

UNIVERSITY OF KWAZULU-NATAL

**EMPLOYEE PERCEPTIONS OF SAFETY CULTURE AND THE EFFECTS ON
SAFETY PERFORMANCE AT A.P. MOLLER TERMINALS (APM TERMINALS)
CAPE TOWN**

by

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degree of**

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DECLARATION

I, Edith Thandeka Ziqubu declare that:

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ABSTRACT

Safety culture has become the buzzword in determining an organisation's safety performance and as such, it has become imperative for organisations to be aware of the state of their safety culture as a tool to driving organisational performance. This study aims to investigate employee perceptions of safety culture at APM Terminals, Cape Town branch, and the effects on safety performance. The study was approached from the positivist philosophy using the quantitative methods with a five-point Likert scale questionnaire used as the data collection instrument. Data were gathered from a population of 110 employees, from which a sample of 80 participants was selected using the stratified random sampling technique. Data analysis was conducted on SPSS version 24, using descriptive and inferential statistical methods.

The results of the study indicated that the safety culture maturity level at APM Terminals borders between the reactive level, calculative level and the proactive level. The participants observed visible management commitment to safety. However, at a departmental level, the participants' perceived absence of safety. The culture of reporting incidents was perceived to be that of no blame, this is indicative of a proactive safety culture. The existence of these organisational characteristics is indicative of a calculative safety culture. However, the participants perceived that production was prioritised over safety, which is indicative of a reactive safety culture. On the factors that affect safety culture, the participants felt informed on safety issues, they perceived leadership involvement as important, however, the factor on supervisor attitudes was perceived to be negative. There was a strong emphasis placed in the reporting of incidents and near misses, there was presence of a learning culture to prevent the reoccurrence of incidents. The study recommended that supervisors should ensure continuous role modelling by utilising skills obtained from the safety leadership program, practical initiatives to promote safety at departmental level were provided and safety culture training was suggested to allow employees to understand their roles in building a positive safety culture.

Key words: employees; safety culture; safety culture maturity level; safety performance and safety leadership.

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LIST OF ACRONYMS

APM:	A.P. Moller
HSE:	Health and safety executive
MBA:	Master of Business Administration
SC:	Safety culture
SCM:	Safety culture maturity
SP:	Safety performance

CHAPTER ONE: INTRODUCTION

1.1 Introduction

Safety culture is concerned with employee attitude, behaviour and perceptions regarding workplace safety (Cox & Cox, 1991). Several factors affect safety culture, such as visible management commitment, communication based on trust and respect, employee and management involvement, reporting incidents and safety training, to mention a few (Andi, 2008). The presence or absence of these factors shapes the safety culture of an organisation into a positive or negative safety culture (Cox & Cheyne, 2000). While these factors are central in defining an organisation's safety culture, attitudes and behaviours of both employees and management play a key role as well (Cheyne et al. 1998). According to Ostrom et al. (1993) workplace injuries occur because of non-compliance to company policies and procedures, this non-compliance is driven by poor attitudes, behaviours and perceptions where there is a lack of prioritisation of safety issues, leading to an increase in injuries and ultimately impacting on productivity and organisational performance (Siu et al., 2004). Safety culture has become the buzzword in determining an organisation's safety performance and as such, it has become imperative for the management of every organisation to be aware of the state of their organisational safety culture, as a tool to driving organisational performance.

This study seeks to determine the safety culture maturity level as a diagnostic tool to determine the current safety culture maturity level. This is followed by an examination of the numerous factors that affect safety culture. The study further seeks to understand the relationship between safety culture and safety performance.

In view of the above, this chapter introduces the study by providing a detailed background to the study, while the key elements of the study are provided and these include motivation for the study, focus of the study, problem statement, objectives and the research questions.

1.2 Background to the study

APM Terminals, Cape Town branch, was established in 2001. APM Terminals Cape Town consists of depot and trucking operations. The Cape Town branch is the largest operation within the APM Terminals Inland Services Southern African region. The organisation is a subsidiary company to Maersk Group, a global shipping giant and has two core business functions: terminal operations and inland container services. Globally, APM Terminals has footprints in 41 countries, with 76 terminal facilities. It also operates 103 inland services, specialising in the handling, transportation, repair and maintenance of containers (APM Terminals, 2017).

Globally, APM Terminals is on a journey to safety excellence, where the focus is on building a robust safety culture in all its operations (APM Terminals, 2017). The company has since embarked on numerous safety initiatives to develop a mature safety culture globally. In this regard, the Cape Town branch was chosen for this study because, as the biggest branch, it has the most challenges, both from the operational standpoint, as well as from the safety perspective. As part of the safety excellence journey, safety leadership programmes were rolled out globally. This programme was targeted at managers from all organisational levels within APM Terminals Inland Services, Southern African Region. Thus, the management from the Cape Town branch was part of the safety leadership workshops that were rolled out. Post the workshop sessions, the managers committed to implementing the skills they learnt at the safety leadership workshops to enhance the safety culture at their respective branches. However, for the Cape Town branch, there have been numerous incidents because of non-compliance with regards to safety. In view of this, the researcher felt the need to assess employee perceptions of the

safety culture in this organisation, to ascertain the current safety culture maturity level and to further determine the factors affecting safety culture, as well as to understand the relationship between safety culture and safety performance.

To ensure a robust safety culture exists, it is important to fully understand employee perceptions of the safety culture and its effects on safety performance (Siu et al., 2004). Therefore, conducting this study might provide the required knowledge in terms of where APM Terminals Inland Services is, in its safety culture journey.

1.3 Problem statement

This study investigates the safety culture maturity level and its effect on safety performance at AMP Terminals, Cape Town branch. Initiatives have been introduced as part of the safety culture journey towards achieving full safe operations at APM Terminals (APM Terminals, 2014). Safety leadership workshops were rolled out to all senior managers, middle managers and supervisors within the Southern African Inland Services. As part of the safety leadership program, managers were taught how to motivate others to work safely, how to deal with safety challenges and how to be exemplary. Since the roll out of safety leadership workshops to date, there have been several incidents that have occurred at the Cape Town branch. It is not clear why these incidents have been occurring, nor is it clear whether the managers have been able to utilise the skills they learnt from the safety leadership workshops to mould employee behaviours and perceptions to positive ones, as well as to improve the state of safety culture. Therefore, this study seeks to investigate employee perceptions of safety culture and its effect on safety performance at AMP Terminals, Cape Town branch.

The main research question that this study seeks to answer is: What are the employee perceptions of safety culture and what effect does it have on safety performance?

1.4 Aims of the study

The aim of the study is to investigate employee perceptions of safety culture and its effect on safety performance. To achieve this, the researcher measured employee perceptions of the safety culture maturity level at APM Terminals, Cape Town branch.

1.5 Objectives of the study

The following are objectives of this study:

- To determine the safety culture maturity level at APM Terminals, Cape Town branch.
- To determine the factors affecting safety culture at APM Terminals, Cape Town branch.
- To investigate the relationship between safety culture and safety performance APM Terminals, Cape Town branch.
- To propose recommendations that would promote a positive safety culture, thereby improving the overall organisational performance at APM Terminals, Cape Town branch.

1.6 Research sub-questions

To answer the main research question, the following questions were identified:

- What is the safety culture maturity level at APM Terminals, Cape Town branch?
- What are the factors affecting safety culture at APM Terminals, Cape Town branch?
- What is the relationship between safety culture and safety performance? APM Terminals, Cape Town branch?

- What recommendations can be made to promote a positive safety and thus improve the overall organisational performance at APM Terminals, Cape Town branch?

1.7 Significance of the study

A safety culture that is shared and embraced by all employees in an organisation is central in assisting the management to achieve a set organisational goals and objectives. This study would benefit APM Terminals by promoting the understanding and the role of safety culture within APM Terminals. It would help in identifying the gaps within the existing safety culture at APM Terminals. The findings of this study might therefore enlighten the management on the important steps that they need to take to promote a positive safety culture within APM Terminals.

Employers from other sectors might also benefit from this study, as they can use the recommendations provided, to understand and better improve their own company safety culture and implement initiatives that would ensure that the reduction of injuries is achieved. The findings from this research might also benefit the Department of Labour policy makers to develop policies that would mandate employers to implement safety culture initiatives to drive compliance to the Occupational Health and Safety Act, thus ensuring a reduction in occupational injuries. Students conducting safety culture research can also use this study as a reference source.

1.8 Focus of the study

This study focuses on the permanent employees at APM Terminals, Cape Town branch. Thus, the employees from the operations and administration departments were included. The Cape Town branch of APM Terminal is one of seven branches within the Southern African Region Inland Services and it consists of gate

operations, workshop, wash bay, reefer and administration departments. The study focused on these departments.

1.9 Methodology

The study was approached from the positivist philosophy using the quantitative methods, with a five-point Likert scale questionnaire used as the data collection instrument. Data for the study were gathered from a population of 110 employees, from which a sample of 80 participants was selected using the stratified random sampling technique.

The data gathered from the participants were coded into SPSS datasets. Data analysis was conducted on SPSS version 24, using descriptive and inferential statistical methods. Descriptive statistics was presented using frequency tables and bar graphs to indicate perceptions among the participants, while inferential statistics involved determining Cronbach alpha to determine internal consistency in the questionnaire. To determine validity, a pre-test was performed by piloting the questionnaire to a small group to determine the accuracy and relevancy in the content of the questions. To understand the relationships among the variables, coefficient correlations were performed.

1.10 Chapter outline

This study consists of six chapters which are briefly outlined below:

Chapter One: Introduction

A broad introduction about the topic under study is provided. The focus and motivation of the study is provided. The research problem, along with the research questions and objectives, are presented. A brief explanation of the research methodology adopted is discussed.

Chapter Two: Literature review

This chapter provides a review of literature on safety culture. It provides a theoretical background and overview of the concept of safety culture. This chapter further discusses literature on the factors affecting safety culture, while it also discusses the theoretical frameworks related to safety culture maturity. In addition, literature on the relationship between safety culture and safety performance is discussed.

Chapter Three: Research methodology

This chapter discusses the research methodology, highlighting the research design, research paradigm, sampling methods, study setting, data collection methods, the data analysis techniques adopted, reliability, validity issues, as well as the bias that was encountered and ethical considerations.

Chapter Four: Presentation of results

This chapter presents the study results in the form of frequency tables and graphs. The chapter also provides the analysis and interpretation of results.

Chapter Five: Discussion of results

This chapter discusses the study findings by linking them back to the literature discussed in the previous chapters.

Chapter Six: Conclusions and Recommendations

This chapter links the study objectives to the findings and draws the study to a conclusion.

1.11 Summary

This chapter has introduced the study by highlighting the topic under study. It has highlighted the constructs that guide this study. The next chapter provides a literature review on safety culture; it will discuss an overview of the concept of

safety culture, the origins of safety culture, the definitions, models and examine literature on the key concepts underpinning the study.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter includes the review of the relevant literature on safety culture. The chapter begins by providing a theoretical background to the concept of safety culture. Next, the existing knowledge on the key concept is discussed, including the definitions and origins of safety culture. This literature review further highlights the existing disputes in literature, in relation to the concepts of safety culture and safety climate. An overview of the different safety culture theoretical frameworks is presented. The factors affecting safety culture, the relationship between safety culture between and safety performance, are also explored and analysed. The review concludes with a summary identifying the gaps in the existing knowledge.

2.2 Background

Generally, in the field of health and safety, the term safety culture is understood to refer to the management of health and safety, with a specific focus to achieving and improving compliance levels, as well as reducing workplace injuries (Cole et al., 2013). In South Africa, the concept is not as prevalent as in the first world countries. In the United Kingdom for instance, the Health and Safety Executive (HSE) conducted numerous safety culture studies and as the independent authority focusing on workplace health and safety, HSE encourages companies in the United Kingdom to implement safety culture initiatives as part of the workplace health and safety programmes (Cox & Flin, 1998). Despite the vast amount of research studies that have been conducted world-wide, there is still confusion surrounding the concept of safety culture (Zhang et al., 2002). This section provides the origins of safety culture and the definitions from different researchers. Furthermore, the literature on the concepts of safety culture and safety climate is reviewed, with a view to understand the distinction between the two concepts.

2.3 Overview of the APM Terminals commitment to safety

Globally, APM Terminals is on a journey of driving safety in all its operations. The safety culture journey is mapped out from the company's headquarters in The Hague, regional levels and throughout all local entities across the world. To make APM Terminals a safe working environment, five hazardous activities that yielded the most injuries and fatalities were identified.

The APM Terminals' Fatal 5 standards consists of five hazards as indicated in Figure 2.1



Figure 2.1: APM Terminals' Fatal five standards Adapted from: (APM Terminals, 2014:9)

The Fatal 5 standards are made up of hazards pertaining to working in elevated positions, contractor control, hazards from stored energy, hazards from suspended loads and transportation hazards. These five hazards forming the Fatal 5 standards form a safety framework that was developed with the main aim of controlling exposures that could lead to injuries and fatalities. The goal of the Fatal 5 standards is to create a hazard free working environment and improve safety performance (APM Terminals, 2014).

The implementation of the Fatal 5 standards is mandatory to all APM Terminals' operations, globally. The management of the Fatal 5 standards is crucial for ensuring proper control of activities that could lead to potential serious injuries, fatalities and property damages. To reinforce positive behaviours towards the importance of safety, the adoption theme for the fatal 5 standards "Rules to Live By" was introduced (APM Terminals, 2014). Safety culture at APM Terminals is driven from safety leadership initiatives that require managers to demonstrate visible commitment to safety. Four key pillars form the basis from which to maintain safety work environments which include operational risks, leadership and culture, technology and innovation, as well as capability and learning. It is clear that safety is at the top of priorities for APM Terminals globally and as such, developments of safety culture initiatives are driven from the top throughout the organisation.

2.3.1 Safety culture origins

The term safety culture first appeared in 1987 after the International Nuclear Safety Advisory Group issued a report on the Chernobyl disaster (Pidgeon, 1991). Following this incident, safety culture became the industry focus, as different industries, especially high-risk industries, felt a pressing need to enhance compliance to reduce workplace incidents. The acceptance that safety culture is important in preventing workplace incidents has seen several safety culture studies being conducted to define and understand the concept better (Parker, Lawrie & Hudson 2006). The concept of safety culture has its origins in the social psychological and organisational psychology backgrounds (Guldenmund, 2000; Zohar, 2010). Several researchers regard safety culture as a subset of organisational culture (Cooper, 2000).

2.3.2 Safety culture defined

The concept of safety culture has been studied broadly for more than three decades, yet there is still no generally accepted definition. This lack of agreement

in defining safety culture creates confusion (Guldenmund, 2010; Misnan & Mohammed, 2007). The absence of clarity around the concept of safety culture encumbers its advancement with the changing working environment, as well as the practical application of safety culture at industry level.

