

Analysis of Risk Management Practices in the Oil and Gas Industry in Ghana. Case Study of Tema Oil Refinery (Tor)

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Abstract

Risk management refers to an interactive process consisting of steps, which when undertaken in sequence, enable continual improvement in decision making. The aim of risk management is to obtain understanding by all parties and agreement around what the risks really are and how they will be managed to improve performance, increase the value of firms and reduce financial distress. We used primary and secondary data in our analysis. The study identified risks confronting Tema Oil Refinery (TOR) as instability in global oil prices, depreciation of the cedi against major currencies, health and safety, political interference, environmental pollution, brain drain, shortage of crude oil, huge debts as a result of subsidizing of petroleum products by government and default on the part of oil marketing companies to pay for products and high operational risks. Other challenges as apathy on the part of staff to abide by safety rules was identified. TOR incorporates risk management in their strategic plan and have operations and Audit risk department but have been battling with effective implementation. Made recommendations to government and management of TOR on how to overcome the problems in implementing risk management in order to achieve the goals of the only refinery in Ghana.

Keywords: Risk Management Practices, Management and industry

1. Introduction

It is an undeniable fact that risk management increases the value of firms and may reduce financial distress. The health and safety of employees poses great risk to the oil and Gas industry. Interruptions in oil production caused by fires and accidents easily lead to significant economic losses, and potential hazards to humans and the environment (Ahleng,2005).Wilson and Shlyakter (1997) defined the concept of risk and its origins in uncertainty. They identified a number of different types of uncertainty and as part of a review of a number of risk calculation methods, they considered the theory of error and concluded that such error is valuable input to any probabilistic risk analysis.

Risk is the likelihood of specific consequence happening. Risk management is therefore recognized as an integral part of a good management practice. Australian Standard AS/NZS 4360:1999-Risk management defined "Risk management as an interactive process consisting of steps, which, when undertaken in sequence, enable continual improvement in decision making. Risk management is a term applied to logical and systematic method of establishing the context, identifying, analyzing, treating, monitoring and communicating risks associated with any activity, function or process in a way that will enable organizations to minimize losses and maximize opportunities. Risk management is as such about identifying opportunities as avoiding or mitigating losses" The aim of risk management is to obtain understanding by all parties and agreement around what the risks really are and how they will be managed. It is also intended to improve performance through early risk detection, mitigation and product life cycle management.

To ensure the development of the private sector and break the monopoly in the oil industry, the government of Ghana by a legislative instrument in 2007 deregulated the oil industry to pave way for fair competition in the industry. Unfortunately the nation's only refinery (Tema oil refinery) has come under heavy public criticism for failing to implement prudent risk management techniques. Emphasis on the heavy debt facing the refinery as well as occasional occupational hazards their employees are exposed to. The fire outbreak at Tema oil refinery on 18th January 2010 which claimed one life and injury to some employees as well as the destruction of the corporation's property raises a lot of questions on the effective implementation of hazard and risks policies by the refinery. TOR which refines 45,000 barrels of oil a day has been going through turbulent times with shortage of crude as a result of huge debt accrued due to government's subsidy on petroleum product. The government of

Ghana in 2010 paid all TOR 's debt (1 billion Ghana cedis debt) owed Ghana Commercial bank accrued over time through government subsidies on petroleum products. The Refinery is battling with operational and financial difficulties resulting in the shutdown of its Residue Fluid Catalytic Cracking and Crude Distillation Unit since March 2012. The questions one poses are, "are stakeholders aware of their risk exposures? Are top executives and employees of Tema oil refinery aware of the many risks the company faces? How are notable risks such as health and safety risk, foreign exchange exposure, political risk and volatility in oil prices and credit risk managed by Ghana's only refinery Have effective management of these risks been incorporated in the company's strategic plan? If TOR have good risk management policies why do they still battle for survival?

2. Aims and Objectives

The Main aim of the study is:

1. To identify major risks threatening the survival of Tema oil Refinery.
2. To examine if Tema oil Refinery incorporates risk management in their strategic plan and its implementation.

