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**An Appraisal of Risk Management in Procurement of Goods at Ghana Grid
Company Limited (GRIDCo),**

by

Osabutey Frank Akrofi (Bsc. Construction Technology and Management)

A Thesis submitted to the Department of Building Technology,
College of Art and Built Environment
in partial fulfilment of the requirements for the degree of

MASTER OF SCIENCE

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DECLARATION

I hereby declare that this submission is my own work towards the MSc. Procurement Management and that, to the best of my knowledge, it contains no material previously published by another person, nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

OSABUTEY FRANK AKROFI

Student PG. No. 1772214

.....
Signature

.....
Date

PROFESSOR J. AYARKWA

(Supervisor)

.....
Signature

.....
Date

PROFESSOR B. K. BAIDEN

(Head of Department)

.....

Signature

.....Date

ABSTRACT

The renewed focus on reducing energy costs due to increasing demand with limited supply called for the need to appraise risk within GRIDCo Procurement Process. This can be achieved not only by managing energy use but also by optimizing the procurement risk management of energy supply contracts. Energy bills for electricity, natural gas and oil are typically in the top four business overheads. In the competitive energy market, optimizing unit costs of energy is now possible with cost effective energy procurement and risk management strategies. The aim of this thesis was to appraise risk within public procurement process. Sample size of sixty, (60) from the sample frame was used for which questionnaires as research instrument were used to collect data for analysis. The data were analyzed using One-Sample t-test and descriptive statistics in which the mean values and p-values were determined and ranked accordingly. It was found from the study that “Demand Risks ranked first followed by Supply Risks, Control Risks, Environmental Risks and Process Risks in that order posed uncertainties on the Ghana Grid Company Limited energy procurement activities. The likelihood of the risk occurrence invariably impact on GRIDCo energy procurement as well as the entire public procurement process. It was found that delayed in delivery process and poor contract management, poor planning due to unrealistic cost and procurement timing and information management, poor need assessment, unethical behavior within procurement process, improper records and poor management of suppliers among others trigger risks to GRIDCo energy procurement. Recommendations such as entity ensuring implementation of standardized procedures, maintaining auditing and reviewing evaluation procedures, strict adherence to the Public Procurement Act 2003, Act 663 to provide value for money while ensuring appropriate energy need assessment prior to supply and through market research as well as investment in supply.

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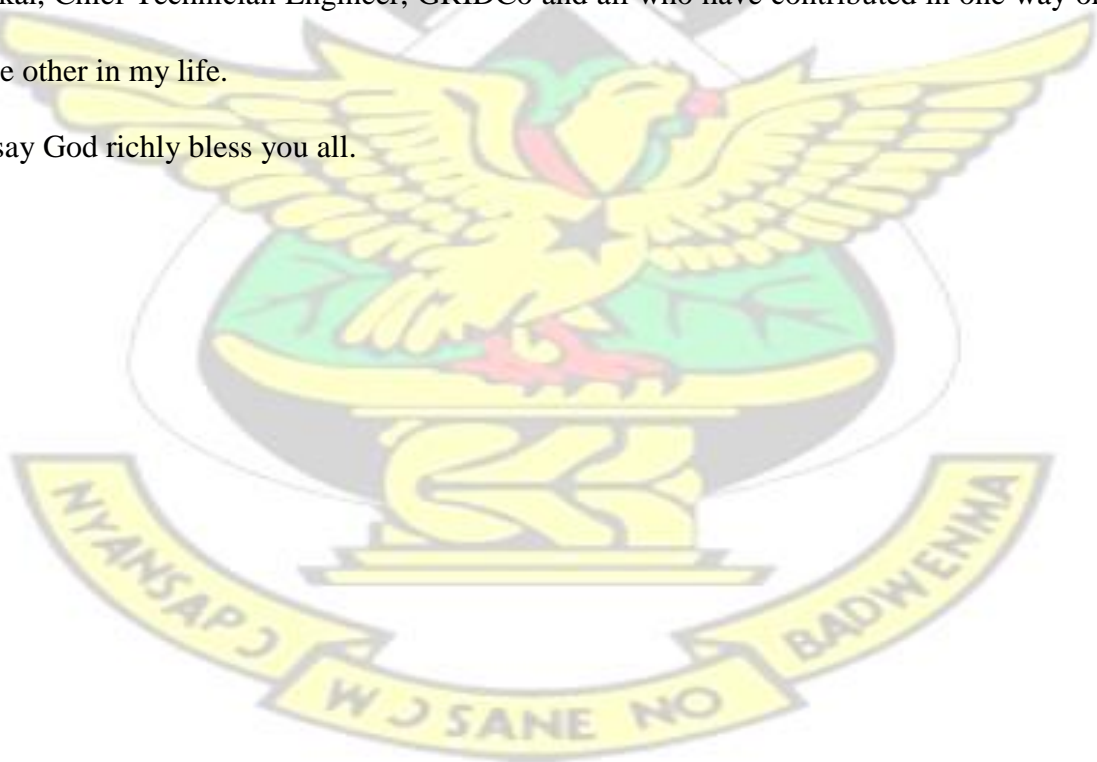
I wish to acknowledge the Lord Almighty for His grace, peace, and favour. I also acknowledge that it would have been difficult or almost impossible to successfully complete this dissertation without the good counsel and guidance from my supervisor, Professor J. Ayarkwa.

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I say God richly bless you all.



DEDICATION

This dissertation is dedicated to God Almighty who has enabled me to get this far and also to my dear children Emmanuel Kwame Kabu Osabutey and Shiloh Kwame Ahumah Osabutey.

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CHAPTER ONE

INTRODUCTION

1.1: General Introduction

Risk management is a key aspect of the management of contracts and one with which all the management of purchasing and supply centered (PMBOK, 2013; CIPS, 2008). Identification and risk management are critical in the performance of a lifetime that cost, to what extent the public and professionals should be alert identify, analyze and mitigate risks associated with each stage of the supply cycle (World Bank, 2005).

The supply risks are paramount and run through the whole process of supply, particularly in the implementation of the contracts, which must be tackled methodically. CIPS we believe that risk analysis should be part of any process of buying and the management of the supply significant; it is a fundamental activity for use in, for example, determine the overall strategy, plans for individual categories of expenditure, procurement, and also, where appropriate, supplying tactical. It is a key skill for any purchase and supply management professional and you need to minimize the trade show (CIPS, 2008).

The International Risk Management Standard AS / NZS / ISO 31000: 2009 defines risk as the 'effect of uncertainty on objectives'. A risk is a future condition or circumstance that may affect its objectives if it occurs, while an issue is a current event or a condition that needs to be addressed. The risk is measured in terms of a combination of consequence / impact of the event and their likelihood and can have a positive or negative impact (AS / NZS / ISO 31000: 2009; PMBOK, 2013).

Risk management can be said to be the logical identification of the threats and utmost identification of the opportunities efficient use of the resources. It also involves the development of appropriate strategies to manage risk and enable an organization to take appropriate action against the management Resources (Rolfstam, M. 2009). A risk is a future condition or circumstance that may affect its objectives if it occurs, while an issue is a current event or condition that should be addressed (Rolfstam, M. 2009). The risk is measured in terms of a combination of result / impact of the event and their probability and can have a positive or negative impact (Rolfstam, M. 2009). Risk management is the systematic identification of threats and the identification of opportunities for the best use of resources Saradan de, O. (1999). It also involves the development of appropriate strategies to manage risk and enable an organization to take appropriate action against and resource management (Rolfstam, M. 2009). Risk management in public procurement becomes even more important when it comes to management of public funds and resources to the supply of energy for the nation and meeting the demands of external donors (World Bank, 2005).

Public procurement has been identified as the government activity most vulnerable to corruption (World Bank, 2005). As the main interface between the public and private sector, public procurement offers many opportunities for both public and private diverting public funds for private purposes (World Bank, 2005). One of the main economic activities of the government where corruption has a high potential impact on taxpayers' money comes from public procurement of energy for example play significant role for economic growth (World Bank, 2005). Corruption thrives on secrecy (Aleshin,, 2001). Transparency and accountability have been recognized as fundamental conditions to promote integrity and prevent corruption in public procurement Ward . & Chapman, C. (1991); (Aleshin, 2001); Seldadyo, de Haan,

(2006); Schiele,(2007). However, they must be balanced against other imperatives of good governance, how to ensure efficient management of public resources "administrative efficiency" or offering guarantees of fair competition sometimes mitigating risk to public procurement (Aleshin, 2001).

