Safety climate and the influence of leadership:

A study of safety climate and the influence leadership training has on employee perceptions of health and safety.

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Abstract

The aim of this study is to understand the influence leadership has upon safety in the workplace as seen through the eyes of its employees. This research was undertaken in the Island City of Singapore and associated with a business owned by a Multi-National Corporation, (MNC), operating locally. The research was carried out as a reflection of the organisations safety climate, through a professionally available questionnaire mechanism.

While research and theory contend that safety culture is enduring and possibly more difficult to assess, it is recognised that safety climate is measureable and is considered to be a reflection of safety culture. Theory also contends safety climate as being a snap shot of the organisations 'mood' at a single point in time and therefore has a short shelf life. It is also recognised that the background to this study is done acknowledging the continued debate surrounding the understanding and definitions associated with the concepts organisational culture & climate, safety culture & climate.

Leadership theory and research points out the importance of leadership on employee behaviour and motivation.   The organisations' senior leadership underwent intervention training provided by the author based upon leadership theory of a transformational style and workplace best practice. A Safety Climate questionnaire was provided to the participating employees of the MNC business and was repeated following a three-month interval. The study was quantitative, longitudinal and comparative in nature.   The participating employees forming a control group and an intervention group. Following the leadership training the Senior Leadership was associated only with the employee intervention group. Safety climate analysis was undertaken with the findings being a result of questionnaire responses. Prior to the research it was expected that the results of the research would provide useful future guidance for organisations and their leadership. The author believed that the study would help organisational leadership better understand and make full use of the influence they have. This knowledge would in turn provide leadership the requisite emphasis to improve workplace safety and employee's perception through the influence leadership holds.

The study's hypothesis was that a discernible difference should be noted between the ensuing assessments due to improved leadership and the understanding of the influence it holds. The improved leadership influence will be reflected in employee's perception of management and workplace safety as captured in the safety climate questionnaire.
It was believed that this research should help provide the organisation greater understanding of both an organisations safety climate, and leadership culture. Through this research the organisation should also recognise the role leadership influence plays

and that the utilisation of safety climate assessment can be a useful and predictive tool. That its use can play a part in the organisations endeavour to reduce workplace injuries and help reduce the associated escalating financial cost to both employees and the organisation of such injuries and loss.

The outcome from the study found a positive correlation to the research question and hypothesis with the safety climate results indicating a positive improvement for the intervention group associated with the leadership influence, as a direct consequence of the intervention training. The safety climate measurement improved significantly for the surveyed dimension of Management Commitment and the other management specific areas. The Safety Climate Index improvement for the dimension of Management Commitment alone increased by 41.03% and an overall increase of 16.95% across all of the nine survey dimensions.

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List of Abbreviations

EH&S	Environmental, Health & Safety
GDP	Gross Domestic Product
GSI	Global Safety Index
HR	Human Resource
HSE	Health & Safety Executive
ILO	International Labor Organisation
ITC	International Trade Compliance
LSI	Leadership Safety Index
MNC	Multi-National Corporation
OHS	Occupational Health & Safety
OHSA	Occupational Safety and Health Administration
PBS	People Based Safety
SCI	Safety Climate Index
WSHi	Workplace Safety & Health Institute

CHAPTER 1: INTRODUCTION

This chapter commences the thesis by introducing the background as to why this topic was chosen, the main impetus of this study and the underlying assumptions. The chapter will conclude by providing an overview of the thesis.

1.1 Background to the Research Objectives

1.1.1 The Issue: The Organisational Burden of Workplace Injuries and Disease

An organisations' ability to provide its employees a safe place to work has become of paramount importance over the past fifty years, (Hajmohammad & Vachon, 2014). The main reasons behind the concern are in part the increased awareness of the disabling consequences that affect the injured party and their family. Also, the ever increasing financial costs including legal compliance requirements, subsequent fines, and business shut down during accident investigation, (Turberfield, 2015). While organisations in general now tend to focus on the safety of people in the workplace the number of employees being harmed while at work remains significant. For example, the U.S. Bureau of Labor Statistics 2014 report highlighted that 3 million nonfatal workplace accidents were reported by private industry for that year, (Bureau of Labor Statistics, 2015). During the same period 4,679 workplace fatalities occurred in the USA workplace, (Bureau of Labor Statistics, 2016). Across a similar timeframe in Singapore 13,595 nonfatal injuries were sustained and 60 fatalities occurred, (WSHi, 2015). While Singapore is significantly smaller in terms of population and physical size, Singapore fatality rates are high in comparison to the USA when comparing population size.

Throughout this study there will be a focus upon the USA and Singapore due to the focal Multi-National Corporation, (MNC), operating in Singapore and its involvement in this study.

1.1.2 Economic Cost of Workplace Injuries and Disease

The International Labour Organisation, (ILO), has estimated that about 2.3 million workers die from occupational accidents and diseases worldwide every year. The average global annual cost associated with these deaths is estimated to be 4% of global GDP or USD 2.3 Trillion according to the ILO, (ILO Introductory Report, 2011). Globally, the economic cost of injuries and illness associated with the workplace across participating countries has been estimated to vary between 1.8% and 6% of GDP, (Takala, Hamalainen, Saarela, Loke, Manickam, Tan, Heng, Tjong, Lim, Lim & Gan, 2014). The economic cost to Singapore for the same year was reported to be S$10.45 Billion, equating to 3.2% of Singapores' GDP, (WSHi Singapore Report, 2014). Interestingly, some research has noted, that while the cost of injuries remains significant, and is in fact trending downwards, the largest cost continues to be borne by the injured party, (Gahan, Sievewright & Evans, 2014; WSHi Singapore Report, 2014).

1.1.3 Continuing Injuries and Disease

Organisations have recognised that it is in their interest to reduce the rate of workplace injuries and illness but it continues to be a journey. Early drivers to encourage businesses to improve have been and continues to be largely due to national legislation and the supporting governmental safety agencies. Legislation though mostly provides a stick approach in its encouragement of safe workplace practices. Management safety systems tend to provide policy and procedural mechanisms in support of the legislative requirements. Organisations understand there is a cost to workplace injuries and illness resulting in penalties. Especially as a consequence of failing to ensure at least that all employees understand their safety role and responsibilities under the law.

Legislation has driven organisations to report injury rate and injury type as part of compliance requirements. Businesses though have also utilised this data as an indication of the organisations level of internal safety. This data is, in the most part, historical, and now recognised as a lagging metric, (De Cieri, Shea, Pettit, & Clarke, 2012). In many organisations the numbers of injuries in the workplace has been reduced to the point where in effect a plateau has been reached, (Hudson, 2007), with no real improvement in injury trends, (Fitzgerald, 2005). Unfortunately, it has also been recognised that reliance just on management systems and compliance to legislation is no longer in itself sufficient to achieve further improvement in organisation workplace injury and illness safety performance, (Hudson, 2007).

1.1.4 The Gap

Increasingly, organisations are recognising that other factors also play an important part in improving workplace safety performance. This was first highlighted as an outcome of the associated findings from major accidents that occurred during the 1980's. These accidents include; the Chernobyl nuclear reactor accident in April 1986, the Kings Cross fire in November 1987 and the Herald of Free Enterprise in March 1987, (Health & Safety Executive, 2005). The case studies that followed these high profile disasters saw a critical examination of the organisations safety management understanding, (Guldenmund, 2000). The findings found weaknesses within aspects of the organisations' culture of safety, (Reason, 1997; Reason, 1998). This has led to organisations focusing on enhancing their safety management systems specifically on the aspect of organisational culture of safety and the role of leadership.

1.1.5 Leadership

It has been argued that one of the most important influences to an organisation and its success is that of the organisations leaders, (Geller, 2005). It is the leaders who set the tone for what employee behaviour's, and perspectives, are deemed important, (De Cenzo & Robbins, 1994). Employees continually watch their leaders and make assessment of what they see. Employee's motivation for how they act and the behaviours they in turn exhibit is directly linked to the influence of the organisations leadership, (O'Dea & Flin, 2003). This influence that organisational leadership holds also impacts upon the employees' workplace safety behaviour, (Andriessen, 1978). How employees see management, their behaviour and the resulting actions is paramount to how safety is perceived as being truly important or merely lip service, (Bailey, 1997; Mearnes & Flin, 1999; Zohar, 2010). To be effective it is important that the organisations leadership should continuously demonstrate their belief in workplace safety through visible actions, time spent in safety related activities and importantly, ensuring that their actions match their words, (Mearns & Flin, 1999; O'Dea & Flin, 2001; Taylor, 2002a).

The relationship between organisational leadership and safety has been explained as an extension of the leaders concern for the employee's welfare. It has been contended and evidence suggests, that closer, higher-quality relationship's, increase the concern a leader portrays for the employee under their responsibility, (Bass, 1990).

Previous findings support the importance of a participative and transformational leadership style, (Bass, 1985). This style is likely to have the most positive influence within the organisation for safety performance, (Mullen, Kelloway, & Teed, 2017). As such,

leadership theory will be a key component within this thesis, and will focus on transformational leadership specifically from a safety perspective.

Transformational leadership concepts have more recently been a focus within workplace safety studies, (Barling, Kelloway & Frone, 2005; Mullen, Kelloway & Teed, 2011; Zohar, 2000). Some researchers contend that both a transactional and a transformation leadership style is applicable for the success of a business, (Bass, 1998). It has also been suggested that the most likely leadership concept to have the most positive influence within the organisation for safety performance is transformational, (Inness, Turner, Barling & Stride, 2010; Mullen, et al, 2017). It is argued that the transformational leader is, one who motivates us to do more than we originally expected to do, (Bass, 1985; Bass, 1990).

Transformational leadership covers a wide range of leadership behaviours including the need to empower subordinates, develop a sense of ownership for what happens in the organisation, and be participative, supportive and build trusting relationships, (O'Dea & Flin, 2003).

The concept also recognises the needs of both the organisation and the employee. As a leadership concept it is more likely to inspire employees to participate in safety initiatives, (Mullen, et al 2011). Therefore, possibly resulting in less reliance on compliance. It has been argued that the attributes of transformational leadership can be learnt, (Bass, 1990). As a consequence this study will explore the influence transformational leadership has upon the employee perspective of safety within the workplace, with a focus on leadership intervention training and as a result how it impacts the organisations safety climate.

1.1.6   Safety Climate

Guldenmund explains that an organisations culture can be viewed as a global, integrating concept underlying most organisational events and processes and expresses itself through organisational climate, (Guldenmund, 2000). Similarly, an organisation's 'culture' of safety is that aspect of an organisations culture that influences attitudes and behaviours that have an impact on the level of safety within the organisation, (Hale, 2000).

It is associated with a positiveness that creates an atmosphere in which the organisations employees are aware of the risks in their workplace and are continually on guard against them, (Ostrom, Wilhelmsen & Kaplan, 1993). Simple put if an organisations'

culture from a safety perspective is seen as the way we do things around here then safety climate can be viewed as its mood at any given point in time, (Cox & Flin, 1998).

Safety climate is now recognised as an important indicator of workplace safety performance, (Jiang, Yu, Li & Li, 2010), and is a reflection of the organisations culture of safety, (Cox & Flin, 1998). Some researchers have stated that it is a global factor involving perceptions of workplace safety related attributes and the relative priority given to safety when competing with all of the other businesses requirements, (Griffin & Neal, 2000).

It has been suggested that much of the organisational factors that impinge upon safety climate fall under the direct control of management, (O'Dea & Flin, 2001). Broad agreement exists that management support for safety and the overall importance assigned to safety within the organisation are keys aspects of safety climate, (DeJoy, Schaffer, Wilson, Vandenberg, & Butts, 2004). It has also been pointed out that safety climate has been shown to exert a strong impact on an individual's motivation to achieve work outcomes and provide a context in which specific evaluations of the importance of safety are made, (O'Dea & Flin, 2003). In the long run though it is the perception of safety that the employees hold that will influence their safety performance and impact the safety climate.

One of the advantages of safety climate is its measurability. Today this is now well established in many industries, (Zohar, 2010). Utilising questionnaires of a quantitative nature, employee perceptions are central to the measure of safety climate, (Griffin & Neal, 2000). Safety climate though is recognised as a snap shot in time of the employees views of safety, (O'Conner & Kennedy, 2011), which places a limitation of its usefulness, (Bergman, Payne, Taylor, Beus, 2014). Zohar suggests though that this type of measurement allows for organisations to make comparisons between business departments within the same organisation, (Zohar, 2010).

The measurement of safety climate becomes a useful tool for organisations. Making use of it allows the organisation to gain a picture of how employees perceive safety within their workplace at a particular point in time. If management is serious about the organisations workplace safety and their employees then safety climate measurement can support improvement and appropriate remedial action.

Safety performance, if it is to provide the results necessary to reduce injuries and support the mitigation of compliance cost, requires a supportive organisational safety culture, effective safety management systems and more importantly, both manager and employee buy-in, (Mansdorf, 1999; Cooper & Phillips, 2004).

1.2   Research Gap

This research will be limited to the location of Singapore and associated with a local MNC business operating on the island. The findings will support the organisation with research that helps them to recognise the influence their managers have and provide the evidence for what actions they can take from a practical perspective that fits their busy schedules. As other research has shown it is possible for leadership to balance the supposed internal business competing influences as an overall win-win situation, (O'Dea & Flin, 2003).

It has been argued that even with the knowledge growth in the area of leadership, issues with management within organisations continues to be a concern, (Sabet, Aadal, Jamshidi & Rad, 2013), therefore further research in this area would be advantageous.

This thesis will also support and add to current research that suggests that leadership is a critical role and central to employee perception of safety in the workplace, (Zohar, 2010). In particular research that supports the fact that leadership training and specifically transformational concepts can be taught, (Kelloway, Barling & Helleur, 2000). Further research also supports and adds to positive improvement in safety climate as a result of leadership intervention and employee perception of workplace safety is also advantageous, (Walumbwa, Avolio, Gardener, Wernsing, & Petersen, 2008; Mullen & Kelloway, 2009). Specifically associated with the region of Singapore is that safety climate has rarely been the focus of research or conducted in non-western and developed economy context, (Jiang et al, 2010).

The objectives of this research therefore are to examine and understand the influence of leadership within the organisation and its impact on employee perception of safety within the workplace.

1.3 Research Question & Hypothesis

Research Question

In order to address and support the research gap the following research question will be addressed in this study:

Can employee perspective of workplace health and safety improve as a result of senior leadership training that highlights the significance of current theoretical knowledge of leadership influence?

Hypothesis

Leadership training, involving senior employees understanding leadership influence, will result in improvements in employee perceptions of health and safety within the organisation as a measure of safety climate.

1.4 Research Design

A single organisation owned by a locally operating MNC within Singapore will take part in the study. The research methodology for this study will be a quantitative analysis, utilising a safety climate assessment tool and will be comparative in nature. An intervention and control group comprising of workplace employees will be identified and selected within the participating organisation. The workplace employee intervention group will be managed by a selected number of senior managers who will receive the leadership training. A pre and post intervention safety climate survey will be undertaken to measure changes in employee perceptions resulting from the leadership intervention. This will be a test and retest analysis and therefore longitudinal in nature, with the safety climate survey being conducted twice within a three month interval.

1.5 Thesis Structure

The first chapter of this thesis has introduced the background to the study, the research question and expectation. Chapter two will provide a literature backdrop to the study with applicable critical arguments, theoretical concepts and associated research. The remaining chapters will cover results and discuss the findings as they pertain to the research question and hypothesis.

Chapter Two: Literature Review

2.1 Introduction

The focus of this literature review was the concepts of organisational safety performance, safety climate and leadership as they relate to organsational culture. The search looked specifically for literature that focused on theory, past and present research and current concepts. The review encompassed literature concerning leadership theories, principles and practices and associated leadership intervention training. The search included the influence leadership may bring to bear especially upon workplace safety performance outcomes and employee's perception of safety. It also sought to locate any literature with any regional or business linkage to Singapore/Asia and businesses similar to the focus Multi-National Company, (MNC).

The search instruments utilised included, Singapore National libraries, Massey Library and on-line research websites including Elsevier, Science Direct, Springer Science – Business Media, Researchgate & Google Scholar.

The search found a large amount of literature written on the search subjects associated with organisational culture, performance, safety climate and leadership. Also, that the supporting theory remains relatively unchanged although there continues to be new and emerging concepts of organisational leadership. There is however, a growing interest in leadership influence on safety and that there is an opportunity for further research in this area. Literature reviewed associated with the study topics and the Singapore/Asia region currently remains largely limited.

2.2 Organisational Culture

Organisational culture is powerful and ubiquitous, (Schein, 1988). Schein further states that its associated forces sometimes result in behaviour that can be puzzling, frustrating and sometimes irrational, (Schein, 2010). Organisational culture, as a topic, is commonly referred to and found embedded within modern day business methods and practices. Pick up most Human Resource, (HR), textbooks and organisational culture is a covered theme, sometimes chapters fully focused on the subject. It is often linked throughout many HR aspects covering implications for recruitment and retention to organisation performance improvement, (Den Hartog & Verburg, 2004).

The Cambridge English Dictionary defines the concept as:

A noun associated with the workplace, "the types of attitudes and agreed ways of working shared by the employees of a company or organisation", (Cambridge Dictionary, 2016).

The Collins Dictionary defines it as:

 "The customs, rituals, and values shared by the members of an organisation that have to be accepted by new members", (Collins Dictionary, 2016).

Both definitions have similarities and differences, which can be viewed as a reflection of the challenge that continues to exist today. The concept of organisational culture is recognised as important but agreement of the definition and coverage remains inconsistent across many theories, (Schein, 1990; Alvesson, 2012; Myers, Nyce & Dekker, 2014).   This challenge for the concept of organisational culture and the ability for researchers to agree on a consistent definition was recognised early on in research of the 'organisation', (Allaire & Fisirotu, 1984; Schein, 1990).

2.2.1   Defining Organisational Culture

It has been stated that organisational culture is learned, not inherited and derives from ones' social environment, (Hofstede, Hofstede & Minkov, 2010). Hofstede concludes that culture is not a characteristic of individuals but rather stems from the collective mental programming of the people in an environment, conditioned by the same education and life experiences, (Hofstede, 1998). Kroeber & Kluckhohn, (1952), defined it as consisting of patterns of behaviour transmitted by symbols, embodied in artefacts, ideas and values, (cited in Redman & Wilkinson, (2009). While Deal & Kennedy, (1982), defined it as a system of informal rules that spells out how people are to behave most of the time, (cited in Redman & Wilkinson, (2009).

A definition that now is commonly used describes the concept of culture as the way we do things around here, (Bower, 1966, cited in Holmes & Mara, 2002; Schein, 1990; Schein, 2010). Haukelid argues that culture is a condition for creating order in the world and that the way we think and the way we act are culturally mediated, (Haukelid, 2008). Ogbonna & Harris argue that culture is the collective sum of beliefs, values, meanings and assumptions that are shared by a social group and that help to shape the ways in which they respond to each other and their external environment, (Ogbonna & Harris, 2002). Uttal, (1983), defined it as being the "shared values, (what is important), and beliefs, (how things work), that interact with a company's people, organisational structures and control systems to produce behavioural norms, (the way we do things around here)", (cited in

Choudhry, Fang & Mohamed, 2007). Reason, suggests Uttals' definition closely captures the essence of organisational culture, (Reason, 1998).

It has been argued that the congruence of the organisations' values and its employees is important and that the strength of the relationship affects the success of the business, (Posner, Kouzes & Schmidt, 1985). Posner, et al, suggest further that a corporate culture with strong shared values provide individuals with a sense of success and fulfillment, a healthy, (less cynical), assessment of the values and ethics of their colleagues, subordinates, and bosses, and a greater regard for organisational objectives and significant organisational constituents, (Posner, et al., 1985).

Schein continues and states that this culture is defined as (a) a pattern of basic assumptions, (b) invented, discovered, or developed by a given group, (c) as it learns to cope with its problems of external adaption and internal integration, (d) that has worked well enough to be considered valid and, therefore, (e) is to be taught to new members as the (f) correct way to perceive, think, and feel in relation to those problems, (Schein, 1990; Schein, 2010). This influence and its effect is associated with the group behavioural norm and is the outcome of the interactions between the organisation and its members, (Wu, Chen & Li, 2008).

2.2.2 Historical Background of Organisational Culture

Mead, (1934), stated that the term 'culture' has its theoretical 'roots' within social anthropology, (cited in Mearns & Flin, 1999). It being utilised to describe qualities of a human group that are passed from one generation to the next, (Maull, Brown, & Cliffe, 2001). Geertz early argument was that culture is the creation of meaning through which human beings interpret their experience and guide their actions, (Geertz, 1973).

Researchers commenced closer examination of an organisations' psychology during the middle of last century, academics recognising the social aspects as a specific focus for the understanding and study of the workplace organisation, (Schein, 1990). It has also been acknowledged that during the 1970's and 1980's a focus occurred on the concept of organisational culture, (Schein, 1990). This attention came from both researchers and practitioners. Guldenmund suggested that in some respects this focus was possibly due to the concept providing a welcomed umbrella approach to explain the notional characteristics associated with an organisation, (Guldenmund, 2000). Alvesson suggests that it was associated with organisation performance and success, (Alvesson, 2012). It was also recognised that there was a need to understand organisational culture and identifying the characteristics associated with top USA businesses, (Peters &

Waterman, 1982). This was needed to support the competition with highly successful Japanese companies, (Ouchi, 1981).

Schein noted that Katz & Kahn in those early days of research concluded that organisational culture as a 'social' organisation it was a contrived system held together by psychological bonds, (Schein, 1990). It was also recognised that as a society an organisation would be equipped with socialised processes, social norms and structure, (Allaire & Fisirotu, 1984). As early as the 1950's researchers such as Selznick attributed organisation's with personality, needs and a character, (Allaire & Fisirotu, 1984).

It also follows then as a 'social' organisation within the context of a workplace there would be the requirement for control to ensure the maintenance and cohesive functioning of the group, (Schein, 1990).   Alvesson suggests that organisational culture frequently works as a source of employees' resistance to managerial objectives and control, (Alvesson, 2012). Intentions behind managerial interventions and arrangements on the one hand and subordinates reactions to those on the other hand may differ considerably, (Alvesson, 2012). It was also during the early days that alongside the term 'norms', the term climate was coined, and has thus been utilised by psychologist for some time, (Schein, 1990).

Organisational culture though has been a more recent concept, (Schein, 1990). The utilisation of the terms organisational culture and organisational climate and the fact that climate preceded culture as a concept led to initial confusion in their use, (Redman & Wilkinson, 2009).

Not only has the understanding of their defining aspects reversed places but some still see them as being interchangeable in their use, (Guldenmund, 2000). It has been argued that the interchanging of the terms is not only confusing but can lead to the concepts being utilised incorrectly, (O'Neill, Wolfe & Holley, 2015). Organisational climate being seen now in a more restricted manner and as being associated with the attitudinal and such phenomena within the organisation.

Schein suggests that climate is more a reflection and manifestation of cultural assumptions, (Guldenmund, 2000). Moran and Volkwein, (1992), defined organisational climate as: a relatively enduring characteristic of an organisation which distinguishes it from other organisation's: and (a) embodies members' collective perceptions about their organisation with respect to such dimensions as autonomy, trust, cohesiveness, support, recognition, innovation, and fairness; (b) is produced by member interaction; (c) serves as a basis for interpreting the situation; (d) reflects the prevalent norms, values and attributes of the organisation's culture; and (e) acts as a source of influence for the shaping of behaviour, (cited in Redman and Wilkingson, 2009). Guldenmund further

states, that currently organisational culture can be viewed as a global, integrating concept underlying most organisational events and processes. While organisational climate referring to that which naturally follows culture or that organisational culture expresses itself through organisational climate, (Guldenmund, 2000).

2.2.3   Organisational Culture Contention

Myers, et al, argue that because the concept of organisational culture is so widely used today and being applied by an increasingly diverse set of disciplines the inclusive concept as originally intended by sociologists and anthropologists has become too broad, (Myers, et al, 2014). Geertz, argues that culture needs to be distinguished from the social system, (Geertz, 1973). Haukelid agrees that while there are many meanings for culture as a concept, a realistic approach for analytical purposes should be utilised, (Guldenmund, 2000; Haukelid, 2008; Myers, et al, 2014). This approach should be one that does not necessarily restrict the researcher to a single definition but while recognising culture as a separate system of meaning it should not be forgotten that the relationship may have other interrelated systems, (Haukelid, 2008). Schein, argues that to be useful and provide the means to understand behaviour that could otherwise seem incomprehensible research should build upon the deeper more complex anthropological models, (Schein, 2010).

Pettigrew, stresses that culture may not just be a concept or source of a family of concepts but a root metaphor for organisational analysis, (cited in Redman & Wilkinson, 2009; Alvesson, 2012). Some researchers have stated that if there is limited agreement of the definition not only will it have limited usefulness it will also only create unnecessary theoretical and operational confusion, (Bacharach, 1989). Schein agrees and goes further by observing that the word and its usage has become so popular that it has been attached to everything from behavioural patterns to new corporate values, (Schein, 1990). Schein argues that this has 'muddied the waters' and as such only adds to the challenge, (Peters & Waterman, 1982; Schein, 1990).

Allaire & Firsirotu remind researchers to remember that the concept of culture does have many different facets or association with a number of different theoretical systems, (Allaire & Fisirotu, 1984). Schein points out that one probable reason for diversity of approaches to culture is that it lies at the intersection of several social sciences, (Schein, 1990). Alvesson contends that just as complex as it is organisational culture remains significant and the case still exists for taking an interest in aspects including relationships to; performance, values, people management and knowledge, (Alvesson, 2012). Schein argues that it continues to be a journey of gathering and gaining knowledge, (Schein, 1990).

2.2.4 Workplace Safety and Organisational Culture

Hale stated that the 'culture' of safety is that aspect of an organisation's culture that influences attitudes and behaviours which have an impact on the level of safety within the organisation, (Hale, 2000; Pidgeon & O'Leary, 2000). O'Toole agrees and argues that an organisation's culture that is associated with safety can be viewed simply as a component or sub-set of the organisation's culture, (Clark, 1999; O'Toole, 2002; Wu, et al 2008), that refers to the individuals, their jobs and the organisational characteristics that affect employees' health and safety, (Fernandez-Muniz, Montes-Peon, & Vazquez-Ordas, 2007).

This aspect of an organisation's culture took a fundamental step in importance following a number of major accidents in the late 1980's, such as; the Chernobyl nuclear reactor accident in April 1986, (Pidgeon & O'Leary, 2000; Choudhry, et al, 2007), the King's Cross fire in November 1987 and the Herald of Free Enterprise in March 1987, (HSE, 2005). The case studies that followed these disasters linked weaknesses within the safety aspect of an organisation's culture with the accidents, (Reason, 1997 & 1998).

The aim of an organisation's culture that is specifically associated with and supports safety according to Ostrom, et al, is one where the organisation's culture has a positiveness that creates an atmosphere in which employees are aware of the risks in their workplace and are continually on guard against them, (Ostrom, et al, 1993). It has been suggested that this positive or good culture as being reflected by and promoted by four factors; senior management commitment to safety, realistic and flexible customs and practices for handling both well-defined and ill-defined hazards, continuous organisational learning through practices such as feedback systems, monitoring and analysing, and a care and concern for hazards which is shared across the workforce, (Pidgeon & O'Leary 2000). Although Reason's earlier suggestion would content that the ideal safety aspect of organisational culture is the 'engine' that drives the system towards the goal of sustaining the maximum resistance towards its operational hazards, regardless of leadership personalities or current concerns, (Reason, 1998).

Taylor argues that when an organisation has attained a positive level of safety performance it will be in its "bloodstream", such that poor conditions and practices will be viewed by all as unacceptable and that the employees will openly challenge these situations, (Taylor, 2002b).

Taylor goes on to state that unsafe events and incidents will be viewed as not being part of normal working life but as exceptional and unacceptable occurrences that can be avoided; a self-sustaining organisational culture of safety therefore will exist, (Taylor, 2002b).

It is important then that an organisation's management be cognisant of its culture and ensure planned strategies, including safety management, align, or the effectiveness of the planning may well be wasted, (Gomez-Mejia, Balkin & Cardy, 1998).

2.2.5   Safety Performance and Organisational Culture

Safety performance of a business can be considered to be a subsystem of the organisation's overall performance, (Wu, et al, 2008). Traditionally, the concept within organisation's concerning safety performance has been associated with capturing injury data and legally required management system data as part of mitigation of compliance, for example ISO 14001 or meeting OSHA reporting rules. It is now understood that reliance just upon traditional safety metrics as an indicator of an organisation's safety performance, especially historical data such as injury rates, may place the organisation at risk, (Cooper, 2000).

