

**THE RELATIONSHIP BETWEEN SAFETY CLIMATE AND SAFETY  
PERFORMANCE**

**By**

**MOHD YUSOF BIN HUSSAIN**

**Thesis Submitted to  
Othman Yeop Abdullah Graduate School of Business,  
Universiti Utara Malaysia,  
in Fulfillment of the Requirement for the Degree of Master Science of  
Occupational Safety and Health Management**



**Othman Yeop Abdullah**  
**Graduate School of Business**

**Universiti Utara Malaysia**

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## **ABSTRAK**

Kajian ini dinilai berdasarkan persepsi keselamatan pekerja di sebuah syarikat pembuatan kertas dengan penekanan kepada hubungan antara iklim keselamatan dan prestasi keselamatan di kalangan pekerja-pekerja di sebuah kilang kertas di Pahang. Kajian ini akan melihat hubungan antara iklim keselamatan dan prestasi keselamatan untuk memahami persepsi keselamatan yang telah diamalkan di Pascorp Paper Industries Berhad. Keselamatan adalah isu yang terbaik, bagaimanapun majikan dan pekerja tidak merasakan ia sebagai satu proses yang penting dalam keselamatan matlamat jangka. Konsep keselamatan pekerja akan meningkatkan kefahaman majikan keperluan keselamatan Kertas Pascorp dan mematuhi keperluan undang-undang. Kajian mendapati bahawa faktor-faktor yang mempengaruhi kejayaan sistem keselamatan adalah iklim keselamatan dan prestasi keselamatan dalam mengurangkan insiden pekerjaan. Menggunakan SPSS 19 diukur hasil daripada kajian dan ujian hipotesis iklim keselamatan dilihat dan komitmen keselamatan ke arkib prestasi keselamatan dalam organisasi. Kajian ini mendapati bahawa terdapat tiada hubungan yang signifikan untuk gender, umur dan tempoh kerja, bagaimanapun terdapat hubungan yang signifikan antara posisi kerja, tahap pelajaran dan dan prestasi keselamatan.

Katakunci: Persepsi Keselamatan, Iklim Keselamatan, Prestasi Keselamatan

## ABSTRACT

*This study evaluated on employee safety perception at a paper manufacturing company with emphasize on relationship between safety climate and safety performance among employees in a paper manufacturing company in Pahang. This study examined the relationship between safety climate and safety performance in order to understand safety perception that has been practiced in Pascorp Paper Industries Berhad. Safety is utmost issue, however employer and employees does not feel it as an important process of long goal safety. Understanding the concept of workers safety will enhance employer understanding the safety requirement of Pascorp Paper and adhere legal requirements. The study found that factors influencing the success of the safety system are safety climate and safety performance in reducing occupational incidents. Using SPSS 19 to measure the result of studies and test of hypothesis perceived safety climate to achieve the safety performance in organization. The study noticed that there is no significant relationship between gender age and year of service status. While significant relationship between workers position, education level and safety performance.*

*Keywords: Safety Perception, Safety Climate, Safety Performance*

## ACKNOWLEDGEMENT

I would like to express my sincere appreciation to my supervisor, En. En Lukman Bin Wan Mat Daud for his encouragement, guidance, critics, friendship and help during the development of this project report. I am especially grateful for his assistance in providing me with ample reference materials at the early stage of this study.

I would also like to express my gratitude and thanks to my wife, Ms. Suhana Binti Halim, for her constant encouragement and advice. This project paper would not have been possible without her love and support.

A special thanks to my daughters my daughter Nur Syuhada, Nur Syafura and Nur Syakina, who was always with me at the computer and when I was studying. Your soft purring and desire to be close was a welcome distraction when I needed a break and a comfort to know how unconditionally important you thought I was!

A special dedication to my late father, Haji Hussain bin Mahdi who had provided me with the fundamentals to excel academically and in my profession.

Lastly, my sincere appreciation also extends to all my colleagues and others who have provided assistance at various occasions. Their views and tips are useful indeed. Unfortunately, it is not possible to list all of them in this limited space.

Thanks to all for helping me either directly or indirectly in the completion of this project paper.

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## **LIST OF ABBREVIATIONS**

<b>Abbreviation</b>	<b>Description</b>
PPIB	Pascorp Paper Industries Berhad
PM1	Paper Machine 1
PM2	Paper Machine 2
PM3	Paper Machine 3
WWTP	Waste Water Treatment Plant

# CHAPTER 1

## INTRODUCTION

### 1.0. Introduction

This study will explain the detail overview of the study on relationship between safety climate and safety performance in the Pascorp Paper Industries Berhad. In this chapter will include an explanation about the research background, area research, safety practices in Pascorp Paper, problem statement, objective and research question for this study.

Occupational Safety and Health Act (OSHA, 1994) set an objective to promote safe and health workplace for every person at work, which adapted their physiological and psychological needs. Organization started giving attention to organizational and management impact on safety performance particularly the function of safety climate (Nahrgang, Morgesan & Hofmann, 2007)

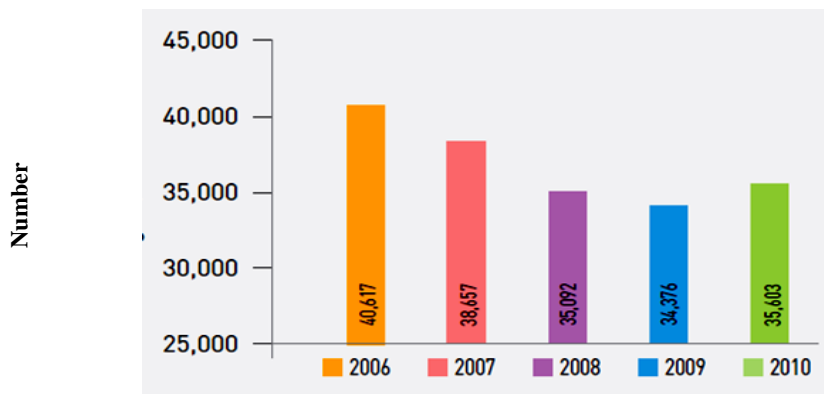
This study on safety perception is paramount, Wong due to measure the level of safety practices in the organization. Studies show that positive safety climate in the organization will result in reducing the accident rate in the company (Huang, 2006, Wong, 2009, Susan et al., 2008, Tsung, 2007). Thus management commitment and involvement of employee's participation as well as total quality management have been highlighted as key elements of success in the safety system (Ahamadon Bakri et al., 2006, Huang, 2006, Chia Yang et al., 2009).

The concept of safety climate has important implications for industrial organizations. It implies that workers have a unified set of cognitions regarding the safety aspect of their work settings. Safety climate measurement is one of the practical tools and low cost instrument that used by management of the organization to evaluate and recognize potential safety issues.

Human suffering and economic losses through productivity and man power losses, cost increased due to medical expenses, compensation, replacement of labour, workplace modification and consequences liability such as penalty and legal suits, are constant reminder to implement better organizational work design, planning, safe work standards and control technologies (P.K. Ng et al, 1998)

In Malaysia, 2010 Annual Report of Social Security Organization (SOCSO) shows the overall industrial accidents recorded an increase of 4.44% reported in 2010, the case against 55,186 57,639 cases in 2009. From the total of reported accidents, accidents in the workplace has increased by 3.57%, from 34,376 cases in 2009 to 35,603 cases in 2010. Number of accidents while traveling related to work, an increase of 5.89% from the previous year 20,810 cases than 22,036 cases in 2010. Altogether in 2010, 61.77% of accidents occur in the workplace, while 38.23% were involved during the course of work-related accidents, as shown in Figure 1.1.

Figure 1.1  
*Number of Industrial Accidents Reported 2006-2010*



Sources: 2010 Annual Report 2010 (PERKESO)

Based on the above data, Malaysia incurring losses in manpower and financial loss of RM1, 678.16 million as a result of an accident with a reference to the 2010 SOSCO Annual Report. Resulting from accidents during the year 2010, SOCO paid to contributor for the purpose of temporary disablement benefits amounting RM109.18 million (2009: RM104.01 million), an increase of 4.97%. Whilst, permanent disablement benefits amounting RM306.38 million (2009: RM274.84 million), an increase of 11.48%. Dependents' benefits amounting RM205.32 million (2009: RM160.214 million), an increase of 28.16%.

Based on the above situation, this study aims to explore the perception of safety climate implementation and measured the safety commitment among PPIB employees towards safety performance system in establishing their organization. A major interest in this study is to examine factors why incurrence of accident cases in PPIB from yearly data.

Survey on employee perception and attitude about safety climate and safety performance was used to investigate workers cooperation, participation, opinion,

knowledge, awareness and readiness to adopt the safety practices. Due to lack of knowledge and information, employee may not necessarily aware the risk of hazards at workplace, they may not know how to protect themselves and accept the risk of occupational accident. Employee that lack of commitment are the most in important circumstances to unsafe acts, accidents, injury , illness and other outcomes such as compensation claims. (Geotsch,D.L., 2008)

It seems to be general statement that the employees who have the worst commitment and attitude are the lost likely to have an accident (Cooper, 1995, Varonen, Mattila, 2000, Susan et al., 2008). Implementation of safety would not archived without the full cooperation and commitment of all workers in all organization level (Geotsch, D.L., 2008)

### **1.1 Information about Pascorp Paper Industries Berhad**

Pascorp Paper Industries Berhad (PPIB) (*Company No 133552-M*) was incorporated on 25<sup>th</sup> March 1990 and located at Lot 1A, Bentong Industrial Estate, 28700 Bentong Pahang. This company is a subsidiary of Pahang State Economic Development Corporation's Group.

