THE IMPACT OF ORGANISATIONAL SAFETY CULTURE ON THE MANAGEMENT OF SAFETY HEALTH AND ENVIRONMENT (SHE) IN THE ELECTRICITY DISTRIBUTION INDUSTRY OF ZAMBIA

By

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DECLARATION

I, **Mwewa Mambwe** hereby declare that the work presented in this dissertation is the result of my research work and that it has never been produced or submitted before at this or another University for academic purposes, and that all sources have information have been duly acknowledge.

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CERTIFICATE OF APPROVAL

The University of Zambia approves this dissertation of Mwewa Mambwe entitled **"The impact of organisational safety culture on the management of Safety Health and Environment (SHE) in the electricity distribution industry of Zambia"** as fulfilling the partial requirements for the award of the degree of Master of Engineering in Project Management Engineering.

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ABSTRACT

Organisational Safety Culture has increasingly come to the fore as an important aspect of Safety, Health and Environmental (SHE) Management. Scanty literature could be found on the application of the concept within the electricity industry in Zambia. Literature reviewed showed that the state of safety in Zambia's electricity industry has been placed under the spotlight after a number of accidents that caused an outcry among workers. The study evaluated the impact of organisational safety culture factors on SHE management and sought to improve electricity safety in the Zambia's electricity distribution operation. Further, the study developed a theoretical model from the literature available that evaluated safety culture of an electricity distribution operation. The approach for the research was quantitative and descriptive. The empirical study was done by using a questionnaire as a measuring instrument. The target population consisted of operational staff, which included managers and workers, of a government electrical distribution operation company, one private owned company and the contractors that render services to these power companies. The convenience sampling method was applied when identifying participants. Statistical analysis was performed using SPSS and Microsoft Excel. Descriptive statistics was applied in compiling results. Further analysis compared the perceptions of various groups within the sample, which included contractors, managers and workers. The relationships between some of the factors were explored to gain a better understanding of the dynamics of organisational factors that influence safety management. The findings yielded a useful model for evaluating the safety culture of the electricity distribution operation, and highlighted strong relationships between shared safety values, management involvement and the safety culture of the organisations. The research also showed that there was no significant difference in the culture perceptions of contractors and workers working in the electricity sector. Significant differences were however found between managers' perceptions of safety culture and the perceptions of workers. The importance of the study is that it will help managers understand the embraced values that can be used to steer the organisation towards an improved safety culture.

DEDICATION

To my daughter and friend Simangele Esther for the sacrifice, patience, understanding, support and encouragement during this work. I cannot imagine my life without you; indeed, you are a blessing.

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LIST OF ACRONYMS

ACSNI	Advisory Committee on Safety of Nuclear Installation
AICHE	American Institute of Chemical Engineers
ERB	Energy Regulation Board
FA	Fatal Accidents
GRZ	Government Republic of Zambia
IRCA	International Register of Certificated Auditors
LTI	Lost Time Injuries
MLSS	Ministry of Labour and Social Security
SHE	Safety, Health and Environment
SHEQ	Safety, Health, Environment and Quality
UNCHE	United Nation Conference on Human Environment
UNDP	United Nations Development Program
UNZA	University of Zambia
WCFCB	Workers Compensation Found Control Board
ZESCO	ZESCO Limited

CHAPTER ONE: INTRODUCTION

1.1   Background

The electricity industry experiences accidents that can be fatal to people and costly to the organisations. Although electricity is treated at a high level in Zambia, accidents do happen. Additionally, electrical accidents are implied to be rare according to statistics, but most of them still remain unreported, leading to scanty information about safety related issues in the organisations averting conformance of preventive actions (Mihai & Sorin, 2010). According to Rutter (2010), the current measures to escalate electrical safety are not effective enough without considering the electricity firms safety cultural aspects. In the past, several fatalities and serious accidents have occurred to workers working on electrical infrastructure from energized conductors and equipment, lifting of poles and falling from heights to mention but a few (ZESCO Limited, 2015) but remain unreported according to the Auditor General's report (2015).

However, SHE management has historically been very proactive and used as a safety management benchmark in the Zambian mining industry compared to the electricity industry whose measures of improvement mostly happen after root causes of major accidents have been established (IRCA Savenda, 2015). Additionally, not much has been done on the safety of workers in the electricity industry. The trend in the last four years has been towards a more preventative approach, with the introduction of baseline risk assessments, formalised task observations, on job training, and behavioural based safety programmes. Workers are essential players in the electricity industry development. The sensitivity of the electricity industry itself cannot be over emphasised as a major factor in the country's modernisation. Hence, organisations in the electricity industry have to ensure that the behaviour of workers is based on being fully aware of the safety, health and environment management systems that affect operations (Germain, Bird, & Labuschagne, 2011). In order to become more competitive, companies have undergone major changes in organisational structure, with smaller numbers of permanent workers and larger

numbers of contractor workers (Clarke, 2006). This brings with it challenges of diverse organisational culture in managing them under one safety system.

The term "organisational safety culture" proposes many interventions starting from individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation's SHE management (ACSNI Human Factors Study Group, 2013). Organisations' culture have a big influence on the safety outcomes of the SHE Management Systems. Positive safety culture is characterised by communications founded on mutual trust, by shared perceptions of the importance of safety and by confidence in the efficacy of preventive measures.

Management in an organisation can build on workers' interest and commitment to the SHE Management system by being aware, getting involved, creating ownership and changing beliefs and actions into positive efficient and effective performance that will benefit the operations of an organisation (Germain et al, 2011). According to Du Toit (2012) operational safety culture in the organisation allows for the development of mankind and the ability to identify the magnitude of threats in a work place.

The concept of safety culture in organisations encompasses a change process that emphasises on overt behaviours to treat or prevent a hazard, the workplace conditions that support risk behaviours and the standard and actions of capabilities (Enslin & Arnold, 2011). Hence, a risk scenario to mitigate a potential threat is dependent on how much a worker understands the potential risk, the individual's perception of risk, his values and beliefs and how much support is rendered from top management. This is according to Smallman and Smith (2013).

While much work has been done in industries such as nuclear (Erdos et al, 2009), air transport (Gibbons et al, 2009), marine (Mittrousi, 2011), construction (Tam & Fung, 2011), and automobile (Clarke, 2006), very little research, if any, could be found on the role of organisational safety culture in managing SHE within the electricity industry in Zambia. In the electricity industry, decisions related to SHE that affect workers' behaviour are usually not made under competent management supervision especially in operational areas of work were processes and standards on

how to do work are ignored or not seen important to cover up potential risk. The workplaces are characterised by lack of failure to follow standards and procedures, casual nature of how work is conducted, lack of motivation and coaching, poor work attitudes, experience and skills, poor SHE driven culture and perception. These unique characteristics of the electricity industry make it distinct in implementation of a safety driven culture (IRCA Savenda, 2015).

With vast experience that the researcher has in the electricity industry, it is right to say that culture plays a role in the management of safety. The aspects or impact of cultural influences are however, not fully understood or quantified in most of the electricity utilities. This research therefore, sought to assess the impact of organisational safety culture on SHE management in the electricity distribution industry of Zambia. This was achieved through the use of mixed approach where both qualitative and quantitative methods will be employed.

1.2   SHE Management System

Schein (2011) positions that one of the unique functions of leadership is its concern for culture in an organisation. It can be said that Management who are leaders, play significant role in culture building, implanting and change. IRCA Savenda (2015) reported that the electricity industry faces a shortage of qualified talent with a forecast of 13% decrease in the number of persons employed within industry between 2004 and 2014. The recent boom in commodity prices had made many large-scale expansion projects viable, and this resulted in a high turnover rate across different levels in the industry. However, in the context of organisational culture, the recent momentary nature of management and leadership has the likelihood of posturing an exceptional challenge to the SHE management.

There is substantive evidence to suggest that safe work culture which is directly related to behaviour is sustained by a positive safety culture (Clarke, 2006). Part of organisational culture in industries with hazardous installations relates to safety (EAOHP, 2012). Clarke (2006) in (Parker, Lawrie, & Hudson, 2006) states that the beliefs and values related to health and safety form the subset of organisational culture referred to as safety culture. Parker *et al* (2006) suggested that culture

reaches correspondingly into all system parts of an organisation that exercises a consistent positive or negative effect on the organisation. For this reason the entrenchment of safety culture in organisations is more effective than increased supervision by management and encouragement of rigorous standard procedures to augment safety performance (Du Toit, 2012).

1.3   SHE Management System Operation in Zambia

In Zambia there is no legislation that is applicable to SHE as a whole. However, there is legislation that applies to safety and health management, and environmental management system. The primary legislation applicable to safety and health is the Occupational Health and Safety Act No. 36 of 2010 whose custodian for policy making and implementation is the Ministry of Labour and Social Security (MLSS) (National Assembly of Zambia, 2010). However, the Department of Labour in the Ministry was not as effective in conducting the necessary duties not until in the last 10 years (ZESCO Limited, 2015). The Ministry is also responsible for effecting the provisions of the Factories Act No. 2 of 1966 Cap 441 of the Laws of Zambia. This is the oldest law regulating occupational health and safety in Zambia. The purpose of the Factories Act is to regulate the conditions of employment in factories and other hazardous work places with regard to safety and health of workers. It also aims to provide for the safety, examination and inspection of certain plant and machinery (National Assembly of Zambia, 1966).

The prime legislation applicable to the Environmental Management System of SHEQ is the Environmental Management Act No. 11 of 2011 which established the Zambia Environmental Management Agency that provides integrated environmental management at workplaces including sustainable use of natural resources. The agency has been effective in ensuring that the environmental issues are managed properly by inspecting and issuing guidelines on hydrocarbon management, and disposal (National Assembly of Zambia, 2011).

The Quality Management System is a system that is regulated by the Zambia Bureau of Standards under the statutory National Standards Body for Zambia established under the Act of Parliament, the Standards Act, Cap 416 of 1994 of the

laws of Zambia. The organization is specialized in standardization, standards formulation, quality control, and quality assurance, quality inspections for imports and exports, certification.

The Electricity Act No. 15 of 1996, is a major statute that governs the generation, transmission, supply of electricity and also factory requirements in terms of managing and use of plant, equipment as well as workers in Zambia (National Assembly of Zambia, 1996). The international standards are guiding principles that are set and can be used for certification and bring about business sustainability plus goodwill on the companies certified with such standards (IRCA Savenda, 2015).

During the World Day for Safety at Work in Lusaka on 28th April, 2015, the Minister of Labour and Social Security at that time, referred to high statistical accidents and articulated that:

"It is clear that there is need to employ strategies that are effective in the implementation of the safety and occupational health at all workplaces in both government institutions and parastatal". He continued to say: *"the efforts have to be consolidated in order to achieve a risk free environment and hence business sustainability"* (ZESCO Limited, 2015).

From this pronouncement, most institutions in the electricity industry besides those in the mining and construction sectors in Zambia, started implementing the safety and health standards, and the environmental management and quality management systems by using the legal requirements, regulatory requirements and international standards. Despite the importance of the electricity industry to the development of Zambia, the sector has been one of the most industries that have been affected by accidents in terms of safety and health and environmental management in the delivery of electricity. Work in the electricity industry is the most hazardous if not properly managed and can affect the economy of the country.

1.4   Relevance of the Study to the Electricity Industry

The Zambian electricity industry boasts of an abundance of water resources to produce clean electricity and is able to export to other countries in the southern region (UNDP, 2010). Many organisations are particularly struggling to compete favourably on the market due to stiff competition, however in the electricity industry it is a different case. The country only has one government owned Electricity company that generates, transmits, distributes and supplies electricity throughout the country (ZESCO Limited, 2015). There are other privately owned small companies that are players in the electricity distribution and take up less than 10% of the industry.

However, there has been public outcry on the current status of safety and health conditions in workplaces in various industries including the electricity industry (Auditor General, 2015). Most electrical accidents result from unsafe equipment or installation, unsafe environment, or unsafe work practices (ERB, 2014). Additionally, investigations into these accidents identified that some of the causes of injuries and fatalities contributing factors such as faulty insulation, improper grounding, loose connections, defective or wrong parts, ground faults in equipment, unguarded live parts, and failure to de-energise electrical before inspection or repair, properly maintained electrical tools and equipment, failure to exercise caution when working, near exposed energised lines and equipment, and using inappropriate personal protective equipment and insulated tools. This is according to the Energy Regulation Board Report on electricity accidents in Zambia (ERB, 2014) and is mostly attributed to ZESCO Limited electricity distribution, which is wholly owned by the government.

The government owned company, ZESCO Limited, has experienced a lot of work related accidents as indicated in the SHEQ Management Review Report of 2016 (ZESCO, 2016). The report indicates that **Forty two (42)** incidents were recorded across ZESCO from 1st quarter to 3rd quarter 2016. Out of these incidents **five (5)** were Fatal Accidents (FA) and **thirty seven (37)** were Lost Time Injuries (LTI). Of the 42 incidences 16 **(38%)** were recorded in the first quarter of 2016 and 13 **(31%)** incidences for each of the second and third quarters of 2016. The incidents were due

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to electrocutions, road traffic accidents, fall from height, electrical burns/flashes, hit/struck by an object, material/manual handling and caught in between. The Table 1.1 below shows the common types of accidents that were experienced in ZESCO in the year 2015. It indicates the number of safety incidents occurrence of which, there are more accidents recorded in the distribution divisions of the electricity sector from the government owned institution compared to generation and transmission division which are almost insignificant. Also note that the information was retrieved before ZESCO Limited started implementing the SHEQ Management System.

Table 1.1   Safety Incidents from 1st quarter to 3rd quarter 2016 – ZESCO Limited

No.	Division	1st Quarter		2nd Quarter		3rd Quarter		Total	
		F.A	L.T.I	F.A	L.T.I	F.A	L.T.I	F.A.	L.T.I.
1	Copperbelt Distribution	1	6	0	1	1	3	**2**	**10**
2	Kafue Gorge Power Station	0	0	0	0	0	0	**0**	**0**
3	Kariba North Bank Power Station	0	1	0	0	0	0	**0**	**1**
4	Lusaka	0	1	0	2	0	2	**0**	**5**
5	Northern Distribution	0	2	2	4	0	3	**2**	**9**
6	Small Hydro Power Stations	0	0	0	0	0	0	**0**	**0**
7	Southern Distribution	0	3	0	4	1	3	**1**	**10**
8	Transmission North	0	1	0	0	0	0	**0**	**1**
9	Transmission South	0	1	0	0	0	0	**0**	**1**
10	Victoria Fall Power Station	0	0	0	0	0	0	**0**	**0**
TOTAL		**1**	**15**	**2**	**11**	**2**	**11**	**5**	**37**

Source: SHEQ Management System Review Report (2016)

The Worker's Compensation Fund Control Board (WCFCB) provides for the compensation of workers disabled due to injuries or accidents, or diseases contracted during course of employment, or death, as stated in the Act (National Assembly of Zambia, 1999). It is the sole obligation of the employer to contribute annually to WCFCB and these contributions are determined by the degree of risk associated with an activity. Additionally, statistics obtained from the Board, indicates that electrical incidents represent about 0.03% of the total incidents recorded in Zambia, while the related fatality rate is about 4% of all incidents in 2015 (WCFCB, 2015).

Therefore, Table 1.2 indicates the information collected from WCFCB on the reported common accidents experienced in ZESCO in the 2015 review.

Table 1.2   Common Accident Types Experienced in ZESCO – Data statistics from WCFCB (2015)

Incident Type	Number of Incidents before SHE (2014)	%	Number Incidents after SHE (2015)	%
Electrocution	29	20	27	20
Electrical Burns	7	4	6	4
Electrical Flash Burns	10	6	8	6
Electric Shock	1	1	1	1
Material Handling	6	4	5	4
Slip and Fall	4	2	2	1
Struck By Object	19	12	17	12
Fall from Height	5	4	5	4
Road Traffic Accident	30	19	28	20
Fire	41	28	39	28
TOTAL	152	100	138	100

Source: WCFCB Report on Common accidents in ZESCO (2015)

Another analysis of data obtained from WCFCB revealed that the rate of fatalities arising from work place accidents rose from 67 to 127 cases in 2011 and 2014 respectively representing an increase of 65% in the period under review.

Table 1.3   Number of Fatalities in Some of the Industry

Industry	2011	2012	2013	2014	Totals	% Totals
Agriculture Forestry, etc.	4	15	14	18	51	13.6
Building Construction	5	18	11	18	52	13.9
Electricity	5	5	7	11	28	11.2
Mining, Quarry Industries	13	10	10	26	59	15.7
Personnel Services, etc.	8	11	15	20	54	14.4
Trade and Commerce etc.	7	1	8	5	21	5.6
Transport and Communication	4	0	14	11	29	7.7
Wood and Furniture industry	0	2	3	1	6	1.6
Total	72	82	111	137	402	111
% Increase	0	14	28	49		

Source: Report from the Auditor General on the Management of Occupational Safety and Health (2015)

As can be seen in Table 1.3, the auditor's report indicated that the highest number of fatalities were from the Mining and quarrying industries which had a total of fifty

nine (59) fatalities representing 14.7% followed by Personnel Service and hotels which recorded fifty four (54) fatalities, representing 13.4% of total fatalities in the period under review. The electricity industry is the seventh with a recording of twenty eight (28) fatalities representing a 6.9% as indicated in Table 1.3.

