

**EVALUATION OF HEALTH AND SAFETY PRACTICES AND POLICIES AT
ELECTRICITY COMPANY OF GHANA, THE CASE OF THE ASHANTI EAST
REGION**

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DECLARATION

I, DANIEL DONKOR, the author of this study, hereby declare that except for the references to other people's work, which I have duly acknowledged, the work presented here was carried out by me, a student of KNUST, School of Business, under the supervision of Miss. Vivian Osei.

I also declare that this work has never been submitted partially or wholly to any institution for award of a certificate.

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DEDICATION

To my wife and two sons for their love, support and care. Naomi, Christian and Prince -
Emmanuel I love you all.

KNUST



ACKNOWLEDGEMENT

I am grateful to my supervisor Ms. Hannah Vivian Osei for her assistance, advice and support without which I would not have successfully executed this project work. Her objective appraisal of this work has been invaluable. I am also grateful to all the respondents at ECG Ashanti East Region for giving me the opportunity to interview them and their immense support, I am very grateful to you all.

May God bless all those who helped me in diverse ways.



ABSTRACT

Employers in Ghana are required by the Ghana Labour Act 2003, Act 651 (sections 118, 119 and 120) to ensure their employees are not exposed to conditions that would lead them to work-related injuries or illnesses. Workplace is associated with numerous risks in connection with injury or illness, which results from accidents. Some workers in ECG climb long poles and work with live wires and some also stay at the control rooms and the substations that are full of electro-magnetic x-ray machines for long hours. The main objective of the study was to evaluate the health and safety policies and practices at the Electricity Company of Ghana (ECG), Ashanti East Region. In achieving the study objectives, 109 respondents were used which included one (1) top level management, nine (9) middle level management, twenty five (25) frontline officers and gang leaders and seventy four (74) lower level employees. The study made use of two research instruments: questionnaires and interviews. Data from questionnaires were analysed using the SPSS package. The study found higher level of awareness about ECG safety policies but significant numbers of such employees do not know the content of such policy. The study revealed that employees normally encounter electrical shocks, burns, conductor cut when they are not well protected. The study revealed that safety planning, monitoring and implementation are carried out at the various levels at ECG. It was however found that policy on health and safety are not carried out fully as 50% of the respondents claim that they have not had any training on health and safety. This implies that a greater majority of employees at ECG were not following the policy for lack of knowledge. A situation that looks worrying for a company like ECG. It was recommended that all newly and existing employees should be educated and trained so that all the workers will be aware of the health and safety issues in the policy. It was also suggested that employees should be involved in decision making on health and safety issues to engender ownership and commitment.

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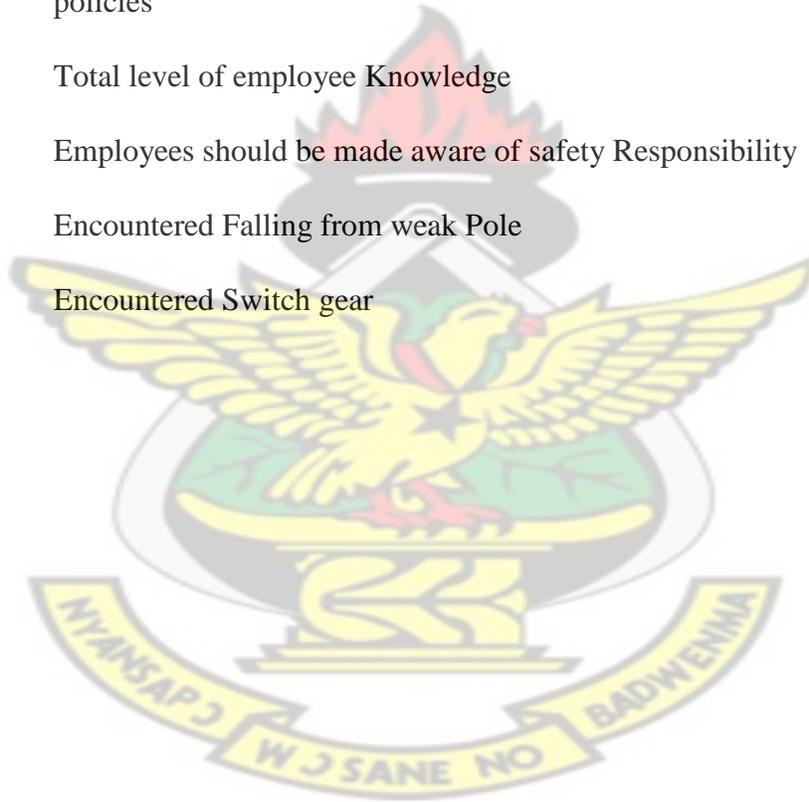
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ABBREVIATIONS AND ACRONYMS

ILO International Labour Organization

WHO World Health Organization

EU European Union

OSH Occupational safety and health

ECG Electricity Company of Ghana

DFI Department of Factory Inspectorate

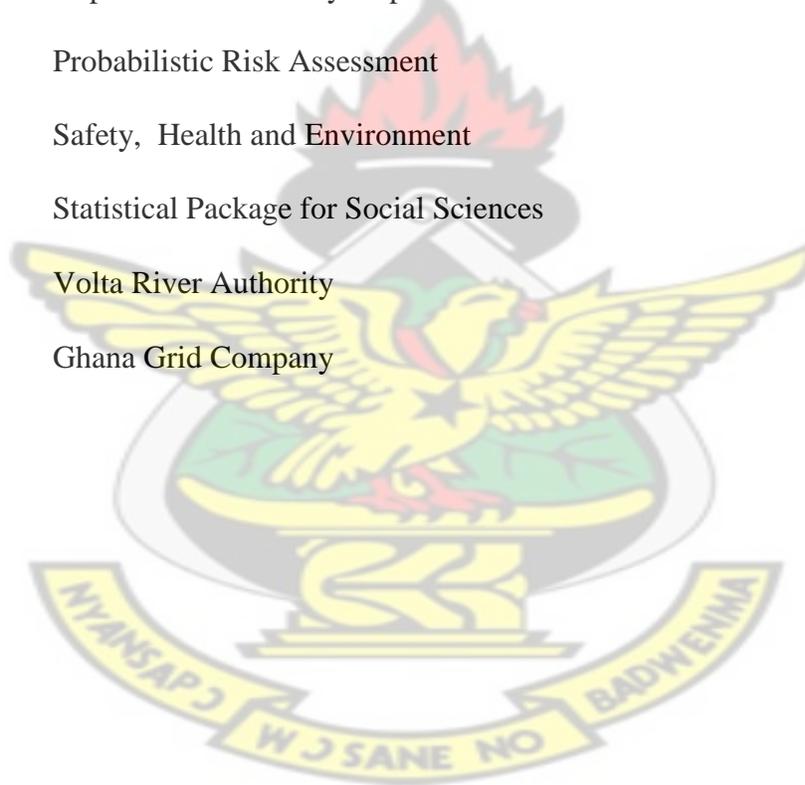
PRA Probabilistic Risk Assessment

SHE Safety, Health and Environment

SPSS Statistical Package for Social Sciences

VRA Volta River Authority

GRICO Ghana Grid Company



CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

There is no doubt that employee's health and safety plays a vital role at the workplace which in turn helps organizations and national economies as a whole. As such the state is much concerned about workers health and safety so as to ensure continuous productivity and economic growth and development. The Ghana Labour Act 2003, (Act 651) section 119 to section 120 touches on health and safety and it is designed to improve safety conditions. Workmen's Compensation Law 1987 (PNDCL 187) is also designed to compensate workers for on- the - job injuries.

Organizations' health and safety is an area which deals with protection of workmen regarding their health, safety and welfare. For this purpose, occupational health and safety programmes and legislations have been initiated to foster a safe working environment.

Occupational hazards threaten the health and safety of many workers. In some cases, circumstances involved in a person's job may cause a long term damage that appears only after years of service. For instance coal miners develop a lung disease called pneumoconiosis or black lung from inhaling the dust. Some industrial chemicals like arsenic and vinyl chloride cause cancer. People who work with x-ray and other form of radiation also face a health hazard unless proper precautions are used. Health and safety regulations are designed to ensure the welfare of company's employees.

Employers in Ghana are required by the Ghana Labour Act 2003, (Act 651) to ensure that their employee are not expose to conditions that would lead them to work related injuries or illnesses. Employees are also required to exhibit their duty with care in insuring that they work as per the employers' standard operating procedures which must incorporate health and safety requirements.

However are the staff and management of Electricity Company of Ghana aware of their health and safety responsibility and obligations?

Five of the 10 leading causes of workers disability worldwide are mental problems (major depression, schizophrenia, bipolar disorders, alcohol use and obsessive-compulsive disorders) (Gaston and Phyllis 2002). These disorders – together with anxiety, depression and stress –have a definitive impact on any working population and should be addressed within that context. They may also develop into long-term disorders with accompanying forms of disability.

The new legislation at the European level in the domain of occupational health and safety requires that employers should adjust the work to suit the individual, especially when it comes to designing work positions, to choosing work equipments, work methods and productions, so that monotony and work with predetermined rhythm should be reduced as well as their subsequent effects on health. Therefore, when the employer needs to recruit personnel s/he should take into consideration the abilities of the prospective employee relative to occupational health and safety.

In 2008, 4,700 people died from unintentional causes at work and 3.5 million people suffered disabling injuries. On the roads, 39,000 people died and 2.3 million people suffered disabling injuries. In our homes and communities, 74,000 people died and 20.6 million people suffered disabling injuries. Each of these was preventable. (2009 National Safety Report compiled by Janet Froetscher and Joseph Ucciferro 2009).

According to the World Health Organization (WHO), about one-third of Africa's disease burden is attributable to environmental hazards (Pniss-Ustun and Corvalan 2006). The major contributing risk factors to environmental disease burden in the continent are traditional environmental health hazards such as lack of access to safe water, indoor air pollution from solid fuel combustion, and lack of sanitation and hygiene. However, with notable economic growth in the past decade (World Bank 2008), urbanization, and continuing industrialization, modern environmental health hazards (MEHs) can be expected to eventually emerge and perhaps supersede traditional hazards as critical contributors to environmental disease burden in the continent. The transition to MEHs is in progress, as evidenced by the combination of preindustrial and industrial-era environmental health issues confronting many African communities (WHO 2002).

1.2 STATEMENT OF PROBLEM

Workplace is associated with numerous risks in connection with injury or illness, which results from accidents. People work with chemicals that cause asthma and dermatitis and do work that can trigger conditions like tenosynovitis that can make existing conditions like back pain worse. Also there are specific hazards and problems which can range from

exposure to cancer through starting of machines and its servicing. Some workers in ECG climb long poles and work with life wires and some also stay at the control rooms and the substations that are full of electro-magnetic x-ray machines for long hours. These and many others are some of the health and safety issues which can affect employees' health and for that matter retard the growth of the company if they are not well managed.

1.2.1 Fire destroys Tema Oil Refinery –Ghana

On Tuesday, January, 19, 2010, a fire outbreak occurred at the Tema Oil Refinery (TOR). The incident resulted in the death of some workers with several others sustaining varied degrees of injuries.

According to the committee set up to investigate the issue, the cause of the fire outbreak was that, a tanker driver restarted his ignition several times after loading premix fuel and that resulted in the fire outbreak which killed more than six workers and injured others. The committee that investigated the issue therefore recommended that the fuel tanker driver and his mate should be held fully accountable for the incident. The committee also recommended among other things the adoption of a better leadership style at the refinery and pointed out the need for better supervision from the appropriate authorities, such as the National Petroleum Authority (NPA) and proper training programmes for all the workers of TOR. It also recommended that proper regulations on safety measures must be enforced, complied with and monitored to avoid such fires in the future. **Pictures on Appendix 2**

Economically, workers are very important because they sustain the progress of our industries by contributing their skills and expertise for companies to achieve their objective and economic growth and national development. In Ghana health and safety is not handled properly by most employers as such employees are normally vulnerable and usually at the mercy of some philanthropies. It is therefore very important from time to time to conduct a search into how some of these health and safety practices are conducted to ensure that good and important health and safety policies and practices are put in place. It is also becoming increasingly important to measure quality of health and safety provision so that resources could be directed effectively and efficiently towards improvement. Injuries and death resulting from workplace accidents remains one of the most costly factors, both personally and financially, in transacting business today. In 2001, there were over 3.9 million disabling injuries and 5,300 deaths in American workplaces (National Safety Council, 2003) costing over \$132.1 billion. A figure exceeding the combined profits reported for the top ten Fortune 500 companies in the same year. Moreover, costs to those injured include lost wages; medical costs not paid by the employer, potential limits on future employment and advancement, and restricted ability to enjoy personal pursuits. All these have made it crucial to look into the health and safety policies and practices in some of the organizations in Ghana, particularly E C G.

1.3 OBJECTIVE

The objectives of the study are grouped into two and these are the general objective and the specific objectives.

1.3.1 General Objective of the Study

To evaluate the health and safety practices and policies at Electricity Company of Ghana (ECG).

1.3.2 Specific Objective of the Study

To achieve the aim of the study, the following specific objective will be used to answer the research question:

1. To evaluate the level of employee awareness of ECG's health and safety practices and policies.
2. To assess how occupational hazards are handled at ECG.
3. To determine how the health and safety of the workers are being safeguarded at ECG.
4. To explore ways of improving upon health and safety practices and policies at ECG.

1.4 RESEARCH QUESTIONS

Based on the stated objective, the following hypothesis or questions shall be considered:

1. What is the level of employees' awareness and participation in ECG safety and health policies?
2. How does ECG handle occupational hazards?
3. What are the measures in place to safeguard the health and safety of workers in ECG?
4. How can the health and safety practices at ECG be improved?

1.5 OVERVIEW OF METHODOLOGY

This was a case study approach focusing on ECG. The research was to evaluate the Health and Safety Practices at Electricity Company of Ghana, to know how it works for the workers especially how it is handled at the Ashanti East Region. Literature search for relevant information, online web search, academic data base, academic journals text books will also be consulted. These were to help in getting the meaning of health and safety issues and also examine laws/ Acts/Degrees that protect workers in Ghana and other countries. Findings were compared with the final results of this research after which recommendations were made. Accurate data gathered will help me in making valid recommendations. Some questionnaires were raised for some cable workers, overhead line workers, maintenance staff, field investigators, Customer Service workers, Human Resources staff and Materials and Transport staff. SPSS analytical package was used to analyze the data received from participants. The diagrams were also derived from the SPSS results using the Microsoft Excel package.

