

**EMPLOYEES' ADHERANCE TO THE OCCUPATIONAL HEALTH AND SAFETY  
ACTIN THE STEEL MANUFACTURING SECTOR**



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September 2016

## DECLARATION

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***May Your Soul Rest in Peace***

## ABSTRACT

### EMPLOYEES' ADHERANCE TO THE OCCUPATIONAL HEALTH AND SAFETY ACT IN THE STEEL MANUFACTURING SECTOR

**Keywords:** employee, adherence, safety, health, disease, accidents, injuries, steel, behaviour.

Industrial accidents have proved to be more prevalent and costly than anticipated especially in developing countries including South Africa. Occupational accidents have direct and indirect cost implications for an organisation as well as society. Governments in many countries have tried to implement legislation to try and curb the scourge of industrial accidents. The primary purpose of this research was to investigate the level of employee adherence to the Occupational, Health and Safety Act (OHSA) 85 of 1993 in the steel manufacturing sector. This research provided an overview of various factors that influences employee's level of understanding and adherence to the OHSA. This included factors such as information and training in health and safety; employee safety perception, employee safety awareness, employee safety adherence, employee behaviour with regard to health and safety, the role of the union in health and safety issues, accident reporting mechanism, and employee's perceptions of the influence of rewards on health and safety. A structured questionnaire consisting of closed-ended questions was developed and disseminated in order to gather relevant data. Given the scale of the research, a quantitative research method was implemented. The population for the study strictly consisted of employees working in the steel manufacturing sector. A purposive sampling technique was selected. Statistical Package for Social Sciences 22.0 (SPSS) was used to analyse the data. The sample size of (n) =165 employees was involved in the study. The response rate for the total was (98.5%). Descriptive, frequency, correlation, regression and means analysis was employed in this study. The results of the study indicated that majority of the employees were aware and adhered with the requirements of the OHSA with the organisation.

It was suggested that strong stake holder partnerships between unions, employers and employees be formulated. The state should reinforce the Department of Labour inspectorate by giving it more powers to be able to execute its task meritoriously and efficiently. It further suggested that the state must rapidly focus on recruiting and training more health and safety labour inspectors to ensure appropriate enforcement of health and safety regulations. Lastly it is advisable to create and engrave a health and safety culture within the organisation that focuses on highly on employee involvement and mutual trust. The proposed recommendation for the study, limitations and the conclusion of the study were outlined in Chapter 5.

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## CHAPTER 1

### INTRODUCTION AND BACKGROUND TO THE STUDY

#### 1.1 INTRODUCTION

Every year, thousands of working hours are lost due to occupational accidents that occur in the workplace and this leads to a serious reduction in productivity for businesses (Gordon-Davis & Cumberlege 2007:201). The Occupational Health and Safety Act no: 85 of 1993 (OHSA) states that every employer must implement and maintain as far as reasonably practicable, a work environment that is safe without risk to the health of employees (Gagno, Guido, Masi & Jacinto 2013:135). For the purposes of this study, the act will be referred to the OHSA.

According to global estimates, job related accidents and illness account for more than 2 million lives annually, while about 337 million accidents and 160 million illnesses occur annually (Somavia 2003:7). The International Labour Organisation (ILO) estimates that \$1.25 trillion is lost yearly and this cost includes compensation, disruption of production and medical expenses (Pillay 2014:25; Reid, Lenguerrand, Santos, Read, LaMontagne, Fritchi & Harding 2014:380). Against this background, the ILO approach to occupational safety and health calls for the promotion of a preventative safety culture in the workplace (Muchiri 2005:28).

In South Africa, employees enjoy a common law right to a safe working environment and the health and safety legislation aims at supplementing this employee right. The primary focus of the OHSA is to protect the health and safety of persons at work or any other persons who are working with plant and machinery (Kopel 2009:221).

Further, the Safety Management System (SMS) in industry must contain a number of safety elements to protect employees. These elements include among others, job

hazard analysis and safety awareness (Law & Chan 2006:779). For administrators and risk assessment managers concerned with health and safety, the construct of a safety climate should be translated into a principle that guides efforts regarding health and safety in the workplace (McGovern, Vesley, Kochevar, Gershon, Rhame & Anderson 2000:159).

1

Since the human factor plays an important role in safety performance, greater consideration must be given to examining the behavioural causes of technological failures (known as human error) which immensely contribute to the occurrence of accidents in many organisations (Ali, Abdullah & Subramaniam 2009:471).

It must be borne in mind that the development of a proper SMS requires continuous attention to three main domains, namely, the working environment, the individual and behaviour that may have a serious bearing on health and safety adherence in the workplace (Moller & Rothmann 2006:300). Safety management strategies can be classified into two main categories, namely, a safe personal approach, which focuses on the individual's behaviour and a safe place approach which emphasises hazard identification and their elimination in the workplace (Law & Chan 2006:782).

By creating a supportive working environment for employees, an individual's sense of well-being in an organization can be increased (McGuire & McLaren 2009:37). It is ethical and good practice to provide health and safety training either formal or informal to all employees, particularly those assigned with the responsibility of carrying out risk assessments in manufacturing steel industries (O' Hara, Dickety & Weyman 2005:33). The aim of this study is to determine the levels of employee's adherence to the safety legislation in the steel manufacturing sector.

## **1.2 PROBLEM STATEMENT**

To date there is still little information that exists on the effectiveness of the South African government's initiatives regarding the promotion of health and safety regulations in the steel manufacturing sector (Edwards, Davey & Armstrong 2014:341). One industry in South Africa where there is a serious concern about health and safety is the steel manufacturing sector (Adebiyi & Charles – Owaba 2009:388). Edington and Schultz (2008:388) argue that health and safety of employees is

priceless and that it is highly impossible and unethical to assign a price tag on an employee's health and safety. Non-adherence with the safety regulations continues to be major challenge for steel companies (Trethewey 2005:109). It is estimated that employees, worldwide, suffer about 250 million accidents annually, accompanied by at least 330,000 fatalities (Moller & Rothmann 2006:299). Reducing occupational disease and accidents would not only improve and save employees lives, but would reduce the hundreds of millions of rands paid out annually by the office of the Compensation Commissioner (CC) to victims of work related accidents (Geminiani & Smallwood 2008:7).

Management at the highest echelon in organisations is often aloof, has little information, and is inexperienced in shop floor issues regarding health and safety. It is, therefore, very difficult for them to relate to the health and safety needs of the employees at the shop floor level (Bosak, Coetsee & Cullinane 2013:257).

Most contemporary models of accident causation recognise the importance of organisational issues and management actions in contributing to workplace accidents (Lingard, Blismas & Cooke 2009:132). The increase of occupational injuries and ill health cases in the workplace is worrisome, given its severe impact on employee's welfare and the high cost to businesses and the country's economy (Casey & Krauss 2013:132).

Furthermore, the costs to employees injured whilst furthering the interests of the employer in the workplace has serious implications on the injured employee. This includes loss of wages, setting up rehabilitation centers and high medical costs. This places limits on future employment prospects for employees due to serious injuries suffered in the workplace (Watson, Scott, Bishop & Turnbeaugh 2005:304).

Occupational accidents and diseases occur mostly due to the decisions primarily made about work, choices about the way work is organised, and the materials and technologies used in the workplace (Rosenberg, Levenstein & Spangler 2005:193). Unionised workplaces are more likely than non-unionised organisations to be inspected by labour inspectors. This is because employees that are unionized have health and safety committees in their workplaces as compared non-unionized employees (Gray & Mendeloff 2005:574).

In addition, OHSA suffers from its own deficiencies and problems such as unrealistic strict occupational standards and limited flexibility for inspectors to negotiate incremental compliance programmes with non-compliant employers. The lack of a safety culture among employees and failure to take responsibility for their safety contributes to high levels of accidents (Dahl 2013:187).

The study is motivated by the fact that there has not been adequate research that focused on employee's adherence to the safety regulations in the steel manufacturing sector. Previous studies concentrated on safety in a broad sense but not on employee adherence to the above-mentioned legislation (Bosak et al.2013:257).

### **1.3 OBJECTIVES OF THE STUDY**

#### **1.3.1 Primary objective**

The primary objective of this study is to investigate employee's level of adherence to the safety regulations in a steel manufacturing company.

#### **1.3.2 Theoretical objectives**

The theoretical objectives of the study are:

- To review the literature on occupational health and safety;
- To establish from the literature, the causes of non-adherence to health and safety by employees; and
- To review the OHSA in terms of adherence to the requirement of health and safety.

#### **1.3.3 Empirical objectives**

The empirical objectives of this are revisited as formulated in order to support the primary objective.

- To establish employee's perceptions of the level of adherence by the employer and employee with regard to health and safety regulations with specific reference to the following components in terms of the OHSA:
  - (a) Information and training in health and safety

- (b) Employee safety awareness
  - (c) Employee safety adherence
  - (d) Employee behaviour with regard to health and safety
  - (e) The role of the supervisor in health and safety
  - (f) Accident reporting mechanisms in health and safety
  - (g) Workplace safety inspection
  - (h) Workplace environment
  - (i) Role of the trade union in health and safety
  - (j) To examine the relationships between employee perceptions of safety, employee safety awareness, employee adherence to safety and employee behaviour.
- To examine whether employee perceptions of safety, employee safety awareness, employee adherence to safety is dependent on safety awareness.

## **1.4 RESEARCH METHODOLOGY**

### **1.4.1 Literature review**

A literature review on health and safety regulations was undertaken. Secondary data sources included the following sources: Internet, electronic journals, and dissertations, textbooks on occupational health and safety, and newspaper articles.

### **1.4.2 Empirical study**

The empirical study focused on the following features: research design, target population, sample, sampling method, sampling size, measuring instrument and statistical analysis.

### **1.4.3 Research design**

A research design is described as a well-crafted or articulated plan that outlines precisely how observations were done and how well the researcher executed the research project (De Vos, Strydom, Fouche & Delpont 2011:143; Fink 2010:63). The procedure used by the researcher was the survey method. The survey method involves the collection of relevant data by placing pre-formulated questions in a pre-

determined order in the form of a structured questionnaire (Fox & Saheed Bayat 2007:87). The study made use of a quantitative research design. Details of the design are elaborated in chapter 3.

#### **1.4.4 Target population**

The target population was restricted to a particular steel company situated in Southern Gauteng and comprised both male and female employees between the ages 18 to 65 years. The study comprised employees who are technically skilled and academically qualified supervisors, qualified artisans, candidate technicians, graduates in training and candidate engineers. The current population is N=748 employees.

#### **1.4.5 Sampling method**

A non-probability purposive sampling method was employed for the study. Purposive sampling is defined as a technique that involves careful selection of members or units based on a specific purpose rather than being selected randomly (Teddie & Tashakkori 2009:173; Andres 2012:97; Leedy & Ormrod 2014:221).

#### **1.4.6 Sample size**

The sample size was based on that used in previous studies in steel production industries. Based on previous researches by Teo, Ling and Ong (2005:416); Watson et al. (2005:311) and Harvey, Bolam, Gregory and Erdos (2000:615) on occupational health and safety in the manufacturing sector, a sample size of (n) = 165 employees was set.

#### **1.4.7 Measuring instrument**

The researcher gathered the relevant data by making use of an adapted structured questionnaire consisting of a Likert scale ranging from 1 to 5 (Choundry, Fang & Mohamed 2007:1001). The questionnaire was distributed to respondents to measure levels of adherence regarding health and safety regulations. Details of the questionnaire construction are reported in chapter 3.

#### **1.4.8 Statistical analysis**

The data was analysed using the Statistical Package for Social Sciences version 22.0 for windows SPSS. Descriptive analysis was applied in the analysis of the data. Means were computed to determine the level of adherence to safety regulations according to the various aspects of the health and safety as outlined in the questionnaire. Correlation analyses were conducted to measure the relationship between employee's' perception of the various aspects of health and safety regulations. Cronbach alpha reliability values were computed to assess the reliability of the various aspects of the components of health and safety. Details of the statistical data analysis are reported in chapter 4.

#### **1.4.9 Validity and Reliability**

It is significant that when one evaluates an instrument to test for validity and reliability. Swartz, De la Rey, Duncan and Townsend (2008:38), Coghlan, and Brannick (2014:683) described reliability as the accuracy and consistency of an instrument if repeated over time produces the same outcomes. The Cronbach Alpha coefficient test was conducted on a questionnaire to test for reliability. Bless and Higson-Smith (2000:126) and Kaplan and Saccuzo (2001:132) defined validity as the test score or measure that is believed to measure the quality is supposed to measure. For the purpose of this study content, construct and convergent validity were used to assess validity. A detail of the validity and reliability analysis is reported in chapter 4.

### **1.5 CHAPTER CLASSIFICATION**

#### **CHAPTER 2: EMPLOYEE ADHERENCE TO SAFETY REGULATIONS**

This section primarily deals with the introduction of the topic at hand, and clarified the concept of adherence to health and safety regulations. A major steel company from Southern Gauteng was explored as the focal point. The legislative ramifications as well as the economic and social implications were explored with regard to health and safety. The primary objective of the OHSWA was addressed as well as some of the factors that hampered the levels of adherence to the safety regulation in the workplace. The fundamental principles for creating adherence were also explored.

## **CHAPTER 3: RESEARCH METHODOLOGY**

This section focused on the research design and method that was employed in the study. The research design, target population sampling method, data collection, and statistical analyses were elaborated.

## **CHAPTER 4: RESEARCH FINDINGS**

Chapter four focused primarily on the analysis and the interpretation of the data collected during the research as well as the findings. In this chapter, the results were analysed using the SPSS version 22.0.

## **CHAPTER 5: RECOMMENDATIONS AND CONCLUSION**

In this chapter, the recommendation from the research is comprehensively discussed. The limitations of the study and further implications for future research are also outlined in this chapter.

### **1.6 CLARIFICATION OF TERMINOLOGY**

For the purpose of the study, relevant concepts are defined and clarified below:

**Accident:** denotes an unlooked or mishap or an untoward event, which is unexpected or designed.

**Adherence:** is the minimum amount of legal obligation and requirement that must be met to ensure the absence of accidents in the workplace.

**Employer:** is any physical or legal person who employs one or more workers

**Exposure:** the process of being exposed to something that is around. Exposure can affect people in a number of different ways.

**Harm:** is a physical injury or damage to the health of people either directly or indirectly, or damage to property or the surrounding environment.

**Hazard:** a physical situation with a potential for human injury, damage to property, damage to the environment or some combination of these.



**Labour inspection:** a government function carried out by specifically appointed inspectors who regularly visit work sites in order to control whether legislation, rules, and regulations are complied with. They normally give verbal and written advice and guidance to reduce the risk factors and hazards at the workplace.

**Labour inspectorate:** a government authority with the task of advising and giving directions on issues concerning the protection of workers and the work environment, as well as checking that the protection is sufficient.

**Occupational accident:** an occurrence arising out of/or in the course of work, which results in a fatal or non-fatal occupational injury.

**Occupational diseases:** a disease contracted because of an exposure to the risk factors arising from work activity.

**Occupational health:** is defined as the protection of the bodies and mind of people from illness resulting from material processes, or procedures used in the workplace. Its aim is the promotion and maintenance of the highest degree of physical, mental, and social well-being of workers in all occupations by preventing departures from health controlling risks and the adaptation of work to people and people to their jobs.

**Occupational injury:** death, any personal injury, or disease resulting from an occupational.

**Personal protective equipment:** equipment a worker wears as a barrier between himself or herself and the hazardous agent(s).

**Risk management:** the whole spectrum of actions taken to achieve, maintain or improve the safety of an installation and its operation.

**Risk:** the likelihood of an undesired event with specified consequences occurring within the specified period or in specified circumstances.

**Safety compliance:** is defined as the extent to which an employee adheres to the required safety standard and following the correct procedures.

## CHAPTER 2

### EMPLOYEE ADHERENCE TO THE OCCUPATIONAL HEALTH AND SAFETY

#### 2.1 INTRODUCTION

Lund and Marriot (2011:10) argued that globalization has created widespread changes in the labour market. These changes include a technological advance, which is meant to improve productivity. The rapid employment changes taking place due to globalization means that some organisations take short cuts in the completion of work, leading to a high rate of occupational accidents. Many organisations are under immense pressure to stay profitable and competitive. This unfortunately happens at the expense of employees' safety in the workplace where strict safety regulations are ignored (Baram 2009:895). The South African steel manufacturing sector continues to play a critical role in the country's economy. The steel industry is one of the largest employers in South Africa and directly employs approximately 16 482 employees nationwide (Arcelor Mittal Sustainability Report 2009:14).

Steel processing and manufacturing industries constantly need to maintain the desired safety standards to improve the present health and safety standard in order to protect the lives of employees, property as well as the working environment. Adherence to occupational safety regulations is a huge challenge encountered by many organisations, and this phenomenon has serious ramifications on both productivity and reputation for an organisation (Omogoroye & Oke 2007:587). This chapter will explore some of the factors that directly affect employees' level of adherence to health and safety legislation.

Attempts are made to clarify the concept "employee" and outline the test that is normally used to determine exactly who qualifies to be an employee. The chapter also highlights some of the behavioural factors that hamper employee adherence to safety regulations and the impact and role of organisational culture regarding organisational safety are explored.

Aspects that have a serious bearing on non-compliance with the OHSA, namely, the social and economic effect on both the individual as well as the economic impact

caused by occupational accidents and its effects on the government wage bill were investigated. Occupational incidents have overwhelmed the world of work for many decades, even the unsinkable ship the “Titanic” was susceptible to fatal human error that resulted in hundreds of human lives perishing (Wallace & Vodanovich 2003:503). According to Bendix (2010:92) when national governments formulate labour legislation and policies, they should conform to the universal acceptable standards as set out in the International Labour Organisation ILO convention. These ILO guidelines guide countries on how to formulate safety and health regulations in their respective countries. A brief background of the OHS Act is provided.

## **2.2 STATUTES THAT GOVERN AND SUPPORT ADHERENCE WITHIN THE EMPLOYMENT RELATIONSHIP**

The nature of legislative framework overseeing the employment relationship is reflective of the degree and the nature of State involvement in the industrial relations matters. National legislative framework should conform to universal standards, and guidelines found in various ILO conventions. It should be borne in mind that for legislations to be ratified, law cannot deviate from the supreme law, which is the Constitution (Nicholas 2008:306). The following legislation that cover the employee’s right to work in a safety and health environment were expounded:

- The Constitution of the Republic of South Africa,
- Compensation for Occupational Injuries and Diseases Act 61 of 1997;
- Basic conditions of employment Act 75 of 1997;
- Labour relations Act no: 55 of 1996; and
- Occupational Health and Safety Act no: 85 of 1998

### **2.2.1 The Constitution of the Republic of South Africa**

According to Du Toit, Bosch, Woolfrey, Godfrey, Rossouw, Christie, Cooper, Giles and Bosch (2003:59) Section 23 (1) and Section 24 (a) of the Constitution everyone has the right to fair labour practice. This includes the right to work in a safe conducive environment that is not detrimental or that compromises the lives of employees in the workplace.

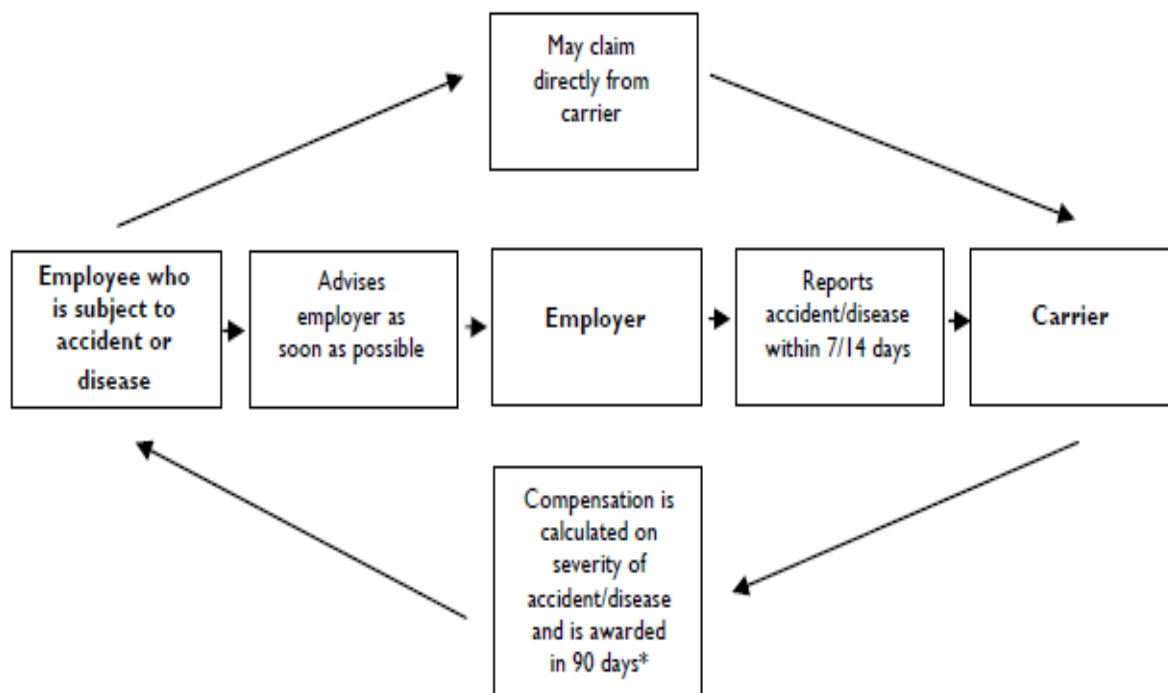
These rights mean that an employer should strive at all times to provide safe working conditions. If this is the case, it will make adherence much easier as employees will view their employer as someone who values employee's safety (Wessels 2007:212; Davis, Cheadle & Haysom 1997:256-257).

### **2.2.2 Compensation for Occupational Injuries and Diseases Act 61 of 1997 (COIDA)**

After the Anglo-Boer War, the first Workmen's Compensation Act (WCA) was introduced in 1914. Prior to the Act, employees who sustained injuries at work had the right to institute a lawsuit against their employer for negligence. Previously, compensation used to be paid out if the fault could be laid directly at the employer. However, the difficulty of proving the cause of negligence against the employer was complex emanating from the common law defenses (Garzarelli, Keeton-Stolk & Schoer 2008:2).

The Act applies to almost all employees, and this includes casual, directors, or members of a body corporate and individuals employed under apprenticeship or learnership contract with the body corporate, and persons provided employment by labour brokers. The only exclusions from the Act are the domestic workers in a private household, persons undergoing military training and members of the South African National Defense Force (SANDF) and the South African Police Services (SAPS) while on active duty (Bendix 2010:36).

The main challenge facing government and legislators include the following late payment to physicians, growing demand of clients and late payments to injured employees. Figure 1 indicates the procedure to be followed in claiming benefits for occupational injuries.



**Figure 1: Claiming benefits process under COIDA**

(Source: Compensation for Occupational Injuries and Diseases Act 2005:5)

The COIDA no: 61 of 1997 provides for the establishment of a state run compensation fund whereby employers contribute to the fund. The objective of the fund is to compensate employees that are injured and disabled due to workplace injuries and diseases (Venter, Levy, Holtzhausen, Conradie, Bendeman & Dworzanowski-Venter 2011:253-254).

In an unfortunate event, where an employee meets an accident or contracts an occupational disease in the workplace, the employee must immediately inform the employer. The employer is legally bound to inform the commissioner of the accident or disease within a period of 7 days if an employee suffered an accident and 14 days if an occupational disease occurred (Brandt 2009:15).

The commissioner will then institute an investigation on the matter and lodge a claim if indeed the accident or occupational disease occurred within the scope of employment. After the severity of the accident or disease has been determined, the commissioner will then compensate the injured employee for any loss of income and

incur any expenses incurred due to the accident or occupational diseases (Venter et al. 2011:254; Department of Labour 1993:32).

### 2.2.3 Basic conditions of employment Act 75 of 1997

According to Strydom, Le Roux, Landman, Christianson, Dupper, Myburgh, Garbers, Barker and Basson (2001:107) the Basic Conditions of Employment Act no: 75 of 1997 (BCEA) does not place any obligation on the employer to retain an employee for an indefinite period, if the employee is unable to continue with his or her duties in case of an illness or injury.

The Act gives effect to the right to fair labour practice. This right is emphasized by section 23 (1) of the Constitution which makes provision for the regulation of basic conditions of employment (Rautenbach & Malherbe 2009:56). Venter et al. (2011:257-258) outlines types of employee benefits covered by the scheme in case an employee suffers occupational injuries or diseases in the workplace. The employee benefits are shown in Table 1.

**Table 1: Employee benefits under BCEA**

Benefits	Description
<b>Illness benefits</b>	When an employee becomes injured or unable to work due to an illness or disease contracted while the employee is fulfilling his contractual obligation as required by the employer, that employee will be legally eligible to qualify for illness benefits. This benefit is paid out when a claimant can no longer work due to illness.
<b>Unemployment benefits</b>	This type of benefits are payable to an employee whose employment contract has ended, due to retrenchments or if unemployment lasts for a period of two weeks.
<b>Dependents benefits.</b>	If it happens that, an employee dies whilst he or she is pursuing the interests of the owner, the surviving spouse will be entitled to claim dependents benefits. The rule states that application for such benefits must be completed within a period of six months.

(Source: Adapted from Unemployment Insurance Fund Act of 2001)

### 2.2.4 Labour Relations Act no: 55 of 1996

The Labour Relations Act (LRA) no: 55 of 1996 was assented by the government after prolonged negotiations at National Economic Development Labour and Council (NEDLAC) between employers, State, unions and civil rights groups. The Act was

promulgated in November 1996 after new structures such as the Labour Court (LC) and the Commission for Conciliation Mediation and Arbitration (CCMA) were established to deal with industrial related matters. The LRA is a significant departure from past legislations that were inconsistent and exclusive in terms of racial make-up (Grossett 1999:128).

The current Act is inclusive of all racial groups and most significantly it is consistent with our country's Constitution. The Act seeks to advance economic development and social justice by promoting compliance with health and safety regulations. The objectives of the Act are to:

- Give effect to the rights and obligation of employees and their unions as well as employers and their organisations in accordance with the fundamental rights of the Constitution and international labour conventions; and
- Promote collective bargaining at sector level and employee participation in the workplace (Finnemore & Van Rensburg 2002:214-215).

With the above-mentioned pieces of legislations, there are still some fundamental challenges that affect the functionality of key institutions tasked with the administration of labour laws.

### **2.2.5 The Occupational Health and Safety Act**

The OHSA no: 85 of 1993 replaced the old Machinery and Occupational Safety Act (MOSA) no: 6 of 1983. The main objective of the OHSA was to strengthen all previous health and safety regulations, which did not adequately cover the majority of employees. The current health and safety legislation clearly stipulates among other things that no employee will be permitted to perform duties if the working environment is unsafe. The Act explicitly states that employees have the right to refuse to work if the employer deliberately put their lives in danger (Nel, Kirsten, Swanepoel, Erasmus and Poisat 2008:151). This right of refusal to work if an employee's life is in danger is very tricky for employees because employees fear losing their jobs due to intimidation by the employer (Breslin, Polzer, MacEachen, Morrogiello, Shannon 2006:783).

### **2.2.3.1 The responsibilities and duties of the employer and employee in terms of section 8 of the Act**

Safety is a determining factor for many organisations. This is because an employee is expected to adhere to health and safety regulations (Lexi Nexis 2005:8). For the purpose of this study adherence is defined as the minimum amount of legal obligation and requirement that should be met to ensure the absence of accidents in the workplace (Masia 2010:5; Sendagala 2010:9).

In addition, it is the employer's responsibility to provide employees with adequate safety training to make sure employees adhere to safety regulations in the workplace (Finnemore & Van Rensburg 2002:467). With this statement in mind, the OHS Act no: 85 of 1993 place certain responsibilities on the employer. This is will be discussed below.

### **2.2.3.2 Responsibility of the employer**

The employer's general duties is to provide and maintain as reasonably possible and practicable a conducive working environment that is secure and without risks to the health and safety of employees (Benjamin 2010:21). For the purpose of the study, an employer means any person who employs or provides work to any person and remunerates that person or expressly or tacitly undertakes to remunerate him (Lexis Nexis 2005:5).

In order for an employer to render a workplace safe, the employer is required to undergo the process of risk assessment and hazard elimination in the workplace (Benjamin 2010:22).

### **2.2.3.3 Conducting risk assessment**

Industrial accidents de-motivates employees, disrupt site activities; delay projects and affects overall costs of productivity and the image of organisations. The employer should create and maintain a work environment that is free from hazards that lead to devastating injuries, illnesses and death. This responsibility has serious ramifications if an employer deviates from his responsibility (Mohamed & Chinda 2011:267).



An employer can be charged with corporate manslaughter for non-adherence with the requirement of the Act. If a workplace is assessed for a potential threat, the employer will know exactly the hazards experienced by employees and try to limit exposure by making employees aware of potential dangers in the workplace (Grobler, Warnich, Carrell, Elbert & Hartfield 2011:444).

#### **2.2.3.4 Elimination of hazards by the employer**

Developing adequate safety systems should be an ongoing process. The elimination of hazards should consist of two main domains. Firstly, the environment which includes equipment, tools, and housekeeping. Secondly, the person which includes elements such as knowledge, skills, abilities, intelligence, and personality as well as behaviour (Moller 2003:20).

#### **2.2.3.5 Duties of an employer**

The employment contract is a document that spells out the duties of parties in the employment relationship. An employer is entrusted with certain obligations as required by the OHSA. An employer needs to reduce risks to health and safety in the workplace, and adequately monitor and regulate health and safety in workplace. In order to ensure compliance with safety regulations the employer must:

- Provide and maintain a safe, healthy working environment;
- Ensure employees are safe by providing information, instructions, training, and supervision;
- Inform safety representatives of incidents, inspections, investigations, and inquiries in workplace; and
- Report to some inspector incidents if an employee is killed, injured, or ill (Swanepoel & Slabbert 2012:291).

The following section will share some insight on the definition of employee and outline the duties of an employee.

### **2.2.3.6 Definition of an employee**

Bezuidenhout, Garbers and Potgieter (2007:32) state that employees enjoy a common right to work in a safe and conducive environment. For the purpose of this study, an “employee” is defined as any individual who has agreed to enter into or who works under a contract of service or apprenticeship or a learnership programme with an employer. The contract can be either expressed or implied (Strydom, le Roux, Landman, Christierson, Dupper, Myburgh, Garbers, Barker, Basson, Esselaar & Dekker 2006:45-46; RSA 2010:24). The following section will present some of the duties of an employee in a workplace.

### **2.2.3.7 Duties of an employee**

Employees in organisations are assigned with certain contractual duties of taking care of their own safety as well as the safety of others. Therefore, employees should always strive to:

- Comply with the health and safety regulations and procedures set by the employer and take prescribed precautions when performing their duties;
- Report any unsafe or unhealthy act to the health and safety representative or the employer, without any intimidation or victimisation; and
- Co-operate with the employer or other designated person with regard to health and safety matters; and refrain from interfering with or misuse anything, provided in the interests of health and safety (Bendix 2010:174; Lexis Nexis 2005:8-9).