Table 2.1: Definitions of Safety Culture

Source/Industry	Definitions
Cox and Cox (1991)	Safety culture reflects the attitudes, beliefs, perceptions and values that employees share in relation to safety (safety culture).
International Safety Advisory Group (1991)	Safety culture is that assembly of characteristics and attitudes in organisations and individuals, which establishes that as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance (safety culture).
Pidgeon (1991)	The set of beliefs, norms, attitudes, roles as well as social and technical practices that are concerned with minimising the exposure of employees, managers, customers and members of the public, to conditions considered dangerous or injurious (safety culture).
Ostrom et al. (1993)	The concept that the organisation's beliefs and attitudes, manifested in actions, policies and procedures, affect its safety performance (safety culture).
Geller (1994)	In a total safety culture (TSC), everyone feels responsible for safety and pursues

	it daily (safety culture).
Berends (1996)	The collective mental programming towards safety of a group of organisational members (safety culture)
Lee (1996)	The safety culture of an organisation is the product of individual and group values, attitudes, perceptions, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of, and the organisation's health and safety management (safety culture)
Kennedy and Kirwan (1998)	An abstract concept, which is underpinned by the amalgamation of individual and group perceptions, thought processes, feelings and behaviours which in turn gives rise to the particular way of doing things in the organisation. It is a sub-element of the overall organisational culture (safety culture)
Hale (2000)	Refers to the attitudes, beliefs and perceptions shared by natural groups as defining norms and values, which determine how they act and react in relation to risks and risk control systems (safety culture)
Glendon and Stanton (2000)	Compromises attitudes, behaviours, norms and values, personal responsibilities, as well as human resource features such as training and development (safety culture)
Guldenmund (2000)	Those aspects of the organisational

	culture, which will impact on the attitudes and behaviour related to increasing or decreasing risk (safety culture)
Cooper (2000)	Culture is the product of multiple goal-directed interactions between people (psychological), jobs (behavioural) and the organisational (situational); while safety culture is that observable degree of effort by which all organisational members direct their attention and actions towards improving safety daily (safety culture)
Mohamed (2003)	A sub-facet of organisational culture which affects the workers' attitudes and behaviour in relation to an organisation's on-going safety performance (safety culture)
Richter and Koch (2004)	Shared and learned meanings, experiences and interpretations of work and safety – expressed partially symbolically- which guide people's actions towards risk, accidents and prevention (safety culture)
(Zohar, 1980) Manufacturing, including metal, food, chemical and textile, Israel	Safety climate is an organisational climate which reflects employees' perceptions about the relative importance of safe conduct in their occupational behaviour. It can vary from highly positive to a neutral level and its average level reflects the safety climate in each company.
Nuclear Regulatory Commission (2011)	Nuclear Safety Culture is the core

	values and behaviours resulting from a collective commitment by leaders and individuals to emphasise safety over competing goals to ensure protection of people and the environment.
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Adapted from (Cole, Stevens-Adams & Wenner, 2013:15)

The safety culture definitions presented in Table 2.1 have some form of similarities. Words such as attitudes, beliefs and perceptions are common in these definitions (Hale, 2000; Pidgeon, 1991; Guldenmund, 2000). Some definitions highlight shared perceptions as a common feature (Hale, 2000; Cox and Cox, 1991). The control of risk and improvement of safety is also highlighted by (Guldenmund (2000); Hale, 2000). Guldenmund (2000) defines safety culture as an element of organisational culture. This notion is further supported by (Cooper, 2000). Safety culture is a sub element of organisational culture (Zohar, 1980).

2.3.3 Safety climate defined

Within the organisational culture field, Zohar (1980) is regarded as the pioneer in safety climate research. He was the first researcher who studied safety climate by extrapolating it from the foundations of the organisational climate paradigm. He paved a way for future research in safety climate research and ultimately, the introduction of the concept of safety culture. Several scholars studied safety climate (Glennon, 1982; Dedobbeleer and Béland, 1991; Flin et al., 1998; Flin et al., 2000; Fogarty and Shaw, 2003; Cooper and Phillips, 2004; Clarke, 2006; Clarke, 2010). However, with the emergence of the safety culture concept, there was confusion in distinguishing the two terms. Several academics conducted a number of studies in an attempt to better understand the two concepts and highlight the differences, if any (Guldenmund, 2000; Edwards et al., 2013; Hale, 2000; Yule, 2003).

Table 2.2: Definitions of Safety Climate

Source/Industry	Definitions
(BASI 1996) Civil aviation, Australia	The procedures and rules governing safety within an organisation are a reflection of its safety climate, which is centred around employees' perceptions of the importance of safety and how it is maintained within the workplace.
(Cheyne, Cox, Oliver, & Thomas, 1998) Manufacturing, UK and France	Safety climate can be viewed as a temporal state measure of culture, which is reflected in the shared perceptions of the organisation at a discrete point in time.
(Dedobbeleer & Beland 1991) Construction, US	Safety climate is viewed as an individual attribute, which is composed of two factors: management's commitment to safety and workers' involvement in safety.
(Flin, Mearns, Gordon & Fleming 1998) Offshore oil and gas, UK	Safety climate refers to the perceived state of safety of a place at a particular time. It is therefore relatively unstable and subject to change, depending on the features of the operating environment.
(Flin, Mearns, O'Connor, & Bryden 2000) Review of various industries, only one aviation related study	Safety climate is the surface features of the safety culture discerned from the workforce's attitudes and perceptions at a given point in time.
(Griffin & Neal 2000) Manufacturing and Mining, Australia	Safety climate should be conceptualised as a higher-order factor comprising more specific first-order factors. First-order factors of safety climate should

	reflect perceptions of safety-related policies, procedures and rewards. The higher order factor of safety climate should reflect the extent to which employees believe that safety is valued within the organisation.
(Hofmann & Stezer 1996) Utilities, US)	Safety climate is operationalised as perceptions regarding management's commitment to safety and worker involvement in safety-related activities.
(Mearns, Whitaker, Flin, Gordon & O'Connor 2000) Offshore oil, UK	Safety climate is defined as a "snapshot" of employees' perceptions of the current environment or prevailing conditions, which impact upon safety.
(Minerals Council of Australia 1999) Minerals, Australia	Safety climate refers to the more intangible issues in the company, such as perceptions of safety systems, job and individual factors.
(Yule, Flin, & Murdy 2001) Conventional power, UK	Safety climate is defined as the product of employee perception and attitudes about the current state of safety initiatives at their place of work.
(Zohar 1980) Manufacturing, including metal, food, chemical and textile, Israel	Safety climate is an organisational climate which reflects employees' perceptions about the relative importance of safe conduct in their occupational behaviour. It can vary from highly positive to a neutral level and its average level reflects the safety climate in a given company.
(Zohar 2000) Manufacturing, Israel	Manufacturing, Israel Group level safety climate refers to the

	shared perceptions among group members, with regards to supervisory practice
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Adapted from (Wiegmann, von Thaden, & Gibbons: 2007:4)

As indicated in Table 2.2, safety climate definitions also carry common themes as was seen in the safety culture definitions. Themes such as shared perceptions, norms, beliefs and assumptions among groups, individuals and management commitment, concerning the working environment, are dominant. Other researchers define safety climate as a temporal state that is subject to change. This highlights safety climate as highly unstable. Helmreich and Merritt (1998) argue that safety culture is more resistant to change and more stable, as compared to safety climate.

Several studies reviewed indicated that safety culture and safety climate are used interchangeably (Zohar, 2014; Mearns and Flin, 1999; Wiegmann et al., 2007). However, Mearns et al. (2000) differentiated safety climate from safety cultures and defined safety climate as a synopsis of employee perceptions, beliefs and attitudes concerning workplace safety standards, while safety culture is regarded as a constant attribute that indicates significant standards, expectations and norms. Other researchers included individual attributes in their definitions of safety climate (Dedobbeleer and Béland, 1991; Yule, 2003) while Zohar (1980) defines safety climate along group perceptions. Hudson (2001b) argues on the appropriate use of the term safety climate by Zohar (1980) and states that Zohar (1980) ought to have used safety culture instead. According to Wiegmann et al. (2007), safety culture refers to a permanent state within an organisation, while safety climate is referred to as an interim state within an organisation, that can be influenced by economic and operational conditions .

In summary, the review of the two concepts reveals that both safety culture and safety climate are concerned with aspects of shared perceptions, values, attitudes

and behaviour at individual and organisational levels. Safety culture speaks to how things are done in an organisation and how employees do things, while safety climate is concerned with employee perceptions of workplace safety. In essence, safety climate presents the state of being concerning the safety culture. From literature review, the distinction between the two concepts is not very clear because of decades of confusion surrounding the two terms in practice. Hopkins (2005) argues that the two concepts should be regarded as the same. From the definitions reviewed, even though there is ambiguity in defining the two concepts, several researchers agree that both safety culture and safety climate are crucial concepts that can be used by organisations to improve workplace safety and performance.

2.4 Factors affecting safety culture

Several research studies found various factors which affect safety culture. Zohar (1980) conducted an explanatory study by administering a 40-item questionnaire to 20 different Israeli organisations. The findings of this study found eight factors affecting safety culture and these included commitment from management, training in safety, status of health and safety officers, status of health and safety committees, level of risk, employee social status, workplace safety promotion and rate of work. Glennon (1982) administered a 68-item questionnaire to eight Australian mining industries. He identified nine factors as opposed to the eight that were initially identified by (Zohar, 1980). However, in a confirmatory study conducted by Brown and Holmes (1986) on ten American manufacturing companies, the study results identified only three factors that affected safety climate and these included perception of risk, action by management and management concern. Hee (2014) examined the role of safety culture in the Malaysian manufacturing industry. The results of his study identified three factors crucial to safety culture and these were support from leadership, commitment from management and successful safety management systems. Wamuziri (2011) examined the factors that contributed to a positive and negative safety culture in construction. The study results revealed six factors that affected safety culture and these included leadership commitment to safety, involvement from all

organisational levels, scope of work and inherent risks, safety leadership training, trust and open communication, as well as behaviour based safety programmes. Pungvongsanuraks et al. (2010) suggested leadership factors, people factors, stakeholder collaboration, as well as procedures and rules, as the five key factors essential for improving safety culture. Zhang and Gao (2012) showed that the factors affecting safety culture in Chinese construction industry were comprehensive. They identified six factors that affected safety culture and these included legislative requirements, social aspects, group aspects, conditions of the project, internal enterprise and state of industry. Cox and Cheyne (2000) assessed safety culture in three offshore companies. The overall results of their study highlighted management commitment and leadership style, as well as the development of safety management system, as the crucial factors affecting safety culture. Common factors that were similar in most studies were perceived management commitment, perceived safety training, perceived safety awareness and perceived risk levels. This is supported by the findings of Flin et al. (2000), who found that factors related to management were dominant in 72% of the studies conducted. Andi (2008) noted that management commitment was a fundamental driver of safety culture.

The implementation of safety culture should be driven from top down; management should display full commitment to safety initiatives. Management support of safety initiatives positively affects safety culture (Hinze and Gambatese, 2003). How management communicates and displays commitment to safety has a direct effect on employee behaviour, which ultimately affects the safety culture. Although positive management commitment has been highlighted as an important factor, Clarke (1999) argued that there are no guarantees that management commitment will transcend to all levels in an organisation. Pidgeon (1991) asserted that individual commitment is equally important to management commitment in ensuring a positive safety culture. Hassan et al. (2007) also suggested that organisational commitment and communication improves accident reporting and employees highly perceive management commitment and the active roles played by supervisors.

Mearns and Flin (1999) highlighted the difference in the identification of factors in safety climate and safety culture studies. They argued that in safety climate studies, the factors identified are concerned with perceptions of employees concerning the existing conditions that affect safety climate, while safety culture studies identified more difficult and numerous factors linked to personal issues. In view of the inconsistencies in the identification of factors affecting safety culture or climate, this review highlighted that leadership commitment was a dominant factor across most studies reviewed. This view is supported by Wamuziri (2011), who highlighted the lack of agreement on the factors that affect safety climate.

2.4.1 Leadership role in safety culture

This review has highlighted several factors that affect safety culture. Noticeably, the leadership role, loosely referred to as management commitment, is a common factor across several studies reviewed (Zohar, 1980; Andi, 2008; Hassan et al., 2007). Roughton and Crutchfield (2013) pointed out that the proactive role played by leadership is important in setting the tone for safety culture. Extensive research has been conducted within the field of organisational culture, where leadership was found as the main driver of organisational culture (Schein, 2010). Hoffmeister et al. (2014) discussed transformational and transactional leadership in association with a positive safety performance.

Zohar (2002) demonstrated that transformational and transactional leadership were crucial in influencing employee safety perceptions. Leaders with strong transformational leadership style are able to influence their employees to work safely, thereby improving safety performance (Blair, 2003). Zohar (2000) also stated that transformational leadership style ensures that managers can listen to employees and effect preventative measures to decrease injuries. Transformational leaders are charismatic, inspirational, motivating and understanding (Flin and Yule, 2004). A leader should be able to articulate a clear safety vision and a sense of pride to employees. He should “walk the talk” and

inspire employees to comply with safety rules and procedures (Krause and Weekley, 2005b; Bass and Avolio, 1993). Skeepers and Mbohwa (2015) argued that the safety culture leadership role in the workplace should not be delegated to employees. Flin and Yule (2004) suggested that both transactional and transformational leadership traits are important at the supervisory level. Flin and Yule (2004) conducted a study to assess safety leadership in a medical setting. They highlighted the importance of transformational leadership styles, which influence safety culture at different management levels. According to Yang et al. (2009), there are three interlinked components that drive leadership behaviour to achieve safety performance, as shown in Figure 2.2.



Figure 2.2: The model relating leadership behaviour, safety culture, and safety performance Adapted from (Yang et al., 2009:549)

The model as suggested by Yang et al. (2009), highlighted associations based on leadership behaviour, safety culture and safety performance. They concluded that a relationship exists between leadership behaviour, safety culture and safety performance. Their study indicated that safety performance is affected by safety culture. Leadership behaviour affected safety culture and indirectly affected safety performance.

2.5 Theoretical framework of safety culture

Misnan and Mohammed (2007) highlighted the poor advancement of theoretical frameworks in relation to safety culture. Several researchers proposed numerous models with differing perspectives. Some models outline the components that make up culture, others describe the factors that lead to workplace incidents, other

models describe the link between safety culture and safety performance, while other frameworks describe the maturity stages of safety culture. (Cooper (2000); Guldenmund, 2000) explained safety culture as an element of organisational culture and as such, the approach of this review will follow the evolution of culture from the perspective of organisational culture through to the safety culture maturity models. According to Choudhry et al. (2007), safety culture models describe the process by which safety culture is linked with organisational safety management practices. The main characteristics of an organisation's safety culture are embedded on shared perceptions amongst management and employees regarding the importance of workplace safety (Clarke, 1999). The evolution of safety culture has seen the introduction of maturity models (Westrum, 1993; Hudson, 2001a; Fleming, 2000), which is based on five maturity levels, from the pathological level through to the generative level. This study analyses Schein's three culture model, Westrum's original model, Geller's total safety culture model, as well as Hudson's safety culture maturity model, to highlight the advancements made in safety culture models

2.5.1 Schein's three culture model

According to Schein (1996), there are three levels of cultures: artefacts, espoused values and underlying assumptions, as evidenced in Figure 2.3.

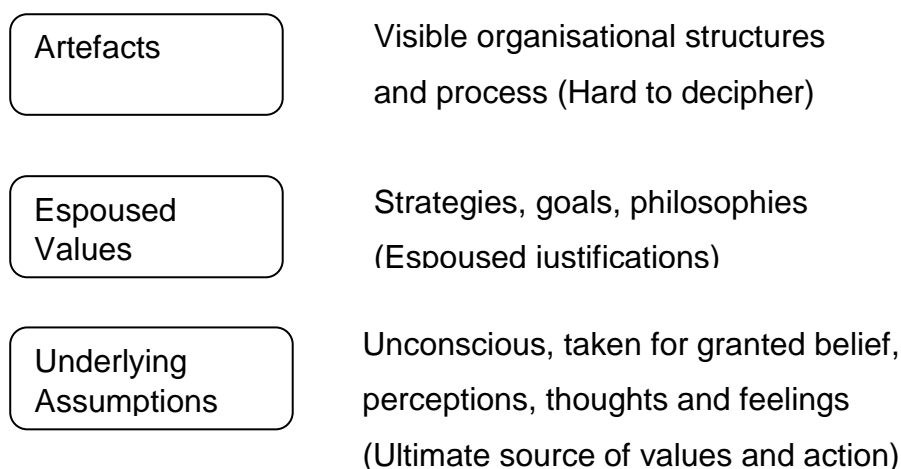


Figure 2.3: Three levels of culture Adapted from (Schein, 1996:9)

According to Schein (1996), culture consists of three levels, where culture exists from the levels of being visible to that of being invisible in an organisation. Schein (1996) regards the first level of culture as the culture that can be easily observed, seen and heard. At this level, the behaviour of employees exposes the organisational culture. At the second level, espoused level, there are observed inconsistencies in the way things are done at an organisation and to get insights on the culture of how things are done, one must enquire by asking questions to get to understand the culture better. The third level requires deeper understanding and enquiry about the historical background of the organisations to understand the underlying assumptions, values and norms embedded on how the organisation functions.

2.5.2 Gellor's (1994) Safety triad

According to Geller (1996), safety culture is embedded in three elements: person, environment and behaviour, as shown in Figure 2.4.

