AN APPRAISAL OF OCCUPATIONAL SAFETY AND HEALTH PRACTICES IN NIGERIAN MANUFACTURING INDUSTRIES IN KADUNA AND NIGER STATES

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CERFIFICATION

This is to certify that this thesis "An Appraisal of occupational safety and health practices in Nigerian manufacturing industries in Kaduna and Niger States" has been read and approved by the under signed persons as having been prepared in accordance with the regulations of thesis presentation and meeting the basic requirements for the award of master degree in metal work technology by the Department of Industrial and Technology Education Federal University of technology, Minna, Niger State.

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Abstract

This study was conducted to appraise occupational safety and health practices in Nigerian manufacturing industries in Kaduna and Niger states. To elicit the pertinent information needed for the study, four research questions guided the study on provision of safety equipment, facilities and accident free environment in the manufacturing industries to determine the extent of compliance with safety practices and government policies in manufacturing industries to also determine extent of management's commitment to occupational safety, health and accident free environment in manufacturing industries. This study was carried out in functional manufacturing industries in Kaduna and Niger state. A descriptive survey research design was adopted for the study. Relevant literature related to the study was reviewed. The respondents comprises of 50 administrators, 70 engineers/technicians and 150 craftsmen. A structured questionnaire consisting of 83 items was used for data collection. A total of 270 copies of the questionnaires were distributed and 250 were completed and returned representing 93% percent. The reliability coefficient of the instrument was 0.80 using Cronbach's alpha, while four research questions and four hypotheses tested at 0.05 level of significance guided the study. Mean statistics was employed to answer the research questions while one-way analysis of variance (ANOVA) was used to test the hypotheses. The findings revealed that safety and health training are not fully adequate whenever new product are to be produced. There is adequately standard medical centre in the manufacturing industries. That all the workers can operate atleast a portable fire extinguisher adequately. The study recommends some of the followings. Adequate provision of diagnosis of workers health and referrals should be made to assigned clinics and the companies should always try to send staff for workshops/seminar on occupational safety and health practices in the industries. These various approaches need to be adopted for effective management of occupational safety and health practice in Nigerian manufacturing industries in Kaduna and Niger states in particular. These includes first aid boxes should be well equipped with necessary drugs in all the workshops in the industries. The workshops in the industries should be well illuminated and ventilated. Functional respirators should be available in the industry for the workers. Government should monitor the company's environment to enhance safety and health practices. And functional fire extinguishers be made available in the workshops and easily assessable to workers at all time. There should be adequate emergency exists in the workshops. Workers should be well trained to improve their practical skills. Lastly, the companies should provide new facilities/equipment recommended by the regulatory bodies.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Industrial safety policy is a policy that guide workers, industrialists and others on staff working conditions in industries and workshops (Encarta, 2004). The Federal Government of Nigeria has no doubt taken a number of steps to address various environmental problems in the country. Concerted efforts in this regard dated back to the year 1989 following the unfortunate incidence of the dumping of toxic hazards waste at Koko port in the Delta area of the then Bendel State of Nigeria. This incidence led to establishment of the Federal Environmental Protection Agency (FEPA) through Degree No. 58 of 1988 as amended by Decree 59 of 1992.

In 1989, the Federal Government through FEPA formulated a National Policy on Environment with the overall goal of achieving sustainable development. As part of the implementation strategies for the policy, environmental guidelines, standards and regulations for industrial pollution, effluent emission and solid wastes management were formulated. In addition the Environmental Impact Assessment (EIA) Decree No. 86 of 1992 was promulgated. The Decree stipulated that all development projects shall be subjected to Environmental Impact Assessment before the commencement of the project or industrial activities. According to Adewoye (1999) Nigeria is committed to a national environmental policy that will ensure sustainable development based on proper management of the industries particularly and the environment. This demands positive and realistic planning that balances human needs against the carrying capacity of the environment. This requires that a number of complementary policies. strategies and management approaches are put in place which should ensure, among others that:

Environmental concerns are integrated into major economic decision-making processes and Environmental Impact Assessment is mandatory before any major development

project is embarked upon;

Environmental monitoring and auditing of existing major development projects are routinely carried out.

