs which are related to workplace accidents. Hence, the payments that are made to hospitals, and those claimed by workers are given to theirs families who involved in accidents can be reduced.

According to Akpan (2011), organizations with effective health and safety leadership pertaining to safety policy tend to enjoy a positive corporate image, the ability to attract potential investors as well as customers. Under such circumstances, this could draw,

attract and maintain a competent and safety-conscious workforce, which in turn enhances the top position of the organization, in terms of growth, good output and efficiency. On the other hand, Antonelli, Baker, McMahon and Wright (2006) hold that health and safety initiatives yield financial benefits through minimizing rates of absence, business disruption, and issues with productivity and quality. Crocker (1995) pointed out that workers are likely to show safe behavior in organization if they feel that their supervisors respect and recognize their contribution, and who is excited by a distinct company policy on safety.

### **2.5.2 Safety Leadership with respect to Safety Concern**

Safety concern is defined as the extent to which a senior manager functions as a role model to workers, and how much he or she stresses the importance of safety equipment, emphasizes workers' interest in acting on safety policies, cares about safety improvement; and cooperate with other departments to solve safety issues (Lu & Yang, 2010). The management practices that indicate concern about safety are important in creating a safe environment to work in, one of which is management commitment, which helps organization to create a safety culture which will eventually lead to employees' safety behavior. As discussed by Zohar (1980); Arboleda, Morrow, Crum and Shelley (2003); Choudhry, Fang and Ahmed, (2008), management's commitment to safety greatly influences the organization's safety programs. In any organization, management that shows certain level of concern about employees' safety is able to retain commitment in employees to carry out their duty in a safer way. Likewise, employees who are

concerned about their own safety would be expected to automatically carry out duties safely at the workplace.

According to Sawacha, Naoum, and Fong (1998), employers who show concern for the safety for their personal staff have a better safety record compared to those who pay no heed to safety in the course of their work. Furthermore the author has also commented that employees' expectations of the safety attitudes of their supervisors would influence their attitudes towards safety at the workplace. The individual employees concern with safety is tied in with management's own expressed concern for safety. Commitment and safety concerns will allow employees to support the management to achieve its safety (Hinze, Pederson, & Fredley, 1998).

### **2.5.3 Safety Leadership with respect to Safety Motivation**

Safety motivation refers to willingness of an individual to put effort to act safely at workplace (Neal et al., 2006). Safety motivation is one of the aspects of transformational leadership. Safety motivation relates to the extent to which a senior manager creates a motivation system to encourage workers' safety behavior. For instance, giving rewards for safe behavior, praising workers safety behavior, give safety incentive, reporting potential incidents and safety suggestions and encouraging workers safety behavior are all methods by which management can affects a motivation system (Lu et al., 2010).

Safety motivation also plays a prominent role in molding employees' safety behavior. The motivation has to be linked to required actions for the outcomes to be achieved (Greshwin, 1994) which is safety climate. Motivation alone does not impact employee behavior in a positive way unless well-established and correct safety climates are put in place to maintain the safety manner, and unless it is made explicit that there is no compromise for unsafe behavior especially in developing countries.

Furthermore, there is an increase in the number of literatures demonstrating that employee safety behavior is greatly influenced by employees' motivation to work safely (Christian, Bradley, Wallace, & Burke, 2009; Griffin & Neal, 2000; Neal et al., 2006; Neal, Griffin, & Hart, 2000).

One of the important organizational factors that influence workplace safety is the understanding into why employees are motivated to work safely. Research has consistently commented that employees who never miss reporting have higher levels of safety motivation and also will comply to their safe behavior (Christian et al., 2009; Neal et al., 2006; Neal et al., 2000; Vinodkumar et al., 2010).

According to Moller, Pedersen, and Kines (2011); Fleming (2012); Seibokaite, and Aukse (2010), safety motivation is able to improve employees' safety behavior by instilling more effective safety intervention steps and developing more occupational

safety and health program. In order to reduce the number of incidents and accidents, there must be a certain level of motivation which is able to motivate employees to abide by safety compliance.

On the other hand, the implementation of an effective system of reporting errors without blame is another method used to motivate employees to engage in a safety behavior (Leape, 1994; Uribe, Schweikhart, Psthak, Dow, & Marsh, 2002). Management or safety leaders can reward workers who discover errors and then report these errors to the respective department, as they are convinced that it is more valuable for an employee to report timely mistakes rather than to hide and overlook them.

In the context of many industries that involve high-risk jobs, employees tend to feel afraid of reporting errors which may lead to penalties. This is evidenced by the study conducted by Sexton, Thomas, and Helmreich (2000) that involved 182 intensive care personnel. They found that several medical errors remained unreported and hidden by the medical staff because of their fear and concerns regarding their personal reputation (76%), malpractice suits (71%), disciplinary action by the licensing boards (64%), and loss of job (63%). Therefore, to help maximize error reporting trust and mutual respect between administrators and front-line employees in an organization have to be established (Firth-Cozens, 2004).

In many industries, quality circles as well as other techniques that encourage open discussion of errors are effective methods that can minimize errors (Edmondson, 1999; Mullins & Schmale, 1993; Klein *et al.*, 1998; Vanderveen, 1991). Specifically, Tucker (2007) revealed that psychological safety, the notion that employees can freely discuss errors, was positively related to performance enhancements among workers.

Safety motivation employers' or top management's involvement with their employees such as in the form of fostering a professional relationship with employees, talking on safety, and advising on safety matters can enhance safety motivation and encourage employees' safety behavior (Hassan, 2007). According to Evelyn (2005), the two types of motivation are positive reinforcement and negative reinforcement. For example, employees are given monetary rewards, bonuses, and job promotions, which are all positive reinforcement whereas negative reinforcement may include criticism, punishment and threats to the employees in order to motivate them to perform their jobs in a safe manner. However, reinforcement on positive motivation is more effective and in this way, many safety practitioners are encouraged to maintain and improve employees' good safety behavior. Safety improvement is only likely to be achieved if incentive schemes are put in place to build motivation in employees to change their behaviors (Vrenderburgh, et., 2002). An organization that creates and maintains good quality employer and employee relationships tend to benefit from higher levels of employee motivation, commitment and job satisfaction, which in turn bring a positive impact on the employee's intention to stay, on employee performance (Leung, Chong, Ng, & Cheung, 2004) employer safety behavior.

## 2.6 Safety Knowledge

Safety knowledge relates to the level of understanding in employees of safety operating procedures and adequate safety training and instructions (Hofman et al., 1995). Most of the industries such as manufacturing, construction, service and many more need safety knowledge to influence their employees to work towards safety behavior at the workplace. Knowledge is made clear to them pertaining to what safety is all about and how it is to be practised and worked out. Based on Cooper and Cotton (2000); Clarke (2004); Chen, Wang, Yang, and Zheng (2015) safety knowledge and training are important to employee safety behavior and environment perceptions of safety work; it is significant predictor of safety behavior.

How a manager behaves towards safety has certain impact on the behavior of the safety knowledge of the workers because most workers would follow whatever they observe from their management. For instance, how a manager designs the safety procedures and systems will have certain influence on employees' safety knowledge. Therefore, management should understand how to develop an effective safety system that could give necessary safety knowledge for employees (Vinodkumar & Bhasi, 2011). Safety motivation of employees would be affected by management behavior. Thus, making a safe atmosphere and strong supervision are important factors affecting staff's self-report behavior (Probst & Estrada, 2010). If a manager can show a higher level of commitment towards safety, this may influence employees to be more secure and be able to understand the importance of safe behavior at the workplace. That would in turn, lead to a reduction in unsafe behavior, and thus a higher level of safety performance (Yule, Flin & Murdy, 2007). Actions speak louder than words; therefore management behavior could

be another factor that could affect employees' safety knowledge. Moreover, if the organization fails to provide sufficient training to employees also may cause malpractice in the organization (Vredenburg, 2002). According to Vinodkumar and Bhasi (2010), safety training is an important tool to instill safety knowledge to employees, thus management should adopt the right management strategies to influence employees' safety behavior.

In order to enhance workers' safety knowledge at the workplace; some initiative ought to be taken such as providing training and education as an attempt to reduce errors (Becher & Chassin, 2001). Training should be conducted to educate employees about the importance of safety in workplace especially those in hazardous industries. Besides being a compulsory program for new employees, training programs must be conducted at timely basis for existing employees as well.

If safety training can teach employees on how to identify the risk of accidents, and ways to have preventive action before accidents occurs in their daily job, then this safety training is considered effective and informative. Hence, safety awareness can be improved by effective safety training programmes (Ghani, Hamid, Zain, Rahim, Kamar, & Rahman, 2010) and to affect behavior employee behavior (Wong, Chan, Tse, & Love, 2000). McDonald (2003) it is very important that employees need to have knowledge on the occupational risks of their work through their daily routine work. Rampant accidents at construction sites were due to lack of safety training among employees (O'Toole, 2002). Based on Komaki, Heinzman and Wyld (1980), in the vehicles industry,



employees found that safety training helped to improve safety behavior. According to Hopton (1969), trainings aimed at workers and operators would not only reduce accidents, but may also reduce costs and save lives.

Apart from giving safety training to employees about safety knowledge, organization can have incorporate more creative methods to convey the message of safety knowledge such as by displaying safety posters used to identify potential hazards at easily seen areas, and assigning performance-linked or promotion based value to employees who follow safety rules. Further, daily communication between workers and supervisors about health and safety, upper management showing the initiative in participating in safety programs, and more frequent informal communication between higher management and workers would help to improve safety knowledge in employees.

