# SAFETY CLIMATE AND SAFETY PERFORMANCE AMONG PETRONAS SUB-CONTRACTORS TRUCK DRIVERS

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(Occupational Safety and Health Management)

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## ABSTRACT

This is a study on safety climate and safety performance among Petronas sub-contractors truck drivers at KVDT at Putrajaya Terminal. The objective of this project paper is to illustrate the effect on truck drivers in view of their safety performance. There were five independent variables element taken from demographic information such as age, marital status, years of experience, race, education level and including safety climate. 80 sets of questionnaires were distributed among the truck drivers at KVDT and only 70 sets of questionnaires were received. The results was analyzed and tabulated. The result shows that safety behaviour does have effect on age and education level. But there were no significant differences on marital status, race, years of experience and safety climate. Based on this study, it is recommended for management commitment and involvement with their action plans such as communication, training, policies, facilities, procedures, campaign and rewards to improve the environment of safety climate among the truck drivers and ground workers.




*Keywords: Age, Marital Status, Years of Experience, Race, Educational Level, Safety Climate, Safety Performance*

## ABSTRAK

Kajian ini adalah mengenai iklim keselamatan dan tingkah laku keselamatan pemandu lori tangka sub-kontraktor Petronas di KVDT lokasi Terminal Putrajaya. Objektif kajian ini adalah khasnya untuk membuktikan kesan terhadap pemandu lori tangki tingkah laku keselamatan individu. Disertakan sebanyak 5 fakta pembolehubah yang penting dari segi butir-butir demografis iaitu umur, bangsa, status perkahwinan, tahap pelajaran, bilangan tahun perkhidmatan dan iklim keselamatan. Sebanyak 80 set soal selidik telah diedarkan kepada pemandu-pemandu lori tangki. Cuma 70 set soal selidik yang telah diterima. Setiap data dianalisa dan dikaji dengan teliti. Daripada hasil analisa didapati tingkah laku keselamatan memang ada kesan terhadap umur dan tahap pelajaran. Bagi bangsa, status perkahwinan, bilangan tahun perkhidmatan dan iklim keselamatan tiada banyak perbezaan signifikan. Oleh itu, penglibatan pengurusan amat diperlukan dari segi komunikasi, latihan, polisi, prosedur, fasiliti, kempen dan ganjaran. Ini akan memberi kesan yang baik terhadap suasana iklim keselamatan terhadap pemandu-pemandu lori tangki dan pekerja am.



Kata kunci: Umur, Tahap Pelajaran, Bangsa, Bilangan Tahun Perkhidmatan, Status Perkahwinan, Iklim Keselamatan, Tingkah Laku Keselamatan

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## LIST OF ABBREVIATIONS

| | |
|---|---|
| HSE | Health Safety and Environment. |
| BOS | Behavioural Observation Safety |
| KPI | Key Performance Indicator |
| LPG | Liquid Petroleum Gas |
| MD | Managing Director |
| ANOVA | Analysis Variance |
| SPSS | Statistical Package Social Sciences |
| CCTV | Close Circuit TV |
| RTOG | Road Tankers Operational Guidelines. |
| DOSH | Department of Occupational Safety and Health. |
| KVDT | Klang Valley Distribution Terminal. |
| PDC | Pre-departure Checklist. |
| PPE | Personal Protective Equipment. |
| OBC | On Board Camera. |
| FM | Fleet Management. |
| SOP | Safe Operation Procedure. |
| SPM | Sijil Pelajaran Malaysia. |
| SRP | Sijil Rendah Pelajaran. |
| OTC | On Truck Camera. |
| PPM01 | Penurunan dan Pengisian Minyak. |
| GDL | Goods Driver's License. |
| EEOC | Equal Employment Opportunity Commission |

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background of the study

Oil tankers are commonly seen on the road to ferry petroleum loads from North to South of the whole nation. Petroleum loads must be distributed from one petrol station to the other station daily. The distribution of petroleum loads list can be obtained from terminal via computer system. Based on the truck driving history record data there were many violations occurred along the roadside which includes traffic offences, inspections and past accidental involvement. Although the current trucks have elegant safety features built in but the drivers behavioral related could be the concern while driving on the road. To address driver's behaviors problem, the hauler should be focusing on few strategies: (1) close monitoring of driver behaviors pattern via "crash predictor model" study (Murray, Lantz, & Keppler, 2005) based on truck drivers, (2) visible enforcement approach by identifying via FM data (Fleet Management) system on trucks locations, harsh brakes application, seat belt fastening, unauthorized stops and over speed, (3) organize aggressive driving apprehension programs; and (4) to start covert enforcement plans immediately. In order to curb the above problems, it is better for the transport companies to start proper safety climate and engage with the drivers more often.

With the organization influence in safety matters, operational factors could able to see better results. Zohar (1980) has suggested earlier, organization influences on

safety practices could influence employee's safety behavior through a process where organization relationship with the drivers or workers can able to guide their individual actions basically referred as organizational safety climate for safety which also termed as 'safety climate'.

When new drivers were hired, the employer does set the criteria to provide basic requirement by providing medical checkup, inspect legal licenses, check traffic offences, PPE, driver's smith training and buddy system training. Although sufficient training was given to the truck drivers but individual behavior could be the reason. These individual truck drivers behavior can be observed via On Board Camera located inside the cabin. Each driver's action will be recorded and monitored daily by fleet executives. Alternatively, driver's performance can be also monitored via FM data system. So these programs and initiatives would provide the desired results including with the list of best practices with factors offering influence on developing and enhancing safety climate.



As part of safety program enhancement, study data collection among the truck drivers was carried out. Also the survey forms were distributed to the truck drives to get clear respond from them. The study result was taken onsite. The motive of this study is to increase safety culture with the excellent best practices in view to have better safety climate.

In summary, the information on best hiring practices and the communication with the employees as stated in paragraph above, the reports to be taken individually by us. Later, those documents need to be handed over to our main contractor for verification. Besides, to make the programs successful, the hauler must start with inferential statistics so that they get more participants response and feedback. With

good inferential statistics analysis, it is likely to bring better safety climate and clear path for success.

As a result, these analysis could identify non-programmatic factors and improve overall culture of safety especially organization leadership roles and among truck drivers. With excellent interaction between management and truck drives, the work place is due to have safer work environment.

## 1.2 Problem Statement

Safety is basically an important element in our daily work especially dealing with petroleum product. Due to its danger naturally, our truck drivers and management team must be well versed with their safety and service level to make the work place conducive and safe. Based on the DOSH data taken from the last 5 years for the transport, storage and communication sector, (Figure 1.1) the graph clearly shows that an increasing trend of non-permanent disability from year 2012 to year 2016.



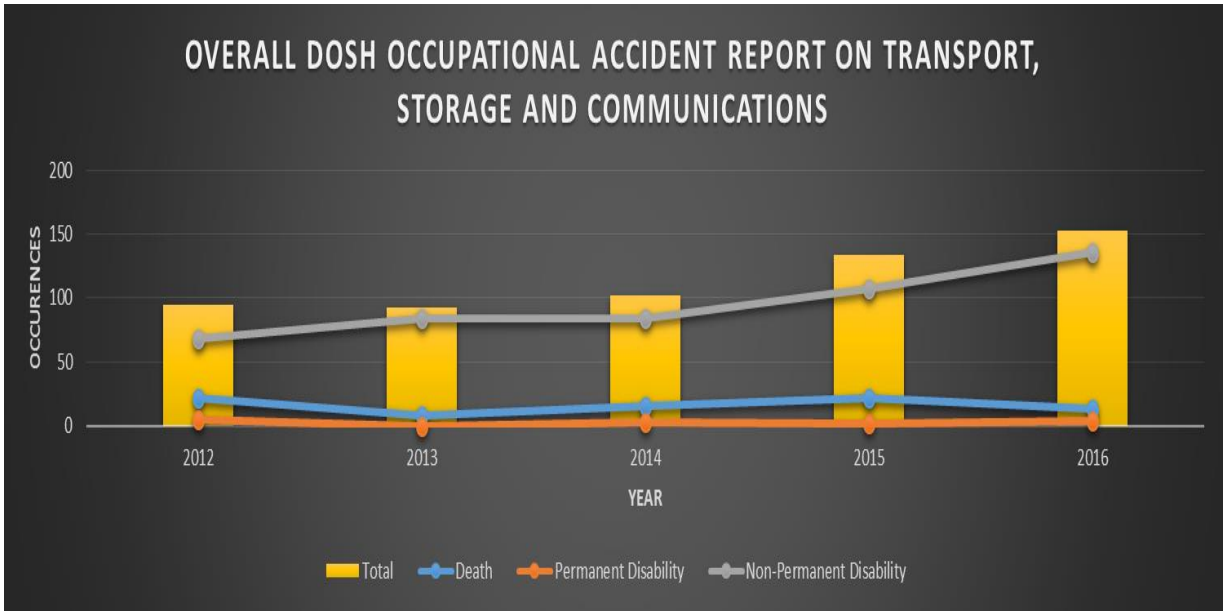


Figure 1.1

*Overall DOSH Occupational Accident Statistics Report On Transport, Storage and Communication Sector from Year 2012 – Year 2016.*

Table 1.2
*Total Yearly Accident Chart*

| Year | Death | Permanent Disability | Non-Permanent Disability | Total |
|---|---|---|---|---|
| 2012 | 22 | 5 | 68 | 95 |
| 2013 | 8 | 0 | 84 | 92 |
| 2014 | 15 | 3 | 84 | 102 |
| 2015 | 22 | 2 | 107 | 134 |
| 2016 | 13 | 4 | 136 | 153 |

Based on the above Table 1.2, safety climate at transport companies need serious improvement. Perhaps more commitment and involvement required from the management team to give proper guidance to the truck drivers. The hauler has to comply both in operational and safety level. Examples of high accident rate in operation level at transport companies such as poor maintenance of trucks, driver fatigue or tiredness, tire wear off which cause fire, slow alertness from the truck drives to inform the foreman on defective parts, poor pre-departure check sheet checking by the drives and never follow Safe Operation Procedure. On safety level the truck drivers must able to apply and check the fire extinguishers, safety harness, emergency cut off sensors functionality, grounding and fuel hoses.

It is stated in Domino Theory of workplace accident statistics, 88% of accidents are caused by unsafe acts (unsafe behavior), 10% are unsafe mechanical or physical conditions and 2% are unpreventable factors. So the top management must be constantly engaged with the truck drivers and get necessary feedback from drivers to improve safety climate at the site. Communication with the drivers is very important. Organizing monthly safety meeting with the drivers is the best practice to

get good suggestions from them. On the other hand, management must identify the correct training and the gaps to improve the safety climate. For instance, Smith Driving Training was given refresher training every year but wonder how many drivers know how to use fire extinguisher in case of emergency. There is no training for firefighting, first aid and over spill scenario. So the hauler should arrange proper training programs for the truck drives so that they can be ready in case of any emergency. Again these are the areas the management involvement required dearly. Their direct engagement with the drivers could improve the safety climate tremendously. Also enhance safety awareness of the current workplace.

### 1.3 Research Questions

i. Does safety performance differ among age of the drivers?
ii. Does safety performance differ among race of the drivers?
iii. Does safety performance differ between marital statuses of the drivers?
iv. Does safety performance differ among the drivers' years of service?
v. Does safety performance differ between the education levels of the drivers?
vi. Does safety climate influence safety performance?