Pascorp Paper Industries Berhad (PPIB) uses "Recycle Paper" known as old corrugated carton boxes, olds newspaper and old magazines and transforms into "Industrial Brown Paper" known as test liner paper and Kraft paper. Main raw material is recycle paper known as old corrugated carton boxes, old newspaper and

magazines. Recycle stored at Stockyard area, later transferred to pulper conveyor system using forklift with special bale clamp attachment.

The stock preparation stage involves the preparation of fibrous raw materials which normally are secondary raw materials consisting of recycled corrugated cartons, paper and the like.

These are fed into a hydra pulper and are repulped to achieve a 5-6% consistency of the mixture, after which it is further processed through a waste processing plant to clean, screen, and remove contaminants such as plastics, adhesives, sand, ink, etc.

After cleaning the secondary feed stock, the fibre is passed through hot dispersion to dissolve uniformly the micro stickiest and pitches that are not removed in the system creating a cleaner stock. It is then passed through a series of deflakers and disk refiners to develop the required strength properties of the paper.

The refined pulp is then metered and fed onto the paper machine. The blend of pulp and chemicals is then passed through a final screen wherein residual contaminants are further removed before being pumped into a pressurized head box.

This process starts after the refined pulp passes through the final screen and the pressurized head box. The refined pulp is then spread uniformly across the width of the paper machine against a continuously moving wire. As the water from the material on the wire drains, a fibre mat is formed, thus, the formed sheet will eventually become the finished product.



The fibre mats are dried passing through a computer controlled mechanical press. The process controls and optimizes the moisture content of the sheet passing through the press section. The moisture content after passing through the press is reduced by up to 50%. The press sheet then passes through a series of steam heated cylinder dryers where the moisture content is further reduced to about 7%. As part of the drying process, the next step is calendering. This is done to achieve uniform calliper and glossy finish. It is through this process that the smoothness requirement is attained.

The final stage in the paper-making process of liner board is rewinding. In this stage, the full width of the paper exiting the paper machine is cut and wound according to the consumer specifications/requirements.

The final product weighs from 850 kilogram to 1500 kilogram per roll. The finished rolls are sampled, weighed, inspected and tested for various physical properties in the plant's laboratory. If the finished product passes the required specifications, the rolls are transferred to the finished goods warehouse and scheduled for delivery.

Industrial Brown paper such as test liner and medium paper boards are used in the manufacture of boxes used for packaging of general consumer products such as toiletries, noodles, canned goods, ceramic tiles, fruits, electronic appliances and other consumer products.

Pascorp Paper sells Industrial Brown paper to more than 25 large carton boxes plant in Malaysia and export approximately 20% of its product to Asian countries with total revenue more than RM200 million per annum.

The Organization of Pascorp Paper was led by Managing Director and assisted by Deputy General Manager. Manufacturing Division consist PM1, PM2, PM3, Electrical, Maintenance, Waste Water Treatment Plant department. Whilst Operating Division consist Safety, Health and Environment, Civil Maintenance, Purchasing and Secondary Fibre Department. Administration, Finance, Corporate, Marketing, Business development, Lab/QA and Internal Audit reporting direct to Managing Director.

Pascorp Paper Industries Berhad was certified with ISO 9001:2008 Quality Management Systems since year 1999. In recent year the company's obligation to obtain Integrated Management System (IMS) which consist ISO 9001:2008 for quality management system, ISO 14001:2007 for Environmental Management System and OSHAS 18001:2004 for Occupational Safety and Health Management System by year 2013.

## **1.2. Safety and Health Practices in Pascorp Paper**

Study on the safety aspect such as safety climate and safety performance is an important part of the safety. This study would emphasize to 3 most basic fundamental of safety matter to encourage achievement in the safety and health performance in the organization as listed below:

### **1.2.1 Establishment of Safety, Health and Environmental Policy**

It is necessary to establish and disseminate the safety and health policy to all employees. Zohar (2008), claims that the safety remarks of policies and procedures that established by top management must be implemented and enacted by departmental manager throughout the organizational hierarchy. The top management are concerned with policy making and establishment of procedures to facilitate policy implementation by organization from top management to production staff.

Geotsch, D.L (2008) mentioned that, to achieve the company safety in organization it should have safety policy. This safety, health and environmental policy will promote safety culture from initial stage toward safety, health and environmental awareness in the organization. The policy should clearly state that safe work practices are expected from all employees at all level. The top management and rest of employee are committed to safety in order to perform their duties in the safe manner.

The company's commitment also extends beyond the wall of its plant, it include everyone particularly customers, contractors and community. He also suggested that one of the key element to promoting safety successfully is to involve and participated form all employees. Employee's commitment to work safely at all times will enhance workplace safety. Employees should involve in the implementation, monitoring and maintained the safety system, employee's empowerment results improvement in safety system.

The formal policy is explicit, relating to overt statement and formal procedures, while enforced policy or enacted practice are tacit, derived from observing top,

middle and lower management pattern of action concerning key policy issues. David et al. (2004), mention that safety-related policies and programs of the organization been seen as the surface manifestations of the basic values and beliefs of the organization concerning workplace safety. It follows that the safety policies and programs of the organization should be an important contributor to achieve in the implementation of safety climate (Zohar, 2008).

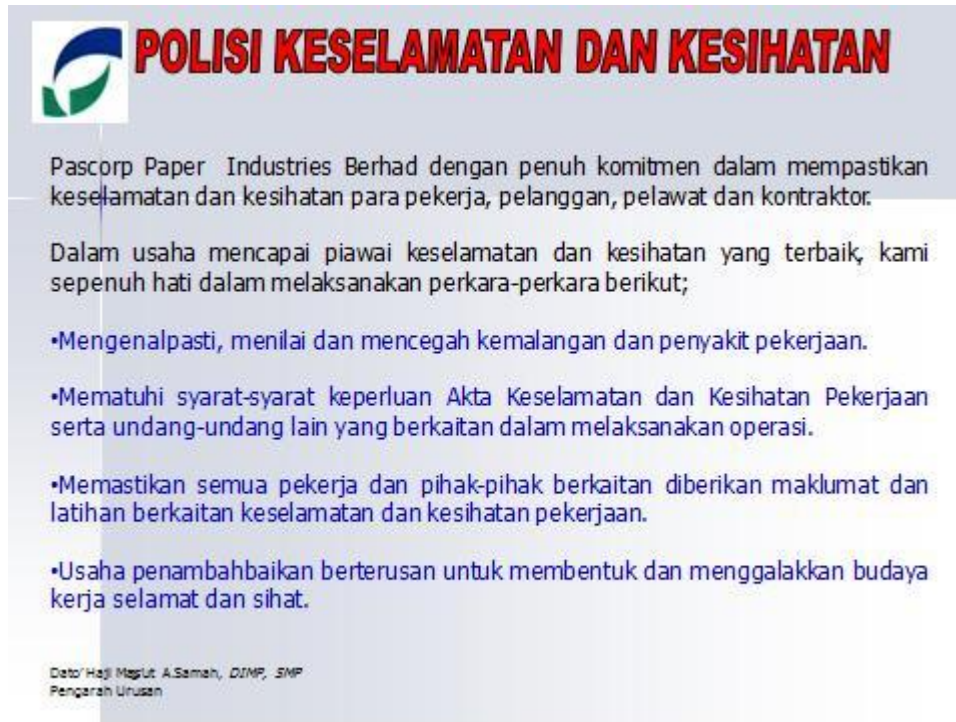
Nor Azimah et al, (2009) proved that high rates of the injury and accident are due to unsatisfactory or non-existent of safety and health systems. Besides management commitment, safety training and safety policy are also important determinants to enhance safety performance. Clear and precise policy statement and safety training play an important role in reducing accident rate. In addition, a company's objective and communication of the objective is a crucial aspect of effective safety and health management as lack of communication may infer employee involvement.

The management of PPI has established the Safety and Health policy since year 1994 and has been implemented for all department and workers. The main objective for this policy is to enhance safety culture and encourage involvement from all employees towards safety and health practices.

The main policy for safety and health implemented in PPIB as follows:

1. To identify, evaluate and prevent occupational accident and health issue
2. To comply with Occupational Safety and Health Act and its regulation
3. To ensure all staff and interested party well informed and trained pertaining safety and health
4. Continual improvement to promote safe work practice as safety culture

Figure 1.2  
*PPIB Safety and Health Policy*



### **1.2.2 Role of Safety Committee and Safety Officer to success in the safety and health program in PPIB.**

Establishment of Safety and Health Committee in the organization was clearly stated in OSHA 1994, Section 30(1), it mentioned that each employer should nominate the Safety and Health committee at workplace if there are more than 40 persons employed in the organization or directed by the Director General of Safety and Health Department (DOSH).

The function of Safety and Health Committee is to coordinate pertaining issue of safety and health between top management and employees in the organization. Cooper (1995) mentioned that general aim of Safety and health committee is to involve both management and workers in the safety planning process. Safety and health committee are judged by how well their influences and safety improvement in an organization.