1.6 SIGNIFICANCE OF THE STUDY

Employing health and safety practices by a Ghanaian employer is one way of ensuring that the employer remains profitable in Ghana. Probably a tough argument to make especially if you consider the fact that employing safety and health practices and adopting a safety culture in an organization costs money. Occupational incidents or accidents are caused by the interaction of unsafe conditions and unsafe behaviors. Employers have control over unsafe conditions at their businesses; they do this by ensuring that all processes, equipments and layout of the organization are designed to the best health and safety standards.

Since safety and health practices do not only promote efficiency of the employees but also enhance higher productivity and quality service delivery by companies, this study will bring to bear the safety and the healthful practices at ECG- Ashanti East and any deficiency identified in the practices will be suggested for immediate action to be taken. The study will therefore help ECG and other power distributors to identify best health and safety practices and appreciate the need to adhere to such practices to improve upon the level of such safety and health practices for employees in order to reduced injury and compensational claims.

However, no matter how safe an organization is, if the employees in the organization do not understand their responsibilities and engage in unsafe behaviors, it could lead to overrides of safety precautions and result in injuries and or property losses. Providing a safe and healthful workplace is not cheap. The study will also make recommendations on how Employers could make conscious decisions to invest in health and safety. For instance employers have to hire safety professionals to run their safety programs and install engineering controls by adding some form of machine modifications.

On a general level, the study will improve our understanding on health and safety and how to achieve change in terms of improving occupational health and safety practices particularly with regards to reducing the risk of injuries or health disorders in ECG. It will also assist in ensuring safe and healthful practices and policies for workers in Electricity Company of Ghana by producing for research, information, education and training in the field of occupational safety and health.

1.7 SCOPE OF THE STUDY

This research paper is limited to Electricity Company of Ghana in relations to Ashanti East Region. Respondents include Cable workers, Overhead line workers, Maintenance staff, Field investigators, Customer Service workers, Human Resources staff, Materials and Transport with the exemption of Accounts, Legal and Audit staff.

1.8 LIMITATION OF THE STUDY

The research is limited to a single case study at the Ashanti-East Region due to time and other resources. It was also difficult to get secondary data from the company to enable the researcher to come out with other conclusions. Nevertheless the researcher was able to obtain information to achieve the objectives set for this research.

1.9 ORGANISATION OF CHAPTERS

This composes of five chapters and it will be arranged as follow;

Chapter one: - This contains the introduction which gives a brief background to the problem, discusses the aim of the study and explains how the work will be carried out.

Chapter two: It will contain the literature review, dealing with the general nature of occupational hazard, types of hazard, health and safety Acts, health and safety protection and benefit of introducing occupational health at the workplace.

Chapter three: Chapter three discusses the methodology and the research strategy

Chapter four: It also discusses the data presentation and analysis.

Chapter five: Discusses the study and gives the summary, conclusions and recommendation.

CHAPTER TWO

LITERATURE REVIEW

2.1 OVERVIEW OF ECG HEALTH, SAFETY AND ENVIRONMENTAL PRACTICES

The Electricity Company of Ghana is a national corporate body established in 1967 for supplying safe and reliable electricity to both industrial and domestic consumers on a sound commercial basis. The Factories, Offices and Shops Act 1970 (Act 328), which is the national legal document on safety and health that charges employers with specific responsibilities to ensure safe and healthy working environment. ECG's Safety, health and environment Policy document sets out the company's general policy on Safety, the management and administrative structures for monitoring its implementation, general safety, health and environment measures that are common to most operations, and code of Safety practices applicable in specific operations.

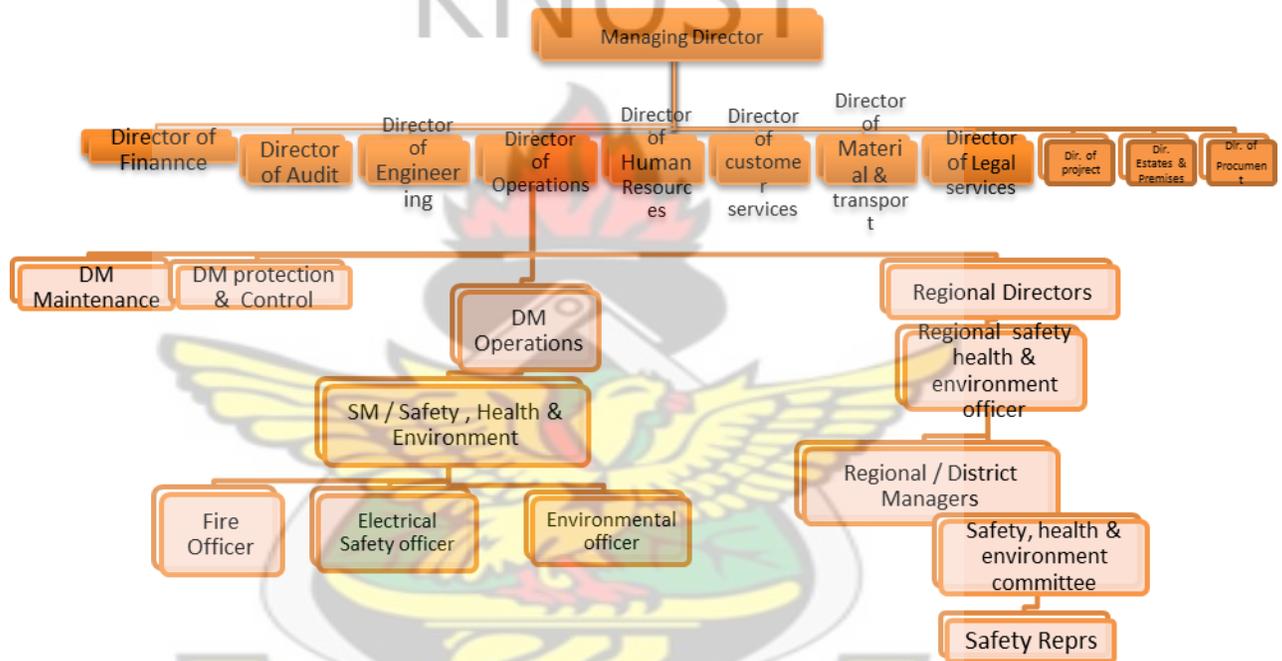
ECG Policy statement on safety, health and environment enjoins the company to pursue a policy that shall eliminate accident as far as is reasonably practicable by;

- i. Developing a safety, health and environment -conscious workforce;
- ii. Providing safe and healthy working environments;
- iii. Ensuring safe working methods; and
- iv. Providing safety machinery/equipment and working gears.

The policy document also indicates that “both employees and employer shall respect the rights of each other in the discharge of their respective obligation as provided in the policy documents. It also sets out what employees should do in emergency situations, compliance,

and reporting and emergency procedures. The study noted that ECG safety, health and environment policy establishes Safety, Health and Environment Committees headed by an officer with the rank of Head office Director at the top level. Similarly ECG has middle level management staff in charge of safety and health at the regional level and safety committees and representatives at the districts level (see Figure 4.5)

Figure 2.1 ECG Organizational Structure - SHE



Source: ECG Head Office, 2012.

However some key informant interviews carried out to cross reference how these structures work in practice revealed a number of shortcomings: While Safety officers are in place according to the organogram, they are not effective on the ground in promoting safety, health and environmental issues in the organization. For instance, the policy enjoins these officers to carry out on-site visits to ensure that field officers and staff strictly adhere to the

company safety, health and environment policies and procedures. Further, safety officers are supposed to regularly sit in Safety meetings to receive first hand information on what is happening on the field and also carry out regular risk assessment. It was noted that these are hardly followed and reasons cited are lack of resources. For funds are budgeted for and allocated based on the company's priority needs. This implies some weak level of commitment on the part of top management of ECG on safety, health and environment matters.

ECG also has a number of policies that ensure adherence to the company's safety, health and environment practice at the work place. The policy outlines guidelines in relation to safety tools and gear, use of safety belts, emergency situations, special operations etc. It was however noted that due to lack of adequate resources, safety equipments and gears are not enough for use by staff that needs them.

2.2 OCCUPATION

Several definitions may be given to the word "occupation". In simple term, occupation is a person's job or profession (work) - any activity on which time is spent by a person. It is also defined as employment; or business, trade, etc.

2.2.1 Definition of occupational health

This is concerned with the two-way relationship of work and health. It is as much related to the effect of the working environment on the health of the worker as it is to the influence of the worker state of health on his/her ability to perform the task to which he/she was

employed. According to joint definition by International Labour Organization (ILO), and World Health Organization (WHO) Committee in 1950, occupational health is defined as “the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations”.

Occupational health has achievements which include the following:

Increase awareness for better conditions of service, Increase in output, Expenditure reduction, improvement in the organization of seminars and workshops on health and safety, increasing Media report on safety, promotion of primary health care and Prevention of dumping of hazardous wastes.

2.3 HAZARDS

According to Longman dictionary of contemporary English, hazard is defined as “something that may be dangerous, cause accidents etc.”

2.3.1 Occupational Hazards

By definition, it is any condition or factor from workplace that can lead to compensation or that can prevent one from going to work (absence), or that can lead to incapacitation.

A hazard is a situation in the workplace that has the potential to harm the health and safety of people or to damage plant and equipment. The situation could involve a task, chemical or equipment used. Hazard management is a continuous process that can be used to improve the health and safety of all workplaces.

To be effective in recognizing and evaluating on-the-job hazards and recommending controls, industrial hygienists must be familiar with the hazards' characteristics. Potential hazards can include air contaminants and chemical, biological, physical and ergonomic hazards.

2.3.2 Air Contaminants

These are commonly classified as either particulate or gas and vapour contaminants. The most common particulate contaminants include dusts, fumes, mists, aerosols and fibres. Dusts are solid particles generated by handling, crushing, grinding, colliding, exploding and heating organic and inorganic materials such as rock, ore, metal, coal, wood and grain. Any process that produces dust fine enough to remain in the air long enough to be inhaled or ingested should be regarded as hazardous until proven otherwise.

Fumes are formed when material from a volatilized solid condenses in cool air. In most cases, the solid particles resulting from the condensation react with air to form an oxide. The term mist is applied to liquid suspended in the atmosphere. Mists are generated by liquids condensing from a vapour back to a liquid or by a liquid being dispersed by splashing or atomizing. Aerosols are also a form of a mist characterized by highly respirable, minute liquid particles.

Fibres are solid particles whose length is several times greater than their diameter, such as asbestos.

Gases are formless fluids that expand to occupy the space or enclosure in which they are confined. They are atomic, diatomic, or molecular in nature as opposed to droplets or particles which are made up of millions of atoms or molecules.

2.3.3 Chemical Hazards

Harmful chemical substance in the form of solids, liquids, gases, mists, dusts, fumes and vapours exert toxic effects by inhalation (breathing), absorption (through direct contact with the skin), or ingestion (eating or drinking). Airborne chemical hazards exist as concentrations of mists, vapours, gases, fumes, or solids. Some are toxic through inhalation and some of them irritate the skin on contact, some can be toxic by absorption through the skin or through ingestion and some are corrosive to living tissue. The degree of worker risk from exposure to any given substance depends on the nature and potency of the toxic effects and the magnitude and duration of exposure.

Information on the risk to workers from chemical hazards can be obtained from the Material Safety Data Sheet (MSDS) that OSHA's Hazards Communication Standard (Title 29 Code of Federal Regulation, Part 1910.1200) requires to be supplied by the manufacturer or importer to the purchaser of all hazardous material. The MSDS is a summary of the important health, safety, and toxicological information on the chemical or the mixture's ingredients. Other provisions of the Hazard Communication Standards require that all containers of hazardous substances in the workplace have appropriate warning and identification labels.

2.3.4 Biological Hazards

These include bacteria, viruses, fungi, and other living organisms that can cause acute and chronic infections by entering the body either directly or through breaks in the skin. Occupations that deal with plants or animals or their products or with food and food processing may expose workers to biological hazards. Laboratory and medical personnel also can be exposed workers to biological hazards. Any occupations that result in contact with bodily fluids pose a risk to workers from biological hazards.

In occupations where animals are involved, biological hazards are dealt with by preventing and controlling diseases in the animal population as well as properly caring for and handling infected animals. Also, effective personal hygiene, particularly, proper attention to minor cuts and scratches especially on the hands and forearms, helps keep worker risks to a minimum.

In occupations where there is potential exposure to biological hazards, workers should practice proper personal hygiene, particularly hand washing. Hospitals should provide proper ventilation, proper personal protective equipment such as gloves and respirators, adequate infectious waste disposal systems, and appropriate controls including isolations in instances of particularly contagious diseases such as tuberculosis.

2.3.5 Physical Hazards

These include excessive levels of ionizing and non ionizing electromagnetic radiation, noise, vibration, illumination and temperature.

In occupations where there is exposure to ionizing radiation, time, distance, and shielding are important tools and ensuring worker safety. Danger from radiation increases with the amount of time one is exposed to it; hence, the shorter the time of exposure, the smaller the radiation danger.

Distance also is a valuable tool in controlling exposure to both ionizing and non ionizing radiation. Radiation levels from some sources can be estimated by comparing the squares of the distances between the worker and the source. For example, at a reference point of 10 feet from a source, the radiation is 1/100 of the intensity at 1 foot from the source. Shielding also is a way to protect against radiation. The greater the protective mass between a radioactive source and the worker, the lower the radiation exposure.

Similarly, shielding workers from non-ionizing radiation can be also an effective control method. In some instances, however, limiting exposure to or increasing distance from certain forms of non-ionizing radiation such as lasers, is not effective. For example, an exposure to laser radiation that is faster than the blinking of an eye can be hazardous and would require workers to be miles away from the laser source before being adequately protected.

Noise, another significant physical hazard, can be controlled by various measures. Noise can be reduced by installing equipment and systems that have been engineered, designed, and built to operate quietly; by enclosing or shielding noisy equipment; by making certain that equipment is in good repair and properly maintained with all worn or unbalanced part

replaced; by mounting noisy equipment on special mounts to reduce vibration; and by installing silencers, mufflers, or baffles. Substituting quiet work methods for noisy ones is another significant way to reduce noise- for example, welding parts rather than riveting them. Also, treating floors, ceilings and walls with acoustical materials can reduce reflected or reverberant noise.