### 1.4 Research Objectives

i. To determine whether safety performance differs among age of the drivers
ii. To determine whether safety performance differs among race of the drivers
iii. To determine whether safety performance differs between marital status of the drivers

iv. To determine whether safety performance differs among the drivers' years of service

v. To determine whether safety performance differs between the education level of the drivers

vi. To determine the influence of safety climate on safety performance among drivers

## 1.5 Scope of study

This study emphasizes on two important variables namely demographic factors and safety performance. Demographic factors referring to age, years of service, race, marital status and educational level. These are the variables representing safety climate. The target group for this study are truck drivers representing two companies. Questionnaires are distributed among the drivers. Respondents give their feedback via filling in the survey form.

## 1.6 Limitations of the study

Truck drivers from two companies were the target group for this study. Total of 80 survey forms distributed among the drivers. Bagan Cipta representing 45 drivers and Matchpage Services 35 drivers. Both companies client is PDB. The researcher does face limitation when doing this study. Listed below are the limitation.

i) The researcher found it difficult especially to meet the drivers and explain the detail contents in the form. He has to stay back in the night to meet them.

ii) The shift working pattern is not fixed. Some drivers arrive to work early and come back home late due to high traffic congestion, long distance coverage and long queue at loading area.

iii) Since there was no proper follow-up. The answers given by the respondents were based on trust.

iv) The researcher also face problem on recollecting the answered survey forms. Difficult to get cooperation from truck drivers.

## 1.7 Significance of Study

Safety climate is the element that generally can improve the safety performance of the organization and workers. Improving the safety climate at work place could enhance the well-being of employees and contractors. In order to improve further the OSH Management System at workplace, management team must give full commitment hence this could instill their workers to focus towards workplace safety. Based on the survey data from questionnaires from the respondents, the organization can able to improve work place by referring to the feedback given by workers.

## 1.8 Organization of the Thesis

There are total five chapters required to focus. Chapter 1 consist of introduction, background of study, problem statement, research question, research objective, scope of study & its limitation. Chapter 2 is focusing on previous research

done in the past to design the structure and scope of this research. Demographic and safety climate attribution towards safety performance.

Chapter 3 further discuss on the research methodology. Consist of research framework, hypothesis, data collection technique, sampling process and analysis.

Chapter 4 is the results and discussion on analysis of data collection, further analyze by using descriptive and inferential statistics to get the results.

Chapter 5 is the conclusion and recommendation of the research study. Recommendation to be made to the organization and for future improvement purposes.



**1.9 Chapter Summary**

From DOSH reports above, safety climate for the transport and logistics must be given priority. Especially for the non-permanent disability. Each year the trend was increasing gradually. The location of this study was taken at Klang Valley Distribution Terminal (KVDT). Generally, the trucks arrive at this terminal to load petroleum and distribute to petroleum kiosks. The focus of this study and target group are the truck drivers. Because they involve in loading and unloading activities by sending the load to desired destination. Since truck drivers are heavily involved in travelling on the road, safety climate study helps to improve safety performance of the workers. This is the core area where drivers need to create safety awareness. In other words, also help to save cost on injuries and to make the work place environment injury free.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

Road tankers involve in accidents could impact a bigger cost for the organization. Accidents such as property damage, injuries and fatalities could end up the company lose big portion of money. According to the DOSH statistics result stated in Figure 1.1 shows there is a decline in permanent injuries and fatalities. But the hauler has to spend a lot of money to recover the trucks in time once those trucks involved in road crashes. Previous studies indicated several factors related to accidents such as fatigue and circadian rhythms, driving experience and crash history related to crashes involving large trucks (Braver 1992; Braver, Preusser, & Ulmer 1999; Hanowski, Wierwille, & Dingus 2003; Lin, Jovanis, & Yang 1994; Murray 2005).



Other elements contribution to reduce accidents are psychological and sociological factors within transport organization companies. Part of the activities, introduction of incentives, give proper motivation to the truck drivers and benefits (insurance coverage) which related to safety issues (Rodrigues, Rocha, Khattak, & Belzer 2003; Rodrigues, Targa, & Belzer 2006). Hence by increasing awareness of organizational, driver's attitude and their beliefs which could influence likelihood of crash before the driver entering their individual vehicles (Clarke 1999; Short 2007; Wills, Watson, & Biggs 2006). Also the factors that associated to safety climate can be observed clearly and predictive. Therefore, it can be useful when assessing safety management within organizations (Flin, 1998).

## 2.2 Safety Performance

The perceptions of safety climate can be divided into individual knowledge, motivation and behaviour that influence safety at workplace. Work behaviours which is essential to safety can be followed as the same for other work behaviour which in turn relates to work performance.

In other words, model of performance can be used as a safety performance. Hence, the model of performance used to determine the components of performance, determinants of performance and antecedents of performance (Campbell, Gasser, & Oswald, 1996).

Basically, the components of performance is derived as behaviours of individual that performing at work. Borman and Motowidlo (1993) suggested two major factors in performance: task performance and contextual performance. Normally, these two components performance can differentiate the safety behaviours at work place. Generally, task performance used as safety compliance describing individuals to perform their safety activities by adhering to procedures and wearing PPE. Logically, this individual activities behaviours can enhance workplace safety. The second definition of contextual performance based on safety participation. Attending safety meeting and performing safety activities on voluntary basis could contribute little changes at workplace but it does help to develop and support safety environment.

Therefore, determinants of performance causes the variation in performance. Hence, these are the driving factors which directly contributing towards individual differences in task and contextual performance.

Campbell et al. (1993) argued that there were only three determinants of individual performance which includes skills, knowledge and motivation. Therefore, safety performance determined by skills and knowledge which is essential for certain behaviours. Also by the motivation of individuals to perform the behaviours. In general, for work performance antecedents have been identified on both person and organization level. Moreover, at individual level research suggested factors relating to ability and experience are critical antecedents for task performance. While personality attribution on conscientiousness, is the important antecedents of contextual performance (McHenry, Hough, Toquam, Hanson, & Ashworth, 1990; Motowidlo & Van Scotter, 1994; Wise, McHenry, & Campbell, 1990). It has been suggested that the relationship between climate and performance can be mediated by knowledge. Hence, the organizational climate can influence knowledge by increasing participation such as training (Morrison, Upton, & Cordery, 1997).



**2.3 Safety Performance and Age**

Since the world's population is aging rapidly, as a result older people are being employed in every country to make up the large scale of labor market by increasing the retirement ages to compensate the labour shortage demand. In Asian and Western countries, age is the major factor included with employee work wellbeing and specifically job satisfaction (Birdi, Warr, & Oswald, 1995; Clark, Oswald, & Warr, 1996; Siu, Spector, Cooper, & Donald 2001). Basically, older workers able to adjust to work better in terms of job satisfaction. Several studies have shown that they have found linear effects with job satisfaction increasing with age (White & Spector, 1987). On the other hand, others found in curvilinear pattern with job satisfaction at first declining and then increasing with age (Clark et al., 1996).

For instance, Petronas truck drivers are allowed to work till the age of 55. After the age of 55, the company will allow the drivers to work on contract basis subject to their health condition. The minimum entry age must be at least twenty years above. Even the company does not hire new truck drivers above 45 years of age. This is due to the driver has to complete mandatory training and safety procedures before being absorbed as a permanent truck drivers.

Generally, employee safety is very expensive in terms of economic and legal matters. A lot of money are wasted due to occupational accidents. Workplace improvements in safety is mandatory for economic and legal reasons. Hence, it has been recorded that age and accident rates are negatively related (probably because older workers are more experienced on the job and with excellent job knowledge, patience and skills compared to younger workers; (Frone, 1998; Kingsma, 1994; Stalneker, 1998; Topf, 2000)). Somehow when injuries occur, older workers tend to get injured more severely and fatalities happen regularly among older workers (Topf, 2000).



The challenge is obviously to find the right solution for the older workers employment to be more rewarding and safer (Brewington & McMillan, 2000; Stalneker, 1998). Certainly, it leads to excellent job performance, lower occupational accidents and illness. As a result, increasing economic efficiency for employing enterprises. Basically, the statement above is the main factors to drive the importance of safety attitudes in performing their duties daily at work. Donald and Canter (1993) proposed using the attitudinal approach, related to safety attitudes to address the concern. This approach starts from basic fundamental meaning "large number of accidents are under the control of those involved in them. The people indulge does not want to get injured, it's their behaviour that leads them to meet accidents

intentionally and certainly they are aware of the task and their actions. In other words, accidents happen due to lapse of concentration or slip" (Donald & Canter, 1993).

In present study, for an instance in Hong Kong age discrimination in employment is always against the law hence in actual fact the older workers finding it difficult to get a job. Certain employers think that older workers are not physical fit and unwilling to follow safety instructions and procedures established by line management or team leaders.

Naturally, the older truck drivers are very much patient drivers compared to young drivers. The young drivers are very much impatient especially on the road. Although the young ones are energetic and eager to finish the trips faster but this can lead to minor road accidents. Perhaps, younger drivers are less experienced compared to the older ones. Hence, the older drivers tend to drive with steady and safe. This is due to the age gap and factors among the truck drivers group.

Mather (2007) described how age factor can influence driving behaviour due to the size of human factors hence indirectly effecting the learning, knowing and understanding the driving method. Distraction, memory, navigation, targets identification, legibility of street sign and judgement of collision are the factors that makes difference among the age gap.

Similarly, age variation also impact on driving behaviour. Significance impact can be seen between older and young drivers. Older drivers are more sensitive towards traffic violations. Younger drivers tend to ignore traffic offences and very aggressive.

## 2.4 Safety Performance and Race

Generally, Petronas do not practice race based hiring. They are open to all races. But most of the drivers in Petronas consist of Malays and Indian truck drivers only. According to the survey respondent carried out for this thesis, majority are Malay truck drivers. Basically, the safety rules and regulations are same. It does not apply to single race alone, safety compliance factor are applicable to all truck drives.

Basically, the moment drivers hold the steering on their trucks their mindset must stick to safety and deliveries. Safe deliveries of petroleum is their utmost priority to deliver the goods to the customers. On the other hand, safe deliveries is mandatory regardless of race, religion, color, gender or marital status.

Hence, Petronas does not portray any race discrimination, harassment, abuse or bullying at workplace among the truck drivers. In United States, Equal Employment Opportunity Commission EEOC, (2011) protect workers from injustice based on age, disability, gender/sex, genetic information, national origin, pregnancy, race/color or religion. Even other federal agencies and some state and local laws also protect workers from workplace injustice based on sexual orientation and gender identity.



Basically, workplace injustice can be intentional or unintentional and encompasses acts of commission and omission. However, such unfair practices faced by some fragile workers from excluding them socially or economically from workplace activities and events might can lead them to overtly hostile actions and behaviours (insult or joke on the particular race/ethnicity).

In general, researchers found that members of gender, racial or minority ethnicity group reported workplace discrimination more often hence the consequences of this exposure are distinguishable from effects produced by other psychosocial features (e.g., decision-making control ad performance expectations) of their occupations (Pavalko, 2003; Roberts, 2004; Wadsworth, 2007). In other words, Petronas employment culture based on driver competency, eligibility with valid driving license, GDL, passing the Smith Defensive Training, PS Pipeline Training and Buddy System Training. These are the basic fundamental training must be attended by all races if being employed as Petronas tanker drivers.