Figure 1.3  
*Safety and Health Committee Organization Chart*

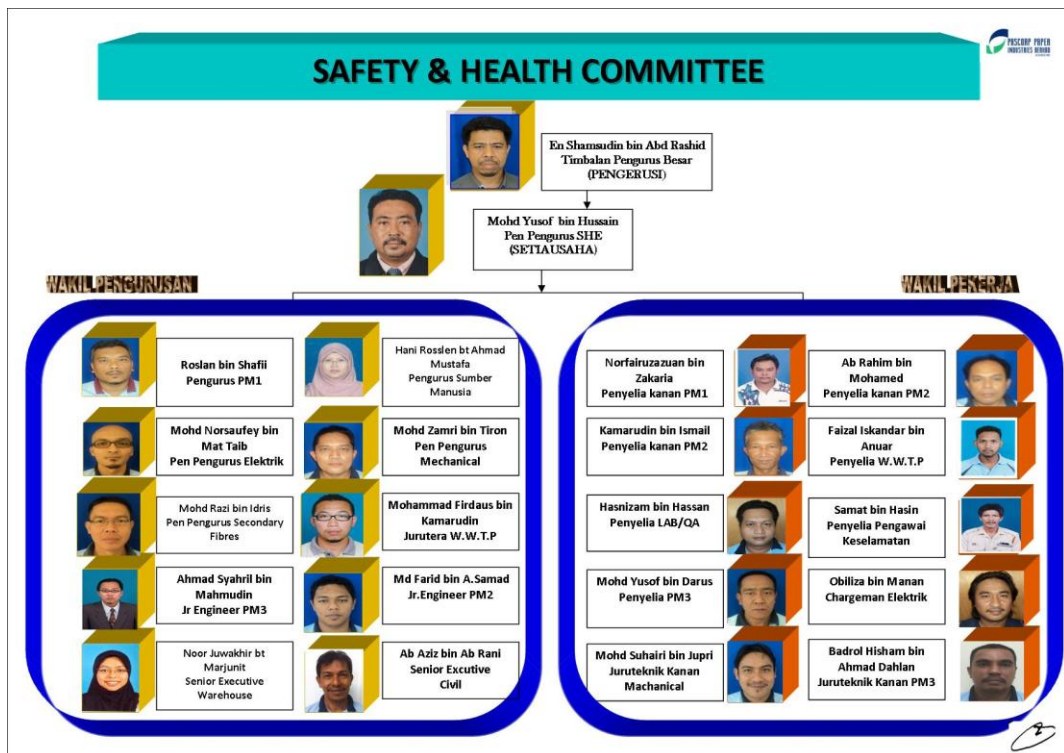


Figure 3 shows that the safety and health committee’s organization chart. The committee members consist of employer representative and employee representative for all departments in PPIB. Safety officer will be secretary as per Occupational Safety and Health (Safety Officer Regulation) 1997. Chairman of the committee will be responsible to top management on performance of safety and health program during monthly management meeting.

### **1.2.3 Safety and Health Program and planning activities**

Safety and Health Program has been planned on yearly basis based on safety requirement at PPIB. The main program related to safety and health policies are to provide safety training and awareness to new and existing staff, review of safe work procedures, periodical safety audit and safety audit, fire drills and safety day. Detail of Safety and Health Program and planning activities on the appendix 1.

### **1.3. Background of study and problem statement.**

The problems with regards to the performance of occupational safety and health to avoid accidents at the workplace in the paper and board industries have becoming major issues in the organization. Awareness and commitment among workers are still below the expectations of the guidelines and statutory as stipulated by the Occupational Safety and Health Act (OSHA) 1994.

The researcher intends to conduct a study of the workers' level of awareness, perceptions and behaviour towards workplace safety culture and the influence on safety practices in the effort to avoid accidents in the organization of Pascorp Paper Industries Berhad. Even though Pascorp Paper Industries Berhad has been certified with ISO9001 and gearing towards Quality, Environment, Safety and Health (QESH) Management Systems (consist of ISO 9001, ISO14001 and OSHAS18001), the organization's Safety Health Committee and the Safety

Practitioner facing problems in implementing the safety and health management system at the work place. This is proven when occupational accident at alarming rates.

Table 1.1  
*PPIB Workplace Accident Statistic 2002-2011*

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Near Miss	2	1	2	0	1	4	8	4	2	2
Property										
Damage	0	0	1	1	0	0	0	1	0	0
Minor	24	11	13	10	7	8	8	9	9	8
Major	3	0	0	0	0	0	0	1	1	0
Total	29	12	16	11	8	12	16	15	12	10

Source: PPIB Safety and Health Report (2011)

There are 141 incident recorded for past 10 years. Effort has been done to reduce and eliminate incident rates for past 10 years resulting reduction of numbers of incident from 29 cases in year 2002 to 10 cases in year 2011. Most of incident involved minor accident which is disabling but not permanent injury, therefore is important to justify the shared perception whether the worker feel safe working in Pascorp Paper. Therefore is important to justify the shared perception whether the worker feel safe working in Pascorp Paper.

As study by Varonen & Mattila (2000) revealed that the relationship between safety climate and occupational accidents. Basically, the safety climate correlated with the accident rate, which translated as the better safety climate of the company, the lower was the accident rate. Huang (2009) studied the safety climate in the construction site in Hong Kong found that poor safety attitude and poor safety climate has statistically proofed to be major cause of accidents in construction industries. The attention of this research is to inspect the significant factor either



demographic factors will significance correlated with between safety climate and safety performance in paper manufacturing industries. Studies will measure factors such as gender, ages, employment status, job tenure that will associate between safety climate and safety performance among employees in PPIB.

The research field in safety climate and safety performance specific to pulp and paper industries in Malaysia rarely explore by the previous researcher. This study will compare and measure the level of safety perception among paper mills workers specifically in PPIB. The study will look into any significant factors influences the safety practices and focused on perception among employees towards safety climate and safety performance in pulp and paper industries. Thus explore an overall perception of safety climate and the safety performance in PPIB.

#### **1.4 Research Questions.**

The research issue for this proposal is to measure the level of workers' perception towards workplace safety climate and the influence on worker's safety performance in the organization. Below are list of research questions defined in this research proposal;

- (1) Is there a significant relationship between safety climate and safety performance towards the year of service in PPIB?
- (2) Is there is significant influence of Safety Climate onto Safety Performance?
- (3) Is there is any significant difference in the mean safety performance related to demographic factors such as gender, age, position, year of service and education level in PPIB?

## **1.5 Objective of Study**

The purpose of the present study is to identify and measure the perception of safety climate and safety performance among workers in preventing accidents at workplace in Pascorp Paper Industries Berhad. The objectives are categorized into general and specific, respectively.

General Objective is to measure the workers' perceptions towards workplace safety climate and safety performance in preventing accidents in the organization. The study intends to measure the relationship between safety climate and safety performance among workers from top management until bottom line in the Pascorp Paper Industries Berhad.

The specific objective is to determine the level of correlation, relationship and differential between demographic variables or independent variables collectively with dependent variables;

- (1) To determine relationship between significant relationship between safety climate and safety performance.
- (2) To determine the influences of Safety Climate on safety Performance.
- (3) To identify the difference in safety climate and safety performance perceived in the safety score for individual factors (gender, age, position, year of service and education level).

## **1.6 Significance of Study**

The researcher are determine the significant of the relationship of the factors of safety climate from the workers' safety practices or performance such as the variables are Management Commitment, Safety Management System, Safety Communication, Training & Education and Worker's participation. The researcher are also determine the significant of the factors of workers' safety practices or performance with the Safety & Health Policy, Risk Assessment; Safety & Health related procedure, Monitoring and Review. All these factors that contribute in improving safety performance have to be determined in order to achieve the objective of safety and health management in the organization. Thus this study has been intended to explore those important factors and the significant relationship between dependent variables with workers' safety practices or performance are the main core purposes of the study.

## **1.7 Scope of Study**

The scope of these studies is focusing on perception among Pascorp Paper's staff towards workplace safety climate and the influence on worker's safety practices in the workplace.

## **1.8 Limitation**

Several limitation of this was noted. As example the respondent in the survey consist of employees of Pascorp Paper Industries Berhad only. Their safety perception may not reflect safety perception in whole manufacturing industries in Malaysia. Three month time constraint may limit the overall result of paper manufacturing industries in Malaysia and finally, this study used self-administered questionnaires as primary tools to collect the data from the respondent. These measurement tools can be viewed as limitation because self-administered questionnaires may raise the tendencies of single source bias. It is understood that majority of the respondent like to show their good safety perception in the survey. This might lead to a wrong conclusion assuming the responses represent the true picture of their shared safety perception at workplace.

## **1.9 Conclusion**

This topic about the studies of the of the workers' level of awareness, perceptions and behaviour towards workplace safety culture and the influence on safety practices in the effort to avoid accidents in the organization of Pascorp Paper Industries Berhad.

In next chapter, we will discuss about safety climate in the organization and the importance of safety climate in preventing accidents at workplace has led to an excess of studies attempting to define and access safety climate in a number of complex, high-risk, industries.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter will review the relevant literature extensively related with relationship between safety climate and safety performance. In this chapter the definition and concept of safety climate and safety performance will be explain in details. Theoretical framework and hypothesis as will be developed based on literature review point of view.

#### **2.2 Safety Climate and Safety Performance Perspectives**

##### **2.2.1 Safety Climate or Safety Culture**

Safety climate often refers to the shared perception among workers in the organizations with regards to organizational policies, practices and procedures (Barling, Laughin & Kelloway, 2002; Griffin & Neal, 2000; Zohar , 2000). A high level of safety climate indicates that higher priority is being in placed on safety, as enacted by top management and perceived by organizational members (Zohar, 2000). Under positive safety climate, the employees develop work area safety awareness and accept safety as first priority during any operation. Thus, everybody

will take the initiative to adopt safety practices that will inevitably reduce the disobedience of safety rules.

Safety climate definition has been discovered by through academics research for last three decades (Zohar, 1980). Definition in this paper can be quoted as “safety climate is interested with the shared perceptions and beliefs that workers kept regarding safety in their workplace” (Cooper and Philips, 2004)

In a review of the literature Flin et al. (2000) found that there were five common dimensions amongst the surveys of which there three main dimensions relating to management, the safety system and risk. From the literature it emerged that the management was the key influence of an organization’s safety climate. The research indicated that different levels of management may influence health and safety in different ways, e.g. managers through communication and supervisors by how fairly they interact with workers (Thompson, 1998).

Cooper (2008) defined safety climate is the shared perceptions of the staff about the way in which safety is managed in the organizations and it is identified as unpredictable which makes it much more amendable to measurement and change. Measuring safety climate offers pragmatic approach and focuses on staff current perceptions of the safety in relation to management support, supervision, risk taking, safety policies and practices.