3. Literature Review

Risk has many different meanings. For example, in technology and economics risk is expressed as an expected value that an event will be accompanied by undesirable consequences. This is measured by both the probability of the event and the seriousness of the consequences. Besanko, Dranove and Sharley (1996) believe that economists and strategic planners view risk management as being related to the issue of the boundaries of the firm. In this structure, the motive to alleviate risks is comparable to the verdict to outsource a particular purpose. Thus they viewed risk management as being the basis of economical plus. According to Mills (2001), risk management has become a main part in the decision making process. It can affect productivity, performance, quality and the budget of an oil and gas industry. Canvello and Mumpower (1985) review the history behind risk management, going back to the 3200 B.C. Asipu people, widely considered the world first risk managers. Hansson (2004) contemporary discussion of risk identifies 10 fallacies specific to such communication: the sheer size fallacy (risk smaller than another accepted risk should be accepted), converse sheer size fallacy of naturalness (natural risks should be accepted), ostrich fallacy (undetected risks are acceptable), proof-seeking fallacy (if no scientific proof, no action should be taken), delay fallacy (more accurate information will become available, decision-making should be postponed), technocratic fallacy (scientists decide acceptability of risk), consensus fallacy (experts should be asked for consensus), fallacy of pricing (risks must be priced) and infallibility fallacy (experts and public disagree, the public is wrong). Sawczuk (1996) stressed that no matter how small or simple a project is, something can go wrong and therefore risk awareness is vital to all stakeholders to ensure the reduction of possible risk. The most promising contribution to risk management is the extension of implicit contracts from employment, sales and financing (Cornell and Shapiro 1987). Since corporate risk management practices may lead to a reduction in expected costs, company value rises Klimczak (2005). This indicates that stakeholder theory provides a new insight into possible reason for risk management. Agency theory examines the firm to include separation of ownership and control. In corporate risk management in the oil and gas industry, agency issues have been shown to influence managerial attitudes towards risk taking (Smith and Stulz 1985). The finance literature describes risk management as being concerned with identifying and managing a firm's exposure to finance risk where financial risk is defined as the variability in cash flows and market values caused by unpredictable changes in commodity prices, interest rates and exchange rates (Democlan 1997). There is however connection between risk management and corporate governance. Corporate governance is often described as the set of rules, structures and procedures by which investors assure themselves of getting a return on their investment and ensures that managers do not misuse the investor's fund (Shleifer and Vishny 1997) How to ensure that managers create value for the owners of the corporation's stakeholders (Kaen 2003). The connection between risk management and corporate governance can be made through asking how risk management creates values for the owners of the company to ensure that managers manage the company in the best interest of the shareholders when the managers and owners are different people- Berle and Means (1933) Besanko, Dravo and Shanley (1996) believe that economic and strategic planners view risk management as being related to the issue of the boundaries of the firm. Risk taking, risk management, risk detection cannot be exhausted. There will always be unforeseen and unintended aspects of risk environment and the need for it to be communicated. Zimmerman (2003) stated that risk communication is guided by three goals: educating, building consensus and merely disclosing information. Quoting research by Chaucy (1985) that indicates the public is more accepting of communication when it shows accurate management of the risk than when it purely disseminates data, he argues government should focus more on the institutional implementation of risk communication. By enabling two-way communication through public forum, broadening both mission and

jurisdiction and localizing operations and where possible site processes closer to the actual issue site (such as waste processing close to the sites of waste generation), public acceptance can be promoted.

3.1 Risk Management Theories

Economic approach to corporate risk management has so far been the most prolific in terms of both theoretical model extensions and empirical research. This approach builds upon classic Modigliani,-Miller and Modigliani (1958) paradigm which states risk management theory finds conditions for irrelevance of financial structure for cooperate value. This paradigm was later extended to the field of risk management. This stipulates that hedging leads to lower volatility of firm value. Rationale for corporate risk management were conducted from the irrelevance conditions and concluded, higher debt capacity. (Miller and Modigliani,1963),Sarewitz, Pielke, & keykhah, (2003) argued for a disconnect between event risk and outcome risk. The former being the probabilistic risk of an event occurring, while the latter reflects the risk of a certain outcome of an event occurring. They introduced six assertions that are fairly critical of how extreme events are modeled in risk analysis: a recurring pattern in these is that risks need to be viewed from multiple perceptives. Covering the cost of risk, they concluded, does not necessary depend on vulnerability reduction. Taken together, these theories, models and prepositions led to certain but not always explicitly recognized assumption about how managers should manage the corporation .Managerial motivation factors in the implementation of corporate risk management have been empirically investigated in a few studies with negative effect. (Faff and Nguyen 2002;Maccrimmon and Wehrung, 1990;Geczy et al. 1997) notably positive evidence was found by Tufano (1996). Agency theory provides strong for hedging as a response to mismatch between managerial incentives and shareholders interest. In certain industries especially the oil and gas industry, consumer trust in the company being able to continue offering its products in future which can substantially contribute to company value. However the value this implicit claim is highly sensitive to expected costs of financial distress and bankruptcy since corporate risk management practices lead to decrease in these expected costs. Many of the reasons listed in financial management textbooks for undertaking risks management are informed by potential conflict of interest among the stakeholders, managers and creditors; conflict that were noted by Berle and Means in the 1930's. Therefore stakeholder's theory provides a new insight into possible rationale for risk management. Hall (1997) developed a Risk Management Map to help chart a course for increasing the capability to manage software risk. The Management Map contains five evolutionary stages of risk management capability, defined as:

3.1.1 Problem Stage: Describes circumstances when risk identification is not seen as positive. Characterized by lack of communication which causes a subsequent lack of coordination. Crisis management is used to address existing problems.

3.1.2 Mitigation Stage: Details a shift from crisis management to risk management. People become aware of risks but do not systematically confront them. There is uncertainty as to how to communicate risks.

3.1.3 Prevention Stage: Discusses the shift of risk management as solely a manager's activity to risk management as a team activity. This is a transactional stage from avoidance of risk symptoms to identification and elimination of root cause of risks, characterized by team, and sometimes customer, involvement. For risk management to succeed it must occur at each level within an organization. This stage represents a turning point from a reactive to a more proactive approach to risk management.

3.1.4 Anticipation Stage: Describes the shift from subjective to quantitative risk management, through the use of measures to anticipate predictable risks, that is characterized by the use of metrics to anticipate failures and predict future events. This stage involves the ability to learn from, adopt to, and anticipate change, representing a completely proactive approach to risk management.

3.1.5 Opportunity Stage: This represents a positive vision of risk management that is used to innovate and shape the future. Risks are perceived as an opportunity to save money and do better than planned. Risk, like quality, is everyone's responsibility. A continuous process of identifying, communicating and resolving risks in an open and non-threatening environment is used. Administration that some things are not known are acceptable and allowances are made for their existence using a best-case, worst-case scenario.

Petts (1998) delivered a paper to illustrate the importance of communication to the risk management process. The author divides risk management into seven phases, moving from hazard identification to monitoring the solutions put in place. Each of these seven phases requires its own type of communication processes.

The first step in operationalizing risk management is to identify the risks to which the company is exposed. The approach is to identify the types of risks that will be measured. It is the process of examining each work area and work task for the purpose of identifying all the risk inherent in the job. Having identified all of the companies' major risks, management must then find a consistent way to measure the firm's exposure to these risks and to identify and qualify all the firms' significant exposures. Without such an approach, exposure to the same risk could have different effect on the firm's performance. For an inventory of risks to be useful, the information

possessed by people within the organization must be colluded, made comparable, and account of correlation among risk. The second step is to partition risks into categories such as technical, cost, schedule and management, some risks may however fall into multiple categories since some risks are more important than others, risks need to be partitioned also, different stakeholders may be concerned about different risks, or different personnel may bear responsibility for tracking/monitoring different risks. Finally, different risk types may require different mitigation strategies.

The initial activity in risk analysis is to identify contribution factors, then establish a hierarchy of those contributing factors. Similarly, for positive risk, a hierarchy of contributing factors could also be created, this time highlighting those elements for which risk is being undertaken in order to leverage a perceived opportunity for the project, such as "Schedule Completion Will Be Early".

There are many number of ways that risk can be partitioned, analyzed and quantified. The approach taken and method (s) used should always be tailored to meet the needs of the business, the customer and the project.