In addition, erecting sound barriers at adjacent work stations around noisy operations will reduce worker exposure to noise generated at adjacent work stations. It is also possible to reduce noise exposure by increasing the distance between the source and the receiver, by isolating workers in acoustical booths, limiting workers' exposure time to noise, and by providing hearing protection. It is required that workers in noisy surroundings be periodically tested as a precaution against hearing loss. Another physical hazard, radiant heat exposure in factories such as steel mills, can be controlled by installing reflective shield and by providing protective clothing.

A fourth general framework for understanding safety improvement is from the interpersonal or social perspective. The central question in the social approach is: what interpersonal factors enhance safety in the workplace? In an apparent foreshadowing of Goldberg, Dar-EL, and Rubin (1991), Zohar (1980) investigated the role of safety climates. Safety climate is considered one dimension of a multi-dimensional organizational climate. Safety climate reflects employees' perceptions about the relative importance of safe conduct. Perceptions of safety climate, according to Zohar, pivot on four dominant factors: perceived relative importance of the safety committee, importance of safety training, work pace, and the

perceived status of the safety officer. Clarke (1999) argued in a related vein that organizational activities such as elevating the status of the safety officer and improving interpersonal communications can foster a positive safety culture. Zohar (2002), examined managerial behavior in the form of safety related feedback and found that as safety goal interactions increased, perceptions of the safety climate improved, specific safety behaviors increased (ear-plug use), and injury rates decreased. In sum, Zohar's contributions highlight the importance of structural factors in enhancing perceptions of the safety climate and reducing injury rates.

2.3.6 Ergonomic Hazards

The science of this ergonomics studies and evaluates a full range of tasks including, but not limited to, lifting, holding, pushing, walking and reaching. Many ergonomic problems result from technological changes such as increased assembly line speeds, adding specialized tasks, and increased repetition; some problems arise from poorly designed job tasks. Any of those conditions can cause ergonomic hazards such as excessive vibration and noise, eye strain, repetitive motion, and heavy lifting problems. Improperly designed tools or work areas also can be ergonomic hazards.

Repetitive motions or repeated shocks over prolonged periods of time as in jobs involving sorting, assembling, and data entry can often cause irritation and inflammation of the tendon sheath of the hands and arms, a condition known as carpal tunnel syndrome. Ergonomic hazards are avoided primarily by the effective design of a job or jobsite and by better designed tools or equipment that meet workers' needs in terms of physical environment and

job tasks. Through thorough worksite analyses,, employers can set up procedures to correct or control ergonomic hazards by using the appropriate engineering controls (e.g. designing or redesigning work stations, lighting, tools and equipment); teaching correct work practices (e.g. proper lifting methods); employing proper administrative controls (e.g. shifting workers among several different tasks, reducing production demand, and increasing rest breaks); and, if necessary, providing and mandating personal protective equipment. Evaluating working conditions from an ergonomics standpoint involves looking at the total physiological and psychological demands of the job on the worker. Overall, the benefits of a well designed ergonomic work environment can include increased efficiency, fewer accidents, lower operating costs, and more effective use of personnel.

2.4 SOME OCCUPATIONAL HEALTH LAW IN GHANA (LABOUR ACT, 2003; ACT 651)

The factories, offices and shops Act of 1970 (**Labour Act, 2003; Act 651**) provides for the registration of factories, the health welfare and safety of persons employed in factories, offices and shops and other places, and matters connected with their work.

2.3.1 PART 1 – REGISTRATION OF FACTORIES

The chief inspector shall keep a register of factories in which he shall cause to be entered such particulars in relation to every factory required to be registered under this Act as he/she may consider necessary or desirable.

(1) Every person who occupies a factory shall within one registration month after commencement of this Act apply for its registration.

- (2) No person who intended to be used as a factory; or
- (1) No person shall commence or permit or cause to be commenced;
- a) The building of any premises intended to be used as factory or
 - b) Any work to alter or add factory or premises intended to be used as factory;
- (2) Such challenges shall be made in the building plans as are reasonably necessary to ensure compliance with the provision of this Act relating to health, welfare and safety.

2.4.2 Offences

Any person who contravenes any provision of section 2(1), 3(1) or 4(1) shall be guilty of an offence and liable on conviction of a fine not exceeding 10,000 cedis.

Part 2 – REGISTRATION AND PRESCRIBED ABSTRACT

2.4.3 General register

- (1) Every factory shall keep a general register containing the following:-
- (a) The certificate of registration of the factory
 - (b) Every other certificate issued by the Chief Inspector in respect of the factory.
 - (c) Prescribed particulars relating to the cleanliness of the factory.
 - (d) Prescribed particulars of every accident and case of occupational disease occurring in factory.
 - (e) All reports and particulars required by this Act to be entered in or attached to the general register.
 - (f) Such other matters as may be prescribed.

- 2) Extracts from the general register shall be sent to an Inspector as he may require for the execution of his duties under this Act.

The general register and every other register or records shall be preserved and kept available for inspection by an inspector for two years after the date of the last entry.

2.4.4 Prescribed extract, regulations and notices

- (1) There shall be kept in prominent position in every factory.
- (a) The prescribed abstract of this Act.
- (b) A notice of the address of the chief inspector and of the nearest inspector and labour officer.
- (c) Printed copies of any regulations made under this Act, which are in force in the factory.
- (d) Every other notice or document required by this Act shall be posted in the factory.

2.4.5 Particulars of officers and shops

This deals with particulars of offices and shops. Any person occupying an office or shop should give particulars to the chief inspector.

2.5 NOTIFICATION OF ACCIDENTS

Where an accident in any factory, offices or shops causes the death of a person employed therein or disables any such person for more than three days for earning full wages at work

which he was employed, the occupier (employer) shall forthwith send written notice of accident, in the prescribed form, and containing the prescribed particulars to the chief inspector or the inspector for the district. Where an accident causing disablement is noticed under this section, and offer notification results in the death of the person disabled, the occupier shall, as soon as the death (of the person) comes to his notice, send written notice of the death to the chief inspector of the district.

2.5.1 Notification of dangerous occurrences

Written notice of every dangerous occurrence to which this section applies, occurring in any factory, etc. shall be sent to the chief inspector or his representative. For example all cases of explosion, fire and collapse of building, bursting or revolving vessels, etc.

Employers are to write notices of all cases of industrial diseases, e.g. lead, phosphorus, manganese, arsenical and mercurial poisoning, toxic anemia, toxic jaundice, anthrax, ulceration and any other prescribed illness or disease.

PART 5 – HEALTH AND WELFARE

2.5.2 Cleanliness

Every factory, and office and shop and all furniture furnishing and fittings there shall be kept in a clean state and accumulation of dirt and refuse shall be removed daily from staircases and passages. The floor of every office, shop and workroom shall be cleaned at least once a week by washing, sweeping or some other suitable and effective method. In every factory, all inside walls and partitions, and all ceilings or tops of rooms and all walls, insides and tops of passage and staircases shall;

Where they have a smooth impervious surface, be washed with hot water and soap or otherwise suitably cleaned at least once in every twelve months.

Where they are varnished or painted with oil paint, be revarnished or repainted at least once in every five years, and at least once in every twelve months be washed with hot water and soap or otherwise suitably cleaned; and in other cases, be whitewashed at least once in every twelve months.

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2.5.3 Overcrowding

- a) This sub-section refers to human overcrowding, furniture, furnishing, feelings, machinery, plant, equipment and appliances.
- b) Floor area (in sq. ft.) or capacity (in cub.Ft.) for each person shall not be less than 40sq. ft. or 400 cub.Ft. respectively.
- c) Workrooms not less than 9 ft. in height.

2.5.4 Ventilation

Effective and suitable provision shall be made in all factories, offices and shops to ensure and maintain by the circulation of fresh air in each workroom for the adequate ventilation of the rooms.

2.5.5 Washing facilities

This deals with the provision of adequate and suitable washing facilities conveniently accessible for the use of employees and chief inspector to exempt promise where (1) is not satisfied.

2.5.6 Lighting

Effective provision should be made to secure and maintain sufficient and suitable lighting either natural or artificial.

2.5.7 Drainage of floors

Floors should be made in such a way that water can drain off easily.

2.5.8 Sanitary conveniences

Adequate and sanitary conveniences conveniently accessible to persons employed shall be provided, maintained and kept clean in every factory, office and shop, and effective provision shall be made for their lighting and ventilation. Separate convenience shall be provided for males and females (except members of the same family). The minister may by executive instrument direct that the provision of this section shall, in any area, be enforced by the local authority.

2.5.9 Protective clothing and appliances

Where in any factory or shop workers are employed in any process involving excessive exposure to wet or any injuries or effective substances, suitable protective clothing appliances, including, where necessary, suitable gloves, footwear, goggles and head coverings, shall be provided and maintained for their use.

Suitable goggles shall be provided to protect the eyes of persons employed in the process.

Where in any factory electrical welding is carried on, effective provision shall be made, by screening or otherwise to prevent persons employed any (other than persons employed in the welding process) being exposed to the electrical flash.

2.5.10 Noise and vibrations

Noise and vibrations likely to affect the health of persons employed in any factory, office or shop shall be reduced as far as possible by appropriate and practicable measures.

2.6 PROHIBITION OF LIFTING EXCESSIVE WEIGHTS

No person shall in the course of his work be required to lift, carry or move any load so heavy to be likely to injure him.

2.6.1 First aid

A first aid box or cupboard of the prescribed shall be provided and maintained in every factory, office and shop so as to be ready accessible, and where more than 150 persons are employed, an additional box or cupboard shall be provided for each additional 150 persons.

2.6.2 Prevention of fire

Every factory, office and shop shall be provided and maintained appropriate means for fighting fire, which shall be so placed as to readily for use.

2.6.3 Prevention and control of occupational hazards

During prevention and control, we consider any substance or procedure that goes against the environment as a hazard. Therefore, before setting up industry the health of the worker should be assessed.

2.6.4 Anticipated preventive aspect

This is taken during the planning of development projects. The impact on the workers' health and environment is very important.

2.6.5 Safety

By the late 1930s and early 1940s, public concern over dangerous working conditions led to the establishment of governmental agencies such as the National Safety Council and other units like the Industrial Fatigue Research Board (Viteles, 1932) that addressed safety and the development of safe conditions at work. In addition, workers' compensation plans were devised to provide aid for workers who were injured on the job. These early efforts took a very mechanistic causal approach to safety by looking for working conditions that were likely to influence the safety of employees and then attempting to change those conditions.

Safety research and legislation were extremely beneficial. Work in industries such as agriculture, mining, meat packing, and construction still remains relatively dangerous in comparison to some other types of work, but, in general, today's work sites are safer than they once were (Riley, 1986).

2.6.6 Early ergonomics

The safety focus on health gave way to what can be labeled early ergonomics. The major changes from the safety model to that of early ergonomics were the inclusion of the workers in the response to safety and health and the recognition of the interaction between work environments and those who populate them. Thus, attempts to improve the safety of the workplace included training workers in safe behaviors, developing incentives to encourage safe behaviors, and selecting people and/or placing them on jobs with safety and health in mind.

2.6.7 Wellness

In the late 1970s and early 1980s, the early ergonomics model gave way to programs labeled wellness or occupational health promotion (Glasgow & Terborg, 1988). Wellness represented two major changes from the previous approaches. First, wellness shifted primary concerns for health from preventing injury or harm to encouraging health. Prior to that time, health was defined primarily in terms of the absence of injury or disease. In wellness, the absence of disease or injury was seen as the neutral point on a scale ranging from illness/injury to health. Points beyond the absence of illness and injury dealt with developing and maintaining a physically and psychologically healthy life-style. This perspective is similar to that of Everly and Feldman (1984), who illustrated the wellness which focuses with respect to disease prevention rather than injury.

The second change in emphasis on wellness was that of looking to persons (workers/employees) as primary precursors of health, How people behave (e.g., what they

eat or drink, the amount they exercise, whether or not they smoke) is the focus of wellness programs. The programs are directed at either changing unhealthy behaviors and replacing them with healthful ones or establishing healthy behaviors in the first place. Typical health-related behaviors targeted by wellness programs are diet, exercise, smoking cessation, substance abuse prevention and treatment, and the provision of health-related feedback to employees. In contrast to previous approaches that looked to job environmental conditions for the causes of unhealthy outcomes and attempted to change the conditions or train people to deal with them, the wellness approach focuses almost exclusively on changing employee behaviors believed to increase the likelihood and seriousness of illness or other forms of incapacitation at some time February 1990 • American Psychologist in the future. Today it is estimated that as many as 50,000 organizations have some form of health promotion activity in place, and that number is growing rapidly (Glasgow & Terborg, 1988).

Without a doubt, safety, ergonomics, wellness, and medical practices related to health in the workplace have made great strides. The workplace is safer. Training and placement improved employees' ability to deal with potentially dangerous conditions. Likewise, there is every reason to believe that improving the healthful behaviors of people should, in the long run, lead to better health (Rowe & Kahn, 1987). In sum, these approaches have contributed a great deal to the health of people at work and are likely to continue to do so.

2.6.8 Risk management and assessment methods

The need to deal with risks is very important to any institution because of the extent of damage that can occur. Hislop (1999, 3) suggests that safety extends beyond “craftsmen

wearing hard hats on construction sites” to a “philosophy that identifies and eliminates job site hazards throughout the lifecycle of a work project” and “discourages work practices that place individuals at risk of injury.” This philosophy also involves the integration of safety into daily work processes and the promotion of an environment in which all parties involved in a construction project have a stated role and responsibility for managing safety (Hislop 1999). Occupational injuries and fatalities are not “chance events” and can be prevented through effective health and safety management (Lingard and Rowlinson 2005). Lingard and Rowlinson (2005) postulate that the same type of work-related deaths, injuries and illnesses periodically occur in the construction industry and that the industry a) fails to learn from its mistakes, and b) does little to prevent them reoccurring. Durham et al. (2002), in addition

Lingard and Rowlinson (2005), contend that this preventative inactivity may be attributable to the organizational, structure and management methods that are manifest in the building and construction sector. These authors maintain that the high rate of accidents and injuries inherent in this industry stem from the highly hazardous operational nature of construction work and the present inadequacies with regard to mitigating these threats to worker safety. These factors are thought to militate against the identification of Organizational Health and Safety problems and therefore impede the implementation of innovative solutions (Lingard and Rowlinson 2005). Despite this tendency, Ringen et al. (1995) maintain that OHS issues can be prevented, provided that effective risk and safety management practices exist.

