RISK MANAGEMENT PRACTICES AND IMPLEMENTATION CHALLENGES AT KENYA ELECTRICITY GENERATING COMPANY LTD

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DECLARATION

This research project is my original work and has not been presented for a degree in any other university.

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This research project has been submitted for examination with my approval as a university supervisor

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DEDICATION

To my beloved wife Eunice Musembi for her tireless support and encouragement during the study and prayers towards completion of the studies.

To my lovely son Brian Muuo thank you for allowing Dad to be away in school even when you needed him to be with you more so over the weekends.

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ABBREVIATIONS AND ACRONYMS

CBA : Cost Benefit Analysis

COSO : The Committee of Sponsoring Organizations of the Tread way Commission Enterprise Risk Management Integrated Framework

CIMA : The Chartered Institute of Management Accountants

ERC : Energy Regulatory Commission

ERM : Enterprise Risk Management

ESKOM : Electricity Supply Commission of South Africa

IPPs : Independent Power Producers

ISO : International organization for Standardization

GAO : U.S. Government Accountability Office

GDC : Geothermal Development Company

KENGEN : Kenya Electricity Generating Company Ltd

KETRACO : Kenya Electricity Transmission Company

KPC : Kenya Power Company

REA : Rural Electricity Authority

PPAs : Power Purchase Agreements

ABSTRACT

Risk management has always been an important part in organisations due to the number of risks organisations face. Risks can disrupt achievement of the strategic as well as operational objectives. Risk exists as a consequence of uncertainty and is present in all activities whatever the size or complexity, industry or business sector (Mcnaull & Loy, 2008). The main objective of KenGen is to generate power by investing in power facilities. According to the KenGen 2014 Annual report and financial statement, Kenya is reliant on power which is subject to erratic weather patterns thereby placing the country in a risk situation of shortage of power. KenGen intends to attain power production capacity of 3000MW by 2018 and it has so far invested Kshs.250.2 billion to meet the demand of power in the country. This requires a comprehensive risk management framework to identify, measure and manage all the risks that might affect the objective of the company and the same time add value to the stakeholders. This study established the risk management practices and challenges faced in implementation at KenGen. The data was collected using the interview guide and analysed using content analysis. The major risks facing KenGen include hydrology risks, regulatory risks, geothermal steam supply shortage risks, competition, political risks, security risks, single buyer model, and site acquisition for project expansion, inadequate stakeholder management, work injuries and plant breakdowns. The findings supports the risk management process which involves six steps from setting of risk management objectives, identification of risks, evaluation of risks, selection of the risk management technique, implementation, control and review. The research established that KenGen faces several challenges in implementation of risk management which include culture of high risk appetite, engaging in projects without identification of risks from planning stage, resistance from staff in implementation of risk management practices in all activities and lack of an autonomous risk department. The study recommended that KenGen should come up with well-structured document on how to conduct risk appraisals of all the projects before the commencement of the projects, formation of a fully-fledged risk management department at KenGen headed by senior manager for effective management of risks facing the organisation, the Audit and Risk Management department should train all the staff on risk management to reduce resistance at the time of implementation.

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

It is important and essential to understand how to manage risk for any organisation whether public or private. The private sector organisations risk management is designed to control risks that could lead to failure if not properly managed. The profit maximization is the end result in the private sector. In the public sector managing of the risk increases the likelihood of an agency achieving its primary mission and strategic objectives (Hardy, 2010). Therefore the success of an organisation to meet its objectives anchors around how it successfully manages the risks it faces whether private or public.

The study is based on the decision theory and stakeholders Theory. Risk management is linked to decision theory in that decision has to be made with the objective of eliminating or reducing risks facing the business firms. Risk management makes decisions to manage the uncertainties whilst decision theory prescribes the correct course of action that would be applied to deal with the risk. On the other hand the stakeholder theory provides that the purpose of an organisation is to create much value as possible to the stakeholders.

Organisations face a number of risks. The risks can disrupt achievement of the strategic as well as operational objectives. Risk exists as a consequence of uncertainty and is present in all activities whatever the size or complexity, industry or business sector (Mcnaull & Loy, 2008). Risk is a broader concept than the traditional view of merely a threat. It includes threats (damaging events) which would lead to failure to achieve objectives and opportunities (challenges) which if exploited could offer an improved way of achieving the desired objectives but which could potentially have negative impacts. That is the risk of taking or not taking opportunities (Mcnaull et al., 2008). The main objective of KenGen is to generate power by investing in power facilities. According to the KenGen 2014 Annual report and financial statement, Kenya is reliant on power which is subject to erratic weather patterns thereby placing the country in a risk situation of shortage of power. KenGen intends to attain power production capacity of 3000MW by 2018 and it has so far invested Kshs.250.2 billion to meet the demand of power in the

country. This requires a comprehensive risk management framework to identify, measure and manage all the risks that might affect the objective of the company and the same time add value to the stakeholders.

1.1.1 Concept of Risk

Risk can be defined as an event that has a potentially negative impact and the possibility that such an event will occur and adversely affect an entity's assets, activities and operations (Gao, 2006). It refers to the uncertainty that surrounds future events and outcomes. It is the expression of the likelihood and impact of an event with the potential to influence the achievement of an organization's objectives. From the perspective of an organisation and in this case study of KenGen, the definition of 'risk' will be the International Organisation for Standardization (ISO) definition used in risk management standardization documentation in the world. The ISO and the International Electro technical commission (IEC) define risk as the combination of the probability of an event and its consequences. This definition takes into account both the chance element (probability or likelihood) and the potential upsides or downsides of the event (consequences or magnitude) in terms of how the risk impacts on the organization's ability to achieve its objectives (Drennan & McConnell, 2007). Organisations require risk management program to identify and increase awareness of risk events .This will ensure that risk is prevented and effective mitigation plans are put in place.