Abd Aziz (2008), give the definition of the safety climate as focuses on individuals perceptions of the current safety issues and activities; it is concerned with the current situational and environmental factors at the work place. David M. et al.

(2004) identified the safety climate as to emphasize the perceptions held by employees regarding the importance of safety in their organization. Safety culture tends to focus on the deeper and less readily accessible core value and assumptions of the organization regarding safety and human resources.

Susan et al. (2008) elaborate the safety climate refers to shared perceptions of employees about the safety of their work environment, and provides a background against which day to day tasks are performed. These shared perceptions derive from several factors, including management decision making, organizational safety norms and expectations and safety practices, policies, and procedures which is related together to communicate organizational commitment to safety. Organizations with strong safety climates tend to have fewer employee injuries, not only because the workplace has well developed and effective safety programs but also because of the existence of management commitment to safety.

Tsung et al. (2007) defined that safety climate as employee's perceptions of safety culture in the organization and the perceptions, which are influenced by the organizational factors, individual factors and affect employee's safety behaviours. The quality of safety climate in the organization may affect the safety performance of the organization. Under positive organizational climate, with a kind and friendly atmosphere, employees are likely to enhance their potential and beneficial for the organization to achieve its objectives. Tsung also defined that the concept of safety climate can be considered as an alternative performance indicator and safety climate as a set of work system conditions and practices which results from safety culture.

Thomas (2000) study safety climate is a temporal measure of culture, focusing perceptions, values and attitude at a particular time. Choudhry et al. (2009) has provided the definition that safety management system including policies, practices and procedure that show how safety is implemented in the organization.

The committee of “The Civil Air Navigation Service Organization” is known as CANSO defined that the safety culture refers to the enduring priority, value and commitment placed on safety by each and every individual, groups at every level of the organization. Safety culture reflects the individual, groups and organizational attitudes, norms and behaviours related to safe provision of the air navigation services. Safety climate represent what human feel and the perception s about safety at specific point of time given. The safety climate measurement captured the state of the safety of an organization. Typically the safety climate is measured using quantitative questionnaires while assessing safety culture requires more qualitative methods.

Abd Aziz (2008) in his studies mentioned that safety culture describes the employee belief, norm, value and priority pace on safety practices and safety policy on the organization. The relationship between safety climate and safety culture has still not been distinguished in great detail, but much more of the literature found suggested that the safety climate is a subset of safety culture. Tsung (2000) found that safety climate and safety culture are often regarded as important concepts, not much consensus has been reached on the cause, the content and the consequences of safety culture and safety climate in past three decades. There is an overall lack of model calculating the relationship of both concepts with safety performance. There are key differences between safety culture and safety climate as Safety culture is as



group of individuals guided in their behaviour by their joint belief in the importance of safety. Build joint responsibility between individuals from management down to employee. Safety climate is varies individually depending in current perceptions and may change on daily basis. Perception of safety procedure and rules are a reflection of safety climate.

### **2.2.2 Benefit in assessing safety climate in organization**

Studies by Wong (2009) give a summary on the advantage to apply the safety climate in organization as follows:

- i. The organization applied on a safety climate assessment display a continuous commitment in safety and health
- ii. Regular assessment to promote and maintain a positive safety climate and enables organization to enhance safety performance and as key element of effective safety management in organization
- iii. It's proved to be valid to predict safety performance (accident rate). Poor safety attitude and poor safety climate has been statically proved to be major cause of accident
- iv. Safety climate used as proactive management safety tools has been gaining popularity to be a better indicator of occupational safety performance. The company who scores lower safety climate assessment revealed its poor safety management in the organization. A proactive measure may be taken accordingly.

### **2.3 Safety Performance**

Safety performance can be determined as a self-reported rate of accident and occupational injuries. Oi Ling Siu et al (2004) agreed that have the relationship between safety climate and safety performance, and psychological strains. They study about safety climate and safety performance among construction workers in Hong Kong. The results of the study shown that safety attitudes predict to the occupational injuries. Safety performance measurement techniques can be categorized into statistical measures, behavioural measures, periodic safety audits, and a balanced scorecard approach. Neal et al. (2000) examined the impact of organizational climate on safety climate and individual behaviours on a sample consisting of 525 employees from 32 work groups in a large Australian hospital.

They concluded that organizational climate exerted a significant impact on safety climate and the effect of safety climate on perceived safety performance was mediated by safety knowledge and motivation. He found empirical support for hypothesized positive relationships among amount of safety training, perceived safety knowledge and supervisor ratings of safety performance.

Evelyn Ai Lin Teo et al. (2005) have identifies two main reasons for unsafe work behaviour, first lack of awareness about safety (don't know) and second poor attitude towards safety (don't care). The research framework found that the number of accidents may be reduced if workers' awareness about safety is increased through

training. The more training is given, the fewer the number of accidents will be reduced. In terms of attitude towards safety, authors suggested that poor attitude might overcome by organizational behaviour modification. To improve the safety, organizations can systematically apply the tools are positive reinforcements, negative reinforcements, extinction and punishment.

Huang et al. (2006) have studied safety in many workplaces, defined safety performance as employee safety control and self-reported occupational injury. Safety performance is a global performance of safety management systems operated and measured by safety organizations, safety management, safety equipment, safety training practice, safety training evaluation, accident investigations, and measures of accident statistics. He suggests that management commitment to safety as one dimension of safety climate.

Reporting system is the basis to discover the limitation and vulnerability of safety management prior accident (Von Thaden et al., 2003). In the other words, reporting system indicates workers willingness to give details of the safety issues and challenges in the workplace. HSE (2005) studied that employee must be given feedback relating the action taken to their reporting.

Clarke (1998) stated that incident reporting can be treated as an indicator of workers' perceptions about management commitment to safety. He study showed that worker perceived negatively about management commitment to safety can trigger employees' unsafe act.

Performance of an organization is critical to ensure success and survival in the business environment. According to National Occupational Health and Safety Commission (2002), evaluation of Safety performance enables an organization to relate safety and health problem and take preventive action. Numbers of organization assess their safety system using accident rates and audit as an indicator of safety performance (Carder & Ragan, 2003). They are using accident rates to measure improvement on safety performance create issue when there is no data to facilitate performance due to accident case to investigate. In addition, near miss accident cannot be used to measure safety performance, as it is not recordable accident even though it can present major threat in future.

As for audit, previous research reported negative relationship correlation between audit and accident rates (Carder & Ragan, 2003). In addition, perception survey can be used to measure the effectiveness of safety system as management is liable to determine their principles through their safety performance (Petersen, 2000). Besides involvement of the management and workers shows positive results in enhancing safety performance (Lin & Mills, 2001)

Enhancing safety performance is paramount to the success of health and safety management at work. Donald and Young (1996) conducted an intervention –based study on the attitude of employees in the UK power generation company. The results of the safety performance showed improvement in the accident rates, absenteeism and general attitude towards safety. In term of management of labour, organization need to employ the right person for the right job as to ensure minimization of workplace injury.

Hassan, Nor Azimah & Chandrakantan (2005) revealed that hiring practices is one aspect that requires major attention by the organization as employee should be hired based on good safety record from previous experience from other organizations. An organization in particular sectors should gather their resources to set up certification bodies to train and certify employees in safety and health.

As conclusion, safety performance can be measured as a safety process evaluation at both the individual and the organizational level. Safety performance is used for measuring safety culture and the organizations competence improvement on the safety audit assessment, accident investigation, and management and safety system.

#### **2.4 Relating Safety Climate and Safety performance and demographic factors**

Another concept that to be review in the propose research is the relationship between safety climate and safety performance. One of the omissions in INSAG's structure for establishing and evaluating safety culture in the link between safety culture and safe of operations. The INSAG approach assumes, but does not attempt to demonstrate a positive relationship between safety culture and facilities safety. No performance indicators to gauge safety culture and its impact on safety of operations appear to have been identify and validate. (J.N. Sorensen, 2001). Highly reliable performance can be achieved through the development of an organizational culture that encourages interpretation, improvisation and unique action. (Weick 1987).

In recent years, many approaches have been introduced to measure safety performance in organizations. First is statistical approach that allows management to account for inherent and uncertainty in making prediction to losses due to accidents. Some common statistical methods include correlation, regression, analysis of variance (ANOVA) and non-parametric contingency table (Adebiyi, Owaba, & Waheed, 2007). One major drawback of this approach is that management must thoroughly concern the reliability of its raw data as it influences the accuracy of the prediction made. Second approach is risk assessment technique such as Hazard Analysis, Failure Mode and Effect Analysis (FMEA), Fault Tree Analysis (FTA) and Probabilistic Risk Analysis (Fuller & Vassie, 2004). Perhaps the most serious disadvantage of this method is that the prediction made may be incorrect if the estimation is inaccurate. This approach comprises several steps that are identifying risk at work, estimating the magnitude of risk and evaluating the risk to employees' safety. And the last is system analysis approach that demands a thorough examination of the accidents including its components, system behavior and organization. Difficulties may arise, however when an attempt is made to collect useful information from employee and management as they may refuse to reveal their 'true' safety behavior.

Meanwhile, the term safety performance tends to be used to refer to level of safety in organizations. Most common safety performance indicators are OSHA recordable and workplace accidents statistic that is also known as an economic predictor (Manzella, 1999; Arezes & Miguel, 2003; Mannan *et al.*, 2008; Clarke, 2006). One question that needs to be asked, however, is whether this predictor is reliable enough to reveal safety situation including subjective indicator such as employees' motivation. According Fabiano *et al.* (2004) there is four factors that

influence accidents frequency in organizations that are economic, technology pressure, job design and employees' issue. Numerous studies employ an accident statistic to safety performance in organizations (Akson & Hadikusumo, 2007; Clarke, 2006; Sawachi *et al.*, 1999).

