The road construction history in mauritius construction essay

CHAPTER 1

Since, 1860s there has been evolution of road construction by first introduction of railway system as a means of goods transport in Mauritius. However, in 1964s railway system was stopped due to persistent unprofitability and there was the introduction of motorized transport. There has been construction of road networks to cope with the increasing road traffic congestion like goods vehicles, buses, cars, motor etc. There are 2 066 km of roads in Mauritius in which 48. 5% are main roads, 28. 7% are subsidiary roads, 3. 6% are motorways and the remaining 19. 2% are made up of further types of roads. Three major road construction companies involved in the decongestion of roads in Mauritius namely Rehm-Grinaker Construction Co. Ltd, Gamma Civic Ltd and Colas (Maurice) Ltée. 1. 2 COLAS IN MAURITIUSColas were established in Mauritius since 1986 as (A&J Maurel Construction Limitée) which is now registered as Colas (Maurice) Limitée since June 2009. It is a frontrunner in the building and maintenance of road, air, rail and transport infrastructure, urban development plans and recreational conveniences. Colas (Maurice) Ltée has played a significant role in the development of the national road networks in Mauritius and Rodrigues. 1. 3 COLAS (MAURICE) LTEE ROAD CONSTRUCTIONColas first came with 1 Asphalt Plant for the road construction in Mauritius as the main projects were given mostly to other companies. Now Colas (Maurice) Ltée has 4 Asphalt Plant in operation in Mauritius and as a result of its long established experience and trustworthiness in road construction, Colas (Maurice) Ltée had been awarded some main contracts which are as follows: Realignment of Laventure Road, Construction of Gros Bois – Mare D’Albert Link Road, Triolet

Bypass, Second Carriageway, Pamplemousses to Forbach, Widening of Motorway M1 between Pailles and CaudanConstruction of Port Louis Ring Road- Phase 1 from Montebello to GuibiesWith the good completion of these major projects, Colas (Maurice) Ltée is now with an ongoing construction of the Terre Rouge-Verdun-Trianon Link Road and the Runway and Parallel Taxiway at the Airport of Mauritius. The company has set up a new hot mix Asphalt Plant different from the other 3 Asphalt Plant in Plaine Magnien on a site next to a stone crushing plant belonging to United Basalt Product Ltd (UBP). The Asphalt Plant there is actually producing for the construction of the Runway of the Airport and it receives aggregates from the stone crushing plant nearby which is helping a lot to complete the project right on time.

1. 4 INTRODUCTION TO HEALTH AND SAFETY

The Occupational Safety, Health & Welfare Act 1988 was repealed and replaced by Occupational Safety and Health Act 2005 in October 2005 as the dynamism of the world of work demands a continuous analysis of the law. The OSHA 2005 aims at " consolidating and widening the scope of legislation on safety, health and welfare of employees at work". This Act utterly binds the State, meaning it is appropriate invariably in the public sector. Though this legislation is not yet in force; it is pending for announcement. If it were to be obligatory now, the government himself, as owner, would be in contravention due to the shortage of Safety and Health Professionals at the time being. OSHA 2005 is not much different from OSHWA 1988, except that it comprehends more elaborate provisions in respect to duty holders’ tasks. Also some unspoken provisions in the preceding law have been rendered more explicit. For example there are precise provisions with respect to risk

assessment, safety and health policy, escalators, manual handling processes and health surveillance of workers. The consequences for offences have been reinforced. Every workplace risk exist which may cause danger to the health and safety of employees. It is therefore necessary that mitigating actions are taken to protect workers and other people who may be affected from these hazardous situations. There are number of control methods that can be used to tackle occupational hazards. Controlling a hazard at its source is the first and best choice because this method will eliminate it from the place of works altogether or will isolate it from the workers. However, it is imperative to first of all identify the hazards and to take the required action to reduce the risk or eliminating them. Risk Assessment is therefore one essential component in the hierarchy of controls that can significantly reduce the number of accidents and injuries in the workplace. Regardless of whether a workplace, a workshop or a company is involved, such an analysis allows to form the hierarchical order of hazards depending their dimension and the efficient assignment of resources for priority measures. Risk assessment implies the identification of all risk factors within the system under examination and the quantification of their dimension, based upon the combination between two parameters: severity and frequency of the maximal possible consequences for the human body. Management participation is fundamental in preserving a health and safety condition at work. OSHA (2005) places a legal duty on employer to provide a safe work setting. According to section 5(1) of OSHA (2005) it states that " Every employer shall, so far be reasonably practicable to ensure the safety, health and welfare of all his employees". An employer has the duties under OSHA (2005) to assess risks in the workplace. Risk assessments shall be carried