## **2.7 Safety Motivation**

Following on Hofmann, Jacobs, and Landy (1995); Neal, Griffin, and Hart (2000), safety safety motivation is an important factor in predicting safety compliance. Safety motivation is defined as employees feel motivated to carry out their task in a safe manner (Hofmann et al., 1995) and the motivation to perform safety behavior (Neal et al., 2000). Motivation can be categorized into 2 which are extrinsic and intrinsic. A number of literature reviews have been done on safety motivation and it reveals the differences between intrinsic and extrinsic motivation. When individuals are intrinsically motivated, they will involve in those activities they feel interested with. When extrinsically

motivated, individuals feel satisfied for external materials or other reasons. (Al-hadir, Panuwatwanich, Stewart, & Rodney, 2013).

Hofmann et al., (1995) stated that employees will not act in a safe manner by adhering to the safety policies if they feel that the reward that they received is not appealing. This implies that employees only abide by their organization's safety regulations if they are rewarded with a certain degree of incentive. In other words, they are more likely to enjoy extrinsic safety motivation. Based on Vroom (1964), employees' desire for reward will make them put more effort in involving in safety activities.. Therefore, by implication, an individual who is rewarded for following safety policies would show a high motivational force in terms of those behaviors. However, if the reward structure "rewards" individuals for their noncompliance, then their motivational force to comply with safety policies is expected to be low.

## **2.8 Social Exchange Theory**

Based on Homans (1961) Social Exchange Theory can be defined as exchange of goods, material goods but also non-material ones, such as the symbols of approval or prestige. He further elaborated the theory as an exchange activity, tangible or intangible, and more or less rewarding or costly, between at least two persons. Moreover, Blau (1964) defined Social Exchange Theory as voluntary actions of individuals that are motivated by the returns they are expected to bring and typically do in fact bring from other.

In this study, this theory applies here as there is a safety leadership in the organization regards to safety policy; employees tend to follow to the organization set policy towards safer work procedures to prevent workplace accidents. Besides, when management shows concern regards to employees' safety and it will create a sense of caring which make employees feel good about the management and in return employees will comply to safety rules and regulations as well as participate in safety related issues. On the other hand, employers who gives motivations to employees in encouraging employees for a safe behaviour, if management able to provide an appealing rewards for employees to behave safely then it is definitely employees will react to such a way which can create safe behaviour among employees.

Whereas, safety knowledge such as the information on the importance of the usage of the Personal Protective Equipments (PPE), the guidelines or procedures that tasks to be carried out safely and so on. If the necessary safety knowledge message is communicated effectively, in return employees will automatically comply to safety rules as well as participate in safety programs. Lastly, safety motivation react effectively with safety behaviour if the individual employee understands the importance of own safety during work and then the organization safety goal is aligned with employees then automatically it will encourage employees safety behaviour.

## 2.9 Hypotheses Developments

H1a: There is a positive and significant relationship between safety leadership with respect to safety policy with safety compliance.

H1b: There is a positive and significant relationship between safety leadership with respect to safety policy with safety participation.

H2a: There is a positive and significant relationship between safety leadership with respect to safety concern with safety compliance.

H2b: There is a positive and significant relationship between safety leadership with respect to safety concern with safety participation.

H3a: There is a positive and significant relationship between safety leadership with respect to safety motivation with safety compliance.

H3b: There is a positive and significant relationship between safety leadership with respect to safety motivation with safety participation.

H4a: There is a positive and significant relationship between safety knowledge with safety compliance.

H4b: There is a positive and significant relationship between safety knowledge with safety participation.

H5a: There is a positive and significant relationship between safety motivation with safety compliance.

H5b: There is a positive and significant relationship between safety motivation with safety participation.

## 2.10 Theoretical Framework

The theoretical framework for this study is designed according to a few study frameworks used as the basis of this study. The reason for performing this study is to understand better the relationship between independent variables such as safety leadership, safety knowledge and safety motivation toward offshore oil and gas employees' safety behavior in Terengganu. The independent variables contain safety leadership, safety knowledge, and safety motivation, while the dependent variable is safety behavior.

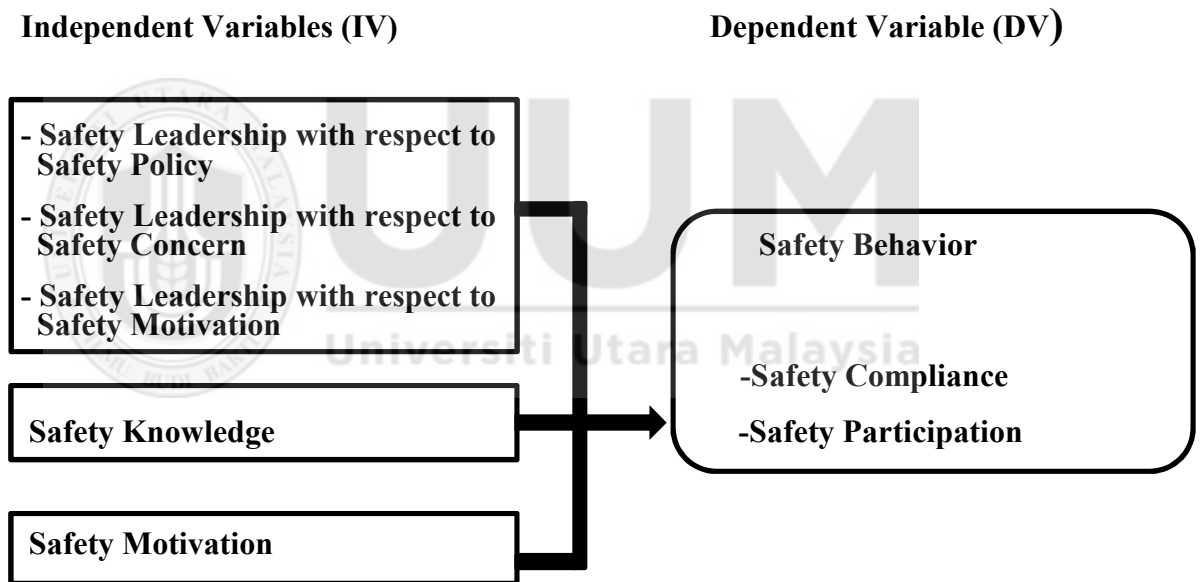


Figure 2.1 Research Framework

## 2.11 Summary

Based on the literatures above, there are several factors that may influence employees' safety behavior at the workplace, and it is important that organizations pay full heed to those factors in order to prevent incidents and accidents which can cause loss of human life. There are plenty of previous studies that have found that safety leadership (safety policy, safety concern, and safety motivation), safety knowledge and safety motivation influence safety behavior in different industries.



## **CHAPTER 3**

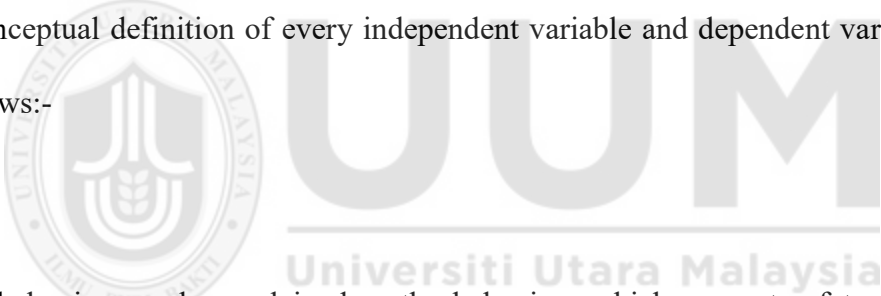
### **METHODOLOGY**

#### **3.1 Introduction**

The research method used to conduct this study will be explained thoroughly in this chapter. It reports the needed data and information required to explain the research objectives and questions. On the other hand, the justifications why the research designs, sampling procedures, data collection procedure and technique used.

#### **3.2 Conceptual Definition**

The conceptual definition of every independent variable and dependent variable is listed as follows:-



Safety behavior can be explained as the behaviors which support safety practices and activities that align with the occupational, safety and health conditions to avoid workplace accidents (Mahmood, 2010). There are two kinds of safety behavior: safety compliance and safety participation. Safety compliance can be defined as the core activities which are needed to be complied when they are carrying out their duties at workplace to ensure workplace safety. For instance, employees' behaviours such as follow the standard work procedure as well as wearing personal protective equipment (PPE). Whereas, safety participation can be explained as those employees' behaviours that do not have direct impact to employees' personal safety but it able to help in developing a situation which can supports safety. For examples, employees participate

voluntarily in safety activities, helping co-workers with safety issues (Borman & Motowidlo, 1993).

Based on Lu et al, (2010) leadership is an important aid to change the people in the organization as leaders are able to offer prized perceptions on safety issues and how their assistance and direction will support a safe workplace. Safety leadership is spelled out as the interaction process between leaders and followers whereby leaders can actually uses their leadership power to exercise their influence on followers to fulfill or complete their tasks based on the organizational safety goals (Wu, 2005). The definition of the three dimensions under safety leadership are safety policy, which describes the level to which a manager will let employees to have a very clear understanding about the mission, roles, and goal, which entails setting a set of behavior for employees and create a safety system to bring workers' safety behavior to the right way (Lu et al, 2010). While safety concern relates to the level to which a senior manager is a role model to workers, emphasizes the significance of safety equipment, concern about safety improvement and coordinates with other departments to overcome safety issues (Lu et al., 2010). Additionally, safety motivation is described as all jobs are done in a safe manner because the motivation that encourages them to behave in such manner (Hofmann et al., 1995) and the motivation to carry out safety behavior (Neal et al., 2000). Likewise, Lu et al, (2010) explained in order to improve employees' safe behavior, organization can set a motivation system to encourage them such as giving reward and praising employees for those workers who work safely as well encourage them to involve in safety participation decision making.