There are different classifications of risks that give properties or characteristics of risk and sources. Financial and non-financial risk can be distinguished. According to Vaughan (1997), financial risks are those risks that have financial loss, consequences or impact. Financial loss considers relationship between an organisation and an asset and the projected income that could be lost or damaged (Cienfuegos Spikin & TwenteHolanda, 2013). There is also a distinction between dynamic and static risks. Dynamic risks are these risks created by dynamic change of the economic environment and depend on the factors like economic factors and competitors and the decisions taken internally by the organisation (Forestieri, 2003). Dynamic risks benefit society over the long run since they are results of adjustments to misallocation of resources (Vaughan, 1997). Dynamic risk could affect large number of people and it would be less predictable than static risk.

Whilst static risks are those risks that rest on internal factors of the entity. Unlike dynamic risks, static risks are predictable and would occur with some regularity. The above principles of dynamic and static risk provide the basis for the reasoning on the transferring process of risks through the insurance market (Pavodani and Tugnoli, 2005).

Another classification is the concept of systematic and diversified risks. The source of systematic risk would be the main macroeconomics variables like variables like GDP or tendency in market interest rates and inflation. Diversified risks are those risks that are not tied to any sources of systematic risk or systematic risk factors (Vaughan, 1997).

Moreover, there is also a distinction between pure and speculative risk. Speculative risk is a situation that would result to either loss or gain (Pavodani and Tugnoli, 2005). On contrast pure risks is a situation that involve only the chance of loss or no loss. A good example is the person who buys an automobile immediately faces the possibility that something may happen to damage or destroy it (Vaughan, 1997). KenGen owns a number of plants for power generation and it is therefore exposed to pure risks. Further classification is fundamental and particular risks. Fundamental risks are risks that involve losses that are impersonal in origin and consequences (Culp, 2001). These types of risks are caused generally by economic, social and political phenomena and also may be as a result of physical occurrences. Due to its causing conditions that are beyond the control of the individuals who suffer loss the society rather than the individual has a responsibility to deal with them (Vaughan 1997). Fundamental risks affect a large segment of the population (Cienfuegos Spikin & TwenteHolanda, 2013). On the other hand particular risks refer to losses that occur in individual events and are experienced by individuals rather than groups (Forestieri, 2003).

1.1.2 Risk Management Practices

Risk Management is the continuous process of assessing risks, reducing the potential that an adverse event will occur, and putting steps in place to deal with any event that does occur (Gao, 2006). Risk management is a process of predicting potential risks that may be encountered by an organisation and develop appropriate strategies in order to deal with the exposure to the identified risks (Berg, 2010). It involves a continuous process of

managing through a series of mitigation actions that permeate an entity's activities. According to Vaughan (1997), risk management is a scientific approach to the problem of risk that has its objective of reduction and elimination of risks facing the business firms. The main components of risk management process are risk identification, risk analysis and evaluation, risk controlling and risk monitoring (Berg, 2010).

Risk management in many utility organisations has concentrated on the areas of energy trading known as Power Purchase Agreements (PPAs) or insurance with the responsibility of risk management been left to the risk champion or risk manager alone to manage. The traditional way of managing risk viewed risks as threats and focused on avoidance on negative events, treated risk as a separate function, and continuously managed risk independently within Silos. Gradually, organisations began to integrate risk by accepting risk as an expense, shifting their focus to managing risk. Organisations adopting Enterprise Risk management (ERM) where risks are recognised as threats and opportunities, and are corporate-wide daily concern that is embedded in the operations. There is a paradigm shift in the last decade in risk management to manage organisation risk in a holistic manner which involves risks in key business processes and areas (Hissom & Tilly, 2007).

Previously organisations focused on hazard risk management and insurable financial risks. Today the practice is much wider including operational, strategic, financial and reputational risks. This is application of holistic approach to risk management is which is referred to as Enterprise Risk Management (ERM). Enterprise Risk Management is a strategic business discipline that supports the achievement of an organization's objectives by addressing the full spectrum of its risks and managing the combined impact of those risks as an interrelated risk portfolio. Enterprise Risk Management integrates the management of both pure and speculative risks. It is defined as a process effected by an entity's board of directors, management and other personnel, applied in strategy-setting and across the enterprise, designed to identify potential events that may affect the entity and manage risk to be within its risk appetite to provide reasonable assurance regarding the achievement of entity objectives (COSO 2004).

1.1.3 Challenges of Risk Management Implementation

The Risk Management team has to uncover all the risks that can affect the organisation. The challenge is to determine an appropriate techniques or a combination of techniques of risk identification so that various risks can be taken care of appropriately (Gustavsson, 2006). Another challenge is how to treat the risk because of various types of risk treatment option which include accept risks, avoid, outsource, share, or transfer (Schanfield and Helming 2008). Dependence on mathematical risk models where the model probably accepts risks at certain levels yet entities should not accept it in their everyday operations (The Chartered Institute of Management Accountants, 2010). Also non-existence of established routines for risk analysis, feedback and follow ups within the company. This is reflected by employees knowing that they should analyse the risks that they are in charge of but they lack directions and have different ways to analyse risks in different parts of the company (Gustavsson, 2006). Finally there is a challenge in implementation where in large organisations top management lacks insight of risk management on a local level (Gustavsson, 2006).

1.1.4 Power Sector in Kenya

The power sector has eight (8) major players namely: Kenya Electricity Generating Company (KenGen), Energy Regulatory Commission (ERC), Ministry of Energy & Petroleum, Rural Electricity Authority (REA), Kenya Electricity Transmission Company (KETRACO), Kenya Power & Lighting Company (KPLC) now known as Kenya power, Geothermal Development Company (GDC), and a number of Independent Power Producers (IPPs) (Kapika & Eberhard, 2013). KenGen is the main generator of electricity in Kenya which it sells on a wholesale basis to Kenya Power. KenGen produces approximately 80% of the Kenya electricity. KPLC is the wholesale buyer of electricity and is obligated to purchase electricity from all power generators and transmit the purchased electricity from the national grid to consumers in Kenya.