out by employer so as all risk is being identified and preventive measures are being taken.

1. 5 RISKS IN CONSTRUCTION INDUSTRY

In construction industry, it could be the likelihood of the occurrence of an event or a combination of events which occur during the whole process of the construction that are risky. In the various definitions of risk, there are many different ways of categorizing risk in a construction industry. Some categorize risk as external risk and internal risk and in more detailed categories risk as political risk, financial risk, market risk, social risk, safety risk, etc. Since construction works have changed significantly over the past several years with the use of new technologies, it also represents greater risk than older ones. Thus, risk assessment is a tool to identify those risks in a project and manage it accordingly with proper treatment. Risk is inherent and tough to deal with. Risk Management is a strict and methodical process of identifying, analyzing and responding to hazards throughout the life-cycle of a certain construction project to risk elimination and control. Some sources of risk in construction projects are: Misunderstanding of ContractsPoorly defined responsibilitiesUnskilled staffPoor coordinated work

1. 6 PROBLEM DEFINITION

The types of exposure to risk that an organisation is confronted with are wide-ranging and differ from one organisation to another. These contacts could be the risk of business disaster, the occurrence of major construction accidents and organisation dangers. It is appropriate to comprehend and recognize the risks sooner as possible so that proper control can be executed to retain specific hazards or to transfer them to lessen any likely undesirable

aspect they may have. As Colas is involved in many activities such as construction of roads and buildings, Safety and Health is the integral part in the organization. Most of their employees carry out their work on-site and while performing their activities, different types of hazards and accidents occurred which could be prevented by risk assessment. The employees are also provided with PPE but they do not use it in a proper manner and for some among them, they are not comfortable with the PPE. Risk Assessment plays a fundamental role in identifying the types of hazards and recommending measures to minimize or eliminate the risk. The risk register shows that there is an increase in accidents on the asphalt plant industry. YearAccident2009272010642011512012 39Table 1 Number of accidentsFigure 1 Number of accidentsFigure 1 represents the number of accidents that normally occurred at colas sites. As it can be found that every year accident occurs and the highest number of accidents occurred in 2010. The accidents are obviously in connection to the number of construction projects given to the company and the management commitment towards safety of employees. The number of accidents until mid-year 2012 was found to be about 39 which could increase more by the end of the year. Identification of the main types of hazards and taking remedial measures is fundamental in reducing the rate of accident.

1. 7 AIMS AND OBJECTIVES

1. 7. 1 Aims of the project

The main aim of this assessment is to develop a risk assessment plan while doing surveys and risk assessment in order to reduce the level of hazards and accidents on the asphalt plant industry.

1. 7. 2 Objectives of the project

Evaluate the effectiveness of risk assessment in identifying the risk of an asphalt plant industry for the construction of the Parallel Taxiway at the Airport of Mauritius. Analyze how risk assessment can reduce risk, be cost effective and increase productivity. To evaluate the type of health hazards involved in an asphalt plantTo propose recommendation based on the research findings so as to minimize the health hazards to employees.

1. 8 METHODOLOGY

In order to achieve the aim of this assessment, and to help the employees to have a safe place of work, these tools would be useful: Data collection through survey, questionnaire, interview and observations, To propose measures for the risks identified, do a risk assessment, Risk assessment matrix, Data analysis through SPSS software which is a Predictive analytics program which helps an organization to anticipate change to improve outcomes through planning and implementations of strategies.