One noted issue of making use of the number of incidents is that the number of real organisational incidents are often rare and as such forms a skewed distribution, (Christian, Bradley, Wallace, Burke, 2009). Also that the prediction of psychological antecedent's on the number of safety events tends to be weak, (Zohar, 2000). It has been recognised that currently the trend of those traditional injury statistics is that they have reached a plateau with no real improvement in performance trends, (Fitzgerald, 2005). Fitzgerald also notes that organisations continue to struggle to identify ways forward to promote further reduction in organisational injuries and illness, (Fitzgerald, 2005).

Taylor, calls this gap the 'the culture gap' and argues that it can be closed by achieving greater commitment, involvement and ownership of safety by all employees within an organisation and should be led by top management, (Taylor, 2002a; Fitzgerald, 2005). Hudson terms this the developmental line and argues that this gap follows on from what technology and systems have already accomplished in safety performance and that knowledge of the organisations' culture will now fill this gap, (Hudson, 2007). Many organisations have learnt the importance of establishing effective safety frameworks within the business that go further than just the mechanistic and compliance measures. This has become important not just in order to prevent harm to employees and equipment but to meet increasingly complex compliance requirements and associated rising costs. These costs are not just from legal requirements but the cost associated with harm to employees, (Sawacha, Naoum, & Fong, 1999; Jiang, et al, 2010; Turberfield, 2015). Most developed countries have legislation that governs workplace safety and bodies that administer the requirements, OSHA in the USA for example. Petersen, (2000), contends that it is the safety management systems rather than the legislation that have had the greatest impact on injury rate reduction, (cited in O'Toole, 2002).

It has been argued that the reliability of complex work and the ability to achieve operational goals safely depends upon workplace social structures as well as technical arrangements, (Mearns, Whitaker & Flin, (2003).   It has been further argued that a man-made disaster is defined not by its physical impacts but in sociological terms and as a disruption or collapse of the existing cultural beliefs and norms about hazards, (Pidgeon, & O'Leary, 2000). An organisational culture that supports safety is now recognised as being equally as important for the prevention of injuries and illness, (O'Toole, 2002). For any organisation to have and maintain effective safety performance it must have an organisational culture that supports it, (Mearns, et al, 2003).

Organisations now recognise that understanding the safety aspect of the organisation's culture and associated predictive indicators can provide a more reliable, holistic picture of their employee's perception of safety and its importance within the workplace, (O'Neill, et al, 2015). In the long run it is the perception of safety that the employees hold that will influence both the safety performance and the organisational culture, (Mansdorf, 1999; Griffin & Neal, 2000; Wu, Chen & Li, 2008). O'Toole agrees and argues further that safety performance with regard to reduction in injury rates within the organisation has shown to improve by and is strongly impacted by positive employee perceptions of organisational safety, (O'Toole, 2002). The perceptions the employee held also appeared to influence employees' at-risks behaviours and work decisions, (O'Toole, 2002; Wu, Chen & Li, 2008).

It has been argued and research has shown that improved safety performance is associated with employee's positive perception of the organisation's management commitment to safety, (Bailey, 1997; O'Toole, 2002). Taylor concluded that implementing and imposing safety systems in its self does not gain employee commitment nor the needed identification with safety required at the individual or team level. He argues that employee involvement and manager's living out their expectations by ensuring their actions match their words was fundamental for the requisite safety performance, (Mearns & Flin, 1999; O'Dea & Flin, 2001; Taylor, 2002b).   Bailey argues further that employee perceptions of management's commitment along with effective safety training are both factors that influence employee's likelihood to comply with safety and health policies and rules, (Bailey, 1997).

Safety performance if it is to provide the results necessary to reduce injuries and support the mitigation of compliance cost requires a supportive organisational culture, effective safety management systems and both manager and employee buy-in, (Mansdorf, 1999; Cooper & Phillips, 2004).

2.3   Safety Climate

Safety climate has had an interesting and sometimes confusing history. It has been noted that over the past 30 years of research on the subject the focus has been primarily one of methodological study rather than theoretical or conceptual, (Zohar, 2010). Zohar suggests that safety climate therefore requires some effort from academics to help reduce the conceptual ambiguity, (Zohar, 2010).

In 1980, being one of the first safety climate researchers, Zohar defined safety climate as "a summary of molar perceptions that employees share about their work environment", (Zohar, 1980; DeJoy, et al, 2004). It has been described by others as employees' perceptions, attitudes and the beliefs they share concerning workplace risk and safety, (Guldenmund, 2000). It has been noted that the climate of an organisation is the reflection of its members' perceptions or their experiences, (O'Neill, et al, 2015,). Cox & Flin suggested that simply put if an organisations' culture from a safety perspective is seen as the way we do things around here then safety climate can be viewed as its mood at any given point in time, (Cox & Flin, 1998).

DeJoy, et al, argue that while there is no universally accepted definition of safety climate, fairly broad agreement exists that management support for safety and the overall importance assigned to safety within the organisation are key aspects of safety climate, (DeJoy, et al, 2004). Many researchers have assessed the organisation's safety climate as an indicator of the organisation's culture of safety, (Cox & Flin, 1998; Flin, Mearns, O'Connor, Bryden, 2000; Guldenmund, 2000). Kenndy & Kirwan content that an organisations' culture of safety is reflected in both its safety management system and its safety climate, (Kenny & Kirwan, 1998). Mearns, et al, argues that it is safety climate that is the more accurate indicator of an organisation's culture of safety that exists within the workplace, (Mearns et al, 2003).

Cox & Cheyne conclude that there is general agreement that the results of safety climate assessments can be used as an indication of the organisation's culture from the safety perspective, (Cox & Cheyne, 2000). Many regard safety climate as now being an important indicator of workplace safety performance, (Jiang, et al, 2010). It is argued that as such it is a predictor enabling safety condition monitoring, (Flin, et al, 2000). Mearns, et al, argue that safety climate as being one observable manifestation of the safety aspect of an organisation's culture, (Mearns, et al, 2003).

Dejoy, et al, argue that their findings indicate that a number of conditions other than just safety climate also contributed to perceived safety at work, including; environmental conditions, safety policies & programs, and organisational climate. Their

findings suggest that more research is required and that organisations should not rely just upon safety climate as an indicator of workplace safety, (DeJoy, et al, 2004).

Safety climate has been stated to be a global factor involving perceptions of workplace safety related attributes and the relative priority given to safety when competing with other operationally competing goals, (Griffin & Neal, 2000; Jiang, et al, 2010). O'Dea argues that safety climate is a multi-dimensional construct that encompasses a wide range of individual evaluations of the work environment. That these are strongly related to attitudes to management and factors which are under the direct control of management such as communication, participation, safety policies and procedures, work pressure and safety activities, (O'Dea & Flin, 2001). O'Dea points out that 'climate' has been shown to exert a strong impact on an individual's motivation to achieve work outcomes and provide a context in which specific evaluations of the importance of safety are made, (O'Dea & Flin, 2003). Hudson contends that the underlying expectation is that the best and safest organisation's have a culture of safety and that safety climate is an indirect measure of how close an organisation approximates to that, (Hudson, 2007). Safety climate studies over the years have revealed that this concept and the methodological results offer a robust prediction of objective and subjective safety criteria across industries and countries, (Nahrgang, Morgeson, & Hoffman, 2007; Christian, et al, 2009).

Recent studies have questioned whether the meaning of safety climate as perceived by employees differs across languages or national cultures, (Barbaranelli, Petitta, & Probst, 2015). Barbaranelli, et al, raise the question of Bahari & Clark, (2013), being unable to replicate the predicted factorial structure of safety climate in an Asian cultural setting, (Bararanelli, et al, 2015). The cross cultural studies undertaken by Baranelli, et al, though provided strong empirical evidence for the invariance of safety climate utilising the Griffin and Neal, (2000), model, (Bararanelli, et al, 2015). Jiang, et al, argue that research on safety climate has rarely been conducted in non-Western contexts, (Jiang, et al, 2010).

2.3.1   Safety Climate Measured

Safety climate measurement is well established in many industries, (Hutchinson, Cooper, Dean, McIntosh, Patterson, & Stride, 2006; Zohar, 2010). It is argued that the measurability of safety climate has led to an escalation of scales each purporting to measure safety climate, (Flin, et al, 2000; Mearns, et al, 2003). Guldenmund argues that this state highlights a lack of a theoretical model supporting this concept, (Guldenmund, 2000). Flin, et al, considers this reflective rather of the sponsoring organisation's distinct requirements, (Flin, et al, 2000). DeJoy, et al, argues that the widespread use of the,

quantitative, methodologies to study safety climate, as opposed to qualitative or ethnographic methods adds further credence to this categorisation, (DeJoy, et al, 2004).

The psychological component of organizational safety culture is what tends to be measured through the concept of safety climate and measured utilising questionnaires that are devised to assess employee's norms, values, attitudes and perceptions of workplace safety, (Gadd & Collins, 2002). It has been argued that employee perceptions are central to the measure of safety climate, (Griffin & Neal, 2000). The safety climate questionnaire though can only be recognised as an indication of employee's perception of safety at that particular point in time, (Tharaldsen, Olsen & Rundmo, 2008). It has been stated that safety climate is a snap shot in time of employees views associated with safety, (Mearns & Flin, 1999; Flin, et al 2000; Huang, Ho, Smith & Chen, 2006; O'Connor & Kennedy, 2011).

The limitation of this snap shot is its usefulness and that it may not have a long shelf life, (Bergman, et al, 2014). The advantage has been suggested though that by regularly utilising this snap shot approach, an organisation can glean important feedback on current perceptions, identify places requiring improvement and review results of previous strategies, (Bailey, & Petersen, 1989, Ostrom, et al, 1993; Cooper & Phillips, 2004). As O'Neill, et al, suggests that resultant survey analyses being compared with ensuing survey results over time provides feedback on the perception employees have of changes management have put into place or to identify areas of opportunity for improvement, (O'Neill, et al, 2015).

Zohar in his reflection of 30 years of safety climate research concludes that well developed safety climate measurement utilising a quantitative approach allow the analysis of perceived latent pathogens, (Zohar, 2010). Zohar, further states, that safety climate analysis in this manner allows for the comparison between organisational departments within the same organization, and between organisations of the same industry, (Zohar, 2010).

While Zohar agrees that this type of analysis is not a deep level examination of the organisational culture he suggests that it can be used as a comparison periodically and will allow for the development of a preventative organisational safety strategy. From this, employee's sense-making and climate perception can be used for identifying underlying factors before an accident takes place, (Zohar, 2010).

For workplace safety and health practitioners and management alike this is a valuable tool when trying to gauge the effectiveness of safety strategies over time and the organisations' employees' perceptions of them, (Flin, et al, 2000). There should be care taken as to what areas will be compared over time. There has to be an alignment in the

areas being assessed, especially considering the recognised short life usefulness of assessing safety climate, (Guldenmund, 2000).   To ensure data reliability is maintained over time the survey format consistency should remain the same. Should the underlining principles behind the survey change the organisation must recognise that it may impinge upon the initial data reliability, (O'Neill, et al, 2015).

It has been recognised that safety climate measurement offers a robust prediction of objective and subjective safety criteria across industries and countries, (Nahrang, et al, 2007). Although, it has been argued that a safety climate measurement should not be taken in and of itself but as one of a holistic number of indicators that are available. Taken together, these indicators should be utilised to provide a more reliable indication of an organisation's overall safety culture, (HSE, 1999; EU- OSHA, 2011).

A number of researchers have recognised safety climate as a leading indicator of safety outcomes, (Flin, et al, 2000; Zohar, 2010; Shea, De Cieri, Donohue, Copper, & Sheehan, 2016). Other researchers have concluded that safety climate survey information can be both a leading and lagging indicator, (Payne, Bergman, Beus, Rodriguez, & Henning 2009). Their argument is based upon the understanding that previous accidents create the opportunity for lessons to be learnt and that as long as these are being communicated within the organisation across all employees effectively, the resultant safety climate responses will be indicative of the lessons learnt.

2.3.2   Safety Climate Assessment

The assessment of an organisations' safety climate tends to focus on a number of specific themes or dimensions, including as suggested by Hayes, et al, specific accident-related variables, or identified themes, (Hayes, Perander, Smecko & Trask, 1998). Zohar published the first set of factors in the early 1980's in order to help establish shared perceptions associated with the organisation's safety climate, (Zohar, 1980).

Zohar utilised his 40-query questionnaire to gather safety cultural understanding across 20 Israeli factories. The questionnaire was developed to gage an understanding of employee's shared perceptions across a number of factors. While the factors have been added to since this initial development they have not significantly deviated from Zohar's original concept. Zohar's original set of factors included: Importance of safety training, effects of required work pace on safety, status of safety committees, status of safety officer, effects of safe conduct on promotion, level of risk at workplace, management attitudes toward safety, and effects of safe conduct on social status, (Zohar, 1980).
Researchers, since Zohar's first results, have identified a large number of other factors, (Mearns et al, 2003). Although, these can be reduced to a smaller group of

common themes, (Flin, et al, 2000). While the number of dimensions remains in dispute the recurring themes across safety climate surveys continue, (Mearn, et al, 2003). Flin, et al, 'speculatively' concluded that there are three core themes, management, risk and safety arrangements, and that they have been repeatedly included in safety climate measures, (Flin, et al, 2000).

Flin, et al, notes that the prime theme being in relation to perceptions of management attitudes and behaviours in relation to safety and production, (Flin, et al, 2000). It has been noted that elements of safety climate emerge as predictors of unsafe behaviour or accidents in numerous structural models, (Cheyne, Cox, Oliver & Tomas, 1998; Brown, Willis, Prussia, 2000). Mearns, et al, argues that it is becoming accepted that a favorable safety climate is essential for a business' safe operation, (Mearns, et al, 2003). It has been contended that what is less clear are which antecedent factors promote a favorable safety climate but note that research at a macro level highlight that management attitudes and behaviour permeate down throughout the organisation of the workforce, (Mearns, et al, 2003). As such these are a major influence of an organisation's safety climate. From a research perspective given the availability and variety of safety perception-based factors or constructs in safety management climate, perception must be distinguished from other organisational perception, (Huang, et al, 2006).

Safety climate perception must focus on the relationships that exist between an organisation's safety policies, procedures and practices.   Recognising that there are many occasions where safety rules and procedures compete with the other organisational business areas, for example, production, (Zohar, 2010). Current research though now suggests that many of the more sophisticated organisation's do not view Occupational Health & Safety, (OHS), as a competitor but rather an integral part of production and a healthier workplace. It is possible for leadership to balance the supposed internal business competing influences as an overall organisational win, (O'Dea & Flin, 2003).

It appears from the number of research papers reviewed that survey questionnaires mainly tend to be developed by specialist safety climate designers rather than in-house by safety practitioners. This view for utilising professionally developed safety climate questionnaires is also support by EU-OSHA, (2011). Ostrom et al, agrees and adds that to be valuable and effective in providing the real concerns of the employees the survey must be properly developed, (Ostrom, et al, 1993). Zohar concluded that well developed questionnaires allow the analysis of perceived latent pathogens and utilised regularly provided the means to develop preventative strategies, (Zohar, 2010). It is further argued that organisation's should utilise specifically built surveys not only for the reason that that are more likely to be validated and reliable but to provide assurance that the time and resources allocated to the survey is not wasted, (O'Neill, et al, 2015). This is important to ensure the results can provide the organisation with clear non-misleading

outcomes. This is especially valid given that an organisation may utilise the learnings from the safety climate questionnaire to develop plans to tackle the gaps noted and establish improvement in its safety performance, (Fitzgerald, 2005).

2.4 Leadership

2.4.1 Introduction

Leadership is one of the most important topics in the social sciences and historically one of the most poorly understood, (Hogan & Kaiser, 2005). The leadership role, it is argued, has been recognised as a long standing universal activity of humankind, (Bass, 2008). As a research topic though, leadership can be considered complex and diverse; often times confusing and contradictory, (Wilson, 2016). The interest in leadership research over the past 100 years has resulted in large amounts of written material on the subject along with a number of paradigm shifts, (Day & Antonakis, 2012). Further, the growth in the leadership research in recent times has become more rapid, (Wilson, 2016).

Leadership has been defined in terms of individual traits, leadership behaviour, interaction patterns, role relationships, follower perception, influence over followers, influence on task goals, and influence on organisational culture, (Yukl, 1989).

Leadership in an organisation solves such problems as how to organise collective effort and is therefore key to organisational effectiveness and the ability to thrive and prosper. When an organisation succeeds, the financial and psychological wellbeing of the employees is also improved, (Hogan & Kaiser, 2005). Organisations, being inherently competitive in nature, and having finite resources, rely upon organisational effectiveness and therefore the effective influence of its leadership. As Katz and Kahn argue "Leadership is the influence over and above mechanical compliance with routine directives of the organisation, (Katz & Kahn, 1978).

2.4.2 Leadership History – From Great Man to Transformational Leadership

Leadership theories have undergone numerous changes since the Great Man theory of the 1840's. As the name implies it was considered that only a man had the necessary characteristics to be a great leader, (Maslanka, 2004). This leader was a born leader never one who could be made into such a leader. During the 1930-40's Trait theories suggested that people could be either born with the necessary leader type qualities or they could be developed. Trait theory focused on analysing what was then considered as characteristics common among leaders including; intelligence, sense of

responsibility and creativity, (Bolden, Goslin, Marturano, & Dennison, 2003). Behavioural theories followed shortly after as a consequence of the development of psychometric and factor analysis. These theories concentrated on what leaders and managers actually do and the relationship of behaviour to managerial effectiveness, (Yukl, 1989).

Contingency theory argued that there was no single way of leading but that every leadership style should be based on certain situations which signified that certain people who perform at maximum levels in certain places and minimum levels when taken out of their element, (Maslanka, 2004). During the 1970's transactional and transformational theories came to the fore, emphasising the importance of the relationship between the leader and the follower, (Bolden, et al, 2003).

2.4.3   Transactional Leadership

Transactional leadership theory espoused the basis of the relationship was associated with a transaction of exchange, (Bass, 1990). Burns, (1978), arguing that the transactional leader understands the needs of the organisation and the needs of the employee and conveys to the employee what must be done to meet both of these, (cited in Hoffmeister, Gibbons, Johnson, Cigularov, Chen & Rosecrance, 2014). The transaction valuing a positive and mutually beneficial relationship for the individuals and that their goals must be in sync, (Maslanka, 2004). Bass & Steidlmeier explain that transactional leadership is multi-dimensional and is comprised of distinct facets including: (a) Continent reward by providing appropriate rewards and recognition for positive behaviours & clear communication of these to employees. (b) Active management by exception that discourages negative behavior and that it is proactive and focused on prevention. (c) Passive management by exception which discourages negative behavior and reactive and focused on correction after the fact, (Bass & Steidlmeier, 1999).

Prior to later literature covering charismatic – transformational leadership theory, it was contended by many researchers that the component of transactional leadership, contingent reinforcement, was the core element of effective organisational leadership, (Bass, Avolio, Jung, & Berson, 2003). It has now been suggested that much of the transactional leadership facets are not associated with what is considered currently to be effective leadership, (Barling, et al, 2005; Bass, 1990). Bass suggests this ineffectiveness to be associated with the passive management by exception component, (Bass, 1990; Bass et al 2003).

Research undertaken by Bass, et al, suggests that in situations similar to the military it takes both transactional and transformational leadership types to be successful, (Bass, et al, 2003).

2.4.4   Transformational Leadership

The transformational leader interacts with others, such as walking the shop floor, (Bass, 1990), and is able to create a solid relationship resulting in a high degree of trust, while increasing motivation for both the leader and follower, (Bass, 1985). Bass & Avolio, (1993), contending that the leader transforms the follower through their inspirational nature and charismatic personality, (cited in McFadden, Henagan & Gowen, 2009). The leaders' attributes providing a sense of belonging for the follower as they easily identify with the leader and the leaders purpose, (Maslanka, 2004).

Bass argues that the transformational leader is one who motivates us to do more than we originally expected to do, (Bass, 1985; Bass, 1990). Bass, et al, suggest that the pace of change confronting organisations requires the leadership to be more adaptive and flexible, and that transformational leadership does that, (Bass, et al, 2003). Bass also contends that the transformation leadership attributes can be learnt, (Bass, 1990).

Bass & Steidlmeier, explain that transformation theory is multi-dimensional, and comprised of related but distinct facets including: (a) Idealised influence being the degree the employee looks to the leader as an example and seeks to emulate him/her, (b) Inspirational motivation which involves encouraging employees to strive for something beyond their individual goals, (c) Intellectual stimulation by inspiring employees to think creatively and innovatively, and, (d) Individualised consideration because the leader shows respect and personal concern for employees as individuals, (Bass & Steidlmeier, 1999).

Transformation leadership then covers a wide range of leadership behaviours including the need to empower subordinates, develop a sense of ownership for what happens in the organisation, and be participative, supportive and build trusting relationships. O'Dea argues that these characteristics have been identified as important by earlier theorists such as Likert (1967), and Fielder (1967), (cited in O'Dea & Flin, 2003). Yukl argues that while there is considerable evidence that transformation leadership is effective the underlying influence processes are still vague, (Yukl, 1999). Hoffmeister, et al, mention that some recent studies have established differential links between specific facets and outcomes such as job satisfaction, productivity and organisational commitment, (Hoffmeister, et al, 2014).

Transformational leadership recognises the need of both the organisation and the employees, but goes beyond these to arouse and satisfy higher needs within each individual. Bass, et al, contends that in rapidly changing business environments transformational leadership being adaptive in nature helps make sense of the challenges confronting both leaders and followers and then able to appropriately respond to them,

(Bass, et al, 2003). The leader encourages employees to unite in the pursuit of higher goals aimed at significant positive change in the organisation, (Hoffmeister, et al, 2014).

Bass, et al, argue that from the literature they reviewed that research indicates general support for a positive correlation between transformation leadership and performance, (Bass et al 2003). Bass, et al, suggested that transformational leadership has shown to be related to greater employee safety motivation and reduced accident rates, (Bass & Avolio, 1993). It has also been argued that transformational leadership has been positively related to improved safety performance, (Inness, et al, 2010). Bass suggests that the transformational leader also exhibits the characteristics of self-determination and self-confidence, which he argues is why they succeed, (Bass, 1990).

It has been suggested that a weakness of the transformational leadership theory from a practical perspective is that such leaders should be cognisant of employee's making negative or personal use of these leaders. Anderson & Sun argue that some employees may make use of their 'relationship' with transformational leaders for their own advantage; they may not put in the expected 'effort' but take the opportunity to 'free-ride', (Anderson & Sun, 2015). Bass suggests that leaders may exhibit a variety of patterns of transactional and transformational leaders, (Bass, 1985), and that both maybe applicable in a variety of setting, (Bass, 1998).

2.4.5 Authentic Leadership

New leadership theories continue to emerge in light of new organisational environments and requirements especially since recent unethical and untrustworthy behaviour of business leaders occurred, (Walumbwa, et al, 2008). Authentic leadership being an example.

Authenticity as a concept is not new but there recently has been renewed interest, (Avolio, Gardner, Walumbwa, Luthans & May, 2004; Walumbwa, et al, 2008) This interest is as organisations cope with restoring organisation leadership credibility following repeated, and spectacular lapses in ethical judgment from highly visible leaders, (Walumbwa, et al, 2008). What the public is demanding is that organisational leaders take accountability for their actions, (Dealy & Thomas, 2006). As Dealy, et al, argues, many leadership qualities can be taught but accountability or being answerable for your actions is something that must first come from within, (Dealy & Thomas, 2006).

Authentic leadership has been defined as a leadership behavior pattern that includes self-awareness, balanced processing of information, and relational transparency with followers and an internalised moral perspective.

Authentic leaders enact their true selves while leading others, this leadership style is not built upon a 'fake' or distorted self but the leader remains true to their own inner thoughts, beliefs and experiences. These leaders practice a form of self-regulation, examining the degree to which they fulfill personal expectations and commitments that they promised they would keep, (Gardener & Carlson, 2015).

Research indicates positive relationship between authentic behavior and individual outcomes including: engagement, job satisfaction, job performance, group and organisational outcomes, including financial, (Gardner & Carlson, 2015). Walumbwa, et al, suggests that their research also indicates a positive correlation between authentic leadership and follower performance but recognise further research is necessary within more specific focus areas such as workplace safety. Walumbwa, et al, also suggests that their research indicates the core components of authentic leadership may generalise across cultures, including Asia, (Walumbwa, et al, 2008).

Gebelein, et al, argues that authentic leaders lead by example, maintain a positive role model that influences, encourages and supports positive succession opportunities, and that followers who are impacted tend to align their own beliefs, values and corresponding actions to that of the leader, (Gebelein, Stevens, Skube, Lee, Davis, Hellervick, 2001).

Authentic leadership then is a relationship that is about mobilising others. Such leadership tends to be nurtured within high reliability organisations as a culture of trust, shared values, and risk mitigating communication processes. Authentic leadership supports communication that provides opportunities for open discussion and improvement. It encourages a distributed decision-making process "where the buck stops everywhere", (Kouzes & Posner, 2012). Authentic leaders tend also to be compassionate. As such authentic leaders are considerate and responsive to the feelings and circumstances of the organisations employees that they direct or support. These leaders listen and speak with empathy. They are also effective in that they are competent, committed, courageous and compassionate. They are effectively portraying active caring, (Klemmer, 2008).

2.4.6   Leadership and the Organisation

Organisations have evolved over time, influenced by environment, economics, global business, compliance and more recently the effects of dishonesty and unethical behavior. This came about as top organisational leaders have been publicly shamed through the legislative process because of corporate mismanagement, (Walumbwa, et al, 2008). It is, the leadership who set the tone for what behaviours and perspectives are important, (De Cenzo & Robbins, 1994).

One of the most important influences to an organisations success is that of the organisations leadership, (Geller, 2005). It has been argued that the organisations culture develops in large part from its leadership but that the culture of an organisation can also affect the development of its leadership, (Bass & Avolio, 1993). As early as 1939, it has been argued that leaders create climate, (Lewin, Lippitt & White, 1939). The motivation of employees is directly linked to the influence of the organisations leadership, (O'Dea & Flin, 2003). It is the influence by management that will result in corresponding employee actions.

How employees see management and their actions is paramount to how safety is perceived as being truly important or merely lip service, (Mearns & Flin, 1999). To be effective it is suggested that the organisational 'leadership' establish high quality relationships with their employees and care about their psychological welfare, (Blackaby & Blackaby, 2001). It has been argued that even with the knowledge growth in the area of leadership, issues with weak management within organisations continues to be a concern, (Sabet, et al, 2013). Reason suggested that the higher the individual is in the organisation, the greater the potential to influence organisational outcomes, (Reason, 1997).   O'Dea & Flin agrees and notes that current research suggests decisions made at senior levels will affect priorities, attitudes and behaviours of managers and employees further down the organisational hierarchy, (O'Dea & Flin, 2003). Further, they suggest that this will be a critical driver for the emphasis front line managers place on competing values of safety and productivity, (O'Dea & Flin, 2003).

2.4.7   Leadership and Safety

Safety leadership has been defined as the process of interaction between leader and followers through which a leader can exert influence on followers to achieve organisational safety goals within the context of organisational and individual factors, (Wu, Li, Chen & Shu, 2008). The relationship between leadership and safety has been explained largely as an extension of the leaders concern for the employee's welfare under the leaders care. Bass contents that the evidence suggests that closer, higher-quality

relationship's increase leaders' concern for member's welfare, (Bass, 1990). Zohar suggests the leaders care extends to the physical welfare in situations that involve workplace high risk, (Zohar, 2010).

Concern then should result in action and as Zohar contends where a consistent pattern of action in regard to safety is displayed, and especially in situations where safety considerations conflict with speed or efficiency, it promotes shared perceptions among the group concerning the priority of safety, (Zohar, 2000; Zohar, 2010). Zohar's research also suggests that team leaders are most influential in shaping employee performance because they are in the position to translate values and organisational goals from senior company levels, (Zohar, 2000; Zohar 2010).

Emerging findings support the importance of a participative, transformational leadership style, (Bass, 1985), which is likely to have the most positive influence within the organisation for safety performance, (Mullen, et al, 2017). This then should be the concern for all levels of leadership, (Flin & Yule, 2004). It has been stated that considerable research has demonstrated the importance of leadership on safety, (Barling, et al, 2005). Although, as Griffin & Hu point out less is known about the specific leadership actions that promote different kinds of safety performance of the team members, (Griffin & Hu, 2013).

From the perspective of workplace safety, leaders play a key role in the creation of a climate of safety, (Zohar, 2010). Griffiths argues that positive safety attitudes at the senior management level are essential in developing a positive safety aspect of an organisation's culture, (Griffiths, 1985). Griffiths continues by stating that it cannot be assumed that these attitudes will cascade throughout the organisation, (Griffiths, 1985). O'Dea suggests that safety climate research findings clearly implicate the leadership process in the formation and maintenance of safety climate and the reduction of accidents, (O'Dea, & Flin, 2001; O'Dea & Flin, 2003).