To ensure value for money, the challenge for policy makers is to achieve an appropriate degree of transparency and accountability to reduce the risks in public procurement while pursuing other purposes of public procurement (World Bank, 2005).

Build an adequate level of generation capacity energy has proven difficult for many countries in the developing world including Ghana because of growing demand and less supply. This poses danger and risk or for the growth of the economy. It 'even more risky to public purchasers of energy, which are under pressure is surrounded by industry and domestic consumers alike. A number of jurisdictions and industries have suffered and continue to suffer from years of difficulties in the supply of energy, and this is still inadequate hinder economic development.

1.2: Background of the study

GRIDCo came in existence in accordance with the law of the Energy Commission of 1997 (Act 541) and the Volta River Development (Amendment) Act 2005 Act 692, which provides for the establishment and operation of the exclusive National interconnected system of transmission by a utility self-regulating and the disjoining of the transmission of the Volta River Authority (VRA) from other activities in the framework of reform of the energy sector. GRIDCo was formed on 15 December 2006 as a limited company under the Companies Code 1963 Law 179 and granted a certificate to start business on December 18, 2006. The company became prepared to start full operation on 1 August 2008 following the transfer of personnel and transmission of

power from VRA core business functions GRIDCo main functions of GRIDCo are:

- 1.Assume economic transmit and broadcast of electricity from extensive suppliers (generation companies) to extensive customers, including the electricity company of Ghana (ECG), Northern Electricity Department (NED) and Mines;
- 2.Provide fair and unbiased transmission to all participants of the power market;
- 3.Obtain, own and manage resources, structures and systems required for the spread of electricity;
- 4.Provide metering and billing services to wholesale customers;
5. Perform the planning of the transmission system and implement the necessary investment to provide the ability to reliably transmit electricity; and manage the power of the wholesale market.

1.3: Aim of the study

The purpose of this study is to assess the risk in the procurement process. Assessing risk in the process of supply, particularly in the energy sector will allow the political strategies of various mitigation mechanisms to manage the risks identified. Whiles adding value to the Grid Company Limited in providing value for money, efficiency, transparency, competition in meeting the energy needs of Ghana as promulgated in the Public Procurement Act, (Act 663, 2003). The establishment of GRIDCo was intended to develop and promote competition in the wholesale energy market in Ghana, providing a transparent and non-discriminatory and opens to the transmission network for all participants in the market power in particular, power generators and consumers of mass and, therefore, bring efficiency in power delivery.

1.4: Statement of the problem

Ghana Grid Company Limited with the search for secure energy supplies and distribution, are encountered with risk in their procurement process, which do not add

value and meet the expectations of stakeholders. Despite quarterly review of entity procurement process there is overwhelmed lack of understanding and proper risk assessment prior to the signing of contracts. There is the problem of poor training and inadequate record keeping as well as the lack of communication about the likely routes of occurrence of the risk. According to 2005, World Bank report, in most countries in the developing world, they were awarded contracts which was badly estimated, ill-considered and, sometimes did not meet specifications, resulting probability of risks and consequences of dying projects that do not meet the expectations and risk exposure (World Bank, 2005).

The problems of lack of accountability or responsibility, inaccurate assumptions and or unexpected events, mistakes in supervision, changes in needs or variations after work are misunderstood. These problems have the likelihood of eventual risks in projects and affect contract effectiveness and delay performance as well as allowing room for contract abrogation leading to increasing cost of public procurement (World Bank, 2005). Furthermore, continuous budgets reduction and pressure in meeting increasing demand for energy without corresponding investments pose threats and deficit supply as well as risk within GRIDCo energy procurement implementation. According to Ward, S. & Chapman, C. (2006), procurement process cannot be completed without the emerging of risks. Hence, providing value for money, promoting competition, fairness and transparency as indicated by PPA, Act 663, (2003) within public procurement are essential if proper risks appraisal are done right from pre-tender stage-tender-post tender in ,creating value for money.

1.5: Research Questions

1. What are the sources of risks available in the Procurement Process?
2. What are the risks triggers in the Procurement Process?

3. How to mitigate the identified risk?

1.6: Objectives of the Study

The general objective of this research is to appraise risks within the public procurement process. To achieve the general objective, specific objectives have been outlined for the study and they are as follow:

1. To identify the risks associated with procurement process at GRIDCo
2. To find out specific risk triggers in the Procurement of Goods at GRIDCo
3. To determine strategies of mitigating the identified risks

1.7: Scope of the study

The scope of the study was limited to risks management in public procurement.

Furthermore, the delimitation of the study has been Ghana Grid Company Limited (GRIDCo), one of the public procurement entities responsible for energy procurement apart from Volta River Authority (VRA)

1.8: Significance of the Study

The findings of the study will specifically help Ghana Grid Company Limited (GRIDCo) in their procurement activities if they are to improve on supplies. The study will also help policy makers in the energy sector formulate energy innovative policy, and mitigate energy risks procurement which currently affects the economy. The study will also act as a basis for further research to other researchers in the field of energy and public procurement in Ghana.

1.9: Justification of the Study

Increasing demand for energy by both domestic and industry called for corresponding investments on energy supply to meet the deficit. The recurrent “*dumsor*” being

experienced by consumers as result of deficit power shortage called for the need to find out risk within GRIDCo procurement process.

Furthermore, various Power Purchase Agreement (PPA) being entered to by various entities continues to failed in risk identification and mitigation strategies between an electricity generator (provider) and a power purchaser (buyer, typically a utility or large power buyer/trader). Risks within this arrangement are relevant to be identified if public procuring entities are to add value. As part of the appraisal by Grid Company Limited to improve performance and capabilities the entity continues to fail to appraise risk within their procurement process hence the study.

1.10: Research Outline

This study comprised with five main chapters; with chapter one made up of the background of the study, statement of the problem, and objectives of the study, hypothesis/research questions, scope and delimitations of study and the significance of study.

Chapter two was devoted to literature review with a look at conceptual to theoretical aspect of risks in public procurement within the energy sector. Furthermore, the research methodology was tackled in chapter three, in which the data collection and presentation procedures were examined. Chapter four was made up of analysis of the various data gathered based on the responses from the respondents. The data captured from the respondents were analyzed were analyzed using Statistical Package for Social Science (SPSS) (descriptive statistic, mean values, standard deviation) for data presentation and analysis. Finally, summary of major findings, recommendations and conclusions formed chapter five respectively.

1.11 Summary of Chapter

This chapter provided the background that gave rise to the study. It emphasized the problem statement, the aim of the study and the objectives of the study. It also included a description of the Ghana Grid Company Limited (GRIDCo), where the data was collected. In order to ensure that the findings of this study were to be deemed significant, a section in this chapter was dedicated to providing a justification of the need to conduct the study in this area.



CHAPTER TWO

LITERATURE REVIEW

2.1: Introduction

This chapter deals with literature, which addresses the work of other authors on the subject under studied. The chapter is structured as follows: Previous studies on the relevance and research, theoretical framework and methodological issues.

2.2: Previous studies and research relevance

2.2.1: The concept of risk and the management of supply

In order to understand and risk management in public procurement, we must first have a clear understanding of what risk is actually the Random House Unabridged Dictionary (2012). Defines risk as the "Exposure to risk of injury or loss; a hazard or dangerous chance" Perminova et al (2008) described risk as "uncertainty" therefore; a context of risk events. In addition, a negative impact on the results of the project. Perminova et al, (2008) has indicated that known and potential risks for managers are to be handled, while uncertainty is an event or situation that should not occur. In addition, distinguished institutions such as (Australian Standard / New Zealand Risk Management standard, 2004) risk management defined as the culture, processes and structures to the effective management of potential opportunities and adverse effects are addressed. It is designed to protect the body, the entire government and the general population from unnecessary costs and losses.

According to Project Management Institute (PMI, 2005); Project Risk Management includes the processes of making a planning risk management, identification, analysis, response planning, monitoring and control on a project. The objectives of Project Risk

Management are to increase the probability and consequences of positive events and decrease the probability and impact of negative events in the project (PMBOK, 2013). Train the above definitions can be considered as the risk the risk of loss due to uncertainty and not farfetched in the procurement process, if not properly monitored and managed to provide value for money. Thus; risk is inevitable in government procurement and are at each stage of the procurement process. Risk management in procurement is an operational activity that is the responsibility of the organization of supply or the person who "owns" or responsible for the procurement.