3.2 Health and Safety in the Oil and Gas Industry

Originally the oil and gas industry is one of the riskiest industries when it comes to health and safety of its employees. Interruption in oil production caused by fires and accidents easily lead to huge economic losses and potential hazards to humans and environments. Shrivastava,(1995) reviews the switch from the industrial to postindustrial revolution from a risk perspective. He identifies a change in understanding that production necessarily implies risk. Risk has also proven not to be merely a technical issue but to have a distinct social profile. It has become a functional equivalent of power. Shrivastava clarifies the disregard management paradigms generally have for ecology. He proposes two alternatives, industrial ecosystems and ecocentric management. The first considers harmful by-products of operations as potential useful input products of other production processes, while the second focuses on better aligning an organization with its natural environment. Markussen (2003), stated several effects on employees' health that a geological survey can produce. He concluded oil and gas production causes chemicals and physical agent exposure, specifically on drilling mud; petroleum products; treatment chemical; radioactive sources. Markussen recommended that all risks must be identified and managed through wisely incorporated resources in order for quality operation to be long lasting. Verma, Johnson and Maclean (2000) undertook research on the benzene and total hydrogen exposures in the upstream petroleum oil and gas industry and formed several safety concerns. The study was based on the Canadian oil and gas industry and total of 1547 air samples taken by oil companies in various sectors were evaluated. The outcome of the research can be generalized for the whole oil and gas industry around the world. For instance, it was discovered that the percentage of samples are over the occupational exposure limit (OEL) of 3.2 mg/mz or one part per million for benzene for personal long-term samples range from 0 to 0.7% in the different sector, and area long-term samples range from 0 to 13%. The findings assist to establish a precaution to the global oil and gas industry that certain operations such as glycol dehydrators should be carefully monitored and there should also be-based monitoring program along with the traditional long-and short-term personal exposure sampling.

3.3 Global Oil Marketing Development

Oil must first be discovered, then produced and will eventually be depleted. Peak oil is not a theory. It is a fact. Oil has already peaked in the USA and more than 50 other oil producing countries. Oil has a finite supply, so just the same as the production of any geological commodity, oil production will graphically (mathematically) 'peak' and then irreversibly decline. Once the halfway point 'peak' has been passed, production begins to fall and oil prices will rise. Peak oil is sometimes misunderstood to mean that 'we are running out'. However, the peak only means we are halfway and there is plenty of oil left, and even conservative estimates are of at least 1.3 Trillion barrels left. The problem is that the oil that is left will not be produced fast enough to meet current or projected needs. The timing of peak in global oil production is highly controversial because of political and economic impact expected from peak oil including the impact on stocks of oil companies in the global market place dependent upon oil for its main source of energy. Many analysts believe peak oil is imminent, even though estimates of the exact year of the peak vary widely from 2010 to 2050 or beyond. Currently being analyzed and discussed is the issue of whether peak oil is being 'marked' by the drop in demand due to the global economic prices and that may be the peak is being shaped into more plateau. This would be similar to the peak in U.S oil production that was predicted as early as 1956 and subsequently actually occurred in 1971, but was not confirmed until about 1974. The fact that the actual peak cannot be accurately predicted, but will only be confirmed years later suggests that aggressive action should be taken to alleviate the economic and political impact of peak oil well before the peak. Unfortunately, it may already be too late to plan intelligently for peak oil impact and the world now faces extreme distress, in securities market and otherwise. Theories that opening the Arctic National

Wildlife Refuge and offshore drilling sites in the U.S to development would alleviate gasoline prices are likely to be misguided; Jim Sweeney, director of the Precourt Institute for Energy Efficiency at Stanford University, says that offshore U.S reserves will account for just 1% of worldwide consumption, but would not be productive for 10 to 15 years. Oil and gas prices are affected by global supply of and demand for this product. Commodity price fluctuation can affect oil and gas business and can impact investment decisions and its financial position.

Demand for oil as well as demand for energy in general is closely held to the global economic cycle. In periods of economic growth, new factories consume energy, shipping company's transport more goods and consumers demand more. This demand for energy or even news suggesting the economy is hitting up-pushes up energy prices. For example in December 2007, five major central banks announced that they will inject money into the world economy to help mitigate the possibility of a recession, immediately the price of oil increased over 4\$ at speculation that energy demand would increase in contrast, during period of economic contraction such as recession demand for oil and other types of energy tends to fall leading to reduction in prices. In china for example, manufacturing fell during July and August 2008, and oil prices followed. According to the international energy agency (IEA) world oil demand was 85 million barrels a day (MBLA) in 2008, it is expected to increase to 105MBLA, by 2030. This has dropped from 2005 forecasts of 120 MBLA in 2030. This decline is due to the impact of the economic crises. Expected increase in oil prices and policies of country's regarding climate change. The agency also stated that sustained investment is needed to combat the decline in output or existing fields, which will drop by almost two thirds by 2030. Demand destruction primarily in the United States is likely responsible for most of the decline in oil prices that occurred during the third quarter of 2008 according to an energy information administration report. Gasoline consumption was expected to drop by 320,000 bpd from 2007 levels and continue to decline. When demand for energy falls, the price of oil falls.