Barling, et al, argue that this in turn influences employees to increase their safety behaviours thereby decreasing the associated accidents and injuries, (Barling, et al, 2005). Wu, et al, suggests research shows that safety leadership and safety climate are two important predictors of good safety performance and that safety climate takes a mediating role in the relationship between safety leadership and safety performance, (Wu, et al, 2008).

Management involvement in safety activities has been shown to be associated with good safety performance, (Smith, Cohen, Cohen, Cleveland, 1978), and their commitment associated with lower incidents and accidents rates, (Mearns, Flin, Gordon & Fleming, 1998). Zohar found that managers in plants where they are less committed to safety tended to assign safety responsibility to safety personnel without the necessary power, (Zohar, 1980). For an organisation to have a positive culture of safety and for it to have some permanency, management must be totally aligned. Their communications to

employees and visible actions must be consistent across the management group. DeJoy, et al, suggest that their research findings highlight that open and honest communication is a key feature of a positive safety climate and indicative of a work climate that is supportive of its members, (DeJoy, et al, 2004; Griffin & Hu, 2013).

Social verification recognises that employee's look to the organisations leadership for not only policy and procedure but also any implied messages that they might receive, (Zohar, 2010). Competing operational demands create the opportunity for which ambiguity surfaces. Discrepancies come about between what a manager states and what the managers' actions imply, (O'Dea & Flin, 2001). It has been suggested that given a lack of simple and rational structure employees need to engage in interpretative and sense-making activities which involve a social interpersonal-based process, (Weick, Sutcliffe & Obstfeld, 2005). As Weick, (1995), contends there is a strong need within the workplace to interpret the complex pattern of signals that exist within the organisation regarding what issues are of high priority or importance, what behaviours are liked and are to be rewarded and supported, (cited in Zohar, 2010). Just because organisational policy state "Safety First", it means nothing if an angry production manager utilises comments such as "we are so behind, just get it done now!" O'Dea suggests that it is not just how committed and involved management are in the aspects of safety but by how much it encourages the involvement of the workforce, (O'Dea & Flin, 2001). O'Dea suggests that recent research indicates that workers appear to perceive safety as a joint responsibility between workers and management, (O'Dea & Flin, 2003).

O'Dea suggests that employees should be able to help shape interventions rather than just playing the more passive role, (O'Dea & Flin, 2003). In this way employees are more likely to take ownership and responsibility for safety and be more actively motivated to take personal initiative in safety aspects, (Williamson, Feyer, Cairns & Biancotti, 1997; Geller, 2003).

It has been argued that organisational programmes that provide employees the opportunity for involvement or support empowerment can sometimes be seen negatively and as managerially inspired and management's prerogative if not managed well, (Bearwell, Holden & Clayton, 2004). As such, the management group may portray differing prejudices depending not only on their own feelings and beliefs of safety but on their personal perspective of the employee, (Gielen & Sleet, 2003). A further difficulty is that these relationships tend to fluctuate and may come in waves, (Boxall & Purcell, 2011).

Managers should believe that maintaining visibility and involvement in the workplace is critical for workplace safety, (O'Dea & Flin, 1998). Cheyne, et al, agree and report that management commitment as a prime factor in their predictive model of safety behaviour, (Cheyne, et al, 1998). Research has found that employees' perceptions of safety climate were predicted by their perceptions of the actions of management, (O'Dea & Flin, 2003). Clark argues that employee perception of management commitment to safety can result in reduced incidents that lead to injury, (Clark, 1999). As Mullen, et al,

research concluded that when employers are perceived to have fulfilled safety related obligations, employees tend to reciprocate with positive safety performance behaviors, (Mullen, et al, 2017). Managers engage in certain actions that employees attach meaning, which in turn guides their behaviour. As Zohar contents cognition that guides employee behaviour is largely related to perception of management attitude to safety, (Zohar, 1980). O'Dea argues that managers who are open and flexible are most likely to be more effective in promoting a positive safety climate and increasing worker commitment to the organisation, (O'Dea & Flin, 2003).

2.4.8 Leadership and Trust

Interpersonal trust between leaders and subordinates has long been thought to be important to organisational success. Whitener contends that research has shown that trust has significant relationships with many organisational variables such as quality of communications, performance, citizenship behaviour, problem solving and co-operation, (Whitener, 1998). O'Dea & Flin states that managerial behaviour is thought to be an important determinant of the development of trust in the employee-manager relationship, (O'Dea & Flin, 2003). O'Dea continues and argues that certain organisational values and norms are likely to engender managerial trustworthy behaviour. Organisations with cultures characterised by inclusiveness, open communications, and valuing people will show greater trustworthy behaviour than will organisations with cultures that do not share these values or norms, (O'Dea & Flin, 2003). Ouchi argues that for businesses to be highly successful an atmosphere of trust is essential. The organisation must operate with concern for the welfare of the subordinates and co-workers as a natural part of the working relationship, (Ouchi, 1981).

2.5 Summary

The consensus of opinion throughout the literature review is that the safety culture of the organisations workplace is an important concept. Although, there continues to be debate and differences of opinion within research as to the concepts definition. As read within the literature review this confusion does not need to be the case as long as people recognise that there are a number of specialised research areas associated with an organisations culture. Also, that clear recognition of the originality base theory and clear linkage to the specialised area of safety being researched could help negate such confusion.

A number of researchers do not support the utilisation of simple analogies or metaphors that help define an organisations culture of safety. Because of the sometimes complex definitions there needs to be the recognition that practitioners look to such simplification to aid in effective communications to organisations' employees to help impart better understanding. It should also be noted that understanding and research of safety and an organisations culture is still on a journey of learning and discovery. More importantly there is recognition that the organisations culture and safety climate concept does support the underlying need to save workplace pain and suffering, reduce injuries and lower the associated cost of such injuries in the workplace.

The literature review found that a transformational, authentic, active caring leadership style appears to garner the most likely employee motivation and support when it comes to workplace safety. Research suggests this type of leadership will most likely result in employee support for safety and the improvement in safety performance. Research highlights that leadership is directly linked as an influencer of employee motivation. It is also agreed that leadership influence has a major effect on employee perception and the importance of workplace safety. Employees continually watch and evaluate the true intentions of leadership in the organisation. Leaders are seen as the window to which safety is truly important or whether more important requirements are implied when competing influences come into play within the organisation during times of business stress.

It is important that an organisations leadership understands and is cognisant of the organisations culture and safety climate that exist within the organisation. Leaders of organisations should also realise the importance of the part they play, the influencing nature they exert both as individuals and as a collective group. Leaders should conscientiously work to not create biases that effect employee actions and behaviour negatively, especially as it relates to workplace safety.

It is the contention of this research that as a result of assessing safety climate from the employee's perspective of 'safety' and the leadership's ability to influence, useful, practical guidance can be provided to the organisation. The outcome of this guidance will result in improved employee perception of workplace safety as a direct response to positive leadership influence. This literature review supports the current thesis that the influence of leadership on safety climate plays an important role on safety performance within organisations, and in particular on a MNC in Singapore.

CHAPTER THREE: RESEARCH METHOD

Research Question

The research question addressed in this study is, **"can employee perspective of workplace health and safety improve as a result of senior leadership training that highlights the significance of current theoretical knowledge of leadership influence?"**

Hypothesis

Leadership training, involving senior employees understanding leadership influence, will result in improvements in employee perceptions of health and safety within the organisation as a measure of safety climate.

3.1   Research Design Overview

This study will firstly undertake an in-depth literature review of the concepts of organisational safety performance, safety climate and leadership as they relate to organsational culture.

A single organisation owned by an MNC operating within Singapore will take part in the study. The organisation has been chosen using the characteristics listed under the section entitled 'Participants'. The specific organisation has provided its support of the study and their permission to undertake the research.

The outcome of the literature review will enable guidance and best practice to be provided as part of the intervention leadership training. This guidance will support the premise that providing useful, practical guidance to an organisations leadership will enable the most positive leadership influence to prevail. As part of this study an intervention and control group within the organisation will be identified. The intervention group will be associated with the leadership training intervention. A pre and post intervention safety climate survey will be undertaken to measure changes in employee perceptions resulting from the leadership training intervention. The results of the surveys will be analysed comparatively, and significant differences in perception scores identified.

In addition, a safety leadership survey of the participating employees in senior leadership positions will be undertaken. The employee safety climate questionnaire will be the primary data collection tool for this study.

The safety climate questionnaire tool to be utilised, will estimate both the Safety Climate Index, (SCI), and the Leadership Safety Index, (LSI), these will be provided by the research arm of Global Safety Index, (GSI).

GSI is an Australian company providing specialised consultancy services in safety culture and safety climate in the Asia Pacific region, (Appendix A – GSI Company Profile). The safety climate and leadership questionnaire has been validated through repeated utilisation across a number of similar organisations in the Asia Pacific region. GSI has over 100 member organisations both within Australia and internationally. Over 32,000 questionnaires have been completed across the 100 Australian and International companies including Rio Tinto and Repsol, (GSI, 2016).

The research methodology for this study will be a quantitative analysis of the resultant survey responses. As the epistemology will be comparative in nature the same safety climate survey will be conducted twice with a three-month interval. This will be a test-retest analysis and therefore longitudinal in nature. The questionnaire tool provided by GSI is based on the Loughborough University Safety Climate Assessment, which was developed in conjunction with the offshore safety division of the Health & Safety Executive of UK, (Health & Safety Executive, 1999). The questionnaires reliability and consistency is supported in the findings of Cox & Cheyne, (2000). The consultant, Global Safety Index, has adapted the original assessment and developed their Safety Climate Index, (SCI). The original Loughborough University questionnaire utilises 43 questions while the adapted GSI survey has 56, (Appendix B). The assessment is considered a multi-category survey designed to categorise individual perceptions, beliefs, experiences and behaviours concerning safety within an organisations' workplace.

3.2   Questionnaire Structure

The organisational areas to be surveyed include: Organisational Context, Social Environment, Individual Appreciation, and Work Environment.

These areas are broken into the following nine dimensions:

Management Commitment - Perception of management's overt commitment to Health and Safety issues. Included in this dimension is the way management acts towards a safety issue or accident and their attitude to employee's safety.
Communication - The nature and efficiency of Health and Safety communications within the organisation. This factor covers both upward and downward communications that concern safety.

Priority of Safety - The relative status of Health and Safety issues within the organisation. In particular, the issue of productivity versus safety is examined.

Safety Rules and Procedures - Views on the efficacy and necessity of rules and procedures. Examines how committed the organisation is to the rules and procedures in place.

Supportive Environment - The nature of the social environment at work, and the support derived from it. This factor explains the interaction of the employees at work in a safety context.

Involvement - The extent to which safety is a focus for everyone and all are involved.

Individual Appreciation: Personal priorities and the need for Safety. The individuals view of their own Health and Safety management and need to feel safe.

Personal Appreciation of Risk - How individuals view the risk associated with their work.

Work Environment - Physical work environment and the perceptions of the nature of the physical environment. This factor examines whether the time and equipment is available for the task to be completed safely.

The 56 questions within the questionnaire are not only linked to the 9 dimensions but also mapped against 14 specific key drivers that are designed to highlight those behaviours impacting the organisations' overall workplace safety climate. The key drivers include: Safety values, employee involvement, just culture, teamwork, risk assessment, workplace perception, production & safety, consistency of safety application, communications, training, procedures, work conditions & employee recognition. The full list of the 14 drivers and their associated definition is listed in Appendix G.

3.3   Participants

This study will be undertaken within the city-state of Singapore and will be associated with a single selected USA, MNC organisation operating on the Island. The organisation has been selected from the following simple characterisation. The applicable elements include:

- The Organisation will be operating in Singapore
- The Organisation will be majority owned by a locally operating MNC
- The Organisation headcount will be approximately: 500 - 800
- The Organisation will be currently utilising the Safety Management System of the MNC.
- The Organisation will be using the MNC workplace safety policies and procedures.
- The Organisation will include a level of manufacturing within its business processes.

- The organisation employee base will reflect the Singapore National cultural makeup, (Chinese, Malay, Indian and Causian).

The selected business was approached, firstly, to engage their support and secondly, to provide them time to review the research proposal. The review by the organisation allowed for discussion should there be any concern with the concept or other issues such as international trade compliance and ethics.

A pilot study was conducted prior to the main study. This small sample group will consisted of union, EH&S, management and human resources representatives. They were provided with the questionnaire initially to gauge their understanding of the questions but also to ensure there was no ambiguity or ethical concerns.

The safety climate and the leadership safety questionnaire was provided to the participants in hardcopy form. The safety climate questionnaire was in English, Malay and Simplified Mandarin, (Appendix B, C & D). The questionnaire was hand delivered and distributed by the author for both the pilot study and both of the following main assessments. The author also physically collected the questionnaires from all participants for all of the assessments. The participants were allowed to complete the questionnaire during company-supported time.

The participants were selected based upon similarities in work type, skill set, and a representative mix of gender and race. Two separate groups of participants were selected and formed the intervention and control group.

The employee intervention group was managed by the selected senior leadership group who received the leadership training. The control group was managed by the remaining group of managers who did not receive the leadership training. The intervention group and the control group were selected in order to provide an appropriate number of survey responses and each was located in separated buildings. The separation allowed some semblance of physical separation between the two groups over the survey period, which was thought to minimize interaction and potential influence between the groups. However, the author provided an overview of the study to all participants.

3.4   Materials

The associated materials for this research included:

- The Safety Climate Index survey questions provided in English, Malay,
  and Simplified Mandarin, (Appendices B, C & D)
- Leadership Safety Index survey questions, (Appendix E)
- Employee support time to complete the questionnaire at the business location.
- Research overview presentation and communication for the participating business.
- Written report to the participating business following the safety climate
  assessment.
- Intervention Leadership Training for the senior leadership, (Appendix L)
- Management Workshop Walk Feedback Form, (Appendix I)
- GSI Statistical analysis software

3.4.1   Leadership Intervention Training

- Trainer – The author
- Intervention Leadership Group – The MNC senior leadership including; General
  Manager, Deputy General Manager and six other senior managers.
- The Employee Intervention Group – Was a single group of day shift employees
  located within one of the business' operational buildings.

The author provided an overview of the study and requirements of the leadership
intervention, including the need to refrain from discussing the content with 'other'
managers. The intervention training, (Appendix L), was delivered in a location away from
the organisation. The author provided details of current leadership theory and concepts
that best supported the improvement of leadership influence. The author included
current best practice from within the workplace safety and health community, including
Transformational and Authentic leadership and elements of active caring. The author also
included principles from the book "The Leadership Challenge" by authors James Kouzes
and Barry Posner, (Kouzes & Posner, 2012).

3.5   Procedure

Business approval to be involved in the study was gained through an email response, including both local and MNC headquarters. This written approval included the Global Director for EH&S, the Asia Regional Director of Business and the site organisation General Manager.

Following an initial review of the proposed study and the questionnaire to be utilised the MNC organisation has not noted any issues with their employees completing the questionnaire. Dates for the questionnaire to be carried out were scheduled according to the project timeline, (Appendix K). The organisation agreed to support time within normal work hours for employees to complete the questionnaire. The organisation has also agreed to provide the facilities for the author to conduct the survey. The author distributed hardcopies of the survey to the employees selected and collected the completed questionnaires at the conclusion of each survey.

The organisation comprises of a number of distinct buildings, two of which have been identified to take part in the research. The employees within these buildings have the same qualifications and skill set and therefore carryout fundamentally the same work type and processes. The two buildings were identified as buildings housing the intervention group and control group.

The questionnaire was provided to the requisite organisational departments for initial vetting to ensure compliance to company policy and procedures. These departments include: EH&S, HR and International Trade Compliance. The union will also be included in the vetting process. The questionnaire was provided to a pilot group comprising of six segments of the MNC organisation including HR, EH&S, union, hourly technician, salaried and management. The feedback from this group and any concerns from the initial vetting group was taken into consideration. Potential concerns identified included any cultural, language and word and/or contextual meaning.

The questionnaire was provided to the employees of the intervention and control groups and the questionnaire responses entered into the statistical software tool for analysis by the author. Only those questionnaires that were filled in and completed correctly were entered into the software. Where any individual questionnaire contained unanswered questions the questionnaire was deemed to be invalid. At the conclusion of the survey all response were entered into the software for analysis and the findings reported to the organisations General Manager.

The author provided the leadership intervention group guidance and recommendations in Leadership theory and best practice through a leadership intervention-training package. Details of the leadership intervention training presentation are attached as Appendix L. At the conclusion of the training a number of possible leadership intervention actions were discussed by the leadership intervention group and agreed to. The General Manager and the senior leadership within the intervention group undertook the agreed actions over the ensuing three months.

At the conclusion of the three-month period the questionnaire were again provided to employees of the intervention and control groups. The questionnaire results from the second survey were again entered into the statistical software by the author. The author utilised the questionnaires results to analyse the employees' responses. A comparative analysis occurred between the pre and post intervention responses. A report and recommendation was provided to the organisation following both of the surveys. The report highlighted both the areas that recognised strong safety perceptions and areas that indicated areas where safety perception was a concern.

3.6   Questionnaire

The Safety Climate Index, (SCI), questionnaire was the primary data collection tool. Analyses included comparative descriptive analysis with a repeat three months later, (Test/ Re-Test). A Leadership survey was also undertaken to capture the perspectives of the management group. The SCI questionnaire contained 56 questions across nine categories that capture individual perceptions of beliefs, experiences and behaviours concerning the organisations safety. The safety climate questions while focusing on the factors of 'management commitment' also compared the other associated dimensions. The Safety Climate Index, (SCI), scoring is designed to remove the issue associated with Central Tendency. SCI scoring is ordinal in nature and is such that it also minimises the tendency of individual reluctance to rate responses at extremes.

The questionnaire scoring is a Likert scale and provides the employees the ability to respond from a selection of five possible choices.

Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree

Figure 1. Questionnaire Response Scoring as a Likert Scale

The possible responses are further mapped against another 5-point scale as indicated below. The responses are allocated a number from the range 1 to 5.

Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
Very Negative	Negative	Neutral	Positive	Very Positive
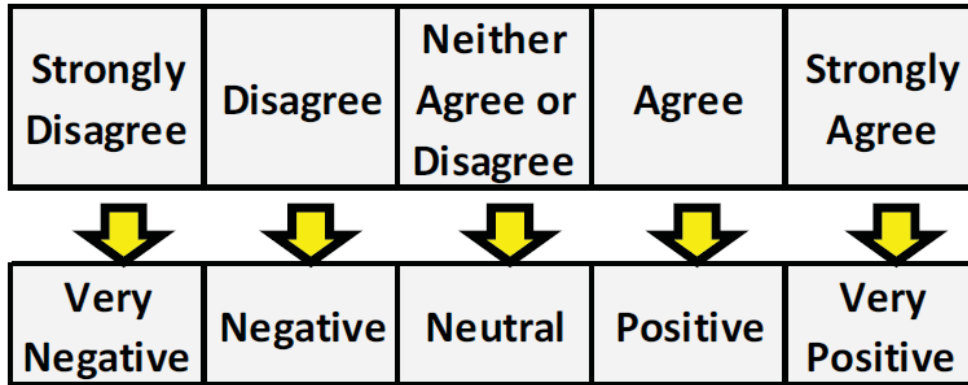
Figure 2. Further Mapping of the Possible Responses

Some of the questions are asked from a negative perspective. The analysis maps the 'agree' response as a negative result and the 'disagree' response as a positive result as depicted in the figure below.

Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
Very Positive	Positive	Neutral	Negative	Very Negative
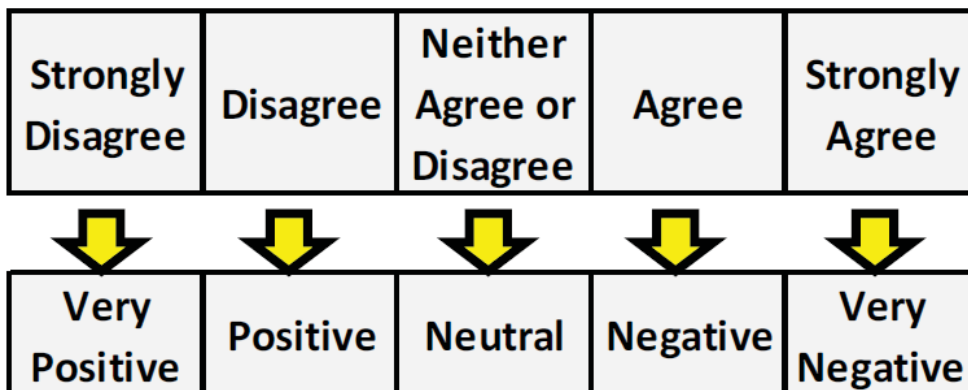
Figure 3. Mapping the Responses Associated with asking the Question in a Negative Fashion

The safety climate index, (SCI), is calculated in three steps:

A positive index is calculated by adding all the 'positive' & 'very positive' answers and then dividing by the number of respondents. This answer is then multiplied by 10. A negative index is calculated by adding all the 'negative' & 'very negative' answers and then dividing by the number of respondents. This answer is then multiplied by 10. Lastly the negative index is subtracted from the positive index with the resultant being multiplied by 10.

The resulting scores will be either categorised positive or negative in respect to employee safety perception and fall theoretically within a range of -100 to +100. This numerical index is mapped against a colour coded seven level model ranging from level 1 – unsustainable, through to level 7 – high performing safety climate, ref Fig. 4 below.

SCI	Description
80 to 100	High Performing
60 to 80	Sustainable
40 to 60	Maturing
20 to 40	Developing
0 to 20	Foundational
-20 to 0	Volatile
-100 to -20	Unsustainable

Figure 4. Seven Level Colour Coded Safety Climate Performance

The quantitative data will be compared and analysed utilising the SCI software, plotted and displayed as spider diagrams, as represented in Fig.5.
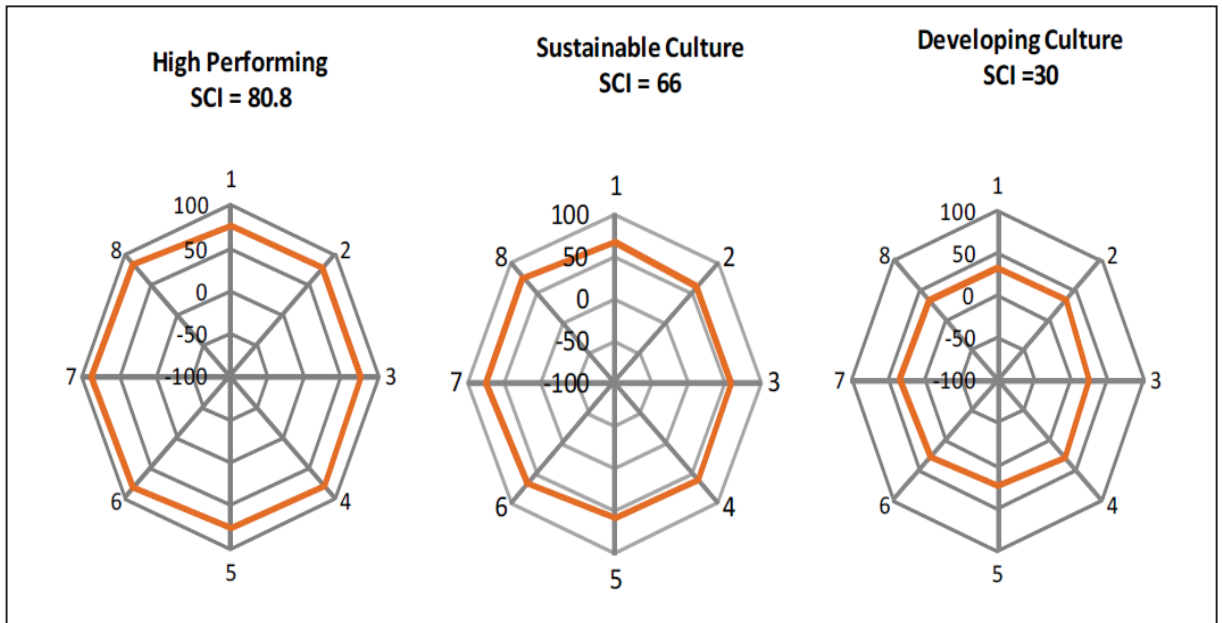
Figure 5. Resulting Survey Data will be displayed as a Spider Diagram

Spider diagrams are appropriate for the displaying of multivariate observations when associated with the comparison of data. Spider diagrams allow the displaying of quantitative data along a single arm that represents an observation. While the limitation of the spider diagram is noted as being the limiting number of arms possible before the spider becomes un-viewable, it is appropriate for the small number of observation dimensions associated with Safety Climate surveys, (Wikipedia, Chart. 2016).

GSI will provide a benchmark of what is considered the level to aim safety climate improvement against. This benchmark is an internally generated data point of the GSI top performing companies. This benchmark will be mapped alongside the surveyed score for reference.
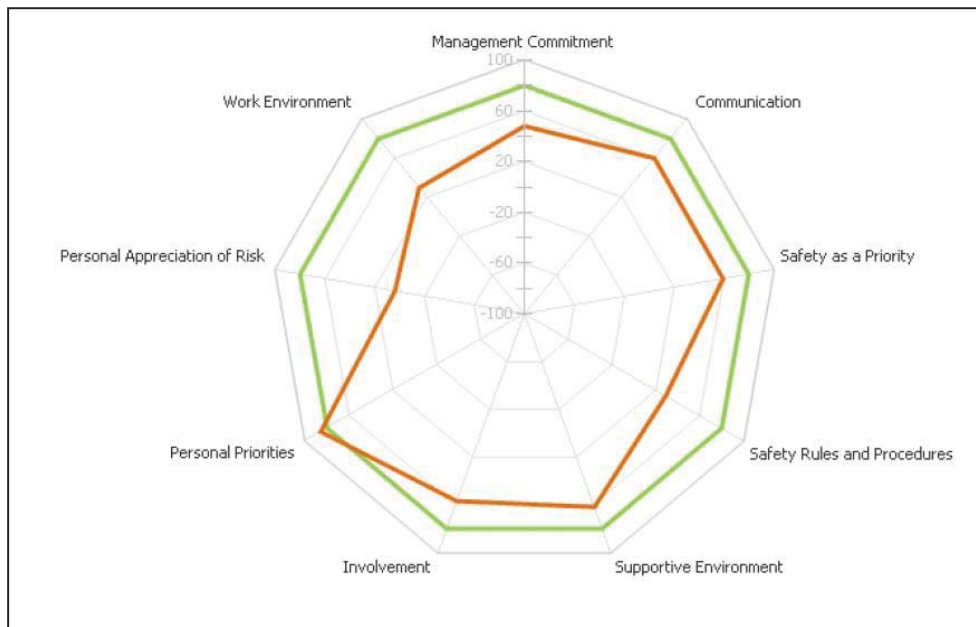
Figure 6. Spider Diagram Showing Organisation SCI Score, (orange line), Compared to High Performing Benchmark, (green line)

The leadership group surveyed were senior managers who sit on the organisations EH&S Council and undertook the 35 question Safety Climate Leadership Questionnaire. The results provide an understanding of their perceptions of how they lead employee's and support safety within the workplace.

3.7   Statistical Analyses

3.7.1   Mann-Whitney Test

The GSI analytical software is designed to undertake the Mann-Whitney test whenever there is the requirement to compare the differences between two independent groups when the dependent variable is ordinal but not normally distributed. This is the case with this research. The two groups for comparison are the intervention and control groups. The dependent variable being the responses and their selection on the Likert scale. It is necessary that there be independence of observations across the intervention

and control groups, the survey participants can not belong to both groups, (Laerd Statistics, 2016).

3.7.2 Statistical Significance – Paired t - Test

The Paired t - Test compares the means of two groups. The effectiveness of the pairing is tested by calculating the Pearson correlation coefficient, r, and a corresponding p value. If the p value is small, the two groups are significantly correlated. This then justifies the use of a paired test, (GraphPad, 2017).

This statistical test will only be undertaken for the dimension of **Management Commitment.** This is due to the statistical requirement that the pairs are independent – whatever factor caused the difference between the paired values, affects only that pair. As the influence in this research is the direct interaction of management on employee perception there are a number of dimensions and key drivers within the survey that from an employees' perspective may not appear directly linked to management. In this case then carrying out statistical significance on the overall dimensions and key drivers would not be appropriate.

3.8   Survey Context - Singapore

The Republic of Singapore is an Island Nation, located at the southernmost point of Malaysia, one degree north of the equator. Singapore is a global commerce, finance and transport hub. While over 5.5 Million people live in Singapore only 60% hold a Singaporean passport. Singapore has a multi-ethnic culture comprising of 77% Chinese, 15% Malay and 6% Indian and a significant expatriate community, (Wikipedia, 2016). Singapore is built upon the premise that the races and ethnicities that make up this country will hold to the understanding that for Singapore to exist as a leader within this region its citizenship must live in harmony alongside each other. This was instilled into Singaporeans by the former Prime Minister Mr. Lee Kuan Yew in that Singapore would always be based upon and that Singaporean's would support multi-racialism and meritocracy.