GDC on the other hand was formed to undertake the high risk exploration and development of geothermal fields, including exploration, appraisal and production drilling and the management of proven steam fields. KETRACO was created to develop new, high –voltage electricity transmission infrastructure to facilitate grid access for rural

areas, allow for grid interconnection with new generating plants, and enable regional power trade with the neighbouring countries. IPPs are private investors in the power sector involved in generation of power on a large scale under the Feed-in-Tariff policy. The IPPs contribute about 28% to the country's stalled capacity. Lastly, ERC is responsible for the regulation of the energy sector while the ministry of Energy & Petroleum is responsible for national energy policy formulation.

1.1.5 Kenya Electricity Generating Company Limited

KenGen was incorporated on 01st February 1954 under the Companies Act (Chapter 486 of the Laws of Kenya) as Kenya Power Company (KPC). The main objective of the Company was to develop geothermal and other generating facilities in the country. The arrangement since its inception was KPC sold electricity in bulk at cost to Kenya power. In 1996, the management of KPC was separated from Kenya Power and renamed KenGen in January 1977. KenGen was listed on the Nairobi Securities in 2006 where 30% ownership was sold to the public and the remaining 70% owned by the government of Kenya.

The Company owns thirty one (31) power generating plants with a total installed capacity of 1337MW. It generates electricity from various sources comprising of hydro, thermal, geothermal and wind. The company produces 80% of the electric power consumed in the country with the rest being produced by Independent power producers. KenGen operates in a liberalised power generation environment with a work force of 2,209 staff with diverse wealth of experience in various disciplines (2014 KenGen Annual Report & Financial Statements). KenGen is faced with operational risks, commercial & legal risks, financial risks, natural disasters risks, political risks, technology risks, management control risks, reputational risks, health & safety risks, and Environmental risks.

The Board of Directors is responsible for implementation of the Risk Management policy. The Board has delegated the responsibility to the Audit & Risk Management committee which in turn has delegated the responsibility to the management team which is primarily responsible for implementing risk management policies and internal controls. The Audit committee continuously assesses the management team on compliance of risk management policy.

The company has in place a risk management policy which guides in decision making process in minimizing potential losses, improving the management of existing uncertainty and utilizing new opportunities. The policy applies to all divisions at head office, all KenGen business locations and the projects undertaken by the company. This ensures proper utilization of company's available resources and successful attainment of its set objectives.

1.2 Research Problem

Risk management is very important for any company to meet its objectives because of the constant changing environment with different outcomes. Risk management is necessary for the organisation to achieve its objectives. In some states like United States of America risk management is mandatory as per the Sarbanes-Oxley Act in the United States. Existence of risk poses a lot of challenges to the organisations and for them to survive they have to come have with effective risk management program to be able to meet its mission and objectives.

Kenya is reliant on one monopoly which produces 80% electricity used in the country. This is subject to erratic weather patterns subjecting the country exposed to shortage of power and also aging power plants set up in the colonial days using old technology exposes KenGen to hydrology risks and frequent breakdowns. The Company has a risk management policy to manage hydrology risks and plant breakdowns which has not been fully implemented. However in the recent years there has been emergence of extreme weather events. In the years (1999-2002) and (2008 -2010), Kenya experienced severe drought that lasted for 33 and 27 months respectively. In 2011 there was suppressed rainfall for 6 months. Due to the poor hydrology, KenGen could not meet the power production thresholds and this let to power rationing and loss of revenue to the company. Over the past decade concern has grown about the quality of risk management and control and this has been reflected in significant new regulation like the Sarbanes-Oxley Act in the United States. All these scenarios call for effective risk management in organisations and more specific in KenGen.

KenGen has very large investments commitments and power plants costs running into several billion dollars involving time horizons of 30 to 50 years covering multiple industry cycles and technological discontinuities. This requires effective risk management to protect the investment against risks which might occur. More so, the electricity sector is facing challenges of constant pressure for more reliable and stable power provision and also the government has put emphasis on KenGen to guarantee continuous and cheap power supply because it affects the development of the economy. Despite the importance of power in the economic growth no study has been carried to establish the risk management practices and implementation challenges in the electricity sector. This study is to assist KenGen to develop effective risk management policy to enhance board and risk management awareness in order to increase effectiveness of the risk management policy and improve execution of the company's objectives.

The risks that face insurance and banking industry are well researched and documented from the previous studies in Kenya. Aum (2014), studied operational risks management practices at the Jubilee Insurance company Ltd. Kamau (2010) studied adoption of risk management by commercial banks in Kenya. Waweru (2012) researched on the effect of risk management practices on financial performance of commercial banks in Kenya. Nderi (2013) studied strategic risk management practices by AAR Insurance Kenya. (Energie, Tak, & Ees, 2009) researched on identifying risk factors in the generating section of the power plants, (Moosa, 2007) concentrated on the framework of insurable operational risk and (Pitinanondha, 2008) researched on operational risk management(ORM) systems. Acharyya (2012), researched on the current practice of operational risk management in insurance. However no study has attempted to determine the risk management practices and implementation challenges in the electricity sector. Therefore there is a gap concerning the risk management practices and implementation challenges in power utility firms and particularly KenGen Limited. This research therefore sought to answer research question, what are the risk management practices at KenGen and the challenges faced in implementation of risk management at KenGen?

1.3 Research Objectives

The objectives of this study were:

i) To determine risk management practices at KenGen

ii) To determine challenges faced in implementation of risk management at KenGen.

1.4 Value of the Study

The study will bring out the risk management practices at KenGen. Future researchers will find valuable information from this research on risk management in the power utility sector. The study will also make significant contribution to the existing literature of risk management practices in the power utility sector. Academic researchers may use the study findings to carry further studies in risk management in the whole energy sector on new emerging risks in oil and gas exploration and in such it will form a good background for further studies.

Risk management involves identifying risk exposures and providing mitigating measures. This study will assist KenGen in identifying the gaps/weakness in the current risk mitigation measures and recommend revision or improvement of the same. This study will look at the alternatives available in dealing with risks. This will involve decision making from alternative course of actions. This will hence support the decision theory on which the study is based. The study will also be useful to the other upcoming Independent power producers in implementing risk management policy in their organisations.