The global oil supply is dependent on the ability of oil companies to produce and the willingness of oil exporting countries to export. Historically, periods of oil price spikes have been caused by oil exporting countries placing embargo on certain countries. In 1973, for example the world's largest oil cartels, OPEC placed an embargo on oil exports to the Netherlands and the United States, in response to the countries support of Israel in the Yom Kipper War; the price of oil acquired by refiners increased by approximately 100% and the US experienced widespread shortages.

In 2007, however, despite a 57% increase in prices, the amount of oil exported by the world's top exporters fell by 2.5%. Demand for oil in the world's six largest exports. (Saudi Arabia United Arab Emirates, Iran, Kuwait, Iraq and Qatar.) Increased by more than 300,000 barrels, while their exports fell by over half a million barrels, while their exports fell by over half a million barrels. In these growing demands in each company acted as a natural embargo, forcing them to meet their needs before exporting to the rest of the world. Oil prices have been volatile because of geo political events affecting the ability of upstream oil companies. Terrorists and political attacks had damaged drilling rigs or the transportation and refining networks- including pipelines, shipping facilities and refineries. For example during the spring of 2008, Nigerian rebels initiated attacks on the oil major pipelines and deep water drilling rigs in the country. (Source: The independent: "oil prices continuous to rise as Nigerian rebels attack Shell" Spring 2008).

4. Methodology

The research would not have been accomplished successfully without relying on relevant data. We relied on two broad data collection techniques which was descriptive in nature. The research technique was primary data and secondary data. The primary data was gathered through the administration of questionnaires to staff and management of Tema oil Refinery as well as Interviews conducted. Two sets of questionnaires were designed for management and employees of Tema Oil Refinery. Five questionnaires were administered to Top management at TOR whilst 50 questionnaires were given to employees. Out of this, three and forty-five questionnaires were retrieved from management and employees respectively.

5. Presentation and analysis of Results

Table 1

Standard guidelines on procedures of managing Risks

| Management | | | Employees | |
|------------|-----------------------|---------|-----------------------|---------|
| Response | Number of respondents | Percent | Number of respondents | Percent |
| Yes | 3 | 100 | 45 | 100 |
| No | 0 | - | - | - |
| Total | 3 | 100 | 45 | 100% |

Source: Field survey 2013

In finding out whether TOR have standard guidelines on procedures in managing risks, both management and employees agreed that TOR use a standard guideline to manage risk.

Table 2

Control measures in implementing risk management process

| Management | | | Employees | |
|------------|-------------------|-----|-------------------|------|
| Response | No of respondents | % | No of respondents | % |
| Yes | 3 | 100 | 45 | 100 |
| No | 0 | - | - | - |
| Total | 3 | 100 | 45 | 100% |

Source: Field survey 2013

Both management and employees of TOR agreed that there are control measures in implementing Risks management procedures.

Table 3

Inculcating employees contribution into the implementation of Risk management

| Response | No of respondents | Percent |
|----------|-------------------|---------|
| Yes | 34 | 76 |
| No | 11 | 24 |
| Total | 45 | 100 |

Source: Field survey 2013

It is clear from the above response that management of TOR after soliciting ideas from employees in formulating its Risk management policies, do inculcate it into its implementation.

Table 4. Management's Assessment of Risk Confronting Tema Oil Refinery (TOR)