## 2.5 Safety Performance and Marital Status



In general, marital status related to employment is not a mandatory. As long as the drivers hired by the company are eligible to drive and deliver safely to the customers are the upmost criteria. However, a married man works with full commitment compared to the younger ones. Because he has to consider his family ad his responsibilities. Married drivers are very careful on speed limits and traffic offences. Whereas, unmarried man their commitment strength is not as severe as married man. Basically, their family commitment is lower hence they tend to speed and getting more traffic summons. Current generation many youngsters getting married in early ages, their behaviour and thinking put their priority on family first.

Therefore, the company should have best hiring practices and communication among the employees. This could enhance the company entry requirement as the truck drivers hence strictly maintain hiring standard. On the other hand, driver's attitude and individual behaviour is very important. This can be enhanced with the

involvement of organization and management towards safety performance. Nurturing positive attitudes among the drivers could reduce accidents and organization priority. As a result, married or unmarried drivers are not the concern.

Generally, compliance on working hours and driving hours is also mandatory. In view of Petronas safety regulation, truck drivers are not allowed to drive more than 9 hours and the working hours should not exceed 12 hours. This time keeping method allowing the drivers to spend more time with their families. Furthermore, this can also relieve their stress. Although truck drivers are required to work shift work, at times those married men could find it uneasy to drive in the night as the drivers have to leave their loved once to focus on their work.

Basically, the safety performance of individual truck drivers can be determined when the drivers in the truck and activities carried outside the truck. For an instance, when the drivers inside the cabin, each trucks are installed OBC which can able to capture their behaviours in the cabin truck. Whereas, when the drivers involvement at petrol stations for loading and unloading purpose. Cameras are installed around the petrol kiosk to check on their behaviours. With the help of GPS system, the movement and location of the trucks can be determined as well. Furthermore, the PDC and PPM01 check sheet must be filled accurately before and after handing the checklist to the next driver on duty. Hence, safety performance of each individual is mandatory regardless of marital status. Onboard computer technology has been used successfully in research using driving simulators for specific behaviours such as speed control (Godley, Triggs, & Fildes, 2002) and braking (Warshawsky-Livne & Shinar, 2002). Also this technology is used in fleet context, in accessing the correlation between acceleration and accident frequency in bus drivers (af Wahlberg, 2000, 2003).

## 2.6 Safety Performance and Years of Services

Basically, in transport industry experienced drivers are always required and given the upper hand compared to inexperience drivers. This concept of safety in trucking industry is primarily discussed in terms of driver practices, environmental conditions and individual behaviors as they are related to road crashes. Mejza, Barnard, Corsi, and Keane, (2003) recently expanded a well-known definition of safety. Stating that "transportation safety can be defined as degree of protection from physical risk to life or property present during carrier movements of freight and passengers". In other words, the older driver has many years of driving experience which he can able to identify the variable conditions likewise the junior drivers experience not sufficient enough to identify the conditions. Experienced drivers easily can able to recognize truck faults and bad road condition due to years of working experience on the road.

As a result, the longer service truck drivers being excellent in terms of truck handling, checking of the truck before and after parking inside the parking yard, safe delivery to the required destination, no over-speeding because of concern on summons and lesser fault committed compared to the less experienced personnel. Based on the research on safety, varieties of variables included meaning towards for unsafe driving behaviours and their consequences. Hence, the variables can be measured into four categories: individual characteristics (human factors), vehicle characteristics, organizational safety policies and physical environmental condition (Rodriguez, Targa, & Belzer, 2006). Especially, the types of variables invaluable to our understanding of crashes with those deemed to have clear causes such a vehicle malfunction and hazardous bad condition roads. This can also lead to collecting data on literally thousands of variables (Staplin, Gish, Decina, & Brewster, 2003),

possibility of creating many hypothesis. Ultimately, experienced drivers can be an example or role models for the young drivers especially with raw experience. The company always welcome experienced drivers as their first choice because less supervision required. Young drivers with less experience needed more monitoring hours by their supervisors. On the other hand, familiarity of road direction is also concern for less experienced drivers. At times the less experienced drivers lost their ways. This can affect the number of delivery trips to designated station. Hence, can create backlog due to unfinished delivery and carry forward to the next day.

Furthermore, less experienced drivers are prone to vehicle accidents due to unable to handle the truck at critical road situations. Basically, the confidence level is still lacking. It takes a couple of years to gain confidence for the junior drivers. In other words, experienced drivers are very well disciplined compared to the less experienced drivers. Many absenteeism cases encountered among the less experienced drivers.



**2.7 Safety Performance and Education Level.**

To be a truck driver, the person do not have to be a great educationist. Petronas basic requirements, the person can able to read and write Bahasa Malaysia language. Also the minimum standard of education to qualify as truck driver is SRP/LCE. Technically, the drivers has to perform the checklist for PDC, PPM01, Smith Defensive Training Questions, PS Pipeline training question and many other in house safety training organized by the company. Especially, Smith Defensive Training and PS Pipeline Training are given yearly as a refresher to the drivers.

As part of the safety training from education about road conditions, speeding, braking, weight distribution, discussion on drivers distraction, fatigue, physical, mental and emotional health (Staplin, Gish, Decina, & Brewster, 2003). Studies of safety focusing the effects of these variables on crash rates in order to measure the degree of safety present within the specific carrier (Nafukho & Hinton, 2003; Nafukho, Hinton, & Graham, 2007).

Every month the management organize safety meeting for the truck drivers to improve the safety performance nevertheless incidents do happen at times due to their negligence. Certainly, this safety meeting is to instill motivation among truck drivers. During the meeting, the management rewards hamper for the best drivers. Although speed limit has been set on highway and non-highway roads, the drivers at times ignore the speed limit in order to fulfill the trips given to them. GPS, OTC and OBC devices are installed to monitor the individual trucks driver's safety performance nevertheless the offences are still committed by the drivers. To improve further on safety performance, the management implemented demerit points system. It is divided into 3 categories. Group A drivers falls on above 90%, Group B falls at 70% - 89% and Group C falls below 70%. Every month the management compile performance of each truck drivers. Each driver's competency tested on the speed limit, harsh braking system, working & driving hours, unauthorized stop and fuel bar. Best driver's falls in group A whereas Group B drivers can still be coached. But group C drivers need to improve. Those truck drivers falls continuously in group C could be shown the exit doors provided if they can't improve.

Basically, the employer does not tolerate with poor performance employees and they prefer to hire new drivers. Hence, the competency test skills are part of the educational plan for the truck drivers.

## 2.8 Safety Climate

Safety climate is defined as combination of previous work done (Guldenmund, 2000). Safety climate is also refers to employees perception on how safety is managed and safety policies are implemented in an organization. Safety climate basically can be best described as the behaviour of employees within the company particularly management team and superiors where they could use the correct language or speech to communicate with their employees (Shannon & Norman, 2008). With managerial actions and involvement, safety climate within organization can be changed.

Previous research has indicated that safety climate have different point of view based on the workplace environment. Research variation results can be obtained from the survey questionnaires distributed to truck drivers. Although the answers from the questionnaires are not 100% accurate but with statistics analysis data can able to get better results. Safety climate (Zohar, 1980) has described that employee perceptions of how safety management is being operational in the workplace especially at particular moment of time (Byrom & Corbridge, 1997).

Over the last 25 years, safety climate research has taken 4 directions: (a) Designing psychometric measurement instruments and ascertaining their underlying factor structures (Brown & Holmes, 1986; Coyle, Sleeman, & Adams, 1995; Dedobbleleer & Blend, 1991; Garavan & Obrien, 2001; Zohar, 1980); (b) Developing and testing theoretical models of safety climate to ascertain determinants of safety behaviour and accidents (Cheyne, Cox, Oliver, & Tomas, 1998; Neal , 2000; Prussia, Brown, & Willis, 2003; Thompson, Hilton, & Witt, 1998); (c) Examining the relationship between safety climate perceptions and actual safety

performance (Glendon & Litherland, 2000; Zohar, 2000); and (d) exploring safety climate and organizational climate (Neal et al., 2000; Silva, 2004).

Seo (2005) dimension on operationalized perceived safety climate dimension as management commitment, supervisor support, co-worker support, employee participation and competence level in the study looking for mediators in safety climate and safety performance relationship. Huang (2006) also included of the dimensions that management commitment to safety, return to work practices, post-injuries administration and safety training as the vital elements of safety climate while analyzing the mediating role of safety control on the relationship between safety climate and safety performance.

Siu et al. (2004) dimension on safety attitudes and communication as the factors in safety climate in safety climate while assessing the mediating role of psychological strain in the safety climate safety performance relationship.



Wu (2008) dimension on safety climate initiation required from top management level or CEO's safety commitment, managers safety commitment, employees safety commitment, emergency response and perceived risk. Neal et al. (2000) dimension on safety climate as a single factor containing management values, communications, training and safety systems. Studied the mediating role of safety knowledge and motivation on the relationship between safety climate and safety behaviour.

Like in US, fatal work injuries occurs every 110 minutes on average, disabling injuries occur every eight seconds. Huge disasters such as Chernobyl and Bhopal, showed real signs of human and economic cost of industrial accidents. As a

result, there is a growing body of literature of its dimension on safety climate which was elaborated from the shared perceptions of managerial policies, procedures and practices as indicators of concern for employee's safety and health (Flin et al., 2000; Guldenmund, 2000; Zohar, 1980).

In another concern on subordinate safety, during operationalization by supervisory practices. Especially on work related actions which highlighting the dimension on speed or efficiency, it promotes shared perceptions among the group concerning on priority of safety, i.e., safety climate (Zohar, 2000). Meanwhile, safety climate also referring to supervisor attribution on safety priority and the importance of working safely while performing the job 'How important is it to act safely around here?'

Even leadership style can also influence safety climate in a workgroup due to the interaction of leader-member and leaders concern on his members physical welfare. Safety climate influences behaviour of group members because climate perceptions informing the importance of acting safely. Basically, dimension on transformational leadership ultimately involves workers concern on their welfare. This could limit the effect of assigned safety priority on supervisory safety practices in that more transformational the leadership, the more safety will be considered a moral obligation, especially under adverse conditions indicated by low assigned priority. Subsequently, safety climate level should remain positively related to transformational level even under low-priority conditions. During under high assigned-priority conditions, safety becomes goal for 'performance beyond expectations' (Bass & Avolio, 1997).

For instance, the dimensions in Australian Railway Systems Gillen (2002) found different perceptions of safety climate between unionized and non-unionized

workers. Cheyne (2003) identified that while managers, supervisors and workers shared the same safety climate factor structure but their perceptions of the factors and their inter-relationships were quite different. Hence, sampling different employee groups from the Australian rail sector, Glendon and Evans (2005) and McInerney (2005) noticed significant differences between employee groups, including managers and supervisors, on a safety climate measure designed for the rails sector. Glendon et al. (2006). Kopelman et al. (1990) proposed that the influence of climate on behaviour is mediated by cognitive and affective states via particular pathways. Some of the examples are climate perceptions impact on work motivation, which could affect job performance, climate perceptions impact on job satisfaction, which in turn affects psychological well-being and withdrawal. Moreover, safety climate survey provides a valuable tool to identify trends in an organization's safety performance. (Cox & Cheyne, 2000; Coyle, 1995; Seo et al, 2004). On the other hand, recent work has focused on group-level safety climate (Zohar, 2000, 2002), as opposed to organizational safety climate, where climate is defined in terms of how supervisors giving importance on safety issues.