The majority of listed industries report on safety as part of their sustainable development measures on the triple bottom line. However, good safety performance is therefore critical for these companies in terms of sustainability and attraction of future investment especially in the electricity industry which needs major investment (UNDP, 2010). In an ideal situation, these fatalities should not be occurring given that these industries have provided work processes, guidelines and procedures for the workers.

ZESCO Limited saw a reduction in incidences attributed to the implementation of the SHEQ management system in 2015 during the second quarter of 2016 as indicated in Table 1.1. This indicates that reduced or incident free workplaces can be achieved by entrenching a SHEQ driven culture in the way things are done, and in the values and beliefs of people at work places. However the implementation rate is slow as it is attributed to the organisational safety culture (IRCA Savenda, 2015). There is need for management commitment in developing a safety culture to prevent accidents as this cannot be done by the workers alone.

1.5   Rationale of the Study

The concept of organisational safety culture in the implementation of a SHE process has been used by many organisations that have safety and health and SHE/Risk management systems in place and produce world class performances with high productivity and excellent service delivery as postulated by Germain et al (2011) in the Guide to Managing Risk Concepts to Improve SHEQ management systems. Additionally, the electricity industry is endowed with unique problems such as shortages in well experienced skills in engineering and technicians and tradesmen, and ineffective trainings during implementation of SHE related issues (IRCA Savenda, 2015). The industry, consequently exposes workers to tasks where dangers are not always easily judged. This is attributed to workers not having the ability to

cope with complex tasks and uncertainty, coupled with the time frame of dealing with that incident (ZESCO Limited, 2015). Additionally, management has not understood the organisational safety culture within the context of electricity industry by setting targets that need to be reached (Enslin & Arnold, 2011).

In the conference paper prepared by Zhang et al (2002), they said that safety culture is a generic solution for all psychological and human factor issues that could actually have exceeded evidence for its effectiveness. Therefore the electricity industry is implored to develop and manage safety culture from the top management to the bottom. To the workers, safety culture is perception and attitude towards the safety of the workplace; while to management, it's about implementing SHE processes and policies, motivate workers, create a conducive climate, and change perception on safety (Enslin & Arnold, 2011). The current approach to the SHE management does not take into account the variable nature of how workers perceive safety and the climate in which it can be created.

During the literature survey, most features related to the research, including information pointing to safety culture in the electricity industry was limited. Hence, considering this background factor and since work related problems can lead to poor quality of service provision, increased risk, workplace health diseases and a poorly managed environment, it is imperative to understand the impact that safety culture in organisations can have in the implementation of SHE in the electricity industry operation.

1.6   Research Study Definition

1.6.1   Research Problem

Upon emphasizing the impact of safety culture on SHE implementation in electricity industry distribution operation, the assertion of the problem statement for this research proposal therefore is that the Zambian electricity industry in managing SHE focused on regulations, policies and processes and is not focused on the safety culture challenges that influence the provisions of the SHE management system

during electricity distribution operations that impact negatively on the rate of incidences and fatalities at workplaces.

1.6.2   Research Objectives

i.   To delineate safety factors that influence a positive organisational safety culture.

ii. To examine the perception of organisational safety culture on overall safety performance by various groups within the sample.

iii. To determine the role of management in enforcing organisational safety culture.

iv. To establish the barriers impeding organisational safety in Zambia's electricity distribution industry.

1.6.3   Research Questions

The following are the research question formulated for this study:

i.   What factors can be used to delineate a positive organisational safety culture?

ii. What are the various perceptions about organisational safety culture in the management of SHE in Zambia's electricity distribution industry?

iii. What are the barriers to organisational safety culture in Zambia's electricity distribution industry?

1.7   Significance of the study

The study is significant as it will create an understanding and appreciation of the importance of organisational safety culture in the management of SHE in the electricity industry distribution operations in Zambia. There was no known similar study that has been carried out before in the Zambian electricity industry at the time of the research. Thus it is significant in relation to enhancing organisational safety culture of the industry. The research will also contribute to the body of knowledge mastery in this area.

1.8   Research Methodology

The aim of the research is to assess the impact of organisational safety culture on safety health and environment in Zambia's electricity distribution operations. The study developed a theoretical model from the literature available that evaluates safety culture of electricity distribution operation. The approach for the research was quantitative and qualitative in which both descriptive and analytical survey methods were adopted. Quantitative methodologies were used to investigate, analyze and compile the required quantitative information to achieve the objectives set out for this research.

1.8.1   Data Collection

During Data collection, both primary and secondary data sources were used to satisfy the objectives of the study.

Primary Data Collection

Primary information is data that was collected at first hand basis and original (Business Dictionary, 2013). Questionnaires were used as primary data collection tools to facilitate the collection of information. Questionnaires were administered to the concerned. The target population consisted of operational staff that included managers and workers of a government electrical distribution operation company, one privately owned company and the contractors that render services to these power companies.

Secondary Data Collection

A secondary source of information is a document or recording that relates or discusses information originally presented elsewhere (Business Dictionary, 2013). Secondary data sets included information from text books, journals, reports, dissertations, dictionary and published articles. Secondary data sources were used to review the literature considering that other documents related to the study have been written by other authors from different countries. This involved among others the use of extensive secondary data such as journals, internet, and dissertations.

1.8.2 Descriptive Survey

According to the book written by Kothari (2004) a descriptive survey was one of the means of data collection. This study used the descriptive survey research and data collected was using the questionnaire was analysed. It worked by collecting quantitative data from designed and pre-tested questionnaire distributed to the target sample. This questionnaire was administered to operational staff, which included managers and workers of a government electrical distribution operation company, one private owned company and the contractors that render services to these power companies.

1.8.3 Administering Questionnaires

In the book by Leady and Ormrod (2010), they suggested that questionnaires be administered through self-administration using the drop-off method, email or fax. However Proctor (2000) postulates that the delivery method is selected based on the ability to yield more data by covering a greater population in an economical and efficient manner. Therefore the questionnaires were forwarded at the same time during the period of data collection.

1.8.4 Data Capture and Analysis

Data captured was analysed using the Microsoft Excel 2010 software and was further examined using the computer programs namely Statistical Packages for Social Sciences (SPSS).

1.9 Research Constraints and Limitations

Due to time constraints and limited financial resources the sample selected that included operational staff of managers and workers of a government electrical distribution operation company, one privately owned company and the contractors that render services to these power companies, five provinces were considered. However, it is important to mention that all the necessary sampling procedures and techniques were followed to avoid bias.

1.10   Ethical Consideration

During the research, ethical and professional conduct advocated by literature coupled with ethical issues, were incorporated in the research process. This was done by abiding to all processes deemed necessary in the design of the investigation, data collection, dispensation, analysis and interpretation. All participants and collected information were protected against any form of abuse of committed rights by any person or organisation likely to be incurred during the research process.

1.11   Chapter Synthesis

This study consisted of six chapters and organized as follows:

Chapter one introduces the research topic, justifies the research, outlines the research problem, and states the objectives and importance of the study. It also states the research questions, scope and significance of the study.

The second chapter meets the objectives by comparing and contrasting the writings of various authors related to the subject of the study and provide support for the development of the research objectives. Other literature were considered which give a more contemporary review of the current safety cultures in the organisations concerned.

Chapter three discusses the methodology adopted for this research. Reasons for selection of the chosen methodology is also discussed in this chapter. It discusses the research approach, design and target population, and thereafter the sample size as well as the sampling process and justifications that will be employed before considering methods of data collection, instruments, methodological reliability as well as validity.

Chapter four lists the findings of the analysis of the research. It presents the actual findings and data presentation as obtained from the questionnaires administered to relevant research samples. This was at aimed at satisfying the objectives.

Chapter five discusses and analyses the findings of the previous chapter in detail relative to the objectives and in relation with the existing body of knowledge on the subject matter.

Chapter six provides the conclusion and recommendations of the research based on the literature review, findings and analysis in relation with the objectives and research questions. It argues that the organisational safety culture exists in the defined categories and is essential for SHE management and performance.

CHAPTER TWO: LITERATURE REVIEW

2.1   Introduction

This chapter presents the findings by various scholars on the impact of organisational safety culture on SHE management in various industries. It deals with the theory and literature relevant to organisational culture and how it influences safety and health management. The background of safety culture as a subset of organisational culture shall be explored, together with the role of competitiveness in safety, factors that influence the safety culture, roles of management and entrenching organisational safety culture, SHE Management in the Electricity distribution industry in Zambia, and finally, the barriers of organisational safety culture in SHE management in the electricity distribution industry. The chapter will conclude by highlighting the gaps in the various literature reviewed.

2.2   Organisational Culture

Organisational culture as defined by Schein (2011) is the pattern of basic assumptions and norms that a given group has conceived, exposed or established in order to cope with problems of outside variation and internal assimilation. These assumptions are considered to have worked well and are measured, valid and considered as a correct way to perceive, operate, think and feel in relation to those problems. Organisational culture was also defined by Ek *et al*, (2007) as "*is the interaction between organisational and individuals, where worker's behaviour can change through mutual interaction*". The approach emphasises on the shared values, attitudes and perceptions as fundamental to culture. However, there has been debate about the real meaning of organisational culture that aligns itself with values or environment of the organisation in describing the attitudes and behaviour of management and workers in a company.

In other article, Schein (2004, p. 3) states that even though culture is a concept, the forces that are created in social and organisational situations as a result of culture can be very influential. He further argues that if culture is misunderstood, it would

make a person fall as a victim to it. This view is very important to this study as not understanding the impact of culture on SHE management can cause missed opportunities in improving the performance of SHE in the electricity industry.

Martin (2004) in Cummings and Worley (2005, p. 483) argues that culture can be regarded as an integrated, distinguished and a fragmented view. The integrated view contends that culture consists of subcultures that can be found throughout an organisation. While the fragmented perspective which is considered as meaningless, it defines culture as an ever changing approach that is dominated by ambiguity and paradox. Organisational culture nonetheless includes major elements at different levels of awareness as postulated by Janssen (2008). The highest level of cultural demonstration is seen from visible signs of profound levels of values and include noticeable behaviours of members such as language, arrangements and systems. Other elements of organisational culture comprise the norms which are the unprinted instructions that guide the behaviour of members, the values that tell members what is important to the organisation and should deserve their attention. Last but not the least, the deepest element in culture of an organisation is the basic assumptions about how organisational problems are solved (Cummings & Worley, 2005, p. 484). The latter elements are not as obviously noticeable as artefacts, and require some analysis and exploration to uncover.

However, organisational culture has also been stated by Robbins and Judge (Robbins & Judge, 2007, p.573) that it is a structure of shared meaning held by members that differentiates the organisation from other organisations. They further theorise that there are seven primary characteristics that capture the essence of an organisation's culture and can be abridged as the level of risk taking and innovation, attention to detail, outcome orientation, people orientation, team orientation, assertiveness and solidity.

2.3   Safety Culture

Choudhry, Fang and Mohamed (2007, p. 3) presents safety culture as a sub-set of organisational culture were values, attitudes and perceptions are shared. Nonetheless, of specific interest on safety is what Robbins and Judges (2007, p. 573)

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mentioned on the issues of risk-taking, outcome orientation and constancy as being good indicators of safety culture were alignment on result is focused on production with the slogan "safety first" is supported. Fernandez-Muniz *et al* (2007, p. 628) recognised the social and technical aspects of safety culture by defining it as 'a set of values, perceptions, attitudes and patterns of behaviour with regard to safety shared by members of the organisation; as well as a set of policies, practices and procedures relating to the reduction of workers' exposure to occupational risks, implemented at every level of the organisation, and reflecting a high level of concern and commitment to the prevention of accidents and illnesses'.

However, Zou and Sunindijo (2015) thus describes safety culture as an assembly of individual and group beliefs, norms, attitudes and technical practices that are concerned with minimising safety risks and exposure of workers and the public to unsafe acts and conditions in an industry. They further point out some illustrations of safety culture in organisations with characterising it as the value of and belief in occupational safety that is deeply and widely shared within the organisation with workers having a particular pattern of attitudes and beliefs regarding safety practices. Additionally, they mentioned in their book that in safety culture, workers are kept prepared for unanticipated variations and ask for help when they meet an unversed hazard, seeking and using available information that improves safety performance. This was also postulated by Clarke (2006) where he assumes that the organisations should have a safety management system in place, applied in practice and revised recurrently so that it can develop into an acceptable culture by all. A good example is seen when electricians are able to bridge out safety devices in order to keep the supply of power going. This kind of behaviour is acceptable and needs to be rewarded since the supply of power is made effective and continuous without any shut downs for maintenance. Hence, high levels of behaviour towards safety are rewarded. This relates to Robbins and Judge (2007) view of people orientation which is one of the primary characteristics that capture the essence of an organisation's culture. They point out that these are characterised by innovation, outcome and people orientation, team orientation stability, attention to detail and aggressiveness.

Additionally, Cummings and Worley (2005) illustrates that organisational culture encompasses major elements that subsists at different levels of awareness and how they are observed from outside. The highest level of culture can be found in the artefacts which are visible symbols of deeper levels of culture and comprises observable behaviours of members such as structures and systems. To add on, the deepest level of the elements include the norms which are unwritten rules guiding the performance of members, their values, what is cardinal for the organisation, the basic assumptions on how problems in the organisation are solved.

2.4   Organisational Culture and Safety Culture

Robbin and Judge (2007) on the issue of safety management indicates that risk taking is a generally good indicator of the safety culture needed in an organisation and its outcomes is largely dependent on production with a "safety first" slogan always promoted. A key role which is influenced by organisational safety culture, focuses on the context of skills shortage, contractor workers and transient nature of skilled capacity.

The Zambian electricity industry which is a highly regulated industry, norms convenient and in compliance with legislation or procedures are accepted and taught. This then develops into accepted culture within the electricity organisation. An illustration to this is when electricians in the distribution sector through several target incentives and equipment are left with dangerous electrical fault that would have fatal consequences, but due to the perceived reward, this action becomes part of culture. The ACSNI Study Group (2013) posits that accidents caused by workers are largely related to behaviour issues that arise from the culture and environment they work in. However, this behaviour can be prevented once quantification of cultural and environmental issues are quantified and understood, expectations are that adjustments can be made to reduce accidents by workers.

In the last three decades, the safety model has progressed from just being technical to human error, safety management and safety culture related issues according to Pyoos (2008). The increase in the role of organisational factors as indicators of safety has increasingly been acknowledged as the third age of safety (Mengoli &

Debarberis, 2008). The focus has now shifted from considering structural components and installations alone to considering the organisation as a whole. Mengoli and Debarberis (2008) postulated that the human factor can be ascribed as a deviation from the need to the development of procedures and regulations to ensure safety governance. With the researcher's experience in this field, many investigations into incidents related to safety have a focus on human factors; while its elimination is important in ensuring operations, organisational facets make available signals of the safety awareness of the organisation as a whole.

Figure 2.1   Organisational Culture and Safety Culture for Safety Performance According to Mengoli and Debarberis (2008)

2.5   What is Safety Culture?

In 1986 when safety culture was introduced by the International Energy Atomic Agency in the Chernobyl Nuclear Power Plant disaster, it was seen that the accident was an indication of a poor safety culture at the plant because of the errors and violations of operating procedures contributed to the accident (Fleming & Meakin, 2004). Williamson (2007) in his interview with Dan Petersen stated that:

"Safety exists as a result of culture; safety is not a sub-function of culture. Culture is one of the things that indicate what goes on in organisations for productivity, for everything including safety" as reported by Olusuyi (2011).

Culture is understood to be "the way things are done" and an influential potency shaping the attitude, belief and behaviour of the organisation and their attitude to work (AICHE, 2010). In this view, it is imperative for organisations to develop their culture, as Parker et al, (2006) suggests saying that an organisation's culture can shake performance even to the point that some accomplishments and failures within an organisation which is ascribed partly to its corporate culture. Culture is a learned way of values reflecting in practices interpreted through guidelines and standards of behaviour (McCarthy, Reeves, & Turner, 2010) thus forming a complexity that indicates varied meanings and arguments about the term in academic literatures, hence forming the rationale for the numerous research carried out in this field.

Safety culture as indicated by Dumas (2011) is regarded as a constituent of the general philosophy of an organisation that affects the attitudes and beliefs of the workers as regard to health and safety routine. Although there is no agreement about safety culture definition, various definitions with similar elements have emerged over the years within the literatures such as Dumas (2011) and Zou and Sunindijo (2015). These elements are attitude, behaviour and perception of workers in an organisation which make them realise that safety is a priority. Choudhry et al, (2007) further described safety culture as:

"Learned behaviour and those beliefs in the necessity, practicality and effectiveness of controls, attitudes and risk perception which makes people think safely and trust in safety measures or characteristics and attitudes in organisations which result in safety issues being a priority".