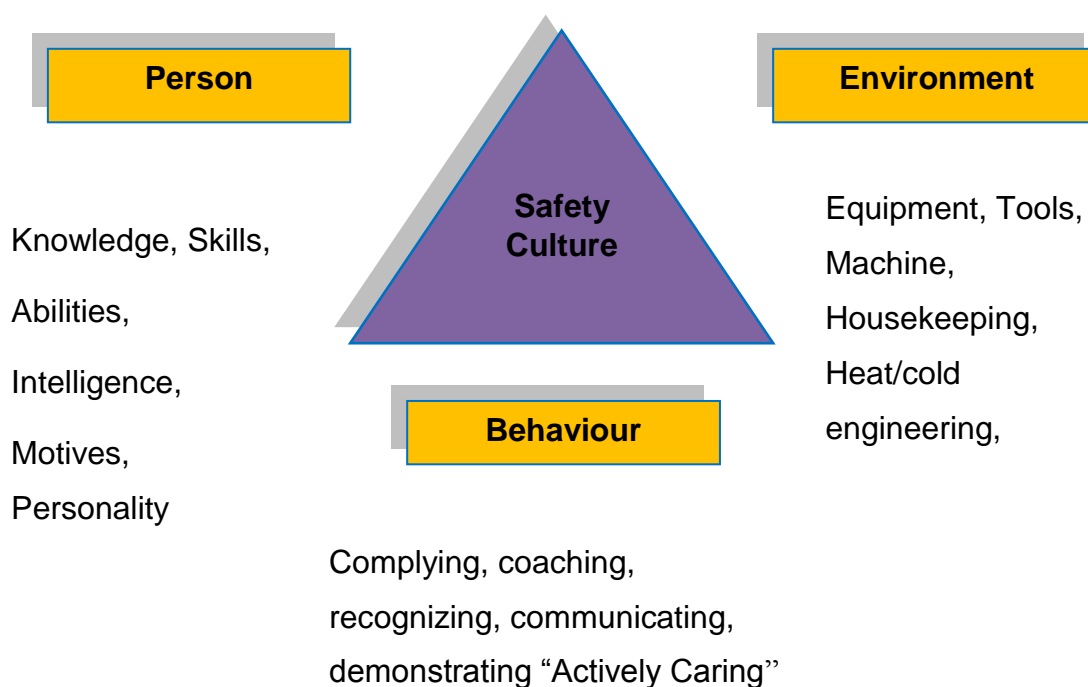


Figure 2.4: Gellor's Safety Triad Adapted from (Fang & Wu, 2013:138-149)

According to Geller (1996), safety culture is entrenched in three key elements which involve personal, environmental and behavioural factors. The personal factors reflect the employee's capabilities to perform, behavioural factors reflect the employee's attitude in ensuring they work safely and follow safety rules and procedures, while environmental factors refer to the safe, hazard free working environment (Geller, 1996). The three factors in Gellor's safety triad are integrated such that a change in one factor influences the other factors (Hassan et al., 2007). The fundamental premise of the safety triad is that safe thinking leads to change in behaviour, where employees act and work safely. This transcends to a changed environment. However, Fang and Wu (2013) argued that this model does not highlight the association between person, behaviour and environmental factors.

2.5.3 Westrum's original model

According to Westrum (1993), there are three forms of cultures: pathological, bureaucratic and generative, as evidenced in Table 2.3.

Table 2.3: Westrum's evolutionary model of safety culture

Pathological	Bureaucratic	Generative
Information is hidden	Information may be ignored	Information is actively sought
Messengers are "shot"	Messengers are tolerated	Messengers are trained
Responsibilities are shirked	Responsibility is compartmented	Responsibilities are shared
Bridging is discouraged	Bridging is allowed but discouraged	Bridging is rewarded
Failure is covered up	Organisation is just and merciful	Failure causes enquiry
New ideas are crushed	New ideas create problems	New ideas are welcome

Adapted from (Hudson, 2001:4)

Westrum (1993) categorised information processing at an organisational level. He highlighted that at the pathological level, employees tend to withhold information, there is usually fear of victimisation to report and poor cooperation between managers and employees, at the bureaucratic level. In the same way, organisations shield departments that neglect organisational rules and at the generative level, employees proactively seek information and the level of trust among employees and management is high.

2.5.4 The APM Terminals Safety Model

According to the APM Terminals safety model, there are three components that are centred on the safety for life core safety value, as indicated in Figure 2.5.

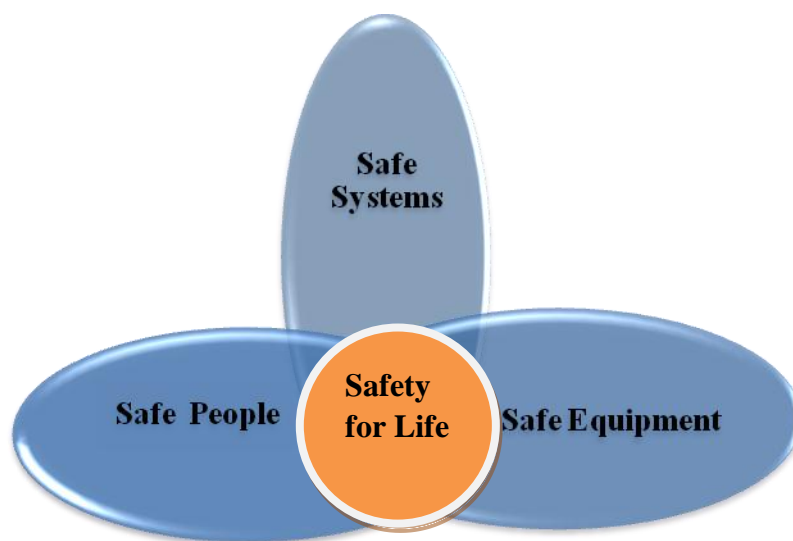


Figure 2.5: Safety for life model Adapted from (APM Terminals:2014:9)

According to the APM Terminals safety for life model, the building blocks for a positive safety culture are rooted on leadership commitment that promotes the creation of safe operations, where employees work with safe equipment and safe systems, thus ultimately ensuring that employees are safe (APM Terminals,2014).

2.5.5 Hudson's safety culture maturity model

According to Hudson (2001a) safety culture maturity levels consist of five maturity levels as shown in Figure 2.6.

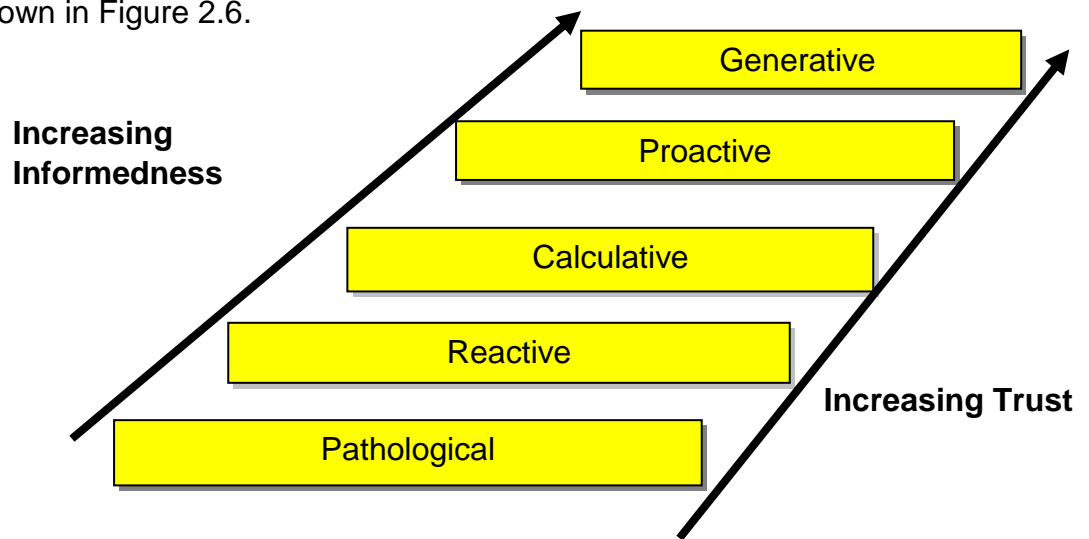


Figure 2.6: Hudson's Safety Culture Model (2001) Adapted from (Hudson: 2001:5)

According to Hudson (2001a), the maturity of safety culture consists of five maturity stages which include the pathological level, the reactive level, the proactive level and the generative level. The safety culture maturity model is an extension of the model developed by Westrum (1993). Figure 2.3 shows the maturity stages according to Hudson's (2001) model. Each stage of the maturity level according to (Hudson, 2001a) is explained below:

Pathological – There is lack of health and safety awareness. No attention is given to health and safety compliance, the focus is on production and not being caught by authorities. Employees are production factors and can be replaced anytime.

Reactive – Production is prioritised over safety. Action is only taken after incidents. Compliance framework covers minimum legal requirements.

Calculative – Safety rules and procedures are in place for the management of hazards. Safety is driven from the top and there are agreed targets to measure safety performance. There is mutual trust and open communication about safety issues that can be improved.

Proactive – Hazards are anticipated before any task is carried out and control measures are put in place. There is confidence among employees and

management that work can be done in a safe manner. Employees are free to report what can be improved. Incidents are regarded as opportunities for learning. The culture is safe, operations or no operations are permitted in unsafe conditions.

Generative –Safe operations are imperative in all business functions. Safety revolves around everything the company does. There is mutual respect and support at all levels. There is a lot of trust at all levels and information is always shared. Employees are always alert and are constantly looking for ways to improve health and safety. Informedness and trust increases as the culture matures from each level.

This study adopted Hudson's (2001) safety culture maturity model. The safety culture maturity model is useful because it allows organisations to determine the existing levels of safety maturity and can thus assist organisations to identify and implement the actions necessary to enhance their safety culture. According to Goncalves Filho et al. (2010), a safety culture maturity framework serves as a diagnostic tool which managers could use to identify specific organisational characteristics which can be used to shape the safety culture.

In a safety culture maturity study conducted on petrochemical industries in Brazil, Goncalves Filho et al. (2010) concluded that the safety culture maturity model can be adopted to other industries. APM Terminals is embarking on a safety culture journey, hence Hudson (2001a) safety culture maturity model was found as a practical and effective tool to measure the current safety maturity levels at APM Terminals, with a view to understand the effects of the safety culture on safety performance.

2.6 The relationship between safety culture and safety performance

Traditionally, within the field of health and safety, safety performance is measured using leading and lagging indicators. For decades, measurement of safety performance has been tracked using lagging indicators which includes incidents; near misses; lost time injuries, as well as –hours worked without an injury. Many business sustainability reports reflect injury frequency rates that most executives are attracted to. There is an on-going debate on whether lagging indicators offer value in tracking organisational safety performance. Krause and Weekley (2005b) argued about the use of lagging indicators as a measure of safety performance by stating that lagging indicators do not provide the safety performance level, but rather report on injuries that have occurred. Hinze et al. (2013) proposed the adoption of effective leading indicators for the creation of a positive safety culture. Leading indicators are proactive safety performance measures that report on safety activities that if well managed, would prevent the occurrence of incidents. Safety performance measures are important in providing information on organisational performance and motivating employees to work safely (Reiman and Pietikäinen, 2012; Reiman and Pietikäinen, 2010). According to Krause and Weekley (2005b), safety is crucial in improving overall organisational importance.

In addition, leading indicators are a proactive measure of identifying hazards before accidents occur (Flin et al. 1998; Yule, 2003). Toellner (2001) argued that lagging indicators do not reflect the actual safety performance, as there are usually different interpretations of what the measures mean between different industries. Within the safety culture research, several factors that affect safety performance are examined (Hinze & Gambatese, 2003; Sawacha et al., 1999; Ali et al., 2013; Clarke, 2006; Dingsdag, 2006; dos Santos Grecco et al., 2014). Central to these factors is the management's involvement in safety issues. It is important for management to identify and mitigate potential hazards, to ensure a safe working environment for their employees.

Safety culture research sought to determine the psychological influences linked to behaviour and attitudes that affect safety performance. For this reason, safety culture research studies examined the associations between safety culture and safety performance (Sawacha et al., 1999; Siu et al., 2004; Neal and Griffin, 2002; Griffin and Neal, 2000; Sexton et al., 2001). However, little research outlined the process through which safety culture translates into safety performance (Clarke, 1999). Several researchers claim that incentive systems improve safety performance (Tam and Fung IV, 1998); (Zhang et al., 2002). However, Sawacha et al. (1999) argue that incentive systems create a practice of unsafe behaviour, as employees tend to work faster and unsafely, with the hope of being rewarded. This type of behaviour leads to injuries, as the focus is not on working safely, but on completing the task fast to be rewarded. Additionally, Hinze and Gambatese (2003) claimed that the incentive systems are not essentially linked with improved safety performance. Mohamed (2003) suggested the adoption of a balanced scorecard approach to improving safety performance. This approach links strategic objectives to the measurement of organisational performance, it is action driven, with the aim of ensuring that set organisational targets are achieved. The use of balanced scorecard approach is entrenched around communicating clear safety targets and assigning responsibilities to individuals to ensure targets are met. Mohamed (2003) concluded that the balanced scorecard approach influences behavioural change, resulting in an injury free culture.

There is research evidence that suggests a relationship between safety motivation, safety behaviour and safety performance (Griffin and Neal, 2000); (Neal and Griffin, 2002). In their study, Griffin and Neal (2000) suggested that when employees have knowledge about the required standards and are motivated, this influences safety performance at an individual level. Management commitment to workplace safety is well recognised in literature as a key factor that influences safety performance (Wu et al., 2008); Fernández-Muñiz et al. (2007). Moreover, Smith-Crowe et al. (2003) claimed that management needs to be personally involved in safety activities to effect positive safety performance. However, negative perceptions of management's commitment to safety culture

results in poor safety performance (Clarke, 1998). Management should provide a supportive working environment which enhances safe working behaviour (Smith-Crowe et al., 2003) as safety culture is vital in influencing employee attitude and behaviour linked to safety performance (Choudhry et al., 2007). The training provided to employees should equip them with safety knowledge that would assist employees to fully understand their roles in health and safety. This would translate to compliance to safety rules and procedures. The creation of a positive working environment is dependent on mutual trust between management and employees, which is facilitated by an open communication and a culture of no-blame (Clarke, 1998). Kapp (2012) argues that the existence of a non-positive work environment leads to poor compliance to safety procedures and ultimately, to poor safety performance. Lin & Mills (2001) measured health and safety performance of Australian construction companies and concluded that employee and management commitment were key factors that influenced safety performance. Chib and Kanetkar (2014) proposed that safety culture is linked with safety performance. Grabowski et al. (2010) suggested that safety culture surveys are important leading indicators that organisations can use to measure safety performance. However, Sorensen (2002) asserted that more research is required in determining the fundamental characteristics of safety culture and to identify consistent performance indicators.

In view of the above, the measurement of safety performance remains a challenge as there are no agreed universal measurement criteria that researchers have proposed. According to Wamuziri (2011), lagging indicators measure failure and are not a true measure of safety performance, hence, he proposed the adoption of leading indicators as a true measure of safety performance.

2.7 Summary

Despite the numerous studies conducted in safety culture, this review revealed a significant lack in the conceptualisation of safety culture. Moreover, there is a lack

of consensus among researchers in properly defining safety culture. The review also revealed the on-going debates among researchers, in the distinction between the concepts of safety culture and safety climate. Some researchers are of the view that these concepts are similar and hence, should be used interchangeably. However, opposing viewpoints suggest that these concepts are different, while other researchers suggest that safety culture is an elevation of safety climate. This lack of distinction hinders the development and broad understanding of these concepts. The findings of this review also indicate differing viewpoints among researchers, on the theoretical models underpinning safety culture studies. This hinders the adoption of sound theoretical models, which would guide future studies to improve the content of safety culture and create new knowledge. Similar to the different viewpoints in defining the concept of safety culture, several researchers have diverse views on the factors that affect safety culture. This creates poor understanding on what constitutes safety culture. Studies reviewed suggest that a strong safety culture improves safety performance (Ali et al., 2013; Dingsdag, 2006; dos Santos Grecco et al., 2014; Erickson, 1997; Grabowski et al., 2010). However, no specific guidance has been provided on how organisations can achieve this. In view of the lack of agreement amongst researchers on several aspects of safety culture, this study seeks to broaden the existing body of knowledge and offer new insights into the African context, as most of the research on safety culture is predominantly conducted in Europe and the United States.

The next chapter highlights the research approach and design employed in this study. Specific descriptions of the sampling methods, research instruments, as well as data collection and analysis methods, are discussed.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The previous chapter highlighted discussed the literature review on safety culture. This chapter discusses the research design and methodology that was followed in the study. The chapter highlights the aim of the study and provides information on the selected study setting. Furthermore, justifications for the sampling methods employed are provided. The description of the research instrument used, as well as data collection methods, is also discussed.