Other key element that an organization need to consider is effective safety training. With excellent training program arrangement for the employees by the organization, improves the behavioural skills, knowledge and attitudes of employees. The dimension to improve the level of safety and health for all employees, the organization should have comprehensive training programme for new employees, mentorship and buddy system to help new employees in safety, health and quality systems (Vredenburgh, 2002). Few studies also indicated that good safety training given by the organization to their employees shows lower accident rates Lee (1998), Ostrom (1993), Tinmannsvik and Hovden (2003), Cohen (1975), Smith (1975) and

Zohar (1980). Dimension on the importance for the management to be committed fully to support training programme especially for new employees. Also the training could new recruits to discuss on safety issues in training sessions, training during emergency situations, encouragement to attend training programs and hazard assessment training.

Regular communication about safety issues between managements, supervisors and workers is another method to improve safety at workplace with effective management practices. Cohen (1977), Vredenburgh (2002), Cox and Cheyne (2000) and Mearns (2003) included dimensions on communication and feedback as a factor that showed safety performance could influence communication level in an organization. Moreover, safety communication and feedback as a management practice and can be measured by hazard reporting system, open door policy for safety issues, communication on safety goals and targets between managers and workers and open discussion about safety issue in meeting.



Neal, Griffin, and Hart (2000) changing employee's awareness and motivation for safety is compulsory before improvements in safety climate which can bring greater impact on overall safety. On the other hand, safety attitudes is the predictor of safety climate (Isla & Diaz 1997). Therefore, the dimension of safety attitudes and motivation is the important factor to improve safety climate in organizations. As a result, management attitudes could be a major ingredient related to safety climate within the vehicle operations. Though other factors such as workers involvement and communication also can have strong impact on safety climate (Williamson 1997; Wills et al. 2006), somehow manager's attitude can create strong influence on how safety is managed and perceived by workers.

O'Toole (2002) also reported that employee's safety climate scores better results with the introduction of organization safety interference. Also Clarke (2006) described that safety climate perceptions were strongly related to work safety compared to individual's attitudes.

In production line, product output is more important than work safety. The management should put more commitment in safety rather than looking for sorely profit. The same environment could happen in transport operations, employee's behaviour that encourage more urgent non-safety related goals such as getting products out quickly and making a profit which could totally ignoring safety. Driver's primary focus and priorities must be safe work (Johnson, 2007).

Salminen and Lahdeniemi (2002) found there were four particular factors identified as significant work-related driving risk by drivers themselves. These included time pressure, thinking about work, tiredness and use of mobile phone while driving. Other factors associated is lack of concentration reported as a risk factor (Downs, Keigan, Maycock & Grayson, 1999). Williamson (1997) highlighted four items as well including alcohol use during driving, irregular driving hours, peaks in workload and fatigue. All these items could be associated to accident and fatalities. Fatigue and stress related to fleet settings, obviously the time prepared by the scheduler to take the load (Bibbings, 1997). Pre-departure checklist or maintenance also reported to be missed out by fleet drivers (Newnam el at., 2002). There are many other elements associated to driver's behaviour which are related to fleet safety. All these are fundamental problems in road safety.

### 2.8.1 Person Related (Psychological) Factors:

Basically, Theory of Planned Behaviour (TPB) explaining that characteristics of different drivers behaviours (Parker, Manstead, Stradling, Reason & Baxter, 1992). The theory also represents combination of stable psychological variables that proven to be successful in predicting a number of other self-reported behaviours including dishonesty (Beck & Ajzen, 1991) and weight-loss (Schifter & Ajzen, 1985). As a result, TPB is clearly defined that its main factor is more towards attitude which are main focus of psychological antecedent to behavioural intentions and ultimate behaviour (Ajzen & Fishbein, 1977). It was revealed that the TPB could indicate number of activities including drink driving, over speeding, close following to the vehicles and dangerous overtaking (Parker, Lajunen & Stradling, 1998; Parker et al., 1992; Stradling & Parker, 1996). Also the research continue to explore regarding on the road behaviour such as aggressive driving (Parker et al., 1998). Generally, in fleet management context, Newnam et al. (2002) expressed that TPB variables intentions to make it fast for both work and personal related driving. Subsequently, TPB activities structure consist of (general attitudes towards driver safety, perceived behavioural control and subjective behavioural norms) are the indicators of person-related influences in this study.



Similarly, BOS system are being used in daily Petronas operations to monitor the driver's behaviour via OBC cameras which is located inside truck cabin. The daily monitoring done via FMD system. Drivers behaviour can also viewed from the SD Card located in the prime mover. The operations manager can able to monitor drivers at least 15 clips of their individual behaviour while driving. This procedure is to check on the driver's attitude and focus. Any misappropriate behaviour, the

drivers to be given counselling. Hence, could be send for retraining to the Driver Mentor for recertification.

### 2.8.2 Sociological Factors (On Road Situational Factors):

Generally, fleet driver's nature of work are on the road. It's the driver's duty to deliver the fuel from one petrol station to the other petrol station safely. Since fleet driver's workplace on the road at most of the time, it all depends on how the driver being influenced by number of on-road situations and external constraints such as road engineering and gridlock (Stradling, Meadows & Beatty, 2000). According to Lyn and Lockwood (1998) found that there were a significant increase in crash risk of fleet drivers especially driving in the night, on motorways and in built-up areas. Other factors contributing to fleet driver's crashes are critical situation and environmental factors.

For instance, it was revealed that non-urban roads have been associated with higher injury risk (Valent, 2002). Some of the other issues related to crashes are lighting quality and time, also depends on the type of vehicle driven (Yau, 2004). Hence aggressive drivers behaviour are most likely to be involve in accident due to their impatient behaviour especially at congestion roads in peak hour traffic (Shinar & Crompton, 2004). Peak-hour traffic, driving in unfamiliar settings, on unsealed roads, non-urban roads, highways and night driving.

With safety management implementation by the organization, the overall safety climate can be improved further enhanced with management involvement. Indeed, achieving objectives, goals and KPI set by the organization could bring positive result among the truck drivers and management team.

## 2.9 The Influence of Safety Climate on Safety Performance.

Generally, safety climate could play a pivotal role in addressing safety performance. It does improve the overall safety performance of the truck drivers and its organization. In Petronas daily operations, adherence and compliance to safety rules gives positive impact on safety performance. Hence, the truck driver's safety awareness could improve as well.

Thus based on the studies, there is a direct relationship between safety climate and safe behaviour (Johnson 2007; Tharaldsen, Olsen & Rundmo 2008; Wu, Chen & Li 2008). Therefore, it was well reflected that good safety climate influence shows excellent result on employees safety performance therefore increased focus in safety climate having better chance in reducing fatalities and injuries (Wills, 2006).

Top management involvement is the best example of improving the safety performance of the organization and the employees. Hinze and Raboud (1988) found that all successful safety management schemes must be supported by top management. Many workplace accidents involvement are part of management negligence. Management commitment and support are essential to bring down the accident rates. Top management's commitment is therefore crucial for every organization to succeed in safety programmes. Hence, results show that safety performance is extremely good when top management be accountable in safety matters. The top level management involvement does indicate their determination to bring down the accidents rates at workplace.

Orientation programmes or safety induction for new employees is one of the best practice to inform on the hazards at workplace. New workers are the most vulnerable to the workplace accidents due to their unfamiliarity with potential

hazards. This view is supported by Lee (1991). Therefore, it is necessary to orientate new workers especially to inform them on the management policy, workplace and developments. This safety induction is not only for new employees but also extended to new contractors coming to work at sites. Companies providing comprehensive orientation programmes can drastically reduce accidents rates.

Safety training is considered by most researches as an important tool in mitigating the workplace accidents (Hinze & Harrison et al., 1981; Duff et al., 1994; Lingard & Rowlinson, 1994). Basically, the truck drivers are required to attend compulsory training arranged by Petronas. Also the drivers need to attend refresher training every year to maintain their permits at work. Due to strict nature of work and the importance of safety, the drivers must pass the competency test. The trainer make sure the driver understands the theory and practical well before being certified pass the competency test.

Setting up safety committee can able to improve overall safety performance of the organization. Hence, safety committee can improve communications and the safety awareness of the workplace. Ngai (1993) reported that safety committee has the function of keeping safety measures under review and provides methods to improve the workplace continuously. This has been shown during safety meeting in every month the safety committee will explain on the road accidents involved by the truck drivers. This is part of the education for the truck drivers.

Our employer do conduct safety campaign on every quarterly basis. This commitment from the management is the fantastic approach to instill workers safety awareness among the truck drivers. During the safety campaign, it is part of the employer's responsibility to reward best worker for those who perform well. The

best drivers photo displayed on the notice board to give encouragement to other drivers so that they also can able to receive rewards when perform well. This practice is strongly advocated by Hinze and Harrison et al., (1981), and described as an effective tool in improving workplace accidents.

## 2.10 Chapter Summary

Meanwhile in road tankers operations especially Petronas products delivering petroleum or LPG across the whole nation. Due to product nature, safety and health policy is always mandatory. Management commitment towards safety practices utterly improve safety performance of the whole organization. Top management compliance on safety policies create positive safety behaviour among the drivers. It also gives motivation to the tank drivers that top management are very serious about safety matters.

Based on the RTOG standard, main contractors and sub-contractors must comply two safety standards called Service level and HSE level. So management involvement in recruitment process, pre-medical process, smith training arrangement for the drivers, buddy system training, pre-departure checking, loading and delivering petroleum procedure, PPE, critical safety equipment monitoring, risk assessment, emergency response, truck safety specification compliance, safety meeting with drivers and journey management.

From the previous research, management commitment was always mentioned as an important criteria to bring changes in safety climate and do have substantial impact within the transport organizations.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 Introduction

Chapter three provides further discussions on research framework, hypothesis, research design, operational definition, instrumentation, data collection, sampling process, procedures, analysis and summary.

## 3.2 Research Framework

In general, research framework is normally applied to determine the criticality of safety climate occurring at workplace. KVDT is the terminal where the truck drivers loading the petroleum. KVDT is considered truck drivers work base before delivering the fuel to petrol stations. In this manner, the researcher can be able to apply the knowledge that had gained with the present research and with the survey questionnaires distributed to the truck drivers. Hence, with the help of this findings, the researcher able to extract analysis and its hypothesis followed with its methodology. On the other hand, the environment of the safety climate occurring at KVDT can be monitored theoretically. Moreover, with previous researches help data was extracted from the chapter two on literature review, focus on each variables of safety climate influences can be determined. To simplify the framework analysis, it is best to get the key differential and its situational approach. Since CCTV has been installed at most of the areas at KVDT, the behaviour of each drivers can be

monitored seriously. As a result, truck drivers can be more cautious in their daily work especially when performing loading and unloading of petroleum at KVDT.