The study will also recommend on the effective risk management practices that can be a basis on policy formulation the government and Energy Regulatory Commission (ERC), the regulator in the power sector in supervising the power sector to ensure risk management policies are in place. This will ensure the heavy investment put in the sector is protected and also the country is able to get cheap and reliable power supply.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviewed literature related to risk management practices and the theoretical framework of the study. It discusses on the theoretical foundation, risks in power utility sector, risk management process and challenges on implementation of risk management practices.

2.2 Theoretical Foundation

The study is based on the decision theory and stakeholder theory of management. In risk management decisions has to be made during the process especially on the alternative techniques to manage the risk and also cost benefit analysis of the decision taken.

2.2.1 Decision Theory

Risk management decisions are concerned primarily with specific steps in risk management process which is through selecting the techniques or strategies that will be used for the risks that have been identified and measured. Consequently, Decision Theory is implicitly contained by the risk management process, since risk management depends on the rules derived from the general knowledge of Decision Theory (Vaughan 1997). One of the common methods for rational decision making is Cost Benefit Analysis (CBA).

Cost - Benefit analysis is the examination of a decision in terms of its consequences or costs or benefits. The purpose of CBA is to provide a consistent procedure for evaluating decisions in terms of their consequences (Drèze & Stern, 1987). Every rational decision maker faces the problem of seeking solutions which could enable him to maximize his benefit (Williams & Giardina, 1993). For the purpose of determining whether or not it is advantageous to adopt a particular choice, a decision maker would try to define and quantify its possible effects. CBA has origins in economic theory, particularly theory of social welfare and resource allocation, ideas that could assist a decision maker in the objectives of finding the best solution through adding up values of all the good and the bad consequences. CBA seeks to value the expected impacts of an option in monetary

terms. The said valuation should consider the willingness to pay for potential gainers for the benefits they will receive as a result of the option, and the willingness of the potential losers to accept compensation for the losses they will incur. Therefore in terms of this criterion, a policy is desirable if the benefits exceeds the losses, appropriately discounted over time (Cienfuegos Spikin & TwenteHolanda, 2013).

CBA applied to the discipline of risk management, seeks to measure the contribution that a risk technique or response makes to the risk management process by determining whether and by how much the technique benefits exceed the cost to implement it. The greater the benefit for a given cost or the lower the cost or a given level of benefits, the more cost effective the particular technique and response is thought to be (Vaughan, 1997). Consequently, risk managers might weigh several factors that include cost and risk. Therefore a risk manager would have to weigh the importance of risk and cost and the availability of resources to respond when applying CBA for decision making and would also make use of the information on risk developed in the stage of the risk management process, where the risks are identified and analysed in respect of their likelihood (frequency) and impact.

Moreover, as discussed by Ayyub (2003), economic efficiency could be pertinent to determine the most effective means of expending resources taking into account that at some point, the costs for risks reductions (controls) might not provide adequate benefits. Thus, CBA applied to risk management compares the costs and risks to determine where the optimal risks value is on cost basis. From this approach then, the optimal value occurs when costs to control risks are equal to the risk cost due to the consequences (losses). Therefore, investing resources to reduce risks below the equilibrium point would not provide additional financial benefits.

2.2.2 Stakeholder Theory

Stakeholder is those groups who are vital to the survival and success of the corporation or any group or individual who can affect or is affected by the corporation. Corporations are managed in the interest of stakeholders defined as employees, financiers, customers, and communities (Freeman and Evan, 1979). The stakeholder theory proposes that the purpose of an organisation is to create as much value as possible for the stakeholders. Managers need to understand the concerns of the shareholders, employees, customers,

suppliers, lenders, and society in order to develop objectives that stakeholders would support (Freeman and McVea, 2001).

Eskom holding Ltd, in the integrated report (2010) defines stakeholders as a person, a group or organisation that has a direct stake in their business because they can be affected by their activities and policies. In this sense the key stakeholders in power sector are shareholder, civil society, the public, customers, Eskom (board of directors and employees), investors, government, regulators, industry, suppliers, media, regulators and government. It is the responsibility of managers and the management function to select activities and direct resources to obtain benefits for stakeholders. The management should put prudent risk management policies in execution of its business management strategies (Donaldson & Preston, 1995). This study will also test how risk management techniques used by KenGen would safeguard the interest of the stakeholders.

2.3 Risks Facing the Power Utility Sector

According to The Union of the Electricity Industry (2007), Companies in the electricity sector are exposed to four main types of risks. The first one is the risk of financial gain or loss due to exposure to fluctuations in market prices. The market risks include the risk that interest rates will change , the risk that foreign exchange rate will change, equity index risk or the risk that stocks or other index prices will change, and commodity risk or the risk that commodity prices (e.g. energy ,emission rights, bio-fuels, metals) will change. A second risk is the risk of loss due to a counterparty defaulting a contract or, more generally risk due to uncertainty about a counterparty's ability or willingness to meet its obligations. The third risk is the risk inherent to the specific industry (e.g. uncertainty in demand, emergence of new technologies or know – how,) including strategic and regulatory risks.

The fourth risk in the electricity sector is the operation risk which is of great concern in the electricity sector. Operational risk is the actual or potential loss resulting from the events caused by inadequate or failed processes, people, equipment or systems or from external events. Operational risks are those kind of risks that are present in the daily functions and services of the entity. According such risks might derive from the people, property or processes involved in delivering the services expected or needed by the organisation (Sadgrove, 2005).

In the recent years has been the emergence of the extreme weather events. In December 1999, a major storm in France cut off the distribution grid to over 200,000 customers. In January 2005, the "Gudrun"storm destroyed 30,000 kilometres of transmission lines and cut off 730,000 customers in the southern Sweden. Over the past decade concern has grown about the quality of risk management and control and this has been reflected in significant new regulation like the Sarbanes-Oxley Act in the United State. All these scenarios call for effective risk management in organisations and more specific in the electricity utility sector.

Risks concern in the power utility sector include personnel, equipment, testing, commissioning, operations and maintenance (Wing & Jin, 2015). According to a report from the Economist intelligence unit sponsored by Swiss Re, electricity sector suffers risk owing to unavailability of resources, plant damage or component failure. Other sources of risks are losses arising from employment practices & workplace safety which lead to individual injuries and external events like environment (Moosa,2007). With the increasing number of workers employed in the energy sector and employees exposed to serious injuries occupational safety and health is becoming a serious risk.