In public, however, the emphasis is often not on risk, but very focused on price; the public expects, and the conventional wisdom is that we find the lowest price. But we must remember the old joke in which the astronaut said, "Just think, we are sitting on a rocket with a million moving parts, all from the lowest bidder made available." What other factors overpriced at stake? Specifically: How does risk play in public procurement, and how can we begin officially, including risk management in the process? The inclusion in the supply risk is not new; but new research points to opportunities, to enable an organization to focus on significant risks to the success of the assessment, identification, acquisition and management.

In dealing with supply risk; if uncertainty or condition that has an effect on at least an acquisition target if it occurs. A risk may have one or more causes and, if it occurs, it may have one or more effects. A cause can create a requirement, assumption, constraint or if the possibility of a positive or negative result (PMBOK, 2013). For example, causes the requirement of an environmental permit to transformers or with limited staff could be assigned to design the proposed acquisition are to install. The risk event is that the issuing authority may take longer than expected to take grant an authorization, or, in the case of Occasionally the available and assigned limited design staff may still be

able to work on time and fully work with less resource use for its GRIDCo. If one of these uncertain events occurs, there may be an impact on the supply cost, schedule or performance. Risk of market conditions might aspects of the environment unit of public contracts, which can help reduce risk, such as immature project management practices, lack of integrated management systems, at the same time several projects, or dependency on external participants who cannot be controlled (PMBOK 2013) must be submitted.

From the above, one can realize that the project risk has its origin in all projects and also the procurement process is uncertain. Known risks are those that have been identified and analyzed, allowing planning responses to these risks for the administration. Specific unknown risks cannot be managed proactively, which suggests that the project team should create a contingency plan. A risk occurred in project can also be a problem.

Public procurement, on the other hand, is the process of acquisition of property by public sector organizations, services and works by others. It contains much that supports the government's work, from routine matters (eg, stationery, temporary office staff, furniture or forms), to complex spending areas (eg, construction, projects Private Finance Initiative or support for major change initiatives) (Sodhi & Lee, 2007). It also includes increasing spending where private and third sectors provide essential services directly to citizens in the areas of well-being at work, education, social services and health. These services can be made directly available by the public sector, and are treated by purchasing mechanisms in some cases, even these public benefits. A public body may work for the government to private companies through a formal competitive process (purchasing capacity of the United Nations Development Center Discussion

Note May 2012) offer. The method includes the purchase or acquires products, services, or results outside the project team needed. The organization can be either the buyer or seller of the products, services, or results of a project (Sodhi & Lee, 2007).

According to the Project Management Institute (PMI, 2005), procurement management of the project, published for the development and management of contracts or orders by authorized members of the project team, contracts management process and change of control. It may also include the administration of a contract by an outside organization (the buyer) that the acquisition shall be issued on the project of the performing organization (the seller), and administering contractual obligations on project team by the contract (PMBOK, 2013) attached. Thus, public procurement concerns the takeover of products, works and / or services by existing products and services or significantly improved a new application of organizational innovations for the supply of existing products and services. Innovation can be developed by the individual entrepreneur, a consortium of suppliers, in addition to the supply chain (below first level) or in partnership with the buyer Co - Production (Rolfstam & Hommen, 2009). It is the desire to provide the services that risk occurs and to assess and manage the expectations of stakeholders.

Furthermore, attracts a broader definition of different sources for the risk occur in the procurement process, as the result of "direct and indirect negative impact of the results and events, which are not considered, or that it is ill-prepared for risk, and in terms of their effects on individuals, businesses and society as a whole (Sodhi & Lee, 2007).

After (Kogan et al, 2007) can result for many reasons, induced occurring both internally and externally with their internal felt impact "(Kogan et al, 2007). The distinction between the risk of errors or the errors of judgment in the procurement process may

uncontrollable events for the organization, a result important distinction when it comes to risk management. Another way to distinguish new hazard risk management and risk perception of great importance especially in the context of public procurement, it is supply and demand appear to be risk sources. Analysis of the situation in the toy industry, (Patrik Johnson, 2008) noted that "the demand for products oriented mode for cooking moves hot night and then evaporate suddenly, like the next hot product sweeping the market."

Regarding supply, the supply chains around the world and are adding many political risks and emerging currencies, may interfere with delivery and cost structures change with little notice "Sodhi and Lee introduced contextual risk as an additional source (Sodhi & Lee, 2007). Supply risks are those that can disrupt or delay operations such as political instability and the volatile labor market, for example; potential threats, a competitor who gets a supplier and possibly lock the power, risks of delays and insufficient quality relative. Incoming Supply risk described as "the possible occurrence of an incident with the provision of inputs are connected by individual suppliers or the food market in which the results lead to the inability of the organization purchase order to meet demand or cause specific threats to the lives and safety of consumers' (Zsidisin, et al, 2004). Risk identification, risk analysis, development of risk management strategy (Patrik Jonsson, 2008): The development of the supply risk management strategy process can be described as consisting of activities arising.

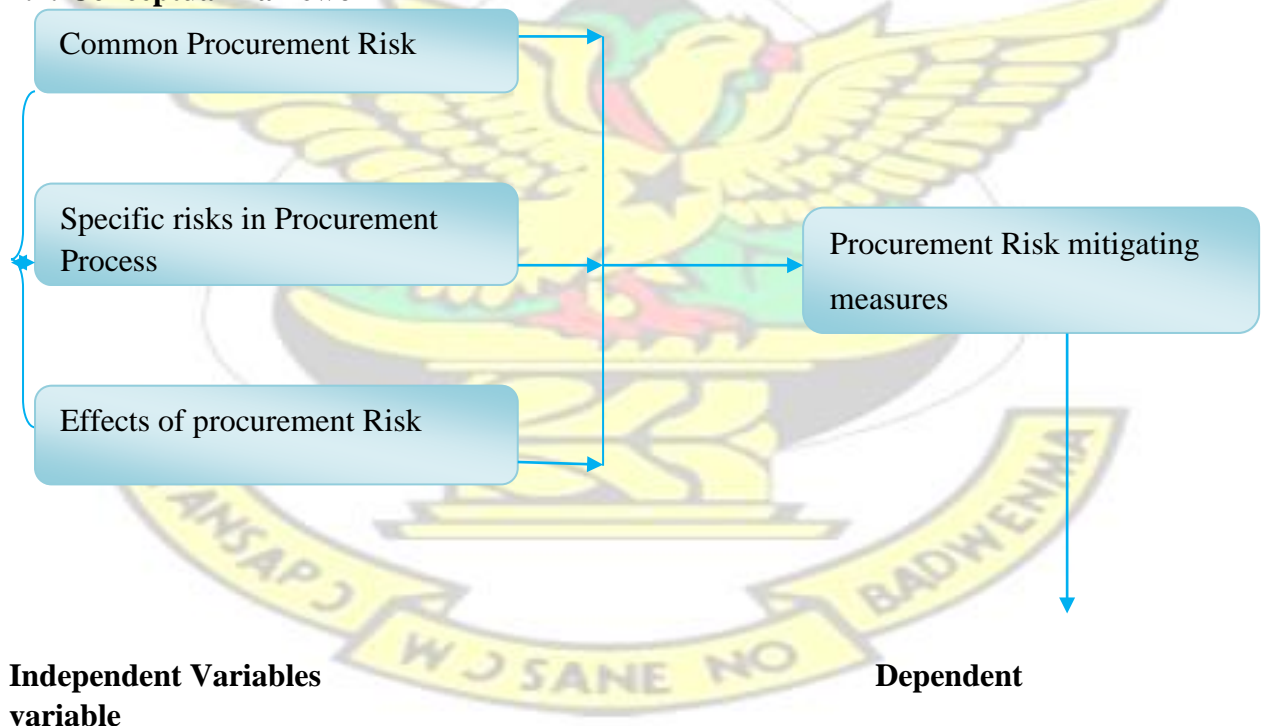
2.3: Conceptual and theoretical framework

A frame is a structure that indicated theoretical relationships between variables. Conceptually, market risk is the dependent variable, which was judged by public procurement procedures as independent variables.

Theoretically, the focus was to variables such as the risk of joint procurement, specific risks in the procurement procedures, the procurement activities and against measures that are in GRIDCO management risk may have implications.

However, Figure 2.1 below describes the relations in this study: The figure below describes the conceptual framework of this study. The concept provides for the joint procurement risk, the specific risks in the procurement process and against measures.