However, the major challenge to constructing the safety culture aspect is the need to highlight the existence of a huge gap between management and front line workers. This was equally observed by Rutter (2010) were administrative teams need to encourage compliance and efficiency by putting in place rules that are standardized including following regulations in order to achieve safety culture. He further says

that bridging the gap between leadership and workers requires workers 'minds perception to change and not just repetitive behaviours.

In describing the mechanisms of an optimistic safety culture, numerous views in various literature were recognised. Pyoos (2008) identified five components of a positive safety culture while others have suggested eight or ten components. Nevertheless, according to Fleming and Meakin, (2004) and AICHE (2010) the components of a positive safety culture can be described as: safety is promoted as a core value with strong present leadership; high standards of performance are recognised and applied; a sense of honesty is upheld and influence is given to workers to fulfil positively safety accountabilities placed upon them; mutual trust is encouraged, unspoilt and effective communications are guaranteed. In addition, a learning environment is established and approbation to capability is provided. Moreover, pertinent reaction to safety issues and concerns and constant monitoring of performance is then provided.

Pyoos (2008) references Clarke (2006) as classifying the safety culture mechanisms as informed culture which is collects data from previous accidents and near-misses and merges them with hands-on procedures, which is the reporting culture. He additionally remarks that the just culture characterised by communal trust inspires participation; and leads to a knowledge culture necessary to draw conclusions from the information available and the will to device change in order to augment organisational performance.

Studies such as that of Yule (2008) identified five stages to world class safety in which he starts by realising the need for action, followed by policies and procedures rule, then the observation stage that is characterised by compliance and training with little level of worker involvement; encompassing the stage of empowerment that entails management and workers' involvement and empowerment to take responsibility for their safety and that of others. Finally, the ideal stage that he highlighted was that of a self-sustaining safety culture which drives the industry to become a yardstick in safety for other industries.

In a nutshell about what safety culture is, Wiegmann et al (2004) provides a summary of the various descriptions of safety culture that can be found in various literature. He conclude that all the definitions devise a number of common features regardless of the industry that is being considered. Their commonalities therefore include:

i. Safety culture is a concept defined at the group level or higher that refers to the shared values among all the group or organisation members.

ii. Safety culture is concerned with formal safety issues in an organisation and closely related to, but not restricted to, the management and supervisory systems.

iii. Safety culture emphasizes the contribution from everyone at every level of an organisation.

iv. The safety culture of an organisation has an impact on its workers 'behaviour at work.

v. Safety culture is usually reflected in the contingency between reward systems and safety performance.

vi. Safety culture is reflected as an organisation's willingness to develop and learn from errors, incidents and accidents.

vii. Safety culture is relatively enduring, stable, and resistant to change.

2.6   Safety Culture Indicators

Guldenmund (2007) states that aspects of safety culture for an organisation have eventual impacts on attitude and behaviour, and values to increase or decrease safety risk. Positive influence can be inculcated on workers by good management systems on the SHE process. Baarts (2009) further highlights that organisations whose principal objectives is to eliminate incidences and accidents, need to focus on safety culture to influence SHE. Rutter (2010) inflates on this factor that development and effectiveness of safety in order to manage a SHE is linked with right culture necessary to make safety systems work. Therefore, safety culture in organisations must exist in all departments and functions to be effective, and not just in one distinct part of the organisation. There is need to have a degree of trust as a vital

component of a good organisational safety culture, between workers and management at all levels of the organisation.

Furthermore, as stated in the objectives of the study, it is necessary to highlight some of the indicators known to influence safety culture as postulated the Human Engineering for the Safety and Health Executives (2011) of which the identified the following indicators; Leadership, Efficient Two-way communication, worker involvement, learning culture, and attitude towards blame. Additionally, Wiegmann et al (2004) also stated that there are at least five organisational indicators of a safety culture in the implementation of SHE. These include organisational commitment, management involvement, worker empowerment, reward or accountability systems, and reporting systems.

Similarly, Fuller and Vassie (2004) equally suggests that there are six levels of organisational development of safety culture and include continuous improvement and motivation, organisational values, workers involvement, management involvement and leadership style, communication, and reporting accident. These indicators are related to the ones postulated crucial to this research as they form the basis of the study methodology, as discussed in Chapter four. Alike, organisational cultural factors were identified as indicators of safety culture by Mengoli and Debarberis (2008) and were assumed in this study.

2.6.1 Continuous Improvement and Motivation

The rewards given to a worker performing a safety act is a means of motivation and equally penalties can be used on workers that fail to conduct an act of safety for the sake of accountability. According to O'toole (2010), an organisation can use to hold workers accountable for both good or poor safety behaviour, and thus a key component of the safety culture. An organisation's safety culture, therefore, is replicated to be an ongoing approach by view of the extent to which it retains an established system for reinforcing safe behaviours (e.g., through monetary incentives or public praise and acknowledgement by management and peers) as well as systems that deject or punish unnecessary risk taking and unsafe behaviours (Safety and Health Executives, 2011). However, an organisation's safety culture is

suggested not only by the existence of such reward systems but also by the extent to which the reward systems are formally documented, regularly and continuously applied, and meticulously elucidated and understood by all of its workers.

2.6.2   Organisational Values

Organisational obligation in the context of safety refers to the extent to which to management is able to pin-point safety as a fundamental value of the organisation. An organisation's values to safety is therefore reflected in the ability of its top management to demonstrate a lasting, positive attitude toward safety, even in financially challenging times, and to actively enhance safety dependably regardless of the level in the entire organisation (Olusuyi, 2011). An organisation's value to safety can be seen by the efforts made in reviewing all areas of routine operation. In the context of the electricity distribution operation, an illustration of this obligation can be regarded as the willingness of management to stop illegal connection as a result of an unacceptable level of risk to workers and community safety. This factor was high emphasised in Rutter (2010) and in Roland and Orange (2011).

2.6.3   Management Involvement and Leadership Style

In the perspective of safety culture in an organisation, participation of management denotes the extent to which top and middle management get individually involved with critical safety activities in the organisation (Dumas, 2011). According to Fuller and Vassie (2004) these safety activities include the presence, collaboration and interaction of managers at safety seminars, safety circles and green area meetings, their omission of critical operations, and their ability to stay in-touch with risks relevant to the day to day operations with the workers.

2.6.4   Workers' Involvement

Worker involvement is an indicator of willingness to make process improvements and is related to safety (Carmargo, 2010). Nonetheless McCarthy *et al* (2010) articulates workers' involvement as a series of procedures intended to engross the sustenance, understanding and optimal influence of all workers in an organisation and their obligation to organisational objectives. However to Roland and Orange

(2011) postulates, contrary to this definition and this has been an ongoing debate that it is about improving workers participation to improve the hazardous industry's safety performance. Worker's participation on the other hand is defined as "*a process of worker involvement intended to offer workers with the chance to influence and where suitable take part in decision making on matters which affects them*" (Enslin & Arnold, 2011). The difference between worker participation and worker involvement is apparent from the definitions. Notwithstanding, a more rounded explanation is that of Kauffman (2010) mentioned that workers' involvement as an allotment authority to workers across all levels of an organisation by including them in strategic initiatives, inspiring them to spawn ideas, produces valuable ingenuities in safety and health, and put them into action.

In identifying the rationale of initiating workers' involvement in the management of safety and health of an organisation, Gennard and Judge (2009) have identified have identified various justifications for initiating workers' involvement practices. They pronounced that these practices intended to escalate workers facts about, and commitment to the organisation as initiated principally by management. According to them, management approach is the acknowledgement that accumulative worker's commitment will result into heightened performance.

2.6.5   Communication

The lack of communication of vital information is a direct causal factor leading to the death of workers. The significance of virtuous communication as a noteworthy factor in the safety management process as stressed by Reason (2007, p. 195-196). Communication on safety issues and dialogue, both up and down the organisation between management and workers without 'fear or favour'. Attention is also given to means that safety culture supplement, and go beyond, SHE management systems in terms of workers' perceptions of management primacies, a complete method to management of safety that combines values, the effectiveness and openness of reporting and communication, and the degree to which organisation's pursue safety as the top priority. Chapman (2006, p.10) is another author who contends against the 'blame the victim' approach where he indicates that the carelessness of workers or absence of appropriate supervision can be used to put across many incidents even

though there is influence of below par designed equipment, unbearable and possible to meet deadlines or let alone poor communication, that might be given some weight.

2.6.6 Usage of Accident Information

Rutter (2010) emphasises the importance of acting on near misses and to learn from near misses as important for creating a positive safety culture. An effective and logical system of reporting accidents and near misses is the foundation for identifying the weakness and vulnerability of SHE management before an accident occurs. It is therefore imperative to safeguard that workers do not experience negative outcomes as a result of using the reporting system. A structured feedback system to inform the workers that their suggestions or concerns have been reviewed and what kind of action will be taken to solve the problems is very significant for the SHE Management and sustenance. A formal reporting system in place and one that is actually used comfortably by workers is an indicator of a good safety culture in an organisation. Pyoos (2008) posits that a good reporting system allows and encourages workers to report any safety problems, and it also provides opportune and valued feedback to all. Reason (2007) indicates that reporting of accidents is one of the four key aspects of developing a safety culture in an electricity distribution industry. This was equally addressed by Farrington-Derby *et al* (2005) and Ek *et al* (2007).

2.6.7 Other Particular Factors

Several other factors of a positive safety culture have been identified in a number of studies and derived through case study research. These factors show consistencies with the safety culture aspects from the various industry. For instance, Farrington-Darby *et al* (2009, p.58) investigated the causes of safety incidents in the rail maintenance industry in the United Kingdom of which they developed a number of factors that contributed to unsafe behaviours. One of the specific feature of the study was enquiry of rule violations which was found to be more complex in orientation. Their interpretation fits well with that of Reason (2007) whose notion was that an error performed at a place of work is a consequence rather than causes. This study

reinforces the need not only to focus on behaviour and human error, but to a holistic approach of managing safety and explaining why incidents occur.

Farrington-Darby *et al* (2009) further points out that their categorisation of such factors as incompetence, blame the victim rather than the holistic safety culture cannot be eradicated through training alone and may be useful in categorising casual factors used to analyse incidents in the electricity distribution industry. Some of the factors are listed in Table 2.1 were highlighted by Farrington-Darby *et al* (2009, p. 50) of which most of them were retrieved from their railway industry study as part of the general and best practices in the implementation of SHE management to attain a safety culture that overlap all industries, thus can be used in the electrical environment.

Table 2.1   List of Other Factors that were identified as Influence Safety Behaviour and Safety Culture

• Communication on the job (Excessive and poor quality)	• Poor and underused real time risk assessment skills	• Individual's perception of what safety is.	• Workers knowledge and understanding
• Competence capability and certification	• Safety role model behaviour	• Manager's communication methods	• Information/communication route clarity
• Pre-job information dissemination	• Planners knowledge for job resourcing	• Manager's visibility and accessibility	• Perceived purpose of paper work
• Feedback messages from managers.	• Manager's knowledge in the industry	• Supervisors presence	• Fatigue, concentration, ability to function
• Supervisors style visibility, communication, representation of staff	• Supervisors (technical competencies and assessment of them)	• Perceived purpose of the rule book	• Rule book usability and availability
Information pathway flow	• Training needs analysis	• Methods for reporting	• Information systems use

Competence capability and certification	Practical alternatives to rules	Recruitment methods	Training methods
Pre-job information dissemination			

Enslin and Arnold (2011) postulated the comparative value of varying behaviours as opposed to varying culture to improve safety performance. The deduction was that a cohesive approach is required, with behaviour seen to be part of organisational safety culture. It is determined that the culture change approach promised to be more all-inclusive but also more multifaceted and hard to authenticate.

2.7   Effectiveness of Safety Culture by Contractors

The need for effectiveness and competitiveness in any organisation is by going through several changes in structure. There are several implications that are known to arise for safety culture of permanent workers and contractors were there are more contractor workers than are permanent in an organisation, according to Clark (2006). The shortest time that dependent workers employ permits for slight period to shape relations and create constancy within the work environment.

Clarke (2006) further positions that numerous experimental studies have alluded mixed support for the evidence that contract workers have weak contracts psychological. Olusuyi (2011) and Tam and Fung (2011) postulated that contracts are associated with truncated organisational commitment in a psychosomatic sense. Nonetheless, there has not been any clear evidential lead to clearly mark the difference between the relations between workers working with contractors and permanent workers (Clarke, 2006). This is largely attributed to the fact that contractors render a professional services and are only there to earn from their period of contract and do not have a feeling of responsibility to bringing provision between independents contractors' transcripting non-critical services.

The conclusion that was made by Fleming and Meakin (2004) was that organisational reformation may impair the joint trust among permanent workers and management; and the addition of contractors would impend the integrity of the safety culture. These contractors are faced with twofold allegiances to the host organisation on one hand and their direct company on the other hand whose anxieties may not always be well-matched.

In the case of the mining study on the effect of safety culture conducted by Pyoos (2008), it concludes that organisational safety culture accountable for enhancement in safety presentation is subject to the same factors that contribute to change within other businesses, political or transnational organisations and desires to change to meet the varying requirements and challenges of the environment.

Fuller and Vassie (2004) states the significance of determining and equating values in partnering organisations, i.e. organisations where a large constituent of the workforce is embraced with contractors. The arrangement of the cultures shows a significant part in safety, since a comprehensive culture conveys harmony where all workers feel appreciated, are enthusiastic and give of their best. In an atmosphere where contractors are not preserved as part of the team, the orientation may extant a difficulty as there are no enticements provided for contractors to give out their best. Germain et al, (2011) in the construction industry indicated that host companies have a pronounced effect on the management of safety and health of contractors holistically. The host companies have a legal responsibility in Zambia to inform contractors of any likely exposures the contractor may be exposed to while on site. The duty of familiarising the contractors to safety can however be conceded by unwarranted pressure from the host company for shorter delivery periods and variations in the scope during the progression of the project.

2.8   Processes of Organisational Safety Culture

Coye and Belohlav (1995 cited in Light, 2004) have discoursed that organisational safety cultural process is a function of the four organisational processes that was mirrored in Lawler's worker involvement model with the four organisational processes at its core (Light, 2004). Likewise, Marchington and Wilkinson (2009)

mentioned the use of the ability, motivation and opportunity in the safety model. The model argues that for people to perform better, they must have the ability, skills and knowledge necessary. They must be motivated by compensating them and rewarding them so that they are able to be participative and be given the opportunity to array their skills. Lawler's four processes as illustrated in Figure 2.2 and include power, information, knowledge and reward. He further argued that effectiveness of organisational safety cultural programs in an organisation are directly dependent on the information and communication, knowledge, power and rewards and compensation that are vertically integrated into the organisational structure (Light, 2004) stating that:

> *"Power without knowledge, information and rewards is likely to lead to poor decisions. Information and knowledge without power leads to frustration because people cannot use their expertise. Rewards for organisational performance without power lead to frustration because people cannot influence their rewards. Information, knowledge and power without rewards for organisational performance are dangerous because nothing will ensure that people will exercise their power in ways that will contribute to organisational effectiveness (p. 42)".*

Information	Empowerment
Knowledge	Rewards
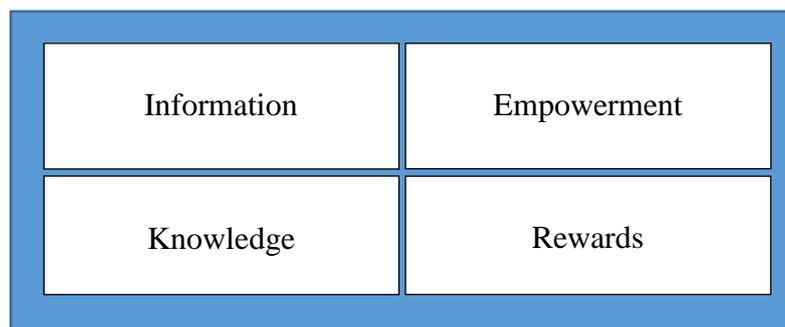
Figure 2.2   Author's Illustration of Lawler's Organisational Safety Culture Process

Information as described by Light (2004) is a means through which power and empowerment is described and thus implies any form of communication that is shared and any form of knowledge transferred. Lawler (1986) cited in Light (2004) equally argued that information sharing is the most essential and the mostly integrated process of involvement. If workers are not well informed, there can be no

pertinent contribution and this can lead to erroneous conclusion. It is also important for information to be evidently communicated in order to eliminate suspicion between management and workers hence fostering mutual trust. Thomas, Tolin and Hartman (2009) focused their study on the role of communication in developing mutual trust and its effect on worker involvement. They referred to the quality and quantity of information communicated taking a great impact on trust.

Consequently, Power denotes to the capability to effect or act on what has been communicated. This is argued to involve workers in their work as they have the ability to make decisions important to their routine working lives (Kular et al, 2008). As Lawler 1986 (cited in Light 2004) suggested, a form of participative decision making to obtain organisational safety culture can comprise any form of judgement made in an organisation outside the top management team. This can be achieved through enablement whereby workers can contribute in decision making without distress of negative feedback. Nevertheless, information and power necessitate proper knowledge to put them into use.