| Risk | Number of respondents (3) | | | | | Management Risk Perception Index |
|--|---------------------------|-----------|---------------|----------|---------------|----------------------------------|
| | Critical 5 | High 4 | Moderate 3 | Low 2 | Very Low 1 | |
| Instability in global oil prices | 1 | 2 | 0 | 0 | 0 | 0.20 |
| Depreciation of the cedi against major currencies | 1 | 2 | 0 | 0 | 0 | 0.20 |
| Health & safety | 1 | 2 | 0 | 0 | 0 | 0.20 |
| Credit risk-default on the part of OMC's | 3 | 0 | 0 | 0 | 0 | 0.23 |
| Theft | 1 | 2 | 0 | 0 | 0 | 0.20 |
| Political interference | 1 | 2 | 0 | 0 | 0 | 0.20 |
| Environmental risk | 0 | 0 | 1 | 2 | 0 | 0.11 |
| Brain Drain | 1 | 2 | 0 | 0 | 0 | 0.20 |
| Shortage of crude oil | 1 | 2 | 0 | 0 | 0 | 0.20 |
| Risk of attack on TOR's facilities | 0 | 0 | 1 | 2 | 0 | 0.11 |
| Operational risk (Fire and breakdown of equipment) | 3 | 0 | 0 | 0 | 0 | 0.23 |
| Huge debt owed Ghana commercial bank | 3 | 0 | 0 | 0 | 0 | 0.23 |
| Reputation: Critique from the general public | 0 | 0 | 0 | 3 | 0 | 0.092 |

Source: Field survey 2013

$$\text{Management risk perception} = \frac{\sum_{t=1}^m (a_i \times x)}{n} \quad m.$$

Risk Ranking/Scale (x): Critical 5, High 4, Moderate 3, Low 2, Very Low 1

n= number of scale=5

m= number of risk factors=13

From the Management risk assessment index, it is clear that 3 out of the 13 risk factors considered are most threatening risk that need urgent redress. These are default on the part of oil marketing companies to pay for petroleum products supplied to them on credit by TOR. This according to management of TOR affect the working capital management of the company and has slowed down the growth of the refinery. The future of TOR depends greatly on its ability to recover every debt owed by its debtors. Operational risk such as fire outbreak and breakdown of equipment is another risk which the refinery is still battling with. Fire outbreak has been a serious phenomenon at TOR which results in lost of lives and properties despite the high safety standards in the refinery. Huge debt has been a major problem and has affected the credit worthiness of TOR leading to frequent shortages of crude oil at the refinery since local banks feel unsecured to issue letters of credit on behalf

of the refinery. This unfavourable debt situation can be attributed to the non-immune foreign exchange exposure of TOR.

5.1 Management Position on Barriers to Risk management at TOR

According to management of TOR, the refinery does not lack the expertise to lead the risk management team. They however asserted that there are barriers in implementing risk management policies. They stated lack of cooperation from staff because they do not understand the process of safety methodology management have adopted to manage risk. Employees therefore fail to comply with risk management procedures and flout safety rules with impunity

Table 5 Employee’s Assessment of how Management of TOR Manage the following risks.

| Risk | Number of respondents | | | Total respondents |
|--|-----------------------|--------------|----------------|-------------------|
| | Excellent | Satisfactory | Unsatisfactory | |
| Health & safety of employees | 10 | 30 | 5 | 45 |
| Default by OMC’s to pay their debt | 4 | 26 | 15 | 45 |
| Brain drain | 0 | 19 | 26 | 45 |
| Environmental pollution | 5 | 35 | 5 | 45 |
| Theft in the refinery | 4 | 36 | 5 | 45 |
| Shortage of crude oil | 3 | 2 | 40 | 45 |
| Operational risk: Fire outbreak and breakdown of Equipment | 8 | 27 | 10 | 45 |
| Huge debt due to foreign exchange exposure | 0.0 | 9 | 36 | 45 |
| Reputation: Public critique | 0.0 | 15 | 30 | 45 |
| Political interference from the government | 0.0 | 3 | 42 | 45 |

Source: Field survey 2013

On foreign exchange exposure confronting TOR which result in huge debt and shortage of crude oil, employees of TOR expressed their dissatisfaction in the way and manner management manages this problem. Foreign exchange exposure has been a protracted canker to the refinery since there is no reliance on financial derivatives to mitigate this risk. Health and safety of employees which management ranked as a high risk facing TOR, 67% of the employees expressed satisfaction with the way management is handling their health and safety needs, 22% said management is excellently managing their health and safety needs. This corroborates management assertion that the refinery has high safety standards. On default of oil marketing companies (OMC) to pay their debt which management ranked as critical risk facing the refinery, 58% of the employees responded they were satisfied, 33% were not satisfied whilst 9% said management is excellently managing their credit. It can be concluded that majority of TOR’s employees are satisfied with management strategies in debt collection. On brain drain which management assessed to be a high risk confronting TOR, 58% of the employees seemed dissatisfied, whilst 32% of the employees were satisfied with how management manages the brain drain affecting TOR., Majority of employees are not satisfied how management is handling this problem. Theft in the Refinery is seen by management to be a high risk, 80% of the employees expressed their satisfaction on how management manages theft 9% claimed it is done excellently whilst 11% were not satisfied with management on the issue of theft. In assessing operational risk, which management ranked as a critical risk confronting the refinery, 60% of employees expressed satisfaction, 18% gave management excellent and 22% were not satisfied with the way management is managing operational risk in the company. This suggests that majority of employees of TOR are satisfied with management addressing its operational risk. This confirms the appreciable