2.4: Conceptual framework

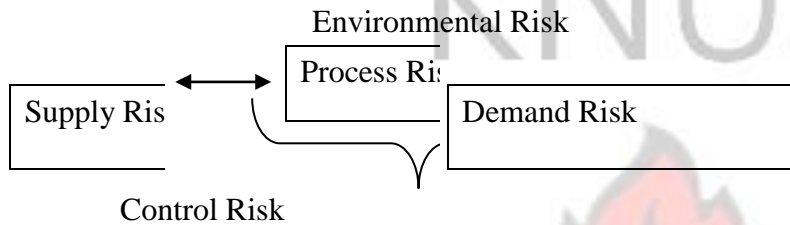


Source: Author's owned, 2015)

Figure 2.1: Conceptual framework

2.5: Common Procurement Risks

In supply chains, the most common sources of risk can be identified by the following scheme according to (Mason Jones and Towill 1988) and cited by (Patrik Jonsson 2008) as environmental, supply, control, process and demand risk.



Source: (Patrik Jonsson, 2008).

Figure 2.2: Common Procurement Risks

Zsidisin, et al, (2004); the first step to manage risk is consciously understood their sources, and that the risk in the purchase can be used as environmental risk, supply risk, process risks, and risk control, (Patrik Jonsson, 2008). The risks which are external are outside the boundaries of the chain system business or supply, occasionally the source for other risks are considered internal influences and therefore by the company itself (Patrik Jonsson, 2008).

Environmental risks: risks origins are external and cannot be influenced by the company or chain of supply; since they occur outside the control of the company and the supply chain (Zsidisin, et al, 2004). Patrik Jonsson 2008 & Zsidisin, et al, 2004) has indicated that external risks can be (eg, terrorist attacks) policies (regulations, environmental taxes), environment (eg, fires, storms, earthquakes) or social.

Supply risk: Supply risk refers to deliver on the business and the relationship with the supplier. The risk is the source or suppliers. Supply risk can be flowed by external risks

so damaged by lightning supplier may in delivery disturbances lead to downstream customers of firms which may not necessarily associated with certain suppliers: Such risk can vary in general and is applicable to the entire line of industry or type of provider. This is the case when a general shortage of capacity of raw materials (Zsidisin, et al, 2004; Patrik Jonsson, 2008).

Demand Risk: demand risk flows and relationship with customers. They could seasonal fluctuations, changes in customer behavior and preferences, changes in design or short product lifecycle (Patrik Jonsson 2008 Zsidisin, et al, 2004) included.

Process Risk: the process is likely due to shortages, changes or deficiencies in internal processes such as material handling, quality control or production processes. And a source of danger can absorb internal or increased risk processes occurring suppliers, customers or the environment. Overcapacity in an internal procedure may be that the effect of the delivery to a customer is the example of minimization (Zsidisin, et al, 2004; Patrik Jonsson, 2008).

Control Risk: Controls are used because of the risks by the internal planning and control system and decision rules. This could lead to material planning method or size of security stocks, problems that are difficult to manage, or may increase or the impact of supply and demand can lead to reduce risks (Zsidisin et al, 2004; Patrik Jonsson, 2008).

The Random House Unabridged Dictionary (2012) defines risk as: "Exposure to risk of injury or loss; a hazard or dangerous chance" The focus is often on risk, but very concentrated on price; the public expects, and the conventional wisdom is that we find the lowest price. Whiles procurement is the process of buying, goods, works or services

from sellers which the client in this case the public institution or the government is unable to make or provide due to certain constraints, care has to be taken in following the procurement process by the actors in their quest to procure services related to energy procurement and distribution.

2.6: Specific Risk triggers within Public Procurement

There are seven key areas in which joint procurement risks can occur after (AS / NZS / ISO 31000: 2009). Here you will find a complete list and different risks can be identified based on the nature of the procurement.

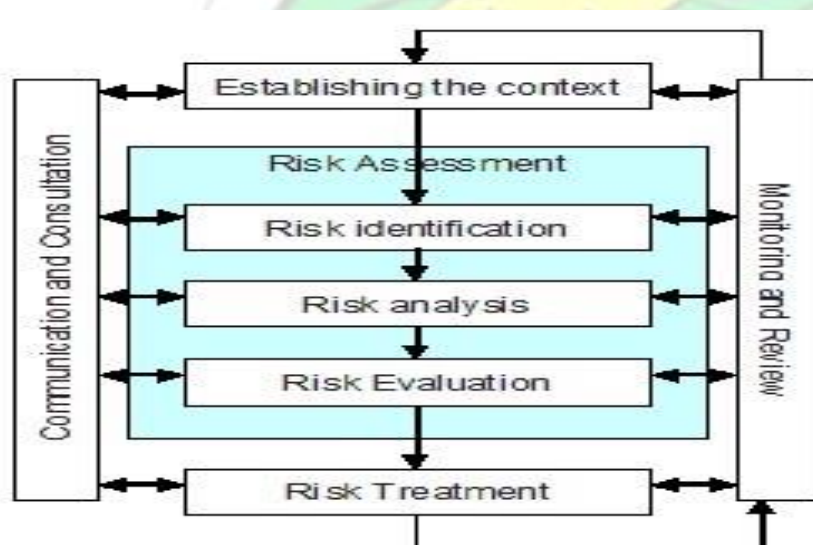
Risk category	Examples
Planning and Preparation	Unrealistic time/cost expectations, conflicts with contracts/agreements existing supply limited capacity to access the necessary information, the legal complexity, delays in obtaining approvals, chose wrong approach.
Products / Services	Limited availability, complex/source product integration into the existing environment, delays in delivery, testing and installation, use of hazardous materials or hazardous processes, the end product/service does not meet the expectations occur.
Procurement Process	Dishonesty or conduct contrary to the ethics, and changes in scope or specifications, proper procedures are not followed, the risks are not managed properly, cannot be achieved offers value for money, government policies are not followed.
Industry and service providers	Lack of interest in response to tender, limited number of potential suppliers, labor disputes, the lack of capacity of individual entrepreneurs, self-satisfaction in long-term relationships with suppliers, non-compliance with contractual partners.
Management	Inappropriate or qualified project team, the lack of communication between the team project group's; responsibilities are unclear expectations and objectives not quite clear and managed, loss of institutional memory regarding the threats, the unethical conduct/conflicts of interest defined.
Stakeholder	The sensitivity of public/attention by the media, the conflict between the parties, the change of government policy /political requirements, ineffective communication and consultation.
Agreement	Offer lapse before the execution, error / omission in the execution of contract by the supplier / terminate the contract, advance payments for goods / receive services, the adoption of terms with suppliers, bank guarantees, markets unmet goals, unexpected changes, scope and / technology, lack of appropriate records, poor management of subcontractors, unfair contract extensions / alterations, fraud.

Source: (AS/NZS/ISO 31000: 2009).

The identification of these common risk purchase the pace of classified unit can supply plan and prepare their annual procurement plan. After AS / NZS / ISO (2009), early identification and categorization of the common risks facing the Company's ability to access the necessary information, the legal complexity, delays in obtaining approvals, chose wrong approach and so the value in the management of public law provide markets.

2.7: Procurement Risk Management Process

According to *ISO 31000*; The main steps of the risk management process are provided to the relevant considerations to contracts: The main principles of risk management (CIPS 2005, PMBOK, 2005, Rita Mulcahy and Laurie Diethelm, 2011) is to ensure early identification and systematic analysis and risk assessment, including interest and develop plans to deal with them conflict; Distribution and acceptance of responsibility for the party best suited to manage risk; and ensure that the management of risks are in line with the importance of the purchase and risks 00for the activities.



Source: Risk Management with ISO 31000.

Figure 2.3 Risk Management Process

2.7.1: Monitoring, Evaluation and Review

The Group purchases will check this policy on an annual basis or on changes to government requirements. The document must be revised entity risk management, with supply glossary risk management guidelines (CIPS 2005).

2.8: Overview of risk mitigation in the energy sector

The global energy market is facing new risks in the form periodic of high demand, tight capacity and high prices, and risks have been subject of major concern in conference held in Brussels by the Secretariat of the Energy Charter, 2010. The Secretary General of the Energy Charter Dr Ria Kemper, indicated that the future of global energy demand will required massive investment for the long term supply.

More so, an increased efforts need to improve the efficiency of energy use and to minimize their impact on the environment. Furthermore, various speakers called for private public partnership approach in solving the energy deficit with strategic schemes of sharing potential risk that might occurred. Among the main topics of discussion were the extents to which high energy prices affect the relationship between producers and consumers of energy, and even if it is the need to rethink the balance within each country between requests potentially competitive market, the environment, taxation and security of supply. For consumer countries, in particular, there was a renewed emphasis on demand-side measures to reduce energy consumption - or at least reduce the growth in energy consumption - in addition to closer cooperation on climate change and clean development.