Safety knowledge refers to employees' understanding of safety operating procedures and sufficient safety training and instruction (Hofmann, Jacobs, & Landay, 1995). Management in the organization has an important role to play to educate workers about workplace safety to prevent incidents and accidents that can cause injuries and even loss of lives.

Lastly, safety motivation is referred to a person's willingness to put effort to to sanction safety behaviors (Neal & Griffin, 2006). The most effective tool to motivate employees is to by using incentives, awards and recognition for performing their works safely (Hagen et al., 2001).

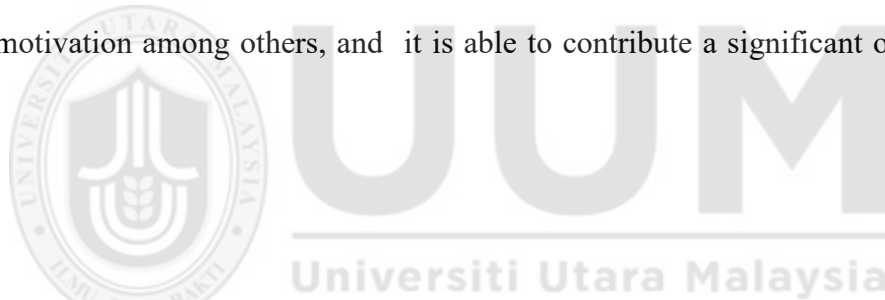


### **3.3 Research Approach/ Design**

The aim of this research is to perform a hypotheses testing as it allows the current researcher to describe the nature of certain relationships. This research is a descriptive study applying quantitative and using a cross-sectional approach in data collection. The hypotheses development in this research allows the present researcher to meet the objectives of this research and assist toward findings. Besides, it defines whether safety leadership, safety knowledge, and safety motivation can affect safety behavior among offshore oil and gas employees in Terengganu.

The questionnaire in this research was developed in two languages. The original questionnaires were created in English and for the current study purpose the researcher translated in in Bahasa Melayu.

In this study, the unit analysis is at individual level where each employee in the offshore oil and gas from Terengganu will be the respondents. The data collection was done at individual level via distribution of questionnaire to test employees' safety leadership, safety knowledge, safety motivation towards safety behavior because different individuals differ in their perceptions towards variables such as safety knowledge, and safety motivation among others, and it is able to contribute a significant output for this study.



### **3.4 Sampling and Sampling Procedure**

Sampling is a process where researchers choose an adequate number of elements from the population with the idea of making a generalization of research sample (Sekaran, 2005). Basically, a research study is performed on a sample from a population. The main aim is to study the facts about the sample that can represent the population as a whole. According to Sekaran (2005), a suitable sample size is very essential in deciding the facts about the sample so as to the generalization made on the population is precise.

In this research, the present researcher used non-probability sampling technique. The rationale to this is the present researcher could not get the sampling frame to signify all oil and gas workers in Terengganu. Therefore, there is no assurance that every respondent has had an opportunity to be chosen.

Convenience sampling technique is adopted in this research which comes under non probability category. Based on Sekaran and Bougie (2010), convenience sampling is the process of collecting data or information from those members of the population who are easily approached. This sampling technique becomes necessary to acquire information for this research and the targeted respondents are offshore oil and gas employees. Moreover, the convenience sampling technique is comparatively cheaper and simple to manage. It is an appropriate method to obtain information speedily and efficiently.

### **3.5 Research Instrument**

This research applies the self-administered questionnaire as the data collecting instrument that was used by Lu et al., (2010). The questionnaire contains 4 sections, Section A (Demographic Information), Section B (Safety Leadership Attributes), Section C (Safety Knowledge and Safety Motivation) and Section D (Safety Compliance and Safety Participation). The items in the questionnaire were applied to measure the dependent variable, “Safety Behavior” and the independent variables, “Safety Leadership, Safety Knowledge, and Safety Motivation”. Safety leadership was assessed by three dimensions that are “Safety Motivation”, “Safety Concern” and “Safety Policy”. These items were

taken from Lu et al., (2010) who had adapted the items from past researches. On the other hand, the other two independent variables (safety knowledge and safety motivation) were taken from Vinodkumar et al., (2010), while the dependent variable namely Safety Behavior was measured by Safety Compliance and Safety Participation, this also came from Vinodkumar et al., (2010).

Table 3.1 Items used for measuring the variables

Variables	Items	Authors
Safety Leadership	<p><b><u>Safety Policy</u></b></p> <ol style="list-style-type: none"> <li>1. My employer has established a safety responsibility system.</li> <li>2. My employer establishes clear safety goals.</li> <li>3. My employer explains the safety mission clearly.</li> <li>4. My employer emphasizes worksite safety.</li> </ol>	Lu & Yang (2010)
	<p><b><u>Safety Concern</u></b></p> <ol style="list-style-type: none"> <li>1. My employer expresses an interest in acting on safety policies.</li> <li>2. My employer is concerned about safety improvement.</li> <li>3. My employer coordinates with other departments to solve safety issues.</li> <li>4. My employer stresses the importance of wearing personal protective equipment.</li> <li>5. My employer shows consideration for workers.</li> </ol>	
	<p><b><u>Safety Motivation</u></b></p> <ol style="list-style-type: none"> <li>1. My employer encourages workers to provide safety suggestions.</li> <li>2. My employer encourages workers' participation in safety decision-making.</li> <li>3. My employer encourages workers to report potential incidents without punishment.</li> <li>4. My employer trusts the workers.</li> <li>5. My employer praises workers' safety behavior.</li> <li>6. My employer rewards those who set an example in safety behavior.</li> <li>7. My employer has set up a safety incentive system.</li> </ol>	

Safety Knowledge	<ol style="list-style-type: none"> <li>1. I know how to perform my job in a safe manner.</li> <li>2. I know how to use safety equipment and standard work procedures.</li> <li>3. I know how to maintain and improve workplace safety and health.</li> <li>4. I know how to reduce the risk of accidents and incidents in the workplace.</li> <li>5. I know what are the hazards associated with my jobs and the necessary precautions to be taken while doing my job.</li> <li>6. I don't know what to do and who to report if a potential hazard is noticed in my workplace.</li> </ol>	Vinodkumar & Bhasi (2010)
Safety Motivation	<ol style="list-style-type: none"> <li>1. I feel that it is important to maintain safety all times.</li> <li>2. I believe that safety at workplace is a very important issue.</li> <li>3. I feel that it is necessary to put efforts to reduce accidents and incidents at workplace.</li> <li>4. I believe that safety can be compromised for increasing production.</li> <li>5. I feel that it is important to encourage others to use safe practices.</li> <li>6. I feel that it is important to promote safety programs.</li> </ol>	Vinodkumar & Bhasi (2010)
Safety Behavior	<p><b><u>Safety Compliance</u></b></p> <ol style="list-style-type: none"> <li>1. I use all necessary safety equipment to do my job.</li> <li>2. I carry out my work in a safe manner.</li> <li>3. I follow correct safety rules and procedures while carrying out my job.</li> <li>4. I ensure the highest levels of safety when I carry out my job.</li> <li>5. Occasionally due to lack of time, I deviate from correct and safe work procedures.</li> <li>6. Occasionally due to over familiarity with the job, I deviate from correct and safe work procedures.</li> <li>7. It is not always practical to follow all safety rules and procedures while doing a job.</li> </ol> <p><b><u>Safety Participation</u></b></p> <ol style="list-style-type: none"> <li>1. I help my co-workers when they are working under risky or hazardous conditions.</li> <li>2. I always point out to the management if I detect any safety related matters are noticed in my company.</li> <li>3. I put extra effort to improve the safety of the workplace.</li> <li>4. I voluntarily carry out tasks or activities that help to improve workplace safety.</li> <li>5. I encourage my co-workers to work safely.</li> </ol>	Vinodkumar & Bhasi (2010)

### 3.6 Pilot Study

It is necessary to perform a pilot study before conducting a complete study. A pilot study is a process to test questionnaire in a small scale in term of the methods and procedure to be used on a large scale. This is to test the questions validity and the reliability of the data which will be collected (Porta, 2008). The following table shows the outcome of reliability test on the pilot study.

Table 3.2 Pilot Study Reliability Test

Variable	Cronbach's Alpha (Pilot Study)	No of Items
<b><u>Independent Variables</u></b>		
<b>Safety Leadership</b>		
1) Safety motivation	0.893	7
2) Safety policy	0.863	4
3) Safety concern	0.933	5
Safety Knowledge	0.875	6
Safety Motivation	0.816	6
<b><u>Dependent Variable</u></b>		
<b>Safety Behavior</b>		
1) Safety Compliance	0.816	7
2) Safety Participation	0.869	5

### **3.7 Data Collection Procedure**

This study's questionnaires were circulated only after getting the approval letter from UUM, Kuala Lumpur for data collection purpose. Questionnaires were distributed to safety managers who were at the time attached to offshore oil and gas industry in Terengganu after communication with the company to obtain the consent to circulate the questionnaire. Questionnaires were distributed to staff members and the duration was set at about a month to collect all questionnaires by postal service. The total printed questionnaires were 300 copies but eventually, the present researcher managed to only receive 170 sets of complete questionnaire. In other words, the present researchers collected about 56% of questionnaire that were distributed.