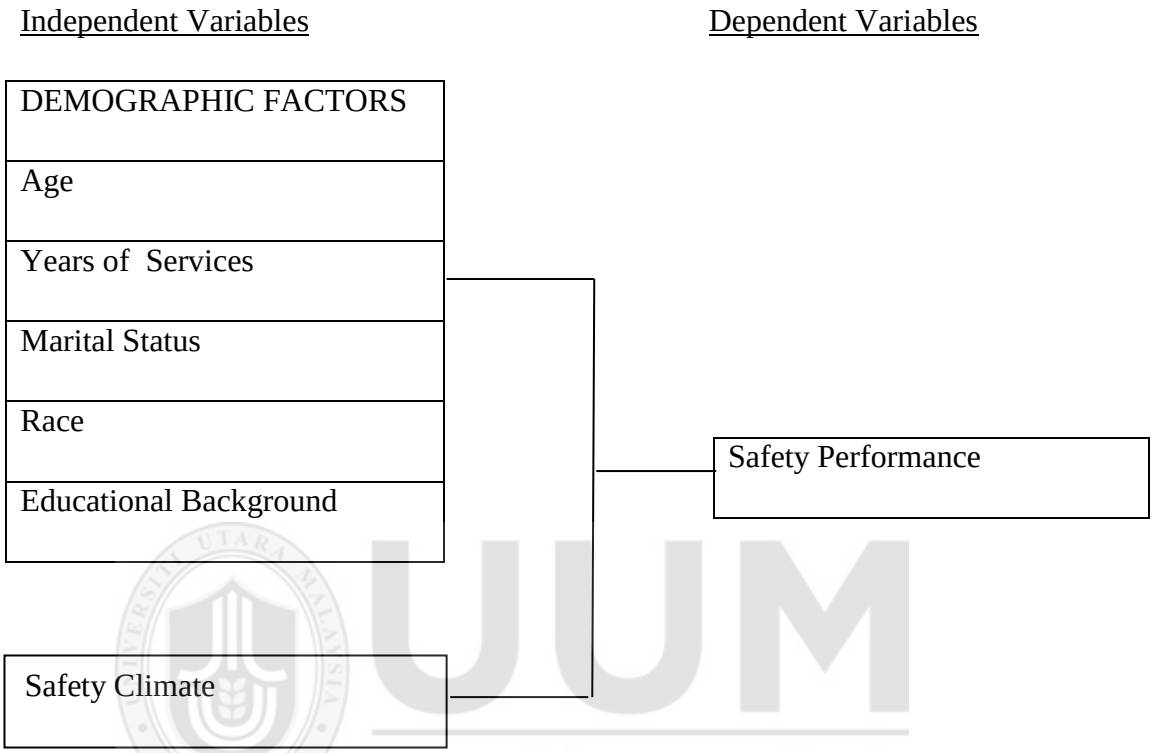




**Figure 3.1**
*Research Framework*

## 3.3 Hypotheses

The aim of this research to investigate further factors influencing on safety climate upon truck drivers safety in the organizational fleet management. As discussed earlier, the combination of person-related factors, situational factors and safety climate factors (organization factors) are the hypothesis considered to analyze the variance measurement related to driver safety.

### 3.3.1 Hypothesis 1

Safety performance does differ among drivers age. On the other hand, Topf (2000) analyzed what are the possibilities that young workers indulge in the increased risk in occupational injuries: restrain in job knowledge, skills, training and responsibilities lacking. Similarly, age variation also plays a major role among truck drivers. Older drivers seems to be more patient and calm comparing to the younger drivers. Therefore:

H1: Safety Performance differs among age of the drivers

### 3.3.2 Hypothesis 2

Although in Petronas majority of the truck drivers are Malays and a small numbers are Indian drivers. Yet there is no discrimination among the races. Work safety and compliance is highly desirable. Adherence to safety practice is a must. Although Petronas hiring more Malay truck drivers compared to Non-Malays but it is under the government policy to give opportunity to Bumiputeras. Since the Indian drivers are minority, the company could face many problem in operations area especially during festival season. The company normally plan the trips but the drivers never turn up. The only concern here is their attitude problem. The management cannot approve annual leave for every drivers. The drivers ended up bringing medical certificates to cover up their absenteeism. Hence, this might effecting non-malay drivers to work longer hours. One of the highlighted roles of the company is to ensure the journey service is delivered safely to the driver, passengers and other road users. This includes providing sufficient training that related to

emergency's handling, behaviour/attitude of the driver and vehicle handling (Osman & Sarani, 2009). Therefore:

H2: Safety performance differs among race of the drivers.

### 3.3.3 Hypothesis 3

Normally, safety performance does differ between married and non-married drivers. Ivancevich et al., (2005) further described that 2 diversity groups of factors that control individual differences; primary dimension and secondary dimension. The primary dimension is classified as stable factor by researches which are related to age, gender and race. A secondary dimension that described as a changeable factor by the research, related to factors such as marital status and experience. All these factors distinguish an individual differences one from another.

H3: Safety performance differs between marital statuses of the drivers.



### 3.3.4 Hypothesis 4

Basically, driver's year of service does have significance in their performance. Normally, younger drivers tend to drive aggressively compared to older truck drivers. Young drivers ignore the traffic. Andy et al., (2006) report is also supported by research conducted in Uppsala (Wahlberg, 1997). In the report, the Author submitted to the National Board of Road Administration of Uppsala that younger drivers drive faster than the older drivers. The aggressive driving by the young drivers is caused by being late. In summary, experienced drivers show better

result compared to younger drivers due to their patience, driving skills and commitment.

H4: Safety performance differs among the driver's years of service.

### 3.3.5 Hypothesis 5

Safety training conducted by the employer is part of the education to develop driver's knowledge and skills. Hinze and Harrison (1981) stated that formal safety training and safety awards are the most effective tools in educating site workers and mitigating workplace accidents. The Commissioner of Labour (1993) advocated the use of committees and post-accident investigation to combat the workplace incidents. Hence, young drivers tend to catch up faster comparing too older drivers. Young drivers are more aggressive so they can able to learn quicker.

H5: Safety Performance differs between the educations among drivers.



### 3.3.6 Hypothesis 6

Safety Climate does influence safety performance of the drivers. Barling and Zacharatos (1999) have argued that leadership is one of the critical organizational determinants of safety. Leaders are playing the vital role in shaping the safety climate within an organization and motivating employees to perform their task safely (Hofmann & Morgeson 1999; Zohar 2000). Basically, management commitment towards safety can able to give positive results on safety performance.

H6: Safety climate does influence safety performance among drivers

### 3.4 Research Design

Truck driver's safety are the utmost criteria at KVDT. Since they are heavily involved in loading and unloading activities of petroleum, the mindset of each truck drivers must be always think to work safe hence also need to consider the safety of workers who are working at KVDT. In this research, the group that the researcher targeted are truck drivers. The research design was extracted based on the DOSH report for the last five years highlighting on gradual increment on accident each year. Also this study allowing the researcher to check safety awareness and their practices among the truck drivers. Although safety briefing given to the truck drivers on monthly basis but their safety awareness are still lacking. For instance, there were cases of near misses happened at KVDT where the driver forget to remove fuel hose from the truck after completing loading. This incident happened when driver was stopped by other workers while the driver was already started to press the truck accelerator. As a result, the fuel hoses damaged badly. Due to the negligence, the worker was suspended for three months of work. Another incident occurred when fuel hose leaking when charging petroleum from the tank farm at KVDT. This is simply the truck driver's negligence and poor observation on PDC checklist before leaving to KVDT to load fuel. Subsequently, the truck driver suspended for two weeks. This reflects truck driver's failure in compliance in safety practices and safe work procedures. The driver's commitment to safety is always mandatory. Handling petroleum product must be very cautious due to its proneness to fire. So all the truck drivers must be well versed and certified before being assigned to work as road tanker drivers. Some of the procedures need to follow such as PDC, PPM01, journey management policy and BOS.

According to this research study, the questionnaires related are more towards the truck driver's characteristics behaviour and their perception towards safety. Basically, for this research cross-sectional studies method to be used to measure units from sample of truck drivers group at KVDT. However, this cross-sectional studies targeting specifically on truck drivers as they are the sample to be used in survey questionnaires.

To describe further on this research, data collection to be carried out once the survey questionnaires has been collected fully from the respondents. At KVDT, the current respondents are the truck drivers. The driver's respondents consist of two companies that are Bagan Cipta, and MatchPage Services Sdn Bhd. All these companies are Petronas contracted road tankers services companies. The data collected in a quantitative manner. A simple statistical method to be used to summarize the data collection. On the other hand, descriptive research is being used to obtain results. Therefore, it is proven that descriptive research explain in detail on the characteristics of the research issues compared to explanatory research.



To conduct this research, details are necessary especially to study the safety climate at KVDT among road tankers drivers. Survey questionnaires were distributed to the road tankers drivers to all the three companies. Later after 3 weeks, those questionnaires were collected back. The data contents on the questionnaires to be used in SPSS analysis. Each respondents were given about approximately 30 minutes to answer the question. Although the answers is not necessary to be accurate but if it is closer to accuracy should be better. The questionnaires format designed in a Likert Scale. The respondents have 7 boxes of preferred Likert Scale to be chosen. It begins from (1) strongly disagree to (7) strongly agree. Respondents can select only 1 preferred box from the 30 questions.

With this research methodology techniques, researcher have a greater opportunity to find the objective and purpose of this research study. Hence, it paves way to get better results for road tankers daily operations safety climate at KVDT.

### 3.5 Operational Definition

i. Safety Climate

Basically, safety climate is a normal fundamental climate that experienced by many individuals in respective organizations. All types of climate are based on individual perceptions of practices, procedures, and rewards in the organization (Schneider, 1990).

ii. Safety Performance

Campbell et al. (1993) argued that only three determinants related to individual performance: knowledge, skill, and motivation. Hence, safety performance must be determined by knowledge and skills of specific behaviours and individual motivation to perform the behaviours.

iii. Demographic Factors

Basic demographic information on age, years of services, race, marital status and education level relates to behaviour. Age has a correlation with aggressive driving that relates to safety behaviour (Lancaster & Ward 2002). Mather (2007) also described how age influences driving behaviour of individuals due to size of human factor.

### 3.6 Instrumentation

The instrument used for this research is the distribution of research questionnaires among the tank drivers. The questionnaires was given to two companies consist of Petronas and Petron tank drivers. Total drivers working at KVDT 80 person. The questionnaires style was done in dual language. It is written in English and Bahasa Malaysia to make the drivers easy to understand. Therefore, the questionnaires done to suit the driver's safety climate at KVDT. Also it discussed on drivers safety perception and practices while working at KVDT. It took almost 3 weeks to get back those questionnaires. The questionnaires was prepared under the concept of Fugas, 2012. Also a modified version of Zohar and Luria's (2005) used for the questionnaires. The questionnaires are designed in the form of 7 point Likert scale (1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = neutral, 5 = slightly agree, 6 = agree, 7 = strongly agree).



i) Safety Climate scale:

The scale was defined with 6 dimensions. Emphasizing on safety training, personnel safety, job safety, safety attitude, safety practices and workers safety.

ii) Safety Performance scale:

The scale divided into 2 division: Proactive safety behaviour and Compliance safety behaviour.