1. 9 OUTLINE OF THESIS

Chapter 1 – Introduction

Road Construction in Mauritius, Colas in Mauritius, Colas Road Construction, Health and Safety in Mauritius, problem definition, aims and objectives, proposed methodology.

Chapter 2 – Company Profile

Colas Ltd (International) and Colas (Mauritius) Ltd, Structure of the company, description of the structure

Chapter 3 – Literature Review

Importance of a Health and Safety at work, OSHAS 18001, Concept of OSHAS18001, Hazards involved in an asphalt plant industry, risk identification, risk assessment and risk control.

Chapter 4 – Research Methodology

Methodology (risk assessment data, questionnaire, interview) and tools and techniques used, for example, risk matrix.

Chapter 5 – Findings and Analysis

Analysis of the risk assessment results through SPSS and interpretation of the results.

Chapter 6 – Recommendation

Discussion on the new risk assessment and proposed measures.

Chapter 7 – Conclusion

Has the proposed objectives been achieved?

Chapter 2

2. 1 COLAS LTD INTERNATIONAL

The Colas Group International is a frontrunner in the building and preservation of road, air, rail and maritime transport structure, town development plans and leisure facilities. Colas internationally consist of 66, 000 employees where half of them work in France and a network of 800 revenue centers and 1, 400 production units operational in nearly 50 countries on five continents. The Group carries out 110, 000 projects each year and in 2011, Colas posted 12. 4 billion euros of consolidated revenue.

The organization share of net turnover amounted to 336 million euros. This business accounts for 80% of revenue which consists of three activities: Construction and preservation of roads, highways, airport taxiways, port, industrial and logistics structure, automobile and tramways, urban conveyance and recreational facilities, bicycle tracks, and more. Building and reutilizing of construction supplies (aggregates, combinations, folders, asphalt mixes and ready-to-use concrete) through a widespread global network of excavations and emulsion, asphalt and concrete plants; building and sale of bitumen. Colas also offers a wide range of additional road-related products and amenities: signage, safety and traffic management systemscivil engineering structures and pipelineswaterproofing, cladding and roofingbuilding construction, restoration and deconstructionrailroad infrastructure construction, upgrading and maintenance

2. 2 COLAS (MAURICE) LTÉE

Colas (Maurice) Ltée is a subsidiary of the Colas Group operating since 30 years in Mauritius with its head office in Coromandel, Colas has also developed activities in Rodrigues Island. Road works is 70% of its overall activity, building and civil engineering 15% and private contracts 15%. Colas (Maurice) Ltée has set up a system of quality management with objectives for quality work, customer satisfaction, and continuous improvement of its performance. Colas is also committed to share its expertise by training graduates, operators, Mauritian engineers to new technologies not yet used on the island. With the thrust of the government's highway projects and the overall economic development of the island, the activity of road construction has become very strong since 2008. The RDA (Road Development Authority)

is at the origin of many innovative projects, and is now one of the main clients of Colas (Maurice) Ltée. In addition to the maintenance of standard sizes projects on the existing road network, Colas has turned to the " major projects" where duration of work exceeds 12 months. Spread throughout the island, they represent real technical challenges for the company. Some of the major achievements of Colas (Maurice) Ltée during the past three years have been the construction and completion of the Pamplemousses-Forbach Carriageway, the Triolet Bypass and the Phoenix Beau Songes Link Road. Based on its expertise and the efficiency of its manpower, three of the island’s major infrastructural projects have been awarded to Colas (Maurice) Ltée: The Ring Road Phase 1 Pailles to Caudan, the Terre Rouge-Verdun-Trianon Link Road (A First in Mauritius) and the Runway and Parallel Taxiway at the Airport of Mauritius. Moreover, Colas (Maurice) Ltée is also participating in the PPP (Public Private Partnership) project for a better Mauritius.

2. 3ORGANIZATIONAL STRUCTURE

2. 3. 1 Administrative Department

The administrative department elaborates and implements the information, communication and financial management systems that enable the strategic planning of the company. Genuine control unit, the administrative department account for compliance with local regulation and ensures that internal procedures are in line with the Group general policy.