### **3.8 Data Analysis Technique**

In this research, the statistical tool that was used to examine data is Statistical Program for Social Science (SPSS) version 20. The SPSS allowed the present researcher to organize the data and make the interpretation. Besides, it also helped to decide the appropriate statistical approach to be used to test the hypothesis. The data was collected and examined by using descriptive analysis (frequencies, min, max, mean and standard deviation), reliability analysis, correlation coefficient and multiple regression analysis.

In reliability analysis, the figure was measured using Cronbach's Alpha. It determined how well the measured elements were positively inked to one another. Nunnaly (1994), defined that Cronbach's Alpha of 0.7 or greater is acceptable in social sciences research. Reliability of a measure is formed by using both consistency and stability test.

Table 3.3: Rule of Thumb Cronbach-Alpha Coefficient Size

<b>Alpha Coefficient Range</b>	<b>Strength of Association</b>
< 0.6	Poor
0.6 to < 0.7	Moderate
0.7 to < 0.8	Good
0.8 to < 0.9	Very Good

Under this study, descriptive analysis was conducted to explain the characteristic of samples, including the demographic sample. It also decided the measures of central tendency (mean and median) and measures of dispersion (variance, standard deviation, etc.).

A correlation analysis was also tested in this research to measure the association of two variables. For this research, Pearson Correlation Coefficient was applied to demonstrate the direction, strength and significance of the bivariate relationships of all variables in the research.

Finally, multiple regression analysis was applied in this research to determine the association between independent variables and dependent variables, the direction of the relationship, the level of the relationship and also the strength of the relationship.



### 3.9 Summary

Data collection is a very important process in determining the significance of the study. Therefore, the SPSS statistical tool allows researchers to recognize the association between independent variables and dependent variables. To sum up, this analysis can indicate whether this research has achieved the objective of this research or otherwise.



## CHAPTER 4

### RESULTS AND DISCUSSION

#### 4.1 Introduction

This chapter will discuss the findings from the data analysis to show whether there is a relationship between the safety leadership (safety policy, safety concern, & safety motivation), safety knowledge, and safety motivation and dependent variable which is safety behavior (safety compliance and safety participation). Data is processed and analyzed using SPSS version 20.0. analyses such as descriptive analysis, correlation analysis, multiple regression analysis would be shown and explained in this part of study.

#### 4.2 Rate of Response

A total of 300 questionnaires were distributed to respondents who are oil and gas offshore employees in Terengganu. Only 170 of them responded and returned and the rest of the questionnaires were not returned which were 130 questionnaires. The returned 170 of questionnaires were completely answered. Therefore, the response rate was 52.5%. Table 4.1 shows the response rate of the survey.

Table 4.1 The Response Rate of Survey

<b><u>Items</u></b>	<b><u>Total</u></b>	<b><u>Percentage (%)</u></b>
Distributed questionnaire	300	100
Returned questionnaire	170	56.67
Completed questionnaire	170	56.67

### 4.3 Respondents' Demographic Background

Table 4.2 Demographic Characteristic of the Respondents

Demographic	Frequency	Percentage (%)
<b>Gender</b>		
Male	143	84.10
Female	27	15.90
<b>Marital Status</b>		
Single	36	21.20
Married	129	75.90
Divorced/Widow	5	2.9
<b>Education</b>		
Primary	8	4.7
PMR	6	3.5
SPM	33	19.4
STPM	10	5.9
Diploma	56	32.9
Degree	43	25.3
Master	8	4.7
PHD	3	1.8
Others	3	1.8
<b>Race</b>		
Melay	141	82.90
Chinese	10	5.90
Indian	17	10.0
Others	2	1.20
<b>Age</b>		
20-30	75	44.4
31-40	63	37
41-50	23	13.7
51-60	9	5.4

<b>Length of Service</b>		
1-5	103	60.5
6-10	30	17.6
11-15	13	7.7
16-20	13	7.7
21-25	8	4.8
26-30	3	1.8
<b>Accident Rate</b>		
1-5	29	17.1
6-10	6	3.5
No	135	79.4
<b>Training Attended</b>		
Yes	143	84.1
No	27	15.9

Table 4.2 indicates that the group that has the largest population in the survey process is Malay (82.90%) and the age range of 20 to 30 years old is the highest group of respondents which have 44.40% out of 100%. Apart from that, offshore oil and gas is mostly concurred by male group because this questionnaire received 143 male respondents (84.10%) whereas there were only 27 female respondents who amounted to 15.90%. It shows the results of the study are mostly derived from the male respondents' opinions.

In terms of age, the respondents who had their age in the interval between 20-40 years old, constituted 81.40% of the respondents and followed by 41-60 only constituted 19.10%. Education wise, the majority of the respondents were from diploma background

which shows the total number of 56 that constituted 32.9%. This is followed by the second highest number of respondents based on their education background, who were from a Degree program and SPM, and their respective constitutions of the percentage are 25.3% and 19.4%.

The largest group of respondents is the employees who had been working for more than 5 years, which consisted 60.5% of the respondents. This is followed by those who had worked for 6 to 10 years 17.6%. And for those who had worked more than 20 years, there were 11 of them out of 170 respondents which constituted 6.6%

Respondents who had married constituted 75.90% which was the highest percentage among single and divorce 21.20 and 2.90% respectively. Majority of the respondents 135 (79.4%) responded that they had never encountered an accident at the workplace since the start their service with the current organization. However, there were 35 respondents who had met workplace accidents since starting employment in their current organization, which constituted 20.6%. The table also shows the number of employees who had attended safety workplace training were 143 (84.10%) whereas 27(15.90%) of them responded that they had never attended any safety training at the workplace.

#### 4.4 Reliability Analysis

According to Sekaran and Bougie (2010), there are three different levels of reliability coefficients. Those value that near exactly at 1.0 or near 1.0 consider is considered the better, and those value get over 0.80 is considered good. Any values that at 0.70 considered acceptable and reliability values than less than 0.60 is considered to be poor.

The current study produced quite good reliability and all the independent and dependent variables met the above requirement range within 0.60 to 0.80. As presented in the table 4.3, after 5 items were deleted from a total 40 items (safety knowledge 1 item, safety motivation 1 item and safety compliance 3 items), the reliability range between moved from 0.80 to 0.90.

Table 4.3 Reliability after Items Deleted

<b>Variables</b>	<b>No. of Final Items</b>	<b>Cronbach Alpha Value</b>
<b>Safety leadership</b>		
- Safety concern	5	0.914
- Safety motivation	7	0.891
- Safety policy	4	0.863
<b>Safety Knowledge</b>	5	0.924
<b>Safety Motivation</b>	5	0.931
<b>Safety Behavior</b>		
- Safety compliance	4	0.899
- Safety Participation	5	0.805
<b>Total</b>	35	

#### 4.5 Descriptive Analysis

Descriptive analysis is used to explain the basic features of a given data set in a study. It gives a simple summary about the sample which can represent the entire sample. This study explains the mean and the standard deviation values which for all the variables which presented in Table 4.4. Based on Sekaran and Bougie (2010) the mean value is the average of all values in a given data set. The mean is a descriptive statistic that measures the center of a balance of the data. All the variables were evaluated based on the five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Based on Davies (1971), the level of the variables is considered high when the mean score is 3.68 to 5, whereas the score of 2.34 to 3.67 is considered moderate level and the low level is at value 1 to 2.33. Based on table 4.4 below, the mean value for safety concern was 4.34 and standard deviation was at the 0.68, whereas for safety motivation variable, the mean value was 4.17 and standard deviation was 0.70 and the safety policy mean value was 4.39 and standard deviation was 0.69 with the minimum value of 1.5 and maximum value was 5. On the other hand, safety knowledge and safety motivation recorded a mean value 4.36 and 4.58 with standard deviation 0.69 and 0.63 respectively. Moreover, the dependent variables; safety compliance had mean value of 4.39 and standard deviation 0.70, whereas safety participation's mean value was 4.39 and standard deviation 0.62.

In conclusion, the mean score for all variables was above 4 and it is considered high and shows that the respondents agreed with safety leadership (safety policy, safety concern, and safety motivation), safety knowledge, and safety motivation influence safety behavior (safety compliance and safety participation).

Table 4.4: Descriptive Analysis for Main Variables

<b>Variables</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>N</b>
Safety concern	4.34	0.68	170
Safety motivation	4.17	0.70	170
Safety policy	4.39	0.69	170
Safety knowledge	4.36	0.69	170
Safety motivation	4.58	0.63	170
Safety compliance	4.38	0.70	170
Safety participation	4.39	0.62	170

#### **4.6 Pearson Correlation Analysis**

Table 4.5 shows the correlation between safety leadership (safety concern, safety motivation, and safety policy), safety knowledge and safety motivation and safety behavior (safety compliance and safety participation). The results indicate that all independent variables have positive significant relationship with safety behavior.

The strongest variable is 0.699, which means that the higher the safety knowledge in organization the higher the safety compliance.

In the following segment, all the independent variables correlation coefficient would be elaborated on according to the relationships.