Therefore, Knowledge as cascaded from the argument of power and information above refers to the required skills, abilities and competence of workers to contribute in safety culture and decision making on safety issues. An impeccable description is "information put to productive use" which is often personal, intangible and difficult to determine and distribute (Armstrong, 2006). It was also postulated that it is important for workers in the organisation to use their expertise and knowledge concerning decision and following processes in an organisation (Kular et al, 2008). Hence, when workers have gone the extra mile of signifying extraordinary proficiency, there is a need for them to be compensated.

However, it was practical that a recompense system is the most under-utilized and mismanaged managerial tool engaged in lashing organisational performance (Armstrong, 2006). Nonetheless, Rewards are a precarious constituent of motivation for organisational safety culture. After obtaining power, information and knowledge, workers assume more when they have in some ways subsidised to organisational effectiveness and safety performance. Therefore organisational reward is vital as all

workers who are part of an organisation making efforts to enhance safety related issues based on organisational performance (Smallman & Smith, 2013).

2.9 The Role of Management and Leadership in Organisational Safety Culture

Most literature reviewed make clear distinction amongst management and leadership as two completely dissimilar, yet associated concepts. Nienaber and Roodt (2008) found that there is a significant amount of opinions believed today concerning overall management and leadership that bring into line with classical management. Classical management interpretations reflect management and leadership to be the same thing (Lawrie, Parker, & Hudson, 2006). In the context of an electricity distribution operation, there is a clearly distinct expectancy for Management to provide leadership in the area of safety. While it is therefore not generally accepted in conventional literature to undertake, that management is identical as leadership, for the determination of this study, matters of leadership will be related with the role that managers play in handling safety.

Schein (2011, p.10) theorises that leadership and culture are two notions that cannot be unwritten in separation as they are considered to be of two sides of the same coin. Cultural norms in organisations define the leadership of the organisation, e.g. who becomes endorsed for promotion, who acquires the consideration of the followers to be a leader. On the other hand, it can be contended that leaders manage and create the organisational culture. Leadership and culture are therefore conceptually entwined (Carmargo, 2010, p.11)

Moreover, Schein (2004, p. 225) further advances the idea of leadership and culture that it has three sources:

  i.   The beliefs, values and assumptions of organisational creators,
  ii. The knowledge practices of group members as the organisation advances, and
  iii. New beliefs, values and expectations brought in by new members and leaders.

The influence creators of the company have on safety has the utmost effect on the development of the organisational culture, as they choose the rudimentary assignment and environmental setting in which the workers function. Pyoos (2008, p.34) further explores the approaches with which leadership uses to embrace and convey culture. He indicates that they include the primary approach such as what leaders pay consideration to, how they respond to perilous incidents, and how they apportion recompenses and reimbursement and penalty. Pyoos (2004) refers to the writing of Schein (2004, p. 246) that secondary approach to this effect include the way in which the design and structure of the organisation is made and the processes and procedures, the resources and formalities embraced by the organisation.

Gibbons *et al* (2009) undertook a qualitative investigation in the construction industry about the workers' perception on management input in encouraging safe working practices. They spread additional light on the matters of management commitment to safety, productivity pressures in relation to safety, overlooked concerns of communication in safety which is a vital component that can be used to address any issues of safety in the construction as well as the electricitty industry. Such a components crosscut the electricity sector and brings about an knowledge in safety related aspects. The understanding of the impact that organisational safety culture has on SHE management in the Zambia's electricity distribution industry can therefore deliver several considerations supporting electricity companies in dropping fatalities and deprived safety records, thereby aggregating investor assurance and sustainability in the industry.

2.10   SHE Management in the Electricity Distribution Industry

Outcomes of main incident examinations points to the misrepresentative idea that rewriting and fixing of rules and procedures are enough to prevent similar incidents (Olusuyi, 2011) . Hence, most organisations have a program to advance safety culture (Fleming & Meakin 2004, Haukelid, 2008). Fleming and Meakin (2004) have also labelled safety culture as the most significant theoretical development in SHE research in recent decades, engendering a great deal of consideration. Mikkelson and Saksvik (2010) carried a research in the electricity industry on safety

culture and looked at the systems approach to organisational culture. Harvey (2009) equally mentioned that training can be used to change safety culture and attitudes within a highly regulated environment such as that of the electricity industry and concluded that training is clearly effective in changing attitudes of workers and enhance a safety driven culture.

As suggested by many researchers in the field of safety and health, 85-98% of all work injuries are caused by unsafe behaviour (Williamsen, 2007). It was disputed that people's unsafe act is the cause of 88% of industrial accidents while 10% are a result of mechanical or environmental conditions and only 2% of accidents are unpreventable (Carrillo, 2010). However, it has also been pronounced that organisational failures will always cause individual lively errors (Grant, 2010).

This proposes that organisational failures are intensely connected to the organisation's prevalent culture and are the foundation for most individual errors. Nonetheless, prevalent issues in relation to human factors explicitly safety culture, have emerged in the electricity studies as can be seen in most literature. In one of such studies, safety culture within the operating organisations involved is pronounced in terms of worker's perceptions by six factors mentioned earlier in this chapter (Yule, 2008).

The specific risky nature of the electricity distribution industry, along with its dispersed physical work localities in the construction and maintenance process, can add extra issues into the management of safety. These factors include communication difficulties, accessibility in the environmentally difficult locations by work crews, and in some cases changes in the composition of workers and management structures (Rutter, 2010). This creates a 'silo effect' in the nature of production in the industry hence appearing that much of the reforms has not countered that tendency. The 'silo effect' is where numerous departments and functions develop disconnected culturally from the general purpose of the Company (Hopkins, 2009).

Hopkins (2005) analyses the 'silo effect' as a causal factor in the Glenbrook rail disaster:

"*I have called this aspect of the way things were done, a culture of 'silos'. The result was a failure of people working in the same organisation to recognise that their actions, or inactions, might have implications for the safety of people in other parts of the system*" (p. 28).

The electricity industry is highly affected by the 'silo effect' due to organisation structures that limits consciousness to divisions and sections of an organisation, rather than to the organisation as a holistic system.

Guldenmund (2007) highlights the dissimilarities in leadership and attitudes of managers in different localities. The specific feature of organisations in the electricity distribution industry that present the 'silo effect' obstacle is geographical distribution. Disjunctures also arise on functional lines, such as arising between those that work with live electricity from those that are support staff. Nonetheless, Galea (2009) informs around the safety culture of various industries and organisation and the relationship between safety and culture who conluded that most safety work focuses on the objective performance and systems and not on the subjective aspect that looks at culture and individual motivation. However, the question to consider is whether the unit of analysis should be related to the industry or an organisation. The electricity distribution industry is therefore appropriate for the reason that hazards are common across the industry.

Dejoy (2005) went further to posits that the most common types of unsafe work practices were unsafe 'normal' work procedures by either management or workers; this indicates that in most electricity related mortalities, the victims made an error attributed to the skill during routine activity (p.7). This interprets the causalities that emphasises behaviour rather than contexts and fits more on the blame the victim ideology as illustrated by Hopkins (2009).

Most relevant to this review is that which was undertaken by Rutter (2010) entitled Organisational Safety Culture and Behaviour in Electricity Distribution. This study examined on-the-job deaths due to interaction with electricity in those professions with high exposure to electricity. This study included research into behavioural factors in the grouping of human error that may have contributed to accident

causality and further identified behavioural and environmental factors behind unsafe work practices as contributory factors.

2.11   Barriers to Organisational Safety Culture

According to a research report by the Safety and Health Executives (2011) who conducted a research aimed at ascertaining forms of incentives that inspire partaking and impediments averting organisational safety culture. They carried out a sequence of focus groups with respondents from the construction, manufacturing, hospitality and retail industry in the UK. The barriers identified are categorised under five themes explained. Inadequate understanding and knowledge of the meaning of safety and health and the cost incurred to implement good practice. The other themes are the issue of complexity in the legislation and regulations, attitudes toward health and safety, the culture of organisations and the value attached to participation in SHE and the size and type of organisation. Management involvement in SHE management also has an impact as a result of perception that unless management was committed to introducing good SHE practices it is unlikely that workers can be involved in Safety and Health related issues (Safety and Health Executives, 2011).

Within the themes, a breakdown of barriers were identified, under the lack of awareness and understanding, it was detected that many workers concluded that safety is a matter of mutual sense and there is therefore no need to be troubled with the majority of material existing on safety and health. The time and cost of instigating good safety and participation practice was also named as a key barrier to the design and practicality of organisational safety culture (Mittrousi, 2011). This is due to limited schedule and inadequate resources that make it unbearable to take time off for training and for effecting correct practices and procedures. Another barrier identified by Baarts (2009) is the intricacy of legislation and regulations, that are continually altering makes it difficult to understand and implement.

The attitude of managers and workers to safety and health is another identified barrier by Haukelid (2008). Within the report, the attitude of managers was described by workers in six major perspectives namely; fear of legal action,

organisational beliefs, nature of operation and the importance of risk management, size of the enterprise and its profit margins, lack of interest and commitment and frustration with the impact of statutory requirements on the job (Safety and Health Executives, 2011). Likewise, workers' attitudes to organisational safety are in turn perceived to be driven by cost and impact on profit margins, age, knowledge and awareness, extent of common sense.

Nevertheless, various authors have identified features of successful techniques and factors relevant to the success of implementing organisational safety culture. Among the most cited one is the observation made by Tam and Fung (2011) that identified four major features of successful techniques namely; daily routine participation in safety and health issues, workers possess a degree of control to make decision, improvements initiated by workers and main changes in worker's work life is required for more successful techniques. He additionally suggested management commitment, training of workers and management education as processes of enhancing organisational safety culture.

On the same note, Gifford, Neathey and Loukas (2005) suggested some success factors for creativities. Among these factors is leadership by which senior level champions of organisational safety is visible. They also mentioned consistency through the entrenched workers' contribution in the general human resource attitude and safety culture of the organisation.

Worthy of mentioning also is sincerity through honest communication necessary for maintaining mutual trust between parties (Veltri, 2007). The value of training was also highlighted (Mengoli & Debarberis, 2008). The importance of training in this case is for workers and management to be informed on issues to be addressed and in new ways of working.

2.12   Gaps Identified

The following were some of the gaps that were identified from the literature reviewed during the research:

i.   The indicators used as factors in the study done by the Safety and Health Executives (2011) did not include management involvement and leadership style, corporation values, and usage of accident information as means and factors that would affect SHE management positively.

ii.   Wiegmann et al, (2004) in their study did not encompass continuous improvement and motivation, involvement of workers and the need to use accident information when implementing safety culture. They indicated reporting systems which did not indicate the lessons learnt from the cause of accidents and how they would use it in the future to mitigate and avoid the incident.

iii. Communication and usage of accident information was equally left out in the studies undertaken by Fuller and Vassie (2004) and Olusuyi (2011). This created a gap in the use of the factors as indicators in enhancing organisational safety culture.

iv.   Some of barriers that were highlighted in the studies undertaken by Galea (2009), Mittrousi (2011) and Baarts (2009), did not include the barriers related to Low level of trust between management and workers, safety training being too expensive, lack of management commitment to ensure safety, health and environmental issues are resolved in good time, and that safety and health related issues are not needed to do work in the electricity industry.

2.13   Chapter Conclusion

A quick review of available writings have indicated that there are about two publications written by IRCA Savenda (2015) and ZESCO Limited (2015) relating principally to SHE aspects, which have been done focusing on the electricity distribution industry in Zambia. The most relevant to this study were studies undertaken in other countries within the electricity distribution industry. From the literature reviewed, the chapter establishes that the electricity industry uses the factors that have been discussed to indicate the impact of organisational safety

culture on the management of SHE in the electricity distribution industry. The review also indicated that most accidents in the industry are attributed to unsafe work practices caused by human error. These are influential in causing fatalities due to electrocution in the industry. This interprets across to electrical accidents that did not result in mortalities. Lastly the chapter reviewed some of the barriers that limit organisational safety culture in the management of SHE.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1   Introduction

This chapter discusses the methods and approach taken in the systematic collection and interpretation of data for this research. The chapter covers research methods to be used in this study. It contains the research design to be used, description of variables, and location of the study, the target population and the sampling technique, that will be used. It will also cover the data collection procedures, the research instrument to be used, the data analysis technique as well as the ethical considerations.

3.2   Research Philosophy

It was opinionated by Saunders, Lewis and Thornhill (2009) that there are four main research philosophies namely positivism, realism, intrepretivism and pragmatism. They further advocated that the intrepretivist perspective is significantly appropriate for researchers predominantly in the fields of organisational safety and behaviour, marketing and human resource management. Consequently, the proposed philosophy adopted by this research was positivism perception which proposes scientific methods as a means of knowledge generation and that the data collection techniques to use include small samples and quantitative in nature. This philosophy was also used by Olusuyi (2011) and Clark (2006).

3.3   Methodology

Saunders et al (2009) devised suggestions that a detailed study contains features such as systematic collection and interpretation of data including a more clear purpose of judgement. They also contended that research should involve a clarification and explanation of methods and approaches used to collect data, an argument as to why the results obtained are valid, and an explanation of any limitations associated with them.

Despite the adoption of quantitative approach in this research, it is essential to distinguish between the other methods, identify the key features and also the limitations and reasons for the adoption of quantitative methods.

3.4   Rationale for the Methodology

Tools for assessing safety culture are classified as either qualitative or quantitative methods (Wiegmann et al., 2004). Qualitative measures include worker observations, focus groups, historical information reviews and case studies. While quantitative processes attempt to use numerical measures to score organisational safety culture, by using standardised procedures such as surveys and questionnaires, and Q-sorts (Wreathall, 1995 in Wiegmann et al, 2004).

Hopkins (2006) explores two supplementary methodologies apart from the survey method to establish an organisations safety culture. The first is an ethnographic approach, which requires the researcher to submerge him/herself in the culture for a long period of time. This type of methodology delivers a better account of the culture, but the description of culture is normally biased towards the researcher's own understanding of the culture (Pyoos, 2008). These explanations have to be authenticated with members of the organisation to ensure that they truly reflect the organisational safety culture. This methodology was found to be time rigorous, and requires the researcher to have as little influence as conceivable on the culture while immersed in the organisation. For the purpose of this study, the approach was found to be unsuitable.

Another approach suggested by Zou and Sunindijo (2015) is the use of data gathered from major accident inquiries. The transcripts of interviews of persons who were either directly involved or witness to accidents provide a wealth of information for the researcher to analyse and gain insights into the organisational culture. The downfall of this method is that it does not provide a complete picture of the culture of the organisation. While such data is available, this method was not adopted due to the relative age of the data and the dynamic nature of organisational cultures over time (Roland & Orange, 2011). Researchers agree that both qualitative and quantitative methods have unique potential for assessment and theory testing, and

that there is a benefit in combining methods to gain a comprehensive understanding of safety culture (Wiegmann et al., 2004). Wreathall (1995) in Wiegmann et al., (2004) states that quantitative approaches, especially surveys of individuals responses, are often more practical in terms of time and cost effectiveness.

Questionnaires are also very useful for measuring changes pre and post interventions and generating a broad picture of an organisation's safety cultural issues (Clarke, 2006). Their limitations can include; a lack of an in-depth understanding or explanation of results, low response rates due to misinterpretation of the objectives of the questionnaire or understanding of the questions, fear of reprisal or blame and low levels of worker literacy. This is particularly prevalent in the electricity industry of the general workers, where communication has been traditionally driven by verbal communication (Guldenmund, 2007). Given the considerations of time and practicality, this research used a questionnaire survey. The approach for the research was quantitative and descriptive.

3.5   Research Design

The study used a quantitative and descriptive survey research design that involved the process of collecting data in order to provide solutions concerning the current status of the study subjects. According to Weigmann et al (2004), quantitative approaches especially surveys of individual responses, are more practical in terms of time and cost effectiveness. With time and practicability in mind, the study used a questionnaire survey and the approach was quantitative and descriptive. The section below introduces the epistemological paradigms, and the overall research methodology.

3.5.1   Research Objectives

The primary aim of this Masters dissertation was to understand the impact of organisational safety culture on the management of SHE. The research was carried out in the electricity distribution industry whose main function is to supply electricity in Zambia.

3.5.2 Stages of the Methodological Approach

This section delivers an overview of the methodological approach undertaken in order to realize the research objectives. This was carried out in two main stages: literature review, and organisational safety culture questionnaire.

Phase 1: Literature Review (Chapter 2): A review of previous studies and analysis to identify the main dimensions of organisational safety culture factors and barriers.

Phase 2: Organisational Safety Culture Questionnaire (Chapter 4): The concepts identified in the literature review informed the development of a tailored organisational safety culture questionnaire specific to the industry. The resulting questionnaire was a collection of existing validated processes of the theories identified as influencing safety culture, these factors established themes in the questionnaire and included:

   i.   Continuous improvement and Motivation (Fuller & Vassie, 2004; O'toole, 2010);

   ii.   Corporation Values (Rutter, 2010; Roland & Orange, 2011);

   iii.   Management involvement and leadership style (Mengoli & Debarberis, 2008; Dumas, 2011);

   iv.   Workers involvement (Olusuyi, 2011; Kauffman, 2010);

   v.   Communication (Reason, 2007); and

   vi.   Usage of Accident Information (Rutter, 2010).