### **2.2.3.8 Test used to determine who constitute an employee**

According to Venter et al. (2011:14) there are three tests in terms of common law that determines who qualifies to be an employee, namely, the organisational test, the control test and the dominant impression test. To be able to determine who constitutes an employee in a workplace and for the purpose of this study, the control test was selected. The element of this test will be discussed in the next section.

### **2.2.3.9 The control/supervision test**

In terms of this type of test the employer or owner of the means of production assumes full control over the employee and controls the method in which the employee executes his or her duties (Grogan 2007:14). This means that the employer controls the nature of the job executed by the employee. The fact that an employer has the authority to dictate to an employee how to perform his or her duties, does not mean that the employer must abdicate his or her responsibilities of providing safe working conditions (Swanepoel & Slabbert 2012: 291-292).

### **2.2.3.10 The role of a shop steward in occupational health and safety**

Shop stewards occupy a prominent position as a representative of a union in a work place. A shop steward is elected by the union members to further employees' interests in the workplace (Holley, Jennings & Wolters 2008:12; Bamber, Lansbury & Wailes 2011:183). They act as liaison officers between employees and their employer between the employees and union and between trade union and management (Bendix 2010:54).

According to the LRA of 1995, a shop steward has the right to monitor the employer's compliance with work-related provisions of the Act, and any laws regulating terms and conditions of employment and collective agreements that binds the employer, and to report any alleged contravention by authorities (Bezuidenhout et al. 2007:219; Lim, Holley, Jennings & Wolters 2012:262-263). The following are the responsibilities that must be executed by a shop steward:

- In the work environment, a shop steward guards the interests of employees and sees to it that the needs of the union are taken into consideration.
- Making sure that all organisational activities comply with the health and safety regulations;
- Ensure that first-aid cabin are fully stocked at all times;
- Advises and assists members in matters concerning statutory and bargaining council benefits (e.g. medical and unemployment insurance claims) and;
- Ensures that prescribed statutory regulations are visibly displayed in the specified way for perusal by fellow colleagues (Bezuidenhout et al. 2007:219).

### **2.2.5.11 Functions of the labour inspector**

The inspectorate is headed by the Chief inspector whose main purpose is to enforce compliance with the OHSA. For the purpose of the study an inspector is defined, as a person with the help of extensive knowledge and specialised equipment which is entrusted with the following obligations. This includes conducting accident investigations, testing of samples such as air and water quality (Department of Labour, 2004:4). The following are the main functions of the labour inspector:

- Without notice, enter any premises which are occupied, used by an employer, on or in which an employer performs any work or any plant or machinery;
- Question any individual who is on the premises of the employer;
- Require from any person who is in charge of the records and books held by the employer;
- To examine such books, records or make copies of such records; and
- Require an explanation from any person about any entry in such books (Jackson 2007:284; Department of Labour 2004:16; Venter et al. 2011:233).

### **2.2.5.12 Challenges and problems faced by the department of labour (DoL) inspectorate**

Inspectors in many developing countries, including South Africa, are unable to carry out their mandate fully due to a myriad of challenges. One of the challenges facing many employers concerning health and safety legislation is the application and knowledge of the OHSA in real practice. It is therefore the primary responsibility of the DoL to ensure that adequate inspection and compliance with safety legislation effectively takes place (Liao & Chiang 2012:4402).

One of the contributing factors leading to non-compliance in many organisations is due to following problems: understaffing, under-training, inadequate resources, and underpayment of labour inspectors. The other challenges are weakening budgets, and brain drain. Most inspectors leave the public sector for better paying jobs in the private sector because the government is unable to pay attractive remuneration and this ultimately affects the quality of safety inspections (Alli 2001:57).

With regard to organisational competitiveness, many organisations aim to maximize performance and profits. This sometime happens at the expense of employees because employers pursue profits. Employers at times forget that in order to be successful as an organisation they need to take into cognizance the employees' personal safety. To remain highly competitive as an establishment companies need to protect and value their human capital. It has been proven that most thriving organisations are the ones that integrate and prioritise employee's health and safety within the organisation (Laroche & Amara 2010:406).

Inspection is supposed to enhance adherence with safety regulations and advocate for the promotion of decent standards and the protection of employee's safety (De Baets 2003:42). To ensure that this happens effectively the Minister of labour is delegated with certain constitutional powers, including one to assign labour inspectors (Grossett, Venter & Hills 2003:204).

Inspectors render an important service on behalf of the State. These services are sometime met with great difficulties. The following are the four main challenges faced by labour inspector as identified by (Alli 2001:58).

- Legislation may not be sufficiently realistic;
- Labour inspectors may have difficulty in imposing their authority; and
- Infrastructure facilities essential for inspection such as transport or communication may not be available

### **2.2.5.13 Inspections conducted by labour inspectors**

The following are types of inspections conducted by inspectors from the Department of Labour:

- **Routine inspection**

Routine inspection is significant as it assists organisations on how to comply with the Act were non-adherence is taking place. This type of inspection covers many issues. For example, a visit by an inspector may check the safety of machinery, proper handling of material, hazardous, and chemical substances (Department of Labour 2010:14).

- **Follow up inspection**

This inspection emphasizes the organisation's response to a routine visit. Under this type of inspection, labour inspectors exercise their discretionary powers, not for the content of the legislation they are required to implement, but for the time given to organisations to address the shortcomings with regard to non-adherence (WorksafeBC 2009:13).

- **Re-active inspection**

This type of inspection is in response to a specific complaint from an employee that has occurred in the workplace such as an accident that happened in the workplace (Department of Labour 2010:14-15).

## **2.3 THE ROLE OF THE STATE IN HEALTH AND SAFETY IN THE WORKPLACE**

Cloete (1993:3) describes a State as a region with a population constituting a community, which is independent from, and not part of any other sovereign political entity that has public institutions to maintain law and order by providing rules and regulations. The State plays a prominent role in the South African industrial relations arena by providing an institutional framework in which business and labour interact. For the purpose of this study, institutional framework is described as the legal framework that regulates practices and structures established by the State (Wood & Coetzee 1998:13).

The management of occupational health and safety in South Africa is a complicated and a bureaucratic exercise that requires adequate resources such as funding and adequate labour inspectors (Myburg, Smit & Van Der Nest 2009:45). There are three main State departments designated to deal with occupational health and safety in South Africa, namely, the (DoL), (DoH) and lastly the Department of Mineral and Resources (DoMR) (Jeebhay & Jacobs 2008:264).

The budget for the DoMR caters for an estimated 467,000 employees which covers employees in the mining sector. This number is twice the budget of the DoL which is

responsible for the occupational health and safety of about 14.2 million people. This indicates a massive challenge faced by the DoL especially the shortage of inspectors (Hermanus 1999:23-24). To understand the role played by the State it is advisable to have a clear view on the extent of health and safety problems in South Africa.

## **2.4 FINANCIAL IMPLICATION OF ACCIDENTS AND DISEASES ON THE ECONOMY**

It is estimated that 58% of employees worldwide, spend one third of their life in the workplace. They sustain the economic and material basis of our society through income taxes. Industrial accidents are exorbitant, and it is estimated that 4.6 million occupational accidents occur every year in the European Union (EU). This results in 146 million of lost working hours, which disrupts productivity level in the workplace. This has devastating consequences for the employer's balance sheet as well as the economy (Shalini 2009:973). This mean that between 2.6% to 3.8 % of Gross National Product (GNP) of EU countries is lost annually due to accidents in the workplace (Rikhardsson & Impgaard 2004:173). In 2007 the United States (US) alone there were about 6 217 deaths and 4.7 million non-fatal injuries. Such accidents cost the US economy 146.6 billion dollars and this includes wages and productivity losses, administrative, and medical costs (Parbotech & Kapp 2008:515; Mearns, Hope, Ford & Tetrick 2009:1445).

South Africa is not an exception and the picture is grim when it comes to high levels of accidents due to poor levels of adherence with safety regulations. The occurrence of occupational accidents has a negative bearing on both the State as well as the employers. Employers wage bills escalates because the employer spends more on insurance payouts, hospital stays, and replacement of injured or killed employees. The State on the other hand spends over 50 billion rands on the compensation fund to compensate the injured and the families of the deceased (Kinoti 2010:2).

To have a thorough understanding of how this costs impact on organisations it is important to distinguish between the following indirect cost and direct costs:

### **2.4.1 Costs of accidents**

Lavicoli, Marinaccio, Vonesch, Ursini, Grandi and Palmi (2001:326) conducted a study that found out that there is a direct link between direct and indirect costs of industrial accidents and diseases.

Mthalande, Othman and Pearl (2007:5) stated that unsafe working conditions pose a serious financial burden for organisations. From a business perspective, accidents affect an organisation's bottom line, as companies have to replace absent employees due to accidents and this normally happens due to non-adherence by employees to follow safety regulations as set by the employer.

Industrial accidents impose direct and indirect costs on both the employer as well as the employee (Shalini 2009:973-974). To be able to have an insight on the impact of these accidents it is important to draw a distinction between the following concepts.

### **2.4.2 Direct costs**

Direct costs are costs that cover employee compensation insurance. Direct costs are defined as costs that are directly related to the accidents and may be insured and are related to the accidents and usually insured by employers (Hare & Cameron 2011:570). These costs usually include premiums, payment of hospital, rehabilitation, burial costs, compensation insurance, liability, and property damages (Waehrer, Dong, Miller, Haile & Men 2007:1259).

### **2.4.3 Indirect costs**

Indirect costs are, those costs attributed to loss of productivity of the injured employee. This includes wage losses, transportation cost to the nearest medical facilities and time spent completing various forms related to the injury which seriously disturbs the production process (Smallwood & Haupt 2007:24). Work-related accidents cost South Africa an estimated 50 billion rands per annum (National Occupational Health and Safety Policy 2003:4).

Pillay (2014:22) outlines the possible indirect costs because of work-related accidents, namely:



- Low morale affecting colleagues;
- Reduced productivity;
- Production disruption when accidents occur
- Recruiting and training of a new incumbent to replace injured or sick employee;
- Equipment damage;
- Investigation costs; and
- Loss of experience and qualified personnel.

One way of preventing escalation of indirect costs is to place emphasis on employee safety training. This can be achieved when top management and safety managers work as a team and see financial viability for the organisation of adherence (Health and Safety Executive 2011:22).

## **2.5 CATEGORIES OF ACCIDENTS IN THE WORKPLACE**

According to Pillay (2014:18), 40% of accidents are due to employee's negligence and lack of adhering to health and safety regulations. Mthlane et al. (2007:3) has identified the following types of industrial accidents experienced by employees in the steel manufacturing sector which is discussed in the foregoing section.

### **2.5.1 Minor accidents**

These are accidents with a less severe impact on an employee. These types of injuries result in an employee not coming to work for a period of three days or less. Injuries that fall within these categories include stepping or striking against an object, sprains, and strains (Pillay 2014:19).

### **2.5.2 Major accidents**

These are injuries that results in amputation of body parts, for example fingers, arm, and a leg. An employee who falls under this group would be absent from the work for

a period of thirty days. These accidents include slipping, falling from heights, machinery and transport accidents (Pajero-Moscoso, Rubio-Romero & Perez-Canto 2012:290).

### **2.5.3 Fatalities**

These are injuries resulting in the death of an employee in a workplace (Mthalande et al. 2007:3-4).

## **2.6 GENERAL EFFECTS OF OCCUPATIONAL ACCIDENTS**

The social implications of workplace accidents are substantial in manufacturing industries (Lanoie & Trottier 1998:65). Occupational injuries and diseases cause a serious burden on families in terms of deaths and disability. When breadwinners pass away, they leave behind a huge financial void that affects their dependents. Dependents are left to experience harsh realities of poverty, increasing debts, emotional trauma and stress due to the breadwinner passing away (Polinder, Segui-Gomez, Toet, Belt, Sethi, Racioppi & van Beeck 2011:211). On the side of an employee, costs will include loss of income and increase in personal debts due to accidents (Jallon, Imbeau, De Marcellis-Warin 2011:149; Ural & Demirkol 2008:1016-1017). Occupational accidents also cause serious disruptions to the working environment in which it occurs. These disruptions have serious economic repercussions for both the employer as well as the employee (Ronza, Lazaro-Touza, Carol & Casal 2009:644).

### **2.6.1 Labour turnover**

Labour turnover is defined as a state where an organisation loses its workforce due to unsatisfactory working conditions such as unsafe and dangerous environment (Currie, Hill & Roy 2012:2). A number of organisational behaviour studies have demonstrated a correlation between high accidents levels and employee turnover in organisations (Burt, Chmiel & Hayes 2008:1002; Cottini, Kato & Westergaard-Nielsen 2011:873).

High labour turnover has dreadful consequences for any business as it negatively affects the organisation's capacity to meet its financial needs, especially the

organisation's bottom line which can lead to a total shut down of an organisation. Turnover in organisation occur due to unsafe working (Hayes, O'Brien-Pallas, Duffield, Shamiam, Buchan, Hughes, Heather Laschinger, North & Stone 2011:237).

### **2.6.2 Working environment**

The steel manufacturing sector is a very hazardous environment to work in. It is associated with the following occupational hazards; excessive heat, high noise level, hazardous gases, and vibrations. Therefore, employee's safety in the workplace is paramount especially in the steel manufacturing sector which is characterized by high levels of accidents (Schoemaker, Barreto, Swerdlow, Higgins & Carpenter 2000:555).

Failure by employees to adhere to organisational safety practices can have serious consequences such as long-term absenteeism, deaths, and injuries. For employers, this results in a serious reduction in productivity and profits, and a dented organisational image. If the above-mentioned factors are ignored this will lead to increased worker's compensation payouts (Woodward 2007:60).

Of great concern is that majority of accidents can be traced back to the absence of inadequate safety strategies, policies, and procedures. The aim of these strategies should focus and target employee's safety in the workplace (Vinodkumar & Bhasi 2010:2082-2083).

In the steel manufacturing sector, the handling of heavy equipment, hazardous chemicals and molten metal are all in day's work for employees. The working environment in the steel manufacturing sector is also notorious for high temperature and high emission of harmful gases. This poses a huge risk on employees experiencing injuries and ill health (Pollitt 2011:7).

Non-adherence with health and safety regulations by employees is regarded as one of the primary factors that contribute to high rate of accidents. It has been shown that when employees are properly trained to adhere to health and safety legislations, it lowers casualties, and leads to organisations spending less money on occupational accident payouts (Eweje 2005:171).

## **2.7 SOURCES OF OCCUPATIONAL ACCIDENTS**

The main sources of accidents in the workplace are stress, job security, employee attitude, social grouping, employee engagement, age, and employee perception (Knegtering & Pasman 2009:164; De Koster, Stam, & Balk 2011:755).

### **2.7.1 Stress and accidents**

The terminology, stress is defined as the physiological and psychological response that individuals portray in response to the environmental events called stressors (Werner, Bagraim, Cunningham, Pieterse-Landman, Potgieter & Viedge 2011:232; Mashego 2014:11).

Organisations are more likely to experience high workplace accidents when employees in the workplace experience high levels of stress. When an employee's concentration level is compromised, accidents are likely to happen frequently in an organisation. This will result in devastating workplace injuries and fatalities in the workplace. It is paramount for organisations to have coping mechanisms such as Employees Assistance Programmes (EAPs) to assist employees to deal with stress (Hayes, O'Brien- Pallas, Duffield, Shamian, Buchan, Hughes, Spence Lachinger and North 2011:889).

An enormous challenge facing employees in many workplaces is meeting the daily job demands. Besides having to meet the daily production targets and deadlines employees are faced with further emotional and mental stress. An employee is expected to juggle between their relations outside work and are also expected to fulfill their obligation as employees (Moorhead & Griffin 1998:226). Attempts to meet productivity demand can be overwhelming and this can lead to employees being prone to high stress levels (Jacobs, Mostert & Pienaar 2008:17-18).

Stress in the workplace is one of the silent health problems facing numerous organisations and employees. There is no doubt that the major influence on job performance, productivity, absenteeism and turnover is due to severe stress levels. Stress is often proved as the main source of frustration and tension in the workplace.

This occurs due to a number of interrelated factors such as employee's behaviour, organisational and environmental factors (Mullins 2006:228).

Unmanageable workload and lack of safety mechanism have shown to be a contributing factor that leads to high levels of stress in the steel manufacturing sector. To ameliorate this, it is important to manage the workplace load of employees in the workplace (Grobler et al. 2011:445).

### **2.7.2 Job insecurity**

Change in workplace is inevitable if an organisation is to remain profitable, relevant, and competitive. Change is either planned or unplanned (Grobler, Bothman, Brewster, Carey, Holland & Warnich 2012:328-329). Unplanned change occurs when there is severe pressure to conform to change, when the employee resists change. A planned change is systematic this includes changes in, tasks, information, and retrenchment that may lead to layoffs (Champoux 2006:437).

In a study conducted by Schultz and Schultz (2006:326) in the food processing industry where the company was faced with serious financial constraints, massive retrenchments and layoffs took place. This high number of layoffs and retrenchments caused insecurities amongst employees. The results showed that when employees generally feel insecure about their jobs, they start to feel demotivated and show low levels of adhering to safe working practices due to changes in the workplace. This means when an employer contemplates any change within the workplace it is important to communicate such changes prior with employees.

### **2.7.3 Employee attitude**

Attitude is defined as the evaluation of people's ideas, issues, and situations and objects (Lamberton & Minor 2010:82). According to Bergh, Theron, Geldenhuys, Ungerer, Albertyn, Roythorne-Jacobs, and Cilliers (2003:168) attitude comprises three main components; these are behavioural, cognitive, and emotional. This is reflected more in the behavioural component that is fundamental and influence attitude of an employee's perception about workplace safety.

Employers should start paying significant attention on employee's attitude as attitude can influence employee behaviour in various ways. The influence of attitude cannot be separated from workplace safety (Shaluf & Ahamadun 2006:789).

Unsafe acts include the failure to comply with safety standards. An example would be when an employee intentionally fails to wear Personal Protective Equipment (PPE). Employees that have a positive attitude are more likely to be satisfied in their jobs and experience lower levels of occupational accidents, turnover, and absenteeism in the workplace (Robbins 2005:33).

Champoux (2006:106) submits that our attitude evolves over time, and that the main source of attitude is within the employee social environment. For an employee mindset to change regarding adherence, two fundamental changes must occur. Firstly, an employee should be persuaded to change his attitude. An employee can be reprimanded by a supervisor for non-compliance with health safety regulations. Secondly, a change in employee social grouping also influences the way an employee behaves in a company. For example, an employee associating with employees who disregard safety rules in the workplace. The probability is high that an employee will not adhere to safety regulations because of association with non-compliant employees. This can be due to social pressure or mob psychology. One common way of changing an employee's attitude is through vigorous persuasive communication (Ho, Hwang & Wang 2006:631).

#### **2.7.4 Employee engagement**

Employee engagement refers to the individual's involvement and satisfaction as well as enthusiasm for work (Sambrook, Jones & Doloriert 2014:174; Rana, Ardichili & Tkachenko 2014:251). Employee engagement is now starting to receive much attention in the field of safety management. Information sharing and trust between employees and senior management is crucial and has been shown to intensify organisational effectiveness (Malinen, Wright, & Cammock 2013:97).

For employees to embrace safety regulations in the workplace, it is advisable that management must share information with employees with regard to workplace safety. This is significant as employees will feel highly appreciated and adding value as part of the organization because the employer engages and consulted them on matters

that concern their safety in the workplace (Nhammer, Schusterschitz & Stummer 2013:39).

### **2.7.5 Influence of age**

A study by Schultz and Schultz (2006:327) found that there is a direct association between employee's age and safety adherence. Dynamics such as physical health and employee's attitude directly interact with age. The study found that older employees have greater knowledge about job description and job knowledge. This is due to years of experience acquired over the years.

It was found that for older employees in the workplace eye coordination, vision, and hearing deteriorate as employees get older. When it comes to personal safety, older employees tend to be cautious as compared to their junior counterparts who are more prone to accidents (Chin, Deluca, Poth, Chadwick, Hutchinson & Munby 2010:571-572; Salminen 2004:518).

### **2.7.6 Employee perception of the safety climate**

Perception is described as a selective process by which one interprets and gives meaning to external factors (Bergh et al. 2003:104). Feldman (2001:41) and Robbins and Judge (2007:146) define perception as a process through which meaning is given in an organisation which is derived from our senses.

Safety climate sets the tone for an employee's perception on adherence with the OHS. Safety climate is described as employees shared perception of the organisation's policies, procedure, and practices as they relate to the value and importance of safety within an organisation (Huang, Verma, Chang, Courtney, Lombardi, Brennan & Perry 2012:46).

## **2.8 ORGANISATIONAL LEADERSHIP AND SAFETY RESPONSIBILITY**

Martins (2005:336) describes leadership as a process in which a leader is able to influence and sway the behaviour and actions of those being led whilst Nelson and

Quick (2003:392) stated that leadership in a workplace is a method of guiding and directing behaviour of employees in an organisational environment.

Leaders in organisations are faced with the enormous task of taking decisions on countless areas that affect the organisation and employees. The primary objective of any business is to maintain sustainability and generate profits and manufacture goods and services of which there is a serious demand in the market (Westaby, Probst & Lee 2010:481).

A study conducted by Kapp (2012:1119) indicated that leadership is an important activity played by top management and top executives. A leader is supposed to lead by example because a leader's conduct also influences the behaviour of employees in the organisation (Martinez-Corcoles, Gracia, Tomas, Peiro & Schobel 2013:294).

Management practices in any organisation influences employee's safety behaviour. Leadership style exercised by top management also has an effect in directing the acceptable behaviour of employees in the workplace (Kapp 2012:1119). For example, a transformational leader encourages employees to strive to perform beyond their self-interests. This means that leaders must always strive to instill the spirit of commitment in employees in order for employees to exhibit the required safety-related behavior (Hon, Hinze & Chan 2014:191).

No leader wants to be seen to be as negligent, uncaring and undermining the safety of employees in the workplace (Smallman & John 2001:234). For a leader to achieve maximum adherence to safety, the leader must act in an ethical and responsible manner as a leader by respecting employees' rights to safety and not look for shortcuts with regards to safety regulations (Schermerhorn, Hunt & Osborn 2003:16).

Executive leaders are often accused of being too detached from employees who are the drivers in productivity process. Such disconnection has proven to be detrimental for the organisation as it leads to strain work relations between leaders and employees (Chen, Trevino & Hambrick 2009:316).

Therefore, safety behaviour of employees indicate that if the leader is close to the employees the better the relationship with employees and this will lead to an increase in adherence to safety regulations (Dahl 2013:18). If this is the case the leader's



concern for the employees wellbeing will take priority, which will in return heighten the employees desire to adhere to the safety legislation (Zohar 2002:76).

Section 16 of the OHS Act assigns the Chief Executive Officer (CEO) with the following responsibilities that are highlighted below and will be discussed in detail. For purposes of this study a CEO means a person who is deemed to be responsible for the overall management and control of the business of such body corporate or enterprise (Department of Labour 2004:11).

### **2.8.1 Responsibilities of the (CEO) in health and safety matters**

- Every CEO shall as far as reasonably practical ensure that the duties of his employer as contemplated in the OHS Act are properly discharged and that employees lives should take priority, and
- The CEO may assign any duties without derogating from his/her responsibilities to any person under his/her control which a person shall act be subjected to the control and directions of the CEO (Lexis Nexis 2005:8).

### **2.8.2 Leadership style and influence on safety in the workplace**

Werner et al. (2011:365) stated that transformational leaders are visionaries and strive to drive subordinates towards their vision. This vision can include adopting a zero tolerance attitude when it comes to accidents and injuries at work. A leader's vision can only come to life when a leader is well inclined with the workplace environment. Leaders should always encourage employees to participate in matters affecting their personal safety (De Koster, Stam & Balk 2011:754). Therefore, safety policies must be inclusive rather than exclusive. Transformational leaders are equipped and empowered with the following actions as agents of change:

- They always seek to clarify any information to every employee, so that anyone who is involved understands their intention and outcomes set by the leader;
- Is able to comprehend change and group dynamics; and
- Is able to lead and develop clear outcomes and facilitate individual accountability (Naidoo & Botha 2012:91).

## **2.9 BENEFITS OF INVESTING IN WORKFORCE SAFETY**

Phillips and Gully (2014:382) maintain that minimizing accidents and injuries in the workplace should be the responsibility of both the employee and employer. Oxenburg and Marlow (2005:209) argue that when an employee sustains an injury at work there are adverse consequences for an organisation. According to Ali, Abdullah & Subramaniam (2009:470) and Farmer (2010:12) the following are benefits of investing on safety for an organisation beneath:

- Better motivated employees;
- Improved skills;
- Fewer health and safety risks;
- Lower medical costs and
- Greater competitive advantage.

Elimination of accidents in the workplace contributes to the success of any project. The elimination of accidents is beneficial and effective if introduced at an early stage of a project (Badri, Gbodossou, & Nadeau 2012:190; Choi, Chan & Chan 2012:147).

## **2.10 BEHAVIOURAL FACTORS AND SAFETY ADHERENCE**

Behaviour Based Safety (BBS) gained prominence in the early 1970s and gained momentum in the early 1990s. BBS is founded on the values and procedures of a sub-discipline of human behaviour. BBS focused on efforts shown by an employee to adhere with safety regulations, rather than the results. Advocates of BBS believed that focusing and directing all efforts on employee safe behaviour could lead to a decline of risk behaviour, and eventually reduce accidents and injuries in the workplace (Niza, Silva & Lima 2007:960).

This will eventually lead to cost effectiveness for employers. However, in order for an employee to adhere with safety regulations, management must show greater commitment, and invest many resources in safety training (Maiti & Paul 2007:450).

Research on occupational health and safety has started to shift focus on examining cognitive behaviour processes of employees. This is because behaviour has proven to have a direct link on safety adherence and also has an impact on one's susceptibility to in accident (Wallace and Vodanovich 2003:504).

One school of thought stated that nearly every accident in the workplace was traced back to employee unsafe behaviour. Brown, Willis and Prussia (2000:445-446) explained that one type of behaviour that has significant impact on employee safety performance is adherence to safety regulations. This should take place even when the employee is not supervised (Mearns et al. 2010:1446).

## **2.11 THEORIES INFLUENCING BEHAVIOUR-BASED SAFETY**

Cox and Jones (2006:165) highlighted that behavioral safety intervention originates from the psychological theoretical teachings that reinforces the importance of learning, attitude, motivation, and beliefs. Behaviour Based Programmes (BBP) place emphasis on the following aspects of learning; social influence and reinforcement.

Friedman and Schustack (2006:212) believed that the environment where an individual emanates from controls and influences behaviour. To understand the effects of behaviour the following theories were explored in order to have a thorough understanding of behaviour.

### **2.11.1 Bandura social cognitive learning theory**

Social learning theorists such as Bandura believed that the environments in which learning occur shapes an individual's behaviour. Learning is described as any relative permanent change in behaviour that occurs because of a particular experience (Robbins 2005:30). Self-management system influences a person's cognition process by which an individual perceives, evaluates and regulates his or her own behaviour so that the projected behaviour is deemed appropriate. When this is achieved, it will correspond with the environment and it will be effective in attaining an individual's goals.

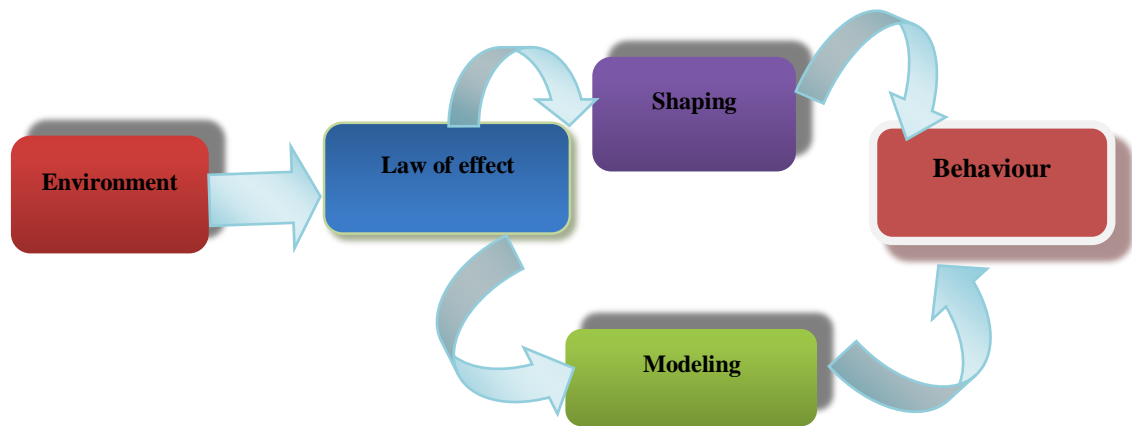
In this case, it will assist in investigating the behavioral factors that influence behaviour in the workplace. This also assists in molding and activating the required behaviour such as adherence to safety regulations (Friedman & Schustack 2006:258). According to Flett (2007:319) new behaviour is learned by operant conditioning and classical conditioning. Employees can learn new behavioural patterns through observation, hearing, and reading.

### **2.11.2 Skinner's reinforcement theory and influence on employee's behaviour**

Renowned behavioural psychologists B.F. Skinner believed that a learned behaviour leading to a desirable outcome should be compensated (Flett 2007:303; Rees & Smith 2014). The operant conditioning theory focuses on rewarding the desired behaviour that is deemed acceptable in the workplace (Botha, Kiley & Werner 2011:164; Munhinsky 2003:392).

This theory deals with the link between behaviour and offering employees rewards. The operant conditioning theory is referred to as an individual operating environment through his or her actions and generates consequences that are either positive or negative (Flett 2007:304). Larsen and Buss (2005:206-207) focused more on biological theory of personality called reinforcement sensitivity theory which focused on biological systems of an employee.

The first biological system is known as Behavioural Activation System (BAS), which is responsive to incentives, regulates the behaviour, and increases adherence. When the (BAS) recognizes a stimulus as a potential reward, it automatically triggers the required behaviour when coming to safety adherence. The second system known as the Behavioural Inhibition System (BIS) is in response to punishment. The purpose of BIS is to discourage unacceptable behaviour by employees in the workplace. This will assist in identifying employees that do not adhere with policies and procedures on health and safety (Hergenhahn & Olson 2003:353). Figure 2 depicts a model indicating employee-learning process in the workplace and which is critical in influencing and shaping employee behaviour.



**Figure 2: Employee learning process model**

(Source: Robbins 2005:31)

The model summarizes how learning can change an employee's attitude and behaviour towards safety in the workplace. Learning empowers employees to adapt to their environment. This means that employees will not be frustrated by ambiguous rules and regulations because they will understand the workplace environment much better (Robbins 2005:30-31).

Behaviour constructed on the law of effect state that when an employee follows safety instructions and the employee's behaviour is repeated it will lead to adherence with the health and safety regulations. For example, if a manager or supervisor always promotes employee-based safety behaviour, other employees will strive to adhere to health and safety requirements (Mason, Sripada & Stich 2005:7).