#### **4.6.1 Safety leadership (safety concern, safety motivation, safety policy) and Safety Behaviour (Safety Compliance)**

##### **4.6.1.1 Safety policy and safety compliance**

From the results, it is proven that there is a relationship between safety leadership with respect to safety policy and safety compliance with the positive value for correlation coefficient. The safety leadership with respect to safety policy variable has a positive



correlation with the safety compliance variable. Thus, when safety leadership with respect safety policy variable is high, safety compliance is also high. The value of this correlation coefficient is 0.684 and falls under moderate level. The relationship between safety leadership with respect to safety policy and safety compliance is significant with the p-value 0.000 is less than alpha value 0.05.

#### **4.6.1.2 Safety concern and safety compliance**

For the second variable which is safety leadership with respect to safety concern, there is a relationship between safety leadership with respect to safety concern and safety compliance with the correlation coefficient value is positive. Thus, when perceived that safety leadership with respect to safety concern is high, safety compliance is also high. The value of this correlation coefficient is 0.612 and this falls under the correlation coefficient range from 0.41 to 0.70. Therefore, the relationship between safety leadership with respect to safety concern and safety compliance is moderate. The relationship between safety leadership (safety concern) and safety compliance is significant with the p-value 0.000 is less than alpha value 0.05.

#### **4.6.1.3 Safety motivation and safety compliance**

From the results, it is evident that there is a relationship between safety leadership with respect to safety motivation and safety compliance because of its positive value for correlation coefficient. The safety leadership with respect to safety motivation variable has a positive correlation with the safety compliance variable. Therefore, when perceived safety leadership with respect to safety motivation is high, safety compliance is high.

The value of this correlation coefficient is 0.598, which falls under the correlation coefficient range from 0.41 to 0.70. Therefore, the relationship between safety leadership with respect to safety motivation and safety compliance is moderate. The relationship between safety leadership with respect to safety motivation and safety compliance is significant because the p-value 0.000 is not more than alpha value 0.05.

#### **4.6.2 Safety knowledge and safety compliance**

On the other hand, there is a relationship between safety knowledge and safety compliance because of the positive value for correlation coefficient. Thus, when perceived safety knowledge is high, safety compliance is high. The value of this correlation coefficient is 0.699 fall under range from 0.41 to 0.70. Therefore, the relationship between these two is moderate. The relationship between safety knowledge and safety compliance is significant with the p-value 0.000 is less than alpha value 0.05.

#### **4.6.3 Safety motivation and safety compliance**

From the results, there is relationship between safety motivation and safety compliance because of the positive value for the correlation coefficient. In other word, when safety motivation is high so does the safety compliance. The value of this correlation coefficient is 0.640 and it falls under the correlation coefficient range from 0.41 to 0.70. Therefore, safety motivation and safety compliance relationship is at moderate level. The relationship between safety motivation and safety compliance is significant with the p-value 0.000 is less than alpha value 0.05.

#### **4.6.4 Safety leadership (safety concern, safety motivation, safety policy) and Safety Behavior (Safety Participation)**

##### **4.6.4.1 Safety policy and safety participation**

The results indicate that there is a relationship between safety leadership with respect to safety policy and safety participation because of the positive value for correlation coefficient. Thus, when perceived safety leadership with respect to safety policy is high, safety participation is also high.

The value of this correlation coefficient, 0.660, falls within the range from 0.41 to 0.70. Therefore, the relationship between safety leadership with respect to safety policy and safety participation is moderate. The relationship between safety leadership with respect to safety policy and safety participation is significant with the p-value 0.000 is less than alpha value 0.05.

##### **4.6.4.2 Safety concern and safety participation**

Besides that, there is a relationship between safety leadership with respect to safety concern and safety participation because of the positive value for correlation coefficient. Thus, when perceived safety leadership with respect to safety concern is high, safety participation is also high.

The value of this correlation coefficient, 0.640, falls within the range from 0.41 to 0.70. Therefore, the relationship between safety leadership with respect to safety concern and safety participation is moderate. The relationship between safety leadership with respect

to safety concern and safety participation is significant with p-value 0.000 is less than alpha value 0.05.

#### **4.6.4.3 Safety motivation and safety participation**

Furthermore, there is a relationship between safety leadership with respect to safety motivation and safety participation because of the positive value for correlation coefficient. Thus, when perceived safety leadership with respect to safety motivation is high, safety participation is also high. The value of this correlation coefficient is 0.643, which falls under the correlation coefficient range from 0.41 to 0.70. Therefore, the relationship between safety leadership with respect to safety motivation and safety participation is moderate. The relationship between safety leadership with respect to safety motivation and safety participation is significant. It is because the p-value 0.000 is less than alpha value 0.05.

#### **4.6.5 Safety knowledge and safety participation**

Moreover, there is a relationship between safety knowledge and safety participation because of the positive value for correlation coefficient. The safety knowledge variable positively correlated with safety participation variable. Therefore, when perceived safety knowledge is high, safety participation is also high. The value of this correlation coefficient is 0.573 and it falls under the correlation coefficient range from 0.41 to 0.70. Therefore, the relationship between safety knowledge and safety participation is moderate. The relationship between safety knowledge and safety participation is significant with the p-value 0.000 is less than alpha value 0.05.

#### **4.6.6 Safety motivation and safety participation**

Lastly, there is relationship between safety motivation and safety participation because of the positive value for correlation coefficient. The safety motivation variable gives positive correlation with the safety participation variable. Thus, when perceived safety motivation is high so does safety participation. The value of this correlation coefficient is 0.580 and it falls under the correlation coefficient range from 0.41 to 0.70. Therefore, the relationship between safety motivation and safety participation is moderate. The relationship between safety motivation and safety participation is significant. It is because the p-value 0.000 is less than alpha value 0.05.



Table 4.5 Pearson Correlation

		LeadershipPolicy	LeadershipConcern	LeadershipMotivation	SKnowledge	SMotivation	SCompliance	SParticipation
LeadershipPolicy	Pearson Correlation	1						
	Sig. (2-tailed)							
	N	170						
LeadershipConcern	Pearson Correlation	.924**	1					
	Sig. (2-tailed)	.000						
	N	170	170					
LeadershipMotivation	Pearson Correlation	.826**	.870**	1				
	Sig. (2-tailed)	.000	.000					
	N	170	170	170				
SKnowledge	Pearson Correlation	.750**	.736**	.703**	1			
	Sig. (2-tailed)	.000	.000	.000				
	N	170	170	170	170			
SMotivation	Pearson Correlation	.742**	.701**	.577**	.750**	1		
	Sig. (2-tailed)	.000	.000	.000	.000			
	N	170	170	170	170	170		
SCompliance	Pearson Correlation	.684**	.612**	.598**	.699**	.640**	1	
	Sig. (2-tailed)	.000	.000	.000	.000	.000		
	N	170	170	170	170	170	170	
SParticipation	Pearson Correlation	.660**	.640**	.643**	.573**	.580**	.644**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	
	N	170	170	170	170	170	170	170

\*\* . Correlation is significant at the 0.01 level (2-tailed).

## **4.7 Hypotheses Testing for Safety Compliance**

Table 4.6 below describes the relationship between the variables; there are safety leadership (safety policy, safety concern, & safety motivation), safety knowledge and safety motivation with safety compliance in the offshore oil and gas companies in Terengganu.

### **4.7.1.1 Safety policy and safety compliance**

The multiple regression results show the relationship between safety variables. Firstly, the relationship for safety leadership with respect to safety policy is positively significant with safety compliance ( $\beta=0.509$  at  $p\text{-value} < 0.01$ ). This indicates that the safety leadership with respect to safety policy is significantly related to safety compliance. Thus, hypothesis 1a is supported.

### **4.7.1.2 Safety concern and safety compliance**

The relationship for safety leadership with respect to safety concern with safety compliance is significant at ( $\beta=-0.369$  at  $p\text{-value} < 0.05$ ). However, the relationship is moving in the opposite direction, as there is an increase in safety concern variable there will be a decrease in safety compliance. It means that if employers show too much safety concern at the workplace, it may decrease the compliance to safety by workers. Hence, hypothesis of 2a is rejected.

#### **4.7.1.3 Safety motivation and safety compliance**

The relationship from safety leadership with respect to safety motivation to safety compliance is not positively significant ( $\beta=0.150$  at  $p\text{-value} >0.05$ ). This indicates that the safety leadership with respect to safety motivation is not positively significantly related to safety compliance. Thus hypothesis 3a is not supported.

#### **4.7.2 Safety knowledge, safety motivation and safety compliance**

Hypothesis 4a suggested there is a significant positive relationship between safety knowledge and safety compliance. The results show ( $\beta=0.361$  at  $p\text{-value} <0.01$ ), therefore, safety knowledge has the significant positive relationship with safety compliance. Thus, hypothesis 4a is supported. Lastly, the hypothesis for 5a tested the relationship between safety motivation and safety compliance. The results show ( $\beta=0.164$  at  $p\text{-value} < 0.05$ ), therefore 5a is supported.

#### **4.8 R Square**

The R square indicates the extent or percentage the independent variables can explain the variations in the dependent variable. In this study, independent variables safety leadership namely (safety policy, safety concern, and safety motivation), safety knowledge, and safety motivation can explain 56.9% of the variations in dependent variable (safety compliance). However, it is still leaves 43.1% (100% - 56.9%) unexplained of this study.