The conference examined the patterns of change in investment conditions in the energy riding the Energy Charter, particularly the impact of a greater presence of the state in

the energy sector in some producing countries. Some participants stressed the importance of a stable legal and regulatory framework in assessing the long-term risk and return and promotion of major investment decisions needed confidence.

A key element for an energy investment projects successful and balanced international system that is fair and sustainable sharing of risks and benefits between the different parties. In this context, the Conference confirmed the value of common multilateral rules for the energy sector, as required by the Energy Charter to promote a transparent and predictable framework conditions for investment in energy and cross-border flows. It was approved by the Conference that the Energy Charter will work on reducing risks through discussions between the member and observer states and dialogue with the aim of ensuring proper energy identification and appraisal accessed:12 / 06/15.

2.9: Conclusion

Risk management is useful in all public procurement projects. Of course, the amount of time and resources spent on purchases should be proportional of uncertainty involved in the procurement project. In less complex projects with few stakeholders, risk management can contribute to successful and efficient implementation, minimizing delays and lower costs. In the energy sector which involved complex projects with many stakeholders, risk management can make the difference between failure and success of the project in many different dimensions: quality and fit of the solution, efficient delivery on time, the costs of the solution, etc.

There are different types of risk that play a role in procurement management and each types of risk posed an opportunity or a threat depending upon the strategic fit of the institution managing such risk whether within public or private institution mandated to

do so. For instance, technological risks: the innovative idea does not match the technical standards in practice and innovation is not feasible, organizational and societal risks: entity within the public authority results in fail or under-deliver of the procurement – for example lack of social acceptance, market risks: potential target group is larger than expected and financial risks: budget is exceeded.

Public Procurement with budget overruns, delayed delivery, and even complete failure and specifications because of lack of acceptance can be easily crafted to mitigate the potential risk within the process. Public authorities have faced issues with procurement of innovations ranging. There are well known examples widely covered in the media are poorly procurement process and method been followed during emergency situations; where officials opted for single sourcing without proper risk assessment. Without going into the details and discuss to what extent risk management practices are crucial in the procurement of energy, the emphasize on the importance to adopt risk management as a standard practice in all steps of the procurement process which has been covered in this work are relevant especially to GRIDCo as statutory public institution responsible for procurement and distribution of power in meeting the increasing energy needs of Ghana.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1: Overview

This chapter describes the research methods and procedures of the planned of study. The methods have been developed using representative data, from the respondents from

Grid Company Limited, which was the focus of study. The research process that was used in this study was descriptive survey statistics methods used where the data were processed and or analyzed and presented.

3.2: Research Design

Cooper & Schindler (2000); has indicated that every research method has its strengths and weaknesses and certain concepts has adequately examined by some methods than others. The study used descriptive research design. Descriptive research design was chosen because it allows the researchers the results to a large population generalize.

3.3: Validity and Reliability

After Mugenda and Mugenda (2003), the reliability coefficients are calculated in a research study to show how reliable data. A coefficient of 0.80 or more means it. Sometimes a researcher, a high level of data security away with less reliable data, if the sample size is very large or the variables studied are very different between the subjects. But where the sample size and variations in the subjects are small, while the design of the questionnaire is a highly reliable data were guaranteed the quality control and the validity by : face validity, where the instrument has been subjected to by experts to see if it measures what it was intended, content validity, where the instrument has been designed according to the study variables and their indicators of measurement to be measured; it has been ensured that every question was appropriate to construct index for a particular variable by the calculation content validity. Also construct, which has been retained in the same construct by restricting the questions to the terms of the variables and to ensure that the indicators for a particular variable fall. The survey instrument was subjected to general reliability analysis, and there were high reliability ($\alpha = 0.937$). Given this overall picture reliability were analyzed coefficient for the actions of the public procurement process and impact of risk management. The data

presented in this study were analyzed using descriptive Statistics, in which percentages, frequencies, together with the means and standard deviations were calculated and analyzed measured for each items, the public procurement process and impact of risk management.

3.4: Population of the study

The trial was conducted in Ghana Grid Company Limited permanent staff responsible for procurement activities for the energy sector of the economy numbering about one hundred and fifty (150), from which the sample size was selected for the study. Given the limited time for the final presentation of this work is available, the study, however, focuses on officers, such as procurement managers (10), Finance Officers (10), Estate Managers (5), Quantity Surveyors (10), administrators General (10) and engineers (15) for the answers with the thought that the composition for the study mold assembly elements sharing the common set of properties that are involved in the procurement activities of Ghana Grid Company Limited by Chandran (2005).

3.5: Sample size of the study

Sampling is defined by Dran (2004), as a process, in drawing samples from a population in such a way that the sample facilitates determination of some hypothesis about the population used normally. Smith (2014) also postulate that the sample size or the number of observations used to make estimates, proportional is crucial in research. Without a proper sample size, cannot data reliably, and to draw conclusions about misinformation based. The study adopted different methods to arrive at sample sizes of research. Approach formula whiles David A de Vout '*adopted. The sample size of sixty (60) from the sample frame was chosen, were given in the questionnaire as a research tool (hair et al., 2006).*

Furthermore, with 95% confidence level and margin of error of 5% of the sample size was determined by the formula; Where N = population size, n = sample size and α = margin of safety / error So: Where N = total population (sample) \times = margin of error (5%), n = sample size, confidence = 95% Therefore: $n = 150/1 + 150 (0.5)$, $n = 60$ as the sample size.

This study has been positioned in a philosophical tradition, while encapsulating aspects of the ontological, epistemological and axiological terms (hair et al., 2006). The philosophical concerns are in the research study important because to justify them and the shape of the selection of research instruments (hair et al., 2006).

3.6: Sampling Technique

Convenience sampling technique is a non-probability sampling technique has been used for this study. The main objective is to focus on particular characteristics of a population that are of interest, and provide expert opinion on the subject under investigation. It provides the researchers with the Justification, analytical generalizations from the sample, which is examined; you can best suit your research questions (hair et al., 2006) do not answer. It is in this case that experts such as project managers, procurement officers, calculators and financial / Auditors are perfectly selected for the study. The sample studied is not representative of the population, but also for researchers pursuing qualitative or mixed methods research design, this is not a weakness. Rather, it is a choice, for the purpose, depending on the Attraction purposing sampling technique that is used depends. For example, in homogeneous sampling units selected on the basis of their similar properties since such properties are of particular interest to the researchers (hair et al., 2006).

3.7: Instrumentation

The study considered a descriptive survey approach, since it is by collecting primary data to answer questions relating to the current status of the study. The construction of the research instruments are in relation to the determination of the type of a situation designed to address. Determine the frequency and interrelationships between economic and sociological and psychological needs (hair et al., 2006). It focuses on vital facts of the respondents' beliefs, opinions and attitudes and behaviors that provide an understanding of the phenomenon (hair et al., 2006). Five point Likert scale with anchors ranging from "strongly disagree" to "strongly agree", were used to measure the study variables.

3.8: Data Analysis

After Mugenda and Mugenda (2003), is the data analysis process, used in order, structure and meaning to the mass of information collected. Data analysis methods involved both qualitative and quantitative methods. Quantitative data were analyzed using descriptive statistical methods. The study has a descriptive analysis through the use of descriptive statistics, such as central tendency, one sample test, standard deviation as a quantitative data analysis by SPSS (Statistical Package for Social Sciences) version 17 were used.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1: Overview

The chapter four has been divided into two main sections that present data analysis discusses the findings. Thus; findings have been summarized into two sections: Section

A: Analysis of Biographical Data. Section B: Knowledge of risk in public procurement and Section C: Discussion of the findings.

Section A: Analysis of Biographical Data

Table 4.1: Respondents Profession and Experience

Responses	Frequency	Percent
Project Engineers	19	31.67
Procurement Officers	11	18.33
Finance Officers	11	18.33
Quality Assurance Managers	7	11.67
Consultant / Suppliers	12	20.00
Total	60	100.00

Table 4.1 above described the profession of the respondents within Ghana Grid Company Limited which signifies respondents' characteristics to the knowledge on procurement and risk within their sector in the energy procurement of GRIDCo.

From the table above, thirty-one point six seven percent (31.67%) were Project Engineers, while twenty percent (20%) serve as consultant or suppliers to GRIDCo, eighteen point thirty three percent (18.33%) each represent, both Procurement Officers and Finance Officers and the remaining eleven point sixty seven percent (11.67%) were Quality Assurance Managers for the Entity who responded to the questionnaires.