2.6.9 Risk Assessment Methods

Institutions and organizations have augmented interest in risk assessment methods as a means of assessing the seriousness of danger and then establishing strict measures. Joy and Griffiths, (2005), stated that risk-awareness is a cultural approach to safety and also a form of risk assessment or informal risk assessments. Carnegie (1993) and Burke (1996) expressed their views that this approach enabled the magnitude of a risk to be expressed in numerical terms by extrapolating from scientific data. However, the limitations to quantitative risk assessments became apparent as lay interest groups and the general public came to understand the nature of the assumptions built into the methodology.

2.7 PROBABILISTIC RISK ASSESSMENT (PRA)

Probabilistic Risk Assessment is the most common method of assessing safety but a safe design is used to reduce risks in the standard (probabilistic) sense but is inadequate. Safe design strategies are used to reduce estimated probabilities of injuries or reducing uncertainties not only risks. They are used to cope with hazards and eventualities that cannot be assigned meaningful probabilities. Risk assessment remains an important tool in evaluating risk and making decision about priorities. It is however only useful when its limitations are properly understood and the assumptions and values implicit in risk assessment process are made explicit.

Once these are known, the political and economic factors extrinsic to the process may prove to be more decisive or important than the scientific data and are likely to involve ethical considerations.

One way of managing risk in the workplace is for the employee to become aware of the various hazards within the working environment of an organization. This gives an idea of how much safety that is needed to be in place to avoid the occurrence of the danger. There are several ways of identifying hazards within the work environment. One of such method or approaches is the mental models approach. This approach to hazard management draws on the theoretical traditions of cognitive psychology which argues that individual's perception is internal representations of external reality.

2.7.1 Mental Model

Jungerman *et al.* (1988) suggested that the mental models are kind of knowledge structures that help us to understand a particular domain. The reason is that, they help us to make sense of the world and what happens around us. It is indeed very important for any institution to have staff that is aware of the hazard associated with their work so that risk can be reduced to very minimal. Additionally, it is more beneficial to have workers who have knowledge on hazards relating to their work than those who do not (Petts et al. 2002). This is more important in situations when there are dangers perceived at the work place. Other studies have revealed significant gaps between expert and non-expert or workers' understanding of the hazards. The mental models approach offers some clear benefits to the study of worker's knowledge of hazards in the work-place. These include the accurate and efficient mapping of knowledge gaps and misunderstandings related to a workplace hazard, as well as providing an efficient means of representing their mental models in the simple and readily comprehensible form of influence diagrams. However, the method also gives rise to some controversies.

While these are mainly theoretical in nature, they merit some discussion because many of the issues also have a practical dimension. The mental models approach offers a demonstrably effective method for studying worker awareness of a particular hazard. However, while the approach reveals much about what a worker knows about a hazard, it reveals little about how a worker might discriminate between hazards, and on what basis.

2.7.2 Attribution Theory and Organizational Health and Safety

Given that supervisors retain responsibility for performing safety inspections and hazard audits, investigating accidents and recommending corrective actions, providing safety training to workers, and motivating members to adopt safe work practices, Dejoy (1985) argues that supervisor bias may be inherent in risk assessments and that the concerns of other stakeholders are often not considered in hazard identification. As a consequence, self-other attribution and self-serving bias are believed to exist—a factor which causes the number of accidents assigned to behavioural causes to be grossly overestimated (Dejoy 1985). Numerous opportunities exist for attribution bias to exist in OHS initiatives, especially when accident reports are completed by supervisors in the same department in which the incident occurred (Dejoy 1985).

Dejoy (1985) claims that biased supervisor attributions have the capacity to influence safety initiatives in a negative fashion, to the extent that safety-related problems become exaggerated rather than mitigated. The attribution bias of supervisors is believed to initiate inappropriate safety policies and program decisions that decrease overall program effectiveness and concomitantly increase organizational conflict. Dejoy (1985, 67) illustrates

this issue of attribution bias in OHS programs in the following statement: “Incorrect attributions by top management regarding accident causation can lead to inappropriate safety policies and programs that magnify rather than correct the problem. A safety problem created by unrealistic production deadlines may be responded to with stepped-up enforcement or unnecessary training. Further, these incorrect attributions may be imposed on lower level supervisors and set up a situation where the first-line supervisor is caught between satisfying the boss and not magnifying the existing problem”.

On account of the fact that supervisors are often too involved in hazard identification and risk appraisal to be sufficiently objective, upper-level managers have been observed to retain a heightened bias towards internal attributions (Brown 1984). The rationale behind this is threefold:

The further removed the observer from the work station, the more difficult it is for him/her to understand external factors involved in the job or empathize with workers. High-level managers are unlikely to have extensive experience in performing floor-level jobs and this lack of experience creates a predisposition towards internal attributions; and Upper-level managers often compare groups of workers rather than individual workers and develop internal attributions. (Brown 1984)

2.7.3 The Concept of Risk

The concept of risk is about getting better understanding of the health security and safety practices concerning an equipment or tool. Safety is a means of taking measures to avoid

risk and causing accident. According to Renn (1998), there has not been any clear definition for risk in any discipline. But Weyman and Kelly (1999) argued that there are various definitions for risk but it all boils down to the fact that it is simply the likelihood occurrence of an action. This shows that risk is simply danger. In the engineering field it is very important to ensure safety in order to perform effectively. Hopkins (2005a), risk-awareness programmes are available as a means of ensuring safety practices. These programmes are carried out to create awareness at the workplace.

Generally, safety practices are designed to prevent accidents that may lead to human death or injuries, long term health effects, damage to the environment or malfunctioning in general. The engineers at Electricity Company of Ghana (ECG), as others elsewhere, over the years, have placed much emphasis on safe practice and this goes a long way to influence the implementation of safety and health policies at the work place and its impact on reducing the frequency of accidents involving staff and non staff. The challenge to be considered is to see whether the company's policy on OHS is carried out to the letter. Firms are under regulation to ensure safety and so they perceive risk. The commonest knowledge about it is to be aware of the danger and taking steps and measures to prevent it from occurring.

According to Ayers et al (1999), risk perception is giving a bad recommendation for an imaginary situation. One's perception may be right or wrong and so it is very appropriate to know the actual situation of the problem. Sjoberg and Drottz-Sjoberg, (1991) and Petts *et al.* (2002) have all established that possibility and actions are all dimensions of risk perception. Also others may suggest that for most ordinary people, severity of outcome is a stronger

dimensional factor than probability. One major conclusion can be made that the perception of risk can be misleading due to varying perception of individuals.

OHS management is underpinned by the concept of risk. Kirchsteiger (2005, 34) defines risk as the “possibilities that technological activities or natural events lead to consequences that affect what humans value.” While Ridley (1990) and Viner (1996) state that risk management is a three-stage process, Matthews (1993) elaborates further. He explains that risk management involves the identification of hazards in the work environment, the assessment of the risks posed by the hazards, and the selection of appropriate risk controls according to a risk control hierarchy. This hierarchy is said to operate on the notion that control measures that aim to target hazards at their source and act on work environment are more effective than controls that aim to change espoused worker behaviour (Holmes et al. 1999). In view of this requirement, Kirchsteiger (2005) claims that clear risk identification and assessment and subsequent risk minimization actions are fundamental for effective OHS risk management. Hislop (1999) supports this view by stating that the underlying cause of most “safety-related losses” is the “absence of a systemic process to identify and mitigate workplace hazards and unsafe work practices.” To aid effective hazard identification, Kirchsteiger (2005) proposes that the following five principles be embedded into risk management initiatives:

2.7.4 Chemical Hazard Investigation

Bryant, Visser & Toshida (1989) collected questionnaire data from 165 hospital workers involved in ethylene oxide (ETO) sterilizing work. They found from 20% to 40% of the

respondent to suffer from headaches, eye/skin irritations, and sore throats attributed to the exposures. Other symptoms recorded were nausea (19%), shortness of breath (15%), and drowsiness (20%). Included in the questionnaire were items asking about the amount of training, which for the sample ranged from less than one hour to more than one day. In more than one-third of the cases first aid was included, and use of protective equipments (i.e., gloves, gowns, masks) while working with ETO.

Environmental samples of ETO were collected during each sterilizer task for the 18 hospitals which employed the 165 hospital workers. Co relational analysis showed amount of training time and use of protective equipment to each bear an inverse relation to the prevalence of reported symptoms; however, only a few of the symptoms showed a significant decrease. Moreover, the expected decrease exposure levels from the use of protective clothing did not cause users to report fewer symptoms of short-term irritation. Indeed, 80% of the workers still complained of one or more symptoms despite exposures within current OSHA regulatory limits.

2.7.5 Risk Perception among Employees

Risk perception is naturally very subjective and it differs from one individual view to another. Rundmo (2001) stated in a report that risk perception can be wrongly explained and may result in wrong actions being taken. Hence, the assessment of most risks is full of uncertainty for several reasons which are usually due to lack of enough information to help access the risk and also understand the procedures behind it. From a more professional view

point, the meaning of risk perception varies and is more complex and not so easy to explain in plain terms (Rayner and Cantor, 1987).

In most cases the most appropriate means to aggregate “real” or “objective” risk is to injury or fatality rates derived from accident data. This is a pragmatic solution for what Rundmo (1996) terms “epistemological risks”. This form of risk relate to potentially large scale accidents, which occur rarely and which cannot be linked directly to personal experience, such as in the nuclear or offshore oil industries. Hope and Sparks (2000) explained that risk assessment can only identify the probability of harm, assess the impact of it on key individuals, and pose intervention strategies which may diminish the risk or reduce the harm. Monitoring and checking the procedures cannot put a stop to risk or stop risk from occurring (Hope and Sparks, 2000).

Rundmo (1996) goes further and suggests that where there is a disparity between risk perceptions and “objective” risk is derived from technical risk estimates. Contrary, it appears there is so far greater validity, on the face of it, in assessing “objective” or “real risk” on accident data. Even this assumption is tantamount to critical challenge.

It can be concluded that most studies have found worker risk perception to be inaccurate and even those studies that have claimed worker perception to be generally accurate have been found on closer examination, to have been an overstatement . Further, Weyman and Clarke (2003), argued that while the validity of the distinction between objective and subjective risk

has attracted a moderate level of criticism, accident data is, nevertheless, generally accepted as being a viable proxy for “real” risk.

Now let us turn our attention to other salient theme emanating from these studies, the scaling of subjective risk perception. Managing risk is only a step but following the procedures is the important action which supervisors are to ensure at the work place. The employees are the working force of any organization and so their perception is very critical in ensuring safety at the work place. These people deal with the day to day activities and so have a better idea of how the place functions. Mainly, these organizations carry routine check on equipment and how it functions in order to avoid accident at the workplace. In recent times organizations and institutions have begun attaching much priority to organizational safety. This is to assess the impact on safety performance predominantly the function of health and safety of employees.

In recent time there has been much awareness in safety and health management as a result of major disasters that have been happening at the workplace. This goes a long way to affect the image of the organization in the public domain if management fails to protect the health and safety issues of their workers and the public. Hale et al., (1997), suggests that it is in this sense that employers are compelled to comply with Occupational Health and Safety Act in order to carry out their responsibilities as employers and to ensure that workers have a favorable working environment. A study by Fleming and Lardner (1999) revealed that human factors contribute to 80% – 90% of all occupational accidents as they neglect the approved practice of working in their study. This is a major concern to employers as they get

to care for the injured employees thereby adding cost to cost of hiring the worker. The technical nature of an organization determines how safety standards are considered critical issue since the least mistake can lead to a serious damage to both equipment and workers.

2.7.6 Managing health and safety

Many countries now have legislation which requires employers to manage the health and safety of their employees, and others who might be affected, in a competent and business-like way. Because the physical environment of the workplace has a direct bearing on health and safety, facilities managers have an important executive responsibility in this area. Their activities form an integral part of the organization's health and safety management system (SMS). (Alan Waring October 199).

2.7.7 NIOSH Studies

During the period 1975-1979, NIOSH (National institute occupational safety and health) published several reports resulting from a project aimed at defining factors in successful occupational safety programs. The project comprises three phases. The first was a questionnaire survey of the safety program practices of pairs of companies in one state that were matched in type of industry, workforce size and locale but differed by more than two-to-one in recorded injury rate (Cohen, Smith Cohen, 1975). The second phase comprised site visits to a sub-sample of the above to verify and observe more closely apparent differences between the pairs that explain the differential injury rate (Smith, Cohen & Cohen, 1978). The third phase used both mail questionnaires and site visits in collecting information from five companies recognized as having outstanding safety records based on total numbers of

hours worked without a disabling injury (Cleveland et al., 1979). This third effort sought added confirmation of the findings of the previous two phases. Data collection for all phases focused on such factors as management's commitment to the program, job safety training, safety incentives, hazard control measures, accident investigation /reporting procedures, and workforce characteristics. The general finding was that early indoctrination of new workers in safe job procedures with follow-up instruction to reinforce the learning was most frequently linked with successful safety performance. Formal classroom instruction versus on-the-job training or the use of varied instructional techniques was less notable considerations. The significance of training as compared with other program practices in accounting for safe performance could not be established. It is important to note, however, that management commitment factors both in these studies and others appear to be the dominant or controlling element (Cohen, 1977).

Miller and Agnew (1973) analyzed frequencies of accidents as reported for workers in five different Canadian work establishments over time periods ranging from 3 months to 3 years. For each workplace, workers trained in first aid, whether on a voluntary basis or as a requirement of the job, were found to have fewer injuries than those who did not have the training. Miller and Agnew speculated that worksite regulations and actions taken for hazard control in combination with the first aid instruction produced an increased safety consciousness in the workforce.

McKenna & Hale (1981; 1982) compared worker injury in two factories for 1-year periods before and after the completion of first aid training. The training was given in 2-hour

sessions and covered the usual topics (i.e., treatment of asphyxia shock, poisons, wounds and bleeding, fractures, etc). This instruction was administered to one group of volunteers (the “experimental group”) who before the training has worse injury records than a “control group” of workers marked by job, age, sex, and job-specific experience. Following the training, the experimental group showed a marked reduction in the injury rate as compared with the changes observed for the control group. Interview data collected 6 months before and 6 months after the training revealed no differences between the trainees and control workers in hazard awareness. When compared with the control group, however, the trainees did show shifts in attitude and beliefs about accidents and injuries believed due to the first aid instruction. The major change was that the trainees regarded more accidents than being preventable and felt responsibility for taking preventive actions. On this basis, McKenna and Hale suggest that the first training served as a personal motivator for adopting safe work practices and improving workplace safety conditions.