However, according to Beaumont (1981) statistics alone are inadequate to measure the real performance. For this reason, Wu *et al.* (2008) introduces more holistic safety performance scale that is not only limited to the number of accidents. It includes various indicators to clearly describe the real safety level in organization that covers safety organization and management, safety equipment, accident statistic, safety training evaluation, accident investigation and safety training practices.

According to Grabowski *et al.* (2006) study, safety performance has traditionally been measured by 'after the loss' type of measurements such as accident and injury rates, incidents and dollar costs. However, there is a growing consensus among safety professionals and researchers that lagging indicators, which means that an accident must occur or a person must get injured before a measure can be made, may or may not provide the necessary insights for avoiding future accidents. This statement supported by Lindsay (1992), where a low reported accident rate, even over a period of years, is no guarantee that risks are being effectively controlled, nor will it ensure the absence of injuries or accidents in the future. Therefore, safety promotion shall be on going activities to provide awareness on the risks of existing or potential hazards.

The safety factor items shall be conducted consistently to ensure safety performance can be improved and maintained at the certain standard. Grabowski et al. (2006) in their study was identified that the management commitment and involvement in safety, effective safety communication throughout the organization, and effective safety training and employee empowerment on safety management issues are the safety factors can influence workplace safety performance. These fact was also supported by Zimolong & Elke (2006) where they revealed that the genuine and consistent management commitment to safety, including prioritization of safety over production; maintaining a high profile for safety in meetings; personal attendance of managers in safety meetings and in walk-about; face-to-face meetings with employees that feature safety as a topic; and jobs descriptions that include safety contracts.

## **2.12 Conclusion.**

This chapter deals with some of the literature that concerned with the safety climate at workplace and the influence on safety practices or performance, and its failure was indirectly causing accidents and injuries. An attempt has been made to relate these general concepts of accidents and injuries in the workplace with specific reference to the level of perception in safety climate and the influence on safety practices or performance among workers. The researcher postulates that workers' low perceptions in safety climate are real threat to the cause of accidents and injuries in the workplace. While it has been a norm to blame the worker for the injury or accidents sustained. Today, there is unequivocal agreement that many factors have to interact and come



together to result in an accident and injury at the workplace. A better understanding of these factors will have far reaching implications on formulating strategies, solutions and policies towards uprising the perceptions of safety climate in an organization.

Next chapter talk about research procedure and the method used to conduct the research related to its objectives.

## **CHAPTER 3**

### **METHODOLOGY**

#### **3.1 Introduction**

This chapter discusses research procedure and the method used to conduct the research related to its objectives that has been highlighted in Chapter 1. Methodology that was adopted for this study is the questionnaire survey. The information or data gathered using questionnaires focus on selected wider spectrum of respondent from Pascorp Paper Industries Berhad.

This chapter will discuss in details about how this study was conducted to meet its objectives. Explanations on the research design, populations and samples, sampling and sample size, data collection method, instrumentation, type and technique of data analysis were provided.

Obtaining in formations from the people by asking is mostly done by survey. Survey is a tool that being used by many researchers in the area of academic. The benefit rely on following protocol in random sampling procedures that allows a relatively small number of people to represent a much larger population which need to follow ethical norm such as respect of privacy and the voluntary nature of the participation of the respondent.

Research is valid when the conclusions are true and reliable when the findings are repeatable. It is important that the survey has to ensure that the research is both valid and reliable.

### **3.2 Framework and Hypothesis of study**

This research was to define the significant of the gap in relation with safety culture and safety practices among workers at Pascorp Paper Industries Berhad. Following are the gap as defined as hypotheses of this research;

#### **3.2.1 Ho1:**

To determine relationship between significant relationship between safety climate and safety performance.

This hypothesis examined the relationship between safety climate and safety performance in PPIB. Based on test results, which indicated variable positive or negative correlation exist between these two variables and then measure the perception level.

#### **3.2.2 Ho2:**

To determine the influences of Safety Climate on Safety Performance.

This hypothesis examined the influences of Safety Climate and Safety Performance and vice versa.

### **3.2.3 Ho3:**

To identify the difference in safety performance perceived in the safety score for individual factors (gender, age, position, year of service and education level).

**Ho3a.** There exists no difference in the mean safety performance among employees of different gender (gender factors).

The hypothesis will examine all perceptions of safety performance in the PPIB between and ages as there is no distinction or the perception of its form the same male and female workers in the ranking of various age category in the PPIB.

**Ho3b.** There exists no difference in the mean safety performance among employees of different age (age factors).

This hypothesis will examine the perception safety performance among employee of different age in PPIB either exist no difference or same perception among them. This test is to explore the significant referent of safety perceptions among age level towards the perception of safety climate and safety performance in PPIB.

**Ho3c.** There exists no difference in the mean safety performance among workers position (employment status factor)

This hypothesis will examine the perception safety performance among workers position in PPIB either exist no difference or same perception among them. Basically this test either there is strong or less perception among workers about safety awareness and acknowledgement in PPIB. This test is to explore the significant referent of safety perceptions among level of job position towards the perception of safety climate and safety performance in PPIB.

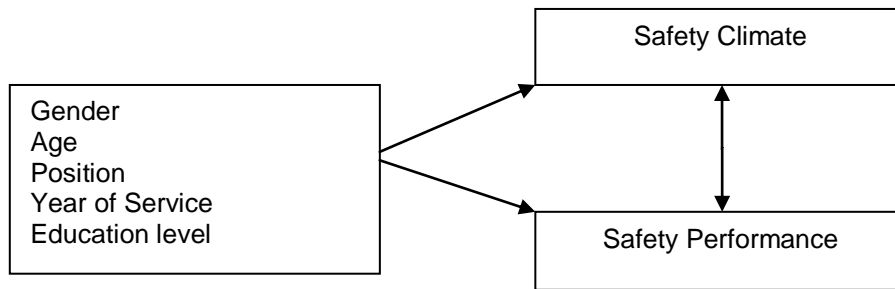
**Ho3d.** There exists no difference in the mean safety performance among employees of different year of service (year of service factor)

This hypothesis will examine the relationship between climate and performance to the safety perception related to year of service. This test will identify if there is no difference or significant difference to the safety among the workers in PPIB.

**Ho3e.** There exists no difference in the mean safety performance among employees of different education level (Education level factor)

This hypothesis will examine the relationship between climate and performance to the safety perception related to education level. This test will identify if there is no difference or significant difference to the safety among the workers in PPIB.

Figure 3.1  
Theoretical Framework



### 3.3 Research Design

This proposed research study was design based on the aspect to determine the level of perceptions towards workplace safety culture in the organization. Non-experimental research design was used as the research conducted in a 'real world' environment and the researcher had no control over the variables involved.

Factors of the organization's safety climate dimension in were determined as; (1) management commitment (2) Safety Communication (3) Training & Education (4) Employees' participation

While the factors of workers' safety practices (dependent variables) were define as; (1) Safety & Health Policy (2) Risk Assessment (3) Safety & Health related procedure, (4) Monitoring and Review.

The significant between workers' characteristics with safety culture and safety Practices or performance will also be measure and defined as below (1) their position in the organization (2) Their education background (3) Their age (4) Working experience (5) Their involvement in safety activities

### **3.4 Population and Samples**

The studies population was the plant personnel of Pascorp Paper Industries Berhad. The sample in this study requires at least 30 percent of total respondents from each department.

Pascorp Paper Industries Berhad having 300 workers' in the workplace which been divided into three shift, this will determine the sample size as it will affect the number of population. In Pascorp Paper Industries Berhad, it was identified only 8 sections in the organization which mentioned as below (1) Production PM1 with current total number of workforce approximately 65 workers. (2) Production PM2 with current total number of workforce approximately 70 workers. (3) Production PM3 with current total number of workforce approximately 65 workers. (4) Warehouse with current total number of workforce of approximately 20 workers. (5) Mechanical Department with current total number of workforce of approximately 30 worker (6) Electrical Department with current total number of workforce of approximately 20 workers (7) Waste Water Treatment Plant with current total number of workforce of approximately 15 worker (8) Stockyard Department with current total number of workforce of approximately 15 worker (9) Make up with current total number of workforce approximately 300 workers.

By knowing the above as a samples for propose research and these eight sections in the organization comprises of total 300 number of workers as the population of the research area.

### **3.5 Data collection method or procedure**

Participants received informed consent form explaining the voluntary nature of study and survey. The researcher decided to use questionnaire as a tools in the research survey. This tool is from “Safety Climate Assessment Process and Toolkit User Guide” and “Safety Climate Assessment” issued by Health and safety Executive, United Kingdom. These methods underwent series of tests and refinements before the production of the Toolkit. It is collaboration with the Offshore Safety Division of the HSE, Chevron UK, Chevron Gulf of Mexico (Ship Shoal/Eugene Island) Mobile North Sea and Oryx UK. Another questionnaire that used in this research is from the research conducted by RSSB (Rail Safety and Standard Board) and ROSPA (The Royal Society for the Prevention of Accident). Almost all the research questions used in this research and choose the question related with the research independent and dependent variables.

The researcher gets concern from Senior Management to conduct the survey and informed the Human Resource department and Head of Department through email. The researcher gathers the respondent during shift tool box meeting and explains the purpose of survey and randomly distributes the questionnaire. The researcher explains details how to fill in and collect filled questionnaire at the end of the session.

### **3.6 Instruments**



In this research, the instrument used by the researcher is a survey questionnaire. This has been discussed in the above topic, the tools was establish based on Safety Culture Assessment Process and Toolkit User Guide issued by Health and safety Executive, United Kingdom. It is collaboration with the Offshore Safety Division of the HSE, Chevron UK, Chevron Gulf of Mexico (Ship Shoal/Eugene Island) Mobile North Sea and Oryx UK. Another questionnaire that used in this research is from the research conducted by RSSB (Rail Safety and Standard Board) and ROSPA (The Royal Society for the Prevention of Accident).