3.5.3 Research Instruments

To achieve the objectives of the study, data was collected using a questionnaire, note taking and direct observation of the study in all the three companies. These implementations was made by the researcher through the guidance of the supervisors. The questionnaire was five paged, which comprised participant's names, position they attain in the company, there current work, and closed ended statements about SHE management questions.

The factors were identified from the review of the literature in Chapter 2 to inform the questionnaire development. They were used as the most dominant themes and were adopted in this study after well-researched existing validation measures. It was prudent to make use of these factors in the questionnaire in this research. The statements most relevant to the factors which were identified as themes in this quantitative study were selected from each measure. This created a composite questionnaire with 76 questions in total and with seven opinionated statements. Statements relating to barriers to organisational safety culture were also included.

Table 3.1   Statements included in the Organisational Safety Culture Questionnaire

Themes	Statements
Continuous improvement and Motivation	• I am confident that maintenance on the system is adequately performed and that equipment/plant is safe to operate. • Training focuses more on minimum requirements for a check on testing the system than on safety. • Training practices are centered on safety. • Management views regulation violations very seriously, even when they don't result in any serious damage. • Management does all it can to prevent accidents or incidents. • When an accident occurs, management always blames the worker. • Workers are given sufficient opportunities to make suggestions regarding safety issues. • Workers get little recognition for new safety ideas. • Supervisors and Head of departments do not hesitate to contact workers to discuss safety issues. • Our distribution system in the organisation is kept in good condition and safe to operate. • Following safety procedures is always expected.
Corporation Values and Safety Culture	• Management closely monitors proficiency and standards to ensure workers are qualified to operate electrical equipment. • I attend SHE Circle (Tool Box) Meetings. • Safety is emphasized during the interview and orientation process. • Safety standards are seldom discussed openly. • Safety issues are assigned high priority in meetings. • Management stops unsafe operations or activities. • As long as there is no accident, management does not care how work is

	performed.
	• Safety is identified as a core value in my organisation.
	• Checklists and procedures are easy to understand.
	• My work manuals and procedures are up to date.
	• Management tries to get around safety requirements whenever they get a chance.
	• The SHE Management in this organisation are doing a good job.
Management involvement and leadership style	• Management and the workforce work together to tackle safety-related issues.
	• Management involvement in safety issues has a high priority.
	• Upper level management gets personally involved in safety activities.
	• Management is receptive to learning about safety concerns.
	• Management has a clear understanding of risks associated with operations.
	• Management shows favouritism to certain workers.
	• Management expects workers to work in poor conditions such as dust.
	• Management is willing to invest money and effort to improve SHE.
	• Management always listens to safety concerns that are raised.
	• Management has a clear understanding of risks associated with electricity/process operations.
	• Management often fails to recognize when workers are working unsafely.
	• When a worker reports a safety problem, management acts quickly to correct safety issues.
	• Management's view is that not all accidents are preventable.
	• Management views risk assessments as a waste of time.
	• Management is committed to equipping workers with up-to-date technology.
Workers Involvement in Organisational Safety Culture	• I receive adequate warning of changes to safety practices.
	• I know fully what is expected of me at work regarding safety.
	• I have authority to make decisions that improve the safety of my work.
	• Unsafe act can be easily reported by me without fear of negative comeback.
	• I regularly receive recognition for doing a safe job.
	• Staff suggestions are readily acted upon by management.
	• I receive the needed training and feedback about my performance.
	• Safety trainings received are effective.
	• I take responsibility for my safety and that of other workers around me.
	• Methods for safe working are set following consultation with the workforce.

	• Workers are involved in making safety-related decisions and participate in safety improvement initiatives
Communication	• The long-term safety strategy of the organisation is always clearly communicated.
	• There are well established means of communicating safety, health and environmental matters from workers to management.
	• There are frequent safety training/briefing sessions that are useful/relevant to me.
	• Discussions about safety at briefings/meetings I attend are open.
	• My organisation only keeps track of major safety problems and overlooks routine ones.
	• There are good communications systems about safety, health and the environment in the organisation.
	• Some safety procedures/rules are not really practical.
	• Visitors and contractors are fully inducted and are aware about safety procedures.
	• I attend at least one awareness training in a month on procedures.
Usage of Accident Information	• I am familiar with the system of formally reporting safety issues in my department.
	• Workers are willing to report information regarding safety violations, performance, and other unsafe behavior.
	• Workers who cause accidents or incidents are not consistently held accountable for their actions.
	• Standards are followed when reporting an accident or incident.
	• Being involved in an accident or incident, even if it was not your fault, has an adverse effect on your reputation with fellow workers.
	• Management often fails to recognize when workers are operating unsafely.
	• Management do not show much concern for safety until there is an accident or incident.
	• It is best to remain anonymous when reporting an unsafe condition or incident.
	• Workers can report safety discrepancies without the fear of negative repercussions.
	• There is no point in reporting a near miss.
	• Workers who admit errors make a big mistake.
	• I know how to report incidents and accidents.
	• Workers can report safety incidents without the fear of victimisation.

Barriers To Organisational Safety Culture	• There is a low level of trust between management and frontline staff. • Safety trainings are expensive and so shouldn't be done too often. • Some Health and Safety procedures do not need to be followed to get the job done safely. • I don not think my immediate boss does enough to ensure a safe working environment.

Advantages of Questionnaires

The Questionnaire was used because of the following advantages as cited in Choudhury et al (2007).

Economical

It is an economical way of accumulating information. It is economical both for the sender and for the respondent in time, effort and cost. The cost of conducting the study with the help of questionnaire method is very low. By using a questionnaire the researcher can only spend on paper printing and postage. There is no need to visit each and every respondent personally, hence it does not require high cost for conduct of the research (Ibid).

Wide Coverage

Questionnaires make it possible to make contact with many people who could not otherwise be reached. It can cover a large group at the same time. Kothari (2004) say that when the researcher has to cover the group of respondents who are widely scattered, they can use the questionnaire in order to minimize the cost (Ibid).

Rapidity

Replies may be received very quickly when using a questionnaire as a means of data collection method. In this case, there is no need to visit the respondent personally or continue the study over a long period. Therefore in comparison with other methods, the mailed questionnaire is the quickest method (Choudhry et al, 2007).

Suitable in Special Type of Response

The information about respondents and any secret matters can be best obtained through questionnaire methods. For example, information about sexual relationship,

marital relationship, secret desires etc. can .be easily obtained by 'keeping the names of the respondents anonymous (Ibid).

Repetitive Information

Compared to other methods like interviews or observations, using a questionnaire is regarded as more useful and cheap, where the repetitive information has to be collected at regular interval (Ibid).

An Easier Method

A questionnaire is comparatively an easier method to plan, construct and administer. It does not require much technical skill or knowledge (Ibid).

Anonymity

A questionnaire ensures anonymity to its respondents. The respondents have high confidence that they will not be identified by anybody for giving a particular view or opinion. They feel more comfortable and free to express their view in this method (Ibid).

Uniformity

It helps in focusing the respondent's attention on significant items. As it is administered, in a written form, its standardized instructions for recording responses ensure some uniformity. Questionnaire does not permit variations.

Greater Validity

Questionnaires have some unique merits as regards validity of information. In methods like interview and observation, the reliability of responses depends on the way the investigator has recorded them. In questionnaire method, the responses given by the subjects are available in their own language and version. Therefore, it cannot be wrongly interpreted by the researcher.

Disadvantages of Questionnaires

Macnealy (1991) indicated the following as some of the disadvantages of using a questionnaire for data collection, which the researcher need to be mindful:

i. Questionnaires are standardised so it is not possible to explain any points in the questions that participants might misinterpret.
ii. Open-ended questions can generate large amounts of data that can take a long time to process and analyse.
iii. Respondents may answer superficially especially if the questionnaire takes a long time to complete.
iv. Respondents may not be willing to answer the questions.

3.6   Methodology Reliability

Saunders *et al* (2009) defined reliability as "*the extent to which results are consistent over time; and an accurate representation of the total population under study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable*". Therefore, in ensuring the reliability of the data collected in this research, similar structured questionnaires were administered and sought respectively among managers, professionals, both skilled and unskilled workers from government owned company, privately owned company and contractors, who are all players in the electricity distribution industry of Zambia. This was done to ensure consistency in the data collected making the research reliable as it agrees with Saunders et al (2009) assertion that reliability is the consistency of the measurement, or the degree to which an instrument measures the same way each time it is used under the same condition with the same subjects.

3.7   Methodological Validity

Kothari (2004) defines validity as the "*best available approximation to the truth or falsity of a given inference, proposition or conclusion*." Validity indicates the extent to which the research measures what it purports to measure thus indicating how

sound the research is through the design and methods adopted (Carole & Winterstein, 2008). Two types of validity exist namely, internal and external. Internal validity refers to whether the study adequately describes the phenomenon it sets out to examine, in the ability to draw inferences from observations; while external validity refers to inference of the causal relationships of the research findings and the extent to which they can be generalized (Khorsan & Crawford, 2014). Hence, validity of the data collected is meant to minimize measurement error, bias, and enhance the thoroughness of the research findings and their interpretability.

This study was therefore externally valid because the findings could only be extended or applied to the electricity industry within which the study took place. Internal validity in this case was achieved since the research describes the singularity within which it was meant to assess. The measures within which the validity of this research include the use of appropriate methodology by taking into account the characteristic of the study and what other studies from the literature reviewed used. Additionally, the respondents were not pressured in any way to select specific choices among the answers given from the questionnaires. Validity of the research was achieved since the findings truly represent the phenomenon being claimed to be measured.

3.8   Study Variables

3.8.1 Independent Variables

In this study, the independent variables stated the necessary enabling environment within the Zambia's electricity industry that facilitated the management of SHE. The study investigated the variables of safety culture factors on SHE management, and sought to improve electricity safety in the Zambia electricity distribution industry.

3.8.2 Dependent Variables

The SHE management is considered an important milestone in understanding the relationship that exists between management and workers working within the electricity distribution industry. It is more important for both management and

workers to demonstrate organisational safety values and perceptions. The performance of safety is demonstrated in continuous improvement and motivation, organisational values, workers involvement, management involvement and leadership style, communication, and usage of accident information.

3.8.3 Pilot

The questionnaire was circulated to a cross section starting from management, then engineers and supervisors and frontline workers, artisans, technicians and general workers during the safety circle meetings. The researcher was present during the final phase to receive any verbal feedback and comments noted.

3.8.4 Item Scaling

A 5-point Likert scale was used with anchor points of 'Strongly Agree'; 'Agree'; 'Neither Agree nor Disagree'; 'Disagree'; 'Strongly Disagree'. The 5-points weighted from one, to five respectively. The use of the Likert scale has a strong potential to produce distributions that can be treated as interval data (Kothari, 2004). The 5-point and 7-point scales are the most commonly used in psychometric measures of safety culture and climate. Carole and Winterstein (2008) have demonstrated that empirically, 5-point and 7-point scales produce equivalent results; thus in keeping with other safety culture measures and for simplicity a 5-point scales was used.

3.9 Location of the Study

The study was conducted in three electricity distribution industries in Zambia, a government electrical distribution company, one private owned company and the contractors that render services to these power companies.

3.10 Target Population

The population is the whole set of people (or objects) devising some mutual characteristics as defined by the sampling criteria established for the study (Burns & Grove, 1998; Kothari, 2004). Further, Parahoo (1997) defines population as *"the total number of units from which data can be collected", such as individuals, artefacts, events or organisations. Burns and Grove (2003) define eligibility criteria*

as *"a list of characteristics that are required for the membership in the target population."*

The study targeted management, supervisors, Artisans/Technologists, and General workers/operators in the electricity distribution industries of Zambia including workers from the contractors hired to work for these operators. The target population was 200 respondents in total.

3.11   Sampling Techniques and Sample Size

A sample is a relatively small subset of a population that is intended to represent, or stand in for, the population in a research (Heiman, 2011). It defines the selected groups of elements, that is, individuals, groups and organisations. The sample is chosen from the study population that is commonly referred to as the *"target population or accessible population"* (Burns & Grove, 1998; Proctor, 2000).

3.11.1 Sampling Techniques

The sample selected was from a non-random cross section of operational staffs. In the questionnaire, six factors which are also global indicators of safety culture were used and modified to fit the electricity industry according to Gibbons et al (2006) as cited by Pyoos (2008). Purposive non-probability sample is also known as judgment or judgmental (Babbie, 1990; Jones H. L., 1955). It is referred to as purposeful by McNealy (1991). This sampling strategy is employed when there is a very large pool of potentially information-rich cases and no obvious reason to choose one case over another. Parahoo (1997) as cited in Annan (2014) describes purposive sampling as "a method of sampling where the researcher deliberately chooses who to include in the study based on their ability to provide necessary data". The rationale for choosing this approach was that it enables the use of judgement to select cases that can best answer the research question(s) and meet the research objectives.

Purposive sampling was used to select two electricity distribution companies and a contractor which had presented respondents for the questionnaire, from a government owned company, a private company and one contractor in Zambia for

the SHE management. From each company the researcher collected data from the management and workers who were purposively sampled and randomly picked workers in various working fields.

3.11.2 Sample Size

A sample size to be representative of the chosen population, should not be less than 5% of the population size (Judd, Smith, & Kiddler, 1991). However, since the research had a view of obtaining a larger sample representation percentage was adopted.

Questionnaires were distributed to the authorities which included safety managers of the companies to validate the content. Questionnaires distributed were in total of 200 and completed during one of the safety circle sessions and a total of 151 responses were received of which 12 were spoiled. The remaining 139 responses account for 69.5% response rate. A model with similar themes was adopted by Fuller and Vassie (2004) which was used and emanated from the questionnaire responses, in collecting and analysing of data. Table 3.1 indicates the demographic distribution and categories of the respondents.

Table 3.2   Demographic Distribution of Respondents

Categories of Respondents	Government Owned Company (G)	Privately Owned Company (P)	Contractors (C)
Management	10	4	2
Supervisors	15	9	4
Artisans/Technologists	31	8	8
General Workers/Operators	21	14	13
Totals	**77**	**35**	**27**

3.12   Data Collection Procedures

The collection of data took a duration of 20 working days. Information was given to the respondents about the purpose of the study, and questionnaires were distributed to the management and workers of the three electricity distribution companies. After that, the researcher went back to collect the answered questionnaires.

3.13 Data Organization

After all, the data gathered from the questionnaires was organised, the researcher went through each questionnaire checklists, scrutinizing each question and their responses one after the other from the respondents. This helped to eliminate the unusable data, interpretation of unclear answers and identification and correction of errors.

3.14 Ethical Considerations

The researcher was authorized by the University of Zambia with introduction to conduct the research. During this study, a relationship was first established between the researcher and the respondents which created a comfortable environment for them to openly and freely participate, and also sought consent from them to take notes during the response sessions. Respondents were assured that respect and confidentiality would be highly considered. This was done by clarify the use of data before the covering letter with the link to the survey could be sent out to offshore personnel by the onshore contact. A covering letter included the statements on the use of data assuring confidentiality and anonymity of the respondents.

3.15 Limitation

The limitation to the research was due to the adoption of a purposive sampling instead of any other sampling technique, there are certain biases which may or may not bias the result of the survey. However, purposive sampling was found to be most appropriate for this study nonetheless, future research might benefit from adopting a different sampling technique based on time and resources available to them. Hence, a random sampling technique to include other members of the workforce can be appropriate for future studies. Additionally, the outcome of the research were limited by time restrictions.

3.16 Chapter Summary

In this chapter the methodology adopted for this research has been discussed, this was accomplished by the appropriate research approach, design and target population, thereafter, the sample size, sampling process as well as its reasonable

justification which was important in ensuring representativeness of the research population. 56

Furthermore, the methods and instruments of data collection employed have been discussed thoroughly together with appropriate research methodological reliability and validity issues.

CHAPTER FOUR: FINDINGS AND DATA PRESENTATION

4.1   Introduction

The previous chapter discussed the following areas; research methodology adopted for this study to satisfy the research objectives as set out in chapter one, research approach, research design, research population, the sample and sampling process, and justification. This is important as it provides the basis on which the findings of the research could be generalized and authenticated. The findings assist the practitioners, management and workers to entrench a safety culture. This chapter presents findings of this research.

4.2   Background to the Findings

The information that was obtained from respondents during the field research is presented and analysed so as to draw conclusions and recommendations for the research. The presentation of findings was aimed at meeting the overall objectives of the study which is to assess the impact of organisational safety culture in the management of SHE in the electricity distribution industry and to answer the research questions.

Questionnaire response from participants in this research has been presented and analysed. The outcome of the results give conclusion and recommendations for the research. Findings led to the proposition that organisational safety cultural factors are pertinent within the context of SHE management in the electricity industry.