The respondents' implications were equally represented and their professional inputs on procurement activities were considered in the analysis of this research. Each of the respondents responded to the same sample of questions for the study. The implication was to eliminate any form of bias from the study while respondents "credibility characteristics" profession and experience in public procurement, were indicators to this study.

Table 4.2: Respondents Educational Qualification

Table 4.2: Respondents Level of Qualification / Professional Membership

Qualification / Professional Membership	Frequency	Percentage
Higher National Diploma	12	20.00
Bachelors Degree(including Professional membership Association)	28	46.70
Postgraduate (MA/MSc/MPhil/PhD)	20	33.30
Total	60	100.00

Source: field survey, 2015

Analyzing table 4.2 above, twenty percent (20%) of the respondents were Higher National Diploma (HND) holders, forty-six point seven percent (46.70%) were holders of Bachelors' degrees including professional membership association and the remaining Thirty-three point three percent (33.30%) of the respondents were Master degree certificates with professional memberships such as MGIS, PMP, MCIPS holders etc. The implications are that each of the respondents are well qualified and experienced as well as capable of providing professional inputs on issues of risks appraisal in public procurement management.

Furthermore, the findings are significant, as it determined the level of experience of the respondents' couple with the respondents' knowledge and skills with public procurement activities.

Table 4.3: Respondents Number of years working within Procurement Section

Responses	Frequency	Percent
1 to 5 years	9	15.00
5-10 years	20	33.33
10 years and above	31	51.67
Total	60	100.00

Source: field survey, 2015

Table 4.3 above also described the number of years' respondents have been working with the Ghana Grid Company Limited (GRIDCo) Procurement Section and any other related activities on procurement for the entity. From the table above, respondents have been working the entity for the past 1 to 10 years and above; one of the critical determinant characteristics of the respondents' knowledge, experience and skills which are needed on risks identification and management in energy sector and in public procurement.

Section B: Knowledge of Risk in Public Procurement.

Table 4.4: General Procurement Risks types Prevalent within GRIDCo

Variables	N	Mean		Std.	Ranked
	Statistic	Statistic	Std. Error	Deviation	
Environmental Risk	60	1.4333	0.09318	0.72174	4 th
Control Risk	60	1.4667	0.10214	0.79119	3 rd
Supply Risk	60	1.5000	0.09358	0.72486	2 nd
Demand Risk	60	1.9667	0.09196	0.71228	1 st
Process Risk	60	1.2833	0.07916	0.61318	5 th

Source: Field survey, 2015

Table 4.4 above presents descriptive statistics of survey results concerning various types of Risks prevailing within GRIDCo Procurement activities. The mean values obtained from the survey range from 1.9667 to 1.2833 and with standard deviation of means range from 0.71228 to 0.61318 with standard error of 0.09196 to 0.07916. The results indicated the current level of risk for the entity, prevalent and posed challenge to GRIDCo procurement activities. The findings were ranked 1st, 2nd, 3rd, 4th, and 5th accordingly based on their uncertainties (Demand Risks, Supply Risks, Control Risks,

Environmental Risks, and Process Risk). The implications are that management is to draw up risk register and map out strategies in mitigating the risks identified.

Table 4.5: Descriptive statistics of the common risks within Public Procurement

	N	Mean		Std. Deviation	
Variables	Statistic	Statistic	Std. Error	Statistic	Ranked
Poor planning due to unrealistic cost and procurement timing and or information on need assessments	60	2.7000	0.16347	1.26625	1 st
Likelihood of delays in delivery process and contract management	60	2.3833	0.16172	1.25268	5 th
Likelihood of unethical behavior within procurement process e.g. corrupt practices.	60	2.6500	0.17438	1.35077	2 nd
Lack of interest in tender and limited suppliers due to supplier limited capacity and knowledge.	60	2.3500	0.19137	1.48238	6 th
Likelihood of lack of communication across supply chain and lack of understanding among the procurement team	60	1.3167	0.08401	1.65073	7 th
Political demands, ineffective and improper consultation processes	60	2.5667	0.19305	1.49538	3 rd
lack of proper records keeping, mismanagement of subcontractors	60	2.4667	0.14913	1.15519	4 th

Source: Field survey, 2015

Table 4.5 above indicates descriptive statistics on the risk triggers identified within GRIDCo Procurement operations. Analyzing the table above, the mean values ranges from 2.7000 to 1.3167 and the standard deviations of the means range from 1.15519 to 1.65073, an indication that there is no significant difference between the estimated mean with the cut off mean of 3.00000 and the likely determinants that triggered the risk were ranked 1st, 2nd, 3rd, 4th, 5th, 6th, and 7th. The variables were further grouped under risk category which impact on energy procurement. It was found that

most prevalent sources of risk found came from Planning and Preparation, Procurement Process, and Contract and Contract management categories. The research was much concerned about Risk Category two (Procurement Process) as area of focus. Designed Questionnaires were further developed to unraveled specific risk within entity procurement process for which One-sample T-test was conducted.

Table 4.6a: Descriptive Statistics on specific risks in GRIDCo Procurement Process

Variables	N	Mean	Std. Deviation	Std. Error Mean
Need identification & planning purchase, understatement of the need, overstatement of the GRIDCo procurement need can be mitigated internal risk	60	1.5333	0.74712	0.09645
Developing specifications which are inappropriate internal risk.	60	1.3833	0.66617	0.08600

Inappropriate selection of procurement routes or methods - Process risk and or control risk.	60	1.2333	0.42652	0.05506
Unacceptable terms and conditions to bidders due to insufficient information-environmental risk (market research)	60	1.7000	0.78762	0.10168
Insufficient numbers of responses from the client, perceived favoritism in providing informationsupply risk	60	1.4000	0.69380	0.08957
Poor contract administration, variations in price and foreign exchange- environmental, demand and process risk	60	1.5000	0.72486	0.09358
Disposals-collusive bidding at auction, inadequate tender management leading to reduction in valueprocess and control risk	60	1.5500	0.72311	0.09335

Source: Field survey, 2015

Table 4.6a above presents descriptive statistics of survey results concerning specific risks in GRIDCo Procurement Process. The variables were tested for significance. From the findings, the mean values of response obtained from the survey range from 1.2333 to 1.7000 and with standard deviation of means ranged from 0.42652 to 0.78762 as well as the standard error of 0.05506 to 0.10168. It was established that significance test conducted to find out the estimated mean revealed five percent (0.05) level of significant. The variables obtained have the likelihood of impacting GRIDCo energy procurement process.

Table 4.6b: Specific risks in GRIDCo Procurement Process

	Test Value = 5			
	T	Df	Mean Difference	95% confidence Interval of the Difference
Variables				Lower Upper

Needs identification & planning purchase, understatement of the need-internal / supply risk	35.941	59	0.46667	0.3597	0.2737
Developing inappropriate specifications-Internal / supply risk	21.053	59	0.41667	0.2888	0.4446
Inappropriate selection of procurement route or methodsprocess and control risk.	18.406	59	0.46667	0.3768	0.6565
Unacceptable terms and conditions to bidders due to insufficient information-environmental risk (Market research)	32.455	59	0.30000	0.5035	0.0965
Insufficient number of response from bidders due to perceived favoritisms within the systemsupply risk	40.192	59	0.61240	0.7792	0.4208
Poor contract administration, price variation and foreign exchangeenvironmental and process risk	37.401	59	0.50000	0.6873	0.3127
Lack of appropriate Disposal clause, collusive bidding at auction, inadequate tender management leading to reduction in valueprocess and supply risk	16.957	59	0.45000	0.6368	0.2632

Source: Field survey, 2015

In order to test the significance of the estimated mean, a t-test was conducted at five percent (0.05) level of significant and revealed that all the variables obtained were significant. The variables were further explained and categorized under supply, process, control, demand and environmental risks which triggered from poor need assessment, inadequate information, insufficient responses from the client, poor contract administering, unauthorized increase in scope of work, and Collusive bidding at auction, inadequate tender management leading to reduction in value for money were significant and pose threats to Grid Company Limited Procurement Process.

Table 4.7a: One-Sample Test on mitigating mechanisms for procurement risks identified.