2.8 DEFINITION OF TERMS

2.8.1 Occupation

It is a person’s job or profession (work) – any activity which a person spends time. It is also defined as employment; or business, trade, etc; which occupies one’s time permanently or as a hobby.

2.8.2 Occupational health

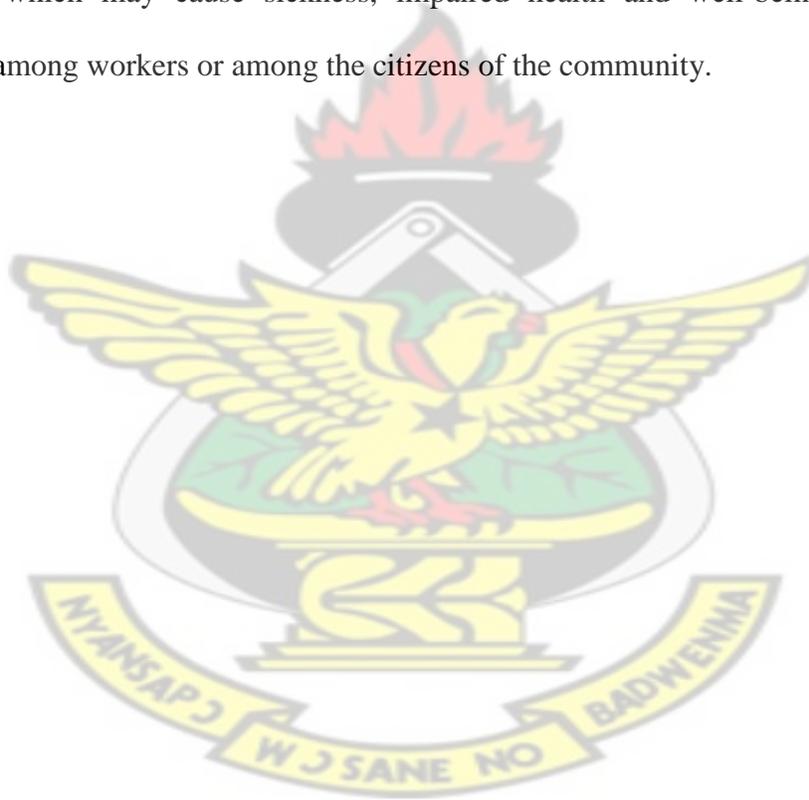
It is the promotion and maintenance of the highest degree of the physical, mental and social well-being of workers in all occupations.

2.8.3 Occupational hazards

It is any condition or factors from workplace that can lead to compensation or that prevent one from going to work (absence), or that can lead to incapacitation.

2.8.4 Industrial hygiene

This has been defined as “that science and art devoted to the anticipation, recognition, evaluation, and control of those environmental factors or stress arising in or from the workplace, which may cause sickness, impaired health and well-being, or significant discomfort among workers or among the citizens of the community.



CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

The preceding section presented the literature relevant to this study and provided explanations on safety, health and environment management at the workplace. This chapter covers the methodology on how the study was carried out. It elaborated more on the research design, sample size and technique and how data was processed into relevant information for the study.

3.2 RESEARCH DESIGN

This was a case study focusing on ECG. The study made use of a cross-level analysis or survey as the research design. Surveys are used to collect large amounts of information from individuals in a population (Mayoux, 2005). A cross-sectional survey is an observational survey used to study a population at a point in time. Cross-sectional surveys involve the use of a sample of the population and generalize the views or behaviours of that group by assuming that they are typical of the whole population (Mayoux, 2005).

In this case therefore, the views of selected sample of managers, supervisors' technicians and other non technical staff at ECG Ashanti East Region were ascertained to ensure the cross-level analysis of the study. The survey was constructed in such a way so as to ensure reliable and reduced bias to the barest minimum. A survey is reliable if the measurement is consistent (i.e. the same results are produced at different times under the same condition) (Mayoux, 2005). The survey was a standardized one which ensured the same meanings were

put to the questions. Validity refers to the degree to which an account is accurate or truthful. In other words whether the survey is able to measure what it is intended to. In addition the study was guided by the structure developed from prior studies and other empirical literature on the subject.

3.3 SOURCES OF DATA

In carrying out this study, both primary and secondary data sources were employed.

3.3.1 Primary Data

Primary data was gathered from a field survey. Primary data enables the researcher to have firsthand knowledge of the source of his information, which enabled him to assess the credibility of the data source.

3.3.2 Secondary Data

Secondary data were gathered from books, journals, articles, accident reports and other firm level data. The use of secondary data afforded the researcher the opportunity to relate the present study to previous findings in relation to safety and health practices in the construction, railway and other sectors. These data were used for literature review and formed the basis for questionnaire design and data analysis. Data collected were both qualitative and quantitative in nature.

3.4 POPULATION

The population for this study involved all the 487 staff at the Ashanti East Region of the Electricity Company of Ghana. The population is made up of top level regional management team, middle level, frontline officers or supervisors / gang leaders' and lower level employees. This is made up of males and females. Table 3.1 presents the total population by categories.

KNUST

Table 3.1 Population of ECG employee in Ashanti East Region

Staff category	Male	Female	Population	Sample size
Top level management	9	-	9	1
Middle level management	6	6	12	9
Frontline Officers supervisors/ gang leaders	81	11	92	28
Lower level Employees	301	81	382	382
Total	394	93	487	420

Source: Human Resource, Department, ECG. Ashanti East; February, 2012.

3.5 SAMPLING TECHNIQUE AND SAMPLE SIZE

Sampling is a method of choosing the size of a research work from the whole population. This enables the researcher to reduce the size of the population in order to access relevant information. The study employed the stratified sampling method in selecting the population for the study and simple random to select from each strata. This method was used because the total population of the study is known. It also allow for scientific generalization. In specific terms, stratified random sampling was employed for the study. According to

Mayoux (2005), stratified sampling is a method used to divide a population into homogeneous subgroups (strata). Each stratum is then sampled individually. The use of this method involves dividing the population into homogeneous subgroups and then taking a simple random sample in each subgroup.

Under this method, employees at ECG, Ashanti East Region were stratified based on rank or level at ECG. Thus employees were stratified into top level management, middle level management, frontline officers /gang leaders and lower level employees. Proportionate numbers of persons were then selected from each stratum. Thus the sample was made up of 1 top level management, 9 middle level management and 28 frontline officers, supervisors' gang leader and 382 lower level employees. In all 420 respondents were sampled for the study. However, 310 questionnaires were returned giving the rate of response to be 73.8%. After cleaning the data, only 109 questionnaires were used.

3.6 DESCRIPTION OF THE RESEARCH INSTRUMENT

Two instruments were used: interview and questionnaire.

3.6.1 Interview

The Regional Manager (top manager) was interviewed. The interview was in the form of conversation and discussion in which the respondent was asked questions in connection with the researcher topic. The researcher used that opportunity to explain the objectives of the researcher.

3.6.2 Questionnaire

The questionnaire was designed specifically to help address the issues raised in the objectives of the study. The questionnaire was made up of both open and close ended questions. The initial part of the questionnaire focused on the demographic background of respondents. Information on the gender, professional background and years of experience was included in the demography. The second part of the questionnaire focused on the safety and health policy and practices at ECG.

The instrument contains portions for supervisors/managers to fill in order to capture the necessary information from their perspectives specifically on issues that border on corporate policies and practices. Respondents were asked to express their views on the subject matter on how the institution assesses reviews and audits its safety and health and practices. The third part of the questionnaire contains questions on how ECG is promoting health and safety at the workplace. Here, respondents were asked about how the environment in which they work affected their work and also whether ECG is environmentally compliance.

Also contained in the questionnaire were portions that explored respondents' knowledge and awareness of safety and health. The questionnaires further probed into issues of perception of risk and how such risks are managed at the workplace. Some specific questions which solicited detail responses on how employees were dealing with challenges with respect to safety, health and environment at the work place were also explored.

3.7 DATA COLLECTION METHODS

This section describes how the researcher gathered the relevant data for this study. The data from the management and staff of ECG Ashanti East Region were self administered to respondents. In some instances, respondents requested for time to fill the questionnaire and later returned it for analysis.

3.8 EDITING AND CODING OF THE QUESTIONNAIRE

The returned questionnaires were edited to remove all unfilled questionnaires as well as those with missing data. This reduced the number of questionnaires received from 309 to 109. These were coded and entered on the SPSS version 16.0.

3.9 DATA ANALYSIS METHOD

The study applied the Statistical Package for Social Sciences (SPSS) technique for the analysis of the data. The analyses were used to examine the responses by the use of frequency distribution. The use of the SPSS analysis involved tables and diagrams in order to graphically display the characteristics of the variables being analyzed. The data for the entire study were input into the Statistical Package for Social Sciences (SPSS) 16.0 programs for Windows and the results were interpreted. Descriptive statistics were employed to generate the variables of interest. Conclusions and generalizations to the study are made by inferring from the results obtained.

CHAPTER FOUR

RESEACH ANALYSIS AND DISCUSSIONS

4.1 INTRODUCTION

In the previous chapter, the research design, the sample of the study, the data collection techniques, the method of data analysis and the statistical procedure of the research were discussed. The focus of the research was to evaluate the health and safety policies and practices at the Electricity Company of Ghana (ECG). This chapter presents the details of the data gathered by the researcher from the field studies organised by the researcher to be able to come out with an unbiased opinion.

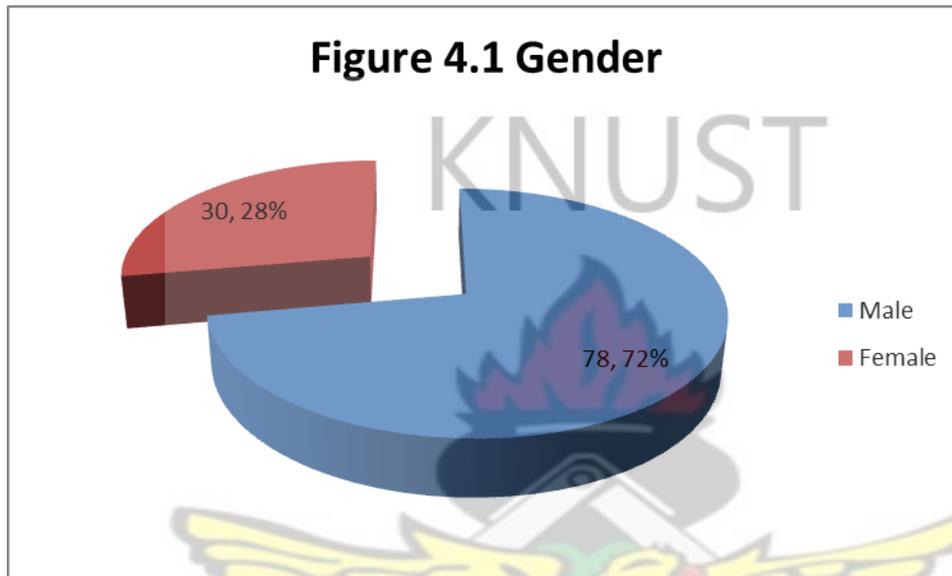
4.2 DEMOGRAPHIC DATA

In the research, a random sampling technique was used to gather the data. It is therefore important to analyse the background and the characteristics of the respondents. This is to enable the researcher identify the various individuals used in the research. The demographic data captured looks at Gender, Marital status, Position held at ECG, the Department of the Respondent, Years of Service and the Employment Status.

4.2.1 Gender

The gender of the respondents was slightly skewed towards the male gender. They served as the majority of respondents where 78 valid responses representing 72% were males and 30 respondents taking 28% were females. Although the national census (2012) depicts more females than males, most researchers especially in sub Saharan Africa and Asia have emphasized that most of these females are usually involved in small informal work settings.

Tsai, 2008 reported that in many Asian countries, the traditional gender ideology stated that women are primarily responsible for child rearing and household maintenance whereas men should be the breadwinners. This situation is not different from what is pertinent in Ghana. It is therefore encouraging that women are now taking up more formal jobs.



Source: Researchers field work, 2012

4.2.2 Marital Status

The marital status of the respondents gave us 62 married respondents out of the 108 valid responses received. This represented 57.4% whilst 39.8% of the total valid responses were single and only 3 responses were divorced.

Figure 4.1 Marital Status

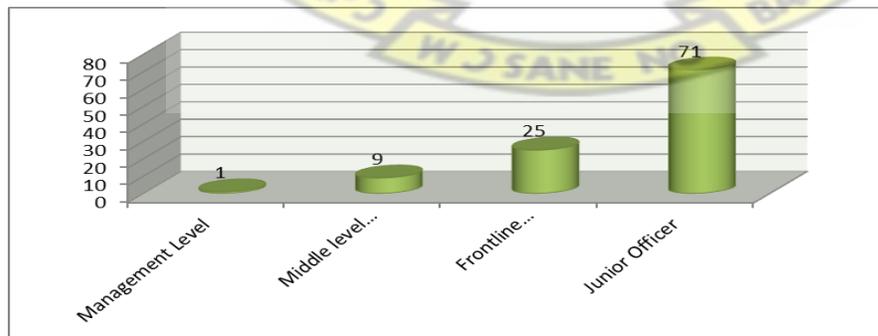
		Frequency	Valid Percent	Cumulative Percent
Valid	Divorced	3	2.8	2.8
	Single	43	39.8	42.6
	Married	62	57.4	100.0
	Total	108	100.0	
Missing	System	1		
Total		109		

Source: Researchers field work, 2012

4.2.3 Position

The various positions were also analysed to ensure that it was representative enough. From figure 4.2 below, junior officers made up majority of the total respondents with 71 responses being junior officers, 25 supervisors, 9 middle level managers and 1 management level staff. It is therefore important to note that majority of the staff are at the junior level and it decreases in number to the high level employees.

Figure 4.2 Position



Source: Researchers field work, 2012

4.2.3 Department

ECG as an organisation has many department to aid in decentralisation and effective completion of work. The respondents were 109 in total but 108 partook in this demographic data. Out of the total valid responses, employees from the Operations Department accounted for 34.3% with Customer Service Department making up 32.4%. Engineering, Accounts, Materials and Transport, and Human Resource representing 6.5%, 14.8%, 1.9% and 10.2% respectively.