The total number of questionnaires distributed were 200 (100%) rate. Only 139 (69.5%), questionnaires was received of which 12 (6%) were spoiled, and the remaining 49 (24.5%) questionnaires were not received as indicated in Figure 4.1.
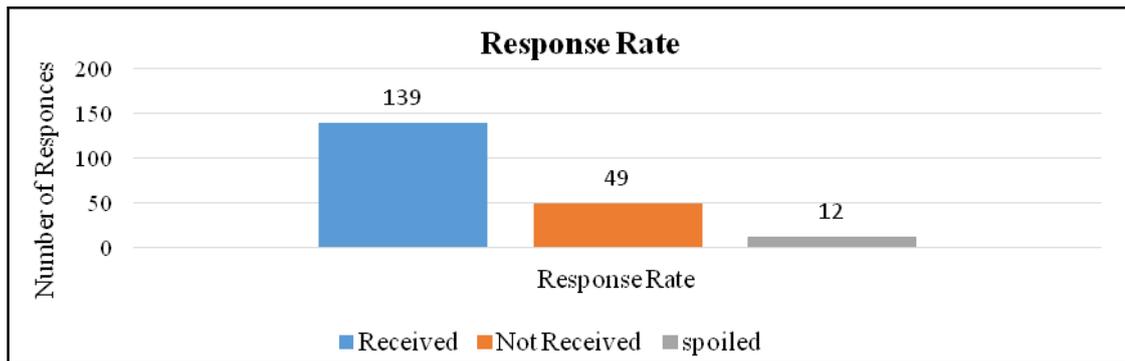
Figure 4.1   Respondent Rate of Questionnaires

4.3   Organisational Safety Culture Dimension Consistency

The questionnaires as part of the organisational safety culture indicators (for more information see Chapter 2) were used to suit the purpose of this study and some minor changes were made to the themes. Reliability coefficients of the questionnaire was carried out (Carole & Winterstein, 2008) in the current study compared with Fuller & Vassie (2004) safety questionnaire dimensions indicating the consistency. It was about measuring the consistency of the measure to understand if there were any errors. Comparisons using a split half reliability approach in SPSS statistical package. The observed or recorded percentage of agreements from the several tests conducted on the factors to organisational safety culture were used though the use of the Spearman-Brown method due to limited time to conduct other tests. And 90% of the reliability coefficients demonstrated consistent reliability across the safety climate dimensions.

4.4   Interpretation of Findings

The Table 4.1 shows the mean, standard deviations and significant differences between the three entities using the Likert analysis of principal questionnaire survey. The contractor had significantly lower factor compared to the other two players, with highest continuous improvement and motivation, usage of accident information/communication and usage being scored by the government owned company.

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Table 4.1   Means (M), Standard Deviations (SD), and Significant Differences among the three players in electricity distribution and Safety Culture of population (n)

	Govt. Owned Company			Privately Owned Company			Contractors		
Factor	n	M	SD	n	M	SD	n	M	SD
Corporation Value	77	5.789 C	1.039	35	5.668	1.092	27	5.308 G	1.173
Management and Leadership Style	77	5.449 C, P	1.301	35	5.388 G, C	1.046	27	4.989 G,P	1.473
Continuous Improvement and Motivation	77	5.266 C	1.306	35	4.921 G	1.547	27	4.820 G	1.305
Workers Involvement	77	5.359 C, P	1.204	35	4.953	0.919	27	5.244	1.137
Communication	77	5.955 C	1.087	35	5.766	0.960	27	5.539 G	1.041
Usage of Accident Information	77	5.703 C	0.758	35	5.409 G	0.808	27	5.205 G	0.781

Note: Common subscripts in each row indicate significant differences between means, p <0.05. For example, the mean shown for Contractors(C) is 5.308 for corporation values. This mean differed significantly from Government owned company (G) and privately owned company (P).

Table 4.1 indicates that the degree of importance to respondent's organisations with six different indicators in terms of the mean score of 5.000. It is notable that the mean scores of continuous improvement by contractors and the privately owned company; and workers involvement in the private sector are below the midpoint score of 5.000. This indicates that these respondents do not perceive these factors as important as the Government owned company do.

Corporation Values

Corporation values were perceived to be positively related to organisational safety culture based on the mean ranging from > 5.308 > 5.789. The preliminary analysis showed that there is a linear link as the results are normally distributed at 45% variation. However, respondents perceive corporation values highly in the SHE

management of an electrical distribution organisation and is important to highly important.

Continuous Improvement and Motivation

Given that the mean for continuous improvement and workers involvement is >4.921 > 4.820, the respondents can be deemed to perceive them to be between not important to less important. Therefore, it can be asserted that this connotation of organisational safety culture is applied in the electricity industry. However, the results from both the respondents from management of the privately owned electricity company and the contractors indicated that there was no affirmative connection that existed in organisational safety culture with indicative factors of continuous improvement and workers involvement. This deduction was derived from the notion that if safety is a highly shared value in the organisations then the safety culture approach would have had a strong positive relationship with the values of the organisation.

Workers Involvement

In relation to workers involvement, the government owned company showed a higher mean of 5.359 than that of contractors (5.244) and private owned company whose mean score was 4.953. A Pearson product-moment correlation was run to assess the relationship between worker engagement and safety climate. Preliminary analysis showed the relationship to be linear and normally distributed, as assessed by Jones (2014) whose mean was ($p > 5.000$), and there were no outliers. There was a strong positive correlation between worker's involvement and organisational safety culture in the government owned company and the contractors.

Management Involvement and Leadership Style

Furthermore, it was noted that management and leadership style for the contractor's organisational safety culture had a mean of 4.989 which was ranked last. This indicates that the current management style and leadership is not seen as a motivation for better SHE Management. The results of the mean score of > 5.00 indicates that the government owned company embraces all the factors, perceives

them to be important in the management of SHE and embraces the organisational safety culture as important to very important compared to the privately owned company and the contractors.

Usage of Accident Information

Usage of accident information had a higher mean in all the three entities with the government owned company showing a mean of 5.703 than that of contractors and privately owned company mean scores. This preliminary analysis showed the relationship to be linear, indicating that there were no outliers in the relationship between accident information usage and the dependent variable of safety culture in the organisation according to Clark (2006). Hence, a strong (High) positive correlation between the two variables exists, usage of accident information and safety culture since the mean value was above the average score of 5.000. Nonetheless, both means for the contractors (5.205) and the privately owned company (5.409) were above the average score but indicated moderate results. This implies that all the respondents from the three categories of companies perceive usage of accident information moderately to highly important

Communication

A Pearson product moment correlation was conducted to assess the relationship between communication and organisational safety culture and was found to be positively correlated. Preliminary analysis showed the relationship is a linear one with normally distributed as assessed by Tam and Feng (2011) which is > 5.000. A mean of 5.539 for contractors as a minimum mean and a maximum mean of 5.955 for the government owned company. This indicates that there is a strong positive relationship between upward communication and organisational safety culture explaining 59% of the variation in safety culture.

4.5   Correlation Results

According to Pyoos (2008) correlations using Pearson Correlations between various factors are performed on the reviewed factors to test the validity of the data and explore the relationships. In order to evaluate if the factors used in the research were

affirmative to the objective of the study, the relationship had to be explored between the safety culture and the six organisational safety cultural factors identified in Chapter 3. Table 4.2 gives the correlation of the results, while Figure 4.2 indicates a scatter plot of organisational safety culture against the means of all the other factors. The minimum correlations between factors used according to Weigmann *et al* (2004) and Pyoos (2008) is (correlation > 0.3). Furthermore, to evaluate the relationship of organisational safety culture with regards to the six safety factors, a Pearson's correlation was used to find the relationship that exists between these factors. The study adopted practical significant relationships (correlation > 0.3) that were found between Management involvement in safety systems and organisational safety values whose relation was found to be (correlation = 0.61). This indicates that the relationship is high. Additionally, the correlation of communication in the three entities was found to be very high (correlation = 0.79). There was a statistically high relationship between upward communication and organisational safety culture in the electricity industry.

More significant correlations > 0.30 are found between the following factors: continuous improvement and motivation (0.39), workers involvement (0.52), and Management and leadership style (0.61). The strongest correlations was found to be for usage of accident information (0.70) and Communication (0.79). It is important to note that even for very weak correlations, all the correlation figures are positive and thus related to organisational safety culture in the management of SHE (see Table 4.2).

Table 4.2   Correlation Figures of Safety Factors

	Continuous improvement and motivation	Corporation values	Workers involvement	Management and Leadership Style	Usage of accident information	Communication
Safety Values	0.39	0.45	0.52	0.61	0.70	0.79

Therefore, in organisational safety culture, values are a profoundly embedded characteristic in an organisation's behaviour, and a worker can either be rewarded or

punished based on the actions taken in enhancing safety. Regarding safety systems and guidelines, respondents felt that there safety culture was dependent upon management commitment on safety, worker empowerment and incident documentation practices. Management involvement is dependent on these factors and the reporting structure adopted in the organisation since a preventive action is dependent on them.

The relationship was also tested using a scatter diagram with a central line in which safety culture against the average of all other factors used in the study and then used as a dependent variable as can be seen in Figure 4.2. The results indicate relationship around a central line demonstrating that all factors used in the research are interdependent of safety culture.

Safety Culture vs Average of all other Factors

$y = 0.0811x + 0.2927$
$R^2 = 0.9939$

Data points: 0.39, 0.45, 0.52, 0.61, 0.7, 0.79

Y-axis: Correlations to Safety Culture
X-axis: Average Reasults of the Six fators
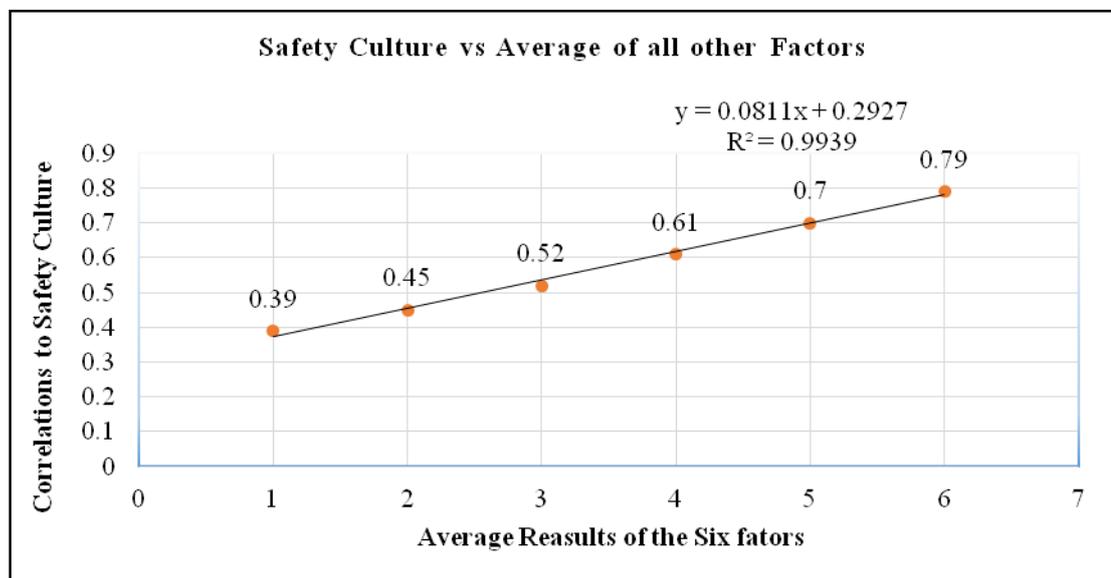
Figure 4.2   Scatter plot of Safety Culture against Average of all other Factors

By comparing the relationship between safety values and the average of the other six factors using a scatter diagram, there is a moderate to high relationship as it is positive a linear with the strongest being communication. This implies that all the six factors are very important and are related with one another to entrench a positive safety culture during the SHE implementation. In the electricity industry, it is important to consider these as some of the factors that can used to drive a culture of safety in the industry.

4.6   Management Involvement in Enforcing Organisational Safety Culture

The research also explored the importance of management involvement against and overall positive culture. This was in line with the third objective of the research which tries to determine the role of management in enforcing organisational safety culture in the electricity industry. Being one of the themes of the questionnaire, management involvement and leadership style factor had questions that were used to probe the respondents on the role management play in SHE management. To evaluate this a statistical correlation between management involvement and the remaining five factors needed to be explored. A correlation matrix was drawn between management involvement and the rest of the factors used in the study. The reason for using this relationship was because the role of management in organisational safety culture is very important and cross-cuts all the other factors in managing SHE.

Table 4.3   Correlation of Figures for Management Involvement

	Communication	Corporation Values	Continuous improvement & Motivation	Workers Involvement	Usage of Accident Information
Management Involvement	0.44	0.57	0.68	0.57	0.73

From the Table 4.3 it can be deduced that there lies a significant positive linear relationship between management involvement and the rest of the factors. The relationship between management involvement and communication was found to be the least at 0.44 and this could be attributed to the fact that management and the process of communication was not substantial enough, low to moderate, to affect organisational safety culture positively, at the time of the study.
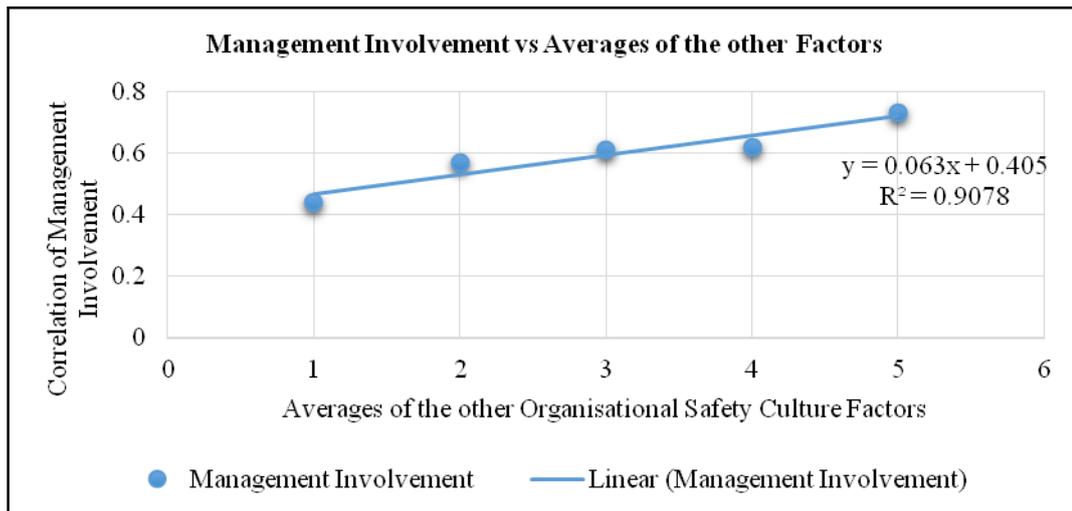
Figure 4.3   Management Involvement vs Averages of the Other Factors

The results in Figure 4.3 indicates that the   relationship between Management involvement and the averages of the rest of the factors used in the study is a positively linear related with the R- Squared of almost 0.9078 which is almost one as indicated from the scatter diagram. There are no extreme outliers in the data set used to determine this relationship. The lowest correlation was found to be communication (0.44) while the highest correlation was found to be usage of accident information giving a result of 0.73. However since all the figures are positive, even if they are those lower than the others, it signifies a linear dependency of management involvement on other factors. In the electricity industry, it is important to consider that the role that management plays in driving an organisational safety culture in SHE management of the electricity distribution industry.

4.7   Barriers to Organisational Safety Culture

The results in Figure 4.4 shows identified barriers to organisational safety culture by respondents. Over 76% of respondents indicated that management did not do enough to ensure a safe working atmosphere. While 50% disagreed that there is low level of trust amongst management and workers. Additionally, 91% disagreed that safety trainings are too expensive and most organisations could only manage to train a few. Finally, 77% disagreed that some SHE procedures do not need to be followed in order to get job done safely but the level of competency and experience would. This

clearly indicates that the most prevalent of these barriers is low level of trust between management and workers that creates a gap and the least likely barrier is the cost of training.
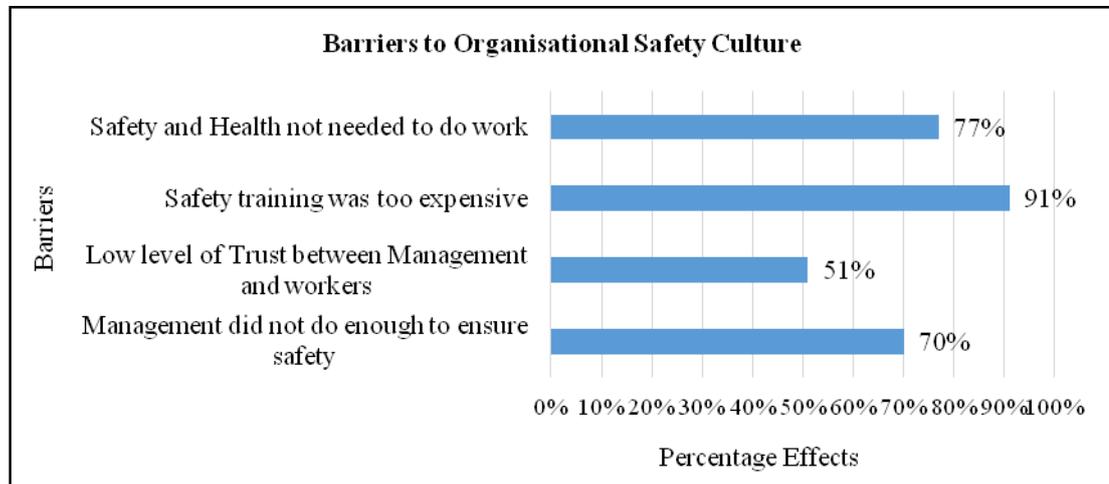
Figure 4.4   Barriers to Organisational Safety Culture

Furthermore opinionated barriers to organisational safety culture beside the ones already stated were staffing levels, fear of negative feedback, inadequate training, deadlines, weak safety culture, gratification based on work experience and age, lack of up-to-date information, failure to recognize workers, lack of interest and ignorance on SHE related issues.