	N	Mean	Std. Deviation	Std. Error Mean
Ensure ethical clauses into the contract, while ensuring appropriate training for staff and disposal clause in the initial contract	60	1.6333	0.78041	0.10075
Agreed formula for calculating variations, maintain the integrity of the contract and good contract administration	60	1.4833	0.72467	0.09355
Implement standardized procedures, maintain, audit and review evaluation procedures	60	1.5500	0.69927	0.09028
Select appropriate procurement routes of supply	60	1.2333	0.42652	0.05506
Use Public Procurement Act 2003, Act 663 and provide staff with appropriate training and experience	60	1.3833	0.66617	0.08600
Ensure proper needs analysis and assessment through market research by using an EOI or ROI to clarify requirements	60	1.4167	0.67124	0.08666
Allow adequate time for bidders to respond, while ensuring effective evaluation procedures	60	1.6333	0.78041	0.10075

Source: Field survey, 2015

Table 4.7a presents descriptive statistics of survey results concerning how to mitigate the identified risk within Ghana Grid Company Limited entity energy procurement process.

From the findings, the mean values of response obtained from the survey range from 1.6333 to 1.2333 and with standard deviation of means ranged from 0.78041 to 0.42652 as well as the standard error of 0.10075 to 0.05506, which established that variables were significant in managing risk in energy procurement.

Furthermore, t-test was conducted at five percent (0.05) level of significant and it has revealed that all the seven relevant variables (Document ethical clauses into the contract, while ensuring appropriate training for staff and disposal clause in the initial contract, Agreed formula for calculating variations, maintain the integrity of the

contract and good contract administration, Implement standardized procedures, maintain, audit and review evaluation procedures, Select appropriate documentation for purchase, Use Public Procurement Act 2003, Act 663 and proper needs analysis and assessment through market research by using an EOI (Earn On Investment) or ROI (Return On Investment) to clarify requirements, Allow adequate time for bidders to respond, while ensuring effective evaluation procedures could significantly mitigate procurement risk identified.

Table 4.7b: One-Sample Test on mitigating mechanisms for procurement risks identified.

Variables	Test Value = 5				
	T	Df	Mean Difference	95% Confidence Interval of the Difference	
				Lower	Upper
Ensure ethical clauses into the contract, while ensuring appropriate training for staff and disposal clause in the initial contract	33.416	59	0.36667	0.5683	0.1651
Agreed formula for calculating variations, maintain the integrity of the contract and good contract administration	37.590	59	0.51667	0.7039	0.3295
Implement standardized procedures, maintain, audit and review evaluation procedures	38.216	59	0.45000	0.6306	0.2694

Select appropriate procurement routes or methods	68.406	59	0.76667	0.8768	0.6565
Use Public Procurement Act, Act 663 and provide staff with appropriate training and experience	42.053	59	0.61667	0.7888	0.4446
Ensure proper needs analysis and assessment through market research e.g. uses an EOI or ROI to clarify requirements	41.351	59	0.58333	0.7567	0.4099
Allow adequate time for bidders to respond, while ensuring effective evaluation procedures	33.416	59	0.36667	0.5683	3.1651

Source: Field survey, 2015

Table 4.7b and since the p-value does not exceed 0.05 the observed values are significance and the attained level of significance lead to reject the decisions. And that some of the mitigating measures such as by ensuring that entity document ethical clauses into the contract, while ensuring appropriate training for staff and disposal clause in the initial contract, Agreed formula for calculating variations, maintain the integrity of the contract and good contract administration, Implement standardized procedures, maintain, audit and review evaluation procedures, Select appropriate documentation for purchase, Use Public Procurement Act, Act 663 and proper needs analysis and assessment through market research e.g uses an EOI or ROI to clarify requirements, Allow adequate time for bidders to respond, while ensuring effective evaluation procedures were essential in managing the risks within the procurement process instead of opting for traditional risk mitigating strategies such as by taking insurance and or transfer the risk which ultimately does not entirely removed the risk.

4.2: Discussion of the findings:

From the study it was found that the Ghana Grid Company Limited procurement processes posed uncertainties with potential risks which impact on entity energy procurement undertakings. From the findings, “Demand Risks ranked first followed by

Supply Risks, Control Risks, Environmental Risks, and Process Risk in that order. The risk has various sources from which it occurs. The likelihood of the risk occurrence invariably impact on Ghana Grid Company procurement entity and the entire public procurement process. For instance environmental risk are likely if there is poor continuing market research by the entity to formulate strategic policy to counter the threat that may be posed externally. Furthermore, the increasing demands for energy with limited supply create demand risk flows where clients are unsatisfied with supply. It was found that economic growth was the major determinants. Also, from the supply perspective, it was identified that due to increasing demand without corresponding investments there were likely causes of risk in the energy sector of procurement.

In addition to the above, further investigation conducted revealed the use of inappropriate procurement method (single source or sole sourcing), unauthorized increase in scope of work, and collusive bidding at auction, and among others were identified as threats to Procurement Process.

In order to design various mechanisms of mitigating the risks identified, questionnaires designed as data collecting instruments were used in which respondents identified various mitigating strategies to be used. Risks identified were to pass through qualitative process where matrix such as short, medium and long term management approach are to be adopted in mitigating their occurrence.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1: Introduction

Chapter five presents the review of the research questions, conclusions as well as the necessary recommendations on appraisal of risk management in public procurement for the Ghana Grid Company Limited upon request.

5.2: Review of the Objectives: 5.2.1: Review of Objective one (1): To identify the common risks associated with

GRIDCo procurement.

From the findings, “Demand Risks ranked first followed by Supply Risks, Control Risks, Environmental Risks and Process Risk in that order. This implies that management is to draw risk register and map out risk mitigating strategies to manage the risks identified. The findings has agreed with (Jones and Towill 1988), which was cited by (Zsidisin, et al, 2004; Patrik Jonsson, 2008); which indicated that risk is prevalent in any procurement undertakings. Furthermore, Project Management Institute, contributing into the subject: risk and procurement management, in their (PMBOK, 2013); the fifth edition; has outlined the identification, and management

process on which risks identified should be managed to improve procurement performance.

5.2.1: Review of Objective 2 (two): To find out specific risks triggers in the Procurement of Goods at GRIDCo

From the study, specific activities which has the likelihood of impacting on the Ghana Grid Company procurement processes are poor need assessments prior to purchase of supply, inappropriate or biased product or service, inappropriate procurement method such as Sole Sourcing or Single Sourcing instead of other competitive methods. The rest are insufficient number of response to bidders providing inadequate information, perceived favoritism in providing information, insufficient responses, failure to follow effective evaluation procedures, variations in price and foreign exchange (Sodhi & Lee, 2007; Zsidisin, et al, 2004). In addition are, poor contract administering, unauthorized increase in scope of work, and collusive bidding at auction, inadequate tender management leading to reduction in value for money were significant according to (AS/NZS/ISO 31000: 2009), pose threats to Procurement Process.

5.2.3: Review of Objective three (3): To determine strategies of mitigating the identified risks.

From the study, it was found that entity could adopt mitigating options such as: the need to document ethical clauses into the contract, ensuring appropriate training for staff and disposal clause in the initial contract, Agreed formula for calculating variations, maintain the integrity of the contract and good contract administration, (AS/NZS/ISO (2009). Also, implement standardized procedures, maintain, audit and review evaluation procedures, Select appropriate documentation for purchase. The uses of Public Procurement Act 2003, Act 663 and provide staff with appropriate training and experience as well as ensuring proper needs analysis and assessment through market

research by using an EOI or ROI to clarify requirements. Furthermore, to improve performance, entity should allow adequate time for bidders to respond, while ensuring effective evaluation procedures. The finding has agreed with (CIPS, 2005; PMBOK, 2013; Rita Mulcahy, 2013) who offered various mitigating strategies such as active acceptance, passive acceptance, and or using contingency reserve, and management reserve if the need arises. Order mitigating mechanisms are to identify risk triggers, determine residual /secondary risk & work round, as well as decrease project threats and increase positive opportunities of mitigating the risks identified.

5.3: Summary of major findings

From the study it was found that increasing demand on energy without corresponding supply and investment pose threat to GRIDCo procurement activities. The probable risks were ranked 1st, 2nd, 3rd, 4th, and 5th accordingly based on their uncertainties: Demand Risks, Supply Risks, Control Risks, Environmental Risks, and Process Risk. The implications are that management is to draw risk register and map out strategies in mitigating the risks identified.

Also, when the respondents were asked to find out specific risks in Public Procurement Process which has the likelihood of impacting on the procurement process are:

- inappropriate product or service,
- failure to identify potential sources and select inappropriate method (sole sourcing),
- failure to adequately address enquiries from bidders and perceived favoritism,
- Variations in price and foreign exchange among others were identified.
- to determine strategies of mitigating the identified risks

Finally, mitigating options such as active acceptance, passive acceptance, and or using contingency reserve, and management reserve if the need arises and or identify risk triggers, determine residual /secondary risk & work round, as well as decrease project threats and increase opportunities as well as to increase positive opportunities to mitigate the risks identified were determined.