**Part A: Demographic Information**

**Table 3.2.1**
*Age.*

| | |
|---|---|
| 20 – 30 years old | 1 |
| 31 – 40 years old | 2 |
| 41 – 50 years old | 3 |
| Above 50 years old | 4 |

**Table 3.2.2**
*Race.*

| | |
|---|---|
| Malay | 1 |
| Chinese | 2 |
| Indian | 3 |
| Others | 4 |

**Table 3.2.3**
*Marital Status*

| | |
|---|---|
| Single | 1 |
| Married | 2 |

**Table 3.2.4**
*Years of Service*

| | |
|---|---|
| 0 – 5 years of service | 1 |
| 6 – 10 years of service | 2 |
| 11 – 15 years of service | 3 |
| 16 – 20 years of service | 4 |
| 21 – 25 years of service | 5 |
| 26 – 30 years of service | 6 |
| Above 30 years of service | 7 |

**Table 3.2.5**
*Education Level*

| | |
|---|---|
| UPSR | 1 |
| SRP | 2 |
| SPM | 3 |

**Part B:**

**Table 3.3.1**
*7 Likert Scale Points*

| | |
|---|---|
| Strongly disagree | 1 |
| Disagree | 2 |
| Slightly disagree | 3 |
| Neutral | 4 |
| Slightly agree | 5 |
| Agree | 6 |
| Strongly agree | 7 |



### 3.7 Population

Target group for this study are mainly truck drivers. A total of 80 drivers were involved. The questionnaires were distributed to two transport companies. Petronas consist of 45 truck drivers. Petron have 35 drivers.

### 3.8 Sampling

A total of 80 truck drivers participated in this study. The workers participated consist of two companies currently based at KVDT. These two companies are the giant companies delivering Petronas bulk petroleum across the nation. A total of 80 participants, 45 drivers from Petronas and 35 from Petron. The researcher received

only 70 sets of questionnaires collected from the transport supervisor. Another 10 participants were removed because the supervisor did not receive any survey questionnaires from them. Total participants 87.5%. Eligibility to participate in this study, the respondents must have at least 6 months truck driving experience on the road. As usual, most of the truck drivers are male drivers. The majority of drivers fall in the age between 40-49 years, 30-39 years, 20-29 years and 50-55 years. Krenjie and Morgan (1970) table used to calculate the sampling size for 80 drivers.

### 3.9 Data Collection

The researcher must be able to collect the data from the questionnaires distributed to the truck drivers. On the other hand, close monitoring at KVDT is necessary so that the researcher can able to get collective information on the truck driver's activities. A total of 80 truck drivers participated in this survey. But the researcher could able to collect only 70 sets. The rest of the questionnaires cannot get from the truck drivers. So the researcher has decided to use 70 questionnaires for sampling purpose. The drivers did not give to the assigned supervisor. It took approximately two one and half months to collect back those questionnaires. Basically, the research has the opportunity to measure safety climate on management commitment, safety behaviour and practices of the truck drivers. This method of research is done by quantitative manner. Later, the data that has been collected must be analyzed by using SPSS methodology.

Table 3.4
*Sample size determination based on population Krejcie and Morgan 1970*

| *Table for Determining Sample Size of a Known Population* | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **N** | **S** | **N** | **S** | **N** | **S** | **N** | **S** | **N** | **S** |
| 10 | 10 | 100 | 80 | 280 | 162 | 800 | 260 | 2800 | 338 |
| 15 | 14 | 110 | 86 | 290 | 165 | 850 | 265 | 3000 | 341 |
| 20 | 19 | 120 | 92 | 300 | 169 | 900 | 269 | 3500 | 346 |
| 25 | 24 | 130 | 97 | 320 | 175 | 950 | 274 | 4000 | 351 |
| 30 | 28 | 140 | 103 | 340 | 181 | 1000 | 278 | 4500 | 354 |
| 35 | 32 | 150 | 108 | 360 | 186 | 1100 | 285 | 5000 | 357 |
| 40 | 36 | 160 | 113 | 380 | 191 | 1200 | 291 | 6000 | 361 |
| 45 | 40 | 170 | 118 | 400 | 196 | 1300 | 297 | 7000 | 364 |
| 50 | 44 | 180 | 123 | 420 | 201 | 1400 | 302 | 8000 | 367 |
| 55 | 48 | 190 | 127 | 440 | 205 | 1500 | 306 | 9000 | 368 |
| 60 | 52 | 200 | 132 | 460 | 210 | 1600 | 310 | 10000 | 370 |
| 65 | 56 | 210 | 136 | 480 | 214 | 1700 | 313 | 15000 | 375 |
| 70 | 59 | 220 | 140 | 500 | 217 | 1800 | 317 | 20000 | 377 |
| 75 | 63 | 230 | 144 | 550 | 226 | 1900 | 320 | 30000 | 379 |
| 80 | 66 | 240 | 148 | 600 | 234 | 2000 | 322 | 40000 | 380 |
| 85 | 70 | 250 | 152 | 650 | 242 | 2200 | 327 | 50000 | 381 |
| 90 | 73 | 260 | 155 | 700 | 248 | 2400 | 331 | 75000 | 382 |
| 95 | 76 | 270 | 159 | 750 | 254 | 2600 | 335 | 1000000 | 384 |
| *Note: N is Population Size; S is Sample Size* | | | | | | | | *Source: Krejcie & Morgan, 1970* | |



**3.10 Data Analysis**

Analysis of data were recorded Hypothesis 1, 4 and 5. H1, using the ANOVA Statistical result. Hypothesis 1 for age factor can be rejected because the p value > 0.05, Hypothesis 4 for years of experience cannot be rejected because p value < 0.05, Hypothesis 5 for education level can be rejected because p value > 0.05. Hypothesis 2 and 3 using t-test analysis. Since Hypothesis 2 represents race factor, there is no Chinese truck drivers. The company have only Malay and Indian truck drivers. Therefore, H2 p value < 0.05. This hypothesis can be accepted. Hypothesis 3 on marital status divided into two categories. Both married and single drivers are

working. Hypothesis 3 cannot be rejected because p value > 0.05. And Hypothesis 6 is using regression test. Hypothesis 6 factor is on safety climate, therefore the p value < 0.05. This hypothesis cannot be rejected. Hence safety climate does influence the safety behaviour of truck drivers.

### 3.11 Chapter Summary

Chapter 3, was discussed on hypothesis and research frame work. Also covered on questionnaires taken from the survey, data collection, data analysis and sampling work. This study also based on the survey questionnaires on 6 safety climate and 6 safety performance dimensions. The data was analyzed to obtain the outcome of the variables. Based on the result H1 and H5 Hypothesis rejected. And Hypothesis 2, 3, 4 and 6 cannot be rejected.

# CHAPTER FOUR

# RESULTS AND DISCUSSION

## 4.1 Introduction

In this chapter all data collected are analyzed through SPSS software. Also the data collected could be further analyzed by using descriptive and inferential statistics to obtain the finding results.

## 4.2 Rate of Response

A total of 80 questionnaires were distributed among the truck drivers at KVDT. Only 70 sets of questionnaires received from the respondents. Another 10 sets were missing or never received from the truck drivers. A total of 87.5% (70 sets) questionnaires were used to proceed further for analysis purpose.



## 4.3 Reliability Test

Table 4.1
*Safety Climate*

**Reliability Statistics**

| Cronbach's Alpha | N of Items |
|---|---|
| .744 | 6 |

Table 4.2
*Safety Performance*

**Reliability Statistics**

| Cronbach's Alpha | N of Items |
|---|---|
| .681 | 6 |

For both safety climate and safety performance reliability test, the value of coefficient shows more than 0.6 value. As long as the value is greater than 0.6 therefore the result is good.

## 4.4 Normality Test

Table 4.3
*Normality Results*

| | | meanSC | meanSB |
|---|---|---|---|
| N | Valid | 70 | 72 |
| | Missing | 2 | 0 |
| Skewness | | -.774 | -.355 |
| Std. Error of Skewness | | .287 | .283 |
| Kurtosis | | .378 | -.088 |
| Std. Error of Kurtosis | | .566 | .559 |

The normality test was carried out to check on mean safety climate and mean safety behaviour. As long as the mean for both on skewness and kurtosis is between -1.96 to +1.96, the result should be acceptable.



## 4.5 Demographic Descriptive Statistics

Table below shows the results has been taken from the data analysis by using SPSS version 22, the demographic section results taken based on age, race, years of service, marital status and education level.

### 4.5.1 Age

Table 4.4
*Age Respondents.*

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | 20-30 | 19 | 27.1 |
| | 31-40 | 37 | 52.9 |
| | 41-50 | 14 | 20.0 |
| | Total | 70 | 100.0 |
| Total | | 70 | |

Total participants were 70 drivers from KVDT. Basically, the age group divided into four categories: 20 - 30 years old are 19 (27.14%) respondents, 31- 40 years old are 37 (52.86%) respondents, 41 – 50 years old consist of 14 (20.0%) respondents and none for the above 50 years old.



### 4.5.2 Race

Table 4.5
*Race Respondents*

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | malay | 40 | 57.1 |
| | indian | 30 | 42.9 |
| | Total | 70 | 100.0 |
| Total | | 70 | |

Participants on race factors divided into four division. Malay drivers respondent there are 40 (57.14%) and Indian drivers respondent 30 (42.86%). Basically, there is no Chinese and other races drives. So there are no respondents from them. Focus is only given to Malay and Indian respondents only.

### 4.5.3 Marital status

Table 4.6
*Marital Status Respondents*

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | single | 21 | 30.0 |
| | married | 49 | 70.0 |
| Total | | 70 | 100.0 |

Next, analysis on marital status. There were 21 (30.0%) single respondents and 49 (70.0%) married respondents. Therefore, the number of married respondents greater than single respondents.

### 4.5.4 Years of service

Table 4.7
*Years of Service Respondents*

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | 0-5 | 40 | 57.1 |
| | 6-10 | 25 | 35.7 |
| | 11-15 | 3 | 4.3 |
| | 16-20 | 1 | 1.4 |
| | 21-25 | 1 | 1.4 |
| Total | | 70 | 100.0 |

Next data on years of services of each respondents. Divided into seven groups. Group one respondents consisting 0 – 5 years of service, 40 (57.14%) drivers. Group two respondents 6 – 10 years of service, 25 (35.71%) drivers. Group three respondents 11 – 15 years of service, 3 (4.29%). Group four respondents 16 – 20 years of service, 1 (1.42%) just a single respondent. Group five respondents 21 – 25 years of service, 1 (1.42%). There are no respondents from 26 – 30 years and above 30 years of service.

### 4.5.5 Education level

Table 4.8
*Education Level Respondents*

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | PMR | 32 | 45.7 |
| | SPM | 38 | 54.3 |
| Total | | 70 | 100.0 |

Education level of the participants divided into three groups. Drivers only with UPSR education are none, SRP education 32 (45.71%) respondents and SPM education 38 (54.29%) respondents.

## 4.6 Inferential Statistics

### 4.6.1 Age and Safety Performance

Table 4.9
*Age Status: ANOVA Statistics*

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | .085 | 2 | .043 | .163 | .850 |
| Within Groups | 17.487 | 67 | .261 | | |
| Total | 17.572 | 69 | | | |

ANOVA test result shows the age to determine is there any difference on their safety performance. Therefore, the significant level of F value is 0.850 where ($p>0.05$), hence Hypothesis 1 is rejected. In other words, mean safety performance does not differ among various age groups of the truck drivers.