level of safety guidelines at TOR. On how management manages critique from the general public, 67% of employees were dissatisfied and 33% of employees satisfied with management on the firm's reputation. Employees are dissatisfied on how management manages public criticism of TOR. On political interference, management ranked it as a high risk facing the refinery. 93% of employees are of the opinion that management have failed in managing political interference.

5.2 Risk management practices adopted by TOR to mitigate Critical and High Risks.

On foreign exchange exposure, such as depreciation of the cedi against the dollar and instability in the global oil prices, management of TOR constantly advises both the National Petroleum Authority (NPA) and government to adjust the ex-refinery prices as the cedi/dollar changes so that the working capital of TOR can be preserved. For instance Tema Oil Refinery lifts crude oil from Nigeria. Prices are quoted in dollars, but sell the final products to the oil marketing companies in local currencies, should the US Dollar appreciate substantially, relative to the cedi, the dollar value of TOR's outstanding debts and receivables will increase. If the dollar remains strong for a longer period, TOR'S overall competitive position will weaken and the appreciation of the dollar will cause huge debt resulting in TOR's inability to honour their debt obligation to its credit suppliers. Default on the part of OMC's according to management threatens to erode the working capital of the refinery. Management adopts the following policies to reduce risk of default. OMC's are expected to produce bank guarantors before credit is granted them. Management has embarked strictly on operation cash sales to OMC's if possible. Management also places limits that OMC's cannot exceed in order to reduce huge unpaid debts. To recover debts owed by OMC's, TOR in January 2010 published the names and debt owed her by oil marketing companies. These defaulting OMC's were denied supply of petroleum products until the old debts were settled. Risk management practices to reduce fire out break and break down of equipment. Management stressed that fire outbreak and breakdown of equipment are critical risk to the refinery which can result in the total collapse of TOR. TOR therefore implements safety measures so safety departments provide training to staff to help prevent fire outbreak and frequent breakdown of equipment. TOR has high safety standards. TOR also has an insurance policy for such residual risk.

5.3 Employees Position on Barriers to Risk Management Practices at TOR.

Most (95%) employees of TOR who responded to the questionnaires out lined the following as barriers to risk management practices at TOR. Bad attitude of workers towards risk management. Inadequate reporting guidelines from management to employees of TOR. Lack of regular training or inadequate training due to non-availability of state of the art facilities to enhance training. Inadequate modern equipment. Non-enforceability of risk management policy by management. Poor supervision of risk management policies. Employees have not yet understood the relevance of risk management. Risk management is taken for granted. Lack of state of the art equipment for the safety department. Frequent rate of engaging casual workers who always fail to apply safety measures. Failure to use safety wears by some workers. Workers failure to always abide by safety rules. Lack of Punitive action against those who flout safety rules.