Table 4.2 Department

		Frequency	Valid Percent	Cumulative Percent
Valid	Engineering	7	6.5	6.5
	Operations	37	34.3	40.7
	CSD	35	32.4	73.1
	Accounts	16	14.8	88.0
	Materials and Transport	2	1.9	89.8
	HR	11	10.2	100.0
	Total	108	100.0	
Missing	System	1		
Total		109		

Source: Researchers field work, 2012

4.2.4 Years of Service

On this demographic, all the sampled view answered on the subject. Cumulatively, members who have spend between 1 to 10 years of service made up 70.6% of the total sampled views. Employees who had spent 11 to 15 years constitute 11% of the sampled population used. 16 to 20 of work experience at ECG 12.8%. It is shown on table 4.3 below.

Table 4.3 Years of Service

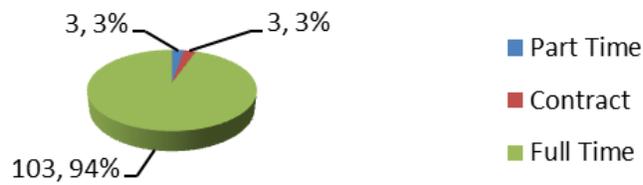
	Frequency	Valid Percent	Cumulative Percent
Valid 1-5	42	38.5	38.5
6-10	35	32.1	70.6
11-15	12	11.0	81.7
16-20	14	12.8	94.5
21 years and above	6	5.5	100.0
Total	109	100.0	

Source: Researchers field work, 2012

4.2.5 Employment Status

This demographic data was to look at the type of employment contract that the respondents had. It categorised it into Part time, Contract and Full Time workers. Responses gave 3%, 3% and 94% respectively. It is mostly the case that state owned enterprises hardly employ people on contract or part time basis.

Figure 4.3 Employment Status



Source: Researchers field work, 2012

4.2.6 Average working hours per day

The average working hours usually is seen as continuous longer working hours usually have influence on the health and safety of workers. We assessed this area to ascertain whether most of the workers work within the allowable working hours of 8 according to part four of the Labour Act 2003, Act 651. From the responses in table 4.4, the employees acknowledged that 42.6% were within 4 to 8 hours which represent the normal working period, 52.8% worked 1 to 2 hours above the normal time thus 9 to 10 hours a day. Other insignificant number chose hours at the extremes thus either too low or too high; responses of 1, 2 and 2 were at 1-3 hours, 11-13 hours and above 14 hours respectively.

Table 4.4 Working hours/day

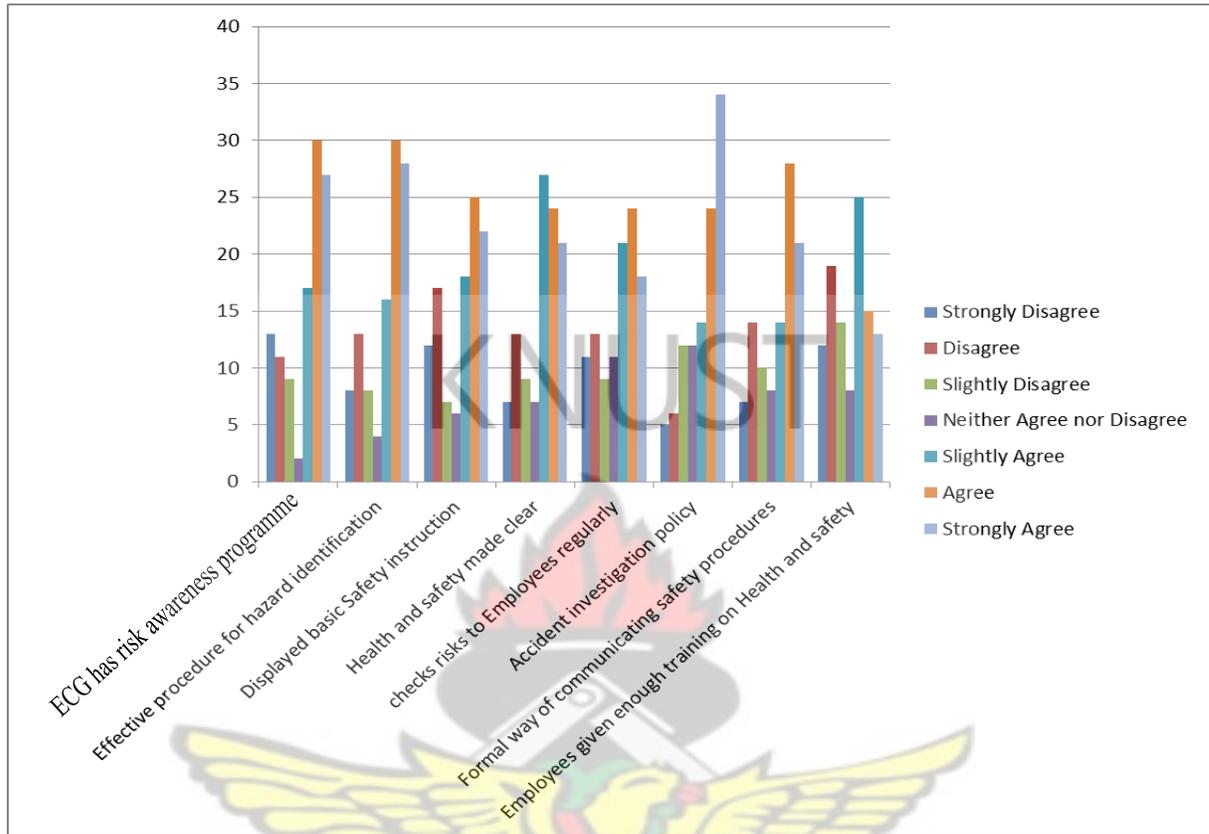
		Frequency	Valid Percent	Cumulative Percent
Valid	1-3	1	.9	.9
	4-8	46	42.6	43.5
	9-10	57	52.8	96.3
	11-13	2	1.9	98.1
	14 hours and above	2	1.9	100.0
	Total	108	100.0	
Missing System		1		
Total		109		

Source: Researchers field work, 2012

4.3 EVALUATE THE LEVEL OF EMPLOYEE AWARENESS OF ECG SAFETY AND HEALTH PRACTICES AND POLICIES.

The level of employees' knowledge on the health and safety practices of ECG. We tested their knowledge on the policies and practices laid down at ECG on health and safety. Figure 4.4 gives the overall details of the responses. Detailed descriptions are given in the tables in this section.

Figure 4.4 Evaluating the awareness of health and safety practices and policies



Source: Researchers field work, 2012

4.3.1 ECG has risk awareness programme

Employees of 109 answered on this question, it can be seen from table 4.5 that 74 (17, 30 and 27) responses agreed to the fact that ECG had an effective risk awareness programme in place. This represents a cumulative percentage of 67.9% of the valid responses. The remaining 30.3% represented disagreement whilst 1.8% were undecided or had no knowledge on the existence. From the responses, it clearly indicates that ECG has a risk awareness programme.

Table 4.5 ECG has risk awareness programme

		Valid Percent
Valid	Strongly Disagree	13 11.9
	Disagree	11 10.1
	Slightly Disagree	9 8.3
	Neither Agree nor Disagree	2 1.8
	Slightly Agree	17 15.6
	Agree	30 27.5
	Strongly Agree	27 24.8
	Total	109 100.0

Source: Researchers field work, 2012.

4.3.2 Effective procedure for hazard identification

On hazard identification, employees responded that it exist as seen on table 4.6. Out of the total responses, a cumulative figure of 30.8% did not agree that there was an effective procedure for hazard identification whilst the remaining 69.2% which signify the majority agreed to the fact that there was an effective mechanism for identifying the various hazards at ECG.

Table 4.6 Effective procedure for hazard identification

		Frequency	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	8	7.5	7.5
	Disagree	13	12.1	19.6
	Slightly Disagree	8	7.5	27.1
	Neither Agree nor Disagree	4	3.7	30.8
	Slightly Agree	16	15.0	45.8
	Agree	30	28.0	73.8
	Strongly Agree	28	26.2	100.0
	Total	107	100.0	
	Missing System	2		
Total	109			

Source: Researchers field work, 2012

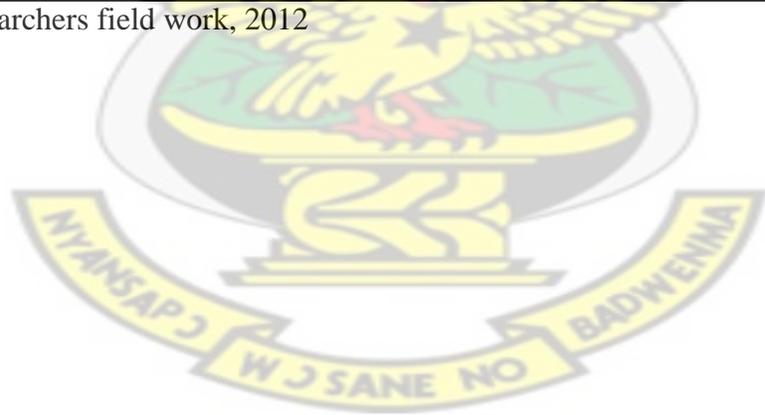
4.3.3 Displayed basic Safety instruction

Basic safety instructions at workplaces are to serve as reminders and to tell workers the various health and safety risks that may exist within a particular area or to caution employees to take necessary steps to prevent any dangers that may occur at the workplace. Although these instructions, 60.7% acknowledge that are present at ECG, it is interesting to note that 39.3% disagree or are indifferent about its existence as depicted in table 4.7 below. The researcher takes a keen interest to the fact that some employees disagree to the fact that it does not exist.

Table 4.7 Displayed basic Safety instruction

		Frequency	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	12	11.2	11.2
	Disagree	17	15.9	27.1
	Slightly Disagree	7	6.5	33.6
	Neither Agree nor Disagree	6	5.6	39.3
	Slightly Agree	18	16.8	56.1
	Agree	25	23.4	79.4
	Strongly Agree	22	20.6	100.0
	Total	107	100.0	
Missing	System	2		
Total		109		

Source: Researchers field work, 2012



4.3.4 Other indicators to check the awareness of employees

Table 4.8 Other indicators to check the awareness of employees

FREQUENCY					
	Health and safety made clear	checks risks to Employees regularly	Accident investigation policy	Formal way of communicating safety procedures	Employees given enough training on Health and safety
Strongly Disagree	7	11	5	7	12
Disagree	13	13	6	14	19
Slightly Disagree	9	9	12	10	14
Neither Agree nor Disagree	7	11	12	8	8
Slightly Agree	27	21	14	14	25
Agree	24	24	24	28	15
Strongly Agree	21	18	34	21	13

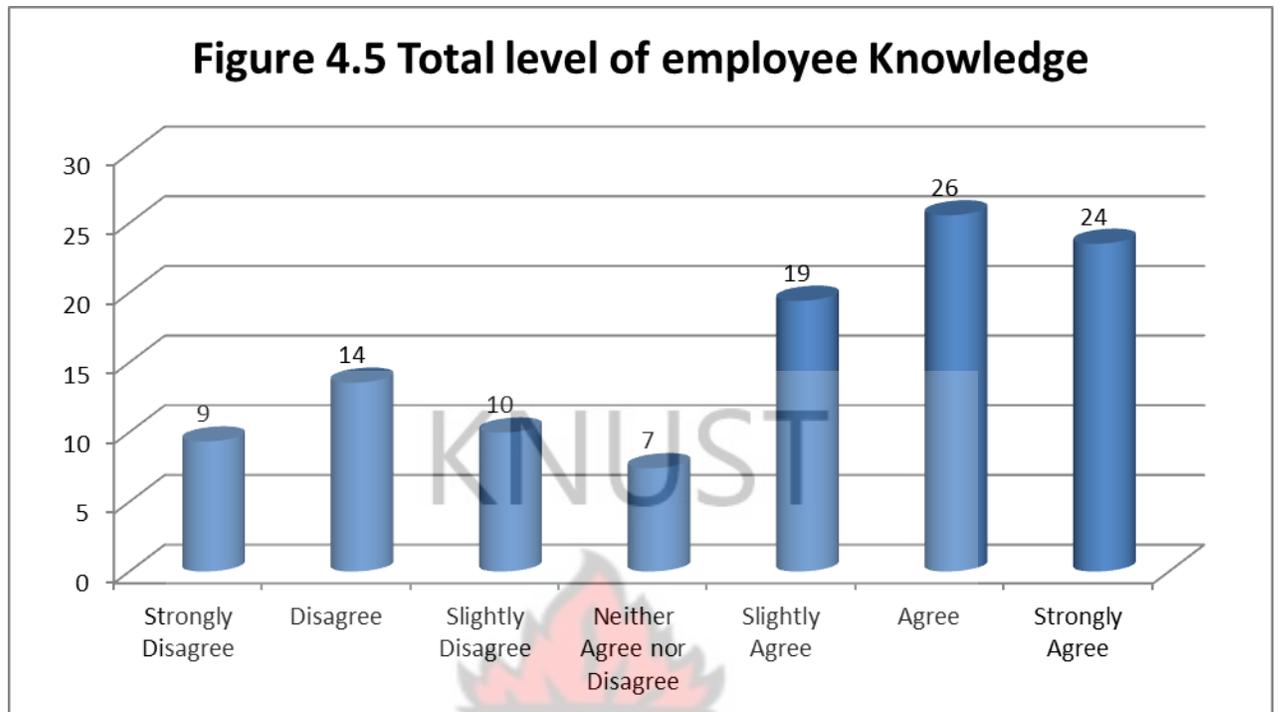
Source: Researchers field work, 2012

The other indicators included the following on which employees were to give responses on; Health and safety made clear, ECG Checks risks to Employees regularly, Accident investigation policy, Formal way of communicating safety procedures and Employees are given enough training on Health and safety. The results are shown on table 4.8. The results were similar for all but Employees are given enough training on health and safety. The results for the Health and safety made clear, ECG Checks risks to Employees regularly, Accident investigation policy and Formal way of communicating safety procedures showed that most of the employees agreed to the fact that those practices existed at ECG.

On the area of Employees are given enough training on Health and safety, the responses were close indicating a very small gap between those who agreed to the fact that employees are given enough training and those who disagreed. Of the total 106 valid responses, 53 employees ranged from slightly agree to strongly agree whilst 45 ranged from slightly disagreed to strongly disagree with 8 neutral responses. As has been done in the previous analysis, the number of neutral responses are added to those that disagreed with the statement, then it brings the total disagreed at par with agreed at 53. What this means is that not a greater majority of employees at ECG have received training on Health and safety practices in the company. A situation that looks worrying for a company like ECG.