Following is the factors that have been considered by the researcher in order to make the research instrument or questionnaire able to be answered by the respondent with successfully; (1) the researcher used English languages in each of questionnaire. (2) The questionnaire was design as a self-explanatory to ensure that respondent can complete the questionnaire by themselves. (3) Considered the time taken by each respondent to complete answering the questionnaire. The researcher established the questionnaire that able to be answer within 20 minutes.

### **3.7 Type of Data Analyses**

All data that obtained and collected from the questionnaire was analyzed using Statistical Package for Social Science (SPSS) software version 19.0. Descriptive statistics used to identify the sample based on the data provided in the respondent information sheet. Correlation test and multiple regressions conducted to analyse the significant of the correlation coefficient and to test independents variables against the dependent variable. Only value  $p < 0.05$  considered significant.

In general, data scaling in non-parametric statistic were categorized into four types, which are nominal or categorical scale, ordinal or ranking scale, interval scale and finally ratio scale. Within this research, the ordinal or ranking scale measurement was used to collect most of the variables relevant to the study. In measuring the level for most of the variables, the method of Likert Scale was used, in particular was five Likert Scale for the entire questionnaire.

### **3.8 Conclusion.**

The study undertaken should shed light as to whether there is co-relation between the level of perceptions on safety climate and the influence on safety practices or performance with the research hypotheses. It will also help with measures that can be taken to improve the situation and thereby increase the perceptions on safety climate and the influence on safety practices or performance among workers.

Next topic discuss about result and explaining the data analysis and research findings. Information on the respondent profile is presented to provide the picture of the frequency and percentage of respondent by work position, gender, marital status, education level, years of service and age. Then, the general factors are reviewed followed by hypothesis result testing. Descriptive statistics is used to explain the mean score for the research variables whereby inferential statistics, Pearson Correlation and Regressions is used to determine the correlation between variables.

## **CHAPTER 4**

### **RESULTS AND DATA ANALYSIS**

#### **4.1. Introduction**

This chapter is explaining the data analysis and research findings. Research data were analyzed using statistical package for social science (SPSS) version 19.0 for Windows to perform the statistical analysis. Information on the respondent profile is presented to provide the picture of the frequency and percentage of respondent by work position, gender, marital status, education level, years of service and age. Then, the general factors are reviewed followed by hypothesis result testing. Descriptive statistics is used to explain the mean score for the research variables whereby inferential statistics, Pearson Correlation and Regressions is used to determine the correlation between variables.

#### **4.2. Descriptive Analysis**

A total 122 workers responded to the survey. Total hit rate is 100% (122/122). Refer to table 4.1 below explained respondent by department, gender, race, age, marital status, work position, education level and year of service.

Production department consist PM1, PM2 and PM3 responded 20.5%, 21.5% and 17.5% respectively. Total respondent from production department is 59%. While respondent from Mechanical department is 13.9%, Warehouse 7.4%, WWTP 7.4%, Electrical 6.6% and Stockyard department 5.7%.

Majority of respondent gender are male and female make up only 1.6% from total respondent. The nature of shift works in this industry requires male workers. Majority of respondent race are Malays and Indian make up only 1.6% from total respondent. All workers are Malaysia.

Profile on respondents' age 20 and below consist 31.1%, age between 21 to 30 years are 26.2%, and age between 31 to 40 years are 31.1% and age 41 year and above is 11.5%. Respondents Marital Status shows 51.6% is single and 47.5% is married and 0.8% is widow.

There are Machine Operator / Technician staff responded to the survey is 51.6%, clerical staff is 7.4%, Production General Worker is 19.7%, Supervisor is 16.4% and Middle Management / Executive is 3.3 % and 1.6% from the Management Level.

Look at respondents Education Level 2.5% are Standard 6 /UPSR, 14.8% having Peperiksaan Menengah Rendah (PMR), 68.9% having Sijil Pelajaran Malaysia (SPM), 4.9% are having Certificate/ STPM, 4.9% is Diploma holder, 4.1% is having Degree holder.

Table 4.1  
*Frequencies of Demographic variables*

Parameter		Frequency	
Percentage, %			
Department	PM1	25	20.5
	PM2	26	21.3
	PM3	21	17.2
	Warehouse	9	7.4
	WWTP	9	7.4
	Mechanical	17	13.9
	Electrical	8	6.6
	Stockyard	7	5.7
Gender	Male	120	98.4
	Female	2	1.6
Race	Malays	120	98.4
	Indian	2	1.6
Age	20 years and below	38	31.1
	21-30 years	32	26.2
	31-40 years	38	31.1
	41 years and above	14	11.5
Marital Status	Single	63	51.6
	Married	58	47.5
	Widow	1	0.9
Position	Operator/ technician	63	51.6
	Clerk	9	7.4
	General Worker	24	19.7
	Supervisor	20	16.4
	Middle Management	4	3.3
	Top Management	2	1.6
Education	Standard 6 / UPSR	3	2.5
	PMR	18	14.8
	SPM	84	68.9
	STPM / Certificate	6	4.9
	Diploma	6	4.9
	Degree	5	4.1
Year of Service	Less than 5 years	41	33.6
	6 – 10 years	35	28.7
	11 – 15 years	22	18.0
	15 years and above	24	19.7

Looking at the Years of Service profile, workers that working years less than 5 years are represented 33.6%, from 6 to 10 years is 28.7%, from 11 to 15 years is 18%, and worker worked for 15 years and above is 19.7%.

### 4.3 Reliability Analysis

The reliability scales are using the Cronbach's Alpha, were the best used for multipoint scaled item. The reliability measure to which extent the measure is without error output. The best reliability coefficient result is closer to 1.0, more than 0.8 considered as good reliability, results between 0.7 to 0.799 at acceptable level and those result below 0,6 considered as poor (Sekaran et al, 2003). Table 4.2 shows that all the four facet of independent variables and dependent variable having the Cronbach's alpha coefficient of higher than 0.7, thus they are all reliable items.

Table 4.2  
*Reliability test for dependent and independent variable*

Variables	Cronbach's Alpha, $\alpha$
Safety Climate	0.930
Safety Performance	0.923

#### 4.4. Mean and Standard Deviation Analysis for Safety Climate and Safety Performance.

The mean, standard deviation and variance for Safety Climate is shown in table 4.3. From the total mean score, Safety Climate has mean = 3.9572 with Standard Deviation of =0.31436 compared to Safety Performance with mean score equivalent to 4.0216 and standard deviation equivalent to .18711.

Table 4.3  
*Mean and Standard Deviation for Safety Climate and Safety Performance.*

<b>One-Sample Statistics</b>				
	N	Mean	Std. Deviation	Std. Error Mean
Mean Climate	122	3.9572	.31436	.02846
Mean Performance	122	4.0216	.18711	.01694

Note: All items used a 5-point Likert scale with 1=Strongly disagree and 5=Strongly agree

#### 4.5 Hypothesis Testing

Referred to the literature review and conceptual framework of safety climate and safety performance as mentioned in the Chapter 3 had been designed, hypotheses were developed which related to the objectives of research. The purpose of hypothesis testing is for confirming the conjectured relationship between two or more elements, and it is expected to provide solutions for the problem. Sekaran et al, (2003) mentioned to testing the relationships through appropriate statistical

analysis, the study is able to obtain some reliable finding in research study. These hypotheses are important for comparing with the previous studies and to support the validation of the management tool (Abd Aziz, 2008). The result of hypothesis testing as follows:

#### 4.5.1 Hypothesis 1

**Ho1.** There is a positive relationship between perception of safety climate and safety performance among employees.

Table 4.4  
*Correlation Matrix among Variables*

Correlations		Mean Climate	Mean Performance
Mean Climate	Pearson	1	.627**
	Correlation		
	Sig. (2-tailed)		.000
	N	122	122
Mean Performance	Pearson	.627**	1
	Correlation		
	Sig. (2-tailed)	.000	
	N	122	122

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

The above tables are to test hypothesis proposed using SPSS version 19.0 *Pearson Correlation Test (Bivariate)*. Analysis results are displayed in tables 4.3 shows that there is significant correlation between safety climate and safety performance which is exceeding a five percent level (0.5).



From the review data as shown in the table, the safety climate has a significant relationship to safety performance, therefore, there is significant relationship between safety climate and safety performance.

#### 4.5.2 Hypotheses 2

**Ho2** To determine the influences of Safety Climate on Safety Performance.

Table 4.5

*Model Summary: the Correlation coefficient and correlation determination*

Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.627 <sup>a</sup>	.393	.388	.14642

a. Predictors: (Constant), Mean Climate

b. Dependent Variable: Mean Performance

ANOVA<sup>b</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.663	1	1.663	77.577	.000 <sup>a</sup>
	Residual	2.573	120	.021		
	Total	4.236	121			

a. Predictors: (Constant), Mean Climate

b. Dependent Variable: Mean Performance

Table 4.5 shows that the correlation coefficient is 0.393, indicated that 39.3% change in the Safety performance variance is due to safety climate.

### 4.5.3 Hypotheses 3

**Ho3a** There exists no difference in the mean safety performance among employees of different gender (gender factors).

The hypothesis measured using independent samples t-test as per table 4.6

Table 4.7  
*Gender: Mean Safety Performance*

#### Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Mean	male	120	4.0205	.18810	.01717
Performance	female	2	4.0900	.12728	.09000

#### Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means			95% Confidence Interval of the Difference			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Mean	Equal variances assumed	.000	.984	-.519	120	.604	-.06950	.13381	-.33443	.19543
Performance	Equal variances not assumed			-.759	1.074	.580	-.06950	.09162	-1.06001	.92101

An independent t –test was conducted to compare there exist no difference in perception in safety performance between different gender of respondent. Table 4.6 shown that male respondent with mean safety performance (M=4.0205, SD=.18810) had no difference with female respondent (M=4.0900, SD=.12728 ) at the  $p=.984$  level of significance.