3.2. Aim of the study

The aim of the study was to investigate employee perceptions of safety culture and its effects on safety performance. To achieve this, the researcher measured employee perceptions of safety culture at APM Terminals in Cape Town.

3.3 Research design and methods

Creswell (2013) stated that a research design provides an overall approach that is used to combine the different elements of the study in a comprehensive and rational manner. A well-structured research design should methodically connect the different components to yield answers to the research questions or research problem (De Vaus and de Vaus, 2001). According to Kothari a research design is 'a formidable problem that follows the task of defining the research problem in the preparation of the design of the research project'3 Kothari (2004:31). The main types of research designs include the experimental, exploratory and descriptive research designs (Kothari, 2004).

3.3.1 Experimental research design

According to Creswell (2014), an experimental research design consists of a control group and an experimental group. In this type of research design, the researcher controls the factors that may affect the study outcomes (Creswell, 2014).

3.3.2 Exploratory research design

Exploratory research designs explore the relationships between variables in relation to the research problem (Newman & Benz, 1998). Exploratory research is conducted when there is limited knowledge about a particular phenomenon (Gray, 2004).

3.3.3 Descriptive research design

Descriptive research, as the name clearly points out, describe the state of being or features of a particular group (Saunders et al., 2009). Saunders et al. (2009) further highlighted that the aim of descriptive research is to obtain the exact state of being of events, situations or persons. In a descriptive study, the researcher normally has a basic understanding of the variables under study (Saunders, 2011). For the purposes of this study, the descriptive research design was adopted to obtain knowledge relating to the state of being, regarding employee perceptions of safety culture.

3.4 Research Methods

Newman & Benz (1998) suggested that research is a process of collecting and analysing information for the purpose of offering new knowledge. Creswell (2013) stated that research methods consist of two types, the quantitative and qualitative methods. However, (Newman & Benz 1998; Punch, 2013) asserted that data may

be collected using the qualitative or quantitative or mixed methods. Khalid et al. (2012) noted that research has two forms, pure research and applied research. Pure research is conducted for the purposes of understanding scientific phenomena, while applied research is useful in discovering solutions and is mainly used by organisations in decision making (Khalid et al., 2012). Quantitative methods are associated with the collection of numerical data and analysis of data that are presented in graphical and statistical form (Saunders, 2011). On the other hand, qualitative methods are associated with non-numerical data that are collected through interviews, videos, ethnographic research or diary accounts. Quantitative research requires the formulation of a research design, where the focus of research is to explain, describe and predict the outcome. Quantitative research uses probability sampling and uses larger sample sizes, unlike the qualitative research designs which uses non-probability sampling and smaller samples (Saunders et al., 2009).

The researcher's decision to use mainly the quantitative approach was informed by two things: firstly, comparable safety culture studies utilised the quantitative approach and secondly, since the study seeks to investigate employee perceptions of safety culture the paradigm used guided the selection of this approach.

3.5 Research paradigm

Bahari (2010) emphasised the importance of research paradigm in all types of research. The Mackenzie's study cited in Mack (2010) defined the term paradigm as 'a loose collection of logically related assumptions, concepts or propositions that orient thinking and research' (p5). Creswell (2014) referred to a paradigm as the worldviews meaning "a basic set of beliefs that guide action". Saunders et al. (2016) explained a research paradigm as the research philosophy referring to a set of assumptions and beliefs concerning knowledge. The essential features of a paradigm/philosophies are ontology, epistemology and axiology (Saunders et al.,

2016). Ontology is an element of philosophical assumptions concerned with what represents reality, while epistemological assumptions are concerned with the attainment of knowledge (Scotland, 2012). Axiology is concerned with role of values in research (Saunders et al., 2016). Saunders et al. (2016) highlighted four commonly used research philosophies: positivism, interpretivism, critical realism, postmodernism and pragmatism.

According to Saunders et al. (2016), every research is guided by the beliefs and assumptions of the researcher, the selection of research philosophies best suited to these beliefs and assumptions, then these define the research design to be used in the study, as evidenced in Figure 3.1.

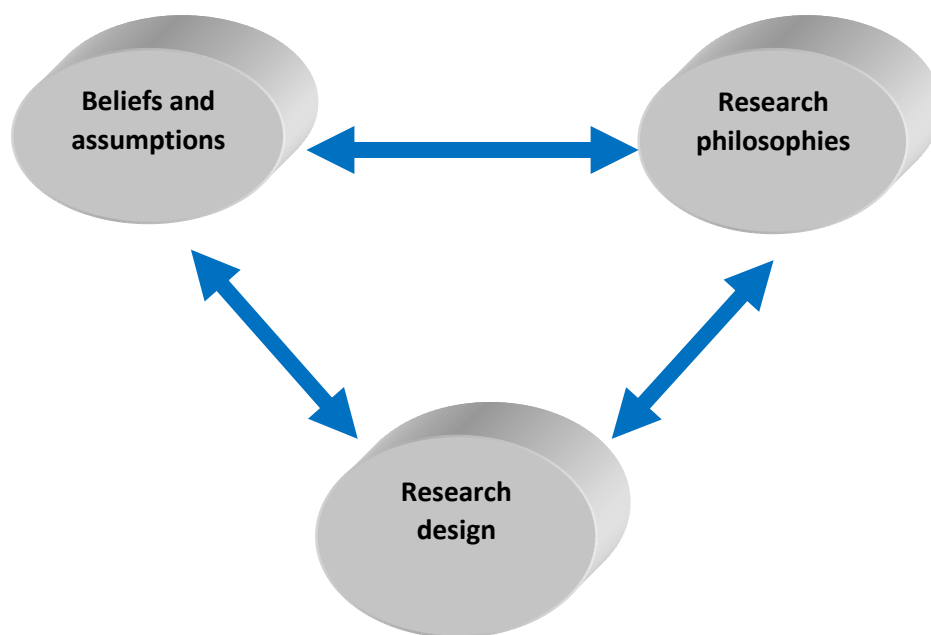


Figure 3.1: Developing your research philosophy: a reflexive process

Adapted from (Saunders et al: 2016:126)

According to Saunders et al. (2016) a researcher has to consider their own beliefs and assumptions when selecting research philosophies to be adopted in research.

Firm beliefs and assumptions lead to a selection of robust research design, research methods, data collection procedures and data analysis techniques.

3.5.1 Positivism paradigm

Creswell (2013) stated that positivist assumptions are based on the philosophy that is concerned with the relationship between causes and effect. The positivist philosophy is mainly used in quantitative research (Saunders et al., 2009). In the realists view, researchers reveal an existing factual reality (Muijs, 2010). In the positivist approach, it becomes the duty of the researcher to expose the reality using sound research methods. The primary focus of this paradigm is to seek facts about a particular phenomenon in the business or social worlds (Zawawi, 2007).

In the positivist worldview, the researcher observes and measures human behaviour and draws generalisations on the observed phenomena. Quantitative research is a deductive approach which involves testing existing theories, where the research either accepts or rejects the theory tested (Muijs, 2010). However, (Saunders et al., 2009) argued that quantitative research might also be inductive in nature, where the researcher might choose to use research data to develop a new theory.

3.5.2 Phenomenological paradigm

Phenomenology falls under the interpretivism paradigm and is concerned with the human experiences (Saunders et al., 2016). According to Mack (2010), this paradigm is concerned with the perceptions of human beings regarding the world they live in. This paradigm is rooted in the exploration of personal experiences concerning existing cultural perceptive in the social or business worlds (Gray, 2004). “The phenomenological approach deals with the way people experience phenomena in the world and define its meaning” (Zawawi, 2007, p.3). Easterby-

Smith et al. (2012) differentiates between positivist and phenomenological paradigms, as shown in Table 3.1 below.

Table 3.1: Summary of positivist and phenomenological paradigms

	Positivist paradigm	Phenomenological paradigm
Basic beliefs	The world is external and objective	The world is socially constructed and subjective.
	The observer is independent.	The observer is a party to what is being observed.
	Science is value-free.	Science is driven by human interests
The researcher should	Focus on facts	Focus on meanings
	Locate causality between variables	Try to understand what is happening
	Formulate and test hypotheses (deductive approach)	Construct theories and models from the data (inductive approach)
Methods include	Operationalizing concepts so that they can be measured	Using multiple methods to establish different views of a phenomenon
	Using large samples from which to generalise to the population	Using small samples researched in depth or over time
	Quantitative methods	Qualitative methods

Adapted from (Collis & Hussey:2013:55)

Easterby-Smith et al. (2012) summarised the differences between the positivist and the phenomenological paradigm, as indicated in Table 3.1. The highlighted

differences guided the researcher's choice in the paradigm selected for this study. The paradigm underpinning this study is the positivist paradigm. The study is concerned with employee perceptions of safety culture and its effects on safety performance. This study thus seeks to gather facts regarding the organisational world in which the employees at APM Terminals work. The study seeks to understand the relationship between variables. Furthermore, the study used the deductive approach to test an existing theory. Quantitative methods were employed to collect and analyse data. In this backdrop, the phenomenological paradigm was not well suited for the study on the basis that it is rooted in understanding perceptions from the individual's own perspective. In any organisation, there are rules and procedures that govern human behaviour and influence it, the positivist paradigm was found best suited in deriving objective meanings of employee perceptions of the safety culture at APM Terminals.

3.6 Study setting

The study was undertaken at APM Terminals, Cape Town branch. This branch is one of the biggest branches within the Southern African region. APM Terminals is a subsidiary company to Maersk Group a global shipping giant. APM Terminals has two core business functions: terminal operations and inland container services. Globally, APM Terminals has footprints in 41 countries, with 76 terminal facilities. APM Terminals also operates 103 inland services specialising in the handling, transportation, repair and maintenance of containers (APM Terminals, 2017).

Globally, APM Terminals is on a journey to safety excellence, where the focus is on building a robust safety culture in all its operations (APM Terminals, 2017). The company has since embarked on numerous health and safety initiatives to develop a mature global safety culture. APM Terminals in Cape Town was chosen for this study because within the Southern African region, the focus on health and safety has recently emerged. The Cape Town branch is the biggest and has the most

challenges, both from the operational standpoint, as well as from the health and safety perspective. To ensure a robust safety culture within APM Terminals, it is important to fully understand employee perceptions of the current state of the safety culture and further understand what the effects it has on safety performance. Therefore, conducting this study will provide the necessary knowledge of where the Cape Town APM Terminals is, in terms of the safety culture maturity scale.

3.7 Population and sample of the study

3.7.1 Description of population

The population consists of individuals to whom the study applies (Kitchenham & Pfleeger, 2002). The population should be clearly defined in respect of the factors appropriate to the study. The population for this study comprised all the permanent employees working at APM Terminals in Cape Town. This population was deemed suitable for this study, as permanent employees are part of the safety culture at APM Terminals.

3.8 Sampling method

Kothari (2004: 152) defines sampling as “the process of obtaining information about an entire population by examining only a part of it”. Generally, in research sampling is used to draw inferences based on samples about the limitations of the population from which samples are taken. The characteristics of the sample should be representative to that of the population. According to Khalid et al. (2012), sampling is important to researchers, as it is cumbersome and costly to study the entire population. Moreover, sampling allows researchers to obtain quality information, it saves time and money, in as much as it allows researchers to generalise research findings to the entire population.

According to Kitchenham and Pfleeger (2002) there are various sampling methods that researchers can use to make strong conclusions about the population. However, Khalid et al. (2012) suggested that the option of using the right method is directed by the type of the study, as well as specific research questions. Kothari (2004) highlighted two broad categories of sampling methods, the probabilistic and non-probabilistic methods that researchers can use. In a probability sampling, every individual in the population has an opportunity to be included in the sample (Saunders, 2011). Probability sampling is also known as representative sampling and is associated with survey research (Saunders, 2011). Probability sampling consists of systematic sampling, stratified sampling, simple random sampling and cluster sampling (Saunders et al., 2009). The aim of probability sampling is to eliminate biasness and to ensure the selection of a representative sample (Kothari, 2004).

Non-probability sampling does not ensure a representative selection of individuals within the population (Saunders, 2011). Non-probability sampling consists of snowball sampling, convenience sampling, quota sampling and judgement sampling (Khalid et al., 2012). Kitchenham and Pfleeger (2002) asserted that non probability sampling can be used when it is not easy to identify the target population, or when the researcher is interested in a specific group (Khalid et al., 2012).

This study employed the stratified random sampling technique. Kothari (2004) stated that stratified sampling provides proportional and non-proportional sampling technique and is also a form of random sampling, whereby the population is divided into groups or strata, based on one or more common features. Within the strata, respondents are selected randomly, thus ensuring adequate representation of all subgroups. For the purposes of this study, proportional stratified random sampling was employed. Different departments were stratified and a proportional random sampling of participants was drawn. Randomisation allowed for a

representative sampling to be achieved, thus allowing the researcher to generalise the findings to the entire population.

3.8.1 Sample frame

A sampling frame is a list consisting of names of all cases from the population (Kothari, 2004). The sampling frame for this study involved an up to date departmental list of all permanent employees employed since May 2011. This list was obtained from the Human Resources Department of the organisation. The Cape Town branch of APM has been in operation since May 2011. The sampling frame was organised into separate strata. Each stratum represented a specific department and from each stratum, stratified random sampling was used to draw a sample from each stratum. Thereafter, questionnaires were distributed during weekly departmental safety meetings in each stratum/ department.

3.8.2 Sample size

A sample is a smaller representative unit drawn from a population (Cooper et al., 2006). Kitchenham and Pfleeger (2002) highlighted the importance of a representative sample. They stated that if the sample is not representative, the results cannot be generalised to the population. According to Kothari (2004) if the sample size is too small it may not achieve the objectives of the study and if it is too large, huge costs may be incurred to undertake the study. It is important to ensure that the sample size is guided by the nature of the population, the nature of the study and the type of sampling to be employed (Saunders et al., 2016).

To obtain an appropriate sample size, the sample size table from research advisors (2006) was used to determine the appropriate sample. This table indicated that for a population of 100 at a confidence level of 95% at an error margin of 5.0%, a sample of 80 respondents was sufficient. The population size for

this study was 110 employees. Therefore, based on the sample size table, the values close to the study population size was 80 participants, which was considered as the sample for this study.

The participants for this study consisted of the permanent employees from different departments at APM Terminals (e.g. gate department, reefer department, workshop, wash bay and administration block). The participants occupied distinct roles, e.g. gate clerks, operators, artisans, technicians, middle and senior management.

3.9 Data collection

Research data can be collected through the use of questionnaires or interviews, depending on the approach adopted (Cooper and Schindler, 2003). Research data may be collected using primary or secondary sources (Khalid et al., 2012). Primary data comprise the data obtained from individuals through the use of questionnaires (Muijs, 2010). Secondary data are obtained from existing sources such as organisational databases, magazines, newspapers etc. The advantages of using secondary data are that it is cheap and not time consuming. Moreover, secondary data are readily available and thus, easily accessible.

In this study, data were collected using the self-completed questionnaires. To ensure proper administration and collection of completed questionnaires, the researcher utilised the assistance of the company safety officers to ensure questionnaires were handed directly to the employees. A two-day data completion period was given to participants, follow-ups were conducted through internet reminders for those employees with email access and follow – ups were also conducted during daily departmental safety talk meetings, thereafter questionnaires were collected and organised for analysis.

3.9.1 Construction of the Instrument

To obtain the exact state of being concerning employee perceptions of safety culture at APM Terminals, self- completed questionnaires were used to gather data for this study. According to Bordens and Abbott (2002), questionnaires are considered the most common technique of gathering data; they are inexpensive and can be administered to many respondents simultaneously, thus saving time.

The four-part questionnaire used in this study consisted of demographic details and Twenty-one Likert scale questions and three open ended questions. The researcher's decision to include one open ended question in each section of the questionnaire was to encourage participants to provide brief comments and suggestions of the subject to obtain unique insights.

The questionnaires used in this study contained a Likert scale for some of the responses where the participants indicated their responses on a scale of 1 to 5. Likert-scale questionnaires provide reliable data and allow researchers to obtain substantial amounts of data with ease (Nemoto and Beglar, 2014). In designing the questionnaires, the researcher ensured that all questions were concise, simple and were specific. Furthermore, the company safety officers assisted the researcher with the interpretations of the questionnaires from English to isiXhosa for employees who were not comfortable responding in English. A consent letter was sent with the questionnaires to ensure anonymity and the option not to take part in the study. The questionnaires consisted of four sections. The first section referred to demographic information. The remaining sections referred to employee perceptions of safety culture, factors that affect safety culture and finally, the relationship between safety culture and safety performance at APM Terminals.