2.4 Risk Management Process

Risk management deals with risk by designing and implementing procedures that minimize the occurrence of loss or the financial impact of the losses that do occur (Vaughan, 1997). Risk management is the continuous process of assessing risks, reducing the potential that an adverse event will occur and putting steps in place to deal with any event that does occur. Risk management involves a continuous process of managing through series of mitigating actions that permeate an entity's activities that is the likelihood of an adverse event and its negative impact. Risk management address risk before mitigating action, as well as the risk that remains after the counter measures have been taken (Gao, 2006).

According to Vaughan (1997) risk management process involves six steps: determination of risk management programme objectives, identification of risks, evaluation of risks, and selection of the techniques to handle the risks, implementation of the techniques and control and review of the decisions made. Nevertheless and according to Van Staveren

(2009), the risk management process or cycle would be composed of at least five stages: determining the objectives; identifying the risks; evaluating the risks; considering alternatives and selecting the risk treatment devices; and implementing and reviewing stages.

The first decision a firm should make is to establish a clear objective for risk management program. The objectives may include maintaining the organization's survival or position in a specific sector, minimizing the cost associated with pure risk, protecting employees from accidents that might cause serious injury among others (Vaughan, 1997). The literature prescribes that the objectives of the risk management program should be formalized in "corporate of organization risk management policy".

After establishing the objectives, the second step in risk management is identification of the risks that the organizations might face. Risk identification is normally performed by using several instruments such as internal records of the organization, insurance policy check list, risk analysis questionnaires, flow process charts, analysis of financial statements, inspection of the firm's operations and interviews among others (Vaughan, 1997). According to Heinz – Peter berg, the appropriate risk identification will depend on nature of activities, the nature of the project phase, resources available, regulatory requirements and the client requirements as to objectives, desired outcome and the required level of detail. The identification of the sources of the risk is the most critical stage in the risk management process. The sources are needed to be managed for pro-active risk management. The better the understanding of the sources, the better the outcomes of the risk assessment/evaluation process and the more meaningful and effective will be the management of risks (Berg, 2010).

Risk identification is followed by risk evaluation. The Risk evaluation step involves measuring the potential size of the loss and the probability that it would actually occur, providing some ranking that would classify the risks in order of priorities. The evaluation step would provide critical information that would determine the attention that the organisation might consider on certain risks. The fourth step in the risk management process is the techniques or strategies that should be used to deal with each risk.

Once the current and the potential have been identified and evaluated, decisions would be made on how to respond and in particular, what actions could be taken in order to improve future outcomes. Consequently a judgement is required to be made about the most appropriate form of range of possible options. This will involve taking into account the cost and benefits of each proposed action, as well as evaluating the probable reaction concerning these measures by stakeholders and other interested parties (Drennan &McConnell 2007). Generally Organizations have the option to avoid (Risk avoidance), reduce (risk reduction), transfer (risk transfer), retain (risk retention) or share (risk sharing) the risk that have been assessed.

According to Vaughan (1997), the techniques of dealing with risk can be grouped into two broad approaches; risk control and risk financing. Risk control refers to techniques that are designed to minimize the risk exposed to the organization. Risk control methods include risk avoidance and various ways to reduce risk through loss prevention and control efforts. Risk avoidance mean that the organisation does not accept the risk even for an instant. Risk avoidance is used for those instances with catastrophic potential and risk cannot be reduced or transferred (Vaughan, 1997). Whereas the strategy of risk reduction would aim to limit the likelihood of occurrence of loss event and the severity of the impact for the organisation for those losses that might occur. Risk reduction is conducted through prevention, meaning those activities that have the objectives of preventing losses from occurring and loss control, the efforts aimed at minimizing the severity of loss if it does occur (Vaughan, 1997).

In contrast with risk control, risk financing focuses on guaranteeing the availability of funds to be available to meet those losses that could occur. Risk financing takes the form of retention or transfer. Basically, risk retention strategy involves maintaining of the risk within the company. Risk retention is recommended when the risk is considered negligible or when the adoption of real measures to reduce would not be considered affordable. The retention of risk is a viable alternative from the cost –benefit point of view. Consequently retention may be accompanied by specific budget or a fund to meet the deviation of expected losses (Vaughan, 1997).

The basic strategies are risk avoidance, risk reduction, risk retention and risk transfer. The fifth step is the implementing stage where decisions that are made in the previous phase are implemented (Cienfuegos, 2013).The final step of the process of risk management is implementation and review of the risk management process of risk management program, establishing check and balance procedures in order to make sure that the objectives of the risk management program are accomplished.

2.5 Challenges in Adoption of Risk Management Practices

The Risk Management team has to uncover all the risks that can affect the organisation. The team needs to be conversant with all the risks affecting the organisation areas and the activities. The challenge is to determining the best technique /strategy or a combination of techniques of risk identification so that various risks can be taken care of appropriately (Gustavsson, 2006). Another challenge is how to treat the risk because of various types of risk treatment option which include accept risks, avoid, outsource, share, or transfer (Schanfield and Helming 2008). Dependence on mathematical risk models where the model probably accepts risks at certain levels yet entities should not accept it in their everyday operations (CIMA, 2010).

Also non-existence of established routines for risk analysis, feedback and follow ups within the company. This is reflected by employees knowing that they should analyse the risks that they are in charge of but they lack directions and have different ways to analyse risks in different parts of the company(Gustavsson, 2006). Finally there is a challenge in implementation where in large organisations top management lacks information on how the risk management is being implemented at the departments (Gustavsson, 2006).

2.6 Empirical Studies and Research Gaps

Majority of published research on risk management practices and implementation challenges are written on the banking sector (Acharyya, 2012) with few focused on electricity power sector. (Energie et al., 2009) researched on identifying risk factors in the generating section of the power plants, (Moosa, 2007) concentrated on the framework of insurable operational risk and (Pitinanondha, 2008) researched on Operational risk management (ORM) systems.