3.8.1   Singapore Cultural Dimension Summary

Power tends to be centralised, managers rely upon what their bosses say. Employees expect to be told what to do. Singaporeans follow the rules. Singapore is a collectivist society and consensus building is important. While maintaining traditional

values such as meritocracy continued success is very important, (The Hofstede Centre, 2016).

Employee's safety behaviour are influenced by perceptions about others beliefs and observations of others behaviour, consistent with the findings of social psychology: people from Eastern Asian like Chinese are more concerned with contextual factors rather than rules, thinking holistically instead of analytically (Nisbett, et al, 2001; Peng, et al, 2005). Chinese employees will be concerned with the contextual factors such as what's important to their co-workers. Also mentioned in western studies, "Perceived safety at work directly influenced by various work situational factors independent of safety climate (Dejoy, et al, 2004; Jiang, et al, 2010).

3.9   Ethics and Research Limitations

This study is limited to a single MNC operating in Singapore. Further, the research has a time constraint of three months for the longitudinal period of the safety climate study. The leadership intervention training was conducted by the author, rather than a professional management leadership-training consultant. As Singapore is a multi-cultural country with three main languages there is possibility for misunderstanding not only from a language perspective but how the question is asked considering the questionnaire was originally developed for English speaking countries.

The Safety Climate Index and Leadership Safety Index questionnaires utilised was not developed by the author but provided by GSI, a specialist consultant in safety climate and as such, commercially available. The questionnaires have been utilised repeatedly and successfully in the past with other organisations. Both the questionnaire and the time to make use of the specialised analytical statistical software have been provided by GSI in order to support this thesis, safety climate research and ensure the highest level of authenticity of the results is attained.

To ensure all questions meet the company requirement of no harm or offense to employees, including race, religious and cultural implications, the MNC Human Resources group vetted the questionnaire and questions. The MNC International Trade Compliance group approved the release of all and any documentation resulting from the research before it is released or made public. Due to the nature of International Trade Compliance it is a stipulation of the MNC and the organisation participating in the research that no reference to the business name can be stated nor its identity be gleaned from any associated published document.

The study was registered with the Massey University Human Ethics Committee as a Low Risk ethics proposal. Ethics Notification Number: 4000016303 as recorded in the Massey Human Ethics Registration System. If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher, please contact Dr. Brian Finch, Director (Research Ethics), email humanethics@massey.ac.nz.

CHAPTER 4: RESULTS

4.1 Introduction

This chapter presents the results of the research for this thesis. Two surveys were carried out as a longitudinal test/retest comparative analysis utilising a safety climate questionnaire that was commercially available. Participants involved in the surveys were employees of the identified MNC organisation located in Singapore. The survey purpose being to take a snapshot view of the employees' perception of their workplace safety environment. The specific focus area being the leadership and its influence upon the workplace environment following leadership intervention training.

4.2 Survey Overview and Preparation

In addressing this question, two specifically identified areas within the business where selected as the intervention and control groups. All employees selected to participate in the research work at the same business address, although are located in physically separate buildings. Both groups of employees carryout primarily the same tasks and hold similar qualifications and skill sets. Intermingling of both groups is still likely as some share a number of common facilities. These two groups of employees represent a true reflection of the overall staff profile of the organisation as its employee characteristic is typical of 90% of the workplace employee base, the remaining 10% being management. Both of these two groups of employee's personal characteristics are similar in that they are representative of ethnicity, age groups, genders and length of service.

As outlined in Chapter Three, (Research Method) a pilot test group was established to ensure the questions in the safety climate questionnaire where all understandable from both a language and cultural perspective. The pilot group also ensured the questions met the organisations HR, ITC and union requirements and further that the questions did not breach any racial or locally required conditions. The pilot group was comprised of representatives from the following departments: HR, ITC, EHS, hourly technicians, salaried employees and the union.

This pilot test resulted in a small number of word changes that did not affect or change the meaning of the questions meaning but provided an enhanced understanding from a local perspective. The other change that resulted from a recommendation from the test group was the necessity to develop the questionnaire in the following languages: Malay, Chinese and English, (ref Appendix: B, C & D). The test group strongly advised that this was prudent due to a large proportion of the employee base having minimal understanding of English.

The 56 questions in the safety climate questionnaire have been adapted from the Loughborough LSCAT, (HSE, 1999; Cox & Cheyne, 2000). All 43 of the original questions were included within the GSI SCI 56 question survey, (Appendix B). Only two of these original questions were not worded in the exact original format. The additional questions in the GSI SCI questionnaire are similar to the original questions but enhance the possible overall employee response.

As the GSI SCI questionnaire is effectively a replica of the original Loughborough set of questions the analysis of the questions as carried out by Cox & Cheyne remain valid today, (Cox & Cheyne, 2000). Cox and Cheyne carried out validity, factor analysis and reliability tests in their original research, (Cox & Cheyne, 2000). Face validity was tested through a pilot group taking the questionnaire, which resulted in the removal of four of the original 47 questions. Cox & Cheyne also undertook factor analysis and examined two forms of reliability, (internal-scale & alternate forms reliability). The results of this examination required some rearranging of how the observed variables were linked with the underlying factors. Refer Appendix J for the final arrangement of how the questions link to the nine underlying factors, (Cox & Cheyne, 2000). As Cox & Cheyne noted within their paper the nine factors utilised in the survey were already well-established dimensions and derived from previous literature, (Cox & Cheyne, 2000).

The results from this current research were examined as a comparison between the control group and the intervention group across the various factors as a result of the leadership training. The possible results from the 56 questions of the safety climate questionnaire were augmented by the author to include the following filters: age, length of service, ethnicity, and gender. The survey results were anonymous and excluded any reference that could identify the participant.

While the survey was not compulsory all of the employees where encouraged to take part and where provided paid time within normal work time to complete the survey. Following the first survey the author entered all questionnaire responses into the GSI survey software and produced an analytical report. This report was presented to the MNC General Manager with a summary highlighting the major results of the survey.

The author took the executive leadership team, which comprised of the General Manager, the Deputy General Manager, and six other executive managers, through the developed leadership training package. A discussion identified a number of activities that this group of executive managers would engage in solely with the intervention group over the following three month period, (Appendix H).

At the conclusion of the three-month period the second safety climate survey was repeated for the intervention and control groups. A Leadership Climate Index survey,

(LCI), was provided to the executive managers who sit on the organisations EHS council. This group is responsible for the strategic overview of the organisations EHS, regular review of EHS budget, projects, safety metrics and injury investigation review. The responses from both the SCI and LCI were entered into the GSI software by the author. The responses from the LCI provided a comparison of managements own perception of their safety leadership effectiveness against that of their employees. An audit of the agreed intervention activities was carried out by the author as a reference to whether leadership accurately undertook the agreed activities across the whole three-month period.

As outlined in Chapter 3 (Research Method) the analytical software of GSI takes into consideration the issues of central tendency.   The same software also takes into consideration the ability to compare two independent groups when the dependent variable is ordinal but not normally distributed. This is accomplished by using the Mann-Whitney test as part of the software analysis. The test result for the surveys for both the intervention and control groups was 95%.

The SCI question responses from the results are linked to the identified nine factors and allocated to one of measured 14 drivers, (ref Appendix G). The software computes SCI for each question, key drivers and the dimensions. The results are provided in a manner that allows comparison between both surveys.

4.3   First Survey Overview

215 employees took part in the first survey; four employee's questionnaires were not entered into the software because they were significantly incomplete. 79 employees took part in the intervention group and 136 in the control group. Total organisation population at the time of the survey was 751. While the surveyed group is 28.6% of the total organisational population 96.35% of the possible population of the two research groups took part in the survey. 211 surveys were completed and the responses entered into the statistical software tool.

Intervention Group

79 (intervention group) employees took part in the survey; one questionnaire was removed due incompleteness of the responses. 51 participants utilised the English version of the questionnaire while 22 employees the Chinese version and the remaining six people the Malay version of the questionnaire.

Control Group

136 (control group) employees took part in the survey; three questionnaires were removed due to incompleteness of the responses. 99 participants utilised the English version of the questionnaire while 33 employees the Chinese version and the remaining four people the Malay version of the questionnaire.

4.3.1 First Survey Results

Intervention Group

The survey results of the intervention group produced a SCI of 41.3. This indicates that the safety climate was at the GSI identified level of "maturing". The nine dimensions that comprise the SCI are illustrated below in the spider chart compared to an aspirational benchmark of 80.
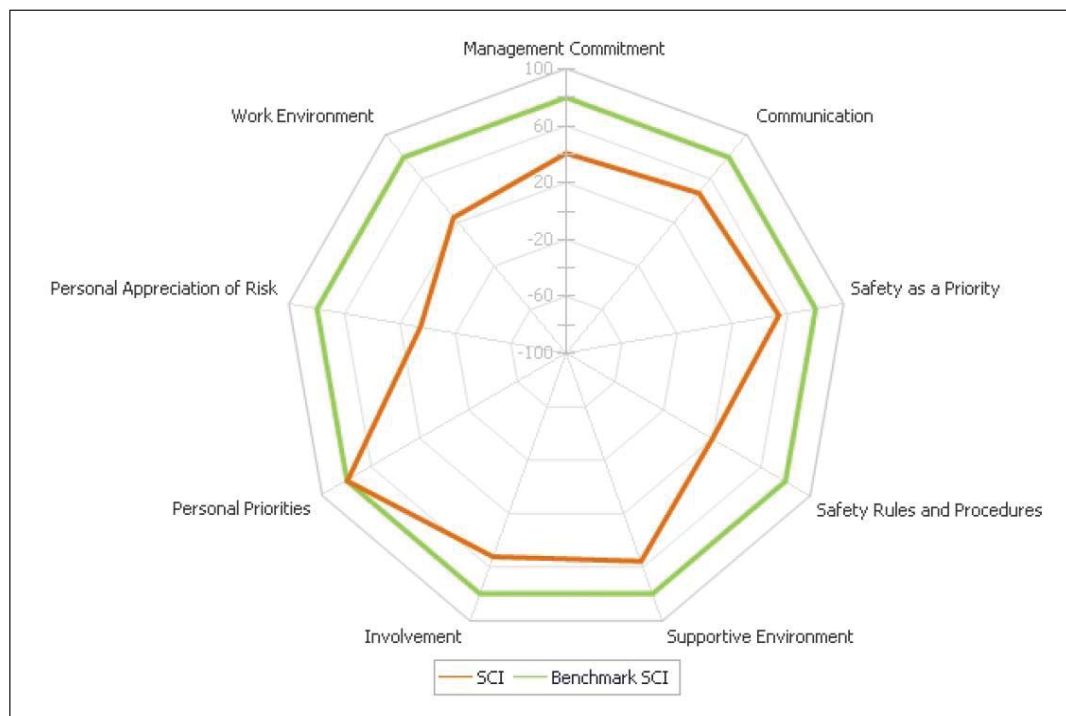
Graph 1: Spider Diagram of the Intervention Group First Survey SCI Results Showing the Nine Dimensions

Control Group

      The survey results of the control group produced a SCI of 47.4. This indicates that the safety climate for the control group was also at the GSI identified level of "maturing". The nine dimensions that comprise the SCI are illustrated below in the spider chart compared to an aspirational benchmark of 80.
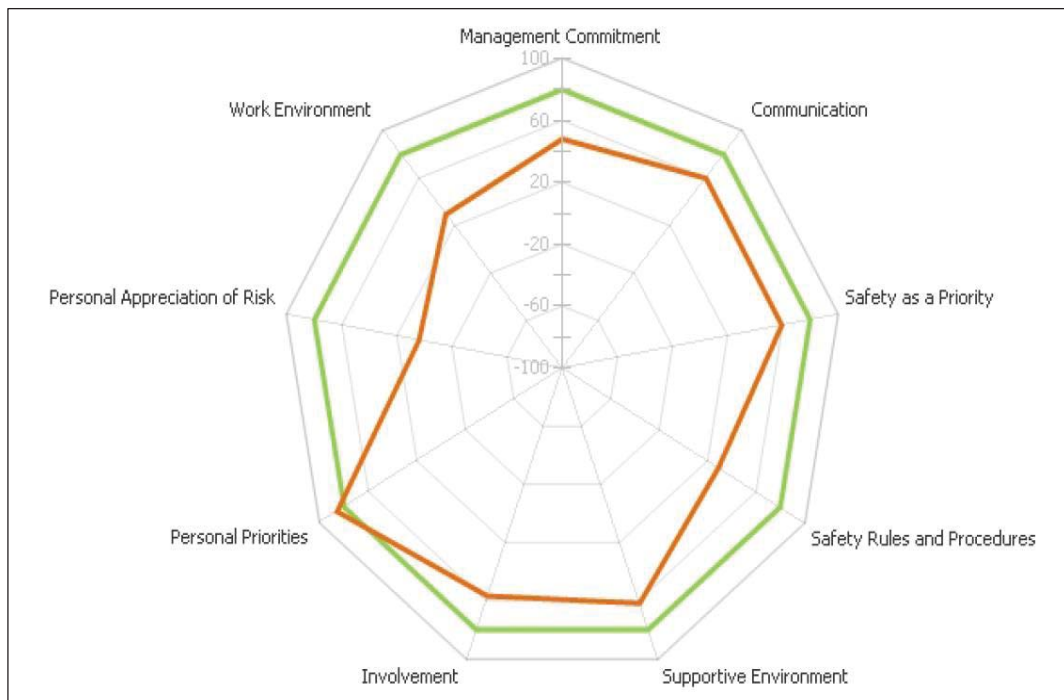
Graph 2: Spider Diagram of the Control Group First Survey SCI Results Showing the Nine Dimensions

4.3.2 First Survey Results Comparison

Nine Dimensions

The SCI results across the nine dimensions of the survey between intervention and control groups indicated that while both groups SCI reflected a 'maturing' safety climate level, the control group indicated a 6.1 point overall higher SCI than the intervention group. The comparison between the intervention and control group's first survey results across the nine dimensions are compared below.

	Management Commitment	Communications	Safety as a Priority	Safety Rules & Regulations	Supportive Environment	Involvement	Personal Priorities	Personal Appreciation of Risk	Work Environment	Overall SCI
Intervention	40.7	47	53.5	20	55.8	52.4	79.7	5.3	24.7	41.3
Control	48	60	59.4	29	62	56.9	85.8	3.9	29.5	47.4

High Performing		80 +
Sustainable		60-80
Maturing		40-60
Developing		20-40
Foundational		0-20
Volatile		=-20-0
Unsustainable		<-20

Table 1: First Survey SCI for the Nine Dimensions of the Intervention and Control Groups

4.4   Second Survey Overview

190 employees took part in the second survey; one employee's questionnaire was excluded as it was incomplete. 70 employees took part in the intervention group and 120 in the control group. The total organisation population at the time of the survey was 757. Employee participation in the second was reduced by 25 employees from the number in the first survey. This was due to employee movements to other production areas within the organisation. The surveyed group was 25.1% of the total organisational population at the time of the second survey.

Intervention Group

70 employees took part in the survey; one questionnaire was excluded due incompleteness of the responses.   45 participants utilised the English version of the questionnaire while 19 employees the Chinese version and the remaining 5 people the Malay version.

Control Group

120 employees took part in the survey; all questionnaires available were completed appropriately. 84 participants utilised the English version of the questionnaire while 32 employees the Chinese version and the remaining 4 people the Malay version.

4.4.1   Second Survey Results Comparison

The results from the second survey for both the intervention group and the control group continue to reflect a 'maturing' safety climate level. The intervention group survey results produced an SCI score of 48.3, an overall SCI improvement of 7 points or 17% compared to the first survey. The control group survey results produced an SCI score of 52.6, an overall change between first and second surveys of 10.97%. The overall difference between the SCI scores of the intervention group and the control group improved positivity by 41.86%.

The Nine Dimensions

The comparison between the intervention and control group's second survey results across the nine dimensions is illustrated below.

	Management Commitment	Communications	Safety as a Priority	Safety Rules & Regulations	Supportive Environment	Involvement	Personal Priorities	Personal Appreciation of Risk	Work Environment	Overall SCI
Intervention	57.4	61.8	63	22.6	64.9	56.8	86.1	2.2	25.5	48.3
Control	51.7	66.5	67.1	39	65.7	63.3	90.8	9.3	31.8	52.6

High Performing		80 +
Sustainable		60-80
Maturing		40-60
Developing		20-40
Foundational		0-20
Volatile		=-20-0
Unsustainable		<-20

Table 2: Second Survey SCI for the Nine Dimensions of the Intervention and Control Groups

4.5 Percentage Change between the Two Surveys

The SCI resultant changes between the first and second surveys across the nine dimensions for the intervention group indicated mostly positive increases with the largest improvement associated with: **Management Commitment**, **Communications**, **Safety as a Priority** and **Supportive Environment**. The similar SCI resultant changes for the control group mostly indicated lesser change in comparison to the intervention group although increases occurred for the dimensions of: **Safety Rules & Regulations**, **Safety as a Priority** and **Involvement**. The area of greatest change for both the intervention and control group was associated with the dimension of **Personal Appreciation of Risk** with a large negative change resulting for the Intervention group and a large positive change for the Control group.

	Management Commitment	Communications	Safety as a Priority	Safety Rules & Regulations	Supportive Environment	Involvement	Personal Priorities	Personal Appreciation of Risk	Work Environment	Overall SCI
Intervention	41.03	31.49	17.76	13	16.31	8.4	8.03	-58.49	3.24	16.95
Control	7.71	10.83	12.96	34.48	5.97	11.25	5.83	138.46	7.796	10.97

Table 3: Percentage Change between the First and Second Surveys for both the Intervention and Control Groups

4.6   Difference between the Intervention and Control Groups

Comparing the initial difference between the intervention and control groups SCI for the nine dimensions, with the difference following the second survey, the results indicate that for the most part the intervention group results improved the difference between the two groups. This result indicates a positive outcome. Out of the nine dimensions only three saw a negative difference between the two groups. **Management Commitment** being the major dimension directly associated to this study resulted in a significant positive improvement. The associated dimensions of **Communications** and **Supportive Environment** also resulted in significant positive improvement for the intervention group.

	Management Commitment	Communications	Safety as a Priority	Safety Rules & Regulations	Supportive Environment	Involvement	Personal Priorities	Personal Appreciation of Risk	Work Environment	Overall SCI
% Change	228.07	176.6	43.9	45.12	675	30.77	29.79	119.72	23.81	41.86

Table 4: Percentage Difference in SCI Scores between the Intervention and Control Groups

4.7   Results for the Key Drivers

The key drivers of the SCI are linked to the 9 dimensions by specifically identified questions within the questionnaire. The results for the intervention and control groups across both surveys are provided below.

Key Drivers	Intervention 1	Control 1	Intervention 2	Control 2	Intervention % Change	Control % Change	Intervention Control % Change
Safety Values	57	62.5	63	67.7	10.53%	8.32%	17.02%
Employee Involvement	60.5	62.6	60.9	67.7	0.66%	8.15%	-69.12%
Just Culture	59	68.4	73.9	60.8	25.25%	-11.11%	171.76%
Teamwork	65.1	69.2	63.4	74.6	-2.61%	7.80%	-63.39%
Hazard/Risk Management	47.6	55.3	66	58	38.66%	4.88%	196.25%
Perception of Workplace	10.9	11	12	15.6	10.09%	41.82%	-97.22%
Production/Safety Trade Off	8.7	18.5	12	21.5	37.93%	16.22%	3.16%
Consistent Application	22.4	28.6	25.7	36	14.73%	25.87%	-39.81%
Top Down Communications	39.1	55	58.7	63.8	50.13%	16.00%	211.76%
Bottom Up Communications	60.9	66.4	65.2	71.3	7.06%	7.38%	-9.84%
Training Outcomes	89.1	90.8	92.8	94.6	4.15%	4.19%	-5.56%
Systemic Approach	61.5	67.3	78.3	77.5	27.32%	15.16%	825.00%
Work Conditions	11.1	16.7	15.5	21.9	39.64%	31.14%	-12.50%
Reward & Recognition	16.7	24.6	32.6	34.6	95.21%	40.65%	295.00%

Table 5: High Level Key Drivers SCI across both Surveys for the Intervention and Control Groups

The table above includes the overall SCI results for both the intervention and control groups across both surveys. The results for the intervention group indicate positive improvement for 13 of the 14 key drivers with the biggest improvement being *Rewards & Recognition*. The Table also includes the percentage change between the surveys for both groups and the percentage change related to the resultant difference between both groups.

The results for the key driver *Systemic Approach* for example indicate a positive change between the intervention and control group by a percentage of 825%. This is the biggest change between the two groups across all of the key drivers. The intervention group survey one results for this key driver came from a position well below the control group but ended with SCI results in survey two better than the control group.

4.8 Directly Associated Management Questions

4.8.1 Dimension of Management Commitment

This dimension covers the perception of management's overt commitment to EH&S within the MNC workplace. The results for this dimension of **Management Commitment** places this dimension within the maturing category.

The eight questions covered in the **Management Commitment** dimension can be grouped into three key drivers. The first four questions cover management attitudes to *Hazard and Risk Management*. There are two questions that cover the management attitude to *Safety Values*.   The last two questions are associated with whether management has a *Consistent Application* to safety.

Management Commitment in depth								
		Intervention 1	Control 1	Intervention 2	Control 2	Intervention % Change	Control % Change	Intervention Control % Gap Change
Key drivers	Survey Questions							
Hazard/Risk Management		36.9	44.5	58.7	46.3	59.08%	4.04%	161.29%
	Acts decisively when a safety concern is raised	55.1	62.1	81.2	57.5	47.37%	-7.41%	129.54%
	Acts only after an incident /accident has occurred	-16.7	-10	0	4.2	100.00%	142.00%	59.52%
	Corrective action always taken when told about unsafe practices	53.8	63	81.2	65.8	50.93%	4.44%	159.74%
	Acts quickly to correct safety concerns	55.1	63	72.5	57.5	31.58%	-8.73%	152.67%
Safety Values		55.1	60.2	72.5	65.4	31.58%	8.64%	171.83%
	Show interest in my personal safety & wellbeing	47.4	45.5	63.8	55.8	34.60%	22.64%	-76.25%
	Take safety personally & appears a personal value	62.8	74.9	81.2	75	29.30%	0.13%	295.16%
Consistent Application		34	42.7	39.9	48.8	17.35%	14.29%	-2.25%
	Walk past unsafe behaviours & will not stop	19.2	23.7	13	27.5	-32.29%	16.03%	-68.97%
	Express concern & follow up action, if safety procedures not followed	48.7	61.6	66.7	70	36.96%	13.64%	290.91%

Table 6: The Results for the Dimension of Management Commitment and Relationship to the Key Drivers and Associated Questions

The dimension of **Management Commitment** resulted in a positive improvement of SCI between the initial survey of the intervention group and the final survey three months later for all of the three related key drivers. For the intervention group, the key driver *Safety Values* had the highest SCI of the three in the final survey. Further, results for the associated questions indicated SCI improvement for seven of the eight questions. For the intervention group the key driver, *Hazard/Risk Management*, resulted in the biggest improvement gain with a percentage increase of 59.08%. While the question with the highest SCI improvement was "Corrective action is always taken when told about unsafe practices". From the perspective of SCI difference between the intervention and control group between the first and second surveys the question "Take safety personally & appears a personal value" resulted in the greatest improvement with a percentage positive change of 295.16%. The SCI for the question "Walk past unsafe behaviours", resulted in a deterioration of the SCI and the difference between the intervention and control group. While the question "Show interest in my personal safety & wellbeing" had an improved SCI for the intervention group but the difference between it and the control group widened negatively.

4.8.1.1 Statistical Significance - Paired t-Test

This test compares the means of two populations where the observations from the one sample can be paired with the observations in the other sample. The results of the paired t-test making sense when the pairs are independent in that whatever factor caused a difference between the paired observations affects only that pair.
A ρ value of less than 0.05 indicates a statistical significance and the influencing factor caused the difference between the paired observations. In this study the causal factor is the influence of the management group, following the leadership training, upon the employees of the intervention group, (GraphPad, 2017).

The paired t-test was run on the before and after survey results for both the intervention group and the control group. The employee intervention group SCI scores indicate that the perception of workplace safety improved for this group as a result of the executive leaderships training and engagement, (ρ = 0.0024, 95% confidence interval = -16.775, t = 4.6386). In contrast, the executive leadership had no influence upon the employees of the control group. The perception of workplace safety for the employees of the control group did not statistically change, (ρ = 0.18, 95% confidence level = -3.687, t = 1.4895).

	Management Commitment			
	Paired t Test		Paired t Test	
	Intervention 1	Intervention 2	Control 1	Control 2
p Value	0.0024		0.18	
Significance	Significant		Not Significant	
Confidence Interval	-16.775		-3.687	
95% confidence from	-25.326 to -8.224		-9.541 to 2.166	
Intermediate values used				
t	4.6386		1.4895	
df	7		7	
Standard error of difference	3.616		2.476	
Mean	40.675	57.45	47.975	51.663
SD	26.567	32.339	28.077	23.912
SEM	9.393	11.434	9.927	8.454
N	8		8	

Table 7: Paired t - Test for the Dimension of Management Commitment

4.8.2 Dimension of Communications

This dimension covers the nature and efficiency of the health and safety communications within the organisation. There are six questions associated with communications in this dimension and they are grouped under the four key drivers: **Bottom-Up Communication**, **Top-Down Communications**, **Recognition and Rewards**, & **Consistent Application**. There are three specific questions directly worded in relationship to management, one each linked to the communication key drivers and the last linked to consistent application.

Communication in depth								
		Intervention 1	Control 1	Intervention 2	Control 2	Intervention % Change	Control % Change	Intervention Control % Gap Change
Key drivers	Survey Questions							
Bottom Up Communications		71.8	78.2	79.7	77.5	11.00%	-0.90%	390.91%
	Encouraged by management to speak openly about safety matters	71.8	78.2	79.7	77.5	11.00%	-0.90%	390.91%
Top Down Communications		42.7	58.6	60.4	66.9	41.45%	14.16%	144.62%
	Management does not always inform me of current safety incidents	19.2	41.2	40.6	52.5	111.46%	27.43%	84.87%
	Communication of safety performance	47.4	61.1	66.7	65	40.72%	6.38%	905.88%
	Communication on Hazards & Risks	61.5	73.5	73.9	83.3	20.16%	13.33%	27.66%
Recognition & Rewards		17.9	31.3	27.5	43.3	53.63%	38.34%	-15.19%
	I receive praise for working safely	17.9	31.3	27.5	43.3	53.63%	38.34%	-15.19%
Consistent Application		64.1	74.9	82.6	77.5	28.86%	3.47%	311.76%
	I am supported by management to raise safety concerns	64.1	74.9	82.6	77.5	28.86%	3.47%	311.76%

Table 8: The Results for the Dimension of Communication and Relationship to the Key Drivers and Associated Questions

The dimension of **Communication** resulted in a positive improvement of SCI between the initial survey of the intervention group and the final survey for all of the four related key drivers including the three specifically related to management. For the intervention group, the key driver ***Consistent Application*** had the highest SCI of the four in the final survey. The final SCI for this key driver was 82.6; the SCI improving by 28.86% and moving from a sustainable level to one considered to be high performing as it relates to the GSI rating. This key driver and its associated question also showed an improvement of 311.76% in the difference between the intervention and control group. The key driver ***Bottom Up Communications*** and its associated question showed an 11% improvement in the SCI and an improvement of the difference between the intervention and control groups by 390.91%. The SCI for the key dimension of ***Top-Down Communications*** resulted in a 41.45% improvement while the associated management question an SCI improvement of 111.46%. This question also saw the SCI improve from a foundation level SCI of 19.2 to a maturing score of 40.6. The results for the key driver ***Rewards & Recognition*** while not featuring a directly specific management question also resulted in an SCI improvement of 38.34% although the gap between the intervention and control group widened negatively.

4.8.3   Dimension of Safety as a Priority

The four questions in this category reflect the relative status of the health and safety issues within the organisation. In particular, the issue of productivity versus safety is examined. There are two questions that are specifically addressed to how management is viewed in its consideration for the safety of the employees and the importance of safety.