Part A: Participants' demographic information

Part B: Employee perceptions of safety culture.

Part C: Factors that affect safety culture.

Part D: Relationship between safety culture and safety performance.

3.9.2 Pilot testing

A pre-test of the translated questionnaire was piloted to a small sample to ensure direct meaning of words and to avoid ambiguity.

3.10 Data analysis

Quantitative data were gathered from the survey questionnaires and were analysed statistically by means of a statistical package for social science (SPSS) software program. Data analysis on SPSS was conducted using descriptive and inferential statistical methods. Descriptive statistics was presented using tabular and graphic presentations to indicate the different perceptions among the groups and show correlation between the variables under study.

3.11 Ethical considerations

According to Creswell (2013), ethical considerations in research are crucial and form part of the entire research process. Saunders (2011) explained that ethics relates to the behaviour of the researcher concerning the rights of the study participants.

Study participants were recruited during weekly departmental safety meetings. During each departmental meeting, the researcher provided full information about the study, explaining in detail, the purpose and benefits of the study.

Confidentiality and anonymity details were explained in a language that all participants understood. Informed consent was obtained from employees who participated in the study.

Research findings were given in a summary form, which was written in plain English and in IsiXhosa. A link was made available on the APM Terminals Safety intranet page to ensure easy accessibility by the participants with computer access. Participants without access to computers received feedback in hard copy form, which was posted in departmental notice boards.

Furthermore, a gatekeeper's approval was obtained from the Managing Director at APM Terminals (Appendix 2). Prior to conducting the study; ethical clearance was applied for and was subsequently granted by the University of KwaZulu-Natal (Appendix 3). Finally, the questionnaires were handed to the participants, along with consent letters (Appendix 1).

3.12 Reliability and validity

3.12.1 Reliability

Reliability and validity are concerned with the quality aspects of research (Saunders, 2011). Reliability is concerned with whether the administered questionnaire will produce similar results if the study was repeated to different participants at a different setting (Khalid et al., 2012). In quantitative research, reliability consists of two components, internal consistency and test re-test. Internal consistency refers to the attainment of consistent results (Khalid et al., 2012). The frequently used method to measure internal consistency is the Cronbach's alpha (Saunders, 2011). The coefficient alpha score of 0.7 is regarded as a reliable scale (Khalid et al., 2012). Test re-test involves handing out the same questionnaire twice to the same respondents. The criterion measured in the test re-test is whether the scores will remain the same or will differ. However, Saunders (2011) highlights the difficulties with this methods and recommends that

test re- test should be used as a supplement method. In this study, the researcher used the Statistical Package for Social Science (SPSS) statistical software package to assess the coefficient alpha.

3.12.2 Validity

Validity is concerned with ensuring that the researcher measures what he or she intends to measure (Muijs, 2010). Validity comprises three types, criterion validity, content validity and construct validity (Muijs, 2010). Criterion validity ensures that the questions produce accurate outcomes (Saunders et al., 2009). According to Muijs (2010), criterion validity consists of two types, predictive and concurrent validity. Predictive validity ensures that questions are able to predict a future occurrence (Khalid et al., 2012). In concurrent validity, the scale excludes cases that are different (Muijs, 2010).

Content validity ensures that the questions in the questionnaire are accurate and related to the research questions that the researcher is trying to measure (Saunders et al., 2009). Construct validity is more complex, as compared to other types of validity (Khalid et al., 2012). It is related to the theoretical knowledge of the questions that the researcher is trying to measure (Khalid et al., 2012).

In this study, face validity was considered. The researcher pre-tested the questionnaire by piloting it to a small group of employees to ensure accuracy and relevancy to the setting and the participants. The responses from the pilot sample were positive, as the respondents confirmed that the questions were relevant to the safety culture aspects at APM Terminals.

3.13 Bias

Krishna et al. (2010: 2320) defined bias as “a form of systematic error that can affect scientific investigations and distort the measurement process”. In research, bias can occur during the research planning phase, data collection phase, data analysis phase and during research publication phases (Pannucci and Wilkins, 2010). Krishna et al. (2010) highlighted the two types of research bias, random bias which occurs because of measurement accuracies and systematic bias, which occurs because of inaccuracies in results.

Sampling bias occurs when a sample is collected such that there is chance that other participants in the target population are unlikely to be included in the sample (Smith and Noble, 2014). There are many forms of bias that can occur in research. Selection bias, occurs when there is unrepresentative selection of participants (Krishna et al., 2010). For this study, the researcher ensured that the recruited study participants were easily accessible and met the aims of the study. Furthermore, the researcher utilised a statistical sample size table to guide the selection of the sample size. Stratified random selection methods were employed within each stratum to ensure representativeness in sampling was achieved.

Measurement bias occurs when the data collection instrument has not been tested for validity (Smith and Noble, 2014). For this study, the researcher pre – tested the measuring instrument to assess it's the accuracy of the questions under study. Bias also occurs during the analysis of data, where the researcher tends to focus on data that confirms his hypotheses (Smith and Noble, 2014),.For this study, the researcher applied a statistical analysis software package (SPSS) in order to ensure the accuracy in the data analysis process.

3.14 Summary

This chapter provided a detailed description of the research methodologies employed, highlighting the research design for the study, which was guided by the research questions and objectives. The participants for the study were identified as permanent employees at APM Terminals. The study was a quantitative descriptive research approached from the positivist approach. The sampling technique employed was the probability sampling in the form of stratified random sampling. The data collection instrument used for this study was the self-administered questionnaires. Discussions in the chapter included validity and reliability issues, to ensure the quality and accuracy of the questionnaire in relation to study outcomes. Data analysis method employed was the Statistical package for social science (SPSS) software program. The next chapter presents study results.

CHAPTER FOUR: PRESENTATION OF RESULTS

4.1 Introduction

The preceding chapter presented the research design and methodology for the study. This chapter documents the findings from the research process discussed in chapter three. The results are presented in line with the objectives of the study. To begin with, the chapter reports on the response rate, followed by the biographical information.

4.2 Response rate

The questionnaire used a 5-point Likert scales ranging from strongly disagree to strongly agree. Questionnaires were administered to a total of 80 participants (sample size). However, responses were received from only 44 participants, resulting in a 55% response rate.

4.3 Cronbach's Coefficient (Reliability measure)

For this study, internal reliability was confirmed using Cronbach's Coefficient Alpha. For research purposes, a Cronbach coefficient Alpha above 0.7 is generally considered to present sound reliability. SPSS version 24 was used to calculate Cronbach coefficient Alpha in this study, see Table 4.1.

Table 4.1: Cronbach's Coefficient Alpha

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0,825	0,845	21

4.4 Descriptive statistics

4.4.1 Demographic information

Demographic variables were analysed using descriptive statistics. The gender, department and number of years worked in the company are presented below.

4.4.1.1 Age

Table 4.2: Frequency Table showing the age of the participants

Demographic measure		Frequency	Percentage %
		N = 43	
Age	20 – 35	16	37.2%
	36 -45	16	37.2%
	46-55	10	23.3%
	56-65	1	2.3%

Figure 4.1: Pie chart showing the age of the participants

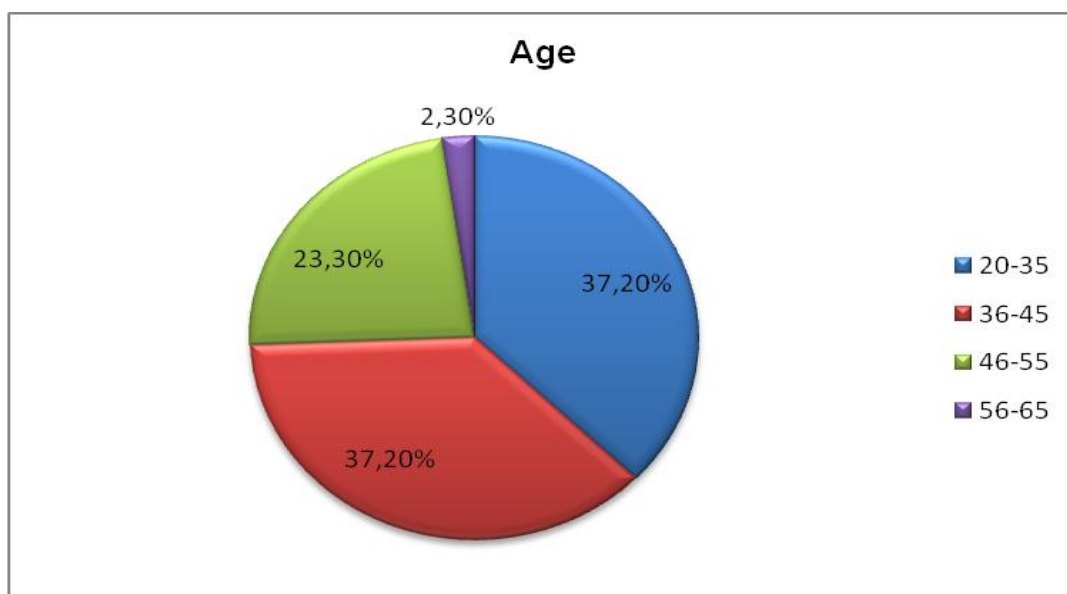


Figure 4.1 indicates that majority of the participants (74.4%) were between the ages of 20 -45 years, followed by the 23.3% of participants, who were between the ages of 46 -55 years. Only (2.3%) was between the ages of 56-65 years old.

4.4.1.2 Gender

Table 4.3: Frequency Table showing the gender of the participants

Gender	Female	5	11.6%
	Male	38	88.4%

Figure 4.2: Pie chart showing the gender of the participants

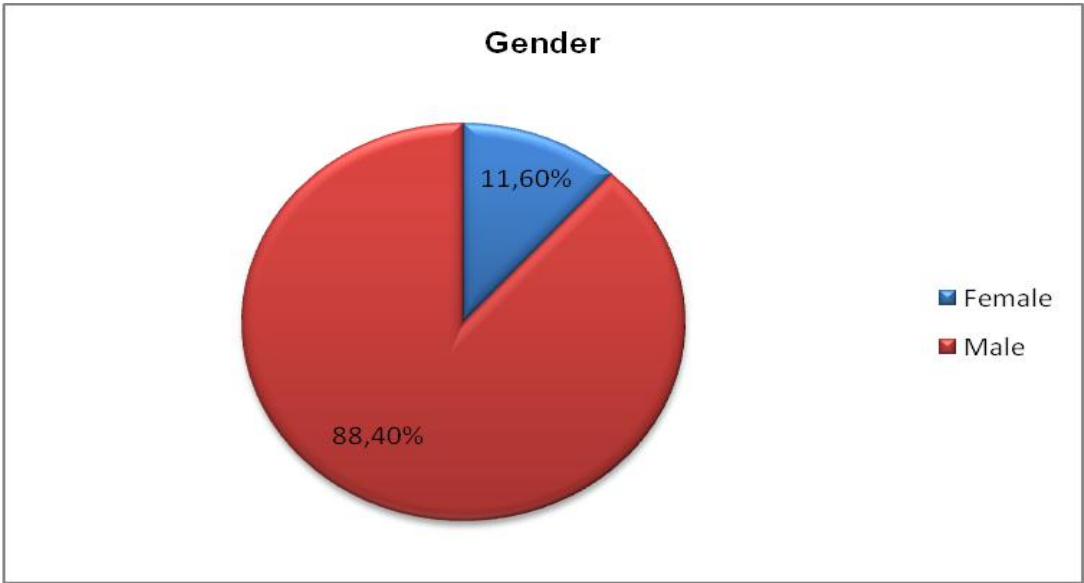


Figure 4.2 indicates that most of the participants were males (88.4%) followed by female participants (11.6%).

4.4.1.3 Department

Table 4.4: Frequency Table showing departments in which participants worked

Department	Administration Block	9	20.9%
	Wash bay	4	9.3%
	Gate	5	11.6%
	Workshop	14	32.6%
	Reefer	11	25.6%

Figure 4.3: Pie chart showing departments in which participants work

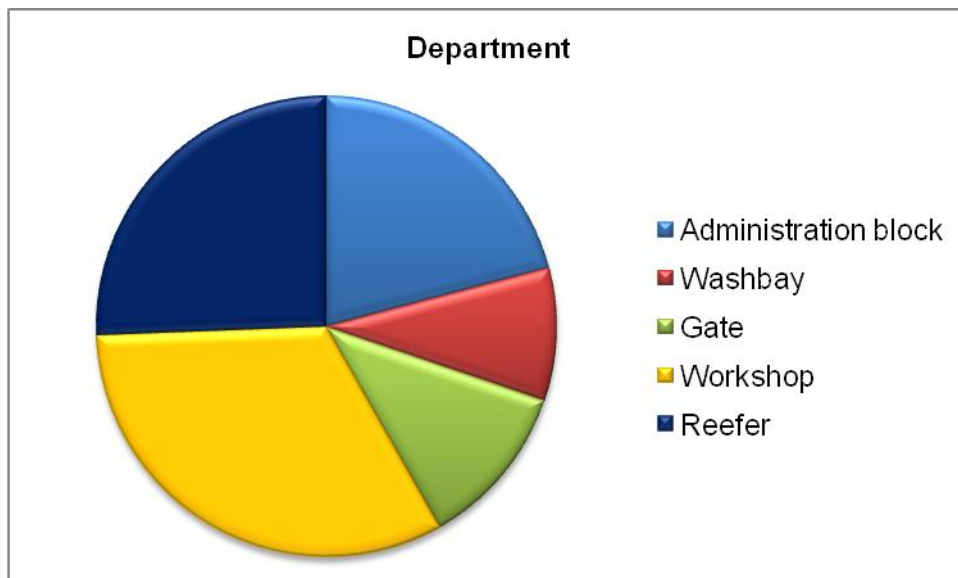


Figure 4.3 indicates that most of the participants were from the Workshop Department (32.6%), followed by Reefer Department (25.6%), and (20.9%) was from the Administration block. In addition, (11.6%) was from the Gate Department and lastly, (9.3%) of the participants were from the Wash Bay Department.

4.4.1.4 Employment status

Table 4.5: Frequency Table showing employment status of the participants

Permanently employed	43	100%
Contractor	0	0%

Table 4.5 indicates that (100%) of participants were permanently employed at APM Terminals.

4.4.1.5 Number of years employed

Table 4.6: Frequency Table showing the number of years participants have worked at APM Terminals

Number of years worked	1-5 years	26	60.5%
	6 – 10 years	10	23.3%
	11-15 years	7	16.3%
	16 years and over	0	0%

Figure 4.4: Pie chart showing numbers of years participants have worked at APM Terminals

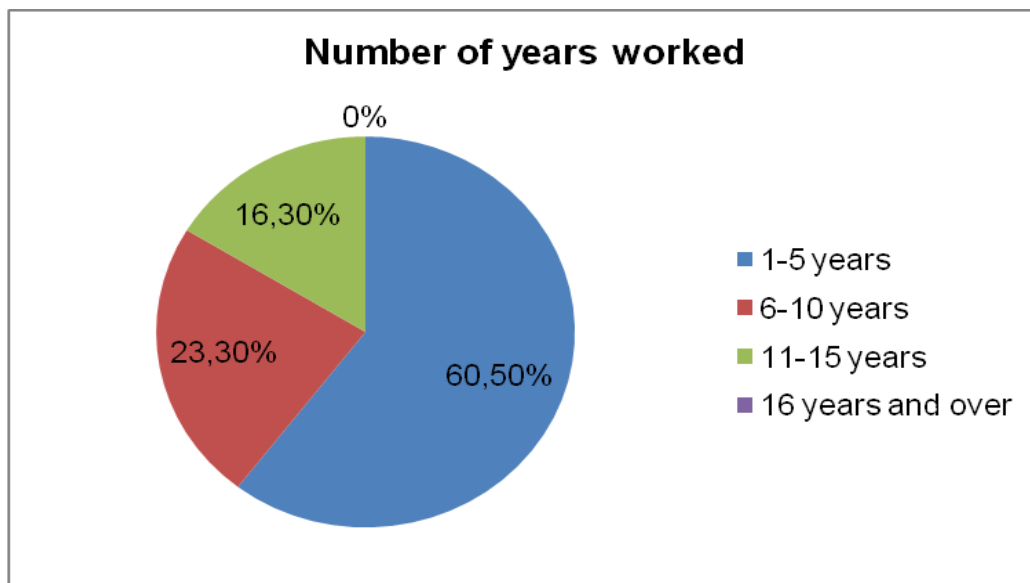


Figure 4.4 indicates that more than a half of the participants (60.5%) had 1- 5years of experience, followed by (23.3%) of participants, who had between 6 -10 years' experience. In addition, (16.3%) of participants had 11-15 years' experience, with (0%) having over 16 years and over.