### 4.6.2 Race and Safety Performance

Table 4.10
*Race: Independent Sample Test*

**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 |
| meanSP | Equal variances assumed | 1.263 | .265 | 2.610 | 68 | .011 | .30556 | .11705 | .07198 | .53913 |
| | Equal variances not assumed | | | 2.561 | 57.705 | .013 | .30556 | .11933 | .06666 | .54445 |

Table 4.11
*Race: Group Statistics*

**Group Statistics**

| | Race | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| mean SP | malay | 40 | 6.0667 | .45573 | .07206 |
| | Indian | 30 | 5.7611 | .52098 | .09512 |

Race status of both individual groups also tested. For both Malay and Indian individuals, results shows (M = 6.0667, SD = 0.4557) and (M = 5.7611, SD = 0.52098). Therefore, both also equally adhere to safety performance. T-test result shows that the significant level is 0.011($p<0.05$), therefore Hypothesis 2 cannot be rejected. In other words, mean safety performance do differ between Malay and Indian drivers.

### 4.6.3 Marital status and Safety Performance

Table 4.12
*Marital Status: Group Statistics*

**Group Statistics**

| | status | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| meanSB | single | 21 | 5.6746 | .41991 | .09163 |
| | married | 49 | 6.0476 | .50000 | .07143 |

Table 4.13
*Marital Status: Independent Sample 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 |
| meanSB | Equal variances assumed | .321 | .573 | -2.993 | 68 | .004 | -.37302 | .12463 | -.62171 | -.12432 |
| | Equal variances not assumed | | | -3.211 | 44.799 | .002 | -.37302 | .11618 | -.60705 | -.13898 |

Marital status of both individual groups also tested. For single individuals and married individuals, results shows (M = 5.675, SD = 0.4199) and (M = 6.048, SD = 0.5000). Therefore, both also equally adhere to safety performance. T-test result shows that the significant level is 0.004($p<0.05$), therefore Hypothesis 3 cannot be rejected. In other words, mean safety performance differs between single and married drivers.

### 4.6.4 Years of service and Safety Performance

Table 4.14
*Years of Service: ANOVA Statistics*

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| meanSB | Between Groups | 3.319 | 4 | .830 | 3.784 | .008 |
| | Within Groups | 14.253 | 65 | .219 | | |
| | Total | 17.572 | 69 | | | |

ANOVA test shows the result between groups and within groups on their years of experience to determine difference on their safety performance. Therefore, there is significant level of F value is 0.008 ($p<0.05$), hence Hypothesis 4 cannot be rejected. In other words, mean safety performance differs among different years of service.

### 4.6.5 Education level and Safety Performance

Table 4.15
*Education Status: ANOVA Statistics*

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| meanSB | Between Groups | .217 | 1 | .217 | .851 | .359 |
| | Within Groups | 17.355 | 68 | .255 | | |
| | Total | 17.572 | 69 | | | |

ANOVA test shows the difference between groups and within groups in education standard PMR and SPM level to determine on the safety performance. Therefore the significant level of F value is 0.850 ($p>0.05$), hence Hypothesis 5 is rejected. In other words, mean safety performance among drivers does not differ much on educational level.

### 4.6.6 Safety Climate and Safety Performance

Table 4.16
*Model Summary*

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .601[a] | .361 | .351 | .40645 |

a. Predictors: (Constant), meanSC

b. Dependent Variable: meanSB

Table 4.17
*Safety Climate Status: ANOVA Statistics*

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 6.338 | 1 | 6.338 | 38.364 | .000[b] |
| | Residual | 11.234 | 68 | .165 | | |
| | Total | 17.572 | 69 | | | |

a. Dependent Variable: meanSB

b. Predictors: (Constant), meanSC

Table 4.18
*Coefficient Results*

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 3.314 | .426 | | 7.777 | .000 |
| | meanSC | .453 | .073 | .601 | 6.194 | .000 |

a. Dependent Variable: meanSB

Regression test result shows that the value of $R^2$ is 0.361 and the F value is 38.364, it is significant at p=0.000. Therefore, hypothesis 6 cannot be rejected. In other words, safety climate does influence safety performance among drivers.

## 4.7 Chapter Summary

In this chapter, the data collected through the survey questionnaires were analyzed. With the help of SPSS version 22, the researcher able to put in the demographic data into the software and follow-up with the test results. Also inferential analysis were being conducted by using ANOVA tables. Test results were also taken for dependent variables (Mean SB) and constant (Mean SC). In the next chapter, discussion and conclusion to be conducted.

# CHAPTER FIVE

# RECOMMENDATION AND CONCLUSION

## 5.1 Introduction

In this chapter, the finding and result analyzed Chapter 4 will be discussed. Hence, from the questionnaires instrument conclusion and recommendation can be presented. The research main target was to discuss on safety climate and demographic factors for independent variables. Safety performance as dependent variable.



## 5.2 Discussion

Based on the study, it has been revealed there were significance variation on the driver's safety performance. From the six hypothesis analysis taken from inferential statistics, four were being accepted and two were rejected.

### 5.2.1 Age and Safety Performance

Safety performance and age hypothesis rejected. Age does have relationship with safety performance. Age has a correlation with aggressive driving that relates to safety behaviour (Lancaster & Ward 2002). The age does give impact on the driving

behaviour. Andy et al., (2006) did suggest that young drivers drive more aggressive than the older drivers.

### 5.2.2 Race and Safety Performance

Safety performance and race hypothesis can be accepted. Safety performance does not varies among races. Each drivers must comply safety standards set by the employer. Drivers have to show their commitment towards safety performance regardless of individual race. Acknowledged that vast literature on workplace or organizational justice described employee's perceptions of equity between workers input and workplace procedures, interactions and outcomes (Elovainio, 2002).

### 5.2.3 Marital Status and Safety Performance

Third hypothesis analysis between marital status and safety performance. This hypothesis can be accepted. Campbell et al. (1996) have argued that there were three determinants of individual differences in performance: skill, knowledge and motivation. Those individuals does not have enough knowledge and skill, deem to fail due to not capable to perform the assigned task. Nevertheless, drivers that married or unmarried must maintain the same safety standard. Safety always mandatory when dealing with petroleum products which is highly flammable.

### 5.2.4 Years of Service and Safety Performance

Next hypothesis on safety performance and years of service. This hypothesis can be accepted. Most of the transport industries prefer experienced drivers rather

than inexperience drives. Especially for the truck drivers, longer the years of service could be advantage. Basically, they know the condition of the truck inspections, roads situation, maintenance and traffic. Older workers are more experienced on the job and have greater knowledge, patience and skills than younger once (Frone, 1998; Kingsma, 1994; Stalneker, 1998; Topf, 2000). Normally, the new recruits are always given on the job training with the experienced drivers. It takes time for a new driver to be an established driver. New drivers can gain more experience by getting more exposure when delivering petroleum at remote kiosk.

### 5.2.5 Educational level and Safety Performance

Safety performance and educational level hypothesis can be rejected. Education level does makes a difference among the drivers. Poor education level and knowledge can't handle the job given by superior. Truck drivers required to be excellent in both safety and service level on delivering products to the customers. Since safety training is part of the education, the older workers do have face problem in adapting to new environment on safety procedures compared to the younger ones. In Hong Kong, few decades ago safety professionals did not focus on older workers due to small group. It is foreseeable that in future there could be more old and young mix of group workers. Hence, the safety procedures and policies should be reevaluated in order to accommodate and anticipate mix different occupational groups. As suggest by Czaja (2001), the cost associated with additional training or extended practice may be offset by lower turnover and absenteeism among older people. Training strategies may need to be modified for older workers so that they can learn more efficiently.

### 5.2.6 Safety Climate and Safety Performance

Safety climate and safety performance level hypothesis among the truck drivers can be accepted. Safety climate does influence safety performance among drivers. It has been mentioned earlier, management commitment and support towards safety can bring positive results in any organization. Hence it could instill workers commitment in safety. As a result, management can be an example or role model to their respective workers. This could also motivate the workers to work safely. In one of the investigations of safety climate, Zohar (1980) found that management's commitment to safety is a major factor affecting the success of an organization's safety programmes. The safety commitment of the management must be observed actively as part of management and should be demonstrated in their behaviour as well as their words (Hofmann et al., 1995).

Therefore, the above discussion has given excellent hints on the six hypothesis. Analysis taken based on their demographic measures on safety climate and safety performance. Basically, age and safety performance do have correlation between them. Certainly, there are huge difference in the attitude and aggressiveness. And young drivers seems more aggressive and impatient compared to senior drivers. Safety performance and race is another area that needs focusing. Hence, regardless of race, ethnic, and religion compliance on safe work procedures is compulsory. On the other hand, safety performance and marital status is another key area needed to pay attention. Even married or unmarried drivers, safety procedures must be followed. Safety performance and education could be a concern. There is a huge difference between both drivers that studied until SPM and those drivers studied till SRP. Basically, majority of senior truck drivers are only educated till SRP. Classroom and practical training for the old drivers never comes easy especially when understanding

the theory concept. Unlike young generation drivers, they could catch up faster. Next is on safety performance and years of services. To be seasoned driver, the driver has to work longer years so that he can be familiar of the road condition and traffic congestion. Also take time for the new person to learn on the road safety. Moving on to safety climate and safety performance. Naturally, safety climate can influence safety performance with initiatives start from management.

### 5.3 Impact of the Research Findings

This research could bring positive impact on safety performance among the truck drivers when top management commitment and involvement in safety. Poor attendance for safety meeting attendance. Also poor attendance during best workers presentation. This could impact the safety performance of the workers because most of the time only a representative attending on behalf of top management. The workers perception thinking their good efforts were not being appreciated by the top management. Sometimes, the management takes very long time to approve the safety gadgets requested by the workers. This could hinder workers commitment hence their trust on management team. Priority must be given to safety first because it involves human life.

### 5.4 Recommendation

Based on the study, the researcher has a few suggestion for the employer so that the working place could be more environment friendly. This recommendation is proposed to the organization and future projects. Hence this proposal could improve the relationship between employer and workers.