Safety as a Priority in depth								
		Intervention 1	Control 1	Intervention 2	Control 2	Intervention % Change	Control % Change	Intervention Control % Gap Change
Key drivers	Survey Questions							
Safety Values		51.3	59.7	57.2	71.3	11.50%	19.43%	-40.43%
	Priority of Safety Issues	38.5	41.2	29	55	-24.68%	33.50%	-89.62%
	Management clearly considers the safety of employees of great importance	64.1	78.2	85.5	87.5	33.39%	11.89%	605.00%
Consistent Application		56.4	61.1	73.9	68.3	31.03%	11.78%	183.93%
	Adherance to safety rules & procedures	56.4	61.1	73.9	68.3	31.03%	11.78%	183.93%
Production/Safety Tradeoff		55.1	56.9	63.8	57.5	15.79%	1.05%	128.57%
	Management considers safety is as important as	55.1	56.9	63.8	57.5	15.79%	1.05%	128.57%

Table 9: The Results for the Dimension of Safety as a Priority and Relationship to the Key Drivers and Associated Questions

The dimension of **Safety as a Priority** resulted in a positive improvement of SCI between the initial survey of the intervention group and the final survey for all of the three related key drivers including the two specifically containing management questions. For the intervention group the key driver with the largest SCI gain was related to ***Consistent Application***, although this key driver did not contain a specifically worded management question. The SCI for this key driver resulted in a gain of 31.03% for the intervention group and saw the difference between the intervention and control group also improving with the intervention group SCI final survey score greater than the control group. The key driver of ***Safety Values*** resulted in an SCI improvement of 11.50% for the intervention group although the difference between it and the control group worsened. The SCI score of the specifically worded management question improved by 33.39% while the second question associated to this key driver declined in its SCI results and the difference between the intervention group and the control decline. The final key driver for this dimension associated with the ***Production/Safety Tradeoff*** had a single related question and worded specifically toward management. The SCI for the intervention group improved by 15.79% and the difference between it and the control group also improved.

4.8.4 Dimension of Involvement

Involvement is one of the social environmental dimensions and measures the participants' perspective as it relates to the extent to which safety is a focus for everyone and all are involved. The six questions covered in this dimension are grouped into three key drivers. The first question related to **Top-Down Communications**. The key driver, **Bottom-Up Communications**, is related to the single question in this dimension specifically worded toward Management. The final key driver containing the remaining four questions is specifically related to employee's perception of their **Involvement** in safety and the extent the organisations safety committee is active.

Involvement in depth								
		Intervention 1	Control 1	Intervention 2	Control 2	Intervention % Change	Control % Change	Intervention Control % Gap Change
Key drivers	Survey Questions							
Top Down Communications		28.2	44.1	53.6	54.2	90.07%	22.90%	2550.00%
	Notifying of close out actions	28.2	44.1	53.6	54.2	90.07%	22.90%	2550.00%
Bottom Up Communications		50	54.5	50.7	65	1.40%	19.27%	-68.53%
	Iam involved in informing management of important safety issues	50	54.5	50.7	65	1.40%	19.27%	-68.53%
Employee Involvement		59	60.7	59.1	65.2	0.17%	7.41%	-72.13%
	I am never involved in review of safety matters	25.6	26.5	8.7	26.7	-66.02%	0.75%	-95.00%
	I would like to be more involved in safety matters	73.1	73.9	71	70.8	-2.87%	-4.19%	500.00%
	I can offer suggests for a safer work environment	65.4	66.8	72.5	80.8	10.86%	20.96%	-83.13%
	Our workplace has a very active safety committee	71.8	75.4	84.1	82.5	17.13%	9.42%	325.00%

Table 10: The Results for the Dimension of Involvement and Relationship to the Key Drivers and Associated Questions

The dimension of **Involvement** resulted in a positive improvement of SCI between the initial survey of the intervention group and the final survey for all of the three related key drivers including the specific key driver containing the sole management question. The improved SCI result for the two key drivers, ***Bottom-up Communications*** & ***Employee Involvement*** was slight.   The SCI for the key driver with the most improved SCI was ***Top – down Communications***, with an improved score of 28.2 to 53.6. The final SCI score for this key driver also resulted in the difference between the intervention and control group improving with the intervention group SCI final survey score greater than the control group. The second key driver of ***Bottom –up Communications*** resulted in a small SCI improvement for the intervention group although the difference between it and the control group worsened. This key driver contained a single associated question and it being the specifically worded management question. The SCI results for this question resulted in a greater difference between the intervention and control groups.   The final key driver for this dimension associated with the ***Employee Involvement*** and the activeness of the organisations safety committee resulted in a small SCI improvement for the intervention group. Two questions specific to employee involvement resulted in a declining SCI result. The remaining two questions resulted in an improved SCI for the intervention group.

4.9 Other Dimensions without Specific Management Questions

4.9.1 Dimension of Safety Rules and Procedures

Safety Rules and Procedures is one of the organisational context dimensions. This dimension looks at the employees' perception of the organisations views on the efficacy and necessity of rules and procedures. The measurement examines how committed the organisation is to the rules and procedures that are in place. The five questions covered in this dimension are grouped into three key drivers. None of the questions are specifically worded toward management.

Safety Rules & Procedures in depth								
Key drivers	Survey Questions	Intervention 1	Control 1	Intervention 2	Control 2	Intervention % Change	Control % Change	Intervention Control % Gap Change
Production/Safety Tradeoff		23.1	44.5	37.7	60.8	63.20%	36.63%	-7.36%
	Application of safety requirements versus production	23.1	44.5	37.7	60.8	63.20%	36.63%	-7.36%
Consistent Application		5.1	11.1	-1	18.9	-119.61%	70.27%	-69.85%
	Practicability of rules & procedures	3.8	4.7	-11.6	14.2	-405.26%	202.13%	-96.51%
	Effectiviness of safety rules & procedures	30.8	52.1	37.7	70.8	22.40%	35.89%	-35.65%
	Consistency of safety rules & procedures across the company	-19.2	-23.7	-29	-28.3	-51.04%	-19.41%	-742.86%
Systemic Approach		61.5	67.3	78.3	77.5	27.32%	15.16%	825.00%
	Review safe work practices & procedures	61.5	67.3	78.3	77.5	27.32%	15.16%	825.00%

Table 11: The Results for the Dimension of Safety Rules & Procedures and Relationship to the Key Drivers and Associated Questions

The dimension of **Safety Rules & Procedures** resulted in a small overall positive improvement of SCI between the initial survey of the intervention group and the final survey. Two of the three key drivers SCI for the intervention group resulted in an improved result. The first key driver for this dimension was ***Production/Safety Tradeoff***, which has a single question. The resulting intervention group SCI for this key driver had a score that improved both the SCI and the difference between it and the control group. The second key driver with an improved SCI for the intervention group was ***Systemic Approach***. The SCI for the single associated question resulted in a 27.32% improvement and also a significant improvement in the difference between the intervention and control groups. The final key driver, ***Consistent Application***, resulted in a reduced SCI for the intervention group and a greater difference between it and the control group. Only one of the three related questions SCI resulted in an improved score for the intervention group. That question being associated with the effectiveness of the safety rules & procedures.

4.9.2 Dimension of Personal Priority & the Need for Safety

This dimension is associated with the individual's view of their own health and safety management and the need to feel safe. There are two related key drivers. The first, *Safety Values*, directly looks at the employee's values and beliefs and as such is important for the development and maintaining of a strong organisational safety culture. The second key driver is *Training Outcomes*, and reflects the employees understanding of the organisation's safety message. There are five questions covered in this dimension and grouped between the two key drivers. None of the questions are specifically worded toward management.

Personal Priorities & Need for Safety in depth		Intervention 1	Control 1	Intervention 2	Control 2	Intervention % Change	Control % Change	Intervention Control % Gap Change
Key drivers	Survey Questions							
Safety Values								
	Safety is the number one priority	76.9	84.2	83.7	89.6	8.84%	6.41%	23.73%
	Safety issues are not the most important aspect	87.2	91.5	97.1	95	11.35%	3.83%	304.76%
	It's important that there is a continued emphasis on safety	53.8	67.3	53.6	76.7	-0.37%	13.97%	-41.56%
	A safe place to work is of personal value to me	76.9	84.8	91.3	90.8	18.73%	7.08%	1680.00%
Training Outcomes		89.7	93.4	92.8	95.8	3.46%	2.57%	23.33%
	Understanding safety risks	91	91.9	95.7	95.8	5.16%	4.24%	800.00%
		91	91.9	95.7	95.8	5.16%	4.24%	800.00%

Table 12: The Results for the Dimension of Personal Priority & the Need for Safety and Relationship to the Key Drivers and Associated Questions

The dimension of **Personal Priority & the Need for Safety** resulted in a positive improvement of SCI between the initial survey of the intervention group and the final survey for both of the two related key drivers. Overall four of the total five questions in the dimension had a resultant SCI for the intervention group that indicated an improved score. The key driver, ***Safety Values***, had four related questions including one of the highest scoring SCI results for the intervention group. The question "Safety issues are not the most important aspect", scored a final SCI of 97.1, being classified as high performing. Two other questions in this key driver group also scored an improving SCI for the intervention group. The question "It's important that there is a continued emphasis on safety", resulted in a slight decrease. The last key driver for this dimension, ***Training Outcomes***, had a single related question. The results for the intervention group for this key driver showed an improvement in the SCI and the difference between this group and the control group.

4.9.3   Dimension of Work Environment

The **Work Environment** dimension concerns the perceptions associated with the nature of the physical environment. It examines whether the time and equipment is available for a task to be completed safely. There are eight questions in total in this dimension, which are linked to four key drivers. The key driver *Work Condition* has three questions. The key driver *Production/Safety Tradeoff* has two questions. *Perception of the Workplace* has a single associated question while the final key driver two questions. None of the key drivers in this dimension have any questions that are specifically worded toward management.

Work Environment in depth							
		Intervention 1	Control 1	Intervention 2	Control 2	Intervention % Change	Control % Change	Intervention Control % Gap Change
Key drivers	Survey Questions							
Work Conditions		11.1	16.7	15.5	21.9	39.64%	31.14%	12.50%
	Availability of equipment	7.7	10	2.9	20.8	-62.34%	108.00%	-87.15%
	Conditions that hinder working safely	-26.9	-18	-7.2	-5	73.23%	72.22%	304.55%
	People availability to work safetly	52.6	58.3	50.7	50	-3.61%	-14.24%	914.29%
Production Safety Tradeoff		-21.8	-13.7	-26.8	-16.3	-22.94%	-18.98%	-22.86%
	Operational target conflict	-25.6	-23.7	-42	-31.7	-64.06%	-33.76%	-81.55%
	Time to complete job safely	-17.9	-3.8	-11.6	-0.8	35.20%	78.95%	30.56%
Perception of the workplace		66.7	70.1	69.6	65.8	4.35%	-6.13%	189.47%
	Safer place to work	66.7	70.1	69.6	65.8	4.35%	-6.13%	189.47%
Teamwork		70.5	71.6	71	77.5	0.71%	8.24%	-83.08%
	Empowerment to stop work	79.5	79.6	69.6	81.7	-12.45%	2.64%	-99.17%
	Safety requirements for contractors	61.5	63.5	72.5	73.3	17.89%	15.43%	150.00%

Table 13: The Results for the Dimension of Work Environment and Relationship to the Key Drivers and Associated Questions

The overall SCI for the dimension of **Work Environment** for the intervention group resulted in an overall positive improvement of 3.4% in comparison to the first survey. Further, for three out of the four related key drivers the SCI resulted in a positive improvement. The key driver of *Product/Safety Tradeoff* SCI for the intervention group resulted in a reduction in the score and a greater difference between itself and the control group. Similarly, for the related question, "Operational target conflict". The SCI for the key driver, *Work Conditions*, resulted in the strongest improvement for this dimension. It also resulted in a 12.5% improvement in the difference between the intervention and control group SCI score. One of the associated questions, "Conditions that hinder working safely", resulted in the most improved SCI score for this dimension. The SCI though remained a negative score but the GSI category improved from unsustainable to volatile. The SCI of the intervention group's key driver *Perception of the Workplace*, and the linked question, "Safer place to work" resulted in an improved SCI score and an improved difference between this group and the control group. The final key driver, *Teamwork*, resulted in the intervention group scoring an improved result but a widening difference in comparison to the control group. Of interest to note the SCI scores for the two questions related to the key driver, *Production/Safety Tradeoff*, for both the intervention and control groups, resulted in negative SCI's.

4.9.4 Dimension of Supportive Environment

The **Supportive Environment** dimension is concerned with the perceptions associated with the nature of the social environment. This dimension explores the interaction of the employees at work in the context of safety. There are eight questions in total in this dimension, which are linked to five key drivers. The key driver **Work Condition** has three questions. None of the questions in this dimension have any questions that are specifically worded toward management.

Supportive Environment in depth								
Key drivers	Survey Questions	Intervention 1	Control 1	Intervention 2	Control 2	Intervention % Change	Control % Change	Intervention Control % Gap Change
Hazard/Risk management		62	69.7	75.8	73.6	22.26%	5.60%	450.00%
	Raising safety issues	66.7	76.3	84.1	82.5	26.09%	8.13%	700.00%
	Reporting near misses	67.9	76.3	73.9	77.5	8.84%	1.57%	133.33%
	Encouraging the reporting of unsafe acts & near misses	51.3	56.4	69.6	60.8	35.67%	7.80%	157.95%
Team Work		59.6	66.8	55.8	71.7	-6.38%	7.34%	-54.72%
	Working safety within the team	69.2	71.1	71	75.8	2.60%	6.61%	-60.42%
	Application of safety procedures to others	50	62.6	40.6	67.5	-18.80%	7.83%	-53.16%
A Just Culture		59	64.9	73.9	60.8	25.25%	-6.32%	145.04%
	Finding the root cause not who is to blame	59	64.9	73.9	60.8	25.25%	-6.32%	145.04%
Employee Involvement		66.7	70.1	68.1	75	2.10%	6.99%	-50.72%
	Influencing H&S performance	66.7	70.1	68.1	75	2.10%	6.99%	-50.72%
Recognition & Rewards		15.4	18	37.7	25.8	144.81%	43.33%	121.85%
	Recognising safe behaviour	15.4	18	37.7	25.8	144.81%	43.33%	121.85%

Table 14: The Results for the Dimension of Supportive Environment and Relationship to the Key Drivers and Associated Questions

The overall SCI for the dimension of **Supportive Environment** for the intervention group resulted in an overall positive improvement of 16.31% in comparison to the first survey. Further, for four out of the five related key drivers the SCI resulted in a positive improvement. The SCI for the key driver of *Teamwork* for the intervention group resulted in a reduced score. The SCI score was impacted due to the results from the question, "When team members ignore safety procedures I feel it is their choice & none of my business". The SCI results from this question for the intervention group reduced in comparison to the first survey and the difference between this group and the control group widened. The SCI for the key drivers, *Just Culture*, and *Employee Involvement*, resulted in an improved SCI score for the intervention group. The key driver with the largest SCI score improvement for the intervention group was, *Reward & Recognition*. The intervention score between the two surveys for the related question resulted in a 144.81% improvement.

4.9.5 Dimension of Personal Appreciation of Risk

This dimension is concerned with the perceptions of the individual's appreciation of risk and specifically how the individual views the risks associated with their work.

There are four key drivers in this dimension with six linked questions in total. The key driver *Perception of the Workplace* has three questions, while single questions are linked to each of the other key drivers.

Personal Appreciation of Risk in depth								
		Intervention 1	Control 1	Intervention 2	Control 2	Intervention % Change	Control % Change	Intervention Control % Gap Change
Key drivers	Survey Questions							
Perception of the Workplace		-7.7	-8.7	-7.2	-1.1	6.49%	87.36%	-116.39%
	Risk of injury at work	-5.1	-19.9	-11.6	-30.8	-127.45%	-54.77%	22.92%
	Risk of accident	15.5	19	13	25.8	-16.13%	35.79%	-72.66%
	Involvement in an accident	-33.3	-25.1	-23.2	1.7	30.33%	106.77%	-67.07%
Training Outcomes		87.2	89.6	89.9	93.3	3.10%	4.13%	-29.41%
	Health & Safety responsibilities	87.2	89.6	89.9	93.3	3.10%	4.13%	-29.41%
Consistent Application		-24.4	-25.6	-27.5	-11.7	-12.70%	54.30%	-107.59%
	Taking calculated risks	-24.4	-25.6	-27.5	-11.7	-12.70%	54.30%	-107.59%
Safety Values		-7.7	-14.7	-27.5	-22.5	-257.14%	-53.06%	-240.00%
	Taking risks outside of work	-7.7	-14.7	-27.5	-22.5	-257.14%	-53.06%	-240.00%

Table 15: The Results for the Dimension of Personal Appreciation of Risk and Relationship to the Key Drivers and Associated Questions

The overall SCI for the dimension of **Personal Appreciation of Risk** for the intervention group resulted in an overall reduced score in comparison to the first survey. The SCI remains in the GSI category of foundational. Further, while the key driver, *Perception of the Workplace* resulted in a slight improvement in the intervention group SCI, the difference between this group and the control group declined. The associated question "Involvement in an accident" resulted in the biggest improved SCI for this key driver although the GSI category remained as unsustainable. The key driver, *Training Outcomes*, also resulted in a positive SCI improvement for the intervention group with the final score for the question associated with, "Health & safety responsibilities", was 89.9. The final two key drivers, *Consistent Application* and *Safety Values* both resulted in a declining SCI for the intervention group. Overall in comparison for both the intervention and control groups both scored SCI's and GSI categories of a similar nature.

4.10   Intervention Group Results by other Factors

4.10.1 Age

The age distribution of the intervention group was taken into consideration as part of the survey. Eight groups were used to match the age range for the intervention group.
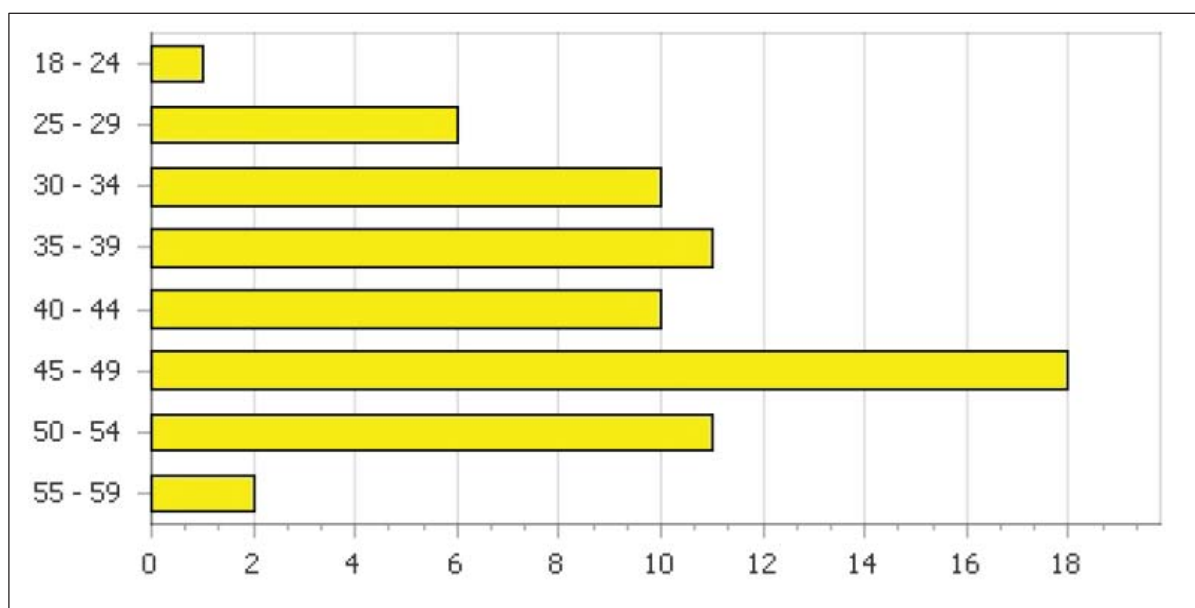
Graph 3: Showing the Numbers of Participants from the Intervention Group by Age

AGE	1st Survey	2nd Survey	Difference	1st Survey	2nd Survey	Difference	1st Survey	2nd Survey	Difference	1st Survey	2nd Survey	Difference	1st Survey	2nd Survey	Difference	1st Survey	2nd Survey	Difference
AGE Group	25-29			30-34			35-39			40-44			45-49			50-54		
Overall SCI	50.8	48.5	-2.3	22.2	48.6	26.4	37.8	41.9	4.1	36.9	57.5	20.6	48	43.7	-4.3	49.6	52.8	3.2
Management Commitment	50	54.2	4.2	14.3	60	45.7	37.5	50	12.5	36.5	66.3	29.8	51.3	59	7.7	48.6	56.8	8.2
Communication	73.8	72.2	-1.6	22.6	60	37.4	34.8	53	18.2	51.4	60	8.6	54.4	57.4	3	53.7	78.8	25.1
Safety as a Priority	67.9	70.8	2.9	25	45	20	31.8	52.3	20.5	50	77.5	27.5	56.6	61.1	4.5	88.9	70.5	-18.4
Safety Rules& Regs	45.7	30	-15.7	-1.4	16	17.4	30.9	29.1	-1.8	13.3	42	28.7	15.8	8.9	-6.9	24.4	21.8	-2.6
Supportive Environment	71.4	60.4	-11	36.6	51.3	14.7	51.1	61.4	10.3	44.8	75	30.2	67.1	65.3	-1.8	65.3	71.6	6.3
Involvement	66.7	61.1	-5.6	25	58.3	33.3	51.5	43.9	-7.6	47.2	58.3	11.1	63.2	52.8	-10.4	66.7	66.7	0
Personal Priorities	85.7	86.7	1	72.9	84	11.1	81.8	76.4	-5.4	73.3	94	20.7	85.3	87.8	2.5	75.6	83.6	8
Personal Appreciation of Risk	-19	-19.4	-0.4	1.2	21.7	20.5	9.1	-6.1	-15.2	11.1	23.3	12.2	7	-12	-19	13	3	-10
Work Environment	26.8	31.3	4.5	10.7	38.8	28.1	18.2	21.6	3.4	15.6	31.3	15.7	32.9	16.7	-16.2	26.4	28.4	2

Table 16: Comparison Results by Age for the Intervention Group across both Survey One and Two

The SCI results for the dimension of Management Commitment improved across all age groups. For the age group 30-34 the most positive increase occurred with the SCI improving from 14.3 to 60.   For the two dimensions containing management specific question; **Communications** and **Safety as a Priority**, all age groups resulted in positive SCI improvement except for one age group in each dimension. **Communications** dimension saw a SCI decline in the age group 25-29 and Safety as a Priority a decline for the age group 50-54. The dimension, **Involvement,** saw a decline in the SCI for the age groups 25-29 & 45-49.

The age group with SCI results indicating positive SCI across all dimensions was the 30-34 group. This age group had the largest improvement being associated with the dimension of **Management Commitment**, an SCI shift from 14.3 to 60. This age group also saw a positive shift from the lowest first survey score of -1.4 to a final score of 16 for the dimension **Safety Rules & Regulations**.

4.10.2 Gender

The intervention group gender distribution was taken into consideration as part of the survey. There were six females in the intervention group and sixty three males. The control group had a similar representation.
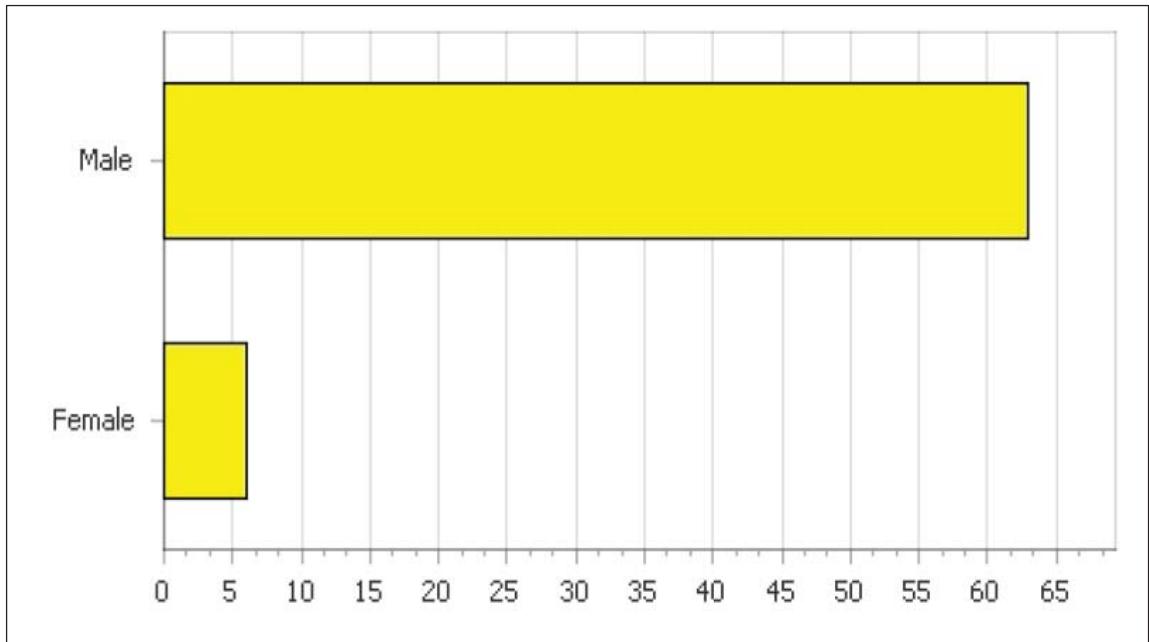
Graph 4: Showing the Number of Participants from the Intervention Group by Gender

4.10.2.1   Gender Results

Gender	1st Survey	2nd Survey	Difference	1st Survey	2nd Survey	Difference
Gender Group	Female			Male		
Overall SCI	56	56.3	0.3	39.3	47.5	8.2
Management Commitment	48.6	58.3	9.7	39.7	57.3	17.6
Communication	63	77.8	14.8	44.9	60.3	15.4
Safety as a Priority	83.3	83.3	0	49.6	61.1	11.5
Safety Rules& Regs	37.8	43.3	5.5	17.7	20.6	2.9
Supportive Environment	79.2	70.8	-8.4	52.7	64.3	11.6
Involvement	68.5	83.3	14.8	50.2	54.2	4
Personal Priorities	93.3	90	-3.3	78	85.7	7.7
Personal Appreciation of Risk	1.9	-19.4	-21.3	5.8	4.2	-1.6
Work Environment	40.3	33.3	-7	22.6	24.8	2.2

Table 17: Comparison of Results by Gender for the Intervention Group across Survey One and Two

The intervention group SCI for both female and male resulted in a positive improvement, although the female SCI provided only a slight increase. The SCI increase of the male group produced an increase of 8.2 SCI. The change of SCI for the male group also improved the GSI category moving the group from 'developing' to 'maturing'. The results for the four specifically related management dimensions with management worded questions found that all resulted in a positive improvement. The SCI for the dimension of **Safety as a Priority** remained static for the female filter. While there was no change in the SCI results the female group SCI for this dimension remains in the "High Performing" GSI category. The dimension, **Management Commitment**, resulted in an increased SCI for the female group of 9.7 and 17.6 for the male group. The SCI improvement for the male group changed their GSI category from 'developing' to 'maturing'.

The dimension of **Communications** resulted in a positive SCI improvement of 14.8 and 15.4 respectively for the female and male groups. The dimension of **Safety as a**

Priority for the male group resulted in a positive improvement of 11.5. Overall, across all dimensions, the female group SCI results indicated that 5 of the 9 dimensions resulted in a positive improvement while the male group resulted in SCI improvements for 8 of the 9 dimensions. The dimension consistently performing the lowest across both female and male groups remains the dimension of **Personal Application of Risk**.