4.5 Presentation of results based on objectives

The questionnaire was designed such that there was an association with each research objective. The presentations of results are discussed below according to the three research objectives.

4.5.1 Objective 1 –To determine safety culture maturity level at APM Terminals

Knowing the current state of the safety culture maturity level assists organisations to identify and implement actions necessary to enhance their safety culture. The

perceptions of participants were investigated to determine the level of the safety culture maturity level at APM Terminals. A five-point Likert scale questionnaire containing seven questions with an additional open ended question was used to determine safety culture maturity perceptions. Participants' responses are indicated in Table 4.3.

Table 4.7: Frequencies and percentages of safety culture maturity level

Q1: There is visible management commitment to Safety at APM Terminals	Response	Frequency (N)	Percent %
	Strongly disagree	2	4.7%
	Disagree	2	4.7%
	Neither agree nor agree	7	16.3%
	Agree	22	51.2%
	Strongly agree	10	23.3%
	Total	43	100%
	Response	Frequency (N)	Percent %
Q2: There are talks about Safety; I don't see it in my department.	Strongly disagree	9	21.1%
	Disagree	6	14%
	Neither agree nor agree	5	11.6%
	Agree	16	37%
	Strongly agree	7	16.3%
	Total	43	100%
	Response	Frequency (N)	Percent %

Q3: The culture of reporting safety concerns is that of no blame	Strongly disagree	1	2.3%
	Disagree	6	14.0%
	Neither agree nor agree	8	18.6%
	Agree	18	41.9%
	Strongly agree	10	23.3%
	Total	43	100%
Q4: The management culture at APM Terminals is that of respect, honesty and cooperation.	Response	Frequency (N)	Percent %
	Strongly disagree	3	7.0%
	Disagree	5	11.6%
	Neither agree nor agree	8	18.6%
	Agree	21	48%
	Strongly agree	6	14.0%
	Total	43	100%
Q5: Management displays an ethical and genuine concern for employee safety	Strongly disagree	1	2.3%
	Disagree	3	7.0%
	Neither agree nor agree	9	20.9%
	Agree	21	48.8%
	Strongly agree	9	20.9%
	Total	43	100%
	Response	Frequency (N)	Percent %
Q6: Safety is integrated in	Strongly disagree	0	0%

all business functions and on how we do things at APM Terminals.	Disagree	3	7.0%
	Neither agree nor agree	9	20.9%
	Agree	24	55.8%
	Strongly agree	7	16.3%
	Total	43	100%
	Response	Frequency (N)	Percent %
Q7: Production is prioritised over Safety	Strongly disagree	4	9.3%
	Disagree	8	18.6%
	Neither agree nor agree	10	23.3%
	Agree	12	27.9%
	Strongly agree	9	20.9%
	Total	43	100%

Table 4.7 demonstrates that 74.5% of the participants strongly agreed/agreed that there was visible management commitment to safety at APM Terminals. Regarding the absence of safety at departmental levels; 53.3% of participants strongly agreed/agreed to not observing safety in their departments. 65.2% of the participants strongly agreed/agreed that the culture of reporting incidents at APM Terminals is that of no blame. Forty-eight percent (48%) of the participants agreed that the management culture at AMP Terminals is that of respect, honesty and cooperation. A sizable percentage of the participants (69.9%) agreed/strongly agreed that management displayed an ethical and genuine concern for employee safety.

The results indicated that 55.8% of the participants agreed that safety was integrated in other business functions. Most of the participants (48.8%) agreed/strongly agreed that production is prioritised over safety.

4.5.1.1 Perceptions of participants on the safety maturity levels at APM Terminals

The questionnaire also included an open-ended question which asked the participants to provide brief comments on the maturity levels at APM Terminals. The results of the participants' comments are presented in Figure 4.1

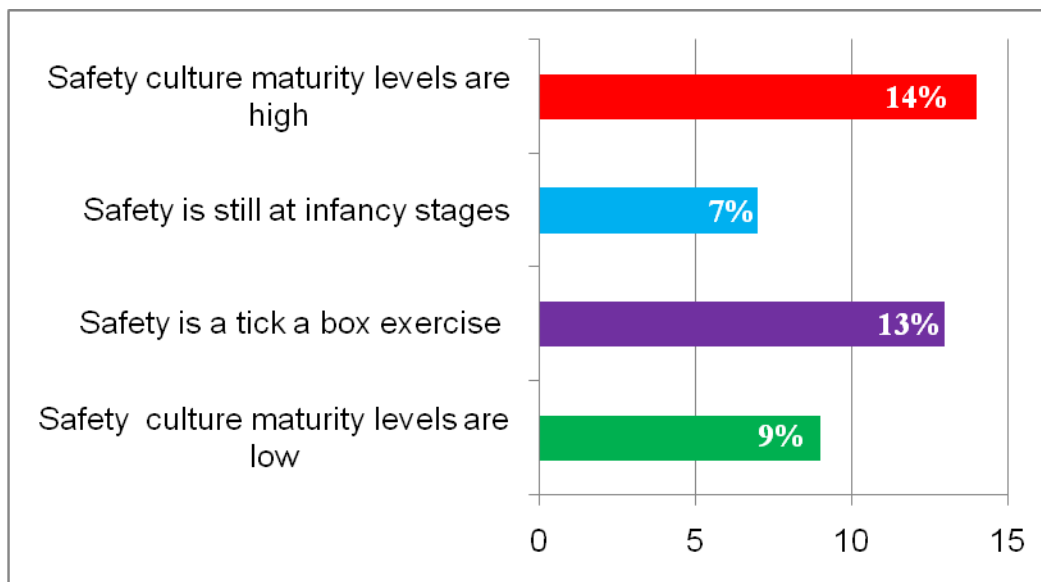


Figure 4.5: Perceptions on the safety culture maturity levels

Figure 4.5 shows that most of the participants (14%) perceived safety culture maturity levels to be high. However, nine percent (9%) perceived the maturity levels to be low. A significant fraction of the participants (13%) perceived safety as a tick exercise. Seven percent (7%) perceived safety maturity levels to be at infancy stages.

4.5.2 Objective 2–To determine the factors affecting safety culture

Understanding the factors affecting safety culture is essential, as several factors can influence and shape an organisation's safety culture, either positively or negatively. A five-point Likert scale questionnaire containing seven questions, with an additional open ended question, was used to determine the factors affecting safety culture.

Table 4.8: Frequencies and percentages of factors affecting safety culture

Q1: I always feel informed and engaged with Safety issues	Response	Frequency (N)	Percent %
	Strongly disagree	1	2.3%
	Disagree	2	4.7%
	Neither agree nor agree	10	23.3%
	Agree	22	51.2%
	Strongly agree	8	18.6%
	Total	43	100%
	Response	Frequency (N)	Percent %
Q2: My supervisor's attitude towards Safety is positive	Strongly disagree	24	55.8%
	Disagree	15	34.9%
	Neither agree nor agree	4	9.3%
	Agree	0	0%
	Strongly agree	0	0%
	Total	43	100%
	Response	Frequency (N)	Percent %
	Strongly disagree	0	0%

Q3: Leadership involvement and commitment to Safety is evident	Disagree	1	2.3%
	Neither agree nor agree	11	25.6%
	Agree	25	58.1%
	Strongly agree	6	14.0%
	Total	43	100%
Q4: There is team spirit and support for Safety at APM Terminals	Response	Frequency (N)	Percent %
	Strongly disagree	4	9.3%
	Disagree	2	4.7%
	Neither agree nor agree	7	16.3%
	Agree	22	51.2%
	Strongly agree	8	18.6%
	Total	43	100%
Q5: Safety is everyone's responsibility at APM Terminals	Strongly disagree	2	4.7%
	Disagree	0	0%
	Neither agree nor agree	5	11.6%
	Agree	17	39.5%
	Strongly agree	19	44.2%
	Total	43	100%
	Response	Frequency (N)	Percent %
Q6: Priority is given to Safety issues to ensure	Strongly disagree	1	2.3%
	Disagree	2	4.7%
	Neither agree	11	25.6%

employee safety and compliance to legislation	nor agree		
	Agree	22	51.6%
	Strongly agree	7	16.3%
	Total	43	100%
	Response	Frequency (N)	Percent %
Q7: I am always willing to speak up and warn my team members of unsafe conditions	Strongly disagree	1	2.3%
	Disagree	0	0%
	Neither agree nor agree	2	4.7%
	Agree	22	51.2%
	Strongly agree	18	41.9%
	Total	43	100%

Table 4.8 demonstrates that most of the participants (51.2%) agreed that they felt informed and engaged with safety issues. Most of the participants (90.7%) also disagreed/strongly disagreed that their supervisors' attitude towards safety is positive. A larger percentage (58.1%) agreed that leadership involvement and commitment to safety was evident. Most of the participants (69.8%) perceived the presence of team spirit and support for safety from both employees and management. The results also indicated that 83.7% of participants perceived safety to be everyone's responsibility. A sizable percentage (51.6%) of participants agreed that priority is given to safety issues to ensure their safety and compliance to legislation. A significant percentage of the participants (93.1%) agreed/strongly agreed that they were willing to speak up and warn their team members of unsafe conditions.

4.5.2.1 Perceptions of participants on factors affecting safety culture at APM Terminals

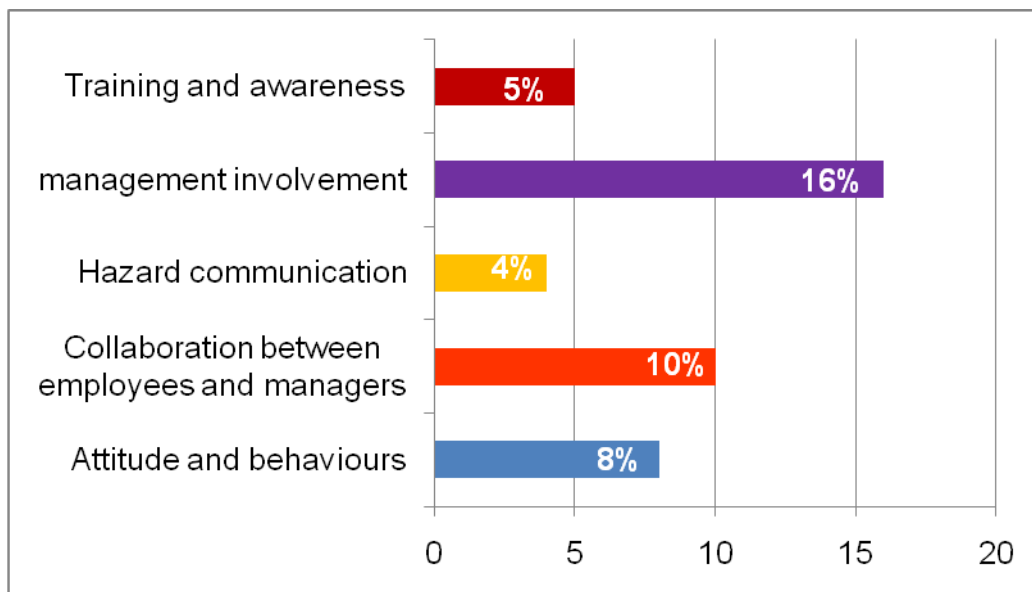


Figure 4.6: Perceptions on factors affecting safety culture

Figure 4.6 shows that a large percent of participants (16%) perceived management commitment to safety as the main factor affecting safety culture, whilst 10% of the participants indicated that collaboration between employees and managers is an essential factor that affects safety culture. Eight percent (8%) suggested that attitudes and behaviours affect safety culture.

4.5.3 Objective 3–To investigate the relationship between safety culture and safety performance

It is important to understand the relationship between safety culture and safety performance. Understanding employee perceptions of this relationship is therefore essential in understanding the organisations safety culture.

Table 4.9: Frequencies and percentages of the relationship between safety culture and safety performance

Q1: There is a strong emphasis placed in the reporting of incidents	Response	Frequency (N)	Percent %
	Strongly disagree	0	0%
	Disagree	1	2.3%
	Neither agree nor agree	11	25.6%
	Agree	20	46.5%
	Strongly agree	11	25.6%
	Total	43	100%
Variable	Response	Frequency (N)	Percent %
Q2: It is important to report incidents, big or small	Strongly disagree	0	0%
	Disagree	2	4.7%
	Neither agree nor agree	3	7.0%
	Agree	14	32.6%
	Strongly agree	24	55.8%
	Total	43	100%
	Response	Frequency (N)	Percent %
Q3: A strong safety culture improves safety performance	Strongly disagree	0	0%
	Disagree	0	0%
	Neither agree nor agree	4	9.3%
	Agree	17	39.5%
	Strongly agree	22	51.2%
	Total	43	100%

Q4: Poor safety behaviours impact on safety performance	Response	Frequency (N)	Percent %
	Strongly disagree	1	2.3%
	Disagree	1	2.3%
	Neither agree nor agree	3	7.0%
	Agree	17	39.5%
	Strongly agree	21	48.8%
	Total	43	100%
Q5: Is safety injury stats shared with you? E.g. number of near misses, number of injuries or number of fatalities	Strongly disagree	5	11.6%
	Disagree	7	16.3%
	Neither agree nor disagree	9	20.9%
	Agree	16	39.5%
	Strongly agree	6	14.0%
	Total	43	100%
Q6: Safety performance is measured in the same context as other business functions e.g. finance	Response	Frequency (N)	Percent %
	Strongly disagree	1	2.3%
	Disagree	1	2.3%
	Neither agree nor agree	16	37.2%
	Agree	16	37.2%
	Strongly agree	9	20.9%
	Total	43	100%

	Response	Frequency (N)	Percent %
Q7: I understand my role in improving Safety performance	Strongly disagree	0	0%
	Disagree	1	20.3%
	Neither agree nor agree	4	9.3%
	Agree	18	41.9%
	Strongly agree	20	46.5%
	Total	43	100%

Table 4.9 indicates that 72.1% of participants agreed/strongly agreed that there was a strong emphasis placed in the reporting of incidents. Most of the participants (88.4%) agreed/strongly agreed that it was important to report all types of incidents. The results also showed that 90.7% of the participants agreed/strongly agreed that a strong safety culture improves safety performance. It was also shown that 88.3% of the participants agreed/strongly agreed that poor safety behaviours impact on safety performance. Most of the participants 39.5% agreed that injury statistics is shared with them. Many participants (58.1%) agreed/strongly agreed that safety is measured in the same manner as other business functions. A sizable proportion of the participants (88.4%) agreed/strongly agreed that they understood their roles in improving safety performance.

4.5.3.1 Recommendations of participants on their roles to improving safety performance

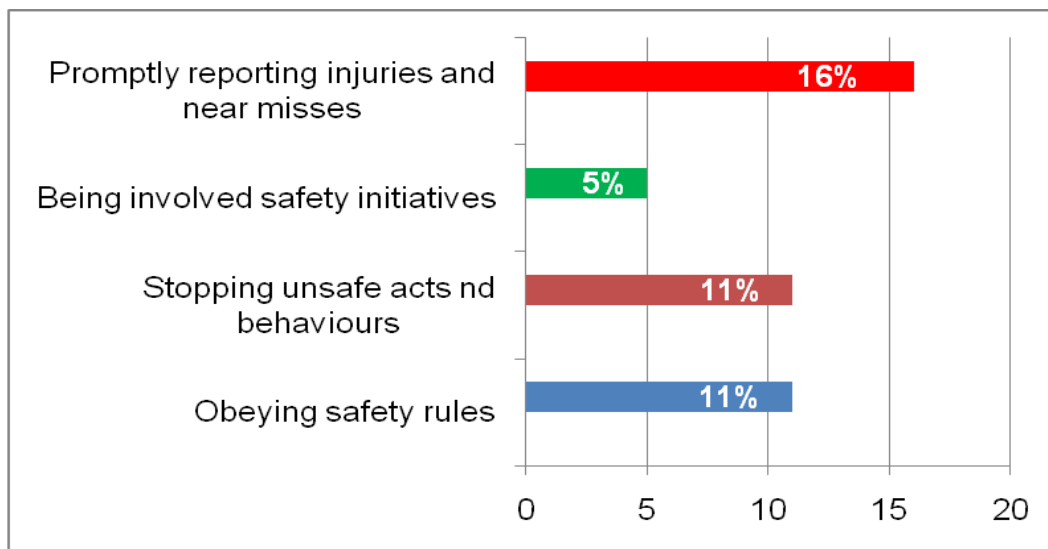


Figure 4.7: Role in improving safety performance

Figure 4.7 shows that most of the participants identified the importance of promptly reporting injuries and near misses as a key role to improving safety performance. Eleven percent (11%) identified stopping unsafe acts and behaviours as a key role in improving safety performance, a further 11% suggested that their role was to obey safety rules.