Modeling and shaping of behaviour is crucial and supervisors are the ones shaping the desired behaviour of employees in the workplace. When the supervisor is careless towards enforcing safety rules, this will have serious consequences on employees. This is because employees will view the supervisor as someone who does not take their safety seriously. This can lead to not adherence of an employee with regards to safety regulations because the employer failed to instill the ethos of adherence to the OHSA. When an employee's performance has improved, for example, employee's proneness to accidents decline, it can therefore be said that the employee's behaviour has changed for the better and this is usually achieved through learning (Green Wood, Wood & Boyd 2005:178).

## **2.12 TRAINING, REWARDS AND MOTIVATION**

### **2.12.1 Training and safety**

One way of effectively dealing and moderating occupational accidents is to intensify safety training as a preventative strategy. Training is defined as a systematic acquisition of knowledge, skills, and attitudes in order to develop the competencies necessary for effective performance in the work environment (Bahn & Barrat-Pugh 2012:215). Safety training is an important aspect that can be used to achieve the organisational goals and one of the goals would be to achieve zero fatalities and accidents (Mbakaya, Onyoyo, Lwaki & Omondli, 1999:308).

Improving the level of safety is a complex exercise that requires buy in from all strategic players in the employment relationship. The main challenge for organisations in trying to ameliorate accidents is to design an effective comprehensive safety training programme for employees to enable them to adhere to the safety regulations in the workplace (Zwesloots, Gerald, Aaltonen, Wybo, Saari, Kines & De Beeck 2013:7).

One of the main goals would be for an organisation to mitigate accidents by inculcating a culture of safety adherence in the workplace and this can be achieved through proper safety training (Feng, Zhang, Wu, Liu, Wang & Bogus 2014:98). It is imperative for employees to undergo proper safety training and be taught on matters such as appropriate use of (PPEs), hazards identification and risk assessment (Rim & Lim 2014:49).

### **2.12.2 Rewards as motivation to safety adherence**

Rewarding good behaviour plays a critical role in the workplace. This motivates other employees to do their work diligently and safely. Safety competitions are a form of an effective tool to use to improve adherence to safety in the workplace. These rewards can be on an individual or collective basis. This is normally achieved by pitting one department against the other to see which department will experience the least accidents in a particular department (Grobler et al. 2011:467).

The competitions encourage employees to pay attention when performing their duties. These practices usually happen in the mining sector where employees in a certain

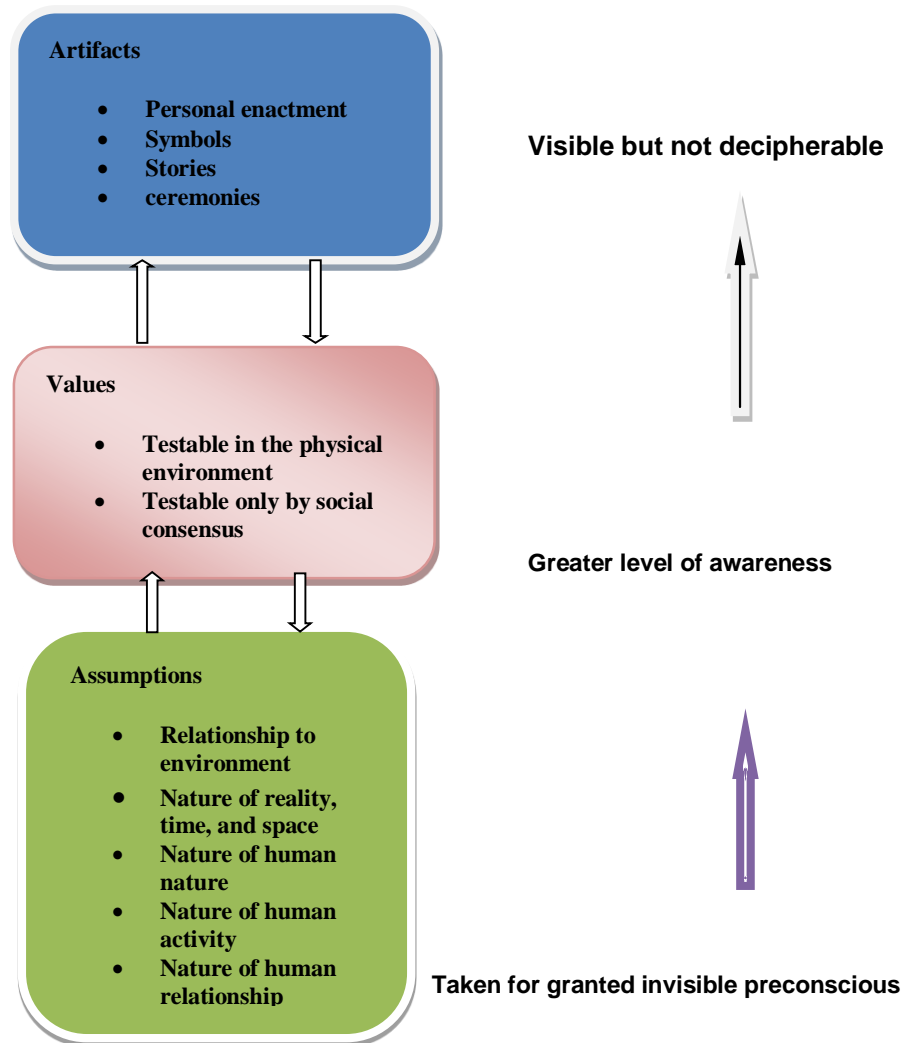
division are rewarded financially for experiencing few accidents (Schultz & Schultz 2006:333).

## **2.13 ORGANISATIONAL SAFETY CULTURE**

Organisational culture is defined as a system of well-shared beliefs and values that influence employee's behaviour in an organisation (Dubrin 2002:278; Macey, Schneider, Barbera & Young 2009:43). For the purpose of this study safety, culture is described as a brief summary of the beliefs and perceptions of the employees about safety in the workplace, which influences employee's behavior (Fernandez-Muniz, Montes-Peon, & Vazquez-Ordas 2011:743).

Scholars in the occupational health and safety field consider the concept organisational or corporate culture to be a learned phenomenon that varies from one organisation to another. Organisational aspects such as societal, environmental, and historical influences have an impact on the safety culture in the workplace. The nature of the organisation's business also influences the organisational systems and assists in identifying the true culture of an organisation (Cheyne, Oliver, Cox, & Tomas 2002:650).

An interest in the organisation's adherence to health and safety regulations has grown in the wake of high profile industrial accidents. An example of such an incident includes the Clapham Junction rail disaster in the United Kingdom (UK), the Bhopal disaster in India and the Russian Chernobyl nuclear plant incidents. The concept organisational culture became popular in the early 1970s (Huang, Chen, DeArmond, Cigularov & Chen 2007:1090). It is widely believed that employees can prevent occupational accidents by maintaining a positive safety culture. A safety culture relates to the nucleus of assumptions and beliefs that organisational members are familiar with safety related matters. This is usually expressed through organisational beliefs, behavioural norms, values of supervisors, and managers, and this is usually found in the organizations' safety policies, rules, and procedures that the organisation espouses (Clarke 2003:42). The levels of organisational culture are discussed in detail in the next section.



**Figure 3: Levels of organisational culture**

(Source: Nelson & Quick 2003)

The levels of organisational culture are illustrated graphically in Figure 3 which explores vital aspects of organisational culture including artifacts, values and assumptions.

### 2.13.1 Artifacts

Symbols of culture in the social work space and physical environment are known as artifacts. Artifacts are highly visible and accessible to all employees and influence the levels of culture on employees. Among the artifacts of corporate culture are personal enactments, ceremonies, stories, rituals, and symbols. Personal enactment probes



the behaviour of an organisation's workforce and this includes behavior such as adherence to safety regulations. It can therefore be argued that when employees observe the above-mentioned artifacts, it becomes easy for employees to adapt to the safety culture of the organisation (Kreitner & Kinicki 2001:68).

Personal enactment by high echelon members of the organisation such as chief executives, safety managers, and supervisors provides a great deal of insight into the value systems when it comes to safety. Whether employees in the organisation comply with the employer's values when it comes to safety depends on whether the management instills such behaviour (Wallis, Yammarino & Feyerherm 2011:184).

If an organisation gives the health and safety employees priority it will automatically influence other employees. This will make it easy for other members of the organisation to adhere to health and safety regulations within the organisation because the management demonstrates commitment to safety of employees (Nelson & Quick 2003:539).

### **2.13.2 Values**

Armstrong (2003:263) delineates values as what is believed to be important about and how people in organisations should behave. Workplace accidents should be managed to avoid excessive medical costs and not compromise employee's safety. It is widely believed that adherence to safety regulations contribute immensely to higher levels of motivation in the workforce (Hadjimanolis & Boutras 2012:3).

An organisation's philosophy is usually expressed through values. Values in organisation are core drivers that guide the required behaviour of employees on a daily basis. When management adopts a relaxed attitude toward safety adherence employee's safety will be compromised. This is because employees will feel that the employer does not value their worth in the workplace (Dubrin 2002:279).

### **2.13.3 Assumptions**

The term assumption is described as deeply held beliefs that guides a certain behavior and dictates to organisational members to identify and think about certain

organisational aspects (Nelson & Quick 2003:544). To strengthen this definition if an employer regularly conducts training and discourages irresponsible behaviour concerning safety, employees will easily learn the required behaviour and safety standards endorsed by the organisation. This will assist removing the culture of non-adherence and embrace a culture of adherence (Werner et al. 2011:341).

## **2.14 TRADE UNION INVOLVEMENT IN HEALTH AND SAFETY**

Trade unions are best known as organisations that are formed to guard their constituencies' needs and to advance their working conditions. A trade union is defined as an association of employees whose prime purpose is to regulate the employment relationship between the employer and employees through a direct process of collective bargaining (Tustin & Geldenhuys 2000:91-92).

The trade union is accepted as an authentic structure that co-ordinates various employee's interests. One of those primary interests is safeguarding member's health and safety in the workplace (Adhikari & Gautam 2010:45; Venter et al. 2011:9; Sloane, Latreille & Oleary 2013:175; Cantor 2008:72).

Barker (2007:86) and Bendix (2010:40) maintained that an individual employee does not possess equal power as an employer when it comes to bargaining power. In order to match the strength of the employer, trade unions must attract and organise members to join unions. The reason why employees join unions is that those who are affiliated to unions enjoy safer working conditions, and earn better wages than non-unionised employees (Phillips & Gully 2014:416). Table 2 outlines the fundamental reasons why employees choose to join a trade union.

**Table 2: Motivation why employees join trade union**

Reasons	Explanation
Job security	The principal aim of the unions is to protect their followers against unfair dismissal, unsafe working conditions, and retrenchments. This is predominantly true in South Africa as accidents and retrenchments are rife.
Protection from exploitation	The underlying rationale for the establishment of unions is because employees need to be collectively united and protect workers interest against exploitation by capital. Workers who are united are in a far better position to match the power of the employer.
Economic and welfare needs	The principal function of a union is to make sure that wage demands of their constituencies is adequately met.
Socialization and self-fulfillment	Trade unions create a sense of belonging for employees in an organisation. This is important particularly to new incumbents who might feel marginalized when joining an organisation.
Political reasons	Trade union federations such as Congress of the South African Trade Union (Cosatu) still influence policies to pressurize the government. The Labour Relations Act no: 66 of 1995 (LRA) makes provision for unions to embark on socio-political protest action in order to protect the socio-economic welfare of their constituencies.
Protection from a particular trade	Craft unions in particular are established with the primary purpose of protecting their members who are uniquely skilled and practice a specific trade. Employees join such unions to have their interests protected.
Psychological needs	Unions often fulfill needs of members by belonging to a specific group.

(Source: Venter et al. 2011:91)

### **2.14.1 The role of safety committees in the workplace**

Section 19 (1) of the OHS Act requires that the employer establish a safety committee in the workplace (Lexis Nexis 2005:9). The function of a health safety committee is to firstly make recommendations to their employer or labour inspector in matters that concern the employees' health and safety.

Secondly, to report any wrong doing or any occupational accident in the workplace or incident in which anyone is injured or killed. This committee plays a critical role of policing the workplace particularly when employees show low levels of safety adherence. The committee also encourages employees to comply with the safety regulations in the workplace (Finnemore & van Rensburg 2002:468).

## **2.15 THE MAGNITUDE OF OCCUPATIONAL HEALTH AND SAFETY PROBLEM IN SOUTH AFRICA**

Due to rapid industrial development, regional economic integration and an increase in the levels of living standards around the world some companies tend to focus on mass production and safety becomes secondary. In some cases, employers tend to circumvent health and safety regulations and focus primary on the bottom line than the safety of employees. When accidents occur in a workplace this will have an impact on productivity and could even damage the reputation of an organisation (Knegtering & Pasman 2009:165). To support this statement one would have to refer to three most catastrophic incidents that happened in South Africa.

Firstly, the Kinross Mpumalanga mine disaster that occurred on the 16 of September 1986 that resulted in 177 miners dying due to inhalation of a lethal fume. These highlighted poor safety standards experienced by employees in some workplaces (Department of Labour 2005:1). Secondly, January 2005 Sasol Natref Sasolburg incident were 17 employees were severely injured. Lastly, the catastrophic Sasol Secunda explosion were 10 employees lost their lives and over 100 employees were injured while performing their duties (Matthew 2008:3).

Occupational accidents and diseases cause massive financial burden on South African organisations as well as the State. A 1997 study conducted by the Department of Labour estimated the costs of industrial incidents and diseases in 1996 to be around 17 billion rand, which equates to 3.5 % of the national Gross Domestic Product (GDP). In 2003, this figure escalated to a massive R30 billion rand per annum (Govindjee 2012:4).

The above-mention figure highlights the challenge that faces many employers and the State due to the failure to adhere to the safety regulations. The following are some of the costs experienced by employers due to occupational accidents: property damages, high rate of absenteeism, loss of skills and production due to employees being injured or ill and costs of engaging and retraining replacements of injured or a dead employee (National Occupational Health and Safety Policy 2003:4).

### **2.15.1 Psychological contract and safety**

Munchinsky (2003:323) describe psychological contract as the employee's perception of the reciprocal obligation that exist within the organisation. Employees have a belief about the organisation's obligation to them. Employees believe that an employer is supposed to provide safe working conditions in terms of the OHSA. Employers on the other hand also believe that employees should adhere to all health and safety requirements in terms of the Act. If one of the parties fails to live up to the commitment of the contract this can lead to either parties rescinding from the contract, which can prompt non-adherence by employees.

If a new employee is given an impression by the employer that when he/she performs exceptionally well on the job, the employee should be rewarded and failure to honour this agreement will lead to a compromise in the psychological contract. When the employer fails to honour this psychological contract the employee will deem the psychological contract as non-existent (Osland, Kolb & Rubin 2001:5).

### **2.15.2 A national preventative safety and health culture**

Policymakers, businesses, and trade union movements together need to take occupational health and safety into serious consideration if they want to win the battle against industrial accidents. The ILO estimated that there are approximately 230000 deaths and about 10000 cases of occupational accidents annually in the Southern African Development Communities (SADC) (Govindjee 2012:4).

A high number of accidents occur mostly in developing countries with a mortality rate of 14 fatalities per 100000 employees as compared to developed countries. It is very critical in developing countries such as South Africa to heed the call of taking health and safety of employees seriously as a *bona fide* member of ILO (Yakovlev & Sobel 2010:433). Since South Africa has a serious skills shortage, it would make economic sense to protect the wellbeing of employees in a workplace (Ho et al. 2006:961).

Occupational diseases and injuries in South Africa places a serious burden on the economy, and around 122889 employees experience occupational accidents and

illnesses whilst executing their duties, (1%) which is equivalent of 884 employees who die due to workplace accidents. This contributes to a number of workdays lost because of sickness suffered by employees (Huess Hedlund 2013:150).

No employer, family member, or co-worker ever wants to experience fatalities in the workplace due to the devastation caused to families such as death and taking care of a sick employee (Health and Safety Executive 2011:1). To be able to achieve excellent health and safety records it is imperative that all stakeholders in the employment relationship, namely, the employer, employees and the State cooperate fully (Smallwood & Musonda 2008:83).

Employees in any organisation are the most valuable assets and should to be protected. This is, however, not the reality in some companies when it comes to adherence with safety regulations (Marmot & Goldblatt 2013:11). Some employers particularly those employing low skilled employees view expenditure on occupational health and safety as a financial burden (Farmer 2010:10).

The next section discusses the importance of promoting decent work and some of the indicators that constitute decent work. In order to understand the legal obligations of the employer it is important to explore the concept decent work and some of the indicators that promote decent work in the workplace.

### **2.15.3 Promotion of decent work as set out by the (ILO) norms and standards**

The protection of vulnerable employees against occupational diseases, injuries, and sicknesses is embodied in the ILO constitution preamble and it has taken center stage since 1919. The ILO constitution is aimed at prioritizing workers' rights to safe working conditions in the workplace (International Labour Organisation 2004:3).

The South African Decent Work Country Programme (SADWCP) is an inclusive process that incorporates all major role partners in the labour relations sphere such as the ILO and NEDLAC and prominent social partners such as business, communities, labour and government. However, the drafting of the SADWCP took place during tough economic times when the economy was in a recession in 2008. This threatened significant economic gains that have been made by South Africa since democracy in

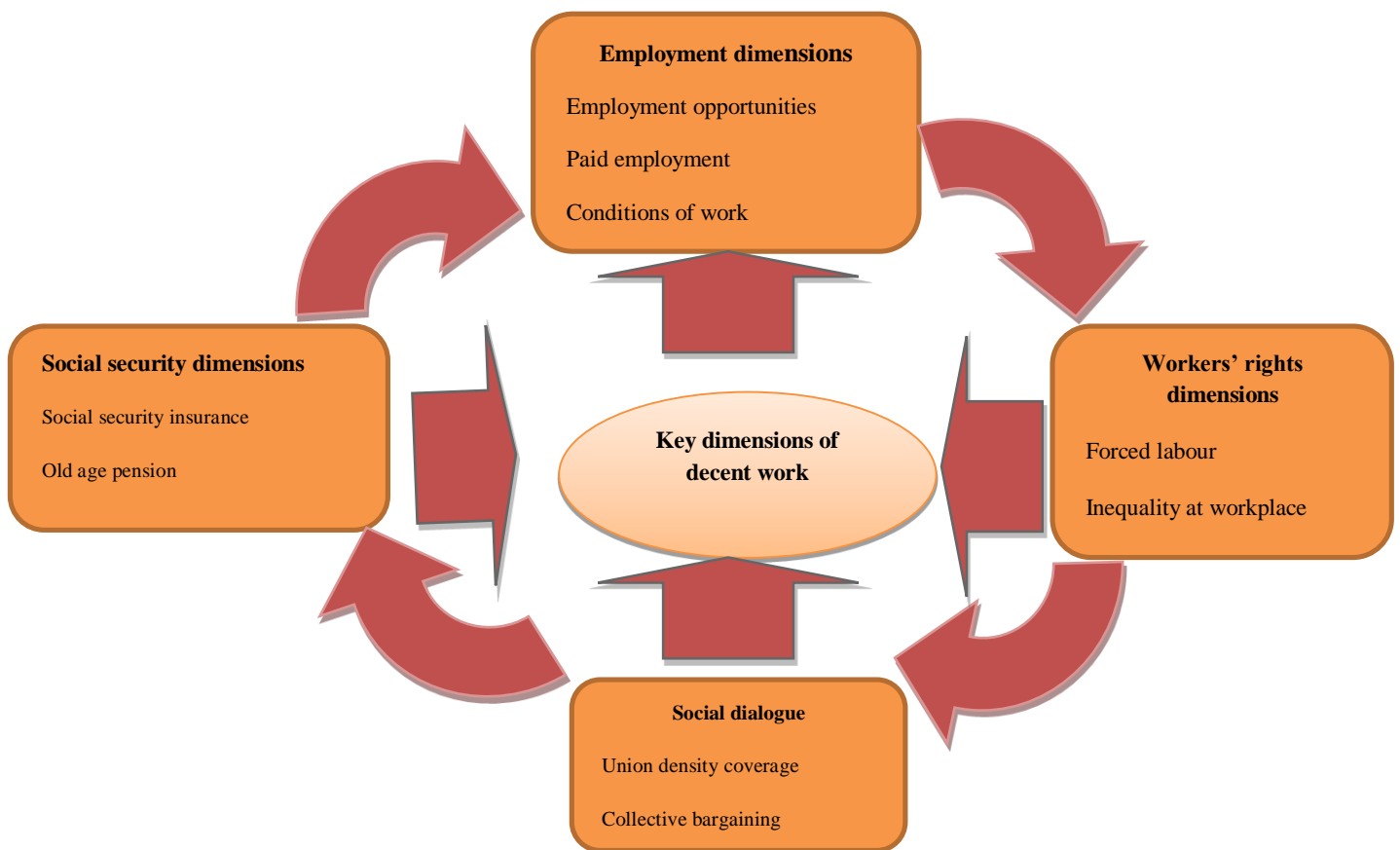
1994 posing a serious danger to the vulnerable workers (International Labour Organisation 2010:4).

According to Takala (2002:1) safety of workers is part of human security. Employee's safety at work is not only a sound economic policy, but a basic human right enshrined in the Constitution. In recent years, there has been an increase in public interest and scrutiny in the field of occupational health and safety and its impact on employees' rights (Eweje 2005:165).

The phrase "decent work" was mooted in 1999 by ILO. Decent work is defined as a mechanism of creating regulations and institutions that enable a large number of people in all societies, to work without any form of oppression, and being provided reasonable security and steadily affording opportunities for employee's personal development and growth (Lawrence et.al 2012:164-165).

The International Labour Organisation (2007:7) and Adhikari, Hirasawa, Takakubo and Pandey (2012:63) define decent work as working under conditions of freedom, equity, security, and human dignity. This involves opportunities for work that is productive and awards fair income and offers security in the workplace and social protection. Based on this definition the following decent work indicators will be discussed: employment dimensions; social security; workers' rights; and social dialogue.

A model indicating the promotion and benefits of decent work is provided in Figure 4.



**Figure 4: Decent work indicators**

(Source: Lawrence, Gil, Fluckeriger, Lambert & Werna 2008)

The first indicator includes factors such as employment opportunities, paid employment and conditions at the workplace including workplace safety (Lawrence et al. 2011:165). The EEA was hailed as a landmark in the South African employment history and aimed at offering decent employment opportunities to designated groups. The EEA made considerable contributions in reshaping the socio-economic and political framework in South Africa. This is achieved by normalizing the workplace environment by creating fair and equal employment opportunities to all employees through the elimination of unfair discrimination and unequal wage disparities (Venter, Levy, Holtzhausen, Conradie, Bendeman, Dworzanowski-Venter 2011:236).



Employee's levels of compensation or pay affect their productivity and their tendency to stay within the organisation. However, employees need for income and fair treatment by employers makes the developing of fair and equitable compensation scheme very crucial, because without a justifiable and fair payment system employees may be too lax and ignore safety regulations (Cottini, Kato & Westergarrd-Nielsen 2011:873). If this occurs, it can have devastating consequences for an organisation. When employees are not happy due to poor pay and an unsafe environment, there is the potential of causing employee not to adhere to the OHSA (Grobler et al. 2011:401).

The legislative framework overseeing employment relationship between employer and the employee is indicative of the State's involvement in upholding the employee's right to safety in the workplace. Section 8 (1) of the OHSA state that an employer must provide and maintain reasonable and practicable working environment that is safe and without risk to the health and safety of all employees (Lexis Nexis 2005:7).

Without a good labour relations system, South African organisations will face a challenge of becoming a global player in the steel manufacturing sector, which is highly competitive. Whether one is self-employed, work for a company, or employed by the government, good relations in the workplace are fundamental for maintaining sound labour relationships. In South Africa, the employment relationship co-exists between the employer, employee, and labour and this is usually referred to as the tripartite relationship (Grobler et al. 2011:481).

## **2.16 CONCLUSION**

Occupational accidents bring with it severe financial implications for both the employee as well as the employer. This has a negative impact on the economy of the country due to the large amount paid for accidents and diseases, which could be diverted to other State departments. This occurs mainly because health and safety regulations are overlooked at the expense of profits margins. Families of the deceased are the ones that bear the burden due to the ripple effect of occupational accidents; most families lose their loved ones and breadwinners. Lastly, the country and organisations lose critical skills due to accidents and diseases that happen in the workplace. For an organisation to succeed in reducing accidents they need to focus more on safety

training and focus more on modification of employee behaviour of employees, because behaviour plays a pivotal role when it comes to enhancing safety adherence.

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

#### **3.1 INTRODUCTION**

In the previous chapter, attention was focused on the literature review where concepts such as employee, employer, and labour inspector were clearly defined and the researcher outlined the role that these individuals play regarding adherence with the OHSA. Various pieces of legislation regulating the employment relationship regarding occupational health and safety within the workplace were reviewed. The reviewed statutory instruments were the Constitution, COIDA, LRA, BCEA and the OHSA. Emphasis was also placed on the socio-economic implications of accidents on the employees, employers as well as the economy.

This chapter outlined the research methodology and design that were executed throughout the study. According to Wisker (2009:88) and Lues and Lategan (2006:17) the term, methodology is described as the coordination of ideas that enables the researcher to deal or address research questions to solve a particular research problem. The sampling design, data collection technique and a discussion of the measuring instrument is outlined. The statistical procedures that were selected for data analysis and the ethical issues are highlighted.

#### **3.2 PERMISSION TO CONDUCT THE STUDY**

Research must be based on principles of mutual respect and there must be trust between the respondents and the researcher (Gaiser & Schreiner 2009:25). The researcher addressed the ethical issues in this study by including informed consent, voluntary participation, and confidentiality (Clough & Nutbrown, 2012:187; Potter 2006:213). An authorization letter to conduct the study was sought from the company. Permission was granted to the researcher to commission the study (Annexure A).

#### **3.3 PILOTING OF A QUESTIONNAIRE**

In order to facilitate communication between the researcher and participants, questionnaire distribution was deemed an appropriate method to gather such

information (Davies 2007:82). Schutt and Engel (2010:190) contend that under no circumstances a questionnaire could be regarded ready without undergoing the piloting process. Gillham (2000:19) indicated that the piloting stage is the first phase of questionnaire development before the researcher can roll out the actual questionnaire. After the questionnaire was formulated, a pilot study was undertaken to determine the reliability of the questionnaire for the study. Welman and Kruger (2001:141) and Tustin, Ligthelm, Marins and Van Wyk (2005:413) stated that the aim of conducting a pilot study is to detect possible errors and to identify ambiguous and unclear items.

### **3.4 RELIABILITY AND VALIDITY**

Reliability is concerned with the findings of the research and relates to the credibility of true findings in the research project (Welman & Kruger 2005:145). Reliability is referred to as the extent to which a scale produces consistent results if repeated measures are conducted (Malhotra 2010:318; Vogt, 2007:114). This simply means that when a researcher is to repeat the research similar results as those obtained originally should be obtained. Reliability results are indicated in Table 3. The Cronbach alpha coefficient was identified to assess reliability (Welman & Kruger 2005:145; Leedy& Ormrod 2014:93; Salkin 2012:109).

The Cronbach alpha coefficient method is described as one that is usually used to measure internal consistency of an instrument (Huck 2004:80). Gray (2009:363) states that the degree of consistency is measured by reliability scale from 0.00 (very unreliable) to 1.00 which indicates (perfect reliability). In respect of this research the reliability of the scales was more than the required 0.70 (Table 3) which was considered satisfactory (Welman & Kruger 2005:145). Thirty completed questionnaires were used to test the reliability.

#### **3.4.1 Reliability of the pilot study**

To determine the levels of reliability SPSS 22.0 for windows was used for statistical analysis of the pilot results. The Cronbach alpha coefficient for the pilot study was 0.933. The following items were deleted to increase reliability levels in section C: C1 and C15 (information and training in health and safety), Section D: D1, (employee

safety awareness), Section H: H3, (rewards and recognition), Section G: G5, (role of a supervisor in health and safety), Section I: I5, (accidents reporting mechanism in health and safety), Section J: J5 (workplace safety inspection) and Section L: L1 (role of the union in health and safety issues). After removal of these items the reliability value increased to 0.952 which surpassed the acceptable reliability level of 0.70 as suggested by Marre et al. (2010:216). The results of the pilot study after the deletion of items are reported in Table 3.

**Table 3: Deleted items**

Section deleted	Item	Reasons
C1	Information and training in health and safety	Low-item total correlations
C15	Information and training in health and safety The above 2 are the same-please check?	Low-item total correlations
D1	Employee safety awareness	Low-item total correlations
H3	To assess employees perceptions of the influence of rewards on health and safety	Low-item total correlations
G 5	Role of a supervisor in health and safety	Low-item total correlations
I5	Accidents reporting mechanism in health and safety	Low-item total correlations
J 5	Workplace safety inspection	Low-item total correlations
L1	Role of the union in health and safety issues	Low-item total correlations

### 3.4.2 Validity

The value of a true research project is measured by elements of trustworthiness, validity, and soundness (Brynard, Hanekom & Brynard 2014:50). A research project is regarded credible if (a) it produces information that seeks to answer the research questions sought after by the researcher, (b) accurately describes the sample or population in hand, and (c) can be extended to individuals beyond the respondents of the study (Andres 2012:115).

Malhotra (2010:320) and Babbie (1998:133) and Rohilla (2010:98) delineate “validity as the extent to which an empirical measure adequately reflects the real meaning of the concept under consideration. Welman and Kruger (2005:142) stated that validity is the extent to which the research finding accurately represents what is really

happening in a particular situation. The outcome or test is regarded effective and valid if it demonstrates or measures what the researcher claims or thinks it does. In light of this, research validity was determined using the following measures.

### **3.4.3 Content- related validity**

Fink (2010:117) and (O' Leary 2004:61) stated that in order to assess content validity one must first consider exactly what is that they want to achieve. Maree et al. (2003:217), Kaplan and Saccuzzo (2001:133) and Fink (2008:195) described content validity as the extent that covers the complete content of the particular construct that is set out to measure. Mustafa (2010:222) and Vijayalakshmi and Sivapragasan (2008:82) stated that the primary purpose of content validity is to check whether the questionnaire structure, design and the language is accurate and not vague. To determine the design and ambiguity of language on the questionnaire certain items were deleted this was reported in Table 7 of Chapter 4 Section 4.2.