4.10.3 Ethnicity

For the intervention group, the distribution of Ethnicity, (Labelled 'Race' within the survey), was taken into consideration as part of the survey. The three main ethnic groups, Chinese, Indian and Malay, were equally represented across both the intervention and control groups in both surveys. The small group Eurasian was not considered as a separate group due to insufficient responses. There were 40 Chinese respondents, 14 each in of the groups Indian and Malay, respectively.
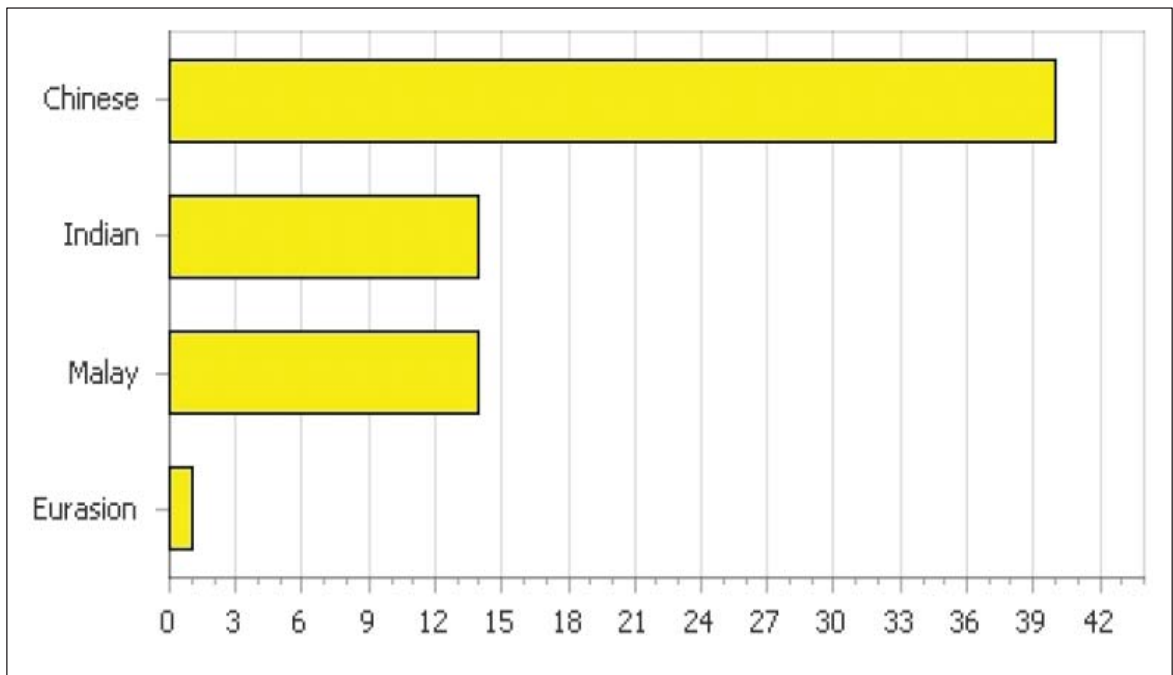
Graph 5: Showing the Numbers of Participants from the Intervention Group by Ethnicity

Race	1st Survey	2nd Survey	Difference	1st Survey	2nd Survey	Difference	1st Survey	2nd Survey	Difference
Race Group		Chinese			Indian			Malay	
Overall SCI	44.4	51.5	7.1	19.1	33.2	14.1	55.7	55.4	-0.3
Management Commitment	47.9	61.6	13.7	7	39.3	32.3	54.5	65.2	10.7
Communication	49.3	64.2	14.9	22.9	48.8	25.9	66.7	70.2	3.5
Safety as a Priority	55.7	71.3	15.6	26.6	41.1	14.5	76.8	62.5	-14.3
Safety Rules& Regs	20	25	5	-3.8	-10	-6.2	47.1	51.4	4.3
Supportive Environment	62.2	66.3	4.1	25	54.5	29.5	68.8	72.3	3.5
Involvement	57.6	59.2	1.6	33.3	47.6	14.3	56	61.9	5.9
Personal Priorities	84.6	88.5	3.9	60	75.7	15.7	85.7	88.6	2.9
Personal Appreciation of Risk	5.2	7.1	1.9	1	-3.6	-4.6	10.7	-8.3	-19
Work Environment	23.4	28.4	5	10.2	7.1	-3.1	45.5	38.4	-7.1

Table 18: Comparison Results by Ethnicity across both Survey One and Two for the Intervention Group

The overall SCI for the Ethnicity factor resulted in an SCI improvement for both the Chinese and Indian groups. The Malay group SCI score reduced slightly but the final SCI remained the highest SCI across the groups. The results for the four specifically related management dimensions with management worded questions found that all resulted in a positive improvement except in one instance where the SCI for the Malay group in the dimension of **Safety as a Priority** declined. The dimension of **Management Commitment** found that the largest improvement came from the Indian group. The SCI for the group improved from 7 to 39.3, an increase of 32.3.

This result moved the Indian group from GSI category of 'foundational' to 'developing'. Both the other two groups, Chinese and Malay improved and now sit in the GSI category of 'sustainable'.

The dimension of **Communication** again resulted in the Indian group SCI results improving significantly. For the dimension of **Safety as a Priority**, the two groups Chinese

and Indian both resulted in an improved SCI score. For the final dimension, **Involvement**, the SCI improved across all three groups, Chinese, Indian and Malay. Overall, movement in the SCI's across the dimensions found positive improvement for all the dimensions for the Chinese group, 6 out of the 9 for the Indian group and lastly 5 out of the 9 for the Malay group. The dimension of **Personal Appreciation of Risk** remains the lowest scoring SCI across the groups.

4.10.4 Time in Business

The category, Time in Business, consisted of seven values. The participants grouping within the values similarly represented across both the intervention and control groups. The majority of the participant's length of service being ten years or longer.
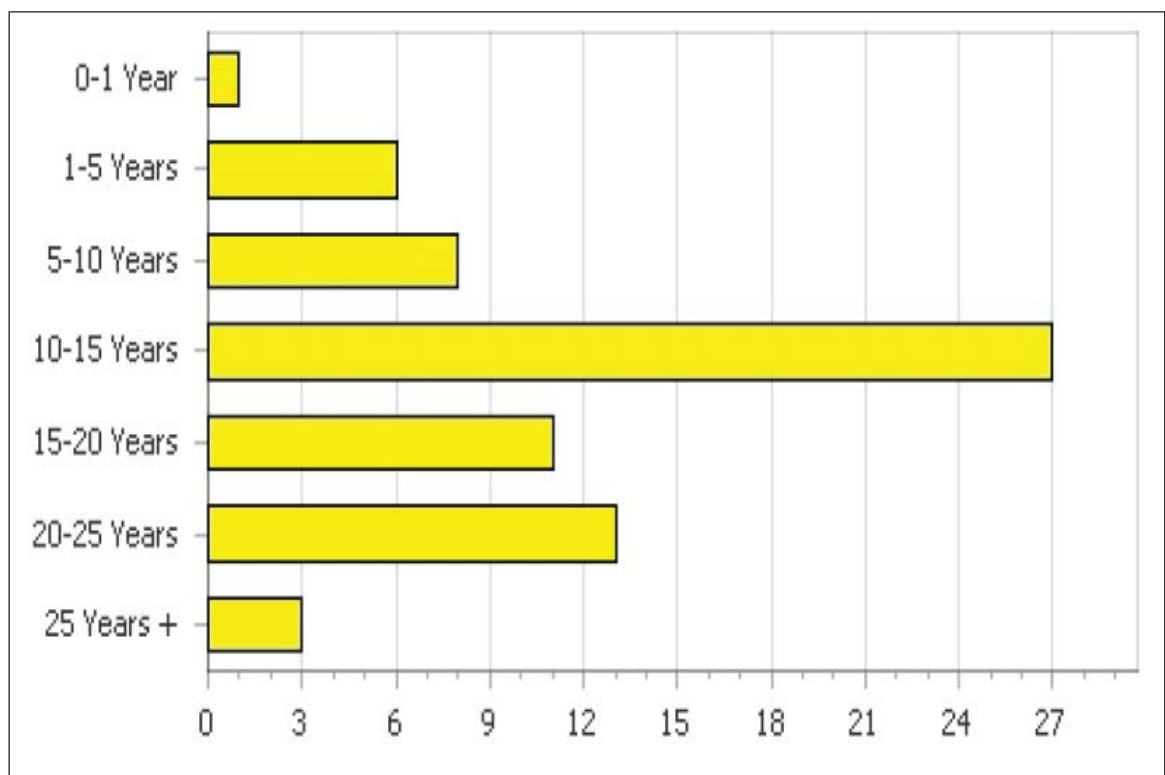
Graph 6: Showing the Numbers of Participants from the Intervention Group by Time in Business
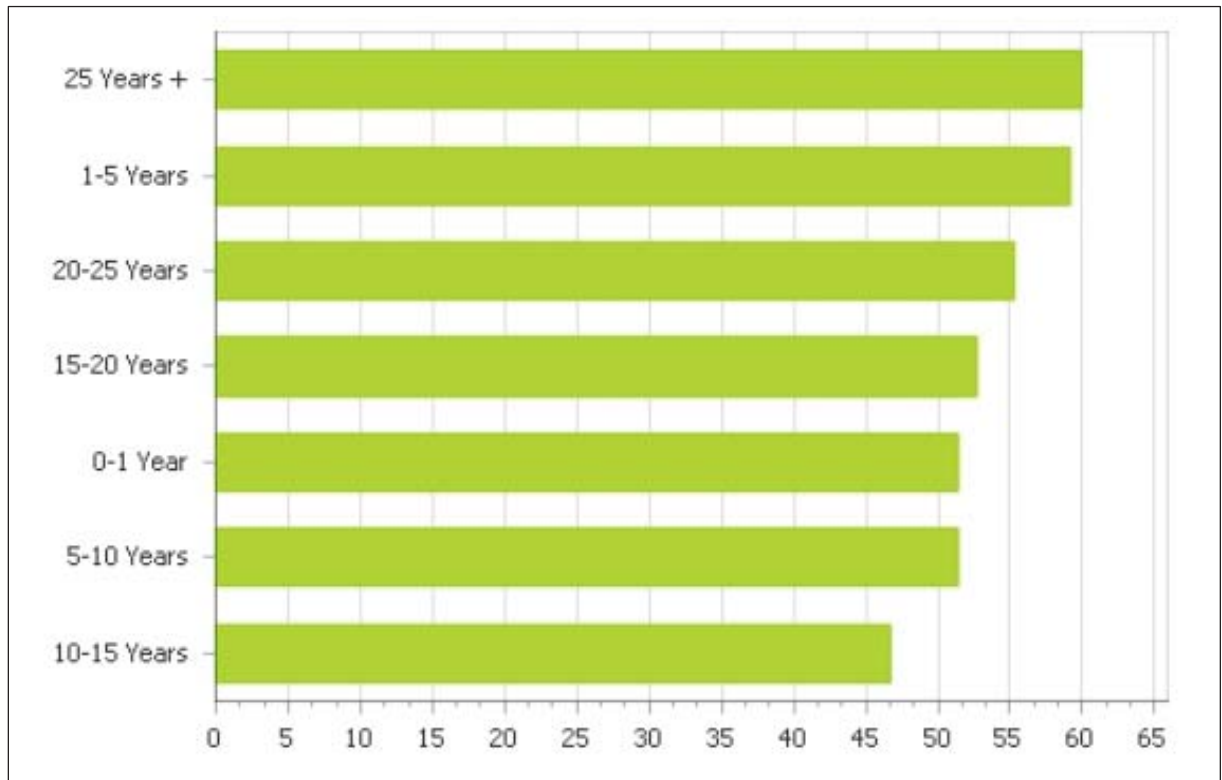
Graph 7: Showing the SCI Results for the Factor 'Time in Business' for the Intervention Group

4.10.4.1 Time in Business Results

Time in Business Length Group	1-5 Years			5-10 Years			10-15 Years			15-20 Years			20-25 Years			25+ Years		
	1st Survey	2nd Survey	Difference	1st Survey	2nd Survey	Difference	1st Survey	2nd Survey	Difference	1st Survey	2nd Survey	Difference	1st Survey	2nd Survey	Difference	1st Survey	2nd Survey	Difference
Overall SCI	53.6	56.5	2.9	27.9	41.7	13.8	32.9	43.5	10.6	51.2	56.5	5.3	54	46.2	-7.8	33.9	50.7	16.8
Management Commitment	57.5	56.3	-1.2	16.3	48.4	32.1	35.6	52.3	16.7	56.3	73.9	17.6	52.8	53.8	1	16.1	70.8	54.7
Communication	53.3	69.4	16.1	34.6	54.2	19.6	40.1	54.9	14.8	58.3	72.7	14.4	53.7	59	5.3	45.2	88.9	43.7
Safety as a Priority	85	91.7	6.7	23.1	59.4	36.3	39.8	47.2	7.4	81.3	77.3	-4	72.2	63.5	-8.7	35.7	91.7	56
Safety Rules& Regs	48	46.7	-1.3	4.6	27.5	22.9	7.4	18.5	11.1	23.3	21.8	-1.5	20	12.3	-7.7	25.7	26.7	1
Supportive Environment	75	68.8	-6.2	41.3	59.4	18.1	47.2	56.5	9.3	68.8	75	6.2	63.9	71.2	7.3	51.8	79.2	27.4
Involvement	70	69.4	-0.6	50	56.3	6.3	36.4	48.1	11.7	59.7	68.2	8.5	70.4	53.8	-16.6	61.9	72.2	10.3
Personal Priorities	96	96.7	0.7	75.4	85	9.6	71.9	80	8.1	91.7	92.7	1	88.9	87.7	-1.2	65.7	86.7	21
Personal Appreciation of Risk	-23.3	-13.9	9.4	-1.3	-12.5	-11.2	10.5	14.2	3.7	1.4	-6.1	-7.5	22.2	-3.8	-26	-4.8	22.2	27
Work Environment	35	41.7	6.7	13.5	10.9	-2.6	13	22.7	9.7	31.3	35.2	3.9	47.2	22.1	-25.1	17.9	20.8	2.9

Table 19: Comparison of Results by Time in Business for both Survey One and Two for the Intervention Group

The overall SCI results for the intervention group across all values indicated improvement except for the group 20-25 years in business. The biggest improvement came from the 25+ year's group with an SCI gain of 16.8 taking the GSI category for the group from developing to maturing. The group, 5-10 years' service, had the lowest SCI in the first survey but a significantly improved SCI in the second survey. The results for the four specifically related management dimensions with management worded questions found that the majority resulted in a positive improvement except a slight decline for the group, 1-5 years. The largest improvement in this dimension came from the 25 + year's group with an SCI gain of 54.7 and a final SCI of 70.8. All the final SCI's for the groups in this dimension resulted in a GSI category of maturing except for the two groups, 15-20 and 25 + years with SCI's in the sustainable category. For the **Communication** dimension all the groups SCI resulted in a positive improvement.

For the dimension of **Safety as a Priority**, the resulting SCI's had a positive improvement except for the 20-25 year group. The **Involvement** dimension resulted in positively improved SCI's for four of the six values.

The two groups, 1-5 & 20-25 years' service both resulted in a decline in SCI. The group with the largest number of respondents was the 10-15 year with 27 participants. This group also had positive improvement for the SCI across all dimensions, as with the 25+ year group. The group's; 1-5, 15-20 & 25+ years' service all featured SCI results in the 90's.

4.11 Intervention Group Question Ranking for Dimension of Management Commitment

This dimension is wholly related to and a reflection of **Management**. The dimension consists of eight questions. All of the questions between the first and second survey resulted in a positive movement for the intervention group when comparing ranking of SCI by question.

Question	Ranking Survey 1	Survey 2
Management acts decisively when a safety concern is raised	26	12
Management acts only after an incident or accident has occurred	50	47
Corrective action is always taken when management is told about unsafe practices	28	11
In my workplace management acts quickly to correct safety concerns	25	21
In my workplace managers walk past unsafe behaviours and will not stop to address the unsafe behaviour	42	42
In my workplace managers show interest in my personal safety and wellbeing	35	31
Managers express concern and followup action as required if safety procedures are not adhered to	33	29
Managers in our business take safety personally and it appears to be a personal value	18	10

Table 20: Intervention Group Question Ranking across both Surveys for the Dimension of Management Commitment

4.12   Leadership Safety Index Review

The Leadership Safety Index, (LSI), provides personal insights into individual mangers safety behaviour and attitudes. It allows for the safety profiling of each manager and is a weighted compilation of their own self-perception. The overall LSI score for the Leadership group was 66.88. The LSI scores are presented against a nominal benchmark. The LSI measures cover the areas of: Lead by example, Set Clear Expectations, Involve Others, Demonstrate Care & Commitment, Provide Feedback, Alignment & Awareness and finally, Skills & Capability. The results of the LSI survey will be provided only as a comparison of the manager's self-belief in their own safety behaviours and attitudes against where the employees see their managers.

	Areas of Measure	LSI	Max	Min
A	Lead by Example	75.56	80	71.11
B	Set Clear Expectations	68.46	80	56.92
C	Involve & Communicate	64.31	84	44.62
D	Demonstrate Care & Commitment	94	100	88
E	Feedback	68.92	84	53.85
F	Alignment & Awareness	80.44	92	68.89
G	Skills & Capabilities	92	96	88

Table 21: LSI Results across the Executive Management Team
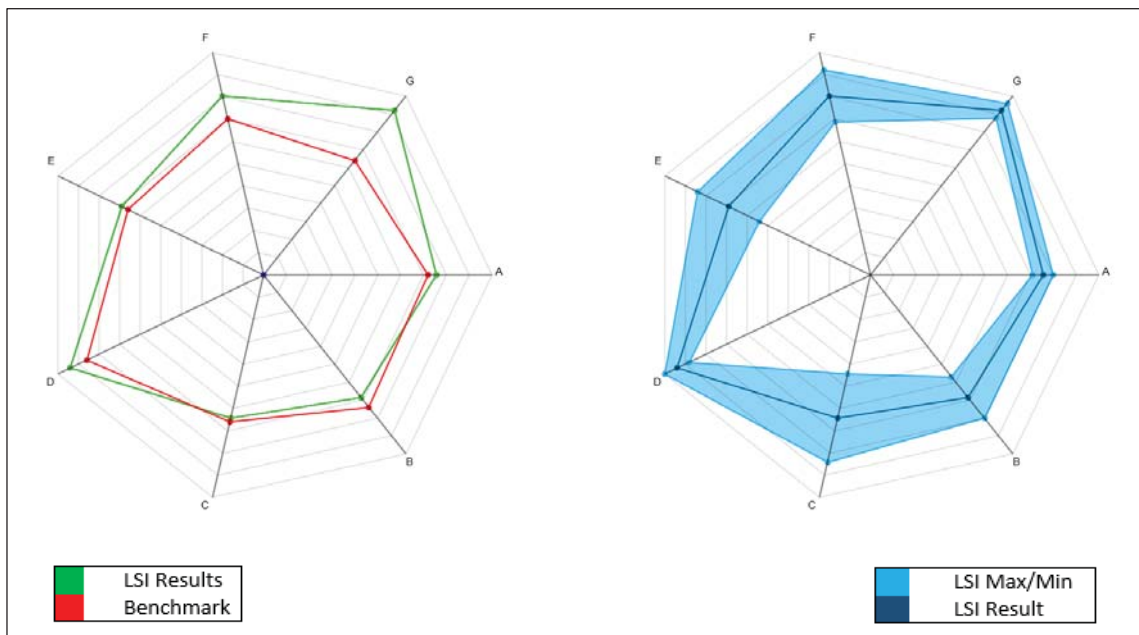
Graph 8: Spider Graphs for Managers LSI Results

4.13 Audit of Leadership Agreed Actions for the Intervention Group

Action #	Agreed Actions	Action Outcome
1	Safety Champion – Develop and identify two employees, provide EHS support and training, provide an open door policy for reporting of concerns and issues.	Safety Champion – Developed and identified six employees. Employees training and the role and process introduced to the shop-floor employees. Project commenced late in third month due business constraints therefore impact limited.
2	Weekly safety management shop floor walks by senior management, rotation basis, to improve visibility of managers who do not normally visit the shop-floor. EHS to provide safety topic support. Walk is about engagement. All feedback documented back to GM.	Weekly safety management shop floor walk occurred 25 occasions over three months. Feedback documented with findings discussed entered into safety Council data base, resolved with feedback to employees. Impact of the activity considered successful.
3	Monthly senior manager led People Based Safety (PBS) work process/ employee safety observation.	Senior manager led PBS observation occurred weekly over the three months. Impact of the activity considered successful.
4	Sherlock Holms competition beginning of October. Intervention Group to organise and run the quiz.	Competition did not occur due business constraints.
5	Senior managers to carry and utilise 'thank you' devices during manager shop floor walks; Gold coin and new 'PBS/Thank you card'.	Recognition of safety performance on the shop floor by the senior management occurred over the three month period. Number of Gold coins and thank you cards presented though while positively received was limited in number.

Table 22: Showing List of Agreed Management Actions Compared to Action Outcome

CHAPTER 5: DISCUSSION

This chapter presents the discussion following the findings that resulted from the two surveys that were carried out as a longitudinal test/retest comparative analysis within the Singapore MNC. Participants involved in the surveys were employees of the identified MNC organisation and formed the intervention and control groups. The survey tool was a commercially available safety climate questionnaire. The purpose of this study was to examine the organisations employees change in perspective of their workplace safety environment as influenced by the organisations leadership following leadership intervention training. The primary emphasis for the intervention training was transformational leadership. The use of the safety climate survey being to take a snap-shot view of the organisations' employee's perception of safety in their workplace in a before and after manner and record any change as a result of the leadership intervention training.

Research Question

The research question addressed in this study is "can employee perspective of workplace health and safety improve as a result of intervention training for the organisations leadership that highlights the significance of current theoretical knowledge of leadership influence?"

Hypothesis

Leadership training, involving senior employees understanding leadership influence, will result in improvements in employee perceptions of health and safety within the organisation as a measure of safety climate.

The findings of this research support the thesis hypothesis. The research findings are consistent with previous studies in that positive improvements in safety climate scores following three months of leadership influence were noted, (Mullen & Kelloway, 2009). Further, the findings support improvement of employee perception as a result of the style of leadership influence. The organisations leadership practiced a transformational, authentic leadership style while showing principles of active caring, (Mullen, et al, 2011). The study adds to previous research noted within the literature review by focusing upon intervention training for leadership based on transformational leadership theory that includes authentic and active caring leadership principles with a primary focus on safety. The research adds the dimension of culture by being carried out within an MNC located in Singapore. Furthermore, this research supports previous studies that suggest that transformational leadership can be taught and providing such training within the organisation can improve safety performance, (Mullen, et al, 2017).

5.1   Process and Preparation Overview

Following the initial survey of the intervention and control groups the MNC leadership was presented with the first survey findings. The author conducted leadership training for the MNC GM and senior leadership group which covered leadership theory concepts and best practice, specifically transformational, authentic and active caring in nature with a specific focus on safety. An agreement was reached as to what specific actions the leadership team would undertake over the ensuing three months. The actions were practical and sustainable and specific only to the intervention group and a focus on workplace safety. Following three months of actions by the leadership team with respect to the intervention group a second safety climate survey was conducted for both the intervention and control groups.

5.2   Management Action Outcome

The senior management agreed a number of activities would occur specific to the intervention group. These activities were the result of the initial survey findings and primarily focused upon management utilising transformational and authentic leadership concepts and focused on safety. Five activities where agreed upon but following the audit of the leadership activities it was found that one activity had not been commenced and a second activity largely incomplete. The remaining three activities associated with the senior management team engaging employees on the shop floor regularly each week were consistently accomplished across the entire three-month period. The verbal feedback from the managers involved following the exercise was positive and most had not realised its importance.   The management team mentioned that they were surprised at the positive response they received from the employees.

5.3   Expectations

It was expected for the intervention group that when the initial and final surveys were compared the final survey results would highlight an improved safety climate index. This expectation was considered reasonable and realistic based upon previous research that linked leadership to improved safety perceptions of employees, (Bailey, 1997; O'Toole, 2002). This especially as research indicated there is a positive association with employee perceptions of workplace safety climate when leadership behaviour utilises a transformational style and is focused specifically on safety, (Mullen & Kelloway, 2009). It was also expected that the SCI for the control group would remain relatively unchanged between the initial and final surveys as this group was not subject to leaderships' active safety engagement.

5.4   Results Overview – Management Commitment Dimension

215 employees took part in the first survey although only 211 questionnaires were entered into the software, as a small number of surveys were incomplete. The intervention group comprised of 78 correctly completed surveys and the control group 133. The second survey a total of 190 employees took part with only one survey being significantly incomplete. The intervention group comprised of 69 correctly completed questionnaires while the control group 120. A number of employees elected to make use of the surveys written in English, Chinese and Malay.

The initial survey resulted in an SCI of 41.3 for the intervention group and 47.4 for the control group. In comparison the second survey resulted in an SCI of 48.3 for the Intervention group and 52.6 for the control group. The intervention group SCI change between the first and second surveys resulted in a positive improvement of 16.95%. A positive improvement was expected for this group because of the intervention of the leadership.

The SCI questionnaires' 56 questions are all linked to 14 key drivers and associated with nine dimensions or underlying factors as originally proposed by Cox & Cheyne, (Cox & Cheyne, 2000). As the main focus of this research was related to management the results discussion will be primarily associated with the findings in this area. Also, as the prime group that the intervention was associated with was the Intervention group the major area of comparison will be this particular group. The main safety climate dimension directly associated with 'management' the dimension of **Management Commitment** resulted in a positive improvement for the intervention group of 41.03%. The initial survey SCI for this dimension was 40.7 while the final survey resulted in an SCI score of 57.4. Not only was the intervention group SCI a positive improvement but the difference between the intervention and control SCI was a significant change of 228.07%. The initial survey SCI's for the intervention and control group's resulted in 40.7 & 48 respectively while the final survey SCI's 57.4 and 51.7 respectively.

The statistical significance was tested utilising the Paired t-Test. The results of the test indicate a positive correlation to the hypothesis for the intervention group. The test results showed that the changes between the first and second survey to be very statistically significant with a p value of 0.0024. The results for the control group provided a p value of 0.1800, a value that is considered not statistically significant indicating that the management influence did not have a bearing on any changes for this group from the first to the second survey.

This positive result indicating a significant change occurred within the intervention group for the dimension of Management Commitment. This dimension is linked to the key drivers; Hazard/Risk Management, Safety Values & Consistent Application. The related final scores also resulted in improved SCI's of 59.08%, 31.58% & 17.35% respectively. All of the associated questions for this dimension are concerning management actions and all except one question resulted in positive improvement. The questions resulting in the biggest improvement included; 'management only acts after an incident has occurred", "corrective action is always taken by management when told about unsafe practices", & "management acts decisively when a safety concern is raised".

Safety climate has been recognised as being influenced significantly by the quality of the leadership, specifically taking a mediating role in the relationship between safety leadership and safety performance, (Wu, Chen, & Li, 2008). Wu, et al, also recognised in their research that of all the elements that contribute to successful safety management; the safety commitment and actions of senior managers is the most important.

As the senior management actions across the period of research involved repeated shop floor walks using transformational leadership styles previous research supports linkage to the improvement in SCI, (Wu et al, 2008; Mullen & Kelloway, 2009).

5.5   Other Directly Related Management Dimensions

There are three additional dimensions with a direct relationship to management. The dimensions are associated due to a number of the linked questions worded specifically toward management. These dimensions include; Communications, Safety as a Priority, and Involvement. The final SCI's of the intervention group for these three dimensions resulted in a positive improvement of 31.49%, 17.76%, & 8.4% respectively. Comparing the initial difference between the intervention group and control group's SCI for these dimensions with the resultant difference following the second survey the results indicate the intervention group closed the difference positively.

Within the Communications Dimension the related key drivers all resulted in positive SCI movement. The key drivers are; 'Bottom-up Communications', 'Top down Communications', 'Recognition & Rewards, and 'Consistent Application'. The SCI results for the intervention group from the above mentioned key drivers scored the following improvements; 11%, 41.45%, 53.63%, & 28.86% respectively. The safety climate results are consistent to previous findings in that they also show that open and effective communications is a key feature of a positive safety climate and indicative of a work climate that is supportive of its members, (DeJoy, et al, 2004). The question specifically associated with the key driver Recognition & Rewards in this instance was "I receive praise for working safety" and the substantial improvement in the SCI is likely to be directly related to leadership engaging employees and rewarding them appropriately. The specific management worded question of, "Encouraged by management to speak openly about safety matters", resulted in an improved SCI result of 11%.

The dimension of Safety as a Priority contained two specifically worded management questions, these being, "Management clearly considers the safety of employees of great importance', and Management considers safety is as important as production'. Both of these questions resulted in positive improvement in the SCI with 33.39% & 15.79% increase respectively. The improvement likely to be linked to the leader's regular engagement and employees witnessing their positive behaviour and actions toward safety. (Mullen & Kelloway, 2009). The three key drivers in this dimension all showed positive improvement in the SCI.

The dimension of Involvement containing three key drivers and a single management worded question all resulted in a positive improvement in their respective SCI's. The key driver 'Top down Communications' resulted in a substantial improvement in the SCI, moving from 28.1 to 53.6, an increase of 90.07%. This is also most likely due to the leadership being on the shop floor regularly and able to speak directly about safety issues and provide immediate responses to employees questions.

Managers should believe that maintaining visibility and involvement in the workplace is critical for workplace safety, (O'Dea & Flin, 2001).

Overall the results for the intervention group and the key drivers indicated that 13 out of the 14 resulted in a positive improvement. The top five including Reward & Recognition, Top down communications, work condition, hazard/risk management & production/safety tradeoff. The SCI improvements being: 95.21%, 50.13%, 39.64%, 38.66% & 37.93% respectively. The improvement in the results for 'hazard/risk' management supports the fact that employees consider this should be an area of joint effort and leadership must be involved especially for support, discussion, investigation and closing the feedback loop. Although some argue that ideally employees should know all the risks associated with their jobs, what is required for safety, and take responsibility for themselves, (Ostrom, et al, 1993). With leadership visible and accessible on the shop floor regularly this strengthens those listed key drivers above and likely is the reason for the positive movement in SCI.