Since probability of error  $< .05$ , the analysis accepted the null hypothesis and concluded that there exists no difference in safety performance among employees of different gender (gender factors).

**Ho3b.** There exists no difference in the mean safety performance among employees of different age (age factors).

Table 4.8  
*Age: Mean Safety Performance*

ANOVA		Sum of	df	Mean	F	Sig.
		Squares		Square		
Mean Performance	Between Groups	.190	3	.063	1.844	.143
	Within Groups	4.046	118	.034		
	Total	4.236	121			

One way ANOVA conducted to measure the influence of respondent age towards relationship between safety climate and safety performance at PPIB.

Since probability of error (p) is  $< .05$ , the analysis accepted the null and concluded there is no significant difference between respondent mean age between the group categories. The result revealed that no significant difference in perception of

safety climate and safety performance among employee of different age (age factors). The result analysis is significant difference. Indicates the probability of error ( $p$ ) = .143 for safety performance.

**Ho3c.** There exists no difference in the mean safety performance among workers position (employment status factor)

Table 4.9  
*Employment Status: Mean Safety Performance*

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Mean Performance	Between Groups	.647	5	.129	4.183	.002
	Within Groups	3.589	116	.031		
	Total	4.236	121			

### Multiple Comparisons

#### Tukey HSD

Dependent Variable	(I) Position	(J) Position	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Mean Performance	Operator / Technician	Clerk	-.04429	.06268	.981	-.2259	.1374
		General Worker	.06544	.04219	.632	-.0568	.1877
		Supervisor	.01827	.04515	.999	-.1126	.1491
		Middle Management	-.17123	.09070	.415	-.4341	.0916
		Top Management	-.44873*	.12634	.007	-.8148	-.0826
Clerk	Operator / Technician	General Worker	.10972	.06875	.603	-.0895	.3090
		Supervisor	.06256	.07060	.949	-.1420	.2672
		Supervisor	.06256	.07060	.949	-.1420	.2672
		Supervisor	.06256	.07060	.949	-.1420	.2672

	Middle Management	-.12694	.10570	.836	-.4333	.1794
	Top Management	-.40444*	.13750	.045	-.8029	-.0060
General Worker	Operator / Technician	-.06544	.04219	.632	-.1877	.0568
	Clerk	-.10972	.06875	.603	-.3090	.0895
	Supervisor	-.04717	.05326	.949	-.2015	.1072
	Middle Management	-.23667	.09500	.135	-.5120	.0386
	Top Management	-.51417*	.12946	.002	-.8893	-.1390
Supervisor	Operator / Technician	-.01827	.04515	.999	-.1491	.1126
	Clerk	-.06256	.07060	.949	-.2672	.1420
	General Worker	.04717	.05326	.949	-.1072	.2015
	Middle Management	-.18950	.09634	.368	-.4687	.0897
	Top Management	-.46700*	.13045	.007	-.8450	-.0890
Middle Management	Operator / Technician	.17123	.09070	.415	-.0916	.4341
	Clerk	.12694	.10570	.836	-.1794	.4333
	General Worker	.23667	.09500	.135	-.0386	.5120
	Supervisor	.18950	.09634	.368	-.0897	.4687
	Top Management	-.27750	.15233	.456	-.7189	.1639
Top Management	Operator / Technician	.44873*	.12634	.007	.0826	.8148
	Clerk	.40444*	.13750	.045	.0060	.8029
	General Worker	.51417*	.12946	.002	.1390	.8893
	Supervisor	.46700*	.13045	.007	.0890	.8450
	Middle Management	.27750	.15233	.456	-.1639	.7189

\*. The mean difference is significant at the 0.05 level.

One way ANOVA conducted to measure the influence of respondent employment status safety performance at PPIB. The result indicates the probability of error ( $p$ )= .002 for safety performance.

By using a Tukey HSD post-hoc test, it is revealed that there was a statistically significant difference in the mean safety performance of score between operator / technician and top management.

Since probability (p) <.05, the analysis rejected the null and concluded there is significant difference between respondent mean age between the group categories. The result revealed that no significant difference in perception of safety performance among employee status from operators to middle management.

**Ho3d.** There exists no difference in the mean safety performance among employees of different year of service (year of service factor)

Table 4.10  
*Year of Service: Mean Safety Performance*

ANOVA						
		Sum of		Mean		
		Squares	df	Square	F	Sig.
Mean Performance	Between	.217	3	.072	2.126	.101
	Groups					
	Within Groups	4.019	118	.034		
Total		4.236	121			

One way ANOVA conducted to measure difference in the mean safety performance among employees of different year of service (year of service

factor) at PPIB. The result indicates the probability of error ( $p$ ) = .101 for safety performance.

Since probability of error ( $p$ ) <.05, the analysis accepted the null and concluded there is no significant difference between respondent of different year of service between the group categories. The result revealed that no significant difference difference in the mean safety performance among employees of different year of service (year of service factor) at PPIB. Indicates the probability of error ( $p$ ) = .101 for safety performance.

**Ho3e.** There exists no difference in the mean safety performance among employees of different education level (Education level factor)

Table 4.11  
*Education: MeanSafety Performance*

		Sum of Squares	df	Mean Square	F	Sig.
Mean Performance	Between Groups	.679	5	.136	4.427	.001
	Within Groups	3.557	116	.031		
	Total	4.236	121			

Multiple Comparisons

Tukey HSD

Dependent Variable	Education	(J) Education	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Mean Performance	Standard 6 /UPSR	PMR	-.06333	.10921	.992	-.3798	.2531
		SPM	-.10155	.10289	.921	-.3997	.1966

	STPM	-.25333	.12383	.323	-.6122	.1055
	/Certificate					
	Diploma	-.20500	.12383	.564	-.5638	.1538
	Degree	-.40267*	.12789	.025	-.7733	-.0321
PMR	Standard 6	.06333	.10921	.992	-.2531	.3798
	/UPSR					
	SPM	-.03821	.04548	.959	-.1700	.0936
	STPM	-.19000	.08255	.202	-.4292	.0492
	/Certificate					
	Diploma	-.14167	.08255	.524	-.3809	.0976
	Degree	-.33933*	.08853	.003	-.5959	-.0828
SPM	Standard 6	.10155	.10289	.921	-.1966	.3997
	/UPSR					
	PMR	.03821	.04548	.959	-.0936	.1700
	STPM	-.15179	.07400	.320	-.3662	.0627
	/Certificate					
	Diploma	-.10345	.07400	.728	-.3179	.1110
	Degree	-.30112*	.08061	.004	-.5347	-.0675
STPM	Standard 6	.25333	.12383	.323	-.1055	.6122
	/Certificate					
	PMR	.19000	.08255	.202	-.0492	.4292
	SPM	.15179	.07400	.320	-.0627	.3662
	Diploma	.04833	.10110	.997	-.2447	.3413
	Degree	-.14933	.10604	.722	-.4566	.1580
Diploma	Standard 6	.20500	.12383	.564	-.1538	.5638
	/UPSR					
	PMR	.14167	.08255	.524	-.0976	.3809
	SPM	.10345	.07400	.728	-.1110	.3179
	STPM	-.04833	.10110	.997	-.3413	.2447
	/Certificate					
	Degree	-.19767	.10604	.429	-.5050	.1096
Degree	Standard 6	.40267*	.12789	.025	.0321	.7733
	/UPSR					
	PMR	.33933*	.08853	.003	.0828	.5959
	SPM	.30112*	.08061	.004	.0675	.5347
	STPM	.14933	.10604	.722	-.1580	.4566
	/Certificate					
	Diploma	.19767	.10604	.429	-.1096	.5050

\*. The mean difference is significant at the 0.05 level.

The p value <0.05, therefore accepted the null hypothesis and there is a significant difference mean safety performance among workers of different education level ( Education level factor)



By using a Tukey HSD post-hoc test, it is revealed that there was a statistically significant difference in the mean safety performance of score between worker who hold degree holder and standard 6 / UPSR .

Since probability (p)  $<.05$ , the analysis rejected the null and concluded there is significant difference between respondent between the group categories who hold degree holder and standard 6 / UPSR. The result revealed that no significant difference in perception of safety performance among employee who hold education status from standard 6/UPSR to diploma level.

#### **4.6 Conclusion**

In this study the analysis revealed the result of correlation between safety climate and safety performance whereby  $r = 0.627$ ,  $n= 122$ ,  $p<0.005$  as strong level perception of safety climate and safety performance among the employees. Results show that hypothesis have significant relationship towards Safety Performance. Thus, discussion of the obtained results will be further discussed in the following chapter.

## CHAPTER 5

### DISCUSSION, SUMMARY, CONCLUSION AND RECOMMENDATION

#### 5.1. Introduction

This chapter will conclude the study on relationship between safety climate and safety performance among PPIB staff. The significance to the study and implication also highlighted. At the end of the chapter conclusion and recommendation is provided.

#### 5.2. Summary of Findings

The result for hypothesis in chapter 4 concluded and summarized as below;-

Figure 5.1  
*Summary results for hypothesis*

<i>Hypothesis</i>	<i>Generate Hypothesis</i>	<i>Method</i>	<i>Result</i>
Ho1	To determine relationship between significant relationship between safety climate and safety performance.	Correlation Bivariate	Null Accepted
Ho2	To determine the influences of Safety Climate on Safety Performance.	One way ANOVA	Null Accepted
Ho3a	There exists no difference in the mean safety performance among employees of different gender (gender factors).	One way ANOVA	Null Rejected
Ho3b	There exists no difference in the mean safety performance among employees of different age (age factors)	One way ANOVA Post-Hoc	Null Accepted
Ho3c	There exists no difference in the mean safety performance among workers position (employment status factor)	One way ANOVA Post-Hoc	Null Rejected
Ho3d	There exists no difference in the mean safety performance among employees of different year of service (year of service factor)	One way ANOVA Post-Hoc	Null Accepted
Ho3e	There exists no difference in the mean safety performance among employees of different education level (Education level factor)	Correlation Bivariate	Null Accepted

Hypothesis testing result as shown in figures 5.1 proved that two hypothesis with null rejected (significance level of safety) and five hypotheses with Null Accepted (not significance level of safety).