Therefore there exists a research gap in the area of overall risk management practices in the electricity sector. There is need is need to carry out research to establish the existing risk management practices and implementation challenges in the electricity power sector to help sector to attain its objectives.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter covers the research design followed in carrying out the study. It describes the research design, data collection methods and data analysis techniques.

3.2 Research Design

The case study method was adopted for this study to facilitate in-depth understanding of the risk management practices and implementation challenges at KenGen. The use of case study methodology ensures that the topic of interest is well explored and the essence of the phenomenon is revealed (Yin, 2003). Case study also enables the researcher to gather data from a variety of sources and to converge the data to light up the case (Baxter & Jack, 2008).

3.3 Data Collection

The study used an interview guide to allow flexibility in data collection and allow clarification on difficult one. Interview guide is described as the cornerstone of case study research but also there is a need to triangulate evidence by collecting and integrating information from a range of sources (Woods, 2009). The approach which was adopted in this study was collection of as much information as possible about KenGen and its risk management practice.

The primary and qualitative data was collected from ten (10) key staff in senior and middle management cadres who are directly involved in implementation of the company's risk management practices. The said staff are based at power stations (operation), Internal Audit & Risk department, Technical Assurance & Safety department, Finance & ICT and Insurance department. These key officers under the various departments play a key role in implementation of risk management practices in KenGen.

3.4 Data Analysis

The data was collected using the interview guide where discussions was held with individual respondents. The data collected was analysed using content analysis. According to Berelson (1952) content analysis is a research technique for the objective, systematic and quantitative description of the content of communication. Content analysis is a method where a content of the message forms the basis of drawing inferences and conclusions about the content (Prasad, 2008). (Holsti, 1968) defined Content analysis as any technique for making inferences by systematically and objectively identifying specified characteristics of messages. Kerlinger (1986) defined content analysis as a method of studying and analysing communications in a systematic, objective and quantitative manner for the purpose of measuring variables.

Content analysis is all about making valid replicable and objective inferences about the message on the basis of explicit rules. The material for content analysis can include letters, diaries, newspaper content, documents ,texts or symbols (Prasad, 2008). This approach is appropriate because it allowed making of objective inferences from the data collected. It was therefore suitable for this research which was conducted within the organisations where the risk management practices and implementation takes place. The data collected was therefore analysed by making reference to the meaning, contexts and intentions contained in messages of all the respondents.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents analysis of data, findings and discussion of the study. The respondents enumerated and explained the major risks faced by KenGen, the risk management process, the mitigation measures put in place and the implementation challenges faced.

4.2 Data Analysis

The objectives of this study were to determine risk management practices and implementation challenges at Kenya Electricity Generating Company Ltd. This was achieved through interview discussions with 10 (ten) staff drawn from senior and middle management based in Internal Audit & Risk management, Finance & ICT, Operations, Insurance and Technical Assurance & Safety departments. The respondents highlighted the risks faced by KenGen and mitigation put in place to manage the risks and implementation challenges. The data was analysed using the content analysis method.

4.3 Findings of the Study

The researcher sought to establish risk management practices and implementation challenges at KenGen. The departmental heads are expected to set risk objectives for the units and identify the risks affecting the department. After the identification of the risk, the risk owner is required to put control measures. The control measures used include use of procedure manuals which gives details of how a department operates so that any deviation can be noted, used of signage in the plants, conditional maintenance of the machines, conducting of surveys, fixing of CCTV cameras at strategic places and well serviced fire fighting equipment. Upon identification of the risks, risk evaluation is done to determine high and low risks. Where the risk is high, the company uses the method of transfer of the risk through insurance whilst low risks are retained by the company like Theft. The Company has procured property insurances and WIBA insurance to protect itself from the losses that may occur. The respondents confirmed that there is continuous monitoring by the Internal Audit and Risk management department on every risk identified.

4.4 Risk Management Practices at KenGen

The interview discussions confirmed that risk management process in KenGen involves six steps which include establishment of objectives by the risk owners, identification of the risks, evaluation/analysis of the risks, treatment of risk monitoring and review and lastly communication and consultation. The risk that may impact the achievement of the objectives is managed in an organised and documented manner. It was confirmed that KenGen identify risks through self-assessment, group brainstorming, incident analysis, going through audit reports, physical inspection, previous history, ISO Audit reports, management reports and bench marking. The respondents reported once the risks has been identified analysis of risk is done in terms of the consequences and likelihood of it to happen with the existing controls being taken into account.

The respondents confirmed that risk analysis considers the potential consequences and likelihood of the consequences happening. Consequences and likelihood are combined to produce an estimated level of risk though there are some risks which are not easily quantifiable like reputation risk. After the analysis is done the risk level is compared against the pre-established criteria to determine its priority whether it is high, medium or low risk. The company applies three colour codes in the risk evaluation process. The high risks according to KenGen evaluation criteria are the risks that require major improvement in the way they are managed and they are coded red in colour. Medium level risk facing KenGen are risks where improvements of management of the risks is required but of less fundamental nature and are coded yellow in colour. The last classification is low level risks that are considered acceptable and monitored through routine controls and are coded green in colour.

The respondents confirmed that the next step after evaluation of the risk is choosing treatment plan. For high priority risks (high & medium) the company develops and implements specific risk management plans. The risk mitigation measures used by KenGen include sharing the risk with third parties through use of insurance policies, waivers and contracts. The other method used is avoidance of risk where the company may consider stopping an operation or withdrawing operations from a particular area. Risks are also avoided through sale or divestment actions. KenGen also manages the risk

through risk reduction. This is done by putting in place new or enhance internal control measures to reduce the likelihood of the risk crystallizing. This includes making sure that there is an approval procedure of any transaction initiated by a staff and also maintenance of power plant is carried as scheduled to reduce the frequencies of breakdowns. The interview discussions also confirmed that the company manages some risks through retention. This is followed by setting a certain budget or fund to deal with the risks that may arise. This arises where the costs of putting in place the requisite mitigation measure outweigh the likely benefits to be derived. The respondents confirmed that the company self-insures itself against burglary of immovable company assets.