4.8   Conclusion of the Findings

This chapter has presented the findings from the participants on the impact of organisational safety culture on SHE Management in Zambia' Electricity Distribution Industry. The findings are based on management and workers from the three selected companies. The next chapter discusses the findings in detail.

CHAPTER FIVE: DISCUSSION OF RESULTS

5.1   Introduction

The research was aimed at establishing the impact of organisational safety culture in the management of SHE in the electricity distribution industry. This section discusses the relevance of the findings of the research to the objectives of the study and provides answers to the research questions after analyzing the results in Chapter 4. This will be achieved through triangulation by linking the various evidences from the secondary research presented in Chapter 2 to the evidences gathered from the primary research and the research questions.

5.2   Safety Factors Influencing a Positive Organisational Safety Culture

In answering the first research question and in relation to the results, the discussion indicates the essence of the safety factors that were used in the study in managing SHE in the electricity distribution industry. The safety indicators that were highlighted from the literature review and used in the study include corporation values, continuous improvement and motivation, workers involvement, management involvement and leadership style, communication and usage of accident information. The analysis for the individual factors revealed that the six factors used in this study had mean differences. All six factors yielded strong management perception of organisational safety culture through integrating them in the values. From the results the following can be deduced:

Corporation Values

To what extent can an organisation go to enhance organisational safety culture as part of the core values, is an important consideration. As postulated by Fuller and Vassie (2004), organizational participation measures the extent to which organisational safety culture can be achieved and encourages middle and senior managers get personally involved with issues pertaining to safety. However, according to the results, respondents perceive corporation values highly in the SHE management of an electrical distribution organisation and is important to highly

important. Managers felt that they are consistently busy driving their involvement in safety related issues through their involvement in group risk assessments and safety meetings. Nonetheless, measures of engrossment is based on how often they see them on the shop floor, engaging workers' concerns and how often they engage safety issues in the organisational core values. Findings of the research gave the understanding that there is a noteworthy linear relationship between the organisational safety culture and the values of the organisation. It has nevertheless, revealed that not all the factors that institute organisational safety culture are well established by a reinforcement of shared safety values.

Continuous Improvement and Motivation

In the case of awareness of workers in the contracted firms who are not permanent employed compared to those in the electricity companies, safety culture is dependent on the host organisations streamlining the difference between the workers of the contractors and those in the electricity firms that are permanent. However, the results from both privately owned company and the contractors indicated that there was no affirmative connection that existed in organisational safety culture with indicative factors of continuous improvement and workers involvement. If contractors are not considered as part of the organisational team, safety culture alignment can be futile. Contractors who are not permanent workers of the host organisation perceive a greater level of enablement than what the permanent members of the organisation do according to the Safety and Health Executives (2011) and McCarthy *et al* (2010). This is because of the short time score that the contractor workers spent in the organisational culture, it does not allow them to build interactions and create stability inside themselves. Continuous improvement is therefore highly related to organisational safety culture. Improvement can only be achieved once workers in the organisation are motivated to work towards cultivating set safety standards, improving on the procedures and processes of carrying out work, and also awareness on improvements and lessons learnt from the audits and evaluations.

Workers Involvement

In establishing the significance of workers involvement in influencing a positive organisational safety culture in the Zambia's electricity distribution industry, it was relevant to explore the various perceptions about worker involvement in SHE management. This raised a question on what organisational safety culture implies to people in the industry in terms of the extent, advantages and disadvantages. As a brief reminder, the literature review highlighted various rationales for organisational safety culture (Mengoli & Debarberis, 2008; Baarts, 2009; Clarke, 2006). Worth mentioning is Guldenmund (2007) observation about the significance of involving workers in SHE management. He referred to the involvement of the workforce as an important means of developing and maintaining an attitude to safety that is beneficial to the prevention of accidents and incidents which may have detrimental consequences. This study indicated that it is important to involve workers to succeed in the implementation and management of SHE.

Management Involvement and Leadership Style

In responding to the perception that managers have on safety culture compared to that of workers, the results indicated that there is a difference of perception about these factors. Clark (2006) postulated that there is a substantial dissimilarity in the views of the safety culture between managers and workers in a vehicle industrial plant. This study showed that there is a substantial difference in perception on safety culture between managers and workers. Managers seemed to have a higher perception of safety culture compared to the workers. The involvement of senior managers and middle managers was found to be personal when it comes to safety in the management of SHE. The research indicated that management and their leadership style involve themselves in safety meetings, risk assessments and green area meetings.

However, workers only involve themselves in safety measures according to the number of times they see the managers in their work areas engaging them on safety and showing concern for safety. These involvement and engagements with workers leave more positive impact on the average worker than does written instructions and procedures from the management. On the issue of the role management plays with

regards to safety, it was found that there exists an exponential relationship between the safety culture factors and the level of management involvement. Hence leadership and culture are issues that are intertwined in organisational safety culture and in the management of SHE.

Communication

Communication based on mutual trust was identified as a major feature of an organisation with a positive safety culture (HSE, 2011). Likewise, Clarke (2006) identified downward and upward communication as the two main approaches to worker involvement. More than 90% of respondents agreed that there exists well established means of upward communication programs from workers to management and vice versa. More so, the data also revealed the various methods of downward communication from management to workers. Some of the methods of communication opinionated from the survey was formal trainings, SHE Circle (Tool Box) meetings, green area meetings, demonstration posters on safety, teleconferencing, brochures as well as video presentations.

The existence of upward communication is commendable because there is involvement of workers which creates immediate feedback and allows for a higher cascade of information to and from management (Marchington & Wilkinson, 2009). The existence of communication in the electricity distribution industry without further probe allows for effectiveness and influences organisational safety culture (Safety and Health Executives, 2011). The importance of communication lies in its ability to develop mutual trust (Thomas et al, 2009) which has been highlighted as still missing according to the findings of the research. Communication from management to workers is relevant and can be seen as a form of entrenching organisational safety culture in the electricity industry. However, communication means from workers to management is more important as this displays the willingness to get input, contribution, updates, solutions and perspective over safety related issued for decision making and planning and reduces mere propaganda or mere discussion.

Usage of Accident Information

The research also established that contractors had difficulty to report incidences to the host company in most cases due to fear that they are not fully aware of the existing structures of reporting or that they did not want to be perceived as jeopardies. Additionally, the expectation is that contractors have a weaker perception of safety culture than what permanent workers perceive. This is in relation to what Fuller and Vassie (2004) found that the alignment of cultures of partnering organisations bring about harmony where workers feel respected, are optimistic and give their best. If contractors are not considered as part of the team, and no incentives are provided for contractors to give of their best, such cultural alignment may be difficult, if not impossible. Clarke (2006) also asserts that contractors face a conflict of demands, with requirements for loyalty from both the host organisation and employers. Hence, this brings about fear to report any accidents and near misses.

5.3   Perceptions on Organisational Safety Culture

The study sought to explore the perception about organisational safety culture in relation to managers compared to workers. According Pyoos (2008) there is a significant difference in the way perceptions of organisational safety culture are eluded between workers and management. In answering the research question on perception, therefore it can be indicated that there was a statistically noteworthy difference in the means of the scores for management and workers. The scores also indicated that the mean for management was significantly higher than that of workers, implying that managers have a significantly stronger perception of the safety culture than what workers do. To further discuss the aspect of perception on organisational safety culture, consideration of management involvement verses worker's participation as part of the research objectives and the inference of organisational safety culture on SHE was discussed in details.

5.3.1   Role of Management Involvement vs. Workers' Participation

From the results derived in Chapter 4, and in answering the second research question of the study, it can be deduced that there was a difference in the way in which safety

culture was perceived by Managers and Workers from the contractors to the government owned companies. This can be compared to the results by Pyoos ((2008) who indicated in his study posited there are significant differences in the perceptions of safety between managers and workers regardless of the industry. The scores also indicated that the mean score for management was significantly higher than that of workers, implying that managers have a significantly stronger perception of the safety culture than what workers do.

When management is involved in issues related to safety, there is safety commitment, enhanced safety systems, values and proper lines of communication. Additionally, the results indicated that workers were inclined to do more work and are motivated once there is reward and compensation when safety is applied. Management involvement measures the degree to which middle and senior managers get individually involved with issues relating to safety. Managers felt that they were consistently busy driving their involvement with safety through their involvement in safety programs, group risk assessments and safety meetings. Workers however measure the involvement of managers based on how often they see them on the shop floor, engaging workers' concerns regarding safety and showing concern for the safety of the individual. These tangible engagements leave more of an impression on the average worker than a written instruction from the office of the manager.

Additionally, correlations were drawn between the results obtained for Management Involvement and all other factors. The results revealed a strong, positive linear relationship between the level of Management Involvement and other factors of the safety culture. The communication factor showed the lowest correlation figure to management involvement, yet positive and not significantly low. The reason for the low correlation can probably be ascribed to the fact that the communication construct did not contain many references to management involvement at the time of the research. It would therefore stand to imply that there would be low levels of correlation between management involvement and communication to workers on aspects to do with safety.

Nonetheless, corporation values and continuous improvement allows for commitment in the context of SHE and denotes the extent to which top management identifies safety as a core value of the organisation and demonstrate a lasting, positive attitude toward safety, and to actively promote safety in a consistent manner across all levels within the organisation (Dejoy, 2005). The strong correlation between Management Involvement and Organisational communication can therefore be argued to be inseparable, since the extent to which the organisation is committed to safety is directly linked to the extent to which management drive and promote safety through communication to the workers.

5.3.2 Inference of Organisational Safety in SHE Management

According to the findings of the data collected, responsibility was one of the factors that was opinionated by the establishment of an organisational safety culture in an electricity distribution industry. In relation to Wiegmann et al (2004), issues of obligation in an organisation are very important to indicate the presence of safety culture and how they are regularly applied. About 55% of the respondents felt that shared safety values have minimal impact in ensuring that the organisations implement and communicate consistently what is documented. Nonetheless, this implies that the system is indeed efficaciously communicated and the indulgent is the same across the organisations visited.

This study provided a basis for arguing that within the electricity industry, both permanent workers in the government and privately owned companies, and contractors have the same perceptions of safety culture. Such alignment makes it easier to manage the safety aspect of the electricity industry, by providing effective management leadership style that will enable continuous safety improvement.

Nienaber and Roodt (2008) found that management and leadership issues are associated with the role played by managers. And therefore this study indicates that management has a big role to play in entrenching safety values, and safety systems in the organisation. Additionally, the findings are therefore consistent with the results from Weigmann (2004) and Pyoos (2008) which are independent researches to determine the perspective of management compared to workers within the context

of organisational safety culture. This can be seen in the lack of significant difference in the reporting practices that measures the extent with which workers report near misses and accidents they are involved in. Therefore, there is a positive impact of organisational safety culture in the management of SHE in the electricity distribution industry.

5.4   Barriers to Organisational Safety Culture

Another research question from the research objectives was to highlight the various barriers to organisational safety culture in the management of SHE in the electricity distribution industry. Questions cited around the commonly cited barriers were asked and respondents agreed of the existence of the barriers within the industry. The results presented in Figure 4.4 indicate that over 77% of the respondents felt that safety and health was really not needed to do work. While 91% of the believed that safety training was too expensive and only 51% attributed barriers to be inclined to low levels of trust between management and workers. And lastly, 70% indicated that management did not do enough to ensure safety. The reason to feel that management did not do much is because their attitude towards safety was repeatedly cited within the literature as a barrier to improvement safety culture. And if the supervisors and management did not do much, it would be difficult to attain safety culture that is much needed to reduce accidents in the electricity distribution industry.

Likewise, when respondents were further asked to comment on other barriers to worker's involvement, majority of the respondents identified lack of training and management as major barriers in SHE management, the reason behind could be attributed to negative management response to safety related issues to lack of management commitment and to poor management of change and supervisors lack of commitment. While the evidence from the survey indicates that low level of trust was not so much of a major barrier to organisational safety, the survey results mainly highlighted the issue of safety training as a barrier and the consensus is whether workers actually need training.

5.5   Summary of the Chapter

This chapter presented the discussion of findings of the study in tandem with the objectives. The findings revealed that workers and management in all the three sectors of the electricity distribution industry were doing their best in the SHE management. Field workers on site from the contractors, government owned institution, and privately owned company have set up procedures that implement SHE Management. The respondents indicated that the industry was responding to an increased number of injuries and death rates with less integrated guidance on how they can be reduced. It was highlighted from the results that the government owned and privately owned institutions were trying to make strides in formulating policies that could enhance a safety driven culture in SHE management.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1   Introduction

From the research findings, the researcher, directed by the objectives of the study, concludes and recommends the following for the purposes of the improvement in the electrical distribution operation companies.

6.2   Evaluation of Research Conclusion

The overarching aim of the research was to determine whether organizational safety culture has any influence on the management of SHE in the electricity distribution industry. The research objectives were provided in Chapter one which indicated that the literature would be reviewed, followed by data collection, analysis findings and discussions. The research synopsis was repeated in this section.

Chapter Two discussed a number of factors to safety culture in SHE management the electricity and other industries. It highlighted the meaning of safety culture and organisational culture, the various indicators to safety and how they can be related to the electricity industry. The chapter also reviewed organisational safety culture in Zambia's electricity industry. Several barriers were identified from various literature reviewed within the industry outside the country. Eventual summing up of the chapter indicated the gaps in the factors and barriers to organisational safety culture from the literature reviewed.

In Chapter Three, the research design was outlined in which the method and procedures for administering the questionnaires, data collection and analysis was also discussed including statistical methods namely descriptive statistics.

Chapter Four provided the results of the empirical data analysis for the study while Chapter Five discussed he results of the research.

6.3   Evaluation of Research Objectives

RO1   To delineate safety factors that influence a positive organisational safety culture.

Study findings have established that there are factors that can be used in the inculcating safety culture during the management of SHE in the electricity industry. The identified factors showed clear linkages of organisational safety culture based on the research questions. The factors delineated from the study that can be used in effecting a positive organisational safety culture and they include:

- Continuous improvement and motivation;
- Corporation values, workers' involvement;
- Management involvement and leadership style;
- Communication; and
- Usage of accident information.

These factors can be used as tools to implementing SHE and manage it in the electricity distribution organisation and hereby create a safety culture in the industry

RO2   To examine the perception of organisational safety culture on overall safety performance by various groups within the sample.

The various perceptions about organisational safety culture in the management of SHE in the Zambia's electricity industry was also explained and concluded that an organisational safety cultural based approach would identify the underlying perceptions and attitudes, allowing management the opportunity to address incidences thereby getting to the root causes. While culture is considered to be a very self-motivated notion, it is perceived to be different from one organisation to the other depending on each organisational values. Implementing safety culture in the organisation can be asserted as a means of reducing accidents and incidences and helps management implement SHE systems in high hazardous environments of the electricity distribution industry. An organisational safety culture aligned approach

identifies fundamental perceptions and outlooks, allowing management to take discourse problems and coming up with preventive and corrective measures.

As a lead indicator, organisational safety culture can give suggestions of potential threats to safety performance by highlighting changing trends. In the context of the research conducted, an example would be if a sudden significant difference in safety perceptions from contractors is identified it could alert management to possible negative safety perceptions and attitudes that can be targeted for specific attention and corrective action. Respondents viewed safety culture analysis to have potential in identifying underlying perceptions and attitudes regarding safety that cannot be observed through traditional methods of task observations and the more recent behavioral based safety systems. A culture based approach would identify the underlying perceptions and attitudes, allowing management the opportunity to address the root cause of safety problems.

RO3 To determine the role of management in enforcing organisational safety culture.

The research showed that there is a relationship between management involvement and organisational safety culture in the management of SHE in the electricity distribution industry. The safety factors used in the study and based on the literature reviewed are applicable in driving a positive impact in the management of SHE. The research unlocked prospects for management and managers in charge of safety such as Safety Managers, to harness additional tools in SHE Management in order to reduce incidences in the electricity distribution industry. This is because safety culture focuses on the receptiveness and attitude to the work environment, organisational systems and social structures.