### **3.4.4 Construct validity**

Balnaves and Caputi (2001:89) and Mashego (2014:64) defined construct validity as the degree to which an instrument measures theoretical constructs that it is intended to measure. In this research project theoretical construct is referred to as information and training in health and safety, employee safety awareness, employee safety adherence, employee behaviour with regard to health and safety and the role of the union in health and safety issues. Construct validity is reported in Chapter 4 (Section 4.7.3)

### **3.4.5 Convergent validity**

Naile (2015:83) defined convergent validity as the degree to which the scale correlates positively to similar constructs evaluated using various methods. According to Mashego (2014:64) for convergent validity to be implemented measures of construct should be observed or interrelated to each other. This can be explored by multi-trait method analysis where two or more traits are evaluated. Convergent validity is in chapter 4 (Section 4.7.4)

### 3.5 RESEARCH APPROACH

Gray, Williamson, Karp and Dalphin (2007:42) submitted that qualitative and quantitative researches are the two basic research approaches used to conduct research. However, there is another third approach called mixed or triangulation method, which combines both qualitative and quantitative research. To gain a deeper understanding of the level of employee adherence to the OHSa a quantitative approach was used in this study.

#### 3.5.1 Quantitative research

Quantitative research is defined as a technique that seeks to quantify data by applying some form of statistical analysis (Osborne 2008:129). The rationale behind selecting a quantitative study was that it is relatively cheaper, flexible, and more objective. The main objective of quantitative research is to quantify the data and generalize the results from the sample to the population of interest. Generalizability is defined as the degree to which a sample based study can be applied to the whole universe (Malhotra 2010:321). The sample contained a large number of representative cases, the data collection is structured, data analysis is statistical, and the outcome is that a final course of action is suggested. For this study, a quantitative approach was undertaken. Table 4 depicts the characteristics of both the quantitative and qualitative research approaches.

**Table 4: Distinguishing characteristics of qualitative and quantitative**

Question	Quantitative	Qualitative
<b>What is the purpose of research?</b>	<ul style="list-style-type: none"> <li>To explain and predict</li> <li>To confirm and validate</li> <li>To test a theory</li> </ul>	<ul style="list-style-type: none"> <li>To describe and explain</li> <li>To explore and interpret</li> <li>To build theory</li> </ul>
<b>What is the nature of the research process</b>	<ul style="list-style-type: none"> <li>Focused</li> <li>Known variables</li> <li>Established guidelines</li> </ul>	<ul style="list-style-type: none"> <li>Holistic</li> <li>Unknown variables</li> <li>Flexible guidelines</li> </ul>
<b>Data collection method?</b>	<ul style="list-style-type: none"> <li>Representative, large sample</li> <li>Standardized instrument</li> </ul>	<ul style="list-style-type: none"> <li>Informative, small sample</li> <li>Observations, interviews</li> </ul>

<b>What is the form of reasoning used in analysis</b>	<ul style="list-style-type: none"> <li>• Deductive analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Inductive analysis</li> </ul>
<b>How are findings communicated</b>	<ul style="list-style-type: none"> <li>• Numbers aggregated data</li> <li>• Use statistics.</li> </ul>	<ul style="list-style-type: none"> <li>• Words</li> <li>• Narratives, individual quotes</li> </ul>

Source: (Leedy & Ormrod 2001:102).

### **3.6 DATA ANALYSIS**

After the researcher collected all the necessary data from the target population, the data was subjected to statistically analysed.

### **3.7 DATA PREPARATION**

The following data preparation procedures editing, coding and data cleaning were implemented in this study to ensure that the questionnaire was complete and ready for distribution. These methods are discussed in the following sections 3.10.1 to 3.10.3.

### **3.7 DATA COLLECTION METHOD**

The method that was applied by the researcher to solicit the required information regarding employee's adherence to safety was a structured questionnaire. A questionnaire is described as a document that contains written questions that the target population has to respond to directly on the questionnaire form (Dejong, Sullivan & Monette 2002:162). One hundred and sixty-five questionnaires were disseminated with the assistance of 6 well-trained field workers to collect data from participants from one of the biggest steel manufacturing companies in Southern Gauteng. The purpose and advantages of using a questionnaire are indicated below (Fox & Saheed-Bayat 2007:100; Swartz et al. 2008:29).

- To draw accurate information from the research participants;
- To provide a standard format in which facts, comments, and attitudes can be recorded;



- It provides a structure to the interview so that it flows smoothly and orderly;
- Finally, it facilitates data processing;
- Is cost effective; and
- Easy to assess.

For these study closed-ended questions was preferred because of its speed, ease to process with computers, and simple to analyse statistically. According to Maree, Creswell, Ebersohn, Eloff, Ferreira, Ivankova, Jansen, Nieuwenhuis, Pietersen Plano Clark and Van der Westheizen (2010:167) and Bell (2010:146) it is recognized that a well-known and useful manner of measuring how participants think and feel is by using scales. Below is an example of a questionnaire depicting the Likert scale

**Figure 5: Example of questionnaire using 1 to 5 Likert scale**

	Strongly disagree	Disagree	Neutral	Strongly agree	Agree
C.1.	1. <b>X</b>	2.	3.	4.	5.
C.2.	1.	2.	3.	4.	5. <b>X</b>

(Source: Welman & Kruger 2001:153)

The questionnaire was divided into three sections to collect the relevant information; the following aspects were covered by the questionnaire (Annexure B)

- **Section-A** focused on voluntary participation; this meant that the researcher sought permission first from the participants.
  - **Section-B** covered the biographical features of the participants.
- Section-C** focused on the research questions, which is the core of the research. The questions focused on:
- (a) Information and training in health and safety;
  - (b) Employee safety awareness;

- (c) Employee safety adherence;
- (d) Employee behaviour with regard to health and safety;
- (e) The role of the supervisor in health and safety;
- (f) Accident reporting mechanisms in health and safety;
- (g) Workplace safety inspection;
- (h) Workplace environment;
- (i) The role of the union in health and safety issues; and
- (j) To assess employee's perceptions of the influence of rewards on health and safety.

### **3.8.1 Research field workers**

The project leader acquired the services of 6 research field workers as previously indicated in section 3.7. The use of field workers was prompted by the large sample size that was involved in the study. The project leader trained the field workers on how to assist respondents to fill in the questionnaire.

## **3.9 SAMPLING DESIGN PROCEDURE**

The following sampling procedures were undertaken for the study:

### **3.9.1 Target population**

O'Leary, Groves, Fowler, Couper, Lepkowski, Singer and Rodger (2010:161) defined target population as a total membership of a distinct group of individuals, objects or events with the primary purpose being to collect data from every element within that population. Population is defined, as a collection of elements or objects that possess the information that is sought after by the researcher (Malhotra 2010:372; O'Leary 2010:160).

In this study, the population consisted of employees from a major steel manufacturing company in Southern Gauteng. Even though the steel manufacturing sector is predominantly, a male dominated industry, the study comprised both male and female participants between the ages of 18 to 65 years. The total population for the study was (N=748) and the study included employees who were technically skilled,

candidate engineers, supervisors, qualified artisans, candidate technicians, graduates in training and entry-level apprentices.

### **3.9.2 Sample frame**

Immediately after the target population was identified there was a need to establish a sampling frame. A sampling frame is known as an objective list of the population from which the researcher can make a selection process (Strugwig & Stead 2001:109). A comprehensive sampling frame should ideally contain a complete and up to date list of all participants that encompass the population who are working within the organisation (Denscombe 2007:109; Blair, Czaja & Blair 2014:111). The list for the study population was obtained from the Human Resource Division of the company.

### **3.9.3 Sampling technique**

The field of research methodology consists of two types of research approaches. There is non-probability sampling and probability sampling (Daniel 2012:66). Non-probability sampling is a technique where there is no way of estimating an individual's inclusion in the sample (Russell & Purcell 2009:179).

Oliver (2010:77) stated that probability-sampling method is a technique whereby each member of the population has a known probability or prospect of being selected to participate in a research (Leedy & Ormrod 2010:205). Heeringa, West, and Berglund (2010:15) stated that the main function of a population is for the researcher to identify in advance a section of the population that will be represented in the sample.

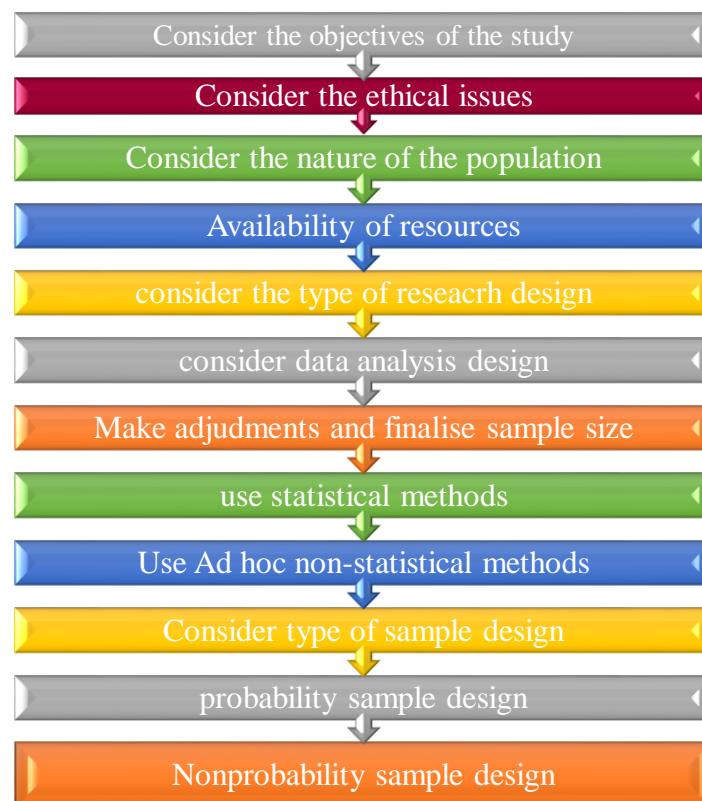
Non-probability sampling technique is described as elements that are within the population and do not have a guaranteed chance or probability of being included or selected for the research (Engel & Schutt 2010:93). In non-probability, sampling findings of the study are not generalized. The sampling technique employed in the study was purposive sampling. Purposive sampling is aimed at addressing specific research questions by selecting cases that are information rich regarding the questions (Teddie & Tashakkori 2009:173-174). According Singh and Bajpai (2007:150) purposive sampling offers the following advantages:

- Uses the best available knowledge concerning the target population;

- Data from the sample can be easily matched; and
- There is enhanced control of significant variables.

### 3.9.4 Sample size

Researchers are frequently faced with a challenge of who will participate in a research study. This is vital, as it will have a direct effect on the results of the study (Graziano & Raulin 2010:103). Rubben and Babbie (2010:132) described a sample as a subdivision of a specific population in which the researcher or project leader is interested in, and wants to involve in the study. It is imperative when deciding a criterion of a sample size that caution be exercised to ensure that it is representative of the population (Bless & Higson-Smith 2000:94). For this study, a representative sample size of (n=165) employees was designated. Figure 6 highlights the following as acceptable guidelines when determining a sample size (Daniel 2012:239).



**Figure 6: Guidelines determining a sample size**

**Source:** Daniel (2012:239)

### **3.10 DATA PREPARATION**

The following data preparation procedures: editing, coding and data cleaning were implemented in this study to ensure that the questionnaire was complete and ready for answering.

#### **3.10.1 Editing**

Editing involves the process of checking completeness, consistency, and eligibility of data and making the data ready for coding and transfer to storage. Occasionally a field-worker makes a mistake and records an improbable answer; for example (birth year: 1890 instead of 1990). This and other errors were rectified before the data was coded. The purpose of editing is to ensure completeness, consistency, and readability of the data to be transferred for storage. The editor's task is to check inaccuracies on the questionnaires.

Editing is often done in two stages; the field edit and the central office edit. The field edit is a preliminary edit, designed to detect the most glaring errors and inaccuracies in the data. It is also useful in helping to control the field force and to clear up misunderstandings about procedures and specific questions (Churchill & Iacobucci 2005:406). The field edit is typically followed by the central office edit, which comprises a more complete and exacting scrutiny and correlation of the completed returns. This task calls for a keen eye of a person well versed in the objectives and procedures of the study. To ensure consistency of treatment, it is best if one individual handles all completed questionnaires (Churchill & Iacobucci 2005:407). Editing was undertaken by the researcher in consultation with the supervisor.

#### **3.10.2 Coding**

The process of identifying and classifying each response with a numerical score or other character symbol is known as coding (Kelly 1997:178; Babbie 1998:365). This was done by assigning numerical scores that permit the transfer of data from the questionnaire into Excel. Codes generally are considered numbered symbols. However, they are more broadly defined as "rules for interpreting, classifying, and capturing data" (Santhakumaran & Sargunamary 2008:62). Codes allow data to be

easily processed for analysis on the computer (Presser, Rothgeb, Couper, Lessler, Martin, Martin & Singer 2004:116). Table 5 depicts an example of a coded questionnaire.

**Table 5: Example of a coded questionnaire**

Your gender	Male	Female			
	1	2			
Your racial group	African	White	Coloured	Indian	Other
	1	2	3	4	5

Source: (Presser, Rothgeb, Couper, Lessler, Martin, Martin & Singer 2004:116)

Researchers organize coded data into fields, records, and files (Zikmund 2000:560). For this study, the questionnaire was pre-coded by the supervisor. It is advisable to follow certain conventions when coding the data. Churchill and Iacobucci (2005:409) suggested the following conventions when coding data.

- Use only one character per column. Most computer programmes cannot read multiple characters per column. When the computer allows multiple responses, use separate columns for each answer;
- The field or portion of the record assigned to the variable should consist of many columns as are necessary to capture the variable;
- Use standard codes for “no information.” Thus all “don’t know” responses for any question on the survey, might be coded 8, “no answers” as 9 and “does not apply” as 0;
- Give each respondent an identification number. This number need not, and typically does not, identify the respondent by name; and
- The final step in the coding process is to prepare a codebook. The codebook contains general instructions indicating how each item of data was coded, so that the people conducting the data analysis can see what the coders did.

### **3.10.3 Data cleaning**

Quantitative research relies heavily on statistics and numbers that depend on numerous assumptions to safeguard the legitimacy of the results of the study and protection from undesirable consequences. Data cleaning is the most critical stage in research as it eliminates reporting erroneous and inaccurate results (Osborne 2013:4). During the data cleaning process all the errors were identified and corrected.

## **3.11 STATISTICAL ANALYSIS**

Descriptive, frequency analysis, mean, tabulation graphs, inferential statistics and correlation analyses were used in this study. These are discussed in the sections below.

- Frequency;
- Descriptive;
- Means;
- Correlation; and
- Regression analysis.

### **3.11.1 Frequency distributions**

To be able to determine the percentage of the participants it is advisable to conduct frequency analysis. Huck (2004:18) submitted that frequency distribution indicates how many participants were similar in the sense that measured on the dependent variable which end up in the same group or had the same score (Cramer 2003:224). Data was presented in a table format in the analysis section to highlight the frequency rate of participants. Frequency distributions displaying gender and language of respondents are shown in Table 7 and 8, Chapter 4 Section 4.4.2 and 4.4.5.

### **3.11.2 Descriptive statistics**

Descriptive statistics are techniques that help to state the characteristics or appearance of sample data (Mustafa 2010:227). Data was displayed with the use of tables and graphs. Graphs are shown in Chapter 4 Section 4.4.4 and 4.4.9.

### **3.11.3 Mean**

Mean is the average value obtained by summing all elements in a set and dividing by the number of elements. The mean, or average value, is the most commonly used measure of central tendency. It was used to estimate the mean when the data have been collected using an interval or ratio scale (Vanderstoep & Johnston 2009:92). Means are reported in Section 4.6.1 to Section 4.6.10 in Chapter 4.

### **3.11.4 Tabulation**

Tabulation of the data is the processing of the data in such a way as to make the data “talk” and arrive at meaningful conclusions. Tabulation consists of counting the number of cases that fall into the various categories (Churchill & Iacobucci 2005:410). Tabulation may take the form of a simple tabulation or a cross tabulation. Simple tabulation involves counting a single variable while cross tabulation, two or more of the variables are treated simultaneously (Churchill & Iacobucci, 2005:410-411). For this study, cross tabulations was selected. Chapter 4 Table 8 Section 4.4.2 and 4.4.5 tables were used, respectively.

### **3.11.5 Graphs**

Graphs such as line charts, pie charts, histograms, and bar charts were utilized to display research findings. Graphs were used to depict absolute and relative magnitudes, differences, proportions and trends (Mustafa 2010:205-206). These methods use both horizontal and vertical bars to examine different elements of a given variable. Chapter 4 Section 4.4.3; 4.4.4; 4.4.6, 4.4.7; and 4.4.9 indicates various graphs that were used in interpretation of data.



### 3.11.6 Correlation analysis

McDaniel and Gates (2002:560) stated that correlation analysis is the degree in which changes in one variable are associated with changes in another. Correlation analysis involves measuring the closeness of the relationship between two variables at a time (Mertens 2009:150). The level of association depicts the direction of the relationships that exists between the independent and the dependent variables of interest (Hair *et al.* 2000:56). This technique explains the closeness of the relationship among variables. Chapter 4 Section 4.4 in Table 9 illustrates the correlation analysis.

### 3.11.7 Regression analysis

One powerful method that can be used for prediction is regression. Regression analysis is usually used to answer how well one or more variables predict another variable (Mashego 2014:104). Adams, Khan and Raeside (2014:202) stated that regression analysis is technique that is more concerned about finding a close relationship between variables in a particular study. When using regression analysis, the predictor variable (X) as known as independent variable (iv) and the predictive variable (Y) is identified as dependent variable (dv) (Salkin 2012:159). For the purpose of this study a simple linear regression was selected. See Chapter 4 under section 4.5, Table 10.

## 3.12 ETHICAL CONSIDERATION

Research must always be based on the principles of mutual respect and there must be trust between the respondents and the researcher (Gaiser & Schreiner 2009:25). An authorization letter to conduct the study was sought from the company. Permission was granted to the researcher to commission the study see (Annexure A). Clough & Nutbrown, (2012:187) and Potter (2006:213) and Fox and Saheed Bayat (2007:148) and Dhurup (2015:66) submitted that a researcher should be guided on the following principles when conducting research:

- **Informed consent:** participants were informed prior to filling in the questionnaire of the objectives of the study. Participants were also informed of

their rights to grant the researcher and field workers permission to conduct the study;

- **Voluntary participation** is a principle that requires research participants not to be coerced into partaking in the research. For this research participants volunteered and were also given an option to withdraw if they wished to do so;
- **Participant harm:** respondents were not placed under any form of harm including both physical and psychological; and
- **Privacy:** All the research participants were granted an opportunity to remain anonymous throughout the duration of the study. The participants were assured that all the personal details collected will remain confidential and will be used strictly for research purpose only.

### 3.13 CONCLUSION

In chapter three, the researcher outlined the methodology that was used in the study. The research design and the measuring instruments were also highlighted. Chapter 3 provided a comprehensive discussion of the research design. For this research project to be successful, the researcher used the appropriate techniques to explore the research problem. The target population was identified for the study and a suitable and up to date sampling frame was used.

Before the questionnaire could be finalised a piloting method was employed to test the validity as well as reliability of the measuring instrument. Chapter 4 provides statistical analysis that reports on the results and findings. Diverse tools for analysis were implemented to assist the researcher to have a comprehensive understanding and breakdown of the research findings. This was executed by employing various methods such as tables, and figures.

## CHAPTER 4

### ANALYSIS AND INTERPRETATION OF RESERACH FINDINGS

#### 4.1 INTRODUCTION

In chapter 3, the researcher delineated the research design and the research approach that was implemented in the study. In chapter 4, the researcher shares insights on the reliability of the pilot study. This is followed by analysis and interpretation of data for the main study.

The statistical method that was employed for analysis in this section was descriptive in nature through frequency analysis, correlation and regression analysis and means analysis. The results of the study were presented in the form of figures and tables.

#### 4.2 OVERALL RELIABILITY OF THE PILOT STUDY

The primary purpose of pilot testing was to detect any flaws in the design of the questionnaire and to determine the reliability of the measuring instrument. Thirty questionnaires were pilot tested on part time safety management students. A Cronbach alpha coefficient was used in Sections C on 67 items. Eight items were removed as reported in Table 6.

**Table 6: Deleted items and adjustment of the scales**

Questionnaire scales	No of items on the scale	Sample size	Deleted items	Corrected item-Total Correlation
Section C	15	30	2	0.134
Section D	10	30	1	0.098
Section H	3	30	1	0.194
Section G	4	30	1	0.183
Section I	5	30	1	0.184
Section J	8	30	1	0.240
Section L	3	30	1	0.007

In section C, D, H, G, I, J and L items were deleted because of low (<0.40) item-total correlations. After the deletion of the items the reliabilities for each of the scales improved. Table 20 reports on the new reliabilities for the scales.

### 4.3 ANALYSIS OF BIOGRAPHICAL INFORMATION - MAIN SURVEY

#### 4.3.1 Employees biographical details

Section B of the questionnaire outlined the demographical details of the respondents. The following biographical information was solicited from respondents: gender, race, age group, home language, educational level, work experience, occupational level and type of employment contract. The provision of biographical information was imperative as it accorded the researcher a better opportunity to know more about the background of the participants.

#### 4.3.2 Gender of participants

**Table 7: Gender**

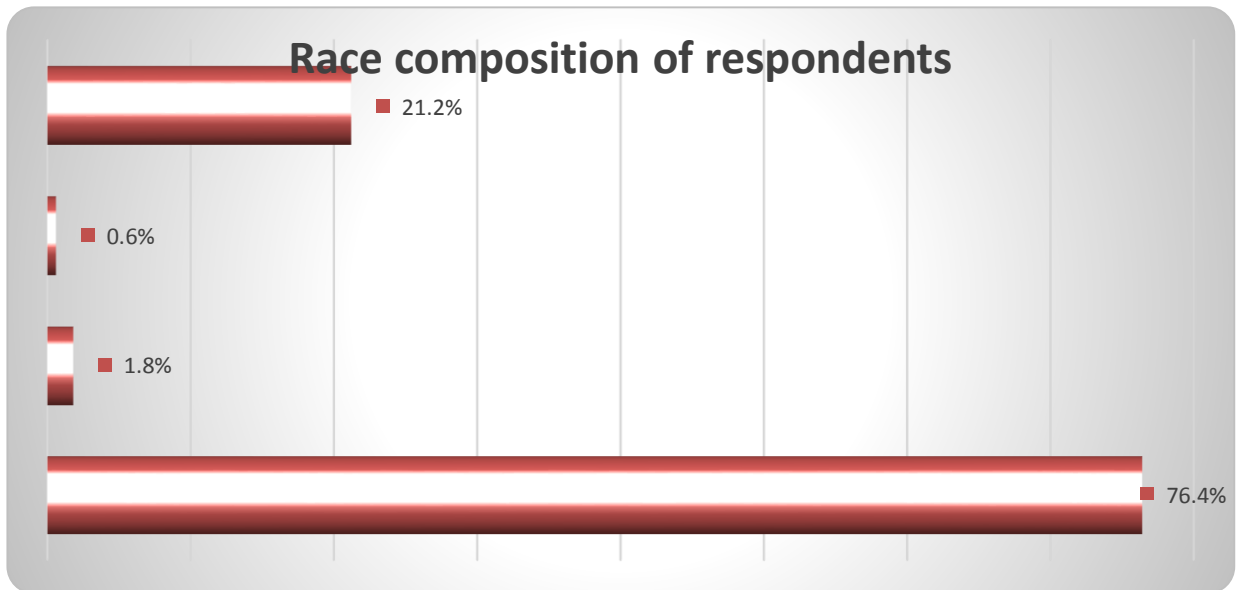
Gender of participants	Frequency	%
Males	116	70.9
Females	49	23.9
Total	165	100 %

Table 7 reports on the gender composition of the sample. There were more male respondents (70.9 %; n=116) compared to female respondents (23.9%; n=49).

#### 4.3.3 Racial classification of participants

Figure 7 indicates the racial composition of the respondents. Majority of the respondents were African (76.4%; n=126), followed by Whites (21.2%; n=35), Coloured (1.8%; n=3) and Indian (0.6%; n=1). The high number of African participants

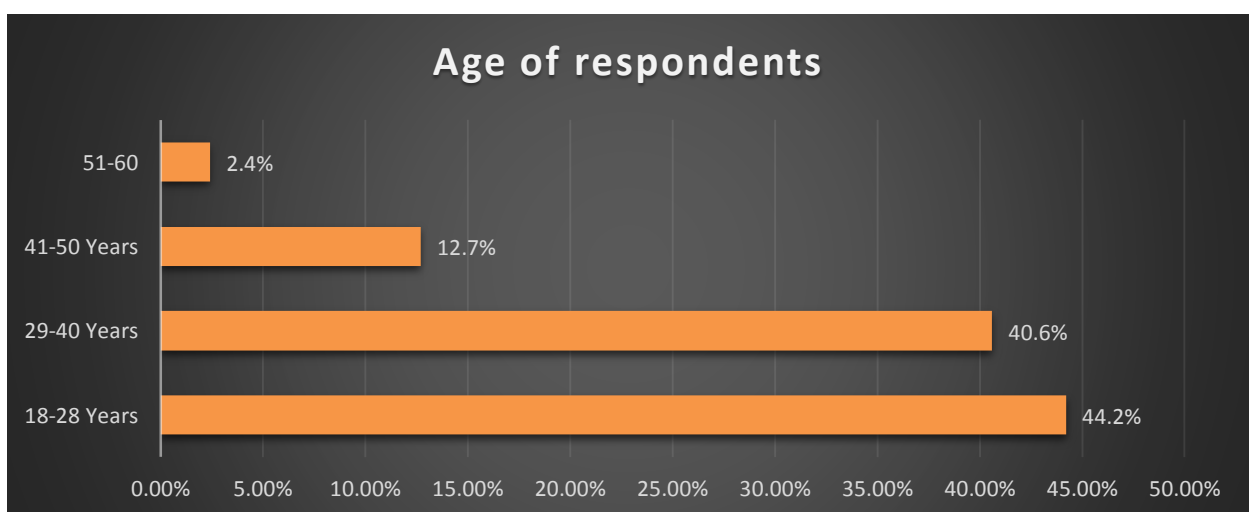
may be attributed to the fact that the steel company is situated around the surrounding townships such Sebokeng, Boipatong, Sharpeville and Bophelong.



**Figure 7: Race of respondents**

#### 4.3.4 Age

Figure 8 show that majority of employees fell within the age group of 18-28 years (44.2%; n=73). This was followed by individuals in the age group of 29-40 years (40.6%; n=67), age group of 41-50 years (12, 7%; n=21) and age group between 51-60 years (2.4%; n=4).



**Figure 8: Age of respondents**

### 4.3.5 Home language of respondents

Language plays critical role when it comes to communication in any organisation especially when communicating fundamental safety health and safety policies. Table 9 illustrates that a large number of employees were predominately Sesotho speaking (33.9% n=56) followed by isiZulu (13.9%; n=23), Sepedi (12.7%; n=21), Afrikaans (12.7%; n=20), English, (8.5%; n=14), Setswana (7.3% ; n=12), isiXhosa (4.2 %; n=7), Xitsonga (3.0%; n=5), Tshivenda (1.8%; n=3) IsiNdebele (1.2%; n=2) and SiSwati (0.6%; n=1). The main reason for dominance of Sesotho as a language was the fact that Southern Gauteng is a predominately surround by neighboring townships that are mostly populated by Sesotho speaking people.

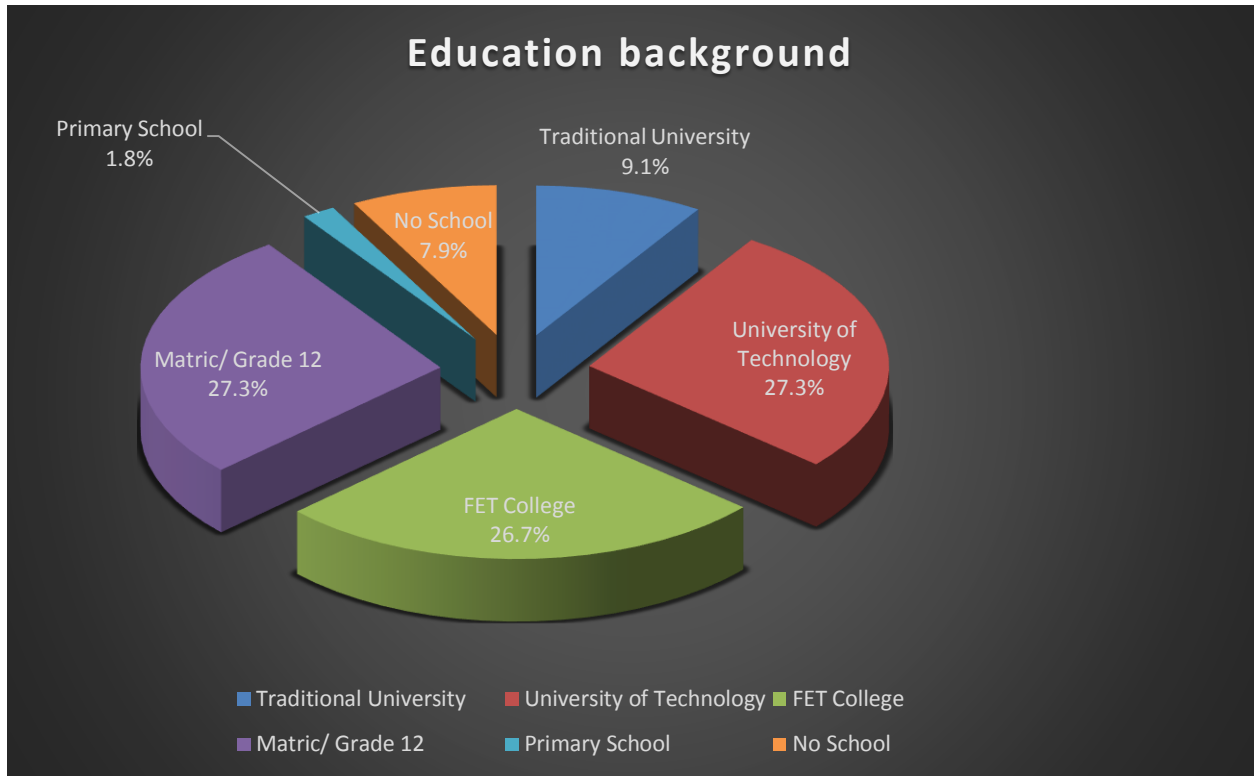
**Table 8: Language of respondents**

Language of participants	Frequency	Percentage
Afrikaans	20	12.7%
English	14	8.5%
IsiXhosa	7	4.2%
Xitsonga	5	3.0%
Tshivenda	3	1.8%
Sesotho	56	33.9%
Sepedi	21	12.7%
IsiNdebele	2	1.2%
Setswana	12	7.3%
IsiZulu	23	13.9%
SiSwati	1	0.6%

### 4.3.6 Education level

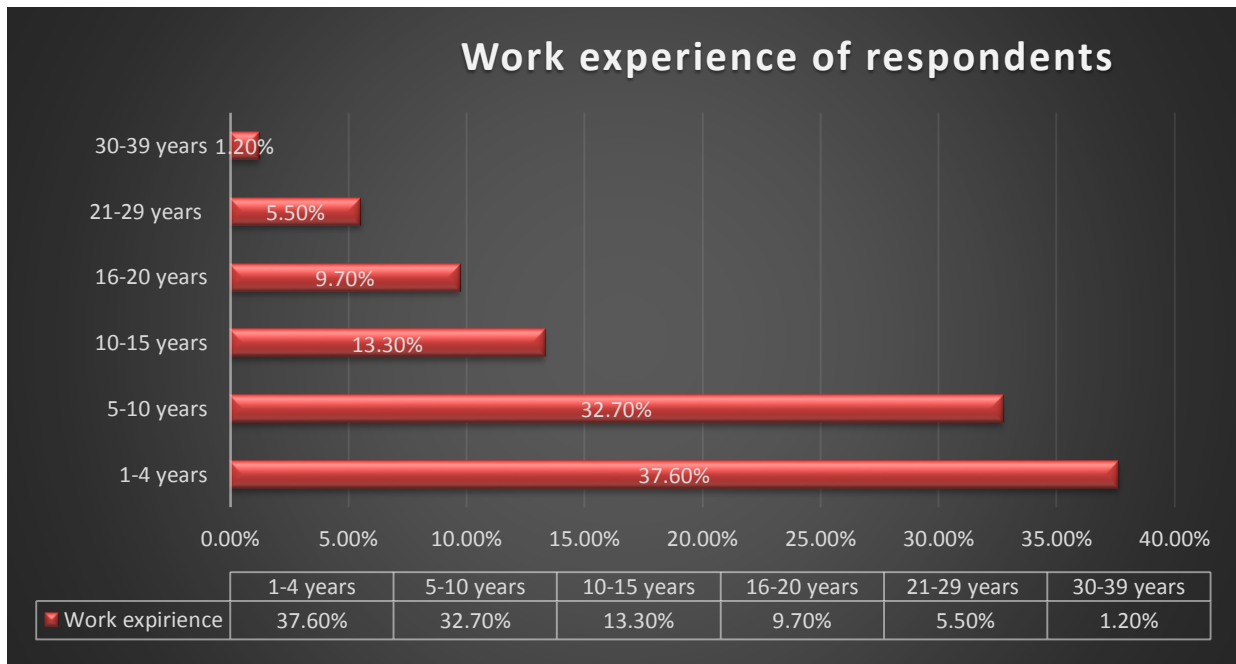
Figure 9 outlines the education background of the participants. This was important in order to determine whether employees were able to comprehend and interpret the safety regulations within the organisation. A study conducted by Choi, Chan and Chan (2012:147) found that there is a direct link between employee's safety adherence and level of literacy and often employees with low levels of literacy are difficult to convince to adhere to health and safety regulations in the workplace (Gyeke, Salminen & Ojajarvi 2012:234). Employees qualification from the different institutions are as follows: University of Technologies (UoTs) (27.3%; n=45), Grade 12 (27.3% n=45),

Further Education and Training Colleges (FET) (26.7%; n=44), Traditional Universities (9.1%; n=15), Primary Education (1.8%; n=3), no schooling (7.9%; n=13).