From the interview discussions it was confirmed that the continuous monitoring and review of risk management processes is carried at all the levels of operations. Overall monitoring and review is done regularly by the Internal Audit and Risk department followed by submission of regular reports on risk management practices to the Internal Audit & Risk Management Committee of the Board. The final step in risk management process in KenGen is communication and consultation with internal and external stakeholders at each stage of the process and in the overall process.

4.5 Risks faced by KenGen and Management Techniques

The respondents confirmed KenGen is exposed to the following major risks which have already been identified by risk management for continuous mitigation. These risks include hydrology risks, regulatory risks, geothermal steam supply, and demand drop/competition, political risks, security risks, political risk, and single buyer model, site acquisition for project expansion, inadequate stakeholder management, work injuries and plant breakdowns.

4.5.1 Hydrology Risks

The respondents confirmed KenGen faces unfavourable hydrological conditions adversely affecting the generating capacity of the company and its revenue. This is caused by shortage of rains in the generation areas and this risk is weather related. The company is mitigating this risk through risk reduction technique through proper water reservoir management and planned storage capacity expansion of one of its reservoir in Masinga. The respondents also confirmed the company is diversifying from hydro plants

with future investments targeting geothermal, wind and coal to reduce the exposure of hydrological risks.

4.5.2 Regulatory Risks

All the respondents confirmed that the company is highly exposed to regulatory risks. Any change in laws and regulation from ERC can expose the company to liability and result in increased costs such as water levies, power project cost overruns and other costs incurred in power project construction that may not be recoverable from power Purchase Agreements (PPAs).This risk is managed by use of loss prevention measure by putting PPAs in place that assures the company full cost recovery and continuous operations for all the power stations.

4.5.3 Geothermal Steam Supply Risk

Further all the respondents confirmed that KenGen is exposed to the risk of depletion of steam in the geothermal power generation wells due to adverse geological nature. This exposes the company to loss of revenue generated from geothermal power production and this can adversely affect the operations of the Company. KenGen closely monitors the steam levels of the generation wells to ensure continuous supply of steam to the power generation plants.

4.5.4 Market Risk

The respondents reported that there is risk of reduction in market share from the current 80% due to increased licensing of more Independent Power Producers (IPPs) as per the government plan to increase power production. The respondents confirmed KenGen is managing this risk by expanding projects geared in increasing geothermal power production to increase the market. In addition the company is in the process of seeking public private partnership in order to remain competitive.

4.5.5 Political Risks

The respondents reported that with the implementation of the new constitution in respect to devolution, there is risk that the government may change its policies or introduce other policies that may affect existing investments and operations of the company. The respondents agreed the County governments may demand KenGen to pay levies in respect to the power stations located within the counties leading to increased cost of power production and operating costs. The respondents confirmed that this is being

mitigated by putting in place an effective stakeholder management programme to minimize adverse effects of national and county legislations on KenGen operations. KenGen is also participating on the ongoing review of the Energy policy and act which is taking consideration of specific changes related to the energy sector.

4.5.6 Security Risks

The respondents confirmed that KenGen's power facilities are exposed to terrorism activities that exposures the company to security risks. The terrorist may target the power generation, transmission and distribution activities. The respondents confirmed that the company has outsourced security firms in all the areas of operations and also employed professional security officers to coordinate and supervise security activities. The company has also engaged the services of armed policemen at all the plants to beef up security. The respondents reported that the company is in the process of lobbying the government to declare KenGen power stations as strategic national assets and provide additional security and other requisite support. The company has also taken sabotage and terrorism policy to cushioned itself against terrorism losses.

4.5.7 Stakeholder Management Risk

The respondents reported that KenGen is exposed to risk of operations interruptions and failure to attain its objectives due to poor relations with the stakeholders. The respondents confirmed this risk is being mitigated through constant participation in the corporate social investment programs as part of giving back to the community to improve the relations with the stakeholders. The respondents confirmed that KenGen has a corporate Affairs department whose responsibility is to engage all the key stakeholders on a continuous basis to protect KenGen interests.

4.5.8 Site Acquisition for Project Expansion Risk

From the interview from all the respondents it came out that site acquisition or availability of land for expansion or construction of new power plants is faced with a number of risks. These risks include resistance of the community to engage the private owners, the unwillingness of host community to be relocated to pave way in the identified project site, political factors, and high compensation demand by the community. This may lead to delay or non-implementation of power projects hence loss

of revenue to the company. The respondents confirmed this is mitigated by proactively engaging the communities living within all project sites before commencement. Also KenGen undertakes Environmental and Social Impact Assessment (ESIA). This results to fruitful negotiations with the persons affected by the project for relocation and compensation for their land to be acquired for development and expansion of projects.

4.5.9 Work Place Injuries

The respondents confirmed that KenGen has experienced more than thirty (30) injuries including some fatalities in 2014 and 2015. The respondents reported that safety exposures are experienced in the power plants and also in the field. The plant injuries are caused mainly when carrying plant maintenance and also as a result of fire breakouts. The staff in the field are also exposed to road traffic accidents. The respondents confirmed that KenGen has safety program in place which involves training of all staff on safety during induction, safety assessment to measure effectiveness of the safety programmes, inspections of facilities, and equipment and tools used by workers, doing regulatory compliance safety audits and also job safety analysis. The respondents also confirmed that they is a well laid down procedure of reporting any incident that occurs in the work place where the accidents are investigated and corrective measures taken in place.

The safety and quality control manager confirmed that the company is in the process of implementing occupational health and safety management system. KenGen has also taken Group personal accident and Employers liability insurance policies to cover the employees against injuries.

4.5.10 Plant Breakdown Risk

The respondents reported that the KenGen is exposed to the risk of sudden breakdown of power generating plants. This risk is made worse by lack of strategic spares due to the old technology of most of production plants that were installed more than 30 years ago. Also the company follows length process of procurement of spare parts hence taking very long time to repair the breakages. This leads to loss of revenue and also attracts penalties from the PPAs agreement due to non-production of power. The company has put in place machinery breakdown and consequential loss insurance policies to take care of this risk.