The study established that top management involvement measures the magnitude to which other managers in an organisation get universally convoluted with matters relevant to safety, health, and environment. The research revealed a strong, positive linear relationship between the level of management involvement and other factors of the safety culture. This designates that the role that management play in enforcing

organisational safety culture is vital in rooting a safety culture in organisations with potential for catastrophic hazards.

RO4 To establish the barriers impeding organisational safety in Zambia's electricity distribution industry.

The research also designated the barriers to organisational safety culture in the industry centered on the research questions. The study indicated that some of the major barriers to organisational safety culture include management failure to put in more effort to ensure safety, there was low level of trust between management and workers, safety training was perceived to be too expensive considering the number of workers working in the organisations in questions, and last but not the least, most workers and management felt that they do not need SHE processes in their daily work related activities.

6.4   Contribution to the Body of Knowledge

Several studies have been undertaken to address the impact of organisational safety in SHE management. Nonetheless, a large number of these studies are focused on the developed countries and developing countries in different industries such as constructions and mining. In these studies, various safety factors and indicators have been developed, adopted and used. This study assessed the impact of organisational safety in SHE management in the electricity distribution industry with a specific focus on Zambia. It was established that certain safety factors can be used to promote organisational safety culture in order to reduce accidents in the electricity industry and manage the SHE related issues. While some key personnel from other organisations that did not take part were not included, the inference drawn from this study can be applied to other organisations as best practices.

This study therefore contributes to the growing body of knowledge established through the empirical research by addressing the following:

- Organisational Safety Culture as a major indicator in SHE management of the electricity distribution industry is not comprehensively documented as a

result most of the official data are not as precise as what is currently happening. The under reporting explains the difficulties of analysis of organisational safety culture in Zambia's electricity industry. Through the empirical studies undertaken in this research, it provided information on the impact of organisational safety culture in the industry. It has also provided information on the perception of safety culture and the barriers that deters the management of SHE in Zambia's electricity industry.

- The study also established factors that can be used as indicators to organisational safety culture which encourages development and strengthening of management roles and engagement in safety related issues and embrace the involvement of workers in SHE management. The factors recognizes the role of management and the importance of adopting a safety culture as part of the organisational values in managing SHE.

- The study established perceptions and barriers that interfere with the implementation of an organisational safety culture in the electricity industry when managing SHE. With an array of perceptions and barriers known, it is easy for organisations to implement strategies that can alleviate the impact of the negative perception and barriers to safety culture. This is one of the notable contributions of the study in that it is the first of its kind known at the time of the research to crack the barriers to organisational safety.

6.5   Research Conclusion

The study has provided useful information involving safety culture and SHE management in the electricity distribution industry in Zambia. Having developed a literature base from similar works done in the same and other industries other than the electricity, a measurement tool which are factors of safety were developed for organisational safety culture. A questionnaire survey was further conducted and the statistical analysis performed to arrive at the useful information for both the study and the industry.

Key safety indicators and their impact on safety culture in the electricity industry, were identified. Therefore it is imperative that organisations in the industry advocate for change by driving safety cultural factors in managing SHE. One of the factors adopted and used in this research, which is management involvement was found to be a bench mark for safety culture in organisations, making inference on the strength of the connection among the factors. These factors were perceived to allow for faster reaction by management to change the trends and open for re-audits in order to create a safety culture, include corporation values, continuous improvement, worker's involvement, management involvement and leadership style, communication, and usage of accident information. The findings also highlighted ways in which safety culture in an electricity organisation can be enhanced of which worthy of emphasis are workers taking more responsibility and ownership, management and workers participation, encouragement, communication and honesty in reporting accidents.

The study has made a significant contribution to SHE management to knowledge on the existence of barriers to organisational safety culture with respect to the industry. The barriers highlighted by the research are management failure to put in more effort to ensure safety, low level of trust between management and workers, safety training perceived as expensive considering the number of workers working in the organisations in questions, and last but not the least, most workers and management felt that they do not need SHE processes in their daily work related activities. Some other less prevalent ones are lack of up to date information, complacency based on the perception of age and experience and lack of recognition.

Conclusively the achievement of best practice of organisational safety culture would go a long way in influencing how SHE aspects are managed in the electricity industry. Not only has safety culture moved a step further as a model towards world class safety, nonetheless the study has also identified the characteristics of a good safety culture and has indicated the barriers to Safety culture. Hence, if these barriers are overcome, a positive organisational safety culture can truly be realized.

To this end, the findings from both the secondary and primary research undertaken have shown a thorough exploration of the research subject and reasonable

conclusions have been made. It is the belief of the researcher that the evidences revealed in this work has shown not only how safety culture influences SHE management but also the impact of management involvement in encouraging safety culture in the electricity industry. Therefore, to a great extent the overall aim of the research which was to establish the significance of organisational safety culture in SHE management was achieved.

6.6   Recommendations

Safety culture does not address the inherent hazards associated with the electricity industry, but rather focuses on the human response and attitudes to the work environment, its systems and social structures. Based on the findings of this study, the following are recommended in line with the findings of the primary research, literature reviewed, the conclusions and issues highlighted.

i.   Management involvement and encouragement was identified as an important factor in relation to safety culture when organisations in the electricity are managing SHE. Consequently, management needs to show active involvement and not just mere consultation with the workers. There is need to walk the talk by practicing what is preached as management in order to reduce the gap between management and workers. Proactive and visible management participation in turn increases the level of trust and confidence in the genuineness of implementing efforts in enhancing organisational safety culture.

ii. There is also the need for a more practical approach to the way safety trainings are conducted. A more practical approach towards safety training is crucial based on the electricity environment thus limiting it to theory as against learning with real on the job situations. In addition, this approach towards safety eliminates the barriers to organisational safety culture increases trust between management and workers and creates a positive perception to safety. It allows the free flow of information to the workers and from workers to management thereby enhancing communication and ability to identify hazards.

iii. The consistency with which previous research as well as this research finds a significant difference in managers' and workers' perceptions of organisational safety culture creates an opportunity for alignment between managers and employees. Such alignment requires concerted efforts by management to ensure gaps in perception of safety culture in issues of safety are redressed.

iv. Organisational safety culture bring about values that indicate clearly strong relationships with other factors of safety culture. Safety values are not the espoused values that management develop for the organisation, but are the underlying beliefs that the organisation have regarding safety within the organisation. Over time, the espoused safety factors can become reflected in the safety culture within which underlying set of perceptions are consistently lived, communicated and demonstrated. Managers need to understand the gap between what the actual shared values are and the espoused safety culture. This would assist managers to steer the organisation towards an improved organisational safety culture.

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APPENDICES

APPENDIX I: LETTER SEEKING AUTHORITY TO CONDUCT THE RESEARCH

The University of Zambia

Directorate of Post Graduate Research Department

P.O. Box 32379

LUSAKA

………………………………………………

………………………………………………

To: The Managing Director

……………………………………………… Company

RE: RESEARCH STUDY FOR MASTERS' STUDENT: MWEWA MAMBWE

The bearer of this letter, **Mwewa Mambwe** computer number **2016145279** is a duly registered student at the University of Zambia, School of Engineering.

She is pursuing a Masters of Engineering in Project Management Engineering. The programme has a fieldwork component which she has to complete. She is therefore seeking your authority to allow her carry out an educational research in your organisation on the The Impact of Organisational Safety Culture on the Management of Safety Health and Environment (SHE) in the Electricity Distribution Industry of Zambia

Yours faithfully,

HEAD OF DEPARTMENT

THE UNIVERSITY OF ZAMBIA

SCHOOL OF ENGINEERING

DEPARTMENT OF CIVIL AND ENVIRONMENT ENGINEERING

Research Topic:

The Impact of Organisational Safety Culture on the Management of Safety Health and Environment (SHE) in the Electricity Distribution Industry of Zambia

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The information in this questionnaire shall be used solely for academic purposes and will be treated in strict confidence. All responses are anonymous and no individual will be identified in any report or feedback to the company

Please answer all questions. Choose only appropriate answer(s) by ticking or explaining where necessary.

In order to participate you will need to give your informed consent. By ticking the boxes you are indicating that you understand the nature of the survey and that you agree to participate in the research.

Please tick the following points if you agree to take part

☐   I understand that I have been provided with an explanation of the survey in which I am participating in and have been given the name and telephone number of an individual to contact if I have questions about the research.

☐   I understand that participation in the survey is voluntary and that I can withdraw at any time.

SECTION A: DEMOGRAPHIC CHARACTERISTICS

1. **Position (Please Tick the correct box)**

Management	Supervisor	Technologist/Artisan	General Worker/ Operators

2. **Category of Company (Please Tick the correct box)**

Government Owned Company	Privately Owned Company	Contractor Company

3. **How long have you been working in the electricity company?**

Years	Months

SECTION B: WORKERS INVOLVEMENT IN ORGANISATIONAL SAFETY CULTURE

(KEY: STRONGLY AGREE = 1; AGREE = 2; NEITHER AGREE NOR DISAGREE = 3; DISAGREE = 4; STRONGLY DISAGREE =5)

No.	Question	1	2	3	4	5
4.	I receive adequate warning of changes to safety practices.					
5.	I know fully what is expected of me at work regarding safety.					
6.	I have authority to make decisions that improve the safety of my work.					
7.	Unsafe act can be easily reported by me without fear of negative comeback.					
8.	I regularly receive recognition for doing a safe job					
9.	Staff suggestions are readily acted upon by management.					
10.	I receive the needed training and feedback about my performance.					
11.	Safety trainings received are effective.					
12.	I take responsibility for my safety and that of other workers around me					
13.	Methods for safe working are set following consultation with the workforce					

14.	Workers are involved in making safety-related decisions and participate in safety improvement initiatives					

15. In my opinion, workers can be further involved by:

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SECTION C: CONTINUOUS IMPROVEMENT AND MOTIVATION TO SAFETY CULTURE

(KEY: STRONGLY AGREE = 1; AGREE = 2; NEITHER AGREE NOR DISAGREE = 3; DISAGREE = 4; STRONGLY DISAGREE =5)

No.	Question	1	2	3	4	5
16.	I am confident that maintenance on the system is adequately performed and that equipment/plant is safe to operate.					
17.	Training focuses more on minimum requirements for a check on testing the system than on safety					
18.	Training practices are centered on safety.					
19.	Management views regulation violations very seriously, even when they don't result in any serious damage.					
20.	Management does all it can to prevent accidents or incidents.					
21.	When an accident occurs, management always blames the worker					
22.	Workers are given sufficient opportunities to make suggestions regarding safety issues.					
23.	Workers get little recognition for new safety ideas					
24.	Supervisor and HOD's do not hesitate to contact workers to discuss safety issues.					
25.	Our distribution system in the organisation is kept in good condition and safe to operate					
26.	Following safety procedures is always expected.					

27. In my opinion continuous improvement and motivation can further be improved by:

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SECTION D: CORPORATION VALUES AND SAFETY CULTURE

(KEY: STRONGLY AGREE = 1; AGREE = 2; NEITHER AGREE NOR DISAGREE = 3; DISAGREE = 4; STRONGLY DISAGREE =5)

No.	Question	1	2	3	4	5
28.	Management closely monitors proficiency and standards to ensure workers are qualified to operate electrical equipment.					
29.	I attend SHE Circle meetings.					
30.	Safety is emphasized during the interview and orientation process.					
31.	Safety standards are seldom discussed openly.					
32.	Safety issues are assigned high priority in meetings.					
33.	Management stops unsafe operations or activities.					
34.	As long as there is no accident, management doesn't care how the work is performed.					
35.	Safety is identified as a core value in my organisation.					
36.	Checklists and procedures are easy to understand.					
37.	My work manuals are up to date.					
38.	Management tries to get around safety requirements whenever they get a chance					
39.	The SHE Management in this organisation are doing a good job					

40. In my opinion corporation values can further be improved by:

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SECTION E: MANAGEMENT INVOLVEMENT AND LEADERSHIP STYLE

(KEY: STRONGLY AGREE = 1; AGREE = 2; NEITHER AGREE NOR DISAGREE = 3; DISAGREE = 4; STRONGLY DISAGREE =5)

No.	Question	1	2	3	4	5
41.	Management and the workforce work together to tackle safety-related issues					
42.	Management involvement in safety issues has a high priority					
43.	Upper level management gets personally involved in safety activities.					
44.	Management is receptive to learning about safety concerns.					
45.	Management has a clear understanding of risks associated with operations.					
46.	Management shows favouritism to certain workers.					
47.	Management expects workers to work in poor conditions such as dust, or storms					
48.	Management is willing to invest money and effort to improve SHE.					
49.	Management always listens to safety concerns that are raised.					
50.	Management has a clear understanding of risks associated with electricity/process operations.					
51.	Management often fails to recognize when workers are working unsafely					
52.	When an worker reports a safety problem, management acts quickly to correct safety issues.					
53.	Management's view is that not all accidents are preventable					
54.	Management views risk assessments as a waste of time					
55.	Management is committed to equipping workers with up-to-date technology.					

56. In my opinion management involvement can further be improved by:

SECTION F: COMMUNICATION

(KEY: STRONGLY AGREE = 1; AGREE = 2; NEITHER AGREE NOR DISAGREE = 3; DISAGREE = 4; STRONGLY DISAGREE =5)

No.	Question	1	2	3	4	5
57.	The long-term safety strategy of the organisation is always clearly communicated.					
58.	There are well established means of communicating safety, health and environmental matters from workers to management.					
59.	There are frequent safety training/briefing sessions that are useful/relevant to me.					
60.	Discussions about safety at briefings/meetings I attend are open					
61.	My organisation only keeps track of major safety problems and overlooks routine ones					
62.	There are good communications systems about safety, health and the environment in the organisation					
63.	Some safety procedures/rules are not really practical					
64.	Visitors and contractors are fully inducted and are aware about safety procedures					
65.	I attend at least one awareness training in a month on procedures					

66. In my opinion communication on safety issues can further be improved by:

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SECTION G: USAGE OF ACCIDENT INFORMATION

(KEY: STRONGLY AGREE = 1; AGREE = 2; NEITHER AGREE NOR DISAGREE = 3; DISAGREE = 4; STRONGLY DISAGREE =5)

No.	Question	1	2	3	4	5
67.	I am familiar with the system for formally reporting safety issues in my department					
68.	Workers are willing to report information regarding safety violations, performance, and other unsafe behavior.					
69.	Workers who cause accidents or incidents are not consistently held accountable for their actions					
70.	Standards followed when reporting an accident or incident					
71.	Being involved in an accident or incident, even if it was not your fault, has an adverse effect on your reputation with fellow workers					
72.	Management often fails to recognize when workers are operating unsafely					
73.	Management doesn't show much concern for safety until there is an accident or incident					
74.	It is best to remain anonymous when reporting an unsafe condition or incident					
75.	Workers can report safety discrepancies without the fear of negative repercussions.					
76.	There is no point in reporting a near miss					
77.	Workers who admit errors make a big mistake					
78.	I know how to report incidents and accidents					
79.	Workers can report safety incident without the fear of victimisation.					

80. In my opinion accident information can be used in:

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SECTION H: BARRIERS TO ORGANISATIONAL SAFETY CULTURE

(KEY: STRONGLY AGREE = 1; AGREE = 2; NEITHER AGREE NOR DISAGREE = 3; DISAGREE = 4; STRONGLY DISAGREE =5)

No.	Question	1	2	3	4	5
81.	There is a low level of trust between management and frontline staff					
82.	Safety trainings are expensive and so shouldn't be done too often					
83.	Some Health and Safety procedures do not need to be followed to get the job done safely					
84.	I don't think my immediate boss does enough to ensure a safe working environment					

85. Other Barriers to Organisational Safety Culture in my Opinion

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THANK YOU FOR YOUR PARTICIPATION

APPENDIX III: INFORMED CONSENT FORM

Dear Respondent,

My name is Mwewa Mambwe. I am a student at the University of Zambia pursuing a Master's Degree of Engineering in Project Management. I am currently carrying out a research on The Impact of Organisational Safety Culture on SHE Management in Zambia's Electricity Distribution Industry. You have been selected as one of the few respondents to help in the provision of relevant information for the study because of your experience as a worker.

1. **Research Purpose**

   The purpose of this study is to investigate factors SHE management. The study is also intended to find out the effects of organisational safety culture on SHE Management in the electricity distribution industry.

2. **Consent**

   Your participation in this exercise is completely voluntary. Therefore, you may participate and choose not to answer questions you are not comfortable with or decline altogether. Also, there is no penalty for discontinuing participation, and so you have the right to withdraw from this study at any time.

3. **Confidentiality**

   All the information you provide in this research is treated with utmost confidentiality. The researcher will not share your individual responses with anyone other than the research supervisor. Therefore, be assured that your identity will remain anonymous and untraceable in this research.

4. **Rights of Respondents**

   The researcher will make every effort to ensure that your rights as a participant are protected and respected. Further, you are assured that you will not suffer any harm for participating in this exercise. Similarly, you

are free to seek any clarification at any point of the exercise and to inform the researcher if you feel uncomfortable about any procedure.

5. **Declaration of consent**

By signing below, you agree that you have read and understood the information given above, and would be interested in participating in this study.

…………………………………   ………………………………

Signature   Date