**Figure 9: Education levels of respondents**

### 4.3.7 Work Experience



**Figure 10: Work experience of respondents**

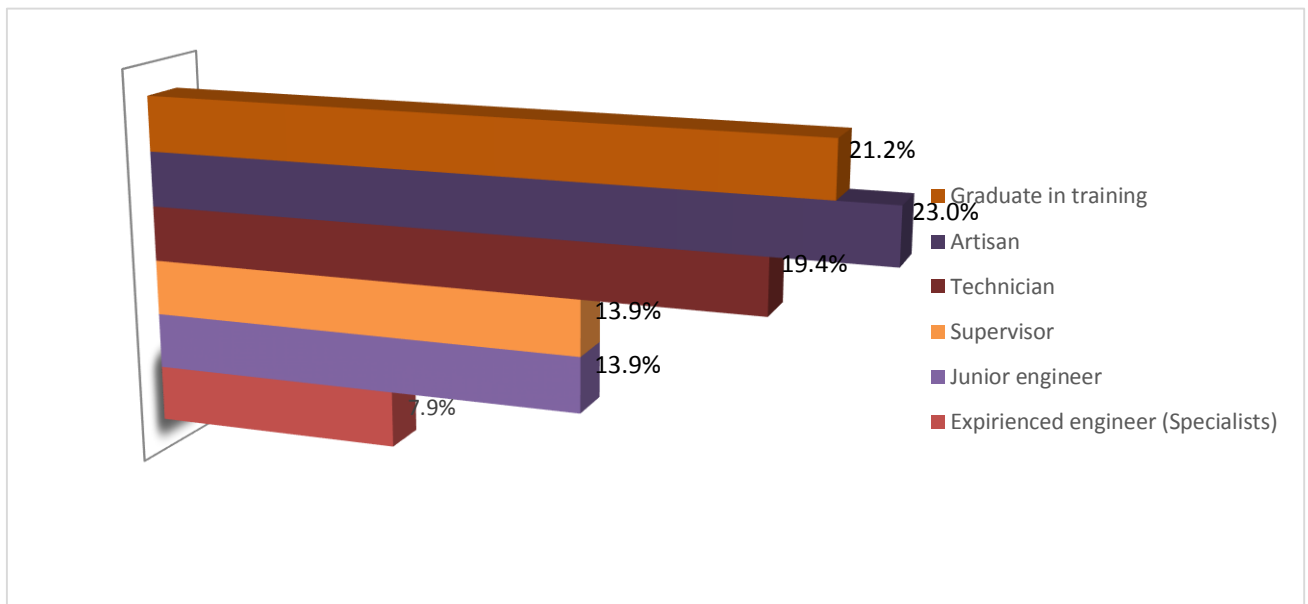
Figure 10 illustrates that majority of employees (37,6%; n=62) in the organisation have between 1-4 years of working experience. This was followed by employees who possessed between 5-10 years of experience (32,7 %; n=54), by those between 11-15 years of experience (13,3%; n=22), between 16-20 years of experience (9, 7%; n=16) and between 21-29 years of experience (5,5%; n=9). The lowest percentage are employees who have between 30-39 years of experience (1.2%; n=2). Work experience and long term commitment from employees has proven to play a meaningful role when it comes to the adherence to health and safety in the workplace as it has been argued that there is a direct linkage between adherence to health and safety regulations and work experience (Gyke et al. 2012:235). Research has shown that employees who are older and possess a great deal of experience are faced with lower levels of occupational accidents as compared to younger employees with less experience in the workplace (Geldart, Smith, Shanon & Lohfeld 2010:563).

### 4.3.8 Occupational Level

Figure 11 report on the occupational levels of participants which show that 23%; (n=38) of employees were employed as technicians, 21.1% (n=35) were in-service



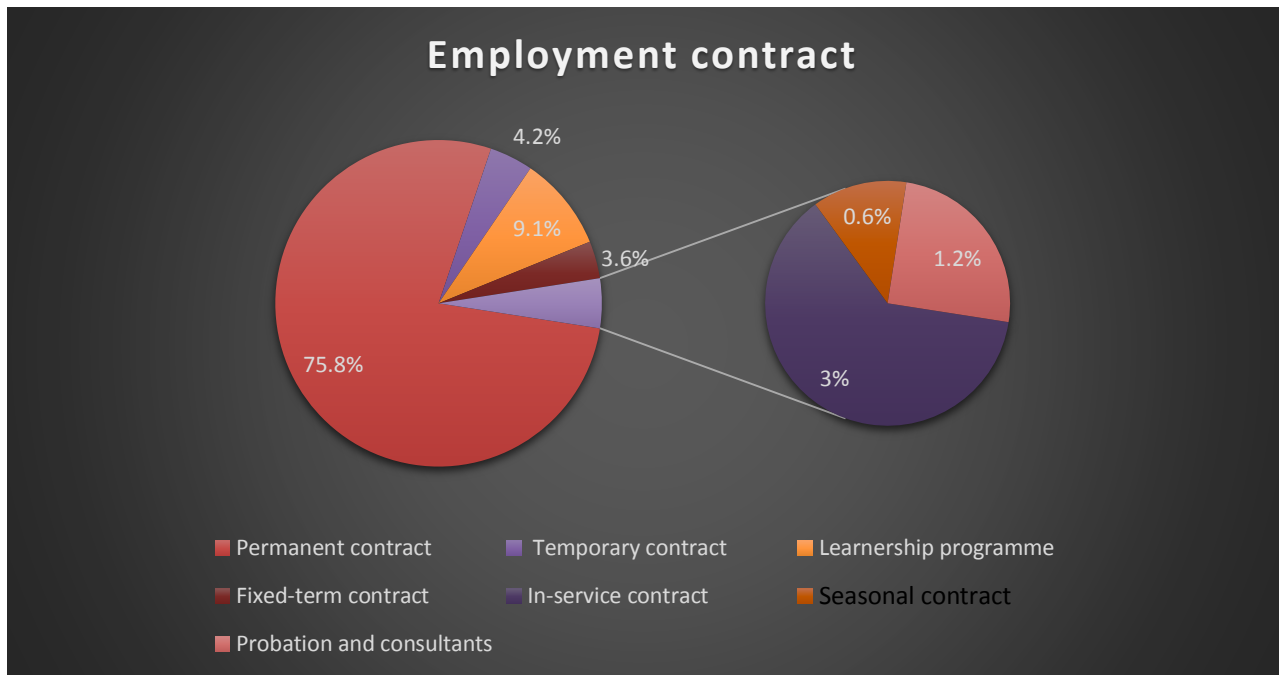
training graduates 19.4% (n=32) were artisans, 13.9% (n=23) were junior engineers, 13.3% (n=22) were supervisors, 7.9% (n=13) were experienced specialists.



**Figure 11: Occupational level of research participants**

#### 4.3.9 Employment Contract

Figure 10 indicated that a majority of the employees were in permanent employment (75,8%; n=125), followed by those who were in learnership programmes (9.1%; n=15), temporary employment (4,2%; n=7), fixed term employment (3,6%; n=6) in service employment (3,0%; n=5), employees on probation and consultants (1,2%; n=2) and seasonal employees (0,6%; n= 1). According to Johnstone and Quilan (2006:275), the use of labour brokers has astronomically increased in many South African organisations.



**Figure 12: Employment contract**

#### 4.4 CORRELATION ANALYSIS

In line with the objectives of the research outlined in Chapter 1 it was necessary to observe the relationship of the following variables: employee safety awareness, employee perception, employee safety adherence and employee behaviour. Pearson correlation coefficient ( $r$ ) was selected to measure the strength of the association between variables. The results of the correlation analysis are presented in Table 9.

**Table 9: Correlation: employee perception, safety awareness, employee safety and employee**

		EMPLOYEE PERCEPTION	SAFETY AWARENESS	EMPLOYEE SAFETY	EMPLOYEE BEHAVIOUR
<b>EMPLOYEE PERCEPTION</b>	Correlation Coefficient	1.000	.571**	.559**	.452**
	Sig.(2-tailed)	.	.000	.000	.000
	N	165	165	165	165
<b>EMPLOYEE SAFETY AWARENESS</b>	Correlation Coefficient	.541**	1.000	.622**	.597**
	Sig.(2-tailed)	.000	.	.000	.000
	N	165	165	165	165
<b>EMPLOYEE SAFETY</b>	Correlation Coefficient	.559**	.622**	1.000	.454**
	Sig.(2-tailed)	.000	.000	.	.000
	N	165	165	165	165
<b>EMPLOYEE BEHAVIOUR</b>	Correlation Coefficient	.452**	.597**	.454**	1000.
	Sig.(2-tailed)	.000	.000	.000	.
	N	165	165	165	165

\*\*Correlation is significant at the 0.001 level (2-tailed).

Table 9 indicates the relationships amongst employee perception, safety awareness, and employee safety and employee behaviour. From Table 9 it is apparent that Pearson correlation coefficients suggest that there is positive linear relationship between employee' perception to safety and employee safety awareness ( $r=0.541$ ;  $p<0.000$ ); employee perceptions of safety and employee safety ( $r=0.559$ ;  $p<0.000$ ) and employee perceptions of safety and employee behaviour ( $r=0.452$ ;  $p<0.000$ ).

There is a positive relationship between safety awareness and employee safety ( $r=0.622$ ;  $p<0.000$ ), safety awareness and employee behaviour ( $r=0.597$ ;  $p<0.000$ ).

Finally, there is a positive relationship between employee safety and safety behaviour ( $r=0.454$ ;  $p<0.000$ ).

When evaluating the size of the correlation it is important to measure the practical significance of the effect. The following effect sizes (Redda 2012:110) are used to report on the results in terms of practical significance.

$r = 0.10$  (low effect)

$r = 0.30$  (medium effect)

$r = 0.50$  (large effect).

In terms of practical significance, the effect sizes range from medium to large. Based on the correlations it is clear that employee's perception, safety awareness, employee's safety and employee behaviour play an influential role in addressing employee's level of safety adherence in the steel company.

#### **4.5 REGRESSION ANALYSIS**

Table 10 reports on linear regression analysis between employee perception of health and safety and safety adherence. Employees perception, employee safety and employee behaviour was entered in the regression model as the independent variable whilst safety awareness was entered as the dependent variable.

**Table 10: Regression analysis; employees perceptions of safety, employee safety adherence and safety awareness**

Model 1 Dependent variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig
	B	Std. Error	Beta ( $\beta$ )		
(Constant)	.419	.263	.	1.593	.113
Employee perception	.110	.052	.126	2.118	.036*
Employee safety adherence	.504	.061	.517	8.327	.000**
Employee behaviour	.286	.063	.274	4.516	.000**
<b>R=0.772    R<sup>2</sup>=0.596    Adjusted R<sup>2</sup>=588    F=79.136    Sig at p&lt;0.005</b>					

The regression analysis gave a value of  $R^2 = 0.588$  which implies that approximately 59% of the variation in safety awareness can be explained by employee's perception of health and safety, employee safety adherence and employee behaviour. The beta weights registered the following on employee's safety adherence ( $\beta=517$ ), employee safety awareness ( $\beta=274$ ) and employee perceptions of health and safety ( $\beta=126$ ).

A study by Kifle, Engdaw, Alemu, Sharma, Amsalu, Fekete and Worku (2014:212) consisting of 453 employees in the Addis Ababa iron and steel industry established that employees who perceive their employers as compliant with safety regulations exhibited higher levels of safety adherence. In other studies, by Basha and Maiti (2013:375) and Kouabenan, Nguetsa and Mbaye (2015:73-74) in the Indian steel plant sector it was established that there was a positive relationship between employee behaviour modification and reduction of occupational accidents and injury rates. Research conducted by Wachter and Yorion (2014:120), Mbaye and Kouabenan (2013:77) and Nordlof, Wiitavaara, Winblad, Wijk and Westerling (2015:127) at major manufacturing companies established that when proper safety management systems are in place and implemented correctly safety adherence in the workplace is followed.

The highest beta weight ( $\beta=517$ ) indicated that majority of the employees are able to comprehend the legislative requirements and this indicated increased levels of safety adherence amongst employees.

Finally, research by Garcia-Herero, Mariscal, Garcia-Rodriquez and Ritzel (2012:1761) and Saracino, Curcuruto, Antonioni, Mariani, Guglieni and Spadoni (2015:176) indicated that psychological factors such as behaviour has an impact and influences employees' degree of safety adherence in the work environment.

#### 4.6 DESCRIPTIVE STATISTICS: MEAN ANALYSIS

##### 4.6.1 Employee perceptions of information and training provided by the employer

Section C of the questionnaire addressed employee's perceptions with regard to information and training in health and safety provided by the employer. Table 11 provides the means of the various items that were included to assess the level of the employee's perceptions regarding information and training in health and safety that is provided by the employer.

**Table 11: Mean analysis on information and training in health and safety**

Items	Description of items	N	Min	Max	Mean	Std. deviation
C2	My employer usually informs me to take precautions to protect myself when I perform my duties.	165	1	2	4.41	.825
C3	My employer usually provides new employees with health and safety training.	165	1	5	4.40	.755
C4	Employer trained me about the correct use of Personal Protective Equipment (PPE).	165	1	5	4.42	.755
C5	My employer regularly informs me about Standard Operating Procedure (SOP) when it comes to performing my task.	165	1	5	4.21	.825
C6	My employer provides regular refresher training on health and safety.	165	1	5	4.23	.888
C7	My employer trained me to recognize hazards at work.	165	1	5	4.32	.864
C8	Training has changed my behaviour about how I view health and safety.	165	1	5	4.27	.842
<b>Scale denotation: Likert scale: 1= Strongly disagree to 5= Strongly agree</b>						

The mean scores on information and training of employees' health and safety ranged from M=4.04 to M=4.40. On a Likert scale of 1 to 5, this indicated that employees

were adequately provided with information and training by the employer. Employee health and safety training, M=4.42, and provision of health and safety induction and instructions, M=4.40, training on the proper usage of personal protective equipment, M=4.42, and behavioral change regarding health and safety seem to be sufficiently addressed by the employer.

Information sharing and provision of safety training are the most powerful tools that employees can utilize in the workplace to be able to adhere to health and safety so that they can stay injury free. How one receives information as well as the quality of safety training in the workplace impacts on the success of employees being able to adhere to health and safety (Scheeres, Solomon, Boud & Rooney 2010:15).

#### 4.6.2 Employee safety awareness

Table 12 provides an overview of employee's safety awareness in the organization.

**Table 12: Means analysis of employee safety awareness**

Items	Description of items	N	Min	Max	Mean	Std Deviation
D1	I have sufficient knowledge of the Occupational Health and Safety Act.	165	1	5	4.19	.840
D2	We have a copy of the OHSA on the employer's premises.	165	1	5	4.40	.651
D3	I know my rights as an employee when it comes to health and safety issues	165	1	5	4.22	.797
D4	We are provided with the necessary skills as employees in the organisation to perform our work safely.	165	1	5	4.36	.758
D5	I usually follow safety procedures at work.	165	1	5	4.30	.837
D6	We have a health and safety representative in my workplace	165	1	5	4.09	.896
D6	All employees are involved in the planning of health and safety	165	1	5	4.31	.778
D7	Employee awareness to OHSA will lead to a reduction of accidents	165	1	5	4.35	.746
D8	Safety meetings are held regularly with employees.	165	1	5	4.36	.765
D9	Safety awareness campaigns are held on a regular basis.	165	1	5	4.26	.780
<b>Scale denotation: Likert scale: 1= Strongly disagree to 5= Strongly agree</b>						

The levels of employee safety awareness is critical when addressing safety adherence. The mean scores for employee awareness ranged from M=4.09 to

M=4.40. These high mean scores indicates that employees possessed the necessary skills in terms of safety vigilance in the workplace. Furthermore, employees seem to have sufficient knowledge and understanding of the OHSA. This was attributed to the fact that health and safety campaigns are held regularly and this led to a reduction of accidents. The safety campaigns mean score was high at (M=4.26). Safety campaigns play a prominent role as they serve as a reminder to employees to minimise and prevent occupational accidents. This is supported by research by Nunez and Villanueva (2011:57) who affirmed that there is direct relationship between safety knowledge and safety awareness and lower occurrence of occupational accidents.

### 4.6.3 Employee safety adherence

Table 13 provides a summary of the means regarding employees safety adherence.

**Table 13: Means analysis-employee safety adherence**

Items	Description of items	N	Min	Max	Mean	Std deviation
E1	Safety procedures and instructions are adhered to.	165	1	5	4.17	.816
E2	I usually wear my Personal Protective Equipment (safety goggles, safety boots, helmets, and gloves) that are provided by the employer.	165	1	5	4.36	.788
E3	Information regarding to the proper use of PPE is provided for by employer.	165	1	5	4.34	.676
E4	Safety adherence leads to good business performance.	165	1	5	4.32	.771
E5	Safety culture is promoted from managers to employees.	165	1	5	4.21	.832
<b>Scale denotation: Likert scale: 1= Strongly disagree to 5= Strongly agree</b>						

The means for the variables relating to employee safety adherence ranged from M=4.17 to M=4.36. These scores highlight that employees are aware of the various aspects regarding safety adherence. Factors such as safety procedure and instructions (M=4.17), correct use of (PPEs) (M=4.36), safety adherence and good business performance (M=4.32), promotion of safety culture by managers (M=4.21) seem to permeate majority of the employees in the workplace.



#### 4.6.4 Employee behaviour with regard to health and safety

Table 14 provides an overview of employees behaviour with regard to safety.

**Table 14: Means analysis of employee behaviour with regards to health and safety**

Items	Description of items	N	Min	Max	Mean	Std deviation
F1	I usually follow safety procedures when doing my job.	165	1	5	4.35	.832
F2	I prefer to spend more time on a task to ensure it is done safely; rather than rushing to complete a task.	165	1	5	4.32	.896
F3	Employees sometimes ignore safety procedures.	165	1	5	3.93	1.057
F4	Some employees get away with unsafe conduct in the work place.	165	1	5	3.90	1.091
F5	Performing my work safely has become a habit for me rather than a challenge.	165	1	5	4.27	.744
F6	As an employee I am fully aware of hazards in my daily job.	165	1	5	4.36	.708
F7	Every employee is responsible for their own safety in the organisation.	165	1	5	4.43	.743

**Scale denotation: Likert scale: 1= Strongly disagree to 5= Strongly agree**

The means on employee behaviour with regard to safety issues ranged from M= 3.90 to M= 4.43. Table 14 indicates that employees seem to display appropriate behaviour in the workplace and obey safety procedures and are aware of hazards on the job. It should be noted that behaviour in the workplace directly influences the safety climate in the workplace which has a positive effect on the attitude of employees in the workplace (Gyeke et al. 2012:243).

#### 4.6.5 Role of the supervisor in health and safety

Table 15 provides an overview of the employees' perceptions of the role of the supervisor with regard to health and safety matters.

**Table 15: Means analysis of the role of the supervisor in health and safety**

Items	Description of items	N	Min	Max	Mean	Std deviation
G1	My supervisor takes employees health and safety very seriously	165	1	5	4.30	.776
G2	Supervisors perform risk assessment on a regular basis.	165	1	5	4.25	.815
G3	Supervisors encourage employees to adhere with the OHSA.	165	1	5	4.23	.831
G4	Supervisor listens to employee's safety concerns in the organisation.	165	1	5	4.19	.855

**Scale denotation: Likert scale: 1= Strongly disagree to 5= Strongly agree**

Table 15 above outlined a pivotal role played by a shop steward at shop floor level. This role usually includes encouraging employees to observe and comply with safety regulations. In this section the highest mean score is M=4.30. Item G1 showed that employees agreed that their supervisors take their safety seriously and that they play a huge role in encouraging employees to adhere with the OHSA.

Item G2 mean score was M=4.25 in which employees agreed that their supervisor performed risk assessment in the workplace on a regularly basis. Item G4 denoted the lowest mean score of M=4.19 which was still acceptable. This item indicate that supervisor listen to employee's safety suggestion and concerns within the workplace.

**Table 16: Means analysis of employees perception of the influence of rewards on health and safety**

Items	Description of items	N	Min	Max	Mean	Std. deviation
H1	Employees must be rewarded for achieving excellent safety record.	165	1	5	4.26	.987
H2	Rewards lessen occupational accidents.	165	1	5	4.08	1.009

*Scale denotation: Likert scale: 1= Strongly disagree to 5= Strongly agree*

#### 4.6.6 Employee’s perception of the influence of rewards on health and safety

Item H1 is the highest mean score M=4.26. This item showed that employees agreed that if they experienced low rate of accidents they should be rewarded. This would motivate employees to comply with safety regulations as it a standard practice in sectors like mining. Employee’s efforts in the workplace should be acknowledged. Most employees within the company agreed that a good safety record must be rewarded in the workplace. Bonuses should be awarded when a specific behaviour and achievements are attained in the workplace as it serves as a motivator to safety adherence (Deeprise 2007:21; Jensen, McMullen & Stark 2007:32-33).

**Table 17: Means analysis of accident reporting mechanism in health and safety**

Items	Description of items	N	Min	Max	Mean	Std deviation
I 2	Facilities for first aid are available in the event of an accident.	165	1	5	4.36	.848
I 3	There are trained first aiders in my workplace.	165	1	5	4.31	.754
I 4	Employees are encouraged to report accidents that occur at work.	165	1	5	4.93	.838

*Scale denotation: Likert scale: 1= Strongly disagree to 5= Strongly agree*

#### 4.6.7 Accident reporting mechanism in health and safety

Table 17 provides a summary of the means in terms of accidents reported in health and safety. Item I 4 shows the highest means score  $M=4.93$  indicating that employees within the company adhere to the requirement of the OHSA by reporting accidents within the company. Item I1  $M=4.32$  also highlights that the company has a formal reporting procedure in place for employees to utilize to report workplace accidents.

Table 18: An overview of the means with regards to workplace inspection.

**Table 18: Means analysis of workplace safety inspection**

Items	Description of items	N	Min	Max	Mean	Std. deviation
J1	Safety inspections take place regularly at work.	165	1	5	4.27	.790
J2	Regular inspections encourage the employer to comply with OHSA	165	1	5	4.38	.783
J3	Labour inspectors are allowed access in the workplace.	165	1	5	4.16	.829
J4	Accidents and injuries are reported when they occur.	165	1	5	4.23	.867
J5	Safety signs are visible for everyone to see	165	1	5	4.36	.742
J6	Inspectors impose fines and penalties when the employer is non-compliant.	165	1	5	4.20	.871
J7	Risk assessment is regularly carried out on the employer's premises by SHE representatives.	165	1	5	4.18	.926
Scale denotation: Likert scale: 1= Strongly disagree to 5= Strongly agree						

#### 4.6.8 Workplace safety inspection

The means score relating to workplace inspection ranged from  $M=4.16$  to  $M=4.38$ . The score indicates that regular inspections take place and encourages employers to adhere with the OHSA. Item J7 with a means score  $M=4.16$  indicates that employees agreed that regular inspections are conducted by the department of labour inspectorate. Employees also agreed that regular inspections  $M=4.38$  compels the employer to adhere to the health and safety legislation (Cantor 2008:71; Capriotti 2007:152).

Table 19 provides an overview of the means in terms of the workplace environment.

**Table 19: Means analysis of workplace environment**

Items	Description of items	N	Min	Max	Mean	Std. deviation
K1	There is enough ventilation at my workstation.	165	1	5	4.19	.860
K2	I am comfortable with the room temperature.	165	1	5	4.05	1.011
K3	I am satisfied with the level of hygiene at my workplace.	165	1	5	3.84	1.118
K4	There is sufficient lighting at my work place.	165	1	5	4.12	1.021
K5	Chemical substances are clearly marked.	165	1	5	4.24	.828

*Scale denotation: Likert scale: 1= Strongly disagree to 5= Strongly agree*

#### 4.6.9 Workplace environment

In Table 19 the mean scores ranged from M=3.84 to M=4.24 and this shows that majority of employees agree that their environment in which they operate meets the required health and safety standard. K5 reported the highest mean (M=4.24) indicating that employees agree that chemical substances are clearly marked when inspections are conducted. Employees agree that there is proper ventilation (M=4.19) to prevent the spread of hazardous chemicals within the workplace and appropriate measures are applied.

Table 20 provides an overview of the mean scores in terms of the role of trade unions in health and safety.

**Table 20: Means analysis of the role of a trade union in health and safety**

Items	Description of items	N	Min	Max	Mean	Std. deviation
L1	My trade union is involved in health and safety matters.	165	1	5	4.04	1.050
L2	My trade union is pro-active in health and safety meetings with the employer.	165	1	5	3.39	1.019

*Scale denotation: Likert scale: 1= Strongly disagree to 5= Strongly agree*

#### **4.6.10 The role of a trade union in health and safety**

The Trade union movement in South Africa is still vibrant and pro-active in health and safety matters. Table 20 depicts a high mean score ( $M=4.04$ ) suggesting that the majority of employees within the company firmly believe that trade unions play a meaningful role in health and safety matters that affects employees in the workplace. Unions' representatives are often invited to attend safety meetings by the management. This indicates pro-activism as compared to a re-activism approach by trade unions (Flynn & Shaw 2008:56).

### **4.7 RELIABILITY AND VALIDITY OF MAIN SURVEY**

#### **4.7.1 Reliability**

Cronbach alpha ( $\alpha$ ) coefficient was estimated to check the internal consistency of each scale. The following scales (information and training in health and safety; employee safety awareness; employee safety adherence; employee behaviour with regard to health and safety; the role of the supervisor in health and safety; accident reporting mechanisms in health and safety; workplace safety inspection; workplace environment; the role of the union in health and safety issues; and to assess employees perceptions of the influence of rewards on health and safety) were computed. Cant, Gerber-Neland Kotze, (2003:123) and Feinberg, Kinnear and Taylor (2013:132) stated that the acceptable level for measuring reliability of an instrument is 0.70. Table 21 indicates the reliability construct was between 0.752 and 0.933.

The overall reliability rate indicated a Cronbach value of 0.969. Cronbach alpha ( $\alpha$ ) value for Section C - information and training in health and safety was 0.932, which comprised thirteen items. Section D- employee safety awareness was 0.932 consisted of nine items. Section E- employee safety adherence was 0.868 and had six items. Section F- employee behaviour with regard to health and safety was 0.865 and contained 7 items. Section G- the role of the supervisor in health and safety was 0.843 entailed four items. Section H accident reporting mechanisms in health and safety was 0.752 consisted of two items. Section I workplace safety inspection was 0.887 with four items. Section J workplace environment was 0.887 and consisted of seven items. Section K the role of the union in health and safety issues was 0.846 which

consisted of five items. Lastly Section L employee's perception of the influence of rewards on health and safety was 0.933 which consisted of two items.

**Table 21: Scale reliabilities**

Scale	Number of items	Cronbach Alpha
<b>Section C</b> Information and training in health and safety	13	0.932
<b>Section D</b> employee safety awareness	9	0.932
<b>Section E</b> employee safety adherence	6	0.868
<b>Section F</b> employee behaviour with regard to health and safety	7	0.865
<b>Section G</b> the role of the supervisor in health and safety	4	0.843
<b>Section H</b> accident reporting mechanisms in safety inspection	2	0.752
<b>Section I</b> workplace safety inspection	4	0.887
<b>Section J</b> workplace environment	7	0.887
<b>Section K</b> role of trade union in health and safety issues	5	0.846
<b>Section L</b> employee's perception on the influence of rewards on health and safety	2	0.933
<b>Overall reliability</b>	<b>59</b>	<b>0.969</b>

#### 4.7.2 Content-related validity

The measuring instrument was assessed by two academics the supervisor, a statistician and a health and safety officer. Items were observed on the questionnaire to ensure relevance of the content covered on the research topic. The main object of conducting content validity was to observe any ambiguities in language, structure and design of the questionnaire (Babbie 2013:192; Neuman 2009:124). The research insights of these individuals was considered in order to administer the final instrument for the main survey.