4.6 Measures of central tendency and dispersion

Table 4.10: Measure of central tendency

	N	Minimum	Maximum	Mean	Std. Deviation
Objective 1	43	1.14	5	3.5388	1.09913
Objective 2	43	1.42	5	3.9668	0.85114
Objective 3	43	1.71	5	4.0531	0.864

4.6.1 Objective 1 – Perceptions on safety culture maturity levels

The mean score ($M = 3.5388$) indicates that the participants slightly agreed on the safety culture maturity levels. The standard deviation ($Sd = 1.09913$) shows some differences in the responses. Some participants disagreed ($Min. = 1.14$) on the levels of safety culture maturity, while others strongly agreed ($Max. = 5.00$).

4.6.2 Objective 2 – Perceptions on factors affecting safety culture

The mean score ($M = 3.9668$) indicates that the participants agreed on the factors affecting safety culture. The standard deviation ($Sd = 0.85114$) shows that there are differences in the responses. Some participants disagreed ($Min. = 1.42$) on the factors affecting safety culture, while others strongly agreed ($Max. = 5.00$).

4.6.3 Objective 3 – Perceptions on the relationship between safety culture and safety performance

The mean score ($M = 4.0531$) indicates that the participants agreed that there was a relationship between safety culture and safety performance. The standard deviation ($Sd = 0.864$) shows some differences in the responses. Some participants disagreed ($Min. = 1.42$) on the relationship between safety culture and safety performance, while others strongly agreed ($Max. = 5.00$).

4.7 Inferential Statistics

To test for normality, a non-parametric test Kolmogorov – Smirnov test was conducted. In this view, the results indicated that data were normally distributed. Spearman's rank correlation coefficient was used to determine the correlation between variables.

4.7.1 Correlation among variables

Correlations were analysed for variables contained in objective 3, to analyse the relationship between safety culture and safety performance using Spearman's rank correlation coefficient. The results are indicated in Table 4.7.

Table 4.11: Spearman's Correlation - Objective 3

		Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	Q 7
Q 1	Coefficient correlation	1,000						
	p	-						
	N	43						
Q 2	Coefficient correlation	0,236	1,000					
	p	0,128	-					
	N	43	43					
Q 3	Coefficient correlation	0,043	.700**	1,000				
	p	0,783	0,000	-				
	N	43	43	43				
Q 4	Coefficient correlation	0,030	.592**	.756**	1,000			
	p	0,850	0,000	0,000	-			
	N	43	43	43	43			
Q 5	Coefficient correlation	.521**	-	-	0,035	1,000		
	p	0,000	0,104	0,197	0,826	-		
	N	43	43	43	43	43		

Q 6	Coefficient correlation	.376*	.341*	0,253	0,117	0,142	1,000	
	p	0,013	0,025	0,101	0,456	0,365	-	
	N	43	43	43	43	43	43	
Q 7	Coefficient correlation	0,144	0,211	.304*	0,287	0,122	0,193	1,000
	p	0,357	0,173	0,048	0,062	0,437	0,214	-

*Correlation is significant at the 0.05 level (2-tailed)

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

The emphasis placed on reporting incidents is strongly and positively correlated with safety statistics ($\rho = 0.521^{**}$, $p < 0.01$), measurement of safety performance like other business functions ($\rho = 0.376^*$, $p < 0.05$) and reporting of incidents ($\rho = 0.341^*$, $p < 0.05$)

The importance of reporting all types of incidents is strongly and positively correlated with poor safety behaviours impacting on safety performance ($\rho = 0.592^{**}$, $p < 0.001$). A strong safety culture improves safety performance and is strongly and positively correlated with the importance of reporting incidents ($\rho = 0.700^{**}$, $p < 0.01$), poor safety behaviours impact safety performance ($\rho = 0.756^{**}$, $p < 0.01$) and understanding the roles that will improve safety performance ($\rho = 0.304^*$, $p < 0.05$).

However, negative correlations exist between the sharing of safety statistics and strong safety culture improves safety performance ($\rho = -0.197$, $p > 0.05$) and the importance of reporting incidents ($\rho = -0.104$, $p > 0.05$).

4.8 Summary

Cronbach's Alpha was used to test the reliability of the questionnaire, while validity was checked through face validity tests. The chapter presented data by defining the characteristics of the sample group; while simple tables were used to present the results. Descriptive statistics was applied to analyse the responses relating to each of the three objectives. Tables, graphs and figures were used to present this data. Correlations between the variables in each study objective were analysed using inferential statistics. The next chapter discusses the results presented in this chapter and it seeks to link the study findings with the existing literature.

CHAPTER FIVE: DISCUSSION OF RESULTS

5.1 Introduction

The aim of the study was to investigate employee perceptions of safety culture and its effect on safety performance. The results, as presented in the previous chapter, are discussed. F, this chapter seeks to connect and compare the study findings in the context of related literature and existing knowledge.

5.2 Discussion of results

5.2.1 Perceived safety culture maturity level

Filho et al. (2010) found the concept of safety maturity model useful as it assists organisations to establish the maturity level at which they are currently and for developing actions to improve safety. The maturity level of an organisation is based on the perceived organisational characteristics.

Results indicate that most participants agreed that there was visible management commitment to safety at APM Terminals. These results support the study by Lawrie et al. (2006), who assert that visible management commitment is an essential contributor to attaining a positive safety culture. Even when visible management exists, it was interesting to note that at departmental level, employees are not observing safety. These findings are contrary to the study by Pronovost et al. (2003), who also suggest that management should be more visible to operational staff in their efforts to improve safety.

The culture of reporting incidents at APM Terminals is perceived to be that of no blame. These results support the findings by Yule (2003), who found that

organisations should seek to create a no blame culture, which allows employees to freely report incidents without fear of being victimised. Clarke (1998) suggests that a no blame culture is dependent on mutual trust between management and employees, which is facilitated by an open communication. However, it would be impractical to have a reporting culture that accepts all reported safety transgressions under the “no- blame” umbrella, as other reported incidents could be serious safety violations that could detrimentally lead to serious injuries and ultimately, affect safety performance. In this regard, Reason (1998) suggests that a no blame culture should have a punitive element to it, allowing employees to learn from reported incidents, thus correcting unsafe behaviours. The existence of a no blame culture for reporting of incidents is indicative of a proactive safety culture, where the reporting of incidents is treated as an opportunity of learning from incidents.

The management culture at AMP Terminals is perceived to be that of respect, honesty and cooperation. Cooper (2000) suggests that management should develop a culture of respect towards health and safety. The results of the study also indicate that management at APM Terminals display an ethical and genuine concern for employee safety. According to Flin & Yule (2004), management should display their commitment by showing concern for employee safety and by ensuring that the necessary resources are provided for implementing safety awareness programs. The existence of these organisational characteristics is indicative of a calculative safety culture where safety is driven from the top and there are rules and procedures for the management of hazards.

The results also indicate that safety is integrated into other business functions. According to Erickson (1997), management should display their support for safety by ensuring that safety is integrated into other business functions, including strategic planning. Furthermore, Flin & Yule (2004) highlight the importance of prioritising safety against other business functions. Erickson (1997) further suggests that safety culture enhancement measures should ensure that

productivity and safety culture are managed in the same manner. However, the results in this study were contrary to this view point, as most participants agreed that production is prioritised over safety. Sorensen (2002) thus, suggests that management should demonstrate that it prioritises safety over production. This is indicative of a reactive safety culture, where safety is subordinate to production.

From the results of the open-ended question, the participants suggested that the safety culture maturity level is high. According to Hudson (2001), safety culture maturity model and a high maturity level is a generative level where safe operations are essential in all business units. Safety revolves around everything that the company does. There is mutual respect and support at all levels. There is a lot of trust and information which is always shared. Employees are always alert and are constantly looking for ways to improve health and safety. With the results of this study highlighting a lack of visible safety at departmental level and the negative attitudes of supervisors, suggestion that the safety maturity is high (i.e. generative level), is not supported. The organisational characteristics deducted from these results are indicative of a calculative level, where safety rules and procedures are in place for the management of hazards. Safety is driven from the top and there are agreed targets to measure safety performance. There is mutual trust and open communication about what can be improved. Safety is mainly driven by management and is imposed, rather than driven by the employees.

5.2.2 Employee perceptions of factors affecting safety culture

To investigate employee perceptions of factors affecting safety culture, seven factors were included in the questionnaire. The majority of the participants agreed that they felt informed and engaged about safety issues. Misnan et al. (2008) assert that a safety culture should encompass safety awareness initiatives to ensure that employees are informed and engaged in safety matters. The majority of the participants indicated that their supervisors' attitude towards safety is negative. Flin & Yule (2004) suggest that supervisors play an important role in

changing employee safety behaviours and improving employee commitment to safety. Wamuziri (2011) found that employee attitude towards safety are aligned with that of their supervisors. This implies that negative attitude displayed by supervisors will be reflected in the employee's attitude towards safety, thereby causing a breakdown of legislative compliance and eventually leading to injuries.

Clarke (1999) proposed that senior management attitude towards safety should be conveyed to operational level to ensure that the attitude held at senior levels is accurately perceived throughout the organisation. Supervisors hold crucial positions and must carry through and mimic senior management attitude towards safety, to ensure the development of a robust safety culture. The results of the study also show that management involvement in safety is evident at APM Terminals. This finding is supported by Hee (2014) who found that leadership involvement is essential in promoting a positive safety culture. Most of the participants perceived the presence of team spirit and support for safety as important. In the same way, Dalling (1997) suggests that in developing a mature safety culture, it is important for management to encourage teams and individuals at all levels to be pro-active towards safety. This speaks to employees taking an active role in prioritising safety by ensuring they work safely and follow company rules and procedures.

The results also indicate that the participants perceived safety to be everyone's responsibility. These findings support Wang & Liu (2012), who analysed safety culture at four Taiwan railway companies and found that railway employees valued safety and regarded it as everyone's responsibility. Furthermore, Misnan & Mohammed (2007) note that establishing a safety culture means that employees are aware of workplace hazards and it becomes everyone's responsibility to improve safety, hence, it is not only the role of the management. Participants agreed that priority is given to safety issues to ensure that compliance is achieved. In a study by Törner & Pousette (2009), they identified safety priority as an important component for maintaining high standards of safety in the construction

sector. Furthermore, Cox & Cheyne (2000) assessed safety culture in offshore companies and identified priority given to safety issues as an important factor in the development of a safety culture.

The results also indicate that participants were willing to speak up and warn their team members of unsafe conditions. These findings are in line with those by Wamuziri (2011), who studied the factors that contribute to a positive and negative safety culture. He concluded that communication that influences safety culture is one whereby employees can speak up on safety issues without waiting for safety practitioners to identify the unsafe conditions. This indicates the presence of mutual trust and communication, whereby employees can openly identify safety issues to be improved. The participants of the study also suggested that management involvement is an important factor affecting safety culture, as highlighted by the results from the open-ended questions. Andi (2008) found that the involvement of senior management influences positive safety behaviours.

5.2.3 Relationship between safety culture and safety performance

The investigation of the relationship between safety culture and safety performance indicated that there is a strong emphasis placed in the reporting of incidents. Ek & Akselsson (2005) highlight the importance of a reporting culture, where employees report incidents through the existing reporting systems. Furthermore, Reason (1998) identified an informed culture, as a culture where employees are able to report injuries and near misses and are shared through learning throughout the organisation, to ensure that the culture of learning is achieved. Managers need to create an open environment to promote the reporting of incidents (O'Dea & Flin, 2001). The findings also indicate that the participants perceived the reporting of all types of incidents as important. Guldenmund (2000) highlights that within a safety culture, the reporting of incidents and near misses act as an important safety performance indicator. The reporting of incidents forms part of the lagging safety performance indicators, as Pronovost et al. (2003)

suggest that reporting incidents allows organisations to learn from what caused the incidents to occur, thus ensuring the prevention of incidents. Wamuziri (2011) also asserts that lagging indicators measure failures and are not a true measure of safety performance. He proposes the adoption of leading indicators as a true measure of safety performance.

The participants in this study agreed that a strong safety culture improves safety performance, while poor safety behaviours negatively impact on safety performance. Safety culture research sought to determine the psychological influences linked to behaviour and attitude that affect safety performance. In this view, Neal et al. (2000) found that improvements in safety culture can positively impact on safety performance. On that note, organisations with a strong safety culture are more successful in preventing accidents and injuries (Krause & Weekley, 2005a). the results also indicate that injury statistics are shared with employees. Reason (1998) identified a learning culture as an important component of safety culture. A learning culture is one whereby employees learn from shared safety information; such learning prevents the reoccurrence of incidents, thus improving safety performance.

It was also shown that safety is measured in the same manner as other business functions. This finding supports propositions made by Mearns et al. (2003), who assert that safety should be regarded as an integral part of the organisation with set targets and agreed performance measures. The findings of the study also indicate that the participants understood their roles towards improving safety performance. Dalling (1997) asserts that employees should undertake personal responsibility towards safety and understand their roles in achieving a positive safety culture.

5.2.3.1 Intercorrelations between variables in objective 3

The findings of correlations between variables used to investigate the relationship between safety culture and safety performance indicate that the emphasis placed on reporting incidents is positively correlated with sharing of safety statistics. This is in line with the findings by Mearns et al. (2003), who conducted a study in offshore environments and found associations between injury statistics and reporting of incidents. Tam & Fung IV (1998) found that investigating incidents reduces the reoccurrence of incidents, thus improving safety performance. A positive correlation exists between poor safety behaviours' impact on safety performance and the importance of reporting all types of incidents. Parker et al. (2006) highlight the importance of reporting of incidents in relation to improved safety performance. Neal & Griffin (2006) found that it takes time to change poor safety behaviours. They assert that changing the working environment is fundamental in improving safety performance. Correlation analysis indicates a positive relationship between poor safety behaviours' impact on safety performance and a strong safety culture improves safety performance.

The result also shows a positive relationship between understanding the roles that would improve safety performance and a strong safety culture, which improves safety performance. This result supports the findings by Krause & Weekley (2005a), who highlighted the issue of safety accountability in improving safety performance, he asserts that managers should clearly communicate employee safety roles, fostering the sense of responsibility towards each employee. The measurement of safety performance in similar contexts was associated with the importance of reporting of incidents. Solomon (2017: 15) asserts that "it is insufficient to talk about safety and then to measure only process efficiency and production performance. If workers are measured solely against production targets, then that is where their focus will be".

A strong safety culture improves safety performance also positively correlated with the importance of reporting incidents. Reiman & Pietikäinen (2010) suggest the use of safety performance indicators to instil the culture of reporting incidents, so as to improve safety performance.

5.3 Summary

The results of this study indicate that safety culture maturity level at APM Terminals sits in between the reactive, the proactive and calculative levels. The participants of the study felt informed on safety issues, while they also perceived leadership involvement as important in addition, the participants perceived safety to be everyone's responsibility; arguing that prioritisation was given to safety issues and there was willingness to speak up on safety issues. However, supervisor attitude towards safety was perceived as negative.