5.4 International Agency's Assessment of Risks at TOR.

A global political and credit risk insurance analysis published an article entitled "Tema oil refinery debt downgrades Ghana in global insurance risk analysis". The publication portrayed Ghana among the world's 18 most risky countries and that Ghana's down grading is as a result of the debt incurred by the country's only oil refinery, The Tema Oil Refinery (TOR), according to the analysis by Aon Corporation, the Chicago-based insurance Brokerage. Aon's 17th annual political and economic risk map for 2010 ranks countries according to levels of perceived political risk ranging from low risk to "very high" risk. The following countries were noted as low risk; United States, Canada and countries in Western Europe. The Eighteen countries that have seen conditions worsened which lead to a downgrade are: Algeria, Argentina, El Salvador, Equatorial Guinea, Ghana, Honduras, Kazakhstan, Latvia, Madagascar, Mauritania, Philippines, Puerto Rico, Seychelles, Sudan, URE, Ukraine, Venezuela and Yemen. Of the eighteen countries, four countries have been identified as major downgrade and these are Latvia, Ghana, Yemen and Ukraine. TOR has a debt of \$680 million, according to the former governor of the Bank of Ghana, Dr. Paul Acquah. The analysis noted that a major issue for underwriters is the risk of government not paying sovereign debt obligation and Ghana was cited as a typical example with the TOR debt. Miles John Stone director of Aon's political risk team was quoted as saying, "high risk counties generally have little cover available.... But it's not impossible to place cover" In Ghana, he said the state-owned oil refinery defaulted on \$600 million in debt. While much of that is internal. He noted so far \$50 million has

been paid by insurers for oil import contract, and notification of loss are still pending. (Source: <http://www.Ghanabusinessnews.com/2010/01/28>).

6. Conclusions and Recommendations

The objective of the research was to identify major risks confronting Tema oil refinery. To examine if Tema oil refinery incorporates risk management in their strategic plan and to also identify the challenges they face in the implementation of risk management. After computing and decomposing Risk indicator, it became clear that the most crucial Risks which the refinery is still battling with are foreign exchange exposure resulting in huge debt to the Refinery. Top management of TOR formulate and incorporate risk management policies in their strategic plan. The refinery provide training in risk management to employees and develops standard guidelines and controls in implementing and managing risks as well as regular review of such policies. The major problems and challenges facing TOR in implementing risk management policies are lack of cooperation from staff because they do not understand risk policies adopted by management. There are some risks which are beyond the scope of management hence they only offer pieces of advice to the government on how to mitigate them. Despite all these challenges and problems most employees of TOR expressed satisfaction on how management manages most of these risks. The company should embark on the use of derivatives like futures, forwards, options and swaps to mitigate its financial risks. They should learn how refineries in the United States have successfully used such derivatives to reduce losses. Strategies such as currency swap for financing its operations to reduce the likelihood of TOR experiencing serious financial problem from unexpected exchange rate movement. Managing currency risk may encourage credit suppliers to supply more crude oil because of the ability exhibited by debtors-TOR to withstand financial difficulties. The improvement in TOR's financial position as a result of risk management will lead to improved terms of transaction. For instance with proper risk management practices, Nigeria may increase the days credit from 90days to about 120days. Casual workers and contract workers engaged by TOR must go through thorough training in risk management prior to their engagement. This has become necessary because management see no need to spend scarce resources on casual workers who are always blamed for failing to observe basic safety rules in the refinery. TOR should step up its educational campaigns on safety for workers to understand the relevance of risk management. This will reduce the bad attitude of workers towards risk management. Management should also be committed to enforcing risk management policies. A well defined reporting guideline should be in place and punitive action should be fairly enforced on workers who flout risk and safety rules. For TOR to fulfill its constitutional mandate, government should be seen to be playing its oversight responsibilities freely and fairly. Conflict of interest should be avoided. For TOR to reduce the huge unpaid debt from oil marketing companies(OMC's) who are given credit facilities, proper credit rating should be carried out on such OMC's. Those with high credit rating should be given credit facility secured by assets. OMC's with poor credit rating should not be given credit facility, transactions should be strictly on the basis of cash sales. This will help reduce the huge debt facing the refinery. If government continues to pay TOR's debt, they will continue to interfere in the management of TOR. TOR should therefore have the financial authority to avoid governmental interference. Borrowing to pay TOR's debt cannot be sustained. Private sector participation in TOR will be a panacea to its predicament. The operations and risk audit department should be well resourced to discharge its duties with professionalism. The refinery should invest in state of the Art equipment to avoid frequent breakdowns and fire outbreak due to the use of outmoded equipment in the refinery. The use of modern facilities could reduce operational risks. Shortage of crude is a critical risk facing the refinery and if not addressed can collapse the refinery. There should be a long term contract for the regular and reliable supply of crude oil from oil producing countries. Being an oil producing country, TOR should be resourced to refine our own crude oil for the local market. The high turnover rate of experts from the refinery is alarming and calls for urgent attention. Incentive packages like bonuses, professional allowance, share of excess profit and special promotion should be instituted to motivate these experts to remain with the refinery.

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