### **4.7.3 Construct validity**

Babbie (2014:156) contended that construct validity is founded on the principle of logical relationships among variables. Punch (2014:240) further submits that construct validity focuses on how well a measure adapts to theoretical expectations of the study. The universal definition of construct validity is that it refers to the extent to which an instrument measures a characteristic that cannot be directly observed but is assumed to exist in people's behaviour (Leedy & Ormrod 2010:92). Examples would be motivation, racial prejudice and creativity. Kumar (2011:180-181) explained that construct validity is a sophisticated method for establishing the validity of an instrument and relies on heavily on statistical procedure. For this study, 30 questionnaires were piloted on part-time safety management students who were employees in the steel sector. These individuals have first-hand experience in health and safety issues. The aim of conducting the pilot study was to determine whether the items making up each variable showed adequate item-total correlations. Items with low item-total correlations were removed from the variables. The participants from the pilot study were left out purposefully in the final distribution of the questionnaire for the main study so as not to contaminate the sample.

### **4.7.4 Convergent validity**

Mashego (2014:106) elucidated that convergent validity is concerned with the nature of constructs that are correlated. To determine the correlation between variables, Pearson correlation analysis was undertaken to determine the level of correlation between employee perception, safety awareness, employee' safety and employee behaviour. The correlations indicated a significance of  $p > 0.001$  (see section 4.4 and Table 10) and thus affirming convergence of the variables in the study.

## **4.8 CONCLUSION**

The primary aim of this study is to determine employee's level of adherence to the OHSA in one major steel company in Southern Gauteng. The results of this study add to the existing current knowledge of literature on occupational health and safety. A pilot exercise was undertaken and 30 questionnaires were distributed to determine the



initial reliability of the questionnaire before the distribution of the final questionnaire. Various methods were employed to present and interpret the results and included charts, graphs and tables.

To determine the relationships, various variables were explored including employee's perception, employee behaviour, safety adherence and employee safety. Pearson correlation analysis, regression analysis and means analysis were used to analyse the data and examine the relationships among the constructs.

Chapter five outlines how the objectives of the research have been achieved. The recommendations, limitations of the study were outlined, and value of the study is also outlined.

## **CHAPTER 5**

### **OVERVIEW, LIMITATIONS, RECOMMENDATIONS AND CONCLUSION**

#### **5.1 INTRODUCTION**

Chapter four outlined the empirical findings of the study including a descriptive analysis of the biographical profile of the research participants. In addition, correlation, regression and means analysis was undertaken. This chapter revisits the objectives of the study and their attainment. Conclusions are drawn based on the results and recommendations are suggested. The significance of the study, future research, recommendations, value and limitations are also summarized in this chapter.

#### **5.2 OVERVIEW OF THE STUDY**

Chapter 1 of the research outlined the introduction and background of the research, the research problem was established, the objectives of the study were defined and the methodology of the discussed. Statistical techniques and ethical considerations were addressed in Chapter 1.

#### **Chapter 2**

Chapter 2 of this study explored the literature based on occupational health and safety. Various sources were used to provide an insight on some of the factors that impeded adherence to OHSA and also the socio-economic impact of occupational accidents were explored.

#### **Chapter 3**

Chapter 3 outlined the methodology that was employed in the study. The research approach that was implemented and the rationale behind choosing a particular research approach was highlighted. Various sampling procedures were selected including the following aspects: target population, sampling technique and sample size. Lastly the reliability and validity of the questionnaire was conducted to test

reliability of the measuring instrument. The methods to analyze the data were outlined and included descriptive, frequency distribution, regression, mean and correlation analysis.

## **Chapter 4**

This section discussed the results of the study as they appeared on the questionnaire. Numerous statistical methods were implemented for analysis. This analysis included the usage of charts, tables and graphs. The results of the study were deliberated in this section.

### **5.3 THE OBJECTIVES AND BRIEF SUMMARY OF THE STUDY**

Every organisation has its own unique challenges that they face on a daily basis and the steel manufacturing sector is not peculiar to this phenomenon. The steel manufacturing sector is a perilous sector with serious health and safety implications for employees as well as financial consequences for the employer. Several factors such as leadership, information and training, employee behaviour, and employee responsibility have been suggested to have an influence on employee adherence to the OHSA (Ismail, Doodstdar & Harun 2011:418).

#### **5.3.1 Evaluation of the objectives**

##### **5.3.1.1 Theoretical objectives**

In order to accomplish the main objective of the research the following secondary objectives were formulated for the study.

**Objective one:** To review the literature on occupational health and safety.

This objective is attained in Chapter 2 in the following Sections 2.2; 2.2.1; 2.2.2, 2.2.3, and 2.2.5.1. This section focused on the relevant legislation that promotes adherence to health and safety. This Chapter covered the definitions of adherence and employee, the role of the state in health and safety, financial implications of accidents and diseases on the economy, categories of accidents in the workplace.

**Objective two:** To establish from the literature the causes of non-adherence by employees

This objective was achieved under the following Sections 2.7, 2.7.1 2.7.2, 2.7.3 2.7.4 and 2.7.5. This section provided a comprehensive discussion on the sources of causes of non-adherence with the Act.

**Objective three:** To review the OHSA in terms of adherence to the requirements of the health and safety

In order to achieve the theoretical objectives various sources were utilized including books, journal articles, newspaper articles and reports. This theoretical objective was dealt with in Sections 2.2.4; 2.2.4.1; 2.2.4.3; 2.2.4.5; 2.2.4.7 and 2.2.4.10. This section provided a brief synopsis of the aims of the Act. The section also outlined the roles, responsibilities and duties of employees, employers, and safety committee and shop stewards in terms of the OHSA.

### **5.3.1.2 Empirical objectives**

The empirical objectives of this are revisited as formulated in Chapter 1 of this study in order to support the primary objective. Thus Chapter 4 outlined the empirical findings of the data.

**Objective 1:** To establish employees' perceptions of the level of adherence by the employer and employee with regard to health and safety regulations with specific reference to the following components in terms of the OHSA:

#### **(a) Information and training in health and safety**

This objective was achieved through (means analysis) as illustrated in Table 11 under Section 4.6.2. Investing in health and safety training by a company will yield positive results and employees will reciprocate by complying with health and safety regulations (Niskanen 2012:536). Employees safety perceptions on the provision of information and safety training on health and safety were positive as the mean scores ranged from M=4.04 to M=4.42. The high M=4.40 showed that employees were provided with

adequate health and safety induction training. Employees agreed that the company offered them comprehensive and effective health and safety training and employees were able to properly use PPEs M=4.42.

### **(b) Employee safety awareness**

This objective was achieved indicated in Chapter 4 under section 4.6.2 in Table 12 (means analysis). The table contained the statistical data for the research. Health and safety campaigns have proven to be an effective tool in reducing workplace accidents and enhancing adherence to the OHSA. The means ranged from M=4.09 to M=4.40. From the means it is indicative that through safety campaigns employee's knowledge of the Act is consistently improved. Sporadic safety campaigns M=4.42 were proven to be the driving force behind employees experiencing minimum occupational accidents.

### **(c) Employee safety adherence**

This objective was accomplished as shown in Section 4.6.3 under Table 13 (means analysis). Insuring safety adherence in any steel manufacturing company is paramount as it improves employees' levels of safety compliance with health and safety rules (Turner, Stride, Carter, McCaughey & Carroll 2012:812). The means score of M=4.17 highlighted that employees from the steel company comprehended the health and safety instructions as advocated by the company. Employee safety adherence was achieved through the promotion of health and safety culture by the company which indicated a mean score of M=4.21.

### **(d) Employee behaviour with regard to health and safety**

This objective was achieved as highlighted in Section 4.6.4 in Table 14 (mean analysis). The table shows the statistical analysis for this study. The mean results indicated that employees within the company behaved in accordance with health and safety rules and regulations. The means M=4.43 ranked high indicating that employees were responsible for their safety and this was an indication that through correct behaviour employee safety adherence can be achieved.

### **(e) The role of the supervisor in health and safety**

This objective was achieved in Section 4.6.5 as highlighted in Table 15 through the (mean analysis). The statistical indicators are illustrated in Table 15 in Chapter 4. Employees from the company agreed that supervisors play an integral part in the promotion of adherence to health and safety regulations in the workplace (De Koster, Stam & Balk 2011:754). Employees agreed that supervisors frequently remind and encourage them to adhere with the requirements of the OHSA. This is reflective with an  $M=4.23$ . Employees also agreed that employees' supervisors take their health and safety into serious consideration  $M=4.30$ .

### **(f) Accident reporting mechanisms in health and safety**

This objective was achieved under section 4.6.7 in Table 17. Occupational accidents and injuries dent the reputation and image of companies. From the mean  $M=4.93$  and  $M=4.32$  it can be concluded that employees within the company are able to report any occupational injuries and accidents without any intimidation by the employer.

### **(g) Workplace safety inspection**

The objective was achieved under section 4.6.8 in Table 18. Safety inspections are often conducted by safety inspectors to determine whether an organisation complies with the legal requirements. From the mean score of  $M= 4.16$  it can be deduced that the majority of employees are in agreement that regular inspections are conducted by the labour inspectors as required by Section 28 to 32 of the OHSA. Employees also further agreed that consistent inspection within the company make the employer comply with the prescripts of the OHSA.

### **(h) Workplace environment**

This objective was achieved under Section 4.6.8 in Table19. A safe and conducive working environment and proper safety performance have proven to benefit

organisations (Cheng, Ryan & Kelly 2012:364). The results showed that when employees are content about the working environment and that their employer is compliant with the OHSA. The M=4.24 showed that chemical substances and other safety signs within the organisation are vividly marked when inspection is carried out. The majority of employees also concur that their workstation is properly ventilated as indicated by M=4.19.

**(i) Role of trade union in health and safety**

This objective was attained in Table 20 (means analysis) under section 4.6.10. Statistical indicators for the dataset are highlighted in Chapter 4. Trade unions continue to play an essential role in matters that affects their constituencies through the direct process of collective bargaining, and this includes health and safety matters. Employees from the company fully concur that their respective trade union is vigorously involved in health and safety issues as substantiated by a mean score of M=4.04.

**(j) To examine the relationship between employee perceptions of safety, employee safety awareness, employee adherence to safety and employee behaviour.**

A positive linear relationship between employee perceptions of safety, employee safety awareness, employees' adherence and employees' behaviour is illustrated in Table 9 under Section 4.4 (correlation analysis).

**(k) To examine whether employees' perceptions of safety, employee safety awareness, employee adherence to safety is dependent on safety awareness.**

The relationship between employee perceptions of safety, employee safety awareness, employee adherence to safety is dependent on safety awareness is illustrated in Table 10 section 4.5 (regression analysis).

## **5.4 RECOMMENDATIONS**

Global competition and industrialization has placed a burden on many countries' economies. Steel in a country such as South Africa plays a pivotal role in government multibillion-infrastructure roll out programmes as envisaged by the National

Development Plan (NDP). Based on the literature review and findings of the study the following recommendations are proposed for the study.

- The company should design a tailor made training programme that focuses specifically on employee's safety behaviour. This is significant as it will assist the company to save time by focusing on the critical psychological element like behaviour that can hinder or improve adherence to safety and health. Studies based on health and safety emphasizes the need on modifying employees' behaviour in order to address and improve the adherence to safety regulations in the workplace. It is thus proposed that the company focus primarily on the psyche of employees when offering health and safety training.
- Management must be proactive and not reactive by acting only when accidents take place. Health and safety matters should be a priority on management's agenda. The involvement of management and top leadership has been deemed to have an effect on how employees accept policies and proposed changes in the workplace. It is therefore recommended that when changes are made in policies proper consultation take place so that employees can embrace any proposed changes by management and this includes health and safety policies.
- The company should spend more time on health and safety training as the levels of safety adherence can be strengthened through training. Training should focus on hazard identification and risk assessments which may offer the company long term benefits as it will potentially lead to a reduction in occupational accidents and injuries within the company.
- Offer employees in-house refresher courses on occupational health and safety at least every three months to consistently improve employees' levels of safety awareness. This exercise of periodic safety training can be beneficial by offering insight into identifying the sources of accidents and injuries within the company.
- Offer bonuses/rewards to employees in various departments/divisions for experiencing lower accidents as this will serve as a motivating factor to



encourage other employees to adhere with the health and safety rules. This is a good strategy in enticing employees to be compliant with the OHS Act. This notion of offering incentives is usually employed in industries such as the mining sector and seems to be working successfully in reducing occupational accidents, injuries and diseases. It is thus proposed that the company should consider this mechanism of offering financial rewards when employees do not encounter any accidents and injuries for extensive periods.

- Companies should set aside a budget for safety training to deal decisively with health and safety issues. This recommendation should be approached with caution as the steel industries are under stress due to cheap Chinese imports that hampers the South African steel manufacturing industries (Sowetan 2015:6). The sector is also shedding jobs. The industry is faced with serious retrenchments and a weak balance sheet due to a shrinking economy. However, companies should not abdicate their responsibility in terms of insufficient budget allocated to health and safety. The best solution would be to use in-house health and safety personnel and cut down on the use of consultants and save operational costs.
- Both trade unions and management must work jointly together in health and safety matters as both parties wield great influence in the workplace. Trade unions have a major influence in steel companies with over 360 000 employees being unionized in this industry. It is therefore recommended that when the company introduces any health and safety policies, the trade unions should be consulted and where there are objections these concerns must be dealt with decisively by both parties as per the requirement of the LRA. The establishment of structures such as health and safety committees should be promoted and form part of strategic health and safety forums.

## **5.5 LIMITATIONS AND IMPLICATIONS FOR FURTHER RESEARCH**

This study provided valuable information about the factors that affect employee's level of adherence to the OHS Act within the steel manufacturing companies. The results of the research must be approached with caution due to the following limitations. Like

any other research project there will always be limitations. In this study, the following shortcomings were established. The study was limited to a steel manufacturing company situated in Southern Gauteng. The research composed of only employees involved, in the manufacturing process. The sample size of n=165 employees involved in the study also need to be taken into cognizance. It should be noted that this was not a universal representation of all employees in the steel manufacturing industries. It is further suggested that a larger sample be considered for future studies and inclusive of other employees. A non-probability sample was undertaken for the study. Purposive sampling technique was used utilized. It is therefore recommended that future studies explore other sampling methods. A quantitative approach was used to measure the level of employee's adherence with the OHSA. This method was deemed restrictive by research some participants. It is therefore advisable that a mixed method be adopted to probe for answers that needed further clarity. It is further proposed that future studies be conducted in other geographical areas that manufacture steel outside Southern Gauteng such as Emalahleni, Northern Cape, Middleburg and Limpopo.

## **5.6 CONCLUDING REMARKS**

The study contributes to previous scholarly research within the field of occupational health and safety. The primary focus of this study was to explore employees' adherence to the OSHA. This study also extends the existing knowledge related to the relationship between employee's perception, employee safety awareness, and employee adherence to safety and employee behaviour. Research in the field of occupational health and safety have identified employee's perception as having a direct effect on employee's behaviour which ultimately affects the employees level of adherence in the workplace. The results of the study highlighted that there was a strong positive correlation between employee's perceptions of safety, employee safety awareness, and employee adherence to safety is dependent on safety awareness.

South Africa has one the best developed labour legislations in the continent. However, non-compliance by some employers and non-adherence by employees negatively affects the image and reputation of many companies. Occupational accidents and injuries cause serious devastation to families and stifle economic growth due to resources being channeled in rehabilitating the injured employees. Therefore it is

paramount that steel manufacturing organisations have sound health and safety policies to ensure and promote safety adherence.

## BIBLIOGRAPHY

ADAMS, J. KHAN, H.T.A. & RAESIDE, R. 2014. *Research Methods for Business and Social Science Students*. 2<sup>nd</sup>ed. New Delhi: Sage Publication.

ADEBIYI, K.A. & CHARLES - OWABA, O.E. 2009. Towards setting a sustainable manufacturing safety programmes in Nigeria: *Disaster Prevention and Management*, 18(4): 388–396. [Online]. Available at: <http://www.emeraldsight.com>. Accessed: 18/07/2009.

ADHIKARI, D, R. & GAUTAM, D, K. 2010. Labor legislations for improving quality of work life in Nepal. *International Journal of Law and Management*, 1(52): 40-53. [Online]. Available at: <http://www.emeraldsight.com>. Accessed: 18/5/2010.

ADHIKARI, D. R. HIRASAWA, K. TAKAKUBO, Y. & PANDEY, D. L. 2012. Decent work and work life quality in Nepal: an observation. *Employee Relations*, 1 (30): 61-79. [Online]. Available at <http://www.emeraldsight.com>. Accessed: 28/05/2012.

ALI, H. ABDULLAH, N. A. C. & SUBRAMANIAM, C. 2009. Management practice in safety culture and its influence on workplace injury: *An industrial Study in Malaysia*, 18(5):470-477. [Online]. Available at: <http://www.emeraldsight.com>. Accessed: 12/03/2010.

ALLI, B. O. 2001. Fundamental principles of occupational health and safety. *International labour organisation*. [Online]. Available at [www.ilo.org.za](http://www.ilo.org.za). Accessed: 15/07/2012.

ANDRES, L. 2012. *Designing and Doing Survey Research*. London: Sage Publication.

ARCELOR MITTAL STEEL SOUTH AFRICA VANDERBIJLPARK WORKS. 2009. *Sustainability Report*. Sedibeng District.

ARMSTRONG, M. 2003. *A Handbook of Human Resource Management Practice*. 9<sup>th</sup> ed. London: Kogan Page.

- BABBIE, E. 2014. *The Basics of Social Research International Edition*. 6<sup>th</sup> ed. Canada: Wadsworth Cengage Learning.
- BABBIE, E. 1998. *The Practice of Social Research*. 8<sup>th</sup> ed. Belmont: Wadsworth Publishing Company.
- BADRI, A. GBODOSSOU, A. NADEAU, S. 2012. Occupational health and safety risks: towards the integration into project management. *Safety Science*, (50):190-198. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 1/03/2012.
- BAHN, S. & BARRAT-PUGH, L. 2012. Emerging issues of health and safety training delivery in Australia: Quality and transferability. *Social Behaviour Sciences*, (62). 213-222. Available at [http<www.sciencedirect.com](http://www.sciencedirect.com). Accessed: 7/11/2014.
- BALNAVES, M. & CAPUTI, P. 2001. *Introduction to Quantitative Research Methods: An Investigative Approach*. London: Sage Publications.
- BAMBER, G.J. LANSBURY, R.D. & WAILES, N. 2011. *International and Comparative Employment Relations*. Globalisation and change. 5<sup>th</sup> ed. London: Sage Publication.
- BARAM, M. 2009. Biological research on the most dangerous pathogens: Challenges for risk governance and safety management. *Safety Science*, (47):6. 890-898. Available at [http<www.sciencedirect.com](http://www.sciencedirect.com). Accessed: 7/11/2014.
- BARKER, F. 2007. *The South African Labour Market Theory and Practice*. 5<sup>th</sup> ed. Pretoria: Van Schaik.
- BASHA, S.A. & MAITI, J. 2013. Relationship of demographic factors job risk perception and work injury in steel plant in India. *Safety Science*, (51). 374-381. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 13/07/2014.
- BELL, J. 2010. Doing your research project. *A guide for first-time researchers in education, health and social science*. 5<sup>th</sup> ed. New York: McGraw Hill.
- BENDIX, S. 2010. *Industrial relations in South Africa*. 4<sup>th</sup> ed. Cape Town: Juta & Co.

BENJAMNI, P. 2010. *Occupational health, safety, and compensation for occupational injuries and diseases Act. Text and commentary*. Cape Town: Juta & Co.

BERGH, Z. THERON, A. GELDENHUYS, D. UNGERER, L. ALBERTYN, L. ROYTHORNE-JACOBS, H. & CILLIERS, F. 2003. *Psychology in the Work Context*. 2<sup>nd</sup> ed. Cape Town: Oxford University Press.

BEZUIDENHOUT, M.C. GARBERS, C. & POTGIETER, S. 2007. *Managing for Healthy Labour Relations: A Practical Guide for Health Services in South Africa*. Pretoria: Van Schaik.

BLAIR, J. CZAJA, R.E. & BLAIR, E.A. 2014. *Designing Surveys. A Guide to Decisions and Procedures*. 3<sup>rd</sup> ed. California: Sage Publication.

BLESS, C. & HIGSON-SMITH, C. 2000. *Fundamentals of Social Research Methods. An African Perspective*. 3<sup>rd</sup> ed. Cape Town: Juta.

BOSAK, J. COETSEE, W. J. & CULLINANE, S. J. 2013. Safety climate dimensions as predictors of risk behaviour. *Accident Analysis and Prevention*, (55). 256-264. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 7/11/2014.

BOTHA, E. KILEY, J. & WERNER, A. 2011. *Introduction to Work Psychology*. Cape Town: Oxford University Press.

BRANDT, D.C. 2009: Civil liability of an employer for injuries on duty. *Master's Thesis*. Nelson Mandela Metropolitan University.

BRESLIN, F.C. POLZER, J. MACEACHEN, E. MORROGIELLO, B. SHANNON, H. 2006. Workplace injury or part of the job: Towards a gendered understanding of injuries and complaints among young workers. *Social Science*, (64):782-793. [Online]. Available at <[www.elsevier.com](http://www.elsevier.com). Accessed: 22/09/2013.

BROWN, K, A. WILLIS, P, G. & PRUSSIA, G, E. 2000. Predicting safe employee behaviour in the steel industry: development and test of a socio technical model.

*Journal of Operations Management*, (18):445-465. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed 11/07/2012.

BRYNARD, D.J. HANEKOM, S.X. & BRYNARD, P.A. 2014. *Introduction to Research*. 3<sup>rd</sup> ed. Pretoria. Van Schaik:

BURT, C, D. B .CHMIEL, N. & HAYES, P. 2008. Implications of turnover and trust for safety attitudes and behaviour in work teams. *Safety Science*, (47): 1002-1006. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed 23/06/2012.

CANT, M. GERBER-NEL, N. NEL, D. & KOTZE, T. 2003. *Marketing Research*. 1<sup>st</sup> ed. Claremont. New Africa Education:

CANTOR, D.E. 2008. Workplace safety in the supply chain: review of the literature and call for research. *International Journal of Logistics Management*, 1(19):65-83. [Online]. Available at [http<www.emeraldsight.com](http://www.emeraldsight.com). Accessed: 20/10/2013.

CAPRIOTTI, P. 2007. Risk communication strategies in chemical industry in Spain: An examination of the web content of companies on issues related to chemical risk. *Journal of Communication Management*, 2(11): 150-169. [Online]. Available at [http<www.emeraldsight.com](http://www.emeraldsight.com). Accessed: 12/10/2013.

CASEY, T.W. & KRAUSS, A.D. 2013. The role of effective error management practices in increasing miner's safety performance. *Safety Science*. (60).131-141. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 11/6/2014.

CHAMPOUX, J. E. 2006. *Organisational behaviour. Integrating Individuals, Groups, and Organisations*. 3<sup>rd</sup>ed. Mason. Thomson Learning:

CHAUKE, X.D. 2014. Online shopping satisfaction, loyalty and repurchase intentions of generation X consumers in Southern Gauteng. *Master's Thesis*. Vaal University of Technology.

CHEN, G. TREVINO, L. K. & HAMBRICK, D.C. 2009. CEO elitist association: Towards a new understanding of an executive behavioral pattern. *The Leadership Quarterly*, (20):316-328. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed 23/06/2012.

CHENG, E.W. L. RYAN, N. & KELLY, N.R. 2012. Exploring the perceived influence of safety management practices on project performance in the construction industry. *Safety Science*, (50). 362-369. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed 2/011/2015.

CHEYNE, A. OLIVER, A. COX, S. & TOMAS J.M. 2002. The architecture of employee attitudes to safety in the manufacturing sector. *Employee Attitudes to Safety*, 31(6): 649-670. [Online]. Available at [http<www.emeraldsight.com](http://www.emeraldsight.com). Accessed: 12/06/2012.

CHIN, P. DELUCA, C. POTH, C. CHADWICK, I. HUTCHINSON, N. & MUNBY, H. 2010. Enabling youth to advocate for workplace safety. *Safety Science*. (48). 570-579. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 9/09/2013.

CHOI, T. N. Y. CHAN, W. M. CHAN, A. P. C. 2012. Potential difficulties in applying the Pay for Safety Scheme (PFSS) in construction projects. *Accident Analysis and Prevention*, (24):145-155. [Online]. Available at [http<www.elsevier.com/locate/ssci](http://www.elsevier.com/locate/ssci). Accessed 26/07/ 2014.

CHOUNDRY, R.M. FANG, D. & MAHOMED, S. 2007. The nature of safety culture: A survey of the state of- the- art. *Science Direct*, (45):993-1012. [Online]. Available at [http<www.elsevier.com/locate/ssci](http://www.elsevier.com/locate/ssci). Accessed 26/07/2014.

CHURCHILL, G. A. & IACOBUCCI, D. 2002. *Marketing Research: Methodological Foundations*. 8<sup>th</sup> ed. Fort Worth: Harcourt College Publishers:

CLARKE, S. 2003. The contemporary workforce implications for organisational safety culture. *Personnel Review*,1 (32):4057. [Online]. Available at [http<www.emeraldsight.com](http://www.emeraldsight.com). Accessed: 10/06/2012.

CLOETE, J. J. N. 1993. *Public Administration in South Africa*. Pretoria: Van Schaik Publishers.

CLOUGH, P. & NUTBROWN, C. 2012. *A Student's Guide to Methodology*. 3<sup>rd</sup> ed. London: Sage Publication.



- COGHLAN, D. & BRANNICK, T. 2014. *Doing Action Research in Your Own Organisation*. 4<sup>th</sup> ed. London: Sage Publication.
- COTTINI, E. KATO, T. & WESTERGAARD-NIELSEN, N. 2011. Adverse workplace conditions, high-involvement work practices, and labor turnover: evidence from Danish linked employer-employee data. *Labour Economics*, (13): 872-880. [Online]. Available at [http< www.elsevier.com](http://www.elsevier.com). Accessed 10/072012.
- COX, S. & JONES, B. 2006. Behavioural safety and accidents prevention. Short-term Fad or sustainable fix. *Institution of chemical engineers. Accidents Prevention*, 3 (1): 34-57. [Online]. Available at [www.sciencedirect.com](http://www.sciencedirect.com). Accessed 1/ 10/ 2012.
- CRAMER, D. 2003. *Advanced Quantitative Data Analysis*. Berkshire: McGraw-Hill.
- CRESWELL, J. 2008. *Education Research Planning Conducting and Evaluating Quantitative and Qualitative Research*. New Jersey: Pearson Prentice Hall.
- CURRIE, E. J. HILL, C. & ROY, A. 2012. What are the reasons for high turnover in nursing: A discussion of presumed causal factors and remedies? *International Journal of Nursing Studies*, (45):456-469 [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 29/06/2012.
- DAHL, O. 2013. Safety compliance in a highly regulated environment: A case study of workers knowledge of rules and procedures within the petroleum industry. *Safety Science*,(60).185-195. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 9/09/2013.
- DANIEL, E. & GUISTINA, D. 2000. Skating on Wheels Safety Concerns Lie in the Shadow of popularity. *Journal of Physical Education, Recreation & Dance*, 2(74):21-23. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 24/08/2013.
- DANIEL, J. 2012. *Sampling Essentials. Practical Guides for Making Sampling Choices*. California: Sage Publications.
- DAVIES, M. B. 2007. *Doing a Successful Research. Using Qualitative or Quantitative methods*. London: Palgrave McMillan.
- DAVIS, D. CHEADLE, H. & HAYSOM, N.1997. *Fundamental Rights in the Constitution*. Cape Town: Juta & Co.

DE BAETS, P. 2003. The labour inspection of Belgium, the United Kingdom and Sweden in a comparative perspective. *International Journal of the Sociology of Law*, (31): 35-53. [Online]. Available at [http>www.elsevier.com](http://www.elsevier.com). Accessed 2/07/2012.

DE KOSTER, R.B.M. STAM, D. & BALK, B.M. 2011. Accidents happen: the influence of safety –specific transformational leadership, safety consciousness, and hazard reducing systems on warehouse accidents. *Journal of Operations Management*, (29). 753-765. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 8/3/2014.

DE VOS, A.S. STRYDOM, H. FOUCHE, C.B. & DELPORT, C.S.L. 2011. *Research at Grassroots*. Pretoria: Van Schaik.

DEEPROSE, D. 2007. *How to Recognize and Reward Employees*. 2<sup>nd</sup>ed. New York: Amacom Publishers.

DEJONG, C.R. MONETTE, D.R. SULLIVAN, T.J.2011. *Applied Social Research*. Belmont: Cengage Learning.

DENSCOMBE, D. 2007. *The Good Research Guide for Small-Scale Social Research Projects*. 3<sup>rd</sup> ed. London: McGraw- Hill.

DEPARTMENT OF LABOUR 2008. Industrial structures and skills in the metals beneficiation sector of South Africa. [Online]. Available at<[www.dol.org.za](http://www.dol.org.za). Accessed: 8/09/2013.

DHURUP, R. 2015. *Writing my first Research Proposal*. Vaal University of Technology. Vanderbijlpark: VUT

DU TOIT, D. BOSCH, D. WOOLFREY, D. GODFREY, S. COOPER, C. GILES, G. & BOSCH, C. 2003. 4<sup>th</sup> ed. *Labour Relations Law a Comprehensive Guide*. Durban: Butterworth.

DU TOIT, D. BOSCH, D. WOOLFREY, S. GODFREY, S. ROSSOUW, CHRISTIE, COOPER, C. GILES, G. & BOSCH, C. 2006. 5<sup>th</sup> ed. *Labour Relations and Law*. Durban: Butterworth.

DUBRIN, A. J. 2002. *Fundamentals of Organisational Behaviour*. 2<sup>nd</sup> ed. Ohio: Thomson Learning.

EDINGTON, D.W., & SCHULTZ, A.B. 2008. The Total Value of Health. *International Journal of Workplace Health Management*, 1(1): 8-19. [Online]. Available at:><http://www.emeraldsight.com>. Accessed: 29/09/2009.

EDWARDS, J.R.D. DAVEY, J. & ARMSTRONG, K.A. 2014. Profiling contextual factors, which influence safety in heavy vehicle industries. *Accident Analysis and Prevention*, (73). 340-350. Available at [http>www.elsevier.com](http://www.elsevier.com). Accessed: 7/11/2014.

ENGEL, R, J. & SCHUTT, R, K. 2010. *Fundamentals of Social Work Research*. 2<sup>nd</sup> ed. London: Sage Publishers.

EWEJE, G. 2005. Hazardous employment and regulatory regimes in the South African mining industry: Arguments for corporate ethics at workplace. *Journal of Business Ethics*, (56):163-183. [Online]. Available at [http>www.jstor.org/stable/25123421](http://www.jstor.org/stable/25123421). Accessed 19/01/ 2011.

FARMER, R. A. 2010. Improving occupational health and safety in a petrochemical environment through culture change. *MBA Thesis*. North West University (Potchefstroom).

FEINBERG, F.M. KINNEAR, T.C. & TAYLOR, J.R. 2013. *Modern Marketing Research Concepts, Methods and Cases*. 2<sup>nd</sup> ed. Cengage Learning. United States.

FELDMAN, R.S. 2001. *Social Psychology*. 3<sup>rd</sup>ed. New Jersey: Pearson Prentice Hall.