### **5.3. Discussion of Hypothesis Result**

#### **5.3.1 Hypothesis 1 and 2**

This study investigated the relationship between safety climate and safety performance and its influences in one of pulp and paper industry in Pahang. It indicates that there is positive relationship between safety climate and safety performance.

There was a strong positive correlation between safety climate and safety performances, both of these variables are interrelated with one another. When the level of awareness of the safety climate is high, the level of safety performance improved. In PPIB safe work culture has always practiced and implemented properly. Safety climate has almost 40% influences towards safety performance, on the other words if we wish to improve the safety performance of PPB among workers, we need to focus on the good management of safety climate, consistent with the safety performance will be better.

It means that the safety climate in PPIB will positively such as formal and informal meeting, accident/incident reporting system, bulletin board and intranet publishing, and employee suggestion programme provided by the company was contribute to the workplace safety performance. Safety issues being discussed during month management meeting shows that safety and health issue being part of important element on business continuity. The management clearly communicated safety and health issue in order to ensure safety performance should communicate what is important clearly through goal setting, establishing policies and procedures, and even rewarding certain job behaviors. Grabowski et al. (2006) agreed with this statement where in their research mentioned about effective communication is the safety factors can influence workplace safety performance in an organization.

Campaign on safety culture at workplace is always performed by the management. Weekly management meeting was held to inform any issue arise about safety programs progress, update report on any accident incurred case, any problems and actions plan that will be presented by the Safety and Health officer and the Safety and Health Committee. Indirectly, the safety management in the PPIB involved with all stakeholders from seniors management to the bottom. This is the good relationships at all levels of employees in PPIB for the benefit of safety achievement for long term.

Varonen and Mattila (2000) also suggest that employees' perceptions of the work environment may have a stronger influence than perceptions of company safety practices, because the work environment has an impact more directly on the individual. This findings is concurrent where management should provide the right job equipment's, visit workplaces to alert of dangerous work practices as well as informing hazards, provide enough safety programs and conducive working environment, investigate, audit, and response to safety problem quickly, also praise and reward safety behavior. These incentive schemes could motivate employees' work safety behavior. Besides that, supported finding that perceived risk level, rather than effectiveness of safety advisors and safety committees have a significant effect on safety performance (Cooper and Phillips, 1994). Finally, the intentions of reducing industrial accidents won't be successful if management is not supportive.

### **5.3.2 Hypothesis 3a**

The result in Table 4.7 shows that there exists no difference in perception of safety climate and safety performance among employees of different gender in PPIB. This study similar with Mahmud et al. (2010) revealed that there were no differences between male and female employees safety climate and safety performance. This study contradict with Abd Aziz (2008), Nor Azimah et al (2009), Tsung et al, (2007) revealed that there were differences between male and female employees commitment and climate perception at the workplace.

As mentioned in earlier chapter that involvement of staff in safety activities and program conducted by safety and health committee or management of safety at workplace involving all level of employees though out the organization. Male worker consist most of the population whereby most of the work in PPIB required manual handling of heavy equipment, the management does not distinguish male and female employee in the implementation safety and health activity in the workplace.

#### **5.3.3.2 Hypothesis 3b**

Result revealed that no significant difference in perception of safety climate and safety performance among employee of different age (age factors). This finding similar with Abd Aziz (2008), Oi-ling Siu et al (2003) but contradict with finding by Tsung et al. (2007).

Most of workers were local Malaysian and most of the workers have been aware of safety because most of them have been exposed to safety training provided by the company before they confirmed in the job position for a period of 6 month. The result may be related to safety knowledge of new employees during safety induction training and structured safety training for existing staff toward safety awareness at workplace.

#### **5.3.3.3 Hypothesis 3c**

It is revealed that there was a statistically significant difference in the mean safety performance of score between operator / technician and top management. This result similar with Abd Aziz (2008) stating that safety performance was found differ between position seniority. Whilst the operator had significant perception toward safety performance compared to top management level.

The result revealed that no significant difference in perception of safety performance among employee status from operators to middle management.

#### **5.3.3.4 Hypothesis 3d**

This hypothesis revealed that there was a statistically no significant difference between all groups in the Year of Service categories in PPIB. This result similar to Nor Azimah et al. (2009). Research by Chin .L et al (2005) indicated that junior respondent had slightly higher mean score compared to senior respondents on safety management dimension.

This result contradict with study by Abd Aziz (2008) with commitment to safety was found differs from employees with works experience and year of service between five to ten years and year of service more than ten years. Safety perception to those with less than five years. Commitment to safety of those with less than 5 years seniority was less than that of more senior employees and study by Mahmud, (2010) which indicate that were significance difference on safety commitment among the employees seniority. Based on these results there is no significant difference between

the seniority of the workers about perception of safety climate and commitment. This shows the level of understanding among employees at all levels of job tenure is a better and equal to each other continuously during they worked at PPIB which is level of perception about safety, understanding and awareness of safety is not reduced. At the same time senior workers will be instructed and given appropriate training on safety in the workplace to new employees. Through this the understanding among them regarding safety climate and employee commitment requirement is main point to succeed in the safety objective.

#### **5.3.3.5 Hypothesis 3e**

It is revealed that there was a statistically significant difference in the mean safety performance of score between UPSR/ Standard 6 and degree holder. This result similar with Abd Aziz (2008) stating that safety performance was found differ between position seniority. Whilst the operator had significant perception toward safety performance compared to top management level.

The result revealed that no significant difference in perception of safety performance among employee's education status from operators to diploma holder as confirmed by Nor Azimah et al (2009).



## **5.4 Recommendation**

In this section, the implications resulting from the outcome of the study will be discussed. It will be focused to both theory and practice. To effectively and efficiently carry out a safety climate toward safety performance in any industry, this is to help focus much attention and resource on improving that dimension. For example, an effective safety and health training to all employees and emphasis proper usage of personal protective equipment suits to risk and hazards in workplace ensure better safety climate at PPIB.

Recognition to employee who attended safety training as part of their performance evaluation may increase their safety perception towards safety performance. As mentioned by Nor Azimah et al, (2009) effective training on safety will assist employees who have a sense of belonging and they were accountable with safety at workplace. Perceptions of employee employees who received training was better than employees who did not received safety training (Tsung et al, 2007) . Cooper (1995) mentioned about low accident companies with higher safety culture which developed integrated job with safety training programmes.

The management may systematically apply the carrot and stick policy effectively that shows high commitment of safety performance. As suggested by Evelyn et al. (2005) that to improve safety in the organization positive and negative enforcement might overcome the organizational behaviour.

## **5.5 Implication**

In this section, the implications resulting from the outcome of the study will be discussed. It will be focused to both theory and practice.

### **5.5.1 Theoretical Implication**

This study was done to investigate the relationship between safety climate and safety performance pulp and paper mills industry. Many similar studies on safety climate, work environment and safety communication had done in various industries. Most of the research done to prove on employees' unsafe behaviour, the better or valid the results will be.

Therefore, this study was extended to pulp and paper industry to measure the reliability of the safety climate and safety performance which will increase the stability on the study academically. Besides that, this study was conducted in local pulp and paper mills where it creates new opportunity for researches to prove on the factors of influence unsafe behaviour of the local industrial. Apart from this study would be worthy and contributes value to the academic world because it was done in a high risk industry.

### **5.5.2 Practical Implication**

The study on relationship between safety climate and safety performance not only an essence to the academic world but also the operations of a company. It is mandatory for every industry to follow and implement safety working environment without fail in order to increase productivity and profitability of the industry. Thus, this study will be helpful to investigate on the effectiveness of safety implementation of the company. By conducting more study on safety climate, work environment, safety communication & unsafe behavior, the management could see the floors and lacking in enforcement to improve the quality of working and provide a safe working environment to the employees. Besides that, training on safety should be held more often to provide awareness and to ensure that safety practices are implemented fully at workplace. Thus, the management holds an important role in improving the recruitment and selection process. There should be pre-workshop on safety where candidates should be given training and simulation on safety practices and emergency response. Indeed, there should be more campaigns on cultivating safety culture at workplace.

### **5.6 Limitation of study**

For research purposes, the model present come in into the component related to safety climate, which give basis for future research in paper manufacturing setting in Malaysia, there are approximately 20 paper mills nationwide. Although this study did not examine all the potential variables that might be reflected in safety climate concepts, it presents a beginning enquiry into significance of exploring the

phenomenon towards better understanding safety climate in paper industries in Malaysia.

However, this study has some limitation which proposes future research. One limitation is the cross sectional studies, making the outcomes only relevant to the point during study. A longitude research accessing the standard measures for safety climate in paper mills is required that would provide additional and firmness support for the effects reported in this study.

An additional work is essential to examine the properties of the safety climate instrument in other paper mills too, especially the instrument have valid outcome measure. Secondly due to resources constraint, the study focuses only in one paper mill and excluded another paper mills in Malaysia.

It is possible that perception in all paper mills nationwide on safety climate at their workplaces may be different as a result of their ability to deal various type of worker especially involving foreign workers.

Lastly future study is required to further refine this instrument using confirmatory factor analysis to come out with model of good fits the industry and develop standard measures for examining safety climate in paper mills.

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