4.3.5 Total level of employee Knowledge

The overall level of employees knowledge on health and safety was computed to determine the level of employee understanding of health and safety policies and practices at ECG. From the responses received and shown in figure 4.5, the level of agreement was high as 24 strongly agreed, 26 agree responses and 19 strongly agreed to the fact that their knowledge level was high. 7 neutral responses were received whilst 10, 14 and 9 slightly disagreed, disagreed and strongly disagreed respectively. This indicates that most employees at ECG have adequate knowledge on health and safety practices in the company.



Source: Researchers field work, 2012

4.4 EXPLORE THE WAYS OF IMPROVING UPON SAFETY AND HEALTH PRACTICES AND POLICIES AT ECG.

Notices on health and safety, Employees should be made aware of safety Responsibility, Schedules expose me to hazards and Consulting employees on health and safety matters were the various areas explored to find out if it can help improve health and safety practices at ECG. Various employee responses on these areas are given in the discussion below.

Table 4.9 Notices on health and safety

		Frequency	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	5.7	5.7
	Disagree	14	13.2	18.9
	Slightly Disagree	5	4.7	23.6
	Neither Agree nor Disagree	6	5.7	29.2
	Slightly Agree	17	16.0	45.3
	Agree	29	27.4	72.6
	Strongly Agree	29	27.4	100.0
	Total	106	100.0	
	Missing System	3		
Total		109		

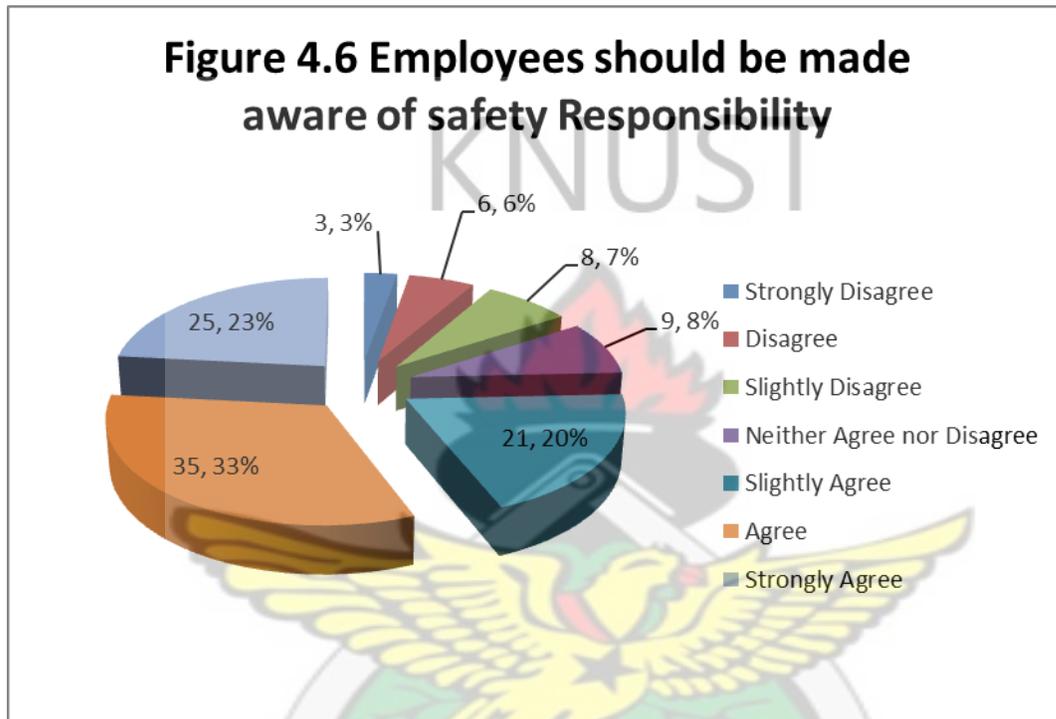
Source: Researchers field work, 2012

4.4.1 Notices on health and safety

With a cumulative figure of 29.2% not in support of the idea that notices should be placed at various points at ECG, 58 (29 Agree and 29 Strongly agree responses) were of the opinion that these notices will help improve the health and safety policies at ECG. 17 (16%) respondents slightly agreed to this idea. It can therefore be realised from the responses that majority of the employees at ECG think that if these notices are placed at various points in the company it will help improve the health and safety of workers at company. It is therefore important for management to ensure that these notices are given enough attention at ECG to

help improve the health and safety level in the company. Table 4.9 above gives a detailed view of the responses obtained from the employees.

4.4.2 Employees should be made aware of safety Responsibility



Source: Researchers field work, 2012

In figure 4.6 above, 23% strongly agree, 33% agree and 21% slightly agree making a total of 77% of agreement to the fact that employees should be made aware of health and safety responsibilities at ECG. As a matter of importance, employees consider communication of these responsibilities a key tool to improving the health and safety conditions prevailing at ECG. It is therefore important to note that the mode of communication is very important. Further interviews conducted revealed that employees are more comfortable with the formal

face to face communication as a very effective way to get these policies across to employees.

4.4.3 Procedural measures to prevent workplace danger

Various procedures are expected by workers to be put in place to curtail various hazards at ECG. From table 4.10, employees acknowledged the fact that standards are to be put in place to prevent danger at the workplaces at ECG. Responses depict that management hazard control mechanisms should move beyond mere policies but should rather proceed to putting in place procedures to improve the health of workers

Table 4.10 Procedural measures to prevent workplace danger

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	4.6	4.7	4.7
	Disagree	4	3.7	3.7	8.4
	Slightly Disagree	9	8.3	8.4	16.8
	Neither Agree nor Disagree	7	6.4	6.5	23.4
	Slightly Agree	27	24.8	25.2	48.6
	Agree	32	29.4	29.9	78.5
	Strongly Agree	23	21.1	21.5	100.0
	Total	107	98.2	100.0	
Missing	System	2	1.8		
Total		109	100.0		

Source: Researchers field work, 20124.4.4 Schedules expose me to hazards

It was set out to identify, how the work schedules at ECG affects their exposure to hazards. From table 4.10, materials and transport respondents showed that there are least hazards associated with their work schedules, other employees from all the other departments had acknowledged that there are hazards with their work schedules at ECG. It is therefore important for management to review the various work schedules of all the various department and review the schedules to minimize the risks involved in their work.

Table 4.11 Schedules expose me to hazards * Department Cross tabulation

	Department						Total
	Engineering	Operations	CSD	Accounts	Materials and Transport	HR	
Strongly Disagree	0	3	6	3	1	4	17
Disagree	2	2	4	1	0	3	12
Slightly Disagree	0	3	1	2	1	0	7
Neither Agree nor Disagree	0	4	4	2	0	0	10
Slightly Agree	0	6	8	1	0	2	17
Agree	3	10	4	1	0	1	19
Strongly Agree	2	6	6	4	0	1	1
Total	7	34	33	14	2	11	101

Source: Researchers field work, 2012

4.4.5 Consult employees on health and safety matters

As depicted in the table 4.12, all but 42.1% disagreed to the consultation approach. This suggests that majority of the employees at ECG want to be consulted on issues concerning health and safety matters at ECG. It therefore leaves onus on the leadership of ECG to consult employees on such decisions.

Table 4.12 Consult employees on health and safety matters

		Frequency	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	5.6	5.6
	Disagree	10	9.3	15.0
	Slightly Disagree	12	11.2	26.2
	Neither Agree nor Disagree	17	15.9	42.1
	Slightly Agree	15	14.0	56.1
	Agree	27	25.2	81.3
	Strongly Agree	20	18.7	100.0
	Total	107	100.0	
Missing	System	2		
Total		109		

Source: Researchers field work, 2012

4.5 TO VERIFY THE EXTENT TO WHICH OCCUPATIONAL HAZARDS ARE HANDLED AT ELECTRICITY COMPANY OF GHANA.

Effective control measures, Review of risk assessment, Arrangements for ensuring Safety, Safety outside the premises of ECG, Periodic Audit on Health and safety, Provides safety Gadgets and Management of ECG review Safety performance were the various measures to verify the ways that occupational hazards are handled at ECG.

In view of the responses, employees responded to the fact that they agreed to the various control measures existed. As depicted in table 4.13 below, majority of responses were skewed towards agreeing to the topical issues mentioned above. This leaves indication that most employees agree that hazards at ECG are handled effectively. This shows that they should continue with the ways they handle health and safety issues.

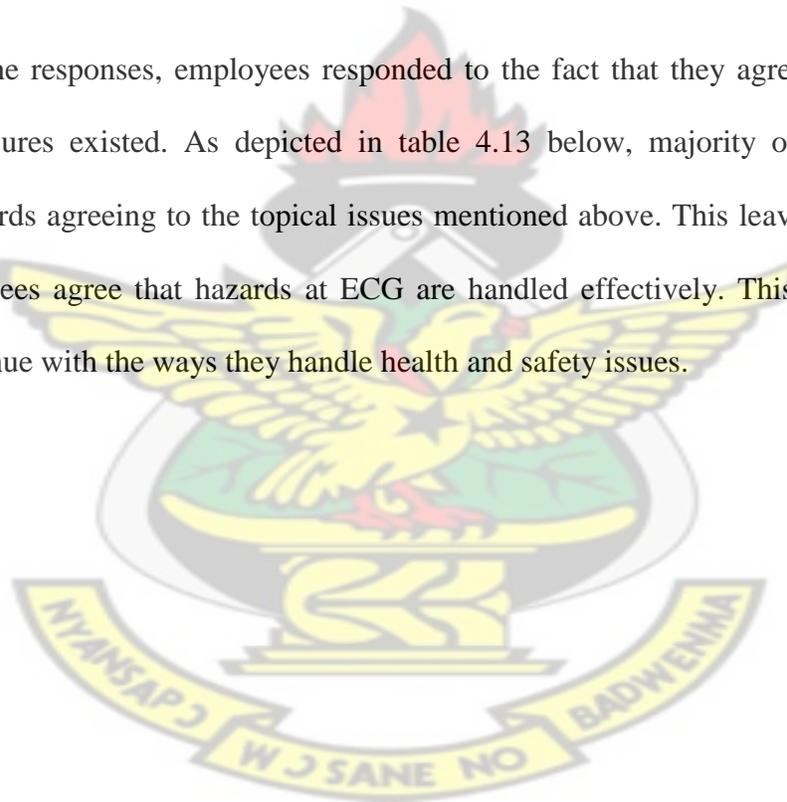


Table 4.13 Ways that Hazards are handled at ECG

	Effective control measures	Review of risk assessment	Arrangements for ensuring Safety	Safety outside the premises of ECG	Periodic Audit on Health and safety	Provides safety Gadgets	Management of ECG review Safety performance
Strongly Disagree	18	12	5	11	11	6	10
Disagree	13	18	7	14	19	6	20
Slightly Disagree	10	9	4	8	12	6	6
Neither Agree nor Disagree	9	14	8	17	9	8	14
Slightly Agree	12	14	20	17	19	22	15
Agree	27	23	31	25	21	30	22
Strongly Agree	18	17	31	13	13	27	21

Source: Researchers field work, 2012

4.6 TO DETERMINE HOW THE HEALTH AND SAFETY OF THE WORKERS CAN BE SAFEGUARDED.

In order to determine how health and safety of the workers are safeguarded then the researcher needed to find out how they encountered various dangers at work. The manner

they encounter various hazards serves as an indicator as to how far employees health and safety are protected.

4.6.1 Electrical Shock

Responding to this, as indicated in table 4.14, 54.1% indicated that they had never encountered electrical shock which is deemed as the major health risk at ECG. It also worth important to know that 22.9% of respondents sometimes encounter electrical shock. 10 persons (7 often responses and 3 Always) accepted that it was very frequent in their activities at ECG.

Table 4.14 Encountered Electrical Shock

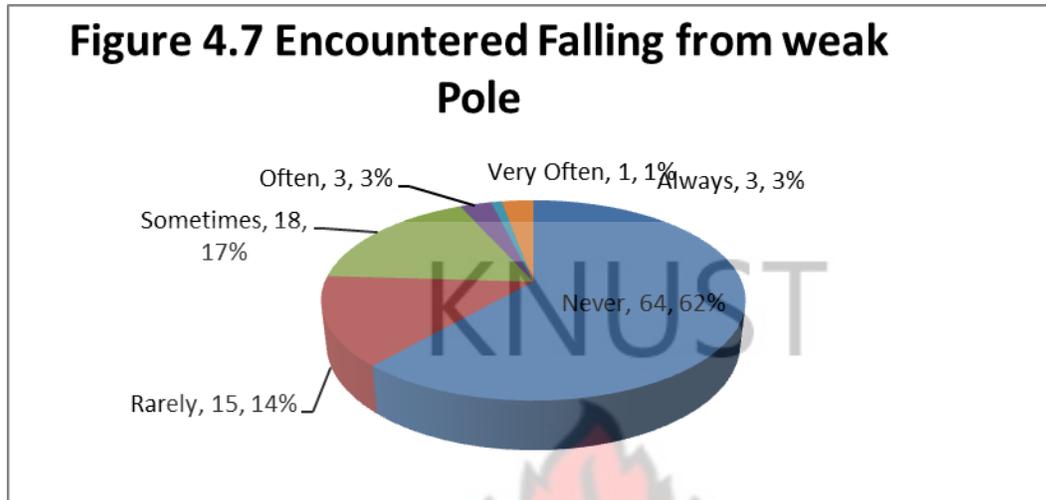
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Never	59	54.1	54.1	54.1
Rarely	15	13.8	13.8	67.9
Sometimes	25	22.9	22.9	90.8
Often	7	6.4	6.4	97.2
Always	3	2.8	2.8	100.0
Total	109	100.0	100.0	

Source: Researchers field work, 2012

4.6.2 Encountered Falling from weak Pole

Weak and falling poles also served as a threat to employees, employees set to see that these hazards were handled effectively. 62% agreed that they had never experienced a falling pole.

Although this is encouraging, a number of employees still have encountered this risk. This risk is therefore needs to be well assessed and controlled to safeguard employees' health.



Source: Researchers field work, 2012

4.6.3 Encountered Conductor cut

Conductor cut saw a huge number of employees thus 25.5% noting that they sometimes encounter this hazard which means that this hazard leaves more room to improve. This creates a serious concern on how conductors are used at ECG. In order to control this hazard, ECG should put measures in place to avoid conductor cuts in the company. Management should therefore put measures to control this hazard and minimize exposure of employees to this risk.