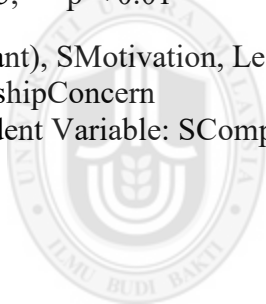


Table 4.6 Results of Regression Analysis for Safety Compliance

	<b>Dependent variable Safety Behavior (Safety Compliance)</b>
<i>Independent variables</i>	
Safety Leadership with respect to Safety Policy	0.509**
Safety Leadership with respect to Safety Concern	-0.369
Safety Leadership with respect to Safety Motivation	0.150
Safety Knowledge	0.361**
Safety Motivation	0.164*
F value	43.254
R <sup>2</sup>	0.569
Adjusted R <sup>2</sup>	0.556

\*p<0.05, \*\* p < 0.01

(Constant), SMotivation, LeadershipMotivation, SKnowledge, LeadershipPolicy,  
LeadershipConcern  
Dependent Variable: SCompliance



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## **4.9 Hypotheses Testing for Safety Participation**

Table 4.7 below demonstrates the relationship between independent variables safety leadership (safety policy, safety concern, and safety motivation), safety knowledge and safety motivation with safety participation in the offshore oil and gas companies in Terengganu.

### **4.9.1 Safety leadership (safety policy, safety concern, safety motivation) and safety behavior (safety participation)**

The relationship for safety leadership with respect to safety policy with safety participation ( $\beta=0.268$  at  $p\text{-value}<0.05$ ) is significant. Thus, hypothesis 1b is supported.

Secondly, the relationship from safety leadership with respect to safety concern with safety participation is not significant with the ( $\beta=-0.091$  at  $p\text{-value}>0.05$ ), therefore hypothesis 2b is rejected.

The relationship from safety leadership with respect to safety motivation to safety participation is positively significant with ( $\beta=0.359$  at  $p\text{-value}<0.01$ ). Thus hypotheses 3b is supported.

### **4.9.2 Safety knowledge, safety motivation and safety participation**

On the other hand, hypothesis 4b which suggested that the positively significant relationship between safety knowledge and safety participation but the results show ( $\beta=0.019$  at  $p\text{-value}>0.05$ ) which is not significant. Thus, hypothesis 4b is not accepted.

Lastly, the hypothesis 5b tested the relationship between safety motivation and safety

participation. The results show ( $\beta=0.223$  at  $p\text{-value} < 0.01$ ). Therefore, hypotheses 5b is supported.

#### 4.10 R Square

The R square indicates the extent or percentage the independent variables can explain the variations in the dependent variable. In this study, independent variables safety leadership namely (safety policy, safety concern, and safety motivation), safety knowledge, and safety motivation can explain 49% of the variations in dependent variable (safety participation). However, it is still leaves 51% (100% - 49%) unexplained of this study.

Table 4.7 Results of Regression Analysis for Safety Participation

	<b>Dependent variable Safety Behavior (Safety Participation)</b>
<i>Independent variables</i>	
Safety Leadership with respect to Safety Policy	0.268*
Safety Leadership with respect to Safety Concern	-0.091
Safety Leadership with respect to Safety Motivation	0.359**
Safety Knowledge	0.019
Safety Motivation	0.223**
F value	31.53
R <sup>2</sup>	0.490
Adjusted R <sup>2</sup>	0.475

\*  $p < 0.05$ , \*\*  $p < 0.01$

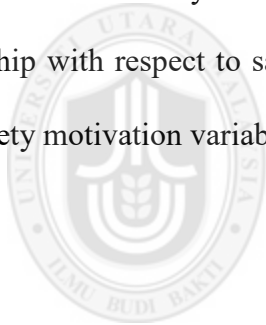
(Constant), SMotivation, LeadershipMotivation, SKnowledge, LeadershipPolicy, LeadershipConcern  
 Dependent Variable: SParticipation

Table 4.8 Hypotheses Results

Hypotheses	Results
Hypotheses 1a: There is a positive and significant relationship between safety leadership with respect to safety policy with safety compliance.	Supported
Hypotheses 1b: There is a positive and significant relationship between safety leadership with respect to safety policy with safety participation.	Supported
Hypotheses 2a: There is a positive and significant relationship between safety leadership with respect to safety concern with safety compliance.	Rejected
Hypotheses 2b: There is a positive and significant relationship between safety leadership with respect to safety concern with safety participation.	Rejected
Hypotheses 3a: There is a positive and significant relationship between safety leadership with respect to safety motivation with safety compliance.	Rejected
Hypotheses 3b: There is a positive and significant relationship between safety leadership with respect to safety motivation with safety participation.	Supported
Hypotheses 4a: There is a positive and significant relationship between safety knowledge with safety compliance.	Supported
Hypotheses 4b: There is a positive and significant relationship between safety knowledge with safety participation.	Rejected
Hypotheses 5a: There is a positive and significant relationship between safety motivation with safety compliance.	Supported
Hypotheses 5b: There is a positive and significant relationship between safety motivation with safety participation.	Supported

#### **4.11 Summary**

This chapter has presented the most important segment of the theses, which has indicated the results of all data analysis, and has determined whether the present study variables are consistent with the previous empirical studies. In this chapter, respondents' demographic details were described and followed by all analysis such as reliability analysis, descriptive analysis, person correlation analysis and multiple regression analysis. There are 6 out of 10 hypotheses that are supported. Among all variables, safety leadership with respect to safety policy, safety knowledge, and safety motivation were found to have influence on safety compliance. Safety leadership with respect to safety concern showed a negative influence on the variable of safety compliance and safety participation. On the other hand, safety leadership with respect to safety policy, safety leadership with respect to safety motivation, and safety motivation variables are important in explaining safety participation.



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## CHAPTER 5

### CONCLUSION AND RECOMMENDATION

#### **5.1 Introduction**

This final chapter explains the results obtained from the present research which tested the safety leadership (safety policy, safety concern, and safety motivation), safety knowledge, and safety motivation with safety behavior among offshore oil and gas employees in Terengganu. The following part covers the discussions on the obtained results, implications of the current study along with suggestions provided for a realistic approach to improve the safety behavior among offshore oil and gas employees. Lastly, the limitation of this study will be highlighted followed by the conclusion.

#### **5.2 Recapitulation of Major Findings**

Based on the output in the previous chapter, the dependent variable (safety behavior-safety compliance and safety participation) have different output from the regression analysis. From the results, there are only 3 independent variables that are positively significant with safety compliance. The 3 independent variables which can explain the dependent variable (safety compliance) are safety leadership (safety policy and safety knowledge), and safety motivation, whereas the rest of the variables give no positive significant explanation to the variable. On the other hand, the other dependent variable is safety participation which can be explained only by safety leadership with respect to safety policy, safety leadership with respect to and safety motivation, and safety motivation since they gave positive significant value compared to other variables.

### **5.3 Discussion of Findings**

This study is focused on investigating the impact of safety leadership (safety policy, safety concern, and safety motivation), safety knowledge, safety motivation on safety behavior in the offshore oil and gas industry in Terengganu. The following section will discuss the result of the hypotheses of this study.

#### **5.3.1 Safety Leadership with respect to Safety Policy and Safety Behaviour**

The results of this study have indicated that safety leadership with respect to safety policy and safety behaviour (safety compliance and safety participation) is significant. It is consistent with the present study's hypotheses. When there is safety policy in the organization, most employees will abide to that and create a safer working environment because it serves as a guideline in their daily routine tasks. This can be supported by Kanten (2013), who stated that workers were more likely to abide with organization safety rules and regulations if they are satisfied with the organization safety management program which is considered a safety policy. According to Mohamed (2003), organizations should have a proper channel to deliver their safety policy in order for employees to comply.

As cited by Author (2006), organizational safety policy is the main issue that influences employees' safety behavior. Organization's top management should have the right and positive attitude towards safety behavior thereby getting workers involved in safety system policy development. This is because involvement brings each worker to

experience the good about safety as well as the importance of safety which can encourage compliance and participation in safety matters.

According to Zohar (2000), safety policies serve as a guideline for employees to abide in ensuring their safety and health in the organization. Organization safety policies give positive impact on employees' safety outcomes as well as influence employees' safety-related behavior across different industries. As commented by Zohar et al., (2000), organizational safety policies and safety procedures are based on importance value that management places on safety as perceived by the workers in the organization. Management's daily observations and interaction with employees at the workplace make employees comprehend what is expected from the management about safety because the management shows and performs their work in their work group, and eventually those members in the group will follow the safety procedure.

A study conducted by Gledart, Smith, Shannon, and Lohfeld (2010) in Canadian manufacturing companies on workplace safety and health. Their study has proven that organization administrative and safety policies have significant impact on safety behavior at workplace. On the other hand, low accident rates were reported among skilled workers and highly experienced workers. And those safety policies and practices encourage workers abide to safety rules and it encourages employees to participate in decision making on safety can reduce the rate of injury in the workplace. Cooperation within



department can create a workplace to be free from injuries (Khadir, Shamsudin, & Subramanian, 2011).

### **5.3.2 Safety Leadership with respect to Safety Concern and Safety Behaviour**

The results of present study have revealed that safety leadership with respect to safety concern and safety behaviour (safety compliance and safety participation) is not significant. And it is not consistent with the present study's hypotheses. Employer overly concern about employees' safety may cause employees to feel stressful and it gives reverse effect to the employees' safety behaviour. Employees will behave in a way which not complies to organization safety rules and regulations nor participate in safety-related issues.