5.4: Conclusion

Increasing demand of energy without corresponding investments has brought with it increased levels of complexity and products with significant opportunities and risks in managing the purchasing of energy. Procurement and Risk Managers should offer creative but innovative tools and processes of applying in-depth knowledge of the market. Risk management ensures that the clients' exposure to risk is minimized through application of detailed risk management strategies over the contract duration. That entity gets the most from their energy supply contracts.

5.5: Recommendations

To improve performance, the following recommendations were made to management to be incorporated into management process upon request:

- that as part of monitoring review programme, all GRIDCo worksites led by the project team ensures regular risk appraisal.
- that there is the need to document ethical clauses into the contract, and ensure appropriate training for staff on management of risk in the procurement processes.
- that entity maintains integrity of the contract and ensures good contract administration,

- that implements standardized procedures in risk management within the procurement system, maintain audit and review evaluation procedures as well as select appropriate documentation for purchase,
- using risk register while ensuring someone is responsible for the risk identification.
- that the uses of Public Procurement Act 2003, Act 663 as reference point is critical
- that entity should ensure proper needs analysis and assessment through market research by using an EOI or ROI to clarify requirements, while monitoring the critical indicators on environmental, demand, supply, control and process risks.
- that there should be corresponding investment in energy procurement to meet an increasing demand.
- that individual risks identified should be qualified (low, medium, or high) and quantified by assigning weight to it for easy interpretation.

5.6: Scope for further Research

For further research, empirical studies into GRIDCo's procurement process especially how their contingency funds were used as risk mitigating mechanism and whether diverse procurement methods were followed in realizing the objectives of Public Procurement Act 2003, Act 663, thus; in ensuring transparency, fairness' competitiveness, while creating value for money are worthy to investigate.

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APPENDIX

Appendix A

Questionnaire for Respondents

Dear Respondent,

Instructions: Tick ☐ and or provide answers as appropriate.

SECTION A: BIOGRAPHICAL DATA

1. Your Profession/Occupation

Project Engineer ☐ Procurement officer ☐ Finance Officers ☐

Quality Assurance Managers ☐ Supplier/Consultant ☐

2. Highest educational and professional level

Higher National Diploma ☐ Bachelors Degree (including honors) ☐ Postgraduate (MA/MSc/MPhil/PhD) ☐ Other (please specify).....

3. How long have you been working with GRIDCO?

1 to 5 years ☐ 6 to 10 years ☐ 11 to 15 years ☐ 20 years and above ☐

SECTION B- RISK MANAGEMENT IN PROCURING PUBLIC PROJECTS

4. Procurement risk is any uncertainty that impact on GRIDCo energy supply

Agree ☐ Strongly agree ☐ Disagree ☐ Strongly disagree ☐ Uncertain ☐

5. GRIDCO procurement process is characterized by lack of understanding and proper risk assessment prior to signing of contracts

Agree ☐ Strongly agree ☐ Disagree ☐ Strongly disagree ☐ Uncertain ☐

6. There are problems of poor preparation and inadequate records keeping as well as failure to communicate about the likely avenues for risk within the entity

Agree ☐ Strongly agree ☐ Disagree ☐ Strongly disagree ☐ Uncertain ☐

7. Do you often think your entity is under threat due to increasing demand for energy by both domestic and industry?

Agree ☐ Strongly agree ☐ Disagree ☐ Strongly disagree ☐ Uncertain ☐ **8. To be able to appraise or manage risk within entity, entity must be aware of the risk and their sources**

Agree ☐ Strongly agree ☐ Disagree ☐ Strongly disagree ☐ Uncertain ☐

9. Risk in procurement can be defined as environmental risk, supply risk, process risk, demand risk, and control risk

Agree ☐ Strongly agree ☐ Disagree ☐ Strongly disagree ☐ Uncertain ☐

10. Which of the following supply risk prevalent within GRIDCo?

Environmental risk ☐ Supply risk ☐ Process risk ☐ Demand risk ☐ Control risk ☐

SECTION C: COMMON & SPECIFIC RISKS WITHIN THE PUBLIC PROCUREMENT

11. Risk within GRIDCo procurement activity can be categorized into:

Contract & Product/service ☐ Stakeholders & Industry/supplier ☐

Planning and preparation ☐ Procurement process ☐ Management ☐

		Please tick <input checked="" type="checkbox"/>
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Q12.	Indicate the sources of risks available in the	SA-3	DA-2	SDA-3
Risk Category	Public Procurement			
Planning and Preparation	Unrealistic time/cost expectations, conflict with existing contracts/supply arrangements limited capacity to access necessary information			
Product/Service	Delays in delivery, testing and installing, unsafe use of hazardous materials or practices, final product/services does not meet expectations			
Procurement Process	Lack of probity or unethical behavior, changes to scope and or specifications, proper processes are not followed			
Industry and Suppliers	Lack of interest in response to tender, limited number of potential suppliers, industrial disputes, lack of capacity of individual contractors			
Management	Inappropriately qualified or resourced project team, lack of communication amongst procurement team			
Stakeholders:	Political demands, ineffective communication and consultation			
Contract:	Error/omissions in the contract, default by the supplier/termination of the contract, lack of proper records, mismanagement of subcontractors			

NB: SA-strongly agree, DA-disagree, SDA-strongly disagree

Q13.	What are the specific risks in Procurement Process?	Please tick [√]		
Procurement Process		SA-3	DA-2	SDA-3

Need identification & planning the purchase	Understatement of the need, overstatement of the need, misinterpretation of user needs, Insufficient funding, impractical timeframe, probity issues			
Developing the specification	Inappropriate or biased product or service specification, inadequate statement of requirements			
Selecting the purchasing method	Failure to identify potential sources, selecting inappropriate method (single source)			
Purchasing documentation	Terms and conditions unacceptable to bidders, providing inadequate information			
Inviting, clarifying and closing offers	Failure to adequately address enquiries from bidders, perceived favoritism in providing information, insufficient number of responses or no response from known quality suppliers			
Evaluating offers	Failure to follow effective evaluation procedures			
Contract management	Variations in price and foreign exchange, unwillingness of the supplier to accept the contract, poor contract administering, unauthorized increase in scope of work.			
Disposals	Collusive bidding at auction, inadequate tender management leading to reduction in value for money			

NB: SA-strongly agree, DA-disagree, SDA-strongly disagree SECTION D: RISKS MITIGATING STRATEGIES

14. Likelihood understatement of the need, overstatement of the GRIDCO procurement need can be mitigated by: Analyze need accurately and obtain a clear statement of work and definition of need

Agree [] Strongly agree [] Disagree [] Strongly disagree [] Uncertain []

15. Inappropriate or biased product or service specification, inadequate statement of requirements by: ensuring specification is consistent with a needs analysis and Improve market knowledge

Agree [] Strongly agree [] Disagree [] Strongly disagree [] Uncertain []

16. Failure to identify potential sources, selecting inappropriate method (single source) are mitigated by:

Use Public Procurement Act, Act 663 and provide staff with appropriate training and experience

Agree [] Strongly agree [] Disagree [] Strongly disagree [] Uncertain [] **17.**

Unacceptable terms and conditions to bidders or inadequate information are best mitigated by: Use standard documentation prepared by PPA and Select appropriate documentation for purchase

Agree [] Strongly agree [] Disagree [] Strongly disagree [] Uncertain []

18. Insufficient numbers of responses or no responses from known quality suppliers/favoritism are mitigated by: Implement standardized procedures, maintain, audit and review evaluation procedures

Agree [] Strongly agree [] Disagree [] Strongly disagree [] Uncertain []

19. Unauthorized increase in scope of work, contract variations in prices, unwillingness of the supplier to accept contract are mitigated by: Agree on a formula for calculating variations

Agree [☐] Strongly agree [☐] Disagree [☐] Strongly disagree [☐] Uncertain [☐]

20. Collusive bidding at auction, inadequate tender management leading to reduction in value for money Sell by open tender can be managed by Document reasons for decision and maintain an ethical environment

Agree [☐] Strongly agree [☐] Disagree [☐] Strongly disagree [☐] Uncertain [☐]

21. Are there adequate correspondent investments on energy supply to mitigate the recurrent “*dumsor*” being experienced?

Agree [☐] Strongly agree [☐] Disagree [☐] Strongly disagree [☐] Uncertain [☐]