FENG, C. ZHANG, G. WU, Q. LIU, X.C. WANG, H. & BOGUS, S.M. 2014. Mixed logit model-based driver injury severity investigation in single and multi-vehicle crashes on rural-lane highways. *Accident Analysis & Prevention*, (72). 105-115. [Online]. [http>www.elsevier.com](http://www.elsevier.com). Accessed: 23/06/2014.

FERNANDEZ-MUNIZ, B. MONTES-PEON, J. M & VAZQUEZ-ORDAS, C. J. 2011. Relationship between occupational safety management and firm performance.

*Accident Analysis*, (47):980-991. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed 12/04/2012.

FINK, A. 2010. *Conducting Research Literature Reviews*. 3<sup>rd</sup> ed. California: Sage Publication.

FINK, A. 2008. *Practicing Research, Discovering Evidence That Matters*. California: Sage Publications.

FINNEMORE, M. & VAN RENSBURG, R. 2002. *Contemporary Labour Relations*. 2<sup>nd</sup> ed. Durban Butterworth: Lexis Nexis.

FLETT, G, L. 2007. *Personality Theory & Research: An international perspective*. 1<sup>st</sup> ed. Ontario: Wiley & Sons.

FLYNN, A. & SHAW, J. 2008. *Safety Matters. A Guide to Health and Safety at Work*. Dublin: Management's Briefs.

FOX, W. & SAHEED BAYAT, M. 2007. *A Guide to Managing Research*. 1<sup>st</sup> ed. Cape Town: Juta & Co Ltd.

FRIEDMAN, H, S & SCHUSTACK, M, W. 2006. *Personality Classic Theories and Modern Research*. 3<sup>rd</sup> ed. Boston: Pearson Publishers.

GAGNO, E. GUIDO, J.L. MASI, D. JACINTO, C. 2013. Economic evaluation of OHS and its way to SMEs: A constructive review. *Safety Science*, (53). 134-152. [Online]. Available at [www.sciencedirect.com](http://www.sciencedirect.com). Accessed: 1/7/2013.

GAISER, T.J. & SCHREINER, A.E. 2009. *A Guide to conducting online Research*. Boston: Sage Publication.

GARCIA-HERERO, S. MARISCAL, M. A. GARCIA-RODRIQUEZ, J. & RITZEL, D. O. 2012. Working conditions psychological/physical symptoms and occupational accidents. Bayesian network models. *Safety Science*, (32):1760-1774. [Online]. [http>www.elsevier.com](http://www.elsevier.com). Accessed: 23/06/2012.

GARZARELLI, P. KEETON-STOLK, H. & SCHOER, R. 2008. *Safety Science*, 8(31):23-32 [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 23/06/2012.

GELDART, S SMITH, C, A. SHANON, H. S. & LOHFELD, L. 2010. Organizational practices and workplace health and safety: A cross-sectional study in manufacturing companies: *Safety Science*, (44):123-134. [Online]. Available at<[www.elsevier.com/locate/ssci](http://www.elsevier.com/locate/ssci). Accessed: 2012/09/23

GERMINIANI, F. & SMALLWOOD, J. 2008. A critical review of the effectiveness of the Department of Labour (DoL) Occupational Health and Safety (OH&S). *Inspectorate in Relation To the Construction Industry in South Africa*. (2): 5-28. [Online]. Available at< [www.sabinet.co.za](http://www.sabinet.co.za). Nelson Mandela Metropolitan University. Accessed: 26/10/2009.

GILLHAM, B. 2000. *Developing a Questionnaire*. London: Continuum Publishers.

GORDON-DAVIS, L. & CUMBERLEGE, P. 2007. *Legal Issues for Entrepreneurs*. Cape Town: Juta & Co.

GOVINDJEE, A. 2012. The role of occupational health and safety in sustaining human capital. 25<sup>th</sup> Annual Labour Law Conference. Sandton Convention Centre.

GRAY, D.E. 2009. *Doing Research in the Real World*. 2<sup>nd</sup> ed. London: Sage Publication.

GRAY, P.S WILLIAMSON, J.B. KARP, D.A. & DALPHIN, J.R. 2007. *Organisational Research Methods*. New York: Cambridge University Press.

GRAY, W.B., & MENDELOFF, J.M. 2005. The Declining Effects of OSHA Inspections on Manufacturing Injuries. *Industrial and Labour Relations Review*, 58(4): 571-587. [Online]. Available at :><http://www.jstor.org/stable/30038607>.

GRAZIANO, A. M. & RAULIN, M. L. 2010. *Research Methods. A Process of Inquiry*. 7<sup>th</sup> ed. Boston: Pearson.

GREASLEY, P. 2008. *Quantitative Data Analysis Using SPSS*. An Introduction for Health and Social Science. Berkshire: McGraw Hill.

GREEN WOOD, E. WOOD, S.E. & BOYD, D. 2005. *The World of Psychology*. 5<sup>th</sup> ed. Boston: Pearson Learning.

GROBLER, P. A. BOTHMAN, R. BREWSTER, C. CAREY, L. HOLLAND, P. & WARNICH, S. 2012. *Contemporary Issues in Human Resources Management*. 4<sup>th</sup> ed. Cape Town: Oxford University Press.

GROBLER, P. A. WARNICH, S. CARRELL, M.R. ELBERT, N. F. & HARTFIELD, R. D. 2011. 4<sup>th</sup> ed. *Human Resource Management in South Africa*. London: Cengage Learning.

GROGAN, J. 2007. *Dismissal, Discrimination & Unfair Labour Practices*. 2<sup>nd</sup> ed. Cape Town: Juta.

GROSSET, M. 1999. *Discipline and Dismissal a Practical Guide for South Africa Managers*. 2<sup>nd</sup> ed. Western Cape: Thomson Publishing.

GROSSETT, M. VENTER, R. & HILLS, S. 2003. *Labour Relation in South Africa*. 2<sup>nd</sup> ed. Cape Town: Oxford University Press.

GROVES, R, M. FOWLER, F, J. COUPER, M. P. LEPKOWSKI, J, M. SINGER, E. & RODGER, T. 2004. *Survey Methodology*. New Jersey: Wiley & Sons.

GYEKE, S. A. SALMINEN, S. & OJAJARVI, A. 2012. A theoretical model to ascertain determinants of occupational accidents among Ghanaian industrial workers. (42): 233-240. *Industrial Ergonomic*, [Online]. Available at >[www.elsevier.com/locate/ssci](http://www.elsevier.com/locate/ssci). Accessed: 8/9/2013.

HADJIMANOLIS, A.& BOUTRAS, G. 2012. Health and safety policies and work attitudes in Cypriot companies. *Safety Science*, (3):1-7. [Online]. Available at >[www.elsevier.com/locate/ssci](http://www.elsevier.com/locate/ssci). Accessed: 8/9/2013.

HALL, R. 2006. *Industrial Relations: A current view*. Sydney: Sage Publication.

HARE, B. & CAMERON, I. 2011. Site manager safety training. *Engineering, Construction and Architectural Management*, (18): 6. 568-578. [Online]. Available at :< [www.emeraldsight.com](http://www.emeraldsight.com). Accessed: 07/ 09/2015.

HARVEY, J. GREGORY, D. & ERDOS, G. 2000. The effectiveness of training to change safety culture and attitudes within a highly regulated environment. *Personnel*

Review, 30(6): 615-636. [Online]. Available at :< [www.emeraldsight.com](http://www.emeraldsight.com). Accessed: 08/ 09/2009.

HAYES, L, J. O'BRIEN- PALLAS, L. DUFFIELD, C. SHAMIAN, J. BUCHAN, J. HUGHES, F. SPENCE LACHINGER, H, K. & NORTH, N. 2011. Nurse turnover: A literature review- An update. *Nursing Studies*, (49): 887-905. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 23/06/2012.

HAYES, L. J. O'BRIEN-PALLAS, L. DUFFIELD, C. SHAMIAM, J. BUCHAN, J. HUGHES, F. HEATHER, K. LASCHINGER, S. NORTH, N. & STONE, P. W. 2006. Nurse turnover: A literature review. *International Journal of Nursing Studies*. (43): 237-263. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 23/06/2012.

HEALTH AND SAFETY EXECUTIVE. 2011. *Mine safety and the law –legal enforcement stoppages and fatalities prevention in the workplace*. Available at>[www.labourguide.co.za](http://www.labourguide.co.za). Accessed: 12/05/2012.

HEERINGA, S. G. WEST, B. T. & BERGLUND, P. A. 2010. *Applied Survey Data Analysis*. Chicago: CRCPress.

HENN, M. WEINSTEIN, M. & FOARD, N. 2006. *A Short Introduction to Social Research*. London: Sage Publication.

HENRIQSON, E. SCHULER, B. VAN WINSEN, R. & DEKKER, S.W.A. 2014. The Constitution and effects of safety culture as an object in the discourse of accident prevention: A Foucauldian approach. *Safety Science*, (70). 465-476. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 17/09/2015.

HERGENHAHN, B. R. & OLSON, M. H. 2003. *An Introduction to Theories of Personality*. 6<sup>th</sup> ed. New Jersey: Prentice Hall.

HERMANUS, M. A. 1999. Trends in Occupational Health and Safety Policy and Regulations – Issues and Challenges in South Africa. *Takemi Program in International Health*. Harvard School of Public Health.

HO, J.J. HWANG, J. S. & WANG, J. D. 2006. Estimations of reduced life expectancy from serious occupational injuries in Taiwan. *Accident Analysis*, (38): 961-968. [Online]. Available [http>www.elsevier.com](http://www.elsevier.com). Accessed: 12/02/2011.

HOLLEY, W.H. JENNINGS, K.M & WOLTERS, R.S. 2008. *Labour Relations Process*. 9<sup>th</sup> ed. Ohio: Cengage Learning.

HON, C.K.H. HINZE, J. & CHAN, A. P.C. 2014. Safety climate and injury occurrence of repair, maintenance, minor alteration, and addition works. *Facilities Management*, (1):188-207. [Online]. Available at <[www.emeraldsight.com](http://www.emeraldsight.com). Accessed: 23/3/2014

HUANG, Y, H. CHEN, J. C. DEARMOND, S. CIGULAROV, K. CHEN, P.Y. 2007. Roles of safety climate and shift work on perceived injury risk: A multi-level analysis. *Accident Analysis and Prevention*. (39):1088-1096. [Online]. Available at< [www.elsevier.com](http://www.elsevier.com). Accessed: 12/04/2013.

HUANG, Y.N. VERMA, S. K. CHANG, W. R. COURTNEY, T. K. LOMBARDI, D. A. BRENNAN, M. J. & PERRY, M. J. 2012. Supervisor vs. employee safety perceptions and association with future injury in US limited-service restaurant workers. *Accident Analysis and Prevention*, (47):45-51. [Online]. Available at [http<www. Elsevier.com](http://www.Elsevier.com). Accessed: 1/07 /2012.

HUCK, S. W. 2004. *Reading Statistics and Research*. 4<sup>th</sup> ed. Boston: Pearson Education Inc.

HUESS-HEDLUND, F. 2013. Recorded fatal and permanent disability injuries in South African manufacturing industry- Overview, analysis, and reflection. *Safety Science*, (55): 149-159. [Online]. Available at< [www.elsevier.com](http://www.elsevier.com). Accessed: 12/04/2013.

INTERNATIONAL LABOUR ORGANISATION. 2002. *Health and Safety at Work: A Trade Union Priority*, [Online]. Available at<[www.ilo.org.za](http://www.ilo.org.za). Accessed: 15/07/2012.

INTERNATIONAL LABOUR ORGANISATION. 2004. Safety in numbers. *Global Safety Culture at Work*, [Online]. Available at<[www.ilo.org.za](http://www.ilo.org.za). Accessed: 15/07/2012.



INTERNATIONAL LABOUR ORGANISATION. 2005. *Promotional Framework for Occupational Safety and Health*, International labour conference ,93<sup>rd</sup> session. [Online]. Available at<[www.ilo.org.za](http://www.ilo.org.za). Accessed: 15/07/2012.

INTERNATIONAL LABOUR ORGANISATION. 2007. *World day for decent work*. [Online]. Available at<[www.ilo.org.za](http://www.ilo.org.za). Accessed: 15/07/2012.

INTERNATIONAL LABOUR ORGANISATION. 2010. *Republic of South Africa Decent Work Country Programme 2010 to 2014*, [Online]. Available at<[www.ilo.org.za](http://www.ilo.org.za). Accessed: 15/07/2012.

ISMAIL, Z. DOODSTDAR, S. & HARUN, Z. 2012. Factors influencing the implementation of a safety management systems for construction sites. *Safety Science*, (50):418-423. [Online]. Available at [http>www.elsevier.com](http://www.elsevier.com). Accessed: 06/14/2015.

JACKSON, M. 2007. Strategies for inspection and enforcement of the occupational health and safety legislation. *PhD Thesis*. University of Johannesburg.

JACOBS, D. MOSTERT, K. & PIENAAR, J. 2008. The experience of work-life interaction in the Northern Cape mining industry: An exploratory study. North West University, *Research Unit for People Policy and Performance*. [Online] Available at [http<www.emeraldsight.com](http://www.emeraldsight.com). Accessed 21/02/2011.

JALLON, R. IMBEAU, D. DE MARCELLIS-WARIN, N. 2011. Development of an indirect-cost calculation model suitable for workplace use. *Journal of Safety Research*, (42):149-164. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 3/06/2012.

JEEBHAY, M. & JACOBS, R. 2008. Chapter 19 Occupational services in South Africa. *Safety Science*, [Online]. Available at [http>www.emeraldsight.com](http://www.emeraldsight.com). Accessed 21/02/2011.

JENSEN, D. MCMULLEN, T. & STARK, M. 2007. *The Manager's Guide to Rewards*. New York: Amacom Publishers.

JOHNSTONE, R & QUINLAN, M. 2006. The OHS regulatory challenges posed by agency workers: evidence from Australia. *Employee Relations*, (23):4. 273-289. [Online]. Available at <[www.emeraldsight.com](http://www.emeraldsight.com)>. Accessed: 2012/10/23.

KAPLAN, R, M. & SACCUZZO, D. S. 2001. *Psychological Testing Principle, Applications and Issues*. 5<sup>th</sup> ed. Stamford: Thomson Learning.

KAPP, E. A. 2012. The influence of supervisor leadership practices and perceived group safety climate on employee safety performance. *Safety Science*. (50).1119-1124. [Online]. Available at <[www.elsevier.com/locate/ssci](http://www.elsevier.com/locate/ssci)>. Accessed: 2013/9/12.

KELLY, D.L.1997. *Measurement Made Accessible. A Research Approach Using Qualitative & Qualitative Improvement Methods*. Stamford: Sage Publication.

KIFLE, M. ENGDAW, D. ALEMU, K. SHARMA, H.R. AMSALU, S. FEKELE, A. & WORKU, W. 2014. Work related injuries and associated risk factors among iron and steel industries workers in Addis Ababa, Ethiopia. *Safety Science*, (63). 211-216. [Online]. Available at <http://www.elsevier.com>. Accessed: 11/10/2014.

KINOTI, M. K. 2010. Association between injuries and occupational exposures in South Africa: An epidemiological study at the population level. *Master's Thesis*. In epidemiology and biostatistics. University of Johannesburg. University of Johannesburg.

KNEGTERING, B. & PASMANN, H.J. 2009. Safety of the process industries in the 21 century: A changing need of process safety management for a changing industry. *Journal of Loss Prevention in the Process Industries*, (22):162-168. [Online]. Available at [www.elsevier.com](http://www.elsevier.com) Accessed: 22/04/2013.

KOPEL, S. 2009. *Guide to Business Law*. Cape Town: Oxford University Press.

KOUABENAN, D.M. NGUETSA, R. & MBAYE, S. 2015. Safety climate, perceived risk and involvement in safety management. *Safety Science*, (77). 71-79. [Online]. Available at <http://www.elsevier.com>. Accessed: 1/8/2015.

KREITNER, R. & KINICKI, A.2001. *Organisational Behaviour*. 5<sup>th</sup>ed. New York: Irwin McGraw-Hill.

KUMAR, R. 2014. *Research Methodology. A Step by Step guide for beginners*. 4<sup>th</sup> ed. London: Sage Publication.

LAMBERTON, L. H. & MINOR, L. 2010. *Human Relations Strategies for Success*. 4<sup>th</sup> ed. New Jersey: McGraw- Hill.

LANOIE, P. & TROTTIER, L. 1998. Costs and benefits of preventing workplace accidents: Going from mechanical to a manual handling system. *Journal of Safety Research*, 2:(29). 65-75. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 2/09/2010.

LAROCHE, E. & AMARA, N. 2010. Transfer activities among Canadian researcher: Evidence in occupational safety and health. *Safety Science*, (49):406-415. [Online]. Available at [http>www.elsevier.com](http://www.elsevier.com). Accessed: 3/8/2012.

LARSEN, R. J. & BUSS, D. M. 2005. *Personality Psychology. Domains of Knowledge about Human Nature*. 2<sup>nd</sup>ed. New York: McGraw-Hill.

LAVICOLI, S. MARINACCIO, N. VONESCH, C, L. URSINI, C. GRANDI, C. PALMI, S. 2001. Research priorities in occupational health and Italy. *Occupational and Environmental Medicine*, 5(58):325-329. [Online]. Available at [www.elsevier.com/locate/ssci](http://www.elsevier.com/locate/ssci). Accessed: 2013/10/12.

LAW, W. K. & CHAN, A. H. S. 2006. Prioritizing the safety management elements. *Industrial Management & Data. Safety Analysis*, 6: (106).778-792. [Online]. Available at <http://www.emeraldsight.com>. Accessed: 15/10/2009.

LAWRENCE, R. J. GIL, M. P. FLUCKIGER, Y. LAMBERT, C. L. & WERNA, E. 2012. Promoting decent work in the construction sector: the role of local authorities. *Habitat International*. (32):160-171. [Online]. Available at [www.elsevier.com/locate/ssci](http://www.elsevier.com/locate/ssci). . Accessed: 2013/1/17.

LAWRENCE, R.J. GIL, M.P. FLUCKERIGER, Y. LAMBERT, C. & WERNA, E. 2008. Promoting decent work in the construction sector: the role of local authorities. *Habitat International*, 2(32): 160-171. [Online]. Available at [http>www.elsevier.com](http://www.elsevier.com) Accessed: 22/04/2013.

- LEEDY, P, D. & ORMROD, J, E. 2010. *Practical Research Planning and Design*. 9<sup>th</sup>ed. New Jersey: Pearson Education.
- LEEDY, P, D. & ORMROD, J, E. 2014. *Practical Research Planning and Design*. Pearson International Edition. 10<sup>th</sup> ed. Essex: Pearson Education.
- LEEDY, P.D. & ORMROD, J.E. 2001. *Practical Research Planning and Design*. 7<sup>th</sup>ed. New Jersey: Pearson Prentice Hall.
- LEXIS NEXIS. 2005. *Occupational Health and Safety Act and Regulations 85 of 1993 full version*. 4<sup>th</sup> ed. Durban: Butterworth.
- LIAO, C, W. & CHIANG, T, L. 2012. Designing of dynamic for labour inspection system for construction industry. *Expert Systems with Applications*. (39):4402-4409. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 11/04/2013.
- LIM, G.S. HOLLEY, W.H. JENNINGS, K.M. & WOLTERS, R.S. 2012. *Labour Relations Process: A partnership Approach to creating Strategic Competitive Advantage*. Ohio: Cengage Learning.
- LIN, J. & MILLS, A. 2001. Measuring the occupational health and safety performance of construction companies in Australia. *Accident Prevention*, (19): 3/4.131-138. [Online]. Available at: [http<www.emereraldshight.com](http://www.emereraldshight.com). Accessed: 22/10/2009.
- LINGARD, H. BLISMAS, N. COOKE, T. 2009. Resource to help Australian Government agencies to promote safe construction. *International Journal of Managing Project in Business*, (1): 2:159-175. [Online]. Available at [http<www.emeraldshight.com](http://www.emeraldshight.com) Accessed: 5/10/2009.
- LOFQUIST, E. A. GREVE, A. & OLSSON, U. F. 2011: Modeling attitudes and perceptions as predictors for changing safety margins during organisational change.. *Safety Science*, (49):531-542. [Online]. Available at<[www.elsevier.com/locate/ssci](http://www.elsevier.com/locate/ssci). Accessed: 2013/09/11.
- LUES, L. & LATEGAN, L.O. K. 2006. *Research ABC*. 1<sup>st</sup>ed. Stellenbosch: African Sun Media.

LUND, F. & MARRIOT, A. 2011. Occupational health and safety and the poorest. *School of Environmental Studies*. Research report no.88, [Online]. Available at <[www.elsevier.com/locate/ssci](http://www.elsevier.com/locate/ssci). . Accessed: 2013/04/14.

MACEY, W. H. SCHNEIDER, B. BARBERA, K. M. & YOUNG, S. A. 2009. *Employee Engagement*, 1<sup>st</sup> ed. Tools for analysis practice and competitive advantage. Wiley–Blackwell. United Kingdom. Available at <http://www.elsevier.com>. Accessed: 13/9/2011.

MAITI, J. & PAUL, P. S. 2007. The role of behavioural factors on safety management in underground mines. *Safety Science*, (45): 4. 449-471. [Online]. Available at <<http://www.elsevier.com/locate/ssci>. Accessed: 2013/06/11" [www.elsevier.com/locate/ssci](http://www.elsevier.com/locate/ssci). Accessed: 2013/06/11.

MALHOTRA, N. K. 2004. *Essentials of Marketing*. Sydney: Pearson Education.

MALHOTRA, N. K. 2010. *Marketing Research: an Applied Orientation Global Edition*. 6<sup>th</sup> ed. Sydney: Prentice Hall.

MALINEN, S. WRIGHT, S. & CAMMOCK, P. 2013. What drives organizational engagement? A case study on trust, justice, perceptions, and withdrawal attitudes. A global forum for empirical scholarship. *Accidents Prevention*, (1):1. 96-108. [Online]. Available at <[www.emeraldsight.com](http://www.emeraldsight.com). Accessed: 23/3/2014.

MANUWA, K. 2008. Step change towards zero incidents in the chemical industry: Managing the human factor. *Master's Thesis*. Engineering development and management. North West University (Potchefstroom).

MAREE, K. CRESWELL, J. W. EBERSOHN, L. ELOFF, I. FERREIRA, R. IVANKOVA, N. V. JANSEN, J. D. NIEUWENHUIS, J. PIETERSEN, J. PLANO CLARK, V. L. VAN DER WESTHEIZEN, C. 2010. *First Steps in Research*. 1<sup>st</sup> ed. Pretoria: Van Schaik Publishers.

MARMOT. M & GOLDBLATT, P. 2013. African Newsletter on Occupational Health and Safety. *Health Promotion at Work*, (23): 3. 1-24. Available at <http://www.elsevier.com>. Accessed: 9/09/2013.

MARSHALL, C. & ROSSMAN, G. B. 2006. *Designing Qualitative Research*. 4<sup>th</sup> ed. California: Sage Publication.

MARTINEZ-CORCOLES, M. GRACIA, F.J. TOMAS, I. PEIRO, J. M. & SCHOBEL, M. 2013. Empowering team leadership and safety performance in nuclear power plants: A multilevel approach. *Safety Science*, (51). 293-301. Available at [http>www.elsevier.com](http://www.elsevier.com). Accessed: 7/11/2014.

MARTINS, J. 2005. *Organisational Behavior and Management*. 3<sup>rd</sup>ed. London: Cengage Learning.

MASHEGO. K.R. 2014. The relationship between occupational stress and organisational commitment among police officers in Sebokeng Cluster. *Master's Thesis*. Vaal University of Technology. (Vanderbuijpark)

MASIA, U. 2010. The relationship of work stress and job insecurity with workplace safety compliance, job satisfaction, and commitment in a mine. *Mini-Dissertation*. North West University (Potchefstroom).

MASON, K. SRIPADA, C.S. & STICH, S. 2005. *The Philosophy of Psychology*. Companion to Twentieth Century Philosophy. 1-46. London: Routledge.

MATTHEW, H. 2008. *Contractors to be charged for Sasol blast*, [Online]. Available at <http://www.engineeringnews.co.za>. Accessed: 1/6/2012.

MBAKAYA, C.F.L. ONYOYO, H.A. LWAKI & OMONDI. 1999. A survey on management perspectives of the state of workplace health and safety practices in Kenya. *Accident Analysis and Prevention*, (31). 305-312. Available at [http<www.sabinet.com](http://www.sabinet.com). Accessed: 8/26/2014.

MBAYE, S. & KOUBENAN, D.R. 2013. How perceptions of experience-based analysis influence explanations of work accidents. *Journal of Safety Research*, (47). 75-83. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 16/04/2014.

MCDANIELS, C. D. & GATES, R. H. 2002. *Marketing Research: the Impact of the Internet*. 5<sup>th</sup>ed. New Jersey: Wiley Higher Education.

McGOVERN, P.M., VESLEY, D. KOCHEVAR, L. GERSHON, R.M.M. RHAME, F, & ANDERSON, E. 2000. Factors Affecting Universal Precautions Compliance. *Journal of Business and Psychology*, (1):15. 149-161. [Online]. Available at:><http://www.jstor.org/stable/25092710>>.Accessed:15/10/2009.

McGUIRE, D. & McLAREN, L. 2009. The impact of physical environment on employee commitment in call centers. *Team Performance Management*,15 :(1/2). 35-48. [Online]. Available at: [http:>www.emeraldsights.com](http://www.emeraldsights.com). Accessed: 13/08/2009.

MEARNS, K. HOPE, L. FORD M, T. TETRICK, L. E. 2009. Investment in workforce health: Exploring the implications for workforce safety climate and commitment. *Accident Analysis & Preventions*, (42).1445-1454. [Online]. Available at<[http:www.elsevier.com/locate/ssci](http://www.elsevier.com/locate/ssci). Accessed: 2013/11/12.

MERTENS. D. M. 2009. *Transformative Research and Evaluation*. New York: Guilford Press.

MILLER, R. L. & BREWER, J. D. 2003. *A to Z of Social Research*. 1st ed. London: Sage Publication.

MOHAMED, S. & CHINDA, T. 2011. System dynamics modeling of construction safety culture. *Engineering Construction and Architectural Management*, (18):3 266-281. [Online]. Available at [http>www.elsevier.com](http://www.elsevier.com). Accessed: 29/05/2012. 180

MOLLER, G. P & ROTHMANN, S. 2006. The implementation and evaluation of a behavior based safety intervention at an iron ore mine. *Workwell Research Unit for People, Policy, and Performance*, [Online]. Available at: <[www.sabinet.co.za](http://www.sabinet.co.za). North-West University (Potchefstroom). Accessed: 11/9/2009.

MOLLER, G. P. 2003. The implementation and evaluation of a behavior based safety intervention at Sishen iron ore mine. *PhD Thesis*. North West University (Potchefstroom).

MOORHEAD, G. & GRIFFIN, R.W. 1998. *Organisational Behaviour: Managing People and Organisation*. 5<sup>th</sup> ed. Boston: Houghton Mifflin Company.

- MORROW, P.C. SUZUKI, Y. CRUM, M.R. RUBEN, R. & PAUTSCH, G. 2005. *Journal of Managerial Psychology*, (20):8.681-694. [Online]. Available at: <http://www.emeraldsight.com>. Accessed: 18/07/2014.
- MOUTON, J. 2001. *How to Succeed in Your Master's and Doctoral Studies*. 1<sup>st</sup> ed. Pretoria: Van Schaik Publishers.
- MTHALANE, D. OTHMAN, A. A. E. & PEARL, R. G. 2007. Economic and social impacts of site accidents on the South African society. *School of Civil Engineering, Surveying and Construction*, Durban: University of Kwa-Zulu Natal.
- MUCHIRI, F. K. 2005. Africa News Letter on Occupational Health and Safety. *Occupational Health and Safety Programmes and Management*, (15). 27-52. [Online]. Available at: <http://www.ttl.fi/> African Newsletter. Accessed: 1/10/2009.
- MULLINS, L. J. 2006. *Essentials of Organisational Behaviour*. 1<sup>st</sup> ed. London: Pearson Education.
- MUNHINSKY, P. M. 2003. *Psychology Applied to Work. An Introduction to Industrial and Organisational Psychology*. 7<sup>th</sup>ed. New York: Thomson Wadsworth.
- MUSKIN, A. WEBER, B. SADYKOVA, D. ILG, L. DUBEY, S. GALLOP, P. SIKOROVA, K. SRYTR, J. SPATAR, S. MUNNIK, V. & PEEK, B. 2008. In the wake of Arcelor Mittal: the global steel giant's local impact. *Safety Science*. 43(6): 89-94. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 13/9/2012.
- MUSTAFA, A. 2010. *Research Methodology*. 1<sup>st</sup>ed. New Delhi: AITBS Publishers.
- MYBURG, P. SMIT, N. & VAN DER NEST, D. 2009. Social Security aspects of accident compensation: COIDA and RAF as examples. Available at [http<www.sabinet.com](http://www.sabinet.com). Accessed: 8/26/2014.
- NAIDOO, K. & BOTHA, C, J. 2012. Management and leadership in secondary schools in South Africa. *African Journal of Business Management*, (6):32. 9218-9227. [Online]. Available at [http ://>www.elsevier.com](http://www.elsevier.com). Accessed: 27/5/2013.



- NAILE, I. 2015. The relationship between motivation and job satisfaction of academics: A case study of a University. *Master's Thesis*. Vaal University of Technology.
- NEL, P. KIRSTEN, M. S. SWANEPOEL, B, J. ERASMUS, B. J & POISAT. P. 2008. *South African Employment Relations Theory and Practice* .6<sup>th</sup> ed. Pretoria: Van Schaik Publishers.
- NELSON, D. & QUICK, J. C. 2003. *Foundations Realities and Challenges Organisational Behaviour*. 4<sup>th</sup> ed. Ohio: Thomson Learning.
- NEUMAN, W.L. 2009. *Understanding Research*. 1<sup>st</sup> ed. Boston: Pearson Education.
- NHAMMER, E. SCHUSTERSCHITZ, C. & STUMMER, H. 2013. Employee perceived effects of workplace health promotion. *International Journal of Workplace Health Management*, [Online]. 1(6): 38-53. Available at >[www.emeraldsight.com](http://www.emeraldsight.com). Accessed: 23/3/2014
- NICHOLAS, L. 2008. *Introduction to Psychology*. 2<sup>nd</sup> ed. Cape Town: UCT Press.
- NISKANEN, T. 2012. Results of Finnish national survey in the chemical industry on EU legislation concerned with risk assessment and safety compliance climate. *Journal of Loss Prevention in the Process Industries*, (25).535-543. [Online]. Available at http :> <http://www.elsevier.com>" [www.elsevier.com](http://www.elsevier.com). Accessed: 29/8/2014.
- NIZA, C. SILVA, S. & LIMA, M, L. 2007. Occupational accidents experience: Association with workers accidents explanation and definition. *Safety Science*, (46): 959-971. [Online]. Available at [http>www.elsevier.com](http://www.elsevier.com). Accessed 29/05/2012.
- NORDLOF, H. WIITAVAARA, B. WINBLAD, U. WIJK, K. & WESTERLING, R. 2015. Safety culture and reasons for risk-taking at a large steel-manufacturing company: Investing the worker perspective. *Safety Science*, (73). 126-135. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 12/08/2015.
- NUNEZ, I & VILLANUEVA, M. 2011. Safety capital: the management of organisational knowledge on occupational health and safety. *Journal of Workplace*

*Learning*. 1(23): 56-71. [Online]. Available at [http>www.elsevier.com](http://www.elsevier.com). Accessed: 21/08/2011.