### 5.4.1 Recommendation for the Organization.

Based on the analysis, four hypothesis are not rejected and two hypothesis are rejected. Below are the proposals from the researcher.

i) The organization should engage in more social activities among the drivers and management team. Organizing such as family day, safety campaign, picnic, travelling and many other activities. This could enhance the relationship among the drivers regardless of their individual races. Also the management should consider some indoor games for the drivers. It is very difficult to meet drivers since they are involved in shift work. Basically, they are divided into two shifts which is day and night shift. Hence interaction among different races is very important in any organization.

ii) In any organization, there are single and married individuals working in one company. Those workers coming from outstation, the employer could provide necessary quarters for the drivers. Also in the quarters, the employer could setup childcare centers and kindergarten as well. This idea would be a big welcome for the married drivers because they can able to bring their spouse and children to the quarters immediately. Since the employer has arranged all the facilities, the spouse can go to work in the morning.

iii) Usually, the employers do welcome those experienced workers. Certainly, employers willing to retain the long service drivers. Senior drivers can be a very good mentor especially for the new drivers. The knowledge and experience that they gained can be useful. This knowledge could be transferred to the new drivers. Also the senior drivers are well versed with road condition, traffic congestion,

truck maintenance and dangerous roads. Basically, Petronas has the buddy system training. New recruit drivers have to undergo two weeks compulsory training after the Smith Training. Hence, this could be the best opportunity for the new drivers to extract knowledge from the senior drivers.

iv) Normally, safety climate in organization is very important. When top management commitment towards safety, the ground workers mindset automatically switched to be safer in their daily work. The employees continue to have brisk awareness in safety matters. Although, safety meeting for drivers and staffs organized every month at KVDT but poor attendance from top management is the main concern. Hence, best driver, best team and birthday gift awarded during monthly meeting. When top management team such as Managing Director present and award the reward to the drivers, this could give a motivation to the drivers. The MD must strive to attend the safety meeting at least two months once so that his participation and commitment is compulsory to instill his workers commitment. Moreover, workers would be very happy to see the MD attending the safety meeting and greeted by him.

v) Generally, there are age disparities among workers in the organization. There are senior and junior workers in any transport company. Senior drivers are the best mentor for the junior drivers. Due to their vast driving experience, naturally they were given the task to handle new recruits or junior drivers. Since senior drivers are very steady and patient employees, perhaps they are also a good coach for the new employees. To improve the system further, employer should attach the new recruit with the senior driver at least two months. Employer should give senior drivers special task for new recruits training and development. Starts from pre-

departure checklist, PPM01, on the road training, truck handling, day and night driving, vehicle safety, emergency response and monitoring the safety behaviour of the new recruits. Although, Petronas has arranged two weeks for buddy system training but some new recruits are not confident enough. They still do have doubts. Basically, the two weeks training is just a very basic training. Longer attachment with seniors should be vital for all new recruits or junior drivers. A good comprehensive training is required for the new recruits before giving the truck for them to handle individually.

### 5.4.2 Recommendation for the Future

i) In terms of education, there are drivers with SRP qualification and some with SPM qualification. Although the minimum employment requirement for a truck driver is can able to read and write. But there is no baseline standard set for the employment. Petronas must set minimum standard education. Can able to read and write simple English and Bahasa Malaysia. Petronas must set SPM is the minimum standard requirement. Since some of the safety books are in English, at least SPM educated person can able to read the manuals. For instance, RTOG (Road Tanker Operations Guidelines) are all in English. Understanding the checklist and writing comments also could be a problem for lower educated drivers. This can be extended when the drivers are required to sit for yearly smith training competency test and PS Pipeline (entry pass for KVDT). Every year the drivers need to be recertified. According to the feedback from the driver mentor, most of the senior drivers are SRP dropouts. Hence they have difficulties in doing theoretical test especially on reading and writing. So Petronas should look into

this matter seriously and must set SPM is the minimum standard requirement for employment purposes.

ii) Training should be extended to subcontractors staffs too. Current practice, Petronas is just concentrating on main contractors and their staffs only. The subcontractors were not given an opportunity to attend any training conducted by Petronas. Example is RTOG training.

iii) Prohibit those drivers involved in theft cases for life especially stealing petroleum from the tanks. Should not allowed to work with other organization. This rules must start with immediate effect.

## 5.5 Conclusion

In order to improve the system efficiently in transport organization, the top management involvement are required. The middle management team must get approval for any new system implementation in terms of budget, cost and standardization. To enhance the system further, management team commitment in safety management could create a positive results in safety climate and safety behaviour in one organization. Also regular involvement in communications, policies and training for the workers. Top management actions could bring better environment and changes among ground workers.

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# APPENDICES

## APPENDICES A: QUESTIONNAIRE USED IN THE STUDY

### SAFETY CLIMATE AND SAFETY PERFORMANCE AMONG PETRONAS SUB-CONTRACTORS TRUCK DRIVERS.

### Part A – DEMOGRAPHIC INFORMATION

Kindly tick (√) where necessary and fill in the blanks where appropriate.



1. Year of birth |___|___|___|___|

2. Gender ☐ Male ☐ Female

3. Race |___|___|___|___|___|___|___|___|___|___|___|___|

4. Marital status ☐ Single ☐ Married

3.Department |___|___|___|___|___|___|___|___|___|___|___|___

4. Position |___|___|___|___|___|___|___|___|___|___|_

5. Years of service |___|___| year/s

6. Education: |___|___|___|___|___|___|___|___|___|___|___

## Part B: Organizational Safety Climate and Safety Behaviour.

Factors about your organization, direct supervisor and co-workers on safety climate. Also on the individual safety attitudes. Please circle the best appropriate answer in the scale which relates to your current work

| Sangat tidak setuju (*Strongly disagree*) | Tidak setuju (*Disagree*) | Sedikit tidak bersetuju (Slighty Disagree) | Berkecuali / natural (*Neutral*) | Sedikit bersetuju (Slighty agree) | Setuju (*Agree*) | Sangat setuju (*Strongly agree*) |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Organizational safety climate**<br>***Iklim keselamatan organisasi*** | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| My Company…<br>*Tempat kerja saya…* | | | | | | | | |
| 1 | Provides all the equipment needed to do the job safely.<br>*Menyediakan semua peralatan yang diperlukan bagi menjalankan tugas dengan selamat.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2 | Quickly corrects any safety hazard even if it is costly.<br>*Segera membuat pembetulan jika terdapat bahaya keselamatan walaupun memerlukan kos yang tinggi.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3 | Considers a person's safety behavior when there are promotions.<br>*Mengambil kira tingkah laku keselamatan setiap individu sewaktu kenaikan pangkat.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4 | Invests a lot of time and money in safety training for workers.<br>*Menggunakan masa dan wang yang banyak dalam menjalankan latihan keselamatan kepada pekerja.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5 | Listens carefully to workers' ideas about improving safety.<br>*Mendengar dengan baik segala idea daripada pekerja dalam meningkatkan tahap keselamatan.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6 | Gives safety personnel the power they need to do their job.<br>*Memberi kuasa yang diperlukan oleh anggota keselamatan untuk menjalankan tugas mereka.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Supervisors' descriptive safety norms**<br>***Deskriptif penyelia terhadap norma keselamatan*** | | | | | | | | |
| My direct supervisor…<br>*Penyelia saya…* | | | | | | | | |
| 7 | Discusses with us how to improve safety.<br>*Berbincang dengan kami bagaimana untuk meningkatkan tahap keselamatan.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | Teaches us to identify safety problems before they arise.<br>*Mengajar kami mengenalpasti masalah keselamatan sebelum ianya terjadi.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9 | Besides demanding, explains to us why we should work in a safe way.<br>*Selain dari meminta, dia juga menerangkan kepada kami kenapa kami perlu bekerja dengan cara yang selamat.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Supervisors' injunctive safety norms**<br>***Injuksi penyelia terhadap norma keselamatan*** | | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| My direct supervisor thinks that…<br>*Penyelia saya berfikir bahawa…* | | | | | | | | |
| 10 | Safety rules should be respected, even when we are working under pressure.<br>*Peraturan keselamatan harus dipatuhi walaupun kami bekerja di bawah tekanan.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11 | Personal protective equipment (PPE) should be used, even if it is uncomfortable.<br>*Peralatan perlindungan diri (PPE) perlu digunakan, walaupun ianya tidak selesa.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12 | Work is to be done in a safe way, even when we are tired or stressed.<br>*Kerja perlu dilaksanakan dengan cara yang selamat, walaupun kami penat atau mengalami tekanan.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Co-workers' descriptive safety norms**<br>***Deskriptif rakan sekerja terhadap norma keselamatan*** | | | | | | | | |
| Members of my team work…<br>*Rakan sepasukan saya…* | | | | | | | | |
| 13 | Check if the other members of the team comply with safety rules.<br>*Memeriksa jika rakan sepasukan yang lain mematuhi peraturan keselamatan.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14 | Make sure the other members of the team comply with all safety rules and not just the most important ones.<br>*Memastikan rakan sepasukan yang lain mematuhi keseluruhan peraturan keselamatan dan bukan hanya pada peraturan yang penting sahaja.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15 | Say a "good word" to co-workers who pay special attention to safety.<br>*Mengatakan 'perkataan yang baik' kepada rakan sekerja yang memberi sepenuh perhatian kepada isu keselamatan.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Co-workers' injunctive safety norms**<br>***Injuksi rakan sekerja terhadap norma keselamatan*** | | | | | | | | |
| Members of my work team think that…<br>*Rakan sepasukan saya berfikir bahawa….* | | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 16 | We should discuss with other workers and the supervisor how to improve safety.<br>*Kami perlu berbincang dengan pekerja lain dan penyelia bagaimana untuk meningkatkan tahap keselamatan.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17 | Problems should be detected before they arise.<br>*Masalah harus dikesan sebelum ianya berlaku.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18 | Explain (and not only demand) why we should work in a safe way.<br>*Menerangkan (dan bukan sahaja meminta) kenapa kami harus bekerja dalam cara yang selamat.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Attitudes toward safety**<br>***Tingkah laku terhadap keselamatan*** | | | | | | | | |
| In my job…<br>*Dalam tugas saya…* | | | | | | | | |
| 19 | Compliance with safety rules is extremely detrimental / extremely beneficial.<br>*Mematuhi peraturan keselamatan adalah sangat merosakkan / sangat berfaedah.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20 | Actively participating in safety rules is extremely irrelevant/extremely relevant.<br>*Bergiat aktif mengambil bahagian dalam peraturan keselamatan adalah sangat tidak relevan/ sangat relevan.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21 | Actively participating in safety rules is extremely inappropriate/extremely appropriate.<br>*Bergiat aktif mengambil bahagian dalam peraturan keselamatan adalah sangat tidak sesuai / sangat sesuai.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Perceived control**<br>***Kawalan persepsi*** | | | | | | | | |
| 22 | I feel I don't have control over the safety performance on my job.<br>*Saya merasakan bahawa saya tidak mempunyai kawalan terhadap prestasi keselamatan dalam tugas saya.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23 | For me, working safely is extremely difficult / extremely easy.<br>*Bagi saya, bekerja secara selamat adalah sangat sukar / sangat mudah.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24 | It depends on me to work in a safe way.<br>*Ianya bergantung pada saya untuk* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | *bekerja secara selamat.* | | | | | | | |
| **Proactive safety behavior**<br>***Tingkah laku keselamatan proaktif*** | | | | | | | | |
| 25 | I have made suggestions to improve safety.<br>*Saya telah membuat cadangan untuk meningkatkan tahap keselamatan.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 26 | I have tried to encourage my colleagues to get involved in safety issues.<br>*Saya telah mencuba untuk menggalakkan rakan sekerja saya untuk terlibat dalam isu keselamatan.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 27 | I have acted to prevent the recurrence of previous incidents.<br>*Saya telah bertindak untuk mencegah berlakunya kejadian/peristiwa yang lalu.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Compliance safety behavior**<br>***Pematuhan tingkah laku keselamatan*** | | | | | | | | |
| 28 | I have used the appropriate PPE as indicated by the Department of Health and Safety.<br>*Saya telah menggunakan PPE yang sesuai seperti yang disarankan oleh Jabatan Kesihatan dan Keselamatan.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 29 | I properly performed my work while wearing PPE.<br>*Saya melakukan kerja saya dengan baik semasa memakai PPE.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 30 | I have taken the appropriate steps to prevent exposure to hazards and risks.<br>*Saya telah mengambil langkah yang sesuai untuk untuk mengelakkan pendedahan kepada bahaya dan risiko.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

If you wish to elaborate on some of your answers, or if you have any comments regarding the study, you are welcome to write them here.
Comments:

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☺Thank you for filling in the questionnaire