According to the article of Promoting Safety Culture, employers and employees' concern about safety behavior is not sufficient to ensure safety behavior within the organization, and accident rates are still reported with the use of faulty equipment or operations, outdated systems and poor working conditions will lead to unsafe behavior at workplace, all these behaviors are not avoidable. The most important factor that influence how the ways the work is carried out is based on the organization attitudes and values regarding safe working and it influences its way to carry out work and eventually influence its safety performance In other words, safety concern alone does not give much impact on safety behavior, but the provision of safe equipment, systems, procedures and knowledge is important to encourage a healthy and safe working environment.

Moreover, Seppala (1995) mentioned that leaders' attitudes play a vital role in stimulating a good safety culture (Seppala, 1995). However, in most organization practice, more attention is given to organization goals such as profitability, schedule, and quality rather than employees safety due to the stiff competition (Hakkinen, 1995). As cited by Tam, Fung, and Chan (2001). Top management or leaders would hardly attend safety meetings. It was evident in their questionnaire responses that only a few turned up for safety meetings.

### **5.3.3 Safety Leadership with respect to Safety Motivation and Safety Behaviour**

In this study, the results have proven that safety leadership with respect to safety motivation and safety compliance is not significant. It is not consistent with present study's hypotheses. It means that although management tries to motivate employees by encouraging or motivating them does not give impact to employee safety compliance. This can be supported by Neal et al., (2006), their study found that safety leadership with respect to safety motivation has weak relationship with safety compliance and the safety climate act as mediator to influence the behavior of employees. Further, Neal and Griffin (2011) also mentioned that safety leadership with respect to safety motivation will not give any impact in safety compliance, which is a part of safety behavior. These results suggested that to ensure the efficacy of safety motivation, management should intervene by conducting safety training by focusing on the importance of safety through workplace management commitment towards safety issues) need to be carried out in conjunction with activities that help promote a high level of safety motivation.

Based on Zin and Ismail (2012), there is a no direct relationship between safety leadership with respect to safety motivation and safety compliance. Their finding shows that safety leadership with respect to safety motivation does not give positive changes in safety compliance. Employees' concerted effort is only expected when they believe that their personal interests are in line with those outlined by the company, which in turn will improve their wellbeing. With an adequate safety climate will drive employees feel motivated to be more committed to safe working behaviors. It can also be argued that individuals who are motivated to work safely would not be able to achieve their safety goals unless their workplaces contain the minimum required level of safe working conditions that support their safety motives.

Besides, the results of present study show that the relationship between safety leadership with respect to safety motivation and safety participation is positively significant. It is consistent with the hypotheses hypothesized in this study. It means that when senior management in the organization motivates employee to be involved in safety related issues, employees are more likely to participate in that. According to Zohar (1980) safety leadership plays an important role as a motivation to improve safety behavior at the workplace.

There were some studies conducted by Garrett and Perry (1996) on worker participation to safety participation. Their studies' results shown that safety program that are organized by the management motivates all employees to be involved in every phase of the program and it reduced injuries effectively and improved workers safety behavior at the

workplace. This also can be supported by Rivilis, Cole, Frazer, Kerr, Wells, and Ibrahim (2006) safety motivation and safety participation have positive significant relationship between them which led to reduced injuries rate at the workplace. Management leadership to safety is an effective method to motivate workers to participate in the generation of ideas about safety. Those who are at the work would give better suggestions better safety at the workplace, and management should empower employees to participate in the organization decision making (Kane-Urrabazo, 2006). It is able to minimize injuries and illness in a workplace. According to Cheng, Li, Fang, and Xie (2004), management could conduct safety inspection and demonstrate commitment to safety and it will motivate workers to participate in safety programme which can encourage workers to work safely upon being provided with the sufficient resources allocated as well as the commitment shows by management team. Workers would feel more motivated towards safety if their employer gives them opportunity to participate in safety programs. Based on the findings from Aksorn and Hadikusumo (2008) found that worker participation in the safety programmes enable to reduce workplace injuries and accidents.

#### **5.3.4 The Relationship between Safety Knowledge & Safety Behaviour**

The results of this study indicated that safety knowledge and safety compliance is significant. It is consistent with what has been hypothesized in previous chapter. According to Campbell (1993), there are several factors that determine individual differences in safety compliance and safety participation at workplace. In order to determine the differences between individual performances, there are 3 determinants which are knowledge, skill, and motivation. However, there are some authors not agreed

that the 3 determinants of individual performances and they believed that there may be other determinants of safety behaviour. Employees' individual differences can be caused by other situational factors Hesketh and Neal (1999), and some evidences do agree that skill, motivation, and knowledge are vital in determining individual differences in safety behaviour. Thus, safety behavior should be used to determine individual safety behaviour by looking at their knowledge they have and necessary skills for specific behaviors and by the motivation of individuals to perform the behaviors. Based on their study, safety knowledge and skill do not have much influence on safety participation compared to compliance. Therefore, employee must understand well on how to carry out their duty safely by abide to safety procedures.

Based on Zin and Ismail (2012), reported accidents cases are mostly from construction industries caused by the reasons of non-compliance with safety requirement. Delivering the knowledge related to the element of safety is important, and the knowledge must be delivered in an effective manner which via a proper communication platform to establish a safer workplace. Via this effective way of communicating, leaders can actually deliver values through interaction (Ismail, 2007) which leads to commonly understood goals. Moreover, Zohar (2002) found better communication of safety related issues led to minimal accidents rates and increased in using Personal Protective Equipment (PPE) in heavy duty equipment industry.

On the other hand, safety knowledge to improve safety compliance can be done via proper safety training. It is essential to pass on safety knowledge to employees on potential accidents in the workplace and how to avoid or minimize accidents and potential hazards that may occur during performing their jobs. Thus, safety knowledge education programs is important in creating safety awareness (Ghani, Abdul Hamid, Mohd Zain, Abdul Rahim, Mohamad Kamar, & Abdul Rahman, 2010) A study conducted by McDonald and Hrymak (2003) that focused on safety training at construction sites in Ireland. Theirs study revealed that in the construction sites, safety training is carried out in an unsystematic manner which just to “cover themselves” and protect the company name if something goes wrong. Therefore, it is very clear that the safety knowledge is very important in order for them to identify the risk of their works through the experience from their work. The common root causes of accidents in the construction sites usually caused by insufficient safety knowledge in the organization because employees do not have the enough knowledge, and skills to recognize potential hazards on site as well as the knowledge to prevent accidents from happening (Toole, 2002). Komaki, Heinzman, and Wyld (1980) have found that safety knowledge will lead to employees’ safety improvement behaviour in vehicles maintenance employees. According to Hopton (1969), in order to reduce the reported accidents rate and save employees life, organization should provide trainings to workers and operators who are directly involve in the riskier tasks.

In this study, the relationship between safety knowledge and safety participation is not positively significant as hypothesized. Therefore, safety knowledge and safety

participation has no relationship between them. It can be supported by the study conducted by Gunningham (2008), employees may feel fear of raising safety issues to management for fear of being victimized, and they are lack of training or safety knowledge to take correct action to protect themselves from the hazards of work. Due to this safety participation is not that easy to take place in such case.

As cited by Gunningham (2007), all provisions of all the above are unlikely to bring or encourage worker participation about the degree of safety that workers require. It cannot be denied that effective decision making is only done at the level of consultations, and rarely involves the participation in decision making by employees owing to the vast difference between the interests of workers and that of the employers. Particularly, employees who are willing to improve safety behavior may perceive that the consultation process is merely a formal process that does not bring any intense change. Moreover, the large mining companies with complex organization structure often lead to thorough consultation at impractical levels.

The genuine safety participation is an important tool of effective safety behavior in the mining industry, however with the conventional way dealing with the safety behavior is unlikely to improve the safety behavior in the organization, as commented by Johnstone, Quilan, & Walters (2004), miners have least knowledge about safety and also the workforce shows nothing meaningful awareness of the safety participation in togetherness to identify the hazard to improve safe behavior in organization.

### **5.3.5 The Relationship between Safety Motivation & Safety Behaviour**

In this study, the relationship between safety motivation and safety behaviour (safety compliance and safety participation) is positively significant. It is consistent as hypothesized. According to Vinodkumar et al., (2010) in order to motivate workers to join in safety matter, the organization should use different incentives scheme, giving rewards and also give recognition to motivate employees to perform safely. The reward systems should be well-designed and it must be convincing enough to change employees' behavior.

As cited by Hassan, Basha, and Hanafi (2007) that management's direct involvement with employees to talk about safety and advice on safety matters would strengthen the employer and employees relationship as well as improve and encourage employees' safety behavior. According to Evelyn (2005), motivation can have two different categories which are positive reinforcement and negative reinforcement. The examples of positive reinforcement will be reward employees in monetary forms, give bonuses and chances of career promotion. On the other hand, negative reinforcement such as punishment, threaten employees in order to force them to do their jobs in safe manners. However, the study shows positive reinforcement is more effective to improve employees' safe behavior at workplace. Organization can improve employees' safety behavior if incentives schemes are given in an appealing manner which can motivate employees to act safely (Vrenderburgh, 2002). The organization that have good employer and employee relationship would indirectly motivate employees to feel committed about job and in return will influence positively on the intention to have safe behavior in the organization (Leung et al., 2004).