O' HARA, R. DICKETY, N. & WEYMAN, A. 2005. Good Practices in Assessing Workplace Risks by Small and Medium – sized Enterprises. *International Journal of Risk Management*, 7(1):31-41. Available at <http://www.emeraldsight.com>. Accessed: 11/10/2009.

O' LEARY, Z. 2004. *The essential Guide to doing research*. London: Sage Publications.

O'LEARY, Z. 2010. *The Essential Guide to Doing Your Research Project*. 2<sup>nd</sup>ed. London: Sage Publication.

OLIVER, P. 2010. *Understanding the research process*. 3<sup>rd</sup> ed. New Dehli: Sage Publication.

OMOGOROYE, O. O. & OKE, S. A. 2007. A safety control model for an offshore oil platform. *Disaster Prevention and Management*, 16(4):134-158. [Online]. Available at [http>www.elsevier.com](http://www.elsevier.com). Accessed: 21/08/2013.

OSBORNE, J.W. 2013. *Best Practices in Data Cleaning*. California: Sage Publication.

OSLAND, J. S. KOLB, D. A. & RUBIN, I. M. 2001. *Organisational Behaviour. An Experiential Approach*. 7<sup>th</sup>ed. New Jersey: Prentice Hall.

OXENBURG, M. & MARLOW, P. 2005. The productivity assessment tool: computer-based cost benefit analysis model for the economic assessment of occupational health and safety intervention in the workplace. *National Safety Council*. (36). 209-214. [Online]. Available at [http:>www.elsevier.com](http://www.elsevier.com). Accessed: 2/09/2012.

PAJERO-MOSCOSO, J. RUBIO-ROMERO, J.C. & PEREZ-CANTO, S. 2012. Occupational accidents rates in olive mills. *Safety Science*, (50). 285-293. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 9/09/2013.

PARBOTEECH, F. P. & KAPP, E. A. 2008. Ethical climate and workplace safety behaviour: An empirical investigation. *Journal of Business Ethics*, 80(4):515-529. [Online]. Available at >[www.springer.com](http://www.springer.com). Accessed: 16/04/2011.

PHILLIPS, J, M & GULLY, S, M. 2014. *Human Resources Management*. International edition. New Jersey: Cengage Learning.

PILLAY. K. R. 2014. The costs of construction accidents. *Master's Thesis*. Construction Management and Quantity Surveying. Cape Peninsula University of Technology.

POLINDER, S. SEGUI-GOMEZ, M. TOET, H. BELT, E. SETHI, D. RACIOPPI, P & VAN BEECK, E, F. 2011. Systematic review and quality assessment of economic evaluation studies of injury prevention. *Accident Analysis & Prevention*. (45). 221-230. [Online]. Available at [http>www.elsevier.com](http://www.elsevier.com). Accessed: 29/05/2012.

POLLITT, D. 2011. Corus forges new approaches to safety and health. *Human Resources Management International Digests*. 19(1): 7-9. [Online]. Available at [http>emeraldsight.com](http://emeraldsight.com). Accessed: 10/06/2012.

POTTER, S. 2006. *Doing Postgraduate Research*. 2<sup>nd</sup> ed. London: Sage Publication.

PRESSER, S. ROTHGEB, J. M. COUPER, M. P. LESSLER, J. T. MARTIN, E. MARTIN, J. & SINGER, E. 2004. *Methods for Testing and Evaluating Survey Questionnaires*. New Jersey: Wiley & Sons.

PUNCH, K.F. 2014. *Introduction to Social Research Qualitative & Quantitative Approaches*. London: Sage Publication.

RANA, S. ARDICHILI, A. & TKACHENKO, O. 2014. A theoretical model of the antecedents and outcomes of employee engagement. *Journal of Workplace Learning*. 3/4(26): 249-266. [Online]. Available at <<http://www.emeraldsight.com> [www.emeraldsight.com](http://www.emeraldsight.com). Accessed: 23/3/2014.

RAUTENBACH. I.M. & MALHERBE. E.F.J. 2009. *Constitutional Law*. 5<sup>th</sup> ed. Durban: Lexis Nexis.

REDDA, E. H. 2012. Customer perceptions technology-based banking service quality and its relationship to customer satisfaction and loyalty. *Master's Thesis*. Vaal University of Technology. (Vanderbijlpark).

REES, G. & SMITH, P.E. 2014. *Strategic Human Resources Management: An International Edition*. London: Sage Publication.

REID, A. LENGUERRAND, E. SANTOS, I. READ, U. LAMONTAGNE, A.D.  
FRITCHI, L. & HARDING, S. 2014. Taking risks and survival jobs: Foreign-born workers and work-related injuries in Australia. *Safety Science*. (70).378-386. Safety Science. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 7/11/2014.

REPUBLIC OF SOUTH AFRICA. 2010. *Labour Relations Amended Bill*. Pretoria: Government Printers.

REPUBLIC OF SOUTH AFRICA. *Department of Labour*. 1993. Amended Compensation for Occupational Injuries and Disease Act. Available at [http>www.dol.gov.za](http://www.dol.gov.za)

REPUBLIC OF SOUTH AFRICA. *Department of Labour*. 2004. Amended Occupational Health and Safety Act. Available at [http<www.labour.gov.za](http://www.labour.gov.za)

REPUBLIC OF SOUTH AFRICA. *Department of Labour*. 2005. *Report to the Portfolio Committee on labour on visit to Sasol Natref*. Available at [http>www.labour.gov.za](http://www.labour.gov.za)

REPUBLIC OF SOUTH AFRICA. *National Occupational Health and Safety Policy*. 2003. Pretoria: Government Printers.

REPUBLIC OF SOUTH AFRICA. *The Constitution*. 1996. Pretoria: Government Printers.

RIKHARDSSON, P, M. & IMPGAARD, M. 2004. Corporate cost of occupational accidents: an activity-based analysis. *Accident Analysis & Preventions*, (36).173-182. [Online]. Available at [http>www.elsevier.com](http://www.elsevier.com). Accessed: 3/06/2011.

RIM, K.T. & LIM, C.H. 2014. Biologically hazardous agents at work and efforts to protect workers' health: A review of recent reports. *Safety and Health at Work*. (5). 43-59. Available at [http<www.e-shaw.org](http://www.e-shaw.org). Accessed: 23/02/2014

ROBBINS, S. P. & JUDGE, T. A. 2007. *Organisational Behaviour*.12<sup>th</sup> ed. New Jersey: Pearson Prentice Hall.

ROBBINS, S. P. 2005. *Essentials of Organisational Behaviour*.8<sup>th</sup> ed. New Jersey: Pearson Prentice Hall.

ROHILLA, P. 2010. *Research Methodology*. New Dehli.APH Publishing Corporation.

RONZA, A. LAZARO-TOUZA, L. CAROL, C. & CASAL, J. 2009. Economic valuation of damages originated by major accidents in port areas. *Journal of Loss Prevention in the Process Industries*, (22). 639-648. Available at [http>www.elsevier.com](http://www.elsevier.com). Accessed: 7/06/2011.

ROSENBERG, B. LEVENSTEIN, C. & SPANGLER, E. 2005. Change in the world of Occupational Health Silica Control, Then and Now. *Journal of Public Health Policy*. 42(1):192-203. [Online]. Available at :> <http://www.jstor.org/stable/4498923>. Accessed: 4/09/2009.

RUBBEN, A. & BABBIE, E. 2010. *Essential Research Methods for Social Work*. 2<sup>nd</sup>ed. Chicago: Cengage learning.

RUGG, G. & PETRE, M. 2007. *A Gentle Guide to Research Methods*. Berkshire: McGraw-Hill.

RUSSELL, B. & PURCELL, J. 2009. *Online Research Essentials: Designing and Implementing Research Studies*. 1<sup>st</sup>ed. San Francisco: Wiley & Sons.

SALKIN, N, J. *100Questions and Answers about Research Methods*. Kansas City: Sage Publication.

SALMINEN, S. 2004. Have young workers more injuries than older ones? An international literature review. *Journal of Safety Research*, (35). 513-521. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 7/5/2014.

SAMBROOK, S.A. JONES, N. & DOLORIERT, C. 2014: Employee engagement and auto ethnography: being and studying self. *Journal of Workplace Learning*, 26(3/4):172-187. [Online]. Available at <http://www.emeraldsight.com>. Accessed: 23/3/2014.

SANTHAKUMARAN, A. & SARGUNAMARY, S.R.G. 2008. *Research Methodology*. 1<sup>st</sup> ed. Chennai: Anuradha Publications.

SARACINO, A. CURCURUTO, M. ANTONIONI, G. MARIANI, M.G. GUGLIENI, D. & SPADONI, G. 2015. Pro-activity-and consequences-based incentives (PCBSI) developed with fuzzy approach to reduce occupational accidents. *Safety Science*, (79). 175-183. [Online]. Available at <http://www.elsevier.com>. Accessed: 15/08/2015.

SCHEERES, H. SOLOMON, N. BOUD, D. & ROONEY, D. 2010. When is it OK to learn at work? The learning work of organisational practices. 22 (1):13-26. *Journal of Workplace Learning*. [Online]. Available at [www.emeraldsight.com](http://www.emeraldsight.com). Accessed: 10/23/2013.

SCHERMERHORN, J. R. HUNT, J. G. & OSBORN, R. N. 2003. *Organisational Behaviour*. 8<sup>th</sup> ed. New Jersey: John Wiley & Sons Inc.

SCHOEMAKER, M. J. BARRETO, S. M. SWERDLOW, A. J. HIGGINS, C. D. & CARPENTER, R. G. 2000. Non-fatal work related injuries in cohort of Brazilian steelworkers. *Occupational Environmental Medicine*, 57(1): 555-562. [Online]. Available <http://www.jstor.org/stable/27731370>. Accessed 23/11/2012.

SCHULTZ, D. & SCHULTZ, S. E. 2006. *Psychology & Work*. 9<sup>th</sup>ed. New Jersey: Pearson Prentice Hall.

SENDAGALA, S. 2010. Factors affecting the adherence to antiretroviral therapy by HIV positive patients treated in a community based HIV/AIDS care programme in rural Uganda. *Master's Thesis*. University of South Africa. Pretoria.

SEO, D, C. 2005. An explicative model of unsafe work behaviour. Department of applied health science. *Safety Science*, 34(1):187-211. [Online]. Available at <http://www.elsevier.com>. Accessed: 12/08/2013.

SHALINI, R. T. 2009. Economic cost of occupational accidents: evidence form a small island economy. *Safety Science*, (47).973-979. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 19/07/2011.

SHALUF, I.M. & AHAMADUN, F.R. 2006.Technological disaster prevention. The case of Malaysia. Technological Disaster Prevention. *Safety Science*. (15):5.783-792. Available at><http://www.sciencedirect.com>" [www.sciencedirect.com](http://www.sciencedirect.com). Accessed: 7/11/2014.

SIBANYONI, M. 2015. Town steels itself for tough times ahead. *Sowetan*, p. 6, September 10.

SIEBENHAGEN, C. ROTHMAN, S. & PIENAAR, J. 2009. Employee health and wellness in South Africa: The role of legislation and management standards. *South African Journal of Human Resources Management*, 7(1):1–9. [Online]. Available at: <http://www.emeraldsight.com>. Accessed: 15/10/2009.

SINCLAIR, R.R. MARTIN, J.E. & SEARS, L.E. 2010. Labor unions and safety climate: Perceived union safety values and retail employee safety outcomes. *Accident Analysis and Prevention*, (42). 1477-1487. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 17/09/2013.

SINGH, Y.K & BAJPAI, R.B 2007. *Research Methodology Techniques and Trends*. New Delhi: A.P.H Publishing Corporation.

SLOANE, P. LATREILLE, P. & OLEARY, N. 2013. *Modern Labour Economics*. New York: Routledge.

SMALLMAN, C. & JOHN, G. 2001. British director's perspectives on the impact of health and safety on corporate performance. *Safety Science*, (38). 227-239. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 2/10/2011.

SMALLWOOD, J. & MUSONDA, I. 2008. Health and safety awareness and implementation in Botswana's construction industry. *Journal of Engineering, Design and Technology*, 6(1): 81-90. [Online]. Available at<[www.elsevier.com](http://www.elsevier.com). Accessed: 9/07/2012.

SMALLWOOD, J. J. & HAUPT, T.C. 2007. Impact of the South African construction regulations on construction health and safety. *Journal of Engineering Design and Technology*, 5(1): 23-34. [Online]. Available at >[www.emeraldsight.com](http://www.emeraldsight.com). Accessed: 29/5/2013

SOMAVIA, J. 2003. Safety in numbers. Pointer for global safety culture at work. International Labour Organisation. Conference proceeding, Geneva: Switzerland. [Online]. Available at > <http://www.ilo.org.za>. Accessed: 17/05/2014.

STRUGWIG, F, W. & STEAD, G, B. 2001. *Planning, Designing and Reporting Research*. 1<sup>st</sup> ed. Cape Town: Pearson Education.

STRYDOM, E. LE ROUX P. A. K. LANDMAN, A. A. CHRISTIANSON, M. DUPPER O. MYBURGH, P. GARBERS, C. J. BARKER, F.S. & BASSON, A.C. 2001. *Essential Social Security Law*. 1<sup>st</sup> ed. Cape Town: Juta & Co Ltd.

STRYDOM, E. LE ROUX, P. A. K. LANDMAN, A. A. CHRIASTIANSON, M. DUPPER, O. MYBURGH, P. GARBERS, C. BARKER, F. BASSON, A. ESSELAAR, V. & DEKKER, A. 2006. 2<sup>nd</sup>ed. *Essential Social Security*. Cape Town:Juta & Co.

SWANEPOEL, B.J. & SLABBERT, J.A. 2012. *Introducing Labour Relations Management in South Africa: Adding value to Africa*. Durban: Lexis Nexis.

SWARTZ, L. DE LA REY, C. Duncan, N. & Townsend, L. 2008. *Psychology an Introduction*. 2<sup>nd</sup> ed. Cape Town: Oxford University Press.

TAKALA, J. 2002. Introductory report: decent work- safe work. *Safe Work*. 1-49. [Online]. Available at <[www.ilo.org.co.za](http://www.ilo.org.co.za) > [Accessed](#): 2/04/2012. 250

TEDDIE, C. & TASHAKKORI, A. 2009. *Foundations of Mixed Methods Research. Integrating Quantitative and Qualitative Approaches in the Social and Behavioural Sciences*. California: Sage Publishers.

TEO, E. A. L. LING, F.Y.Y. & ONG, D.S.Y. 2005. Fostering safe work behaviour in workers at construction sites. *Engineering Construction and Architectural*



*Management. Construction Safety*, 12(4):410-422. [Online]. Available at [http>www.emeraldsight.com](http://www.emeraldsight.com)>. Accessed: 10/09/2009.

TURNER, N. STRIDE, C.B. CARTER, A.J. MCCAUHEY, D. & CARROLL, A.E. 2012. Job Demands–Control–Support model and employee safety performance. *Accident Analysis and Prevention*, (45). 811-817. Available at [http>www.elsevier.com](http://www.elsevier.com). Accessed: 9/09/2014.

TUSTIN, C. & GELDENHUYS, D. 2000. Labour Relations. *The Psychology of conflict and Negotiation*. 2<sup>nd</sup> ed. Cape Town: Oxford University Press.

TUSTIN, D. H. LIGTHELM, A. A. MARTINS, J. H. & VAN WYK, H. D. J. 2005. *Marketing Research in Practice*. 1<sup>st</sup> ed. Pretoria: Unisa Press.

UNITE HEALTH AND SAFETY GUIDE. 2011. Available at [www.unitedtheunion.org](http://www.unitedtheunion.org). Accessed: 19/04/2013.

URAL, S. & DEMIRKOL, S. 2008. Evaluation of occupational safety and health in surface mines. *Safety Science*, (46). 1016-1024. [Online]. Available at [www.elsevier.com](http://www.elsevier.com). Accessed 2/05/2013.

VANDERSTOEP, S. W. & JOHNSTON, D. D. 2009. *Research Methods for Everyday Life: Blending Qualitative and Quantitative Approaches*. 1<sup>st</sup> ed. San Francisco: John Wiley & Sons.

VENTER, R. LEVY, A. HOLTZHAUSEN, M. CONRADIE, M. BENDEMAN, H. DWORZANOWSKI-VENTER, B. 2011. 4<sup>th</sup> ed. *Labour Relations in South Africa*. Cape Town: Oxford University Press.

VIJAYALAKSHMI, G. & SIVAPRAGASAN, C 2008. *Research Methods Tips and Techniques*. 1<sup>st</sup> ed. Chennai. MJP Publishers.

VINODKUMAR, M, N. & BHASI, M. 2010. Safety management practices and safety behaviour: Assessing the mediating role of safety knowledge and motivation. *Accidents Analysis & Prevention*, (42). 2082-2093. [Online]. Available at [http>www.elsevier.com](http://www.elsevier.com). Accessed: 19/04/2011.

VOGT, W. P. 2007. *Quantitative Research Methods for Professionals*. Boston: Pearson Education.

WACHTER, J.K. & YORION, P.L. 2014. A system of safety management practices and worker engagement for reducing and preventing accidents: An empirical and theoretical investigation. *Accidents Analysis and Prevention*, (68). 117-130. [Online]. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 10/03/2015.

WAEHRER, G, M. DONG, X.S. MILLER, T. HAILE, E. & MEN, Y. 2007. Costs of occupational injuries in construction in the United States. *Accident Analysis & Prevention*,(39): 1258-1266. [Online]. Available at<[www.elsevier.com](http://www.elsevier.com). Accessed: 26/8/2012.

WALLACE, J. C. & VODANOVICH, S. J. 2003. Can accidents and industrial mishaps be predicted further investigation into the relationship between cognitive failure and reports of accidents? *Journal of Business and Psychology*, 17(4): 503-514. [Online]. Available at [http<www.jstor.org/stable/25092836](http://www.jstor.org/stable/25092836). Accessed: 27.04/2011.

WALLIS, N.C. YAMMARINO, F.J. & FEYERHERM, A. 2011. Individualized leadership: A qualitative study of senior executive leaders. *Leadership Quarterly*, (22):182-206. Available at [http>www.elsevier.com](http://www.elsevier.com). Accessed: 7/5/2014.

WATSON, G. SCOTT, D. BISHOP, J. & TURNBEAUGH, T. 2005. Dimensions of Interpersonal Relationships and Safety in the Steel Industry. *Journal of Business and Psychology*,19 (3): 303-318. [Online].Available at<  
<http://www.jstor.org/stable/25092904>. Accessed: 19/09/2010.

WELMAN, J. C. KRUGER, S. J. & MITCHELL, B. 2005. *Research Methodology*. 3<sup>rd</sup> ed. Cape Town: Oxford University Press.

WELMAN, J. C. & KRUGER, S. J. 2001. *Research Methodology*. 2<sup>nd</sup>ed. Cape Town: Oxford University Press.

WERNER, A. BAGRAIM, J. CUNNINGHAM, P. PIETERSE-LANDMAN, E. POTGIETER, T. & VIEDGE, C. 2011. *Organisational Behaviour: A contemporary South African Perspective*. 3<sup>rd</sup> ed. Pretoria: Van Schaik.

- WESSELS, L. 2007. *My Right Your Rights Let's Talk*. 1<sup>st</sup> ed. Pretoria: Lapa Publishers.
- WESTABY, D. PROBST, T. M. & LEE, B. C. 2010. Leadership decision-making: A behavioural reasoning theory analysis. *The Leadership Quarterly*, (21):481-495. [Online]. Available at [http>www.elsevier.com](http://www.elsevier.com). Accessed: 23/06/2012.
- WISKER, G. 2009. *The Undergraduate Research Hand Book*. 1<sup>st</sup>ed. London: Palgrave MacMillan.
- WOOD, G. & COETZEE, J. K. 1998. *Trade Union Recognition Cornerstone of the New South African Employment Relations*. Cape Town: Thomson Publishing.
- WOODWARD, N. H. 2007. Making safety job no.1. *Hr Magazine*, 1(52):1-60 [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 12/011/2012.
- WORKSAFEBC 2009. Working to make a difference. Available at [at>www.worksafebc.com](http://www.worksafebc.com). Access 19/02/2015.
- YAKOVLEV, P. & SOBEL, R.S. 2010. Occupational safety and profit maximisation: Friends or Foes. *Journal of Socio-Economics*, (39):429-435. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 9/09/2013.
- YEOW, P.H.P. & GOOMAS, D.T. 2014. Outcome-and behaviour-based safety incentives program to reduce accidents: A case study of fluid manufacturing plant. *Safety Science*, (70). 429-437. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 21/07/2015.
- YOUSF, M. UY, B. TAO, Z. REMENNIKOV, A. LIEW, J.Y.R. 2014. Impact behaviour of pre-compressed hollow and concrete filled mild and stainless steel columns. *Journal of Constructional Steel Research*, (96). 54-68. [Online]. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 1/08/2015.
- ZIKMUND, W. G. 1999. *Essentials of Marketing Research*. Orlando: The Dryden Press.

ZOHAR, D. 2002. The effects of leadership dimension safety climate and priorities on minor injuries in work groups. *Journal of Organisational Behaviour*, 34(1): 75-92. [Online]. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 19/04/2011.

ZWESLOOTS, M. GERALD, I.J.M. AALTONEN, M. WYBO, J.L. SAARI, J. KINES, P. & DE BEECK, R.O. 2013. The case for research into the zero accident vision. *Safety Science*, [Online]. (58): 41-48. Available at [http<www.elsevier.com](http://www.elsevier.com). Accessed: 2/10/2014.

## LIST OF APPENDICES

### APPENDIX A: PERMISSION LETEER TO CONDUCT RESEARCH

Vereeniging Works

Memo



To VUT  
Company ArcelorMittal South Africa  
From Herbert Khalane  
Date 14/09/2012  
Pages 1 of 1

To whom it might concern

This is to confirm that Mr. Jerry Mojapelo will be conducting a masters research project on a topic : Employee's adherence to the occupational health and safety Act in the Steel manufacturing sector.

Regards

A handwritten signature in black ink, appearing to be "H. Khalane".

Herbert Khalane | Manager Health and Safety

ArcelorMittal South Africa

Vereeniging Works  
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## APPENDIX B: QUESTIONNAIRE

### EMPLOYEES ADHERENCE TO THE OCCUPATIONAL HEALTH AND SAFETY ACT NO: 85 OF 1993 WITHIN THE STEEL MANUFACTURING SECTOR.

#### SECTION A: INFORMED CONSENT

- **Objective of the study:** to determine the level of employee's adherence to the Occupational Health and Safety Act at Arcelor Mittal Vereeniging Tubular Works.
- Please note that participation in this research project is voluntary, and that the respondent may withdraw from the study at any time.
- Please read the following statements carefully and mark the box with **(x)** to indicate your response to each statement.

• I fully understand that my involvement in this research project is voluntary, without any coercion and I may withdraw at any time.	Yes	No
• I fully understand that my name and details will remain confidential at all times and shall not be disclosed.	Yes	No
• The researcher/field worker has clarified and explained the details of the research.	Yes	No
• The researcher/field worker may contact me for any clarity in future.	Yes	No

#### SECTION B: BIOGRAPHICAL INFORMATION

This section seeks background information about you. Please note that it is imperative to obtain this information as this will have a bearing on the results of the research survey. This information provided will be used for academic research purpose only. Please indicate your answers by crossing **(x)** the appropriate block or by filling the answer.

<b>B1</b>	<b>Your gender</b>	Male	Female
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<b>B2</b>	<b>Your racial group</b>	African	White	Coloured	Indian	Other
<b>B3</b>	<b>Your age group</b>	18-28	29-40	41-50	51-60	60+

<b>B4</b>	<b>Your home language</b>					
	English	Zulu	Setswana	SiSwati	Xhivenda	Xhosa
	Afrikaans	Sesotho	Sepedi	Ndebele	Tsonga	Other

<b>B5</b>	<b>Your highest level of education</b>					
	Traditional University	University of Technology	FET College	Matric/ Grade 12	Primary school	No formal education

<b>B6</b>	<b>Your work experience</b>					
	1-4 years	5-10 years	11-15 years	16-20 years	21-29 years	30-39 years

<b>B7</b>	<b>Your occupational level</b>					
	Engineer, experienced specialist (Professional)	Juniour engineer	Foreman	Technician	Artisan	Graduate in training

<b>B8</b>	<b>Your type of employment contract with your organisation</b>				
	Permanent	Fixed term	Temporary	Probation	In-service training
	Learnership	Consultant	Seasonal employment	Other (Specify)	

### SECTION C: QUESTIONNAIRE

NB: Please indicate the extent to which you agree or disagree with each question by crossing (X) one of the numbers. Use the following scale. Please note that there is no right or wrong answer.

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<b>ROLE OF INFORMATION AND TRAINING IN HEALTH AND SAFETY</b>						
C1	My employer usually protects employees against risk.	1	2	3	4	5
C2	My employer usually informs me to take precautions to protect myself when I perform my duties.	1	2	3	4	5
C3	My employer usually provides new employees with health and safety induction.	1	2	3	4	5
C4	My employer trained me about the correct use of Personal Protective Equipment <b>PPE</b> .	1	2	3	4	5
C5	My employer regularly informs me about Standard Operating Procedure SOP when it comes to performing my task.	1	2	3	4	5
C6	My employer provides regular refresher training on health and safety.	1	2	3	4	5

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
C7	My employer trained me to recognize hazards at work.	1	2	3	4	5
C8	My employer's training has changed my behaviour about how I view health and safety.	1	2	3	4	5
C9	My employer has done enough to educate me about OHSA.	1	2	3	4	5
C10	My employer usually consults employees about their health and safety.	1	2	3	4	5
C11	My employer invests a lot of money in employee's safety training.	1	2	3	4	5
C12	My employer enforces health and safety rules at all times.	1	2	3	4	5
C13	My employer cares about my well-being and safety at work.	1	2	3	4	5
<b>EMPLOYEE SAFETY AWARENESS</b>						
D1	We have a copy of the OHSA on the employer's premises.	1	2	3	4	5
D2	I know my rights as an employee when it comes to health and safety.	1	2	3	4	5
D3	We are provided with the necessary skills as employees in the organisation to perform our work safely.	1	2	3	4	5
D4	I usually follow safety procedures at work.	1	2	3	4	5
D5	We have a health and safety representative in my workplace	1	2	3	4	5
D6	All employees are involved in the planning of health and safety Programs of the organisation.	1	2	3	4	5
D7	Employee awareness to OHSA will lead to a reduction of accidents	1	2	3	4	5
D8	Safety meetings are held regularly with employees.	1	2	3	4	5
D9	Safety awareness campaigns are held on a regular basis.	1	2	3	4	5
<b>EMPLOYEE SAFETY ADHERENCE</b>						
E1	Safety procedures and instructions are adhered to.	1	2	3	4	5
E2	I usually wear my Personal Protective Equipment (safety goggle, safety boots, helmets and gloves) that are provided by the employer.	1	2	3	4	5
E3	Information with regard to the proper use of Personal Protective Equipment <b>PPE</b> is provided for by the employer.	1	2	3	4	5



		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
E4	Safety adherence leads to good business performance.	1	2	3	4	5
E5	Safety culture is promoted from managers to employees.	1	2	3	4	5
E6	Employees who do not adhere to OHSA are disciplined by the employer.	1	2	3	4	5
<b>INFLUENCE OF EMPLOYEE BEHAVIOUR IN SAFETY</b>						
F1	I usually follow safety procedures when doing my job.	1	2	3	4	5
F2	I prefer to spend more time on a task to ensure it is done safely; rather than rushing to complete a task.	1	2	3	4	5
F3	Employees sometimes ignore safety procedures.	1	2	3	4	5
F4	Some employees get away with unsafe conduct in the workplace.	1	2	3	4	5
F5	Performing my work safely has become a habit for me rather than a challenge.	1	2	3	4	5
F6	As an employee I am fully aware of hazards in my daily job.	1	2	3	4	5
F7	Every employee is responsible for their own safety in the organisation.	1	2	3	4	5
<b>ROLE OF THE SUPERVISOR IN HEALTH AND SAFETY</b>						
G1	My supervisor takes employees health and safety very seriously.	1	2	3	4	5
G2	Supervisors perform risk assessment on a regular basis.	1	2	3	4	5
G3	Supervisors encourage employees to adhere with the OHSA.	1	2	3	4	5
G4	Supervisor listens to employee's safety concerns in the organisation.	1	2	3	4	5
<b>INFLUENCE OF REWARDS AND RECOGNITION IN HEALTH AND SAFETY</b>						
H1	Employees must be rewarded for achieving excellent safety record.	1	2	3	4	5
H2	Rewards lessen occupational accidents.	1	2	3	4	5
<b>ACCIDENT REPORTING MECHANISM IN HEALTH AND SAFETY</b>						
I1	We have formal procedure in your workplace to report accidents.	1	2	3	4	5
I2	Facilities for first aid are available in the event of an accident.	1	2	3	4	5
I3	There are trained first aiders in my workplace.	1	2	3	4	5
I4	Employees are encouraged to report accidents that occur at work.	1	2	3	4	5

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<b>WORKPLACE INSPECTION</b>						
J1	Safety inspections take place regularly at work.	1	2	3	4	5
J2	Regular inspections encourage the employer to comply with OHSA	1	2	3	4	5
J3	Labour inspectors are allowed access in the workplace.	1	2	3	4	5
J4	Accidents and injuries are reported when they occur.	1	2	3	4	5
J5	Safety signs are visible for everyone to see them.	1	2	3	4	5
J6	Inspectors impose fines and penalties when the employer is non-compliant.	1	2	3	4	5
J7	Risk assessment is regularly carried out on the employer's premises by SHE representatives.	1	2	3	4	5
<b>WORKPLACE ENVIRONMENT</b>						
K1	There is enough ventilation at my workstation.	1	2	3	4	5
K2	I am comfortable with the room temperature.	1	2	3	4	5
K3	I am satisfied with the level of hygiene at my workplace.	1	2	3	4	5
K4	There is sufficient lighting at my work place.	1	2	3	4	5
K5	Chemical substances are clearly marked.	1	2	3	4	5
<b>ROLE OF A TRADE UNION IN HEALTH AND SAFETY</b>						
L1	My trade union is involved in health and safety matters.	1	2	3	4	5
L2	My trade union is pro-active in health and safety meetings with the employer.	1	2	3	4	5

**Thank you for your corporation and participation in filling this questionnaire**