5.6   Results Summary from other Factors

In general the SCI scores by Race, Gender, Age, and Time in Business resulted in improvement. The most positive age group being the 30 – 34 years. The SCI for both genders resulted in positive improvement although only a small increase for the female group. The workforce is primarily male dominated. From a race perspective the workforce has a majority of Chinese. The Indian group had the largest improvement in SCI although in comparison to both the Chinese and Malay group the final SCI score is lower. The factor 'time in business' indicated that the 10 – 15 years of service group had the most positive SCI improvements across all dimensions. For future research it is possible that a number of these factors are unnecessary; gender and age in particular. As this research has a cultural dimension the factor, Race, may still provide some useful data. Also, as this research is associated with a business organisation, the time in business, factor may still be of interest.

5.7 Unexpected Results

5.7.1 Managers Walk Past Unsafe Behaviours and Will Not Stop and Address Them

Within the dimension of management commitment the question "Managers walk past unsafe behaviours and will not stop and address them", had a foundational category SCI score of 19.2 initially and resulted in a 32.29% deteriorated final SCI score.

It was expected that as a result of the management actions that included, People Based Safety, (PBS), employee engagement activities over the research period the SCI for this area would improve. This especially as the audit of management activities noted the number and consistency of PBS events carried out over the research time frame with proof of safety findings, employee involvement and evidence of resolution, close out and feedback to the employees.   A number of factors may be affecting the results including for example the possibility that an element of distrust in management actions still exists. Research has indicated the role of trust as an antecedent to many valued performance outcomes. It is also recognised as a process that results improve from collaborative interaction between leaders and employee, (Burke, Sims, Lazzare, & Salas, 2007). Trust is something that can be developed or broken due to specific interactions or linked to specific situations, (Burke, et al, 2007). There is also empirical evidence that indicates that employees hold beliefs about safety obligations of managers, (Mullen, et al, 2017). It has been noted that research based on social exchange theory in safety literature suggests that positive safety attitudes and behaviour resulted through reciprocation of social influences experienced within the organisation, (Mullen, et al, 2017). Managers operating in a passive manner for example and walking by unsafe situations or behaviours has been proven to have a detrimental effect on employee safety, (Mullen & Kelloway, 2009). Further, it has been argued that passive styles of leadership have been associated with negative perceptions of safety climate, (Mullen, et al, 2011).

Further, prior to this study management shop floor walks and employee engagement was not the norm at this MNC. As such, it has been suggested that some organisational programme's can be seen negatively and managerially inspired, (Beardwell, Holden, & Clayton, 2004), hence the unexpected results.

Transformational leadership requires reinforcement of people's optimism and enthusiasm for change is a multiplier of effort, (Avolio, et al 2004). Consistent feedback, communications and follow up corrective actions by leadership are required to show people that the change effort is sincere, (Cooper, 2015).

5.7.2   Personal Appreciation of Risk

The dimension Personal Appreciation of Risk examined the employees individual view of risk associated with their work. The final SCI score for this dimension for the intervention group declined negatively by 58.49%. The final SCI score being 2.2, categorized as foundational.   There are six questions associated with this dimension with five of them being in amongst the lowest ranking questions of all the survey questions. As this area considers employees personal appreciation of risk it could be suggested that there is a lack of training associated. However, the SCI score for the key driver of training is the highest scoring area with a resulting SCI of 92.8.

In comparing both the intervention and control groups initial and final survey results in both of these areas the results are conspicuously similar. For the groups, intervention and control, initial SCI results for the dimension of Personal Appreciation of Risk the scores are 5.3 and 3.9 respectively while the final SCI results were 2.2 and 9.3. Similarly, for the training key driver. The intervention and control groups initial SCI resulted in scores of 89.1 and 90.8 respectively while the final SCI results were 92.8 and 94.6.   Reviewing these results together it appears both groups have very similar and consistent results with the intervention having little affect. As pointed out by Choudry, et al, it is possible for a unitary organisational culture to evolve when all members of the organisation face roughly the same problems, when everyone communicates with almost everyone else and when each member adopts a common set of understandings for enacting proper and consensually approved behaviour, (Choudry, et al. 2007). While these conditions rarely exist within contemporary organisations, (Guldenmund, 2000), the results indicate a subset may be possible within the organisation. While the conditions for the employees at the researched organisation are such that they are separated by work area and by building, the converging area for meal consumption is common. Also, many of the employees travel together from their home in Malaysia. While it is unlikely that a unitary culture exits there will be some common understanding within the organisation in part due to interaction during meal breaks or through outside work association.

More important though is that certain organisational events may also support common views across the business. Specifically, a number of earlier recent events may have contributed to the employees' commonly held view associated with personal risk, including a major injury of one of the employees. While it is likely that a number of employees may take the opportunity in a survey to make a personal statement and create a negative impact the results for the dimension of personal appreciation of risk are to consistently extreme and appear to reflect a more commonly held organisational employee opinion.

5.8   Opportunities

5.8.1   Production/Safety Trade-Off

The question with the lowest SCI was the question, "Operational targets often conflict with safety measures". This question is linked to the key driver of Production/Safety Trade-Off, which resulted in low SCI scores for both the intervention and control group. The SCI scores being 12 and 21.5 respectively. The actual question SCI resulted in a score of -42 and -31.7 for both the intervention and control group. While the question does not utilise the word 'management' it is implied that this is a management responsibility. While the very low SCI results are common across both the intervention and control groups it was not an unexpected result. This is considering the role productivity has within the organisational and the drive required to ensure its success. The organisation clearly has an opportunity due to the SCI score for this question. Safety climate has been stated to be a global factor involving perceptions of workplace safety related attributes and the relative priority given to safety when competing with other operation goals, (Griffin & Neal, 2000). Employees understand quite clearly whether managers are concerned about their safety, (Mullen, et al, 2017). Zohar contends that where a consistent pattern of action in regard to safety is displayed it promotes a shared perception among the group concerning safety, (Zohar, 2000, Zohar, 2000). Should there be competing operational demands there is the opportunity for ambiguity to set in. Discrepancies come about between what a manager states and what a managers actions imply, (O'Dea & Flin, 2001).

5.8.2   Leadership Intervention Training

The MNC's senior leadership was involved in intervention training to help them understand their role of leadership influence, especially as it relates to safety. Following the intervention training the organisations leadership practiced a transformational, authentic leadership style while showing principles of active caring when engaging with the shop floor employees. The safety climate outcome following the leaderships period of shop floor active engagement with employees resulted in positive improvement overall, (16.95%), and specifically in the dimension of Management Commitment, (41.03%). This positive increase and change in SCI has a positive correlation to this research hypothesis. The findings support previous research findings that indicate that the key to successful leadership intervention training is employee perception of the leaderships resulting behaviour and actions, (Kelloway, Barling & Helleur, 2000).

The findings from this current research also supports other research where leadership intervention training resulted in improved organisational performance, (Mullen

& Kelloway, 2009), and specifically transformational leadership training with a focus on safety, (Mullen & Kelloway, 2009). This current research supports Mullen, et al, studies that show improvement for transformational leadership training that has a focus on involvement and discussion, (Mullen, et al, 2017). This current research further supports the concept that leadership behaviour especially transformation in style can be taught and behaviour changed through intervention training, (Mullen, & Kelloway, 2009; Schwarz, Hasson, & Tafrelin, 2016).

The effectiveness of the research intervention training can further be gauged by the results of the LSI. From Kirkpatrick's training outcome model, training effectiveness criteria includes behaviour and attitude change with a transfer of this knowledge to workplace actions, (cited in Mullen & Kelloway, 2009). The results from the LSI indicate an overall score of 66.88 for the leadership group. The leadership safety Index provides personal insights into individual mangers safety behaviour and attitudes based upon their own perceptions. The LSI provides an indication of Leaderships intention for behaviour change following the training. LSI results for related transformational behaviours including; Lead by example, Demonstrate care & commitment, Feedback, Alignment & capabilities provided scores of 75.56, 94, 68.92 & 80.44 respectively.

The management team believed they had the requisite skill set following the intervention training. This was indicative of the LSI score of 92 for the area of measure "Skills and Capabilities". Further, the managers consistency of belief across the team is supported by the narrow spread of responses, (96 – 88). The LSI result of 94 for "Demonstrate care and Commitment was the highest score and also one of the narrowest response spreads, (100 – 88). This LSI score is in alignment with the subject of the training and the SCI employee perception results. The areas resulting in lower LSI scores including; Set clear expectations, and Involve & communicate, suggest further opportunity to improve the area of competing organisational demands.

It is suggested that leadership actions concerning the competing demands of production may continue to feature discrepancy between what is stated about the importance of safety and production and what is implied, (O'Dea & Flin, 2003). As Mullen, et al, highlight, employer safety obligations signal to employees that the organisation values safety and is concerned about the health and wellbeing of its employees, (Mullen, et al, 2017).

5.9   Culture

The intervention group 'race' make up is representative of the rest of the MNC organisation, made up of 59% Chinese, 14% each of Indian and Malay. This is not too dissimilar to that of Singapore with 77% Chinese, 6% Indian and 15% Malay. The Chinese group overall SCI improved by 7.1% while the Indian group SCI improved by 14.1% and the Malay group SCI declining.   The Chinese group was the only group to have positive SCI results for all of the nine dimensions, including the **Management Commitment** dimension. The majority of the dimensions for both the Chinese and Malay groups resulting in SCI's that placed them in the maturing and sustainable category.

While the Indian factor is a smaller population group the SCI score showed improved results including a significant increase in the dimension of **Management Commitment** of 32.3%. Improvement in the dimensions of Communications and Supportive Environment with respective results of 25.9% & 29.5% also occurred. These noteworthy improvements may suggest the Indian community advocate the regular leadership shop-floor employee interaction and the Transformational leadership style.

Previous research suggests that these levels of SCI scores may not be unexpected considering the cultural makeup of country. Singapore is recognised as being hierarchical, authoritarian and disciplined, featuring such characteristics as; control, discipline, repression, compliance, inequality, competitiveness & capitalism, (Hofstede, et al, 2010; Retna & Jones, 2003). Although traits such as high power distance are slowly decreasing in Singapore likely due to the influence of the high population of foreigners and the changing political landscape. This change is resulting in employees demanding for greater job satisfaction, engagement and choice, (Chong, 2013). The cultural makeup of this research's participants is likely to have supported the overall SCI improvement results.

The Singapore culture is likely to be supportive of the leaderships' transformational style of regular employee interaction and social engagement. Although some previous research suggests that Singaporeans find too much dialog sometimes too long winded, (Retna & Jones, 2003). Further, research suggests that Singaporeans find it hard to trust and sometimes feel it's dangerous to speak your mind, while some employee's may use the opportunity to express their dissatisfaction to higher authority, (Retna & Jones, 2003).

Neither agree/disagree can be a powerful answer given cultural sensitivities, for those who do not want to answer the question. This is especially if not wanting to offend or tell the actual truth. The Singaporean cultural aspect heightens the chance of employees choosing this option. The results for the intervention group are suggestive as overall neutral responses accounted for over 20% consistently across both surveys. While National culture influences may play a part in safety performance proximal influences such as perceived management commitment to safety is found to exert more impact on workforce behaviour and safety performance, (Mearns & Yule, 2009).

5.10   Further Research

The research from this thesis supports and adds to previous research that indicates the importance of leadership influence on employee perception of workplace safety and the importance of a transformational leadership style. While a number of new studies have been occurring in recent literature there still exists opportunity to explore the area in more depth. Managers have considerable impact on safety climate which exists in the workplace. The managers role in establishing a positive climate appears to be particularly important in high reliability industries including chemical plants, nuclear power plants and aviation maintenance, (O'Dea & Flin, 2001). For example in many MNC's in particular there are several supervisory levels between shop-floor employee and senior manager. Supervisors can at times be seen as separate from or part of management. Supervisor tasks normally are related directly to production requirements and time lines, which may add to the frustration seen by employees of competing organisational requirements. Further, while this study looked at the influence of senior leadership, the management level below; area manager or site management should be researched as the position tends to be held solely by local Singaporeans and therefore without the direct visibility of the MNC overseas supervision. Additionally, research in safety climate has rarely been conducted in non-Western context, (Jiang, et al, 2010).

5.11   Limitations

Several limitations exist within this research study. The length of the longitudinal period of three months is likely to have disadvantaged the results. In comparison the Schwarz et al, study had a longitudinal period of 1.5 years, (Schwarz, et al, 2016). As noted within this current study there was not enough time to implement the leadership activity of 'Safety Champion'. With more time the dimensions of **Work Environment** and **Personal Appreciation of Risk** may have had the opportunity to be positively impacted. For many employees in the associated work area English is considered to be a second language. English proficiency ranges from employee to employee. While the SCI questionnaire was provided in three languages there is the risk for possible misinterpretation of the questions meaning.

The professional level of the Leadership Intervention Training should also be considered. The training was not provided by a professional expert in this field but rather by the author. This was necessary due to the substantial cost of such professionally provided training for which the author had no budget.

Finally, it should also be recognised that while the surveyed population was only 28% of the total organisation population it was 96% of the combined two buildings being the focus of this research. It would be flawed too consider that the safety climate results from this surveyed group represented the 'total' safety climate of this organisation, (Guldenmund, 2000). The results should be considered as a snap shot picture of just the areas surveyed.

CHAPTER 6: CONCLUSION

The purpose of this study was to examine the question "Can employee perspective of workplace health and safety improve as a result of intervention training for the organisations leadership that highlights the significance of current theoretical knowledge of leadership influence".

The findings of this study support the thesis question and hypothesis and the results indicate an improved safety climate score in the employee perspective of workplace safety as a direct result of the leadership intervention training. The safety climate results indicated a positive improvement for the group associated with the leadership influence and as a direct consequence of the intervention training. The safety climate improved significantly for the surveyed dimension of Management Commitment and the other management specific areas.

This study's findings support previous studies that indicated that leaders play a critical role and are central to employees' perception of the importance of safety in their workplace, (Zohar, 2000; Zohar, 2010). The research findings are also consistent with previous studies in that positive improvements in safety climate scores followed the period of leadership influence, (Mullen & Kelloway, 2009). Further, the findings support improvement of employee perception as a result of the style of leadership influence. The organisations leadership practiced a transformational, authentic leadership style while showing principles of active caring. This also adds to previous research in that it supports the fact that leadership intervention training provides positive changes to the organisations safety climate and specifically that the concept of transformational leadership can be taught, (Kelloway, Barling, & Helleur, 2000). It is also possible that the results indicate that safety-specific transformational leadership can help shift the focus away from managing through the enforcement of safety rules and regulations, to the development of safety initiative among employees, (Mullen, et al, 2011). The research for this thesis was undertaken in Singapore and associated with a Western MNC, which further adds to current research the aspect of safety climate across national cultures.

There are a number of limitations for this research. While most of the managerial activities within this study were accomplished over the three-month study period a limitation to this study was the time restriction. Although the organisations senior leadership spent quality time within the workplace engaging employees it is not enough for leaders to promote safety episodically or on an occasional basis; rather, safety behaviours are most encouraged when leaders engage in transformational safety leadership behaviours consistently, (Mullen, et al, 2011). While the leadership of this particular MNC experienced first-hand the usefulness and positiveness of their actions only time will tell whether they will continue with the activities.

As a direct result of this study the MNC leadership understands the importance of safety and the influence they bring to bear within the workplace. The senior leaderships'

own recorded perception's confirmed this through this studies separate leadership survey, (LSI), results. It is also recognised that the organisation leadership faces other competing business demands.   The challenge for the leadership is therefore dealing with these demands and ensuring the importance of workplace safety remains high and also supported on a day to day basis within the organisation. The organisations leadership now recognise that discrepancy between what is stated about the importance of safety and production and what is implied can feature when competing demands exit, (O'Dea & Flin, 2003).

Future research opportunity exists in the area of safety leadership intervention studies to assess the impact of various managerial/supervisory levels. This is especially important within the Asia area considering the limited research on safety climate and leadership currently undertaken within the region.

In conclusion, the results from this study highlight the importance of leadership influence on employee perspective of health and safety within the workplace and that leadership intervention training can improve leadership knowledge of their influence and their direct effect on the safety climate of the organisation.

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Appendix A: Global Safety Index, (GSI), Company Profile

Global Safety Index

Global Safety Index is a community, which brings together like-minded safety leaders and businesses from around the world, who are committed to working towards a safer more productive workplace. This open collaboration leverages the collective knowledge of Members by sharing the latest insights, experiences and successes around safety.

Global Safety Index is a membership organisation, established to encourage global collaboration and foster a sense of shared responsibility for its stated mission. Current Foundation 100 Members are leading organisations from around the world who have made the commitment to understand how leadership and culture impact their safety performance. Global Safety Index is committed to growing its global footprint and membership support by appointing local agents, distributors and partners who are accredited to enlist and grow the membership base as well as support the needs of existing members globally.
GSI has established relationships with organisations in France, Canada, Republic of Korea and South Africa and are actively looking to grow this support network.
We have also established partnerships with organisations who share our values and objectives around improving safety performance, to provide added value to our members.
In Australia, these partnerships include respected consulting firms, industry associations and government bodies.

Global Safety Index Mission

Global Safety Index exists to help build a safer, more productive world.
Our mission is to be the global reference on safety measurement and insights.
We will enable companies to measure and compare their safety performance globally, to profile their safety culture and leadership capabilities and to prioritise their plans to improve their safety performance.
We will also leverage our collective wisdom to share insights collaboratively and to provoke thought leadership in safety.

Global Safety Beliefs

GSI believe that a safer workplace is not only a legal and moral obligation for organisations, but also leads to better business performance.

In Australia, improved safety performance results in better operational performance, with studies showing a $3-$6 return for every $1 invested in safety improvements (Liberty Mutual Group, Executive Survey of Workplace Safety).

GSI also believe that in order to improve, you must first understand where you are. Organisations are currently asking what their current safety performance is, how do they compare and how can they improve their safety performance.

Website: http://www.globalsafetyindex.com/

Appendix B: English version of the Safety Climate Survey Questions, including correlation to two of the original researcher publications

	Question	HSE, 1999	Cox & Cheyne, 2000
1	For me Safety is the number one priority when completing a task	●	●
2	Co-workers often give tips to each other on how to work safely	●	●
3	I am supported by management to raise safety concerns directly with a person whom I believe is acting unsafely including other managers	●	●
4	Our Managers take safety personally and it appears to be a personal value	●	●
5	Our workplace has a very active EH&S/Safety Committee		
6	I am more likely to take risks outside of work		
7	I am encouraged by management to speak openly about all safety matters	●	●
8	I am sure it is only a matter of time before I am involved in an accident	●	●
9	Sometimes I am not given enough time to get the job done safely	●	●
10	I am involved in telling management of important safety issues	●	●
11	Management acts decisively when a safety concern is raised	●	●
12	There is good communication here about Hazards and Risks, which affect others and me	●	●
13	I understand the safety risks relating to my work	●	●
14	I receive praise for working safely	●	●
15	It is important to me that there is a continuing emphasis on safety	●	●
16	I am notified of follow up actions from safety concerns I have raised	●	●
17	I would like to be more involved with safety at my business	●	●
18	Management clearly considers the safety of employees of great importance	●	●
19	I regularly take calculated risks in performing my role		
20	This is a safer place to work compared to other companies I have worked for	●	●
21	I am strongly encouraged to report all near misses	●	●
22	In my workplace managers/supervisors walk past unsafe behaviours and will not stop to address the unsafe behaviour	●	●
23	Some safety rules and procedures do not need to be followed to get the job done safely	●	●
24	I am not often worried about being injured at work	●	●
25	Management acts only after an incident or accident has occurred	●	●
26	I believe that safety issues are not assigned a high priority	●	●
27	Some health and safety rules and procedures are not really practical	●	●
28	Our business safety performance (safety metrics/KPI's) are communicated well within our business		
29	Employees are encouraged to raise safety concerns	●	●
30	Personally I feel that safety issues are not the most important aspect of my job	●	●
31	In my workplace the chances of being involved in an accident are quite high	●	●
32	Safe behaviour is regularly recognised and rewarded		
33	Corrective action is always taken when management is told about unsafe practices	●	●
34	Safety rules and procedures are carefully followed by most people I work with on a consistent basis	●	●
35	My manager/supervisor does not always inform me of current safety incidents or accidents	●	●
36	I can influence and improve health and safety performance here in a positive manner	●	●
37	Sometimes conditions make it difficult for me to work safely	●	●
38	I feel I can stop work if my colleagues or myself are in danger		
39	This organisation regularly reviews safe work practices and procedures		
40	When team members ignore safety procedures here, I feel it is their choice and none of my business	●	●

41	In my workplace management acts quickly to correct safety concerns	🔴	🔴
42	I am clear about what my responsibilities are for health and safety in my workplace	🔴	🔴
43	Sometimes it is necessary to ignore safety requirements for production's sake	🔴	🔴
44	A safe place to work is of great personal value to me	🔴	🔴
45	I feel I can offer suggestions for a safer work environment		
46	There are always enough people available to get the job done safely	🔴	🔴
47	Managers/supervisors show interest in my personal safety and wellbeing	🔴	🔴
48	I am never involved in the ongoing review of safety matters	🔴	🔴
49	Management considers safety to be as important as productivity	🔴	🔴
50	When a safety incident occurs the focus is finding the root cause not finding who is to blame		
51	Managers and supervisors are concerned and take action if safety procedures are not adhered to	🔴	🔴
52	I feel outside contractors who come on site are also expected to meet our safety requirements		
53	I cannot always get the equipment I need to do the task safely	🔴	🔴
54	Focus on safety rules and procedures seems to be inconsistent with some areas having greater focus than others		
55	Reporting of incidents of unsafe acts and near misses is encouraged and valued	🔴	🔴
56	Operational targets often conflict with safety measures	🔴	🔴

🔴 Indicates that the question was part of the original researchers' publication.

Appendix C: SCI Survey Questions translated into Malay

	Question
1	Bagi saya Keselamatan adalah keutamaan nombor satu apabila melengkapkan tugas
2	Rakan sekerja sering memberi tips antara satu sama lain tentang bagaimana bekerja dengan selamat
3	Saya disokong oleh pihak pengurusan untuk meningkatkan kebimbangan keselamatan secara langsung dengan orang yang saya percaya bertindak tidak selamat termasuk pengurus lain
4	Pengurus kami mengambil keselamatan peribadi dan ia kelihatan sebagai satu nilai peribadi
5	Tempat kerja kami mempunyai EH & S / Jawatankuasa Keselamatan yang sangat aktif
6	Saya lebih cenderung untuk mengambil risiko di luar kerja
7	Saya digalakkan oleh pihak pengurusan untuk bercakap secara terbuka tentang semua perkara-perkara keselamatan
8	Saya yakin ia hanya menunggu masa sebelum saya terlibat dalam satu kemalangan
9	Kadang-kadang saya tidak diberi cukup masa untuk melakukan kerja dengan selamat
10	Saya terlibat dalam memberitahu pengurusan isu-isu keselamatan yang penting
11	Pengurusan bertindak tegas apabila kebimbangan keselamatan di bangkitkan
12	Ada komunikasi baik di sini tentang Bahaya dan Risiko, yang memberi kesan kepada orang lain dan saya
13	Saya faham risiko keselamatan berkaitan dengan kerja saya
14	Saya menerima pujian untuk bekerja dengan selamat
15	Ia adalah penting kepada saya bahawa terdapat satu penekanan berterusan mengenai keselamatan
16	Saya diberitahu tentang tindakan susulan daripada kebimbangan keselamatan yang telah saya bangkitkan
17	Saya ingin lebih terlibat dengan keselamatan di tempat kerja saya
18	Pengurusan jelas menganggap keselamatan pekerja amat penting
19	Saya selalu mengambil risiko dalam melaksanakan peranan saya
20	Ini adalah tempat yang selamat untuk bekerja berbanding dengan syarikat lain yang saya pernah bekerja untuk
21	Saya digalakkan untuk melaporkan semua kejadian yang nyaris berlaku
22	Dalam pengurus tempat kerja saya / penyelia berjalan lalu tanpa menghiraukan tingkah laku yang tidak selamat dan tidak akan berhenti untuk menangani tingkah laku yang tidak selamat
23	Beberapa peraturan dan prosedur keselamatan tidak perlu diikuti untuk mendapatkan perkerjaan dilakukan dengan selamat
24	Saya sering tidak takut cedera di tempat kerja
25	Pengurusan bertindak hanya selepas satu insiden atau kemalangan telah berlaku
26	Saya percaya bahawa isu-isu keselamatan tidak diberikan keutamaan yang tinggi
27	Beberapa peraturan dan prosedur kesihatan dan keselamatan tidak benar-benar praktikal
28	Prestasi keselamatan perniagaan (metrik keselamatan / KPI) kami disampaikan dengan baik dalam perniagaan kami
29	Pekerja digalakkan untuk meningkatkan kebimbangan keselamatan
30	Saya rasa isu keselamatan tidak lah aspek yang paling penting dalam kerja saya
31	Di tempat kerja saya peluang untuk terlibat dalam satu kemalangan adalah agak tinggi
32	Tingkah laku selamat kerap diiktiraf dan diberi ganjaran
33	Tindakan pembetulan sentiasa diambil apabila pihak pengurusan diberitahu mengenai amalan yang tidak selamat
34	Peraturan dan prosedur keselamatan diikuti dengan teliti oleh kebanyakan orang yang bekerja dengan saya secara konsisten
35	Pengurus / penyelia saya tidak selalu memaklumkan kepada saya tentang insiden keselamatan atau kemalangan
36	Saya boleh mempengaruhi dan meningkatkan prestasi kesihatan dan keselamatan di sini dengan cara yang positif
37	Kadang-kadang keadaan menyebabkan sukar bagi saya untuk bekerja dengan selamat
38	Saya rasa saya boleh berhenti melakukan sesuatu kerja jika rakan-rakan saya atau diri saya berada dalam bahaya
39	Sentiasa mengkaji amalan dan prosedur kerja yang selamat
40	Apabila rakan-rakan mengabaikan prosedur keselamatan di sini, saya rasa ia adalah pilihan mereka dan bukan urusan saya
41	Di tempat kerja saya pengurusan bertindak dengan cepat untuk membetulkan kebimbangan keselamatan

42	Saya jelas tentang apa adalah tanggungjawab saya untuk kesihatan dan keselamatan di tempat kerja saya
43	Kadang-kadang ia adalah perlu untuk mengabaikan keperluan keselamatan demi pengeluaran/produksi
44	Tempat yang selamat untuk bekerja mempunyai nilai peribadi yang besar kepada saya
45	Saya rasa saya boleh menawarkan cadangan untuk persekitaran kerja yang lebih selamat
46	Selalu ada cukup orang untuk melakukan pekerjaan dengan selamat
47	Pengurus / penyelia menunjukkan minat terhadap keselamatan peribadi dan kesejahteraan saya
48	Saya tidak pernah terlibat dalam kajian berterusan mengenai hal-hal keselamatan
49	Pihak pengurusan menimbangkan keselamatan sama penting seperti produktiviti
50	Apabila kejadian keselamatan berlaku, tumpuan adalah mencari punca, tidak mencari siapa yang harus dipersalahkan
51	Pengurus dan penyelia bimbang dan mengambil tindakan jika prosedur keselamatan tidak dipatuhi
52	Saya rasa kontraktor luar yang datang juga dijangka untuk memenuhi keperluan keselamatan kami
53	Saya sentiasa tidak boleh mendapat peralatan yang saya perlukan untuk melakukan tugas dengan selamat
54	Tumpuan kepada peraturan dan prosedur keselamatan seolah-olah tidak selaras dengan beberapa kawasan yang mempunyai tumpuan yang lebih daripada yang lain
55	Laporan kejadian perbuatan yang tidak selamat dan kejadian yang nyaris berlaku sangat digalakkan dan dihargai
56	Sasaran operasi sering bercanggah dengan langkah-langkah keselamatan

Appendix D: SCI Survey Questions translated into Simplified Mandarin

	Question
1	对我来说，安全是完成任务时的首要（第一）考虑
2	同事们时常互相提示如何安全的工作
3	管理层支持我向有不安全行为的有关人员提出安全问题，包括其他部门经理
4	经理重视安全，也当安全为一种价值观
5	公司有个非常活跃的EH&S /安全委员会
6	我在工作外会冒比较大的风险
7	管理层鼓励我坦白提出安全问题
8	我相信工伤意外迟早会发生在我身上
9	有时候，我没有足够的时间来安全的完成工作
10	我参与向管理层提出重要的安全问题
11	管理果断的解决被提出的安全问题
12	对于工作的风险有很好的讯息与沟通
13	我了解我的工作的安全及风险
14	我为工作安全得到赞扬
15	对我来说，持续强调安全是很重要的
16	我提出的安全问题之后，会收到改进行动的讯息
17	我想更加参与安全活动
18	管理层认为员工的安全很重要
19	我经常在工作时承担能接受的风险
20	与我以前的公司相比，这是一个更安全的工作场所
21	我被鼓励报告所有未遂事故（几乎发生的意外）
22	在我的工作场所经理/主管如果看到不安全的行为，并不会停下来解决不安全的行为
23	有些安全规则是在工作的时候不需要遵守的
24	我不经常担心会在工作中受伤
25	只有在发生事故后，管理层才采取行动
26	I我相信安全问题不是优先考虑
27	一些安全的规定和程序都不是很实用
28	公司向我们沟通公司的安全表现（安全指标/ KPI）
29	员工们受鼓励提出安全疑问
30	在我的工作，安全不是最重要的考量
31	在我的工作场所，发生事故的几率相当高
32	安全行为会定期被确认和奖励
33	当管理层获知有不安全的行为时一定会采取行动纠正
34	与我工作的同事们都遵守安全规则和程序