2. 3. 1. 1 The Accounting Department

The detail figures of various operational and functional costs of the company reflect of the performance and profitability of the company; they explain its functioning and guide it towards optimal development.

2. 3. 1. 2 The Human Resources Department

Responsible for managing over 1000 employees, the recruitment, payroll and compliance with social regulation, this department is a key link in the running of the company.

2. 3. 1. 3 The IT Department

With more than 120 connection to the internet network, this department assures the flow of information and links over 150 configured terminal across the island for the colas department.

2. 3. 2 Divisional Manager of Building and Civil Department

Divisional Manager of Building and Civil Department helps to establish objectives that define key result areas of the Division and communicate to their staff. Moreover, this department helps to prepare and submit construction project budget estimates so as the director can evaluate the project and provide resources.

2. 3. 3 Divisional Manager Road, Workshop and Major Works.

Division Managers provide leadership and assistance to their team members. They provide technical direction and work-related advice. They oversee, review and direct the actions of their team members' deadlines. Moreover, they also manage the communication and facilitate inter-departmental

cooperation and shared assignments and projects. They make sure that their employees meet their organizational goals and so as to provide high quality of service.

2. 3. 4 Health and Safety Department

Colas Mauritius reinforces its action towards the prevention of work related accidents for all of its activity. Indeed, increase labor force and the recruitment of staff that are not familiar with site activity amplify the risks of accidents. While benefitting from the exchange of good practices and experience of other branches of the group, Colas Mauritius has defined a security policy adapted to its activities and to the particularities of the local environment. With a continuous frame of mind, the frequency and gravity of work related accidents are monitored via indicators so as to meet annual targets. Action plans are implemented base on the assessment of the risks and the finding of the root causes of the work related accidents. The elaboration of the safety policy of colas Mauritius is based on the specific health and safety recommendations: monthly " safety talks", training module (road safety, scaffolding assembly, operating construction equipment, handling of fire extinguishers, etc.), enhancing awareness about the important of personal safety equipment and safety audits.

SITES OF COLAS (MAURICE) LTÉE

After the completion of the Ring Road Phase 1, Pailles to Caudan, the major projects that Colas is working on are the Terre Rouge-Verdun-Trianon Link Road which is a first in Mauritius and the Runway and Parallel Taxiway at the Airport of Mauritius. For these constructions, Colas is using its own Asphalt Plant where it produces the different types of asphalt needed with the

mixture of bitumen and aggregates which it takes from UBP and Gamma. Colas has always been placing its Asphalt Plant on the site where the stone crushing plant is found and near the construction sites so that it is easy for the loading and unloading of materials and asphalts.

PROBLEMS INVOLVING HEALTH AND SAFETY ON SITE

Construction workers are at risk of exposure to various health hazards that can result in injury, illness, disability or even death. Different types of health hazards are grouped as: ChemicalPhysicalBiologicalErgonomicChemical are fond in variety of products used at construction sites. Workers may also be exposed to chemicals generated during construction activities and these hazards are: dusts, fumes, liquids, gases, vapors and fibers (solids). Physical hazards are different types of energy which may be hazardous to workers and these include: noise, vibration, temperature extremes and radiation. Biological hazards also can cause diseases or illnesses for example, bacteria and viruses. Ergonomic hazards can cause painful and disabling injuries to joints and muscles and these occur from: Heavy, frequent or awkward liftingRepetitive tasksExcessive forceUsing wrong tools for a particular job or simply using the tool improperlyErgonomic hazards are the most frequently occurring health hazards in construction and the cause of most injuries.

SITE SELECTION

The site chosen for this assessment is the Runway and Parallel Taxiway at the Airport of Mauritius. Apart from road construction, Colas also provide extensive airside capabilities and expertise on all aspects of airfield pavement construction and maintenance. Employees working at the Asphalt

plant industry of the Parallel Taxiway, they are exposed to many health hazards resulting from their own work as well as from nearby activities. For example, they are exposed to materials that can cause serious illness and affect health in the long-term. Workers are also exposed to noise, vibration, chemicals and more hazards on the site. These types of hazards and risks should be prevented on construction sites and this can be done by doing a proper risk assessment.