4.6 Challenges in Implementation of Risk Management Practices

The respondents discussed several number of challenges faced in the implementation of risk management practices. One of the major challenges is the culture of high risk appetite where the organisation risk acceptance levels is very high. The respondents confirmed the company engages in projects activities without identifying the risks involved from the planning stage. This makes it very hard to put the mitigation measures in place at the time of project commencement and exposes the company to high risks.

The other challenge is resistance from the staff to implement risk management practices in all the activities. This is contributed by the fact that the staff lack awareness or knowledge of risk management practices and therefore there is an urgent need to do continuous training. The risk department is under Internal Audit and Risk management and it lacks empowerment in executing its mandate in risk implementation. Most respondents proposed that risk department should be on its own with a representation in the top management meetings so as to identify risks before they occur.

4.7 Discussion of Findings

The study confirmed that KenGen faces a number of risks which included hydrology risks, regulatory risks, geothermal steam supply, and demand drop/competition, political risks, security risks, political risk, and single buyer model, site acquisition for project expansion, inadequate stakeholder management, work injuries and plant breakdowns. The risks identified have the possibility of occurring and adversely affecting the KenGen's activities and operations as revealed in the literature review (Gao, 2006). These risks can impact on the KenGen's ability to achieve its objectives as discussed in the literature review (Drennan & McConnell, 2007).

The study established that risk management process in KenGen involves six steps which include determination of risk management programme objectives, identification of risks, evaluation of risks, and selection of the techniques to handle the risks, implementation of the techniques and control and review of the decisions made. This has been revealed in the literature where Vaughan (1997) found that risk management process involves six steps. This was also echoed by Van Staveren (2009) that risk management process would be composed of at least five stages which include determining the objectives, identifying the risks, evaluating the risks, considering alternatives and selecting the risk treatment devices and implementing and review. Therefore analysis of the findings found that there is quite a good discipline regarding risk management practices in KenGen.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter presents the summary of the findings presented in chapter four on risk management practices and implementation challenges at KenGen. It also covers conclusion and recommendation suggested to the company, the limitation of study and suggestions for further study.

5.2 Summary of the Findings

The company has identified and documented the major risks that include hydrology risks, Geothermal steam supply risks, competition risks, political risks, security risks, single buyer model risks, site acquisition for project expansion risk, inadequate stakeholder management, work injuries and plant breakdowns. KenGen follows six steps of risk management process which includes setting up of risk management objectives by the risk owners, identification of risks, analysis/evaluation of risks, and selection of the techniques to deal with the risks and monitoring and review of the decisions made. In addition there is communication and consultation with the internal and external stakeholders in the overall risk management process.

KenGen applies sharing/transfer, avoidance, reduction and retention strategies in risk management with a well-structured risk management policy which gives guidelines on how to manage the risks. In addition, the company has an insurance department which handles a number of the risks by procurement of the necessary insurance covers. The company also has signed PPAs with the single buyer to safeguard itself from liability of not recovering its investment and operation costs. The company is faced by a number of challenges in implementation of risk management practices which include culture of high risk appetite, resistance from the staff, lack of awareness or knowledge of risk management and ineffective flow of information on risk management within the company.

5.3 Conclusion

The study was aimed at studying risk management practices and implementation challenges at KenGen. The study revealed that the company has a risk management policy in place and internal audit and risk management department which is responsible for corporate implementation of risk management. The company has also identified the major risk exposures and has a well-documented guidelines on how to deal with the risks. However the study revealed that the company has experienced a high number of work place injuries in the last 2 years and therefore should come up with more preventative and reduction measures with a view of minimizing or eliminating work injuries.

5.4 Recommendations

The study revealed that there is poor culture of accepting projects with very high risks. As a remedy KenGen should come have with well-structured document on how to conduct risk appraisals of all the projects before the commencement of the projects. The high risk projects can either be avoided or mitigation measures put in place to address them from inception. Risk management function of KenGen is combined with internal audit function hence it lacks the independence to implement risk objectives effectively. The study recommends formation of a fully-fledged risk management department at KenGen headed by senior manager for effective management of risk facing the organisation.

The company has in place an elaborate risk management policy however the same has not been communicated to all the staff. The Audit and risk management department which should train all the staff on risk management to reduce resistance at the time of implementation.

5.5 Limitations of the Study

There was limitation of time within which the study was conducted to interview all the levels of the staff. This limited the number of the staff that could be interviewed. The consequence is that some information in custody of the junior staff may have not being gathered and taken into consideration in the study.

5.6 Suggestions for Further Studies

The study suggests that this study should be done on all the players of the energy sector on how to manage risk and come up with legislation on ideal risk management practices. More so further studies should be carried in the upcoming oil and gas industry on new emerging risks.

5.7 Implications for Policy and Practice

This paper enriches the case study material on the practice of risk management practices in power utility sector. The findings supports the risk management process which involves six steps from setting of risk management objectives, identification of risks, evaluation of risks, selection of the techniques, implementation ,control and review.

The findings should be used in the development of sustainable and agreed upon standards of risk management practices for the power utility sector and the entire energy sector which can be used by the regulator to supervise the energy sector in safe guarding the heavy investment by the government of Kenya in the electricity sector.

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APPENDIX 1 - INTERVIEW GUIDE

1. From your point of view does KenGen consider risk Management in all its activities?

2. Who is responsible for risk management in KenGen?

3. What risks are considered most important by KenGen?

4. What are the risks faced by KenGen in its operations?

5. What steps are used in the risk management process in KenGen?

6. How is risk Identification process carried in KenGen?

7. What strategies are used in managing/mitigating the risks in KenGen?

8. Does KenGen have fully fledged risk department?

9. What are the main challenges faced in implementation of risk management in KenGen?

10. Are all Staff involved in risk management?

11. How many work place injuries have you experience in your department in the last 2 years?

12. What measures have you put to prevent the occurrences of work place injuries?

13. What other losses have you experienced in your area of operation in the last 5 years and how can they be prevented?