35	我的经理/主管不经常告诉我最近发生的安全事故/意外
36	我能以积极的方式影响和改善健康和安全
37	有些情况使我很难安全地工作
38	当我的同事和我有危险时，我觉得我可以停止工作
39	公司定期检举工作的做法和步骤的安全性
40	当同事们忽略安全程序时，我觉得这是他们自己的选择，与我无关
41	在我的工作场所，管理层迅速的纠正安全问题
42	我很清楚我在职厂安全的责任
43	有时候，为了生产的要求，必须忽略安全的程序
44	一个安全的工作场所对我来说很重要
45	我觉得我可以为一个更安全的工作环境提供建议
46	有足够的人手安全的把工作作完
47	经理/主管关心我的个人安全和健康
48	我从来没有参与安全审查/检讨
49	管理层认为安全和生产一样重要
50	当意外发生后，重点是寻找根源（原因），而不是找该为意外负责任的人
51	如果安全程序不被遵守，经理们和主管们会关注，并会采取行动
52	我觉得承包商在厂内施工，也可以达到预期的安全水平
53	我不是每一次能得到所需要的安全配件
54	对于不同的安全规则，管理层会有不同的重视度
55	报告不安全行为和未遂事件受到鼓励和重视
56	生产目标与安全规则时常有冲突

Appendix E: Safety Leadership Index Survey Questions

	Question
	Question
1	I would describe how I lead safety in my business as…..
2	Safety is my number one priority as evidenced by my actions and the language I use on a regular basis
3	I am a role model for all my team in everything I say and do concerning safety
4	I regularly set aside time to proactively consider safety and take action to prevent safety incidents from occurring
5	I act decisively when a safety concern is raised
6	I am consistent in setting clear expectations with each of my team members.
7	My team members clearly understand what I expect, with respect to: Near miss reporting, reward & recognition, unacceptable behaviours & housekeeping
8	When there is a change at work that might impact safety, I ensure I meet with the team/individual as a priority to discuss and review expectations
9	I ensure I monitor each of my team member's understanding of their safety responsibilities to themselves and to others
10	I set clear expectations with visitors or guests before allowing them to access our company facility
11	actively seek input from all my team members on an ongoing basis on how we can maintain a safe work environment
12	Team members are encouraged and recognised for supporting each other on how to work safely
13	All team members are involved in identifying and managing risks that may impact them
14	I ask for feedback with respect to safety from visitors and guests in my work environment
15	I find ways to make safety engaging for everyone, and encourage my team to think differently about it to find even better solutions
16	I demonstrate care and commitment regarding the wellbeing of employees and contractors
17	I encourage all incidents and near misses to be reported, regardless of how minor they may seem
18	When an incident occurs my priority is to understand what went wrong and what we can learn from this incident to prevent re-occurrence, not who to blame
19	I take personal responsibility for incidents and/or accidents that occur in my area
20	I actively monitor the emotional as well as physical wellbeing of my team members
21	I provide regular feedback to my team on our safety performance
22	I take every opportunity presented to me to engage personally with my team members and to coach them on safety matters
23	I proactively look for, acknowledge and reward high safety performance
24	provide contractors with feedback regarding safety and involve them in discussions to help resolve safety issues
25	I review all incident reports to ensure root cause is identified and follow up to ensure corrective actions are implemented in the relevant area
26	I ensure all team members are informed about any safety incident shortly after it has occurred
27	I clearly understand the safety rules relevant to my area and what is accepted and not accepted
28	If a co-worker saw me doing something at-risk, they would feel comfortable to talk to me
29	I review the current safety performance of my business unit on a weekly basis
30	I am aware of the risks within my work environment
31	I ensure my team has the necessary skills and capabilities to perform their roles safely
32	I know and understand my obligations under the WHS legislation
33	I understand what a risk matrix is and how to complete a risk assessment
34	I feel comfortable performing a safety observation
35	If an incident occurred I am clear on who to contact and what steps to follow

Appendix F: Safety Climate Index Maturity Levels Descriptors

Rating	Description
High Performing 80-100	The prevention of all injuries or harm to employees and all other stakeholders is a core company and personal value for all employees. This company is a true role model to others in how safety is perceived and managed. It would be considered 'best practice' in its application of safety as a fundamental in everything that it does. The organisation is likely to have a sustained period without a recordable injury or high potential incident, but there is no feeling of complacency. The organisation uses a range of (leading and lagging) indicators to monitor performance but it is not performance driven – it has confidence in its safety processes. The organisation strives to be better and find better hazard control approaches. All employees share the belief that health and safety is a critical aspect of their job and accept that prevention of non-work injuries is important. The company invests considerable effort in promoting health and safety on and off the job.
Sustainable 60-80	The majority of staff believes that health and safety is critical to the long-term sustainability of the organisation. Management recognise that a wide range of factors lead to accidents and the root causes are likely to stem from management decisions and leadership behaviour as well as systems and structure inefficiencies. Front-line staff accept responsibility for their own and others' health and safety and act decisively to ensure a strong safety culture. Employees feel valued and are treated fairly. The organisation makes significant effort in proactive safety communication to raise awareness and prevent accidents. Safety performance is actively monitored using all data available. Employee Health and Wellbeing is encouraged.
Maturing 40-60	The organisation realises safety is a key enabler to business success and employee involvement is essential for safety improvement. Management recognise that a wide range of factors lead to accidents and leadership and culture must also be considered. Employees are willing to provide feedback and work with management to improve health and safety. The majority of staff accepts personal responsibility for their own health and safety. Safety performance is actively monitored and the data used to consider potential causes of harm and support targeted improvement programs.
Developing 20-40	The organisation is focused primarily on systems only. Safety measures focus on lag and some leading indicators. Strong training and compliance processes in place. Management starting to accept some responsibility for risks in the workplace, but there is still a culture that blames the individual worker for an accident. There are pockets of the organisation where workers are working with management to improve health and safety.
Foundational 0-20	Safety is seen as a business risk and management time and effort is devoted to accident prevention, the focus is on adherence with rules, procedures and engineering controls. Accidents are seen as preventable, but management perceive that the majority of accidents are solely due to the unsafe behaviour of front-line staff or systems compliance failure. Safety performance measured with lagging indicators (e.g. injury rates). Safety incentives based on reducing loss time incidents. Senior

	managers only become involved in health and safety if accidents increase; punishment likely to be used. Accident rates are likely to be near the industry sector average – but tend to have more serious accidents
Volatile 0 to -20	Safety remains largely perceived as of secondary importance to production but may occasionally appear on management radar as a business risk to be managed. Compliance is the major focus. Responsibility for safety still lies with the safety department. Safety performance is measured (lag indicators) but may be poorly and infrequently communicated and it is likely no safety incentives are used. Safety is not generally discussed unless there is a serious accident.
Unsustainable -20 to -100	Safety is seen to be no more than a regulatory imposition and therefore only requires what is necessary to meet minimum workplace safety requirements. Attention is on technical and procedural solutions and compliance with regulations, Safety is not seen as a key business risk. The safety department is perceived as being primarily responsible for safety. Many accidents are seen as unavoidable and most front line staff are not interested in safety, only used as a lever on other issues.

Appendix G: Safety Climate Index 14 Key Drivers

	Driver	Description
1	Safety Value's	Captures the under pinning values & beliefs associated with a strong culture
2	Employee Involvement	The safety journey is not possible unless employees involved
3	Just Culture	Captures the level at which employees are blamed
4	Team Work	Represents how well each employee works as part of the team in addressing safety
5	Hazard/Risk Management	The approach of employees & managers in reporting, finding solutions to& then closing the loop back to the employees for all incidents, near misses & hazard identification
6	Perception of the Workplace	Represents the perception the employees have of the workplace as a safe place to work
7	Production/Safety Trade Off	The extent to which safety goals & production goals interact
8	Consistent Application	Represents the perception of whether safety rules and procedures are applied consistently across the organisaton
9	Top Down Communications	Represents the effectiveness of management in communicating the safety message
10	Bottom Up Communications	Represents the involvement of employees in communicating incidents, near misses & hazards in the workplace
11	Training Outcomes	Reflects the employees understanding of company's safety message
12	Systemic Approach	Reflects whether the company updates the processes & procedures required to drive safety
13	Work Conditions	Reflects the perception of whether there are enough people, equipment & time to support the safety goals of the organisation
14	Rewards & Recognition	Reflects whether employees are rewarded or recognised for safety behaviours & results

Appendix H: List of Leadership agreed Leadership Intervention Activities

Agreed Actions

1. Safety Champion. Two people identified, initial training/support by EHS to support
   & develop the role, access for SC to provide feedback, give ideas, suggestions, safety observations, EHS to introduce them and the role to the employees, EHS regular meet them to give them current topics for dissemination, GM & DGM to touch base on walk around & support an open door policy.
2. Weekly Safety management walk round, senior management rotation, will include HR and finance manager, (improve visibility for managers who do not normally visit the shop-floor). EHS to provide safety topic support. Walk is about engagement. All feedback documented back to GM.
3. Monthly senior manager led PBS work process employee safety observation.
4. Sherlock Holms competition beginning of October. Intervention Group to organise and run the quiz.
5. Senior managers to carry and utilise 'thank you' devices during manager walk arounds; Gold Coin and new 'PBS/Thank you card' booklet.
6. Audit against agreed actions at end of the three month period.
7. Senior manager to keep track of action periodicity.

Appendix I: Management Workplace Walk Feedback Form

Management Walk
General Information Date & Time start: Members: Building & Cell: Return completed form to General Mangers Office
Guidance for the walk 1. Observer to prepare PPE required (safety shoes & glasses) 2. Purpose of the walk is to engage employees at their workplace 3. Typical topics with employees to gather feedback: Greet the employee Observe their work process, tools used, body posture "Do you have the necessary tools to perform your work?" "How do you find using the tools?" "Do you have any suggestions than can help improve?" (quality, use, safety, supply) "Are there any concerns, issues, worries?" Thank the employee for sharing. 4. Please note down the employee's name so that any ideas, concerns, actions required can be carried out and also the employee can receive feedback.

Glads	Sads

Appendix J: Questions linked to the Nine Dimensions, Cox & Cheyne, 2000

Management Commitment
In my workplace management acts quickly to correct safety problems
Management acts decisively when a safety concern is raised
In my workplace management turn a blind eye to safety issues
Corrective action is always taken when management is told about unsafe practices
In my workplace managers show interest in my safety
Management acts only after accidents have occurred
Managers and supervisors express concern if safety procedures are not adhered to

Priority of Safety
Management clearly considered the safety of employees of great importance
I believe that safety issues are not assigned a high priority
Safety procedures are carefully followed
Management considers safety to be equally as important as production

Communication
There is good communication here about safety issues which affect me
Safety information is always brought to my attention by my line manager
My line manager does not always inform me of current concerns and issues
I do not receive praise for working safely

Safety rules
Some safety rules and procedures do not need to be followed to get the job done safely
Some health and safety rules and procedures are not really practical
Sometimes it is necessary to depart from safety requirements for production's sake

Supportive environment
I am strongly encouraged to report unsafe conditions
I can influence health and safety performance here
When people ignore safety procedures here, I feel it is none of my business
Employees are not encouraged to raise safety concerns
A no-blame approach is used to persuade people acting unsafely that their behaviour is inappropriate
Co-workers often give tips to each other on how to work safely

Involvement
I am involved in informing management of important safety issues
I am involved with safety issues at work
I am never involved in the ongoing review of safety

Personal priorities and need for safety
It is important that there is a continuing emphasis on safety
I understand the safety rules for my job
Safety is the number one priority in my mind when completing a job
A safe place to work has a lot of personal meaning to me
Personally I feel that safety issues are not the most important aspect of my job

Personal appreciation of risk
I am sure it is only a matter of time before I am involved in an accident
In my workplace the chances of being involved in an accident are quite large
I am rarely worried about being injured on the job
I am clear about what my responsibilities are for health and safety

Work environment
Operation targets often conflict with safety measures
Sometimes I am not given enough time to get the job done safely
Sometimes conditions here hinder my ability to work safely
There are always enough people available to get the job done safely
I cannot always get the equipment I need to get the job done safely
This is a safer place to work than other companies I have worked for

Appendix K: Detailed Timeline of Research Project Events

Date	Activity	Complete
1 March 2016	Organisation 'in principle' permission and support for research	10 Mar 2016
31 March 2016	MNC Headquarters Research permission	20 Mar 2016
1 April 2016	GSI Questionnaire and software time purchase	1 April 2016
13 April 2016	Initial Research Proposal to (Dr.) Ian Laird & Barry Foster	10 April 2016
13 April 2016	Research Proposal acceptance	15 June 2016
6 June 2016	Questionnaire to HR, ITC and test group & collected	6 June 2016
13 June 2016	Research overview communication out to organisation	13 June 2016
14 June 2016	Massey University ethical acceptance of Research Proposal	14 June 2016
15 June 2016	Survey translated into Malay, Chinese. Survey available in three languages.	30 June 2016
1 July	Questionnaires out to participants (Intervention & control group)	Delayed due business Global employee survey
14 July 2016	Questionnaires out to participants (Intervention & control group)	14 July 2016
14 July 2016	Questionnaires collected.	14 July 2016
15 July 2016	Survey template created within GSI software. Questionnaire data entry Into GSI software.	20 July 2016
25 July 2016	Analysis report complete	22 July 2016
28 July 2016	Meeting with Organisation GM & Executive Managers (Intervention)	28 July 2016
29 July 2016	Intervention training for GM & Executive Managers	29 July 2016
1 Aug 2016	Commencement of three month period of leadership influence	1 August 2016
1 Nov 2016	Questionnaires out to participants (Intervention & control group)	10 November 2016
1 Nov 2016	Questionnaire out to Management team, (LSI Questionnaire)	10 November 2016
3 Nov 2016	Questionnaire data entry into GSI software	15 November 2016
7 Nov 2016	Analysis report complete	17 November 2016
7 Nov 2016	Compilation of research & completion of Thesis	Due 28 Feb 2017

Appendix L: Leadership Training Package

Safety Climate and the Influence of Leadership:

A study of safety climate and the influence leadership training has on employee perceptions of health and safety.

The aim of this study is to understand the influence leadership has upon safety in the workplace as seen through the eyes of its employees.

This research will be undertaken as a reflection of the organisations safety climate, through a questionnaire mechanism.

While research and theory contend that safety culture is enduring and possibly more difficult to assess, it is recognised that safety climate is measureable and is considered to be a reflection of safety culture. Theory also contends safety climate as being a snap shot of the organisations 'mood' at a single point in time and therefore has a short shelf life.
Leadership theory and research points out the importance of leadership on employee behaviour and motivation.

The organisations leadership will be provided intervention training based upon leadership theory and workplace best practice.

The study's hypothesis is that a discernible difference should be noted between the ensuing assessments due to improved leadership understanding of the influence it holds.

The improved leadership influence will be reflected in employee's perception of management and workplace safety as captured in the safety climate questionnaire.

It is believed that this research should help provide the organisation greater understanding of both an organisations safety climate, and leadership culture.

Through this research the organisation should also recognise the role leadership influence plays and that the utilisation of safety climate assessment as a useful and predictive tool. That its use can play a part in the organisations endeavour to reduce workplace injuries and also help reduce the escalating financial cost to both employees and the organisation.

As Albert Schweizer noted (*leadership leading by*)

"example is not the main thing in influencing others. It is the only thing."

Organisational Culture

The concept of an organisations culture gained attention from business and researchers in the early 1970's, (Guldenmund, 2000). Hofstede stated that organisational culture is learned, not inherited and derives from one's social environment, (Hofstede, Hofstede & Minkov, 2010).

These shared values and beliefs can shape critical aspects of how things are done, prejudices formed and the expected way the group individuals are to conduct themselves, (Mathis & Jackson, 2003).

These social relationships may very well appear non-rational but the ties and the associated loyalties can be strong and these social relationships that exist as part of the organisations culture will shape behaviour, (Wilson, 1999).

Safety Culture

Safety culture took a fundamental step in importance following a number of major accidents in the late 1990's, such as the Chernobyl nuclear reactor accident in April 1996, (Choudhry, Fang & Mohamed, 2007).

It is now understood that reliance just upon traditional safety metrics, especially historical data such as injury rates, places the organisation at risk, (Cooper, 2000). This view underscores the importance of developing a safety management system and addressing the associated at risk behaviours and beliefs, (Cooper, 2001). Organisations have learnt that an understanding of safety culture and the associated predictive indicators can provide a more reliable, holistic picture of their employee's perception of safety and its importance within the workplace, (O'Neill, Wolfe & Holley, 2015).

A useful definition:

"enduring value and priority placed on safety by everyone in every group at every level of an organization", (Weigmann, Zhang, von Thaden, Sharma, & Mitchell as cited in Freaney, 2011).

Simplistically stated as:

"the way we do things around here" (O'Neill, Wolfe, & Holley, 2015).

Safety Climate

Employees perceptions, attitudes and the beliefs they share concerning workplace risk and safety, (Guldenmund, 2010).

Safety climate can be viewed as the organisations mood at any given point in time, (as cited in EU-OSHA, 2011).

Safety climate then is a snap shot in time of employees views associated with safety. The advantage is that by regularly utilising this snap shot approach an organisation can glean important feedback on current perceptions, places requiring improvement and results of previous strategies.

For workplace safety and health practitioners and management alike this is a valuable tool when trying to gauge the effectiveness of safety strategies over time and the organisations employees' perceptions of them. There is general agreement that the results of safety climate assessments can be used as an indication of the associated safety culture, (Cox & Cheyne, 2000).

Safety climate has been recognised as a leading indicator of safety outcomes, (Zohar, 2010; Shea, De Cieri, Donohue, Cooper, & Sheehan 2016; Barbaranelli, Petitta & Probst, 2015).

Safety climate can be measured.

Leadership

One of the most important influences to an organisations success is that of the organisations leadership, (Geller, 2005). It has been suggested that even with the knowledge growth in the area of leadership, issues with weak management within organisations continues to be a concern, (Sabet, Aadal, Jamshidi, & Rad, 2013).

'Leadership' is recognised as one of the leading factors that influence safety climate

The motivation of employees is directly linked to the influence of the organisations leadership. How employees see management and their actions is paramount to how safety is perceived as being truly important or merely lip service. It is the influence by management that will result in corresponding employee actions. It is the leadership who set the tone for what behaviours and perspectives are important, (De Cenzo & Robbins, 1994).

Leadership

Research has proven that the behavior of managers and leaders reflects the priority they place on safety and health on the job and workers do interpret these behavior's and will create ideas and norms regarding the importance of safety to their leaders, (Zohar, 2011).

Leaders play a key role in the creation of safety climate, which in turn influences employees to increase their safety behaviours thereby decreasing their accidents and injuries, (Barling et al, 2002).

Leadership - Theory

Transactional

Multi-dimensional, comprised of related but distinct facets, (continent reward, active management-by-exception, and passive management-by-exception.).

Continent reward – providing appropriate rewards and recognition for positive behaviours & clear communication of these to employees.

Active management-by-exception – Discourage negative behavior, Proactive, focused on prevention.

Passive management-by-exception - Discourage negative behavior, Reactive and focused on correction after the fact. (recognized as not effective leadership).

Leadership - Theory

Transformational

Multi-dimensional, comprised of related but distinct facets, (idealized influence, inspirational motivation, intellectual stimulation & individualized consideration).

Idealized influence – The degree the employee look to the leader as an example and seek to emulate him/her.

Inspirational motivation – involves encouraging employees to strive for something beyond their individual goals.

Intellectual stimulation – inspiring employees to think creatively and innovatively. Individualized consideration – showing respect and personal concern for employees as individuals.

Recognises the need of both the organization and the employees, but go beyond these to arouse and satisfy higher needs within each individual. Encourages employees to unite in the pursuit of higher goals aimed at significant positive change in the organization.

Authentic Leadership

Enacting their true selves while leading others, leadership not built upon a 'fake' or distorted self, remains true to inner thoughts, beliefs and experiences.
As the degree to which one fulfills personal expectations and commitments promised to oneself. A form of self regulation.

Defined as a leadership behavior pattern that includes self-awareness, balanced processing of information, relational transparency with followers and an internalized moral perspective.(research indicates positive relationship between this behavior and individual outcomes including; engagement, job satisfaction, job performance, group and organizational outcomes, including financial, (Gardner & Carlson, 2015).

The lead by example, positive role model influence encourages and supports positive succession opportunities, followers who are impacted tend to align their own beliefs, values and corresponding actions to that of the leader.

Actively Caring – Promoting:

"Behaviour that is continually looking for environmental hazards and unsafe work practices and implementing appropriate actions when unsafe conditions or behaviour's are observed".

Actively Caring Family Perspective

Use more rewards than penalties
Don't pick on mistakes
Don't rank one family member against another
Celebrate accomplishments
Respect property and personal space
Pick up after family members
Correct at-risk behaviour
Accept corrective feedback
Care for family members

Actively Caring: Human dynamics of actively caring.

More likely to Actively Care

1. I can make a valuable difference
2. We can make a difference
3. I'm a valuable team member
4. We can make a valuable difference

Actively Caring Influencing Factors:

Remove mixed signals;
   Not 'production & maybe safety',
   Emphasis on 'faster' **implies** risk is OK!
Risky behaviour can be rewarded by, (especially when injury rates are low);
   Meeting 'Boss' expectations,
   Can be more comfortable or convenient,
   'I wasn't injured so must be OK'
Rewards for unsafe work are often soon and probable,
Penalties for unsafe work are usually delayed and improbable.
It's normally co-workers who see the unsafe behaviour.

Actively Caring Creates an Atmosphere of Belonging

1. Decreases frequency of top-down directives and 'quick-fixes',
2. Increase team building discussions, group goal-setting, feed back and group collaboration,
3. Use self managed or self directed teams.

Total Safety Culture

Addresses human behaviour as the major contributing factor of incidents and injuries.

An employee owned, employee empowered and employee driven process Whose behavioural observations are done on a voluntary basis.

A process whose employees are empowered to create data sets of safe and at-risk behaviours and use them to predict and avoid injuries.

A process with key leadership attributes: vision, communication, trust, action orientated collaboration, recognition/feedback, accountability and caring.

It is not about:

A collection of observations done on the basis of a requirement or metric.
This only drives frustration and pencil whipping.
Individual fault finding or blame.

Observations should be provided with an actual finding/correction/suggestion for improvement.

The leadership Challenge – James Kouzes & Barry Posner

Compassionate Samurai – Brian Klemmer

Honesty

Be honest because you care, don't pretend not to know or try to cover up by giving half a story, people see right through you. They will not trust or believe again.

Honesty enables commitment and loyalty and encourages good people to contribute great ideas.

Keep your principles and values important when building relationships. If you make a commitment keep it. Employees need to see that the ideas developed they have a part in, that the ideas are to their benefit as well and not just your career. They need to believe this project is mutually beneficial or it may not succeed.

Forward Looking

Have the courage to see the potential in yourself and others. Courage helps us be kind, true, merciful, generous and honest. Be humble enough to know you don't have all the answers, accept feedback and ideas from others.

Competent

People will listen and follow if they judge you as being competent, competent leader, technically, active with other areas such as the union. People watch you even when you don't recognize it.
Be focused, don't allow distractions to interfere.

Inspiring (shared (common) vision)

Sharing a common vision or purpose. Create a learning environment, foster collaboration, show concern for others.

Let your values guide you, workplace and organizational commitment should be based on alignment with your personal values.

Build on agreement, not everyone will be in accordance on everything you share. Corporate culture based on a foundation of shared values out perform others. Empower others. Imagine possibilities, invoke ideas, and support the building of possibilities.
Share what is important, what is safe and unsafe, values, beliefs and correct safety practices.

Share the safe way a procedure must be conducted. Correct behaviour's that are currently norms that are not safe.

Just Culture

Principles for achieving a culture in which front-line personal feel comfortable disclosing errors including their own while maintaining professional accountability.

A just culture recognizes that individual practitioners should not be held accountable for system failings over which they have no control. Recognises anyone can produce errors as a consequence of predicable interaction between human operators and the system in which they work. A contrast to a culture that turns to blame as its governing principle, a just culture does not tolerate conscious disregard of rules, reckless behavior or gross misconduct.

Removes employees sense of powerlessness,

Involved

Get to know people. Recognise contributions, thank you, gold coin, give in front of peers.

People appreciate the boss caring about them. Spread stories of success.
Engage and foster safety on the shop floor, doing it from the office doesn't work.
Take part in solution generation and support active learning. Learn and understand the shop-floor and those that work there. Understand their desires and needs. Facilitate relationships you are a catalyst.
Know what is already going on, spot the trends and patterns.

Employee Feedback

Listen actively, support the generation of ideas and encourage folk to participate. Be prepared to act on feedback.

Lead By Example

The best leader brings out talent in others, followers will emulate the leaders that they trust and who inspires them.

Remain humble and human. Say what you mean and mean what you say. Make a promise you have to keep it. Don't blame others.
Build trust between others in the team, one-on-one time/small group, straight forward approach make use of open ended questions.

Creates a spirit of community. Social connections, improves trust, information flow, collective action, happiness and greater wealth generation. Care. Be concerned. Your heart must be in it. Benefits are it actually feels good, you give to get, builds loyalty, increase's your power.

Leadership is a relationship and you should be mobilizing others.

High Reliability Organisation's nurture a culture of trust, shared values, and risk mitigating communication processes.

It supports communication that provides opportunities for open discussion and improvement. It encourages a distributed decision making process, "where the buck stops everywhere"

Compassionate Leaders:

Are considerate and responsive to the feelings and circumstances of the employees they direct or support.
These leaders listen and speak with empathy.
These leaders are effective in that they are also competent, committed, courageous and compassionate.
The outcome is Actively Caring!

Commonality Across Leadership Types – Safety Culture Toxins

Meeting deadlines has priority over safety
Management not visible on the shop floor
Lack of concern for employee welfare
Not keeping commitments
Lack of agreement on a common direction or standard
Poor/inconsistent accountability
Poor communication of important information
Blame fixing, personal attacks and retribution are the norm
Response and follow up to safety concerns is slow or non-existent
Fear in the workplace

Commonality Across Leadership Types – Positive Factors

Employee Participation
Reward & Recognition
Lead by Example
Integrity/Ethical
Competent
Just (Culture)
Clear Communication
Inspiring (Shared common vision)

Employee Input/Feedback
Proactive Prevention
Trustworthy/Honesty
Forward Looking
Involved
Caring
Active Listening

Safety Leadership Formula:
Trust + Credibility * Competence = Results

Suggested Actions

1. Walk the shop minimum of once each week.
   a. Engage,
   b. Seek feedback,
   c. Be personal, give people a reason to care,
   d. Ask something specific about EHS, issue, suggestion, ask about the PPE, about the process (what is the most difficult thing?), how would they do? See if they will tell you how they do it if no one watching?
   Is the PPE easy to get a replacement? Do they have to use damaged PPE while they wait?
   Would they tell you about an idea or concern if they had one or is it better to be quiet? What safety thing did you do today?
   Did you help a colleague with a safety issue? Did you see a colleague do a good safety thing and you told him good job? If there was one safety idea you had what would it be?
   e. Ask their opinion, listen and don't judge
   f. GM and manager should make a point of recognizing safe behavior etc if he sees.
   g. Be prepared to make changes based upon sound feedback.

Suggested Actions

2. Make a point of watching for safe/unsafe actions. Make a point of praise in public and correction if needed quiet and not public. Praise can be celebrated, can be just a thank you/well done, specific mention during the safety chat time even special thanks from EHS Manager, GM etc.

3. Once a week have a safety chat time. Take a Safety topic and get into group and tell them about it, discuss it, ideas, and thoughts. Keep it short and simple. Get a couple of current topics from Kok Hien. See if they have a topic/issue for next time. Give this time a name. Ask them to provide it. Do not cancel it.

4. Have team leaders once a day make a point of walking their area and ensuring all PPE is useable and safe. Make a point of being obvious about watching for safe acts/unsafe.

5. Make use of the 'Thank You cards" or Gold Coins when you spot good stuff.

6. Consider incorporating a safety champion programme, a couple of volunteers for the shop floor who would like to support workplace safety. Can give them some extra training, encourage them to be proactive, meet once a week with EHS for discussion on what is happening, info that can be taking back to the floor to help others, seek their input, provide them other training over time. The aim is to foster a grassroots approach. Recognise them and their effort, communicate their input etc as appropriate.