In other words, the both extrinsic and intrinsic safety motivation will have positive impact in safety behavior by the creation of the work atmosphere where employees perceive that the importance of workplace safety is valued and collectively shared among their colleagues and top management. (Panuwatwanich, Al-Haadir, & Stewart, 2017). Employees who feel motivated to carry out their task safely will be more likely to help induce such a formation of safety climate through their engagement in a social verification process to test their belief about work place safety (Zohar, 2010). Therefore, for those companies that willing to improve workplace safety and promote good safety climate should set strategy towards the implementation of programs that value safety motivation. Those programs such as development of safety motivation should focus on both extrinsic (e.g. incentives and/or disincentives for certain safe work behaviours) and intrinsic motivation (e.g. a workplace-wide promotion of safety awareness).

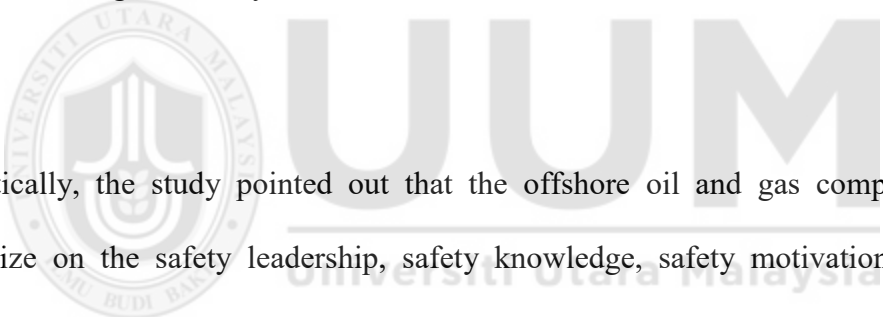
#### **5.4 Implication**

In this section, the implications resulting from the outcome on both theoretical and practical will be highlighted here.

##### **5.4.1 Theoretical Implication**

The main reason of this study was to find out the influence of safety leadership (safety concern, safety policy, and safety policy), safety knowledge, and safety motivation with safety behavior among offshore oil and gas employees in Terengganu. Manufacturing and construction industries always got the most publishes on safety issues (O'Toole, 2002 ;Siu, Phillips, & Leung, 2004). Most of the studies have been conducted in safety

management practices on safety performance in construction, manufacturing industries, but not in oil and gas industry (Wu, 2001). Therefore, this study was done in offshore oil and gas industry to measure the reliability of the safety leadership, safety knowledge, and safety motivation which influences safety behavior. Besides, this study was conducted among employees who are offshore which made it very challenging to gain access to this target group of people, but if access could be successfully gained, it could create a valuable opportunity for the researcher to arrive at evidence on safety leadership, safety knowledge, safety motivation and safety behavior. Moreover, this study would also be beneficial to the academic world due to the limited number of studies done among offshore oil and gas industry.

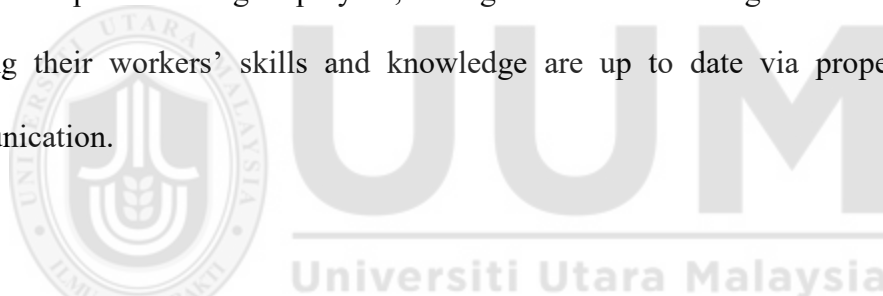


Theoretically, the study pointed out that the offshore oil and gas companies should emphasize on the safety leadership, safety knowledge, safety motivation in order to improve the safety compliance and safety participation among employees.

#### **5.4.2 Managerial implication**

There are few implications can be highlighted in this study and suggestions can be provided to enhance offshore oil and gas industry. The result shows that safety behavior is an essential factor in determining the organization's human safety. Therefore, every organization should practice it by designing a good working environment such as creating new and safer systems which generates among employees awareness on the importance of safety at the workplace. Managers are expected to educate and encourage safety

compliance and safety participation among employees by giving out safety knowledge via effective training on a monthly basis to make raise understanding on the benefits of complying and participating in safety matters. On the other hand, organizations should offer a platform where employees can provide safety ideas, and report accidents and comments about the company safety issues. This study proposes several suggestions based on the findings which highlight the importance of safety management practices in encouraging safety behavior (safety compliance and safety participation). The findings of this study show that the antecedents of safety behavior are safety leadership, safety knowledge, and safety motivation. Thus, in an attempt to increase safety compliance and safety participation among employees, managers need to encourage the three variables by ensuring their workers' skills and knowledge are up to date via proper channel of communication.



In practical perspectives, the findings collected via this study will be beneficial for industrial practitioners or safety teams who will benefit from understanding the influencing factors towards safety behavior (e.g. safety compliance and safety participation), especially among the offshore employees from oil and gas company in Malaysia. Those safety teams should be in-charged of conducting training sessions and spending time identifying potential workplace hazards. The teams can also take time to check whether the safety policies are followed and make recommendations regarding how they can be improved. The safety teams should ideally have the autonomy to do their jobs effectively and avoid conflicts of interest between those tasked with the responsibility of providing objective safety results and the management. Besides, the

findings of the this study also could provide some insights to those oil and gas offshore company to become more alert and vigilant in reducing unwanted incidents, accidents and fatalities at workplace.

The result of this study can also be used as guideline for management team in dealing with safety related issues in oil and gas offshore company. It comes handy to the management in developing any new safety policy, design training program such as safety workshops, additional safety procedures or work instructions, guideline for conducting specific task associated with offshore and even reward for those who show compliance with safety procedures in the course of related work. Besides developing safety policy, management needs to review their organization safety policy periodically to make sure safety policy is up-to-date. Development of measurement systems by the organization can incorporate all variables in this study to evaluate the effectiveness of safety behavior in the organization to have a more comprehensive assessment in term of safety behavior at the workplace.

Moreover, this study would bring important message to those respondents from the oil and gas offshore on what factors such as safety motivation variable enables employees to understand the importance of employees and they will act that really influence them in order to have safety behavior in them while carrying out their duty. With this study, they are able to identify what are the dominant factors that actually influence them in acting safely during time of carrying out their task.

Finally, findings from this study may contribute certain informative idea to our country, Malaysia. Government able to recognize safety leadership (safety concern, safety motivation and safety policy), safety motivation, and safety knowledge that influence safety behaviour among workers in the oil and gas offshore company and make sure oil and gas sector in Malaysia will continue to progress without affecting or taking toll of workers' safety and health. Government can regulate workplace safety by referring to this study based on the results shown.

### **5.5 Limitation and Suggestions for Future Study**

This current research has faced some limitations in terms of low respondents' rate due to the time frame issues. The use of self-administered questionnaire was also another limitation, as the respondents are likely to have been influenced by intentional distortions and misinformation.

Apart from that, the method used to collect data was cross-sectional research design. This data collection process collected data from a population, or a representative subset, at a specific time which was only done once. In order to obtain exhaustive data or information, a longitudinal sectional research design should be applied and ensure the questions is short and comprehensive so that respondents will not get to bored in answering lengthy questions which may not be accurate in the end due to their time constraint.

On the other hand, the other limitation was that the questionnaire is too lengthy. Some respondents had responded that they need to spend much time to answer the questions and their work got interrupted. Therefore, short and comprehensive questions would be the ideal way of preparing the questionnaire.

Besides that, this research only focused on offshore oil and gas companies in Terengganu with is only limited to East Malaysia whereby the generalization made was only based on East Malaysia which has neglected the population in West Malaysia.

## **5.6 Conclusion**

The results of this study indicate the validity as well as the reliability of the five independent variables, safety leadership (safety policy, safety concern, and safety motivation), safety knowledge, and safety motivation on safety compliance and safety participation among offshore oil and gas industry workers. The direct positive influence of safety leadership (safety policy and safety motivation), safety knowledge and safety motivation on components of safety behavior (safety compliance and safety participation) were also identified. The results of this study also highlighted certain variables are really important to those hazardous industries such as construction, manufacturing, agricultural and so on to reduce the accident rate in the industries. This study is beneficial to those involved in academic research, and various practitioners in the industries to think of mechanisms to improve workplace safety behavior.

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## Appendix 1

Table 1.1: Oil and Gas Industry Accidents Reported to the Labor Department & Social Security Organization, 2010-2014

Year	Perusahaan/ Industry	Kemalangan dilaporkan Accident reported			HUS dibayar TD Paid			HUK dibayar PD Paid			FOT dibayar DB Paid		
		L/M	P/F	Jumlah	L/M	P/F	Jumlah	L/M	P/F	Jumlah	L/M	P/F	Jumlah
				<b>Total</b>			<b>Total</b>			<b>Total</b>			<b>Total</b>
2014	Pencarian minyak & gas Crude oil & natural gas production	71	12	<b>83</b>	73	9	82	25	1	26	1	0	1
2013	Pencarian minyak & gas Crude oil & natural gas production	49	5	<b>54</b>	41	4	45	11	0	11	3	0	3
2012	Pencarian minyak & gas Crude oil & natural gas production	58	3	<b>61</b>	43	2	45	16	1	17	2	0	2
2011	Pencarian minyak & gas Crude oil & natural gas production	48	4	<b>52</b>	45	4	49	6	1	7	0	0	0
2010	Pencarian minyak & gas Crude oil & natural gas production	38	4	<b>42</b>	27	3	30	4	0	4	0	0	0