Lastly, the results of the study indicate that there is a strong emphasis placed in the reporting of incidents and near misses, while the causes of these incidents are shared and communicated with employees to create a learning culture that would prevent the reoccurrence of incidents. The participants perceived that a strong safety culture improves safety performance. Essentially, most of the participants understood their roles in improving safety performance. They also noted that safety is measured in the same manner as other business functions, which allows employees to prioritise safety and report incidents. Based on the results discussed in this chapter, Chapter 6 provides the conclusions and recommendations of the study.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter provides the conclusions for the results presented and discussed in Chapters 4 and 5. Specific practical recommendations are provided, which the organisation could implement to enhance its safety culture to the desired maturity level. The limitations encountered during the study are also discussed and lastly, recommendations for future studies are provided. Prior to highlighting the abovementioned, it is essential to reiterate that the following objectives guided this study:

- To determine the safety culture maturity level at APM Terminals
- To determine the factors affecting safety culture.
- To investigate the relationship between safety culture and safety performance.

6.2 Conclusion

The following conclusions are made, based on the findings of the study, as well as in line with the study objectives.

6.2.1 Summary of findings on safety culture maturity level

Objective	Finding
To determine the safety culture maturity level at APM Terminals.	Participants (74.5%) agreed that there was visible management commitment to safety at APM Terminals. Participants (53.3%) indicated that they did not see safety in their departments. Participants (48%) agreed that the management culture

	<p>is that of respect, honesty and cooperation.</p> <p>Participants (69.9%) agreed that management displayed an ethical and genuine concern for employee safety.</p> <p>Participants (55.8%) agreed that safety was integrated into other business functions.</p> <p>Participants 48.8% agreed that production is prioritised over safety.</p> <p>Participants (14%) perceived safety culture maturity levels to be high.</p>
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6.2.2 Summary of findings on the factors affecting safety culture

Objective	Finding
To determine the factors affecting safety culture	<p>Participants (51.2%) agreed that they felt informed and engaged with safety issues.</p> <p>Participants (90.7%) highlighted that their supervisors' attitude towards safety was negative.</p> <p>Participants (58.1%) agreed that leadership involvement and commitment to safety was evident.</p> <p>Participants (69.8%) perceived the presence of team spirit and support for safety.</p> <p>Participants (83.7%) perceived safety to be everyone's responsibility.</p> <p>Participants (51.6%) agreed that priority was given to safety issues to ensure their safety and compliance to</p>

	<p>legislation.</p> <p>Participants (93.1%) agreed that they were willing to speak up and warn their team members of unsafe conditions.</p>
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6.2.3 Summary of findings on the relationship between safety culture and safety performance

Objective	Findings
To investigate the relationship between safety culture and safety performance.	Correlation results highlighted that a strong safety culture exists when employees understand their safety roles and are encouraged to report incidents. It was also indicated that the existence of poor safety behaviours negatively impacts on safety performance, as the lack of reporting increases incidents, thus affecting safety performance. When injury statistics are shared, employees learn from past incidents, which create a culture of learning that prevents the reoccurrence of incidents. The measurement of safety performance like other business functions improves employee behaviour towards safety. Importantly, if performance is only based on production targets, then employees will not be encouraged to prioritise safety, hence, the issue of production over safety surfaces.

It can be concluded that the safety culture at APM Terminals consists of a management culture of respect, where management displays genuine concern for employee safety. The employees who participated in the study felt informed and engaged on safety issues, they indicated the presence of team spirit and support for safety in their organisation. They also confirmed the presence of visible management involvement and commitment. However, at departmental level, the

employees perceived that there was absence of safety, in addition to their supervisors' negative attitude. This was argued to impact on employee behaviour, as supervisors play a crucial role in influencing employee attitude and behaviour. What these results indicate is that messages of safety commitments are firm and clear at senior management level. However, these messages are not as clear or as evident at operational level, as the employees who participated in this study felt that production was prioritised over safety. As pointed out by Flin & Yule (2004), both transactional and transformational leadership traits are important at the supervisory level, in order to drive positive safety attitudes.

The results also indicate that the relationship between safety culture and safety performance exists when the culture of reporting incidents is emphasised, when injury statistics are shared to allow employees to learn from incidents so that they can be able to prevent the reoccurrence of incidents. When safety roles are understood by employees, when there is an understanding that poor safety behaviours of not reporting incidents negatively impact on safety performance and lastly, when safety is measured in the same manner as other business functions, then employees can work towards improving the safety culture.

From the above, the safety culture maturity level at APM Terminals borders between the reactive level, calculative level and the proactive level. The evidence gathered and analysed, provides organisational characteristics that can be plugged in all three maturity levels. This suggests that the existing safety culture is not a robust safety culture that can be allocated to a specific singular maturity level, which will then define the exact maturity level that APM Terminal Cape Branch sits at.

6.3 Implications of this research

This study provides the foundation for future safety culture perception surveys that APM Terminals is planning to roll out globally. The findings are indicative that a broader safety culture study needs to be conducted; hence, this current study can be used as a reference point. The results of the study might assist APM Terminals management to address areas that were found to be requiring improvement along its safety culture journey.

6.4 Limitations of the study

The following limitations emerged from the study:

- a) The intention of the study was to sample permanently employed employees only, but it emerged that APM Terminals in Cape Town uses permanent contractors based on site on a contractual period of between one to two years. Permanent contractors should have been included in the sample, as their safety behaviour also affects safety culture and safety performance at the branch.
- b) The study findings are only limited to APM Terminals, Cape Town branch and not all other APM Terminals Southern African Inland Services.
- c) Data were collected using self-administered questionnaires hence; the response rate could not be controlled.
- d) The questionnaire was translated into isiXhosa for those participants who did not understand English. The translation process might not have been completely accurate and the meaning of the questions may have been lost.
- e) The inclusion of open ended questions in the questionnaire was aimed at gaining additional perspectives from the participants; however, the analysis and interpretation of this part of the questionnaire proved to be a challenge.

6.5 Recommendations to solve the research problem

Based on the results of this study, the following recommendations are provided:

6.5.1 Safety leadership

The results of this study revealed that employees at the APM Terminals, Cape Town branch, do not observe safety at departmental level, production was prioritised over safety and supervisor attitudes towards safety were perceived as negative. It was also indicated that supervisors play a crucial role in ensuring that employees are fully aligned with the company safety objectives and as such, they should ensure that commitments to safety that exist at management senior level are evident at operational level. Supervisors should take an active role in ensuring that their teams are aware of the risks pertaining to the tasks performed, they should communicate with their teams, to understand and resolve any safety concerns that the employees might have. Supervisors should ensure continuous role modelling by utilising skills they obtained from the safety leadership skills. It is the responsibility of the supervisors to ensure that they are persistent in their approach and keep raising the safety flag to ensure that they drive the desired safety culture at departmental level that is aligned to the overall APM Terminals safety culture.

APM Terminals is on a safety journey and workshops on safety leadership have been rolled out, which all senior and middle management, as well as the supervisors, attended. Learnings from these workshops should be put into practice to ensure the development of a robust safety culture. Some of the practical recommendations that can be adopted to improve safety leadership, both at middle management and supervisory level, include the following:

- Allocating time to conduct walk-through inspections in operational areas and engaging with employees on safety matters.
- Examining one's own safety behaviour, as well as shifting poor attitude to positive attitude.
- Taking a pro-active role and leading by example.
- Ensuring that safety issues highlighted by employees are resolved quickly to encourage employees to develop a culture of reporting.

- Promoting safety and making it fun yet important (for instance, selecting a safety champion of the week).
- Ensuring that the consequence management process for safety violations is seen by employees as learnings and not as a punitive measure.
- Continuously promoting open communication and engagement on safety issues.
- Upholding the APM Terminals requirements for safe operations (demonstrating constant care, accountability, having a culture that strives for higher standards and building the right team) to ensure that production is not prioritised over safety, but that prioritisation is on safe operations.

6.5.2 Promotion of Safety

Safety was not observed at departmental level; the following is recommended to promote safety at departmental level:

- The promotion of safety by putting up safety information on notice boards, information that is visual and easy to read and can be understood by all employees.
- Putting up minutes of safety meetings on notice boards to keep all employees informed about safety issues.
- Promoting safe behaviours by rewarding employees who are pro- active in safety, through a reward system.

6.5.3 Safety culture training

APM Terminals globally has rolled out safety culture workshops to senior and middle managers, as well as supervisors. To ensure consistency and understanding of the safety culture journey, training in this regard should be rolled out to operational staff, as well in a practical manner that would allow them to understand what their role is in building a positive safety culture.

6.6 Recommendations for future research

Given the fact that there are limited safety culture studies in South Africa, this study has contributed to the limited body of knowledge within the South African context. Moreover, there is a need for future studies that would continue to investigate the state of the safety culture maturity levels in organisations, with a view of better understanding the relationship between safety culture and safety performance. Furthermore, future studies can be expanded to other sectors as safety culture is relatively a new phenomenon in South Africa.

6.7 Summary

Data gathered in this study have provided enough evidence to address the research questions. This was despite the existence of limitations that could have influenced the study outcomes. Employee perceptions of safety culture were examined, the safety culture maturity level was identified, factors that affect safety culture were discussed, the relationship between safety culture and safety performance was also examined. This study highlighted a need for the development of safety leadership traits at supervisory level, which would carry through senior management commitments to be visible and felt at operational level. The development of safety leadership traits would also improve supervisor attitudes towards safety. The study provided practical recommendations to improve safety culture at APM Terminals. This study has highlighted that understanding an organisation's safety culture is an essential diagnostic tool that can be implemented as part of incident reduction strategies, thus improving both safety and organisational performance.

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APPENDICES

Appendix 1: Informed Consent Letter and Survey Questionnaire

Informed Consent Letter 3C

UNIVERSITY OF KWAZULU-NATAL
GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP

Dear Participant

My name is **Edith Thandeka Ziqubu**, I am a Master of Business Administration candidate at the University of Kwa Zulu-Natal, Westville campus, South Africa. I would like to invite you to participate in a research project entitled "**Employee perceptions of safety culture and the effects on safety performance at A.P. Moller Terminals. (APM Terminals), Cape Town**". The aim of the study is to investigate employee perceptions of safety culture and its effect on safety performance.

Through your participation I hope to gain a deeper understanding of perceptions that impact safety culture at APM Terminals. The study will provide recommendations on how to promote and a positive safety culture that will improve safety performance at APM Terminals.

Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequences. There will be no monetary gain from participating in this study. Confidentiality and anonymity of records identifying you as a participant will be maintained by the Graduate School of Business and Leadership, UKZN.

If you have any questions or concerns about completing the questionnaire or about participating in this study, you may contact me or my supervisor at the numbers listed above.

The survey should take you about **15** minutes to complete. I hope you will take the time to complete this survey.

Researcher: Edith Thandeka Ziqubu (0840407309)

Supervisor: Dr. E. Mutambara (074 561 5083)

Research Office: (031 - 260 7291)

Sincerely,

Investigator's signature_____

Date_____

SURVEY QUESTIONNAIRE

PART A: DEMOGRAPHIC DETAILS

In this part, I would like to know more about you. You are requested to put a cross(X) in the appropriate response.

A1. Please specify your age group

20 - 35	1
36 - 45	2
46 – 55	3
56 – 65	4

A2. Please indicate your gender

Female	1	Male	2
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A3. Please specify your department

Administration Block	1
Wash bay	2
Gate	3
Workshop	4
Reefer	5

A4. Please specify your employment status

Permanently employed	1
Contractor	2

A5. Please specify how long you have been employed at APM Terminals

1-5 years	1
6- 10 years	2
11 – 15 years	3
16 years and over	4

PARTB: PERCEPTIONS OF SAFETY CULTURE MATURITY LEVEL AT APM TERMINALS.

This part of the questionnaire is designed to assess perceptions of safety culture maturity at APM Terminals. To what extent do you agree with the following statements, please make a cross (X) in appropriate response.

- 1 = Strongly disagree
 2 = Disagree
 3 = Neither agree nor disagree
 4 = Agree
 5 = Strongly agree

B1	There is visible management commitment to Safety at APM Terminals.	1	2	3	4	5
B2	There are talks about Safety, I don't see it in my department.	1	2	3	4	5
B3	The culture of reporting safety concerns is that of no blame.	1	2	3	4	5
B4	The management culture at AMP Terminals is that of respect, honesty and cooperation.	1	2	3	4	5
B5	Management displays an ethical and genuine concern for employee safety.	1	2	3	4	5
B6	Safety is integrated in all business functions and on how we do things at APM Terminals.	1	2	3	4	5
B7	Production is prioritised over Safety.	1	2	3	4	5
B8	Please provide brief comments about your thoughts of the maturity levels of Safety culture at APM Terminals. ----- ----- ----- -----					

PART C: FACTORS AFFECTING SAFETY CULTURE

This part of the questionnaire is designed to determine factors affecting safety culture. To what extent do you agree with the following statements, please make a cross (X) in the appropriate response.

- 1 = Strongly disagree
 2 = Disagree
 3 = Neither agree nor disagree
 4 = Agree
 5 = Strongly agree

C1	I always feel informed and engaged with Safety issues.	1	2	3	4	5
C2	My supervisor's attitude towards Safety is positive.	1	2	3	4	5
C3	Leadership involvement and commitment to Safety is evident.	1	2	3	4	5
C4	There is team spirit and support for Safety at APM Terminals.	1	2	3	4	5
C5	Safety is everyone's responsibility at APM Terminals.	1	2	3	4	5
C6	Priority is given to Safety issues to ensure employee safety and compliance to legislation.	1	2	3	4	5
C7	I am always willing to speak up and warn my team members of unsafe conditions.	1	2	3	4	5
C8	Please provide comment briefly on factors you think affect Safety culture at APM Terminals ----- ----- ----- ----- ----- ----- ----- ----- -----					

PART D: RELATIONSHIP BETWEEN SAFETY CULTURE ON SAFETY PERFORMANCE

This part of the questionnaire is designed to determine your perceptions on the relationship of safety culture and safety performance. To what extent do you agree with the following statements, please make a cross (X) in the appropriate response.

- 1 = Strongly disagree
 2 = Disagree
 3 = Neither agree nor disagree
 4 = Agree
 5 = Strongly agree

D1	There is a strong emphasis placed in the reporting of incidents.	1	2	3	4	5
D2	It is important to report incidents, big or small.	1	2	3	4	5
D3	A strong safety culture improves safety performance	1	2	3	4	5
D4	Poor safety behaviours impact safety performance.	1	2	3	4	5
D5	Are safety injury stats shared with you? E.g. number of near misses, number of injuries or number of fatalities.	1	2	3	4	5
D6	Safety performance is measured in the same context as other business functions e.g. finance	1	2	3	4	5
D7	I understand my role in improving Safety performance.	1	2	3	4	5
D8	In brief state your role in improving safety performance----- ----- ----- ----- ----- ----- ----- -----					

Thank you for taking time to complete this questionnaire.

Appendix 2

Letter of consent from company



LETTER OF CONSENT TO CONDUCT RESEARCH AT APM TERMINALS, CAPE TOWN BRANCH

Dear Mrs. E. T Ziqubu,

I have gone through your request and I understand that the research is purely for the fulfilment of a Master's degree in Business Administration, I also understand that the data from the research project will be treated with the highest care and confidentiality. Therefore, I, Erie de Jager in my capacity as Managing Director of Apn Terminals hereby approve that you may conduct the aforementioned research project within APM Terminals, Cape Town branch.

.....
Signature and date

Appendix 3

Ethical Clearance



20 September 2017

Mrs Edith Thandeka Ziqubu (211543818)
Graduate School of Business & Leadership
Westville Campus

Dear Mrs Ziqubu,

Protocol reference number: HSS/1337/017M

Project title: Employee perceptions of Safety culture and the effects on Safety Performance at A.P. Moller Terminals (APM Terminals), Cape Town

Approval Notification – Expedited Application

In response to your application received on 14 August 2017, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully


Dr Shenuka Singh (Chair)

/ms

Cc Supervisor: Dr Emmanuel Mutambara
Cc Academic Leader Research: Dr Muhammad Hoque
Cc School Administrator: Ms Zarina Bullyraj

Humanities & Social Sciences Research Ethics Committee

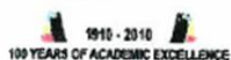
Dr Shenuka Singh (Chair)

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Website: www.ukzn.ac.za



Flagship Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

Appendix 4

Turnitin Report

TII Final Report

ORIGINALITY REPORT

5%	4%	5%	5%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	webcache.googleusercontent.com Internet Source	2%
2	Submitted to University of Northumbria at Newcastle Student Paper	1%
3	Submitted to University of East London Student Paper	1%
4	Submitted to Mancosa Student Paper	1%
5	Submitted to Universiti Malaysia Terengganu UMT Student Paper	1%

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Exclude bibliography	On		