Table 4.15 Encountered Conductor cut

		Frequency	Valid Percent	Cumulative Percent
Valid	Never	52	49.1	49.1
	Rarely	11	10.4	59.4
	Sometimes	27	25.5	84.9
	Often	4	3.8	88.7
	Very Often	9	8.5	97.2
	Always	3	2.8	100.0
	Total	106	100.0	
Missing	System	3		
Total		109		

Source: Researchers field work, 2012

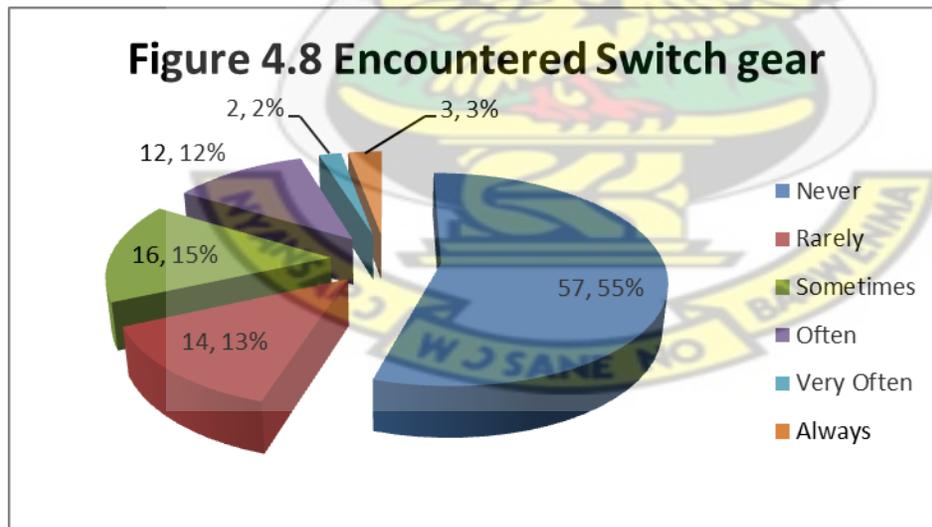
4.6.4 Other risks encountered

Table 4.16 and figure 4.8 present employees' responses on encountering electrical burns and switch gear problems respectively. Although in both tables, majority of employees had not experienced these two hazards but the responses for other occurrence level were also significant which calls for improvement in ensuring that employees do not experience the hazards.

Table 4.16 Encountered Electrical Burns

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	59	54.1	55.7	55.7
	Rarely	14	12.8	13.2	68.9
	Sometimes	24	22.0	22.6	91.5
	Often	5	4.6	4.7	96.2
	Very Often	1	.9	.9	97.2
	Always	3	2.8	2.8	100.0
	Total	106	97.2	100.0	
Missing	System	3	2.8		
Total		109	100.0		

Source: Researchers field work, 2012



Source: Researchers field work, 2012

CHAPTER 5

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter presents the summary of major findings arising from the data analysis, makes appropriate recommendations. The study is concluded at the last section of this chapter.

5.2 SUMMARY

The researcher sought to evaluate the level of employee awareness of ECG safety, and health practices and policies, Explore the ways of improving upon safety and health practices and policies at ECG, To verify the extent to which occupational hazards are handled at Electricity Company of Ghana and To determine how the health and safety of the workers can be safeguarded.

5.2.1 Evaluate the level of employee awareness of ECG safety

It was identified that in analysing employees' level of awareness of safety rules, the responses indicated that the employees had adequate knowledge on the safety practices. It showed that the management had been able to effectively communicate the health and safety practices but an area that needed a review was the area where training section on health and safety practices. The received data indicated that the employees were split as to whether they have received the training or not. It is therefore important that management take into consideration capturing most of the employees in the training sections organised as training might be in favour of some selected few.

5.2.2 Ways of improving upon safety and health practices and policies at ECG

The employees of ECG gave their impression in their responses agreed to the various ways of improving the health and safety practices listed. These included Notices on health and safety, Employees should be made aware of safety Responsibility, Procedural measures to prevent workplace danger, Schedules expose me to hazards and Consult employees on health and safety matters. These measures majority of the employees believe will help improve the health and safety practices and policies in the company. It is therefore advised that management adopt and improve these measures to improve health and safety.

5.2.3 Verify the extent to which occupational hazards are handled at Electricity

Company of Ghana

The researcher identified that most employees agreed to the various trend of handling hazards as being effective and useful. It was therefore encouraging to know that employees are satisfied with how they handle issues related to health and safety.

5.2.4 Determine how the health and safety of the workers can be safeguarded.

Although the hazards identified with the work at ECG were assessed as to how often they occur. It was seen that most employees had never experienced the risk but significant numbers ranged from sometimes too often. This indicates that management should endeavour to reduce these occurrences to safeguard the health and safety of its workers.

5.3 CONCLUSION

The study has revealed that ECG has effective health and safety measures of which employees are very aware and indicated that they have knowledge off. It is therefore interesting to note why significant number of employees still experiences various forms of accidents. Then it therefore leads to ask questions on the availability of materials. It is therefore important for employees to also adhere to the procedures set by the company and to follow them strictly.

5.4 DIRECTION FOR FUTURE RESEARCH

The following research areas are recommended for future research.

1. Future research should look into the reasons why certain employees are experiencing hazards more frequently than others.

5.5 RECOMMENDATIONS

Based on the data received and analysed, the following recommendations are made to management of ECG.

5.5.1 Evaluate the level of employee awareness of ECG safety

1. Regular safety, health and environment education and training must be encouraged and made compulsory.
2. Newly recruited employees must be familiar with the safety and health policy before they begin to function.

3. There should be the use of audio visual as re-enforcement tools to psyche up employees to be safety, health and environment conscious/compliant.

5.5.2 Ways of improving upon safety and health practices and policies at ECG

4. Training sections should not be organised for a selective few but almost all the employees. This is because as some acknowledged that they have formal training other half disagreed there were no training sections.
5. Increase the involvement of employees in decision making on safety and health issues to engender ownership and commitment: Participatory decision making have been identified as a key ingredient to generating ownership and support for an issue. If employees are involved in the setting up of safety benchmarks, they would feel obliged to adhere strictly to it.

5.5.3 Verify the extent to which occupational hazards are handled at Electricity Company of Ghana

6. Safety and health policy should be monitored and reviewed regularly to improve quality policy.
7. Introduce incentive schemes and safety competitions to reduce apathy among managers and staff.
8. There should be a Regional and National award ceremonies on annual basis to recognize and reward individual staff and sections who have recorded zero industrial accident in their Regions/Sections.

5.5.4 Determine how the health and safety of the workers can be safeguarded.

9. Provision of modern safety gadget for employees must be enhanced.
10. Safety gadget should be attractive to employees and adequate for supervisors to effectively do their work.

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APPENDIX 1 – QUESTIONNAIRE

DEMOGRAPHIC BACKGROUND

1. Gender: Male Female

2. Marital status: Divorce Single Married

3. What is your positional level at ECG: Management Level
 Middle Level Management Frontline Officer/ Supervisor
 Junior officer

4. Which department do you work at ECG? Engineering Operations

 CSD Accounts Materials and Transport HR.

5. How long have you been with ECG? 1-5 yrs 6-10 yrs
 11-15 yrs 16-20 yrs 21 yrs and above

6. What is your employment status for the past three months?
 Part Time Contract Full Time.

7. How long do you work in a day?

1-4 hours 4- 8[7- 10 hours 11-13[
14 hours and above

I have sustained injury at the work place within the past 3 years as a result of the under mentioned accident.

Illustrate how you think these factors affect health and safety at ECG.

Use 1 = Never , 2 = Rarely , 3 = Sometimes , 4 = Often , 5 = Very often, 6 =Always to answer the following questions

No.	Accident	1	2	3	4	5	6
1.	Electrical Shock						
2.	Falling from weak/eroding base Pole						
3.	Conductor cut						
4.	Electrical burnt						
5.	Failure of switch gear						

I have nearly missed the under mentioned accident at ECG within the past 3 years

Use 1= Never , 2= Rarely , 3= Sometimes , 4= Often , 5= Very often, 6 =Always to answer questions.

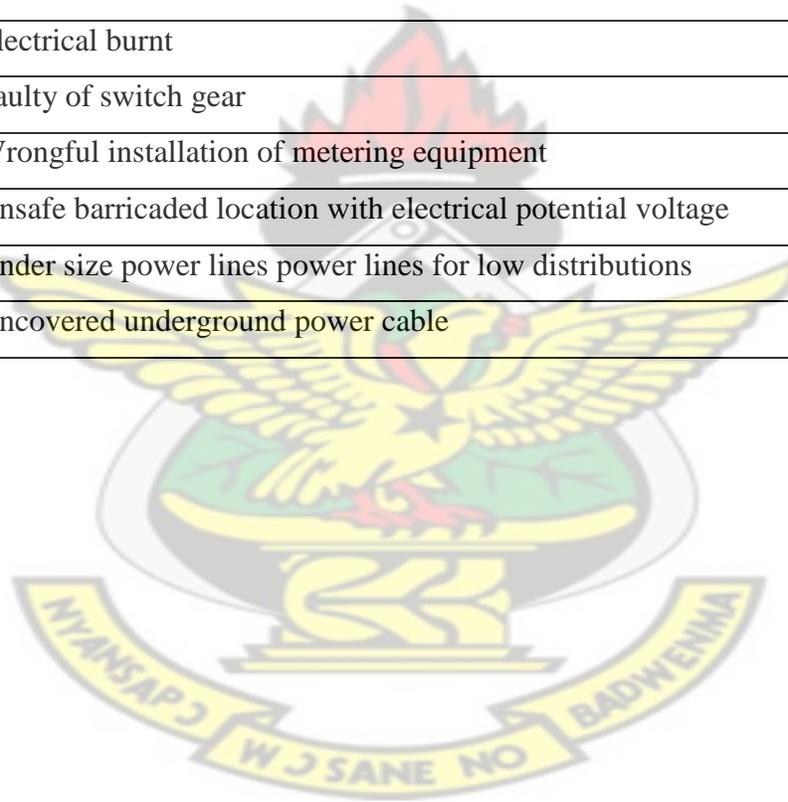
No.	Accident	1	2	3	4	5	6
6.	Electrical Shock						
7.	Falling from weak/eroding base Pole						
8.	Conductor cut						
9.	Electrical burnt						
10.	Failure of switch gear						
11.	Wrongful installation of metering equipment						
12.	Unsafe barricaded location with electrical potential voltage						

Illustrate how you think these factors affect health and safety at ECG.

Use 1 = Never , 2 = Rarely , 3 = Sometimes , 4 = Often , 5 = Very often, 6 =Always

to answer the following questions

No.	Cause	1	2	3	4	5	6
13.	Poor illumination						
14.	Commercial trees like mangoes and palm trees growing into power lines.						
15.	Electrical						
16.	Falling from weak/eroding base Pole						
17.	Conductor cut						
18.	Electrical burnt						
19.	Faulty of switch gear						
20.	Wrongful installation of metering equipment						
21.	Unsafe barricaded location with electrical potential voltage						
22.	Under size power lines power lines for low distributions						
23.	Uncovered underground power cable						



HEALTH AND SAFETY POLICY & PRACTICES

Indicate your extent of agreement or disagreement to the following statements where Strongly Disagree=1, Disagree=2 Slightly Disagree=3 Neither Agree nor Disagree= 4 Slightly Agree=5 Agree=6 Strongly Agree= 7

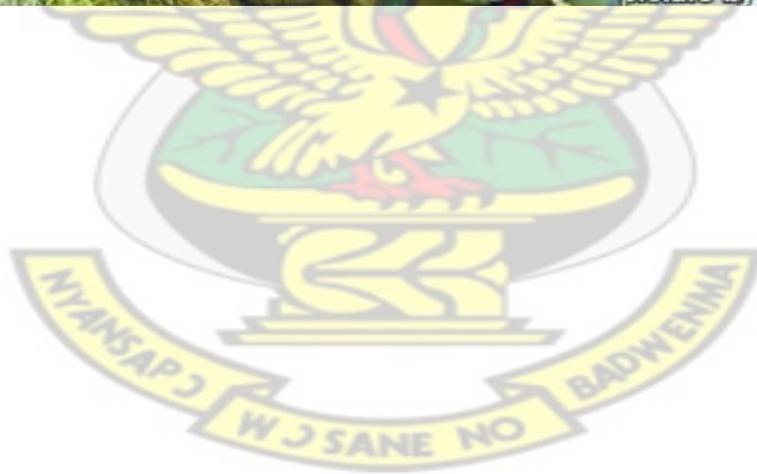
No.	Statement	1	2	3	4	5	6	7
Awareness of health and safety practices								
24.	ECG has risk-awareness programmes, for its employees to better understand the safety practices of all tools and equipment before they are put to use.							
25.	ECG has specific procedure for effective hazard identification.							
26.	Basic safety instructions and Notices are displayed in my Substations and offices.							
27.	Health and Safety responsibilities are made clear to you and your colleagues at ECG.							
28.	ECG carries out risks to health and safety of its employees regularly							
29.	ECG has an accident reporting and investigation format/policy.							
30.	ECG has a formal way of communicating safety procedures/issues to its customers, employees and the public.							
31.	I have attended enough health and safety training programs at ECG.							
Promoting, safe, healthy and supportive environments								
32.	ECG has effective control measures/precautions at ECG as a result of the risk assessments it carries out.							
33.	ECG review risk assessments to take account of changes/accidents/incidents.							
34.	ECG has arrangements for ensuring safety of plant and equipment.							

35.	If work takes place at other locations e.g. site or client's home etc, ECG has an arrangements to assess the health and safety suitability prior to the employee starting the work								
36.	ECG periodically audits its health and safety arrangements.								
37.	ECG provides safety gadgets to its employees.								
38.	Management of ECG review health and safety performance annually, and identify short falls for improvements.								
Improving health and Safety at ECG									
		1	2	3	4	5	6	7	
39.	ECG have identification badges lock off, tags, caution notices on its equipments.								
40.	ECG employees are aware of their responsibility to safety and environmental issues.								
41.	The policy works in practice and helps create a 'safety culture' and 'safe working environment at ECG.								
42.	ECG has a procedural measures to identify and prevent workplace potential danger								
43.	My schedules at ECG expose me to these hazards and risks.								
44.	ECG has effective arrangements for the consultation and participation of employees in health and safety matters.								

APPENDIX 2 FIRE DESTROYS TEMA OIL REFINERY –GHANA 2010



Fire destroys Tema Oil Refinery –Ghana 2010



APPENDIX 3 FIRE AT FOREIGN MINISTRY -GHANA 2010