Although industrialization is an essential prerequisite for economic growth and prosperity in developing nations, it cannot be achieved without a threat to the health of workers. The Nigerian scene is repel with instances of haphazard establishment of industries and industrial estates. The prevailing situation in many of the small and medium size factories which constitute the majority of industrial establishment in Nigeria clearly shows that safely, health, protection of workers and even the work environment is nothing to write home about. Nufi (2005) observed that protection of workers from exposure to health hazards is still inadequate, rudimentary or non-existent at all. Stressing the importance of work free environment and its attendant contribution to workers safely, Timings (1972), opined that section 28 of the factories Act specifies that: floors, steps, stairs, passages and gangways must be soundly constructed, properly maintained, and as far as is practicable, kept free from obstructions and any substance likely to course persons to slip. He further maintained that how this specification is met would depend upon the particular working area and its floor.

He further highlighted that, this policy, in order to succeed, must be built on the following sustainable development principles as follows:

(a) The precautionary principles which holds that where there are threats of serious or irreversible damage, the Lack of full scientific knowledge shall not be used as a reason for postponing cost effective means to prevent environmental degradation,

(b) Pollution prevention pays principle (3p+) which encourages industry to invest positively to prevent pollution,

(c) The polluter pays principle (PPP) which suggest that the polluter should bear the cost of preventing and controlling pollution,

(d) The user pays principle (PP), in which the cost of a resource to a user include all the environmental cost associated with its extraction, transformation and use (including the cost of alternative or future uses for gone),

(e) The principle of participation which requires that decisions should as much as possible be made by communities affected or on their behalf by the authorities closest to them.

In enunciating a national policy on the environment, cognizance must be taken of the various institutional settings and professional groupings, as well as the complex historical, social, cultural and legal considerations, which have been and continue to be involved in the identification and implementation of measure designed to solve national environmental problems. The provisions of the policy have thus been informed by recent national policy initiatives in science and Technology, Agriculture, Health, Industry, Oil and Gas, population culture, etc. as well as the major international efforts in the field of environment. The policy is aimed at providing a national, practicable, coherent and comprehensive approach to the pursuit of economic and social development in a way that minimizes contradictions and duplications, while enhancing inter – and intra – sectoral co-operation and effectiveness at all levels.

(FEPA, 1999), since the health and welfare of all Nigerians depend on making the transition to sustainable development as rapid as possible, this National policy on the Environment provides the concepts and strategies which will lead to the procedures and other concrete requirements for lunching Nigerian into an era of social justice, self – reliance and

sustainable development as in the 21st century. Some of the strategies for achieving the objectives include:

Preparation of a national classification/categorization of industries that will ensure optimal utilization of common services by industries that produce similar effluents;

Preventing industries from being sited close to ecologically sensitive areas, historic and archaeological monuments, national parks, scenic areas, beaches, swamps, flood plains, wetlands etc.;

Encouraging the use of state –of- the - act equipment and environmentally sound technologies in process operations to enhance in plant safety and healthy environments;

This policy thrust is based on fundamental re thinking and a clearer appreciation of the interdependent linkages among development processes, environmental factors as well as human and natural resources. Since development remains a national priority, it is recognized that the actions designed to increase the productivity of the society and meet the essential needs of the populace must be reconciled with environmental issues that had hitherto been neglected or not given sufficient attention.

Anderson, (1999) stated that a considerable portion of a worker's life is spent within his work environment. It is therefore, essential to ensure that environmental factors in the work place conform to generally acceptable standards to ensure optimal productivity as well as the protection of the health and safety of the worker. Some of the strategies for achieving occupational health and safety include:

Establish appropriate regulations and standards to guarantee the protection of workers against hazards that threaten their health and safety within the working environment;

Monitor and up date levels of various pollutants permissible within the working environment consistent with nationally set standard for human health and well being;

Institute training and enlightenment programmes for the management, union leaders as well as workers on the dangers posed by industrial operations including excessive exposure to industrial emission and other health hazards;

Bugate, Hamalai & Indabawa (2002) observed that one of the historical events that had the most profound impact in changing human civilization is the industrial revolution of 19th century. The revolution ushered in new amenities such as electricity, motor vehicles, telecommunication, and today the frontiers are unlimited with these, massive wealth (of unimaginable proportions 200 years ago) in the hands of individuals and government. The revolution gave birth to the modern manufacturing industrial sector. It is not an overstatement to say that the development and growth of a vibrant and dynamic manufacturing sector is the pillar of accelerated economic growth and improvement in the quality of life in any society.

Manufacturing industries deals with processing of raw materials resources into finished products. Some of these processes result into emission of dangerous chemicals, waste products that are harmful to human health and even environment.

Atsumbe (2005) observed that modern industries must use an infinite number of substances and compounds, some of which are injurious to the workers health. More than 500 of such materials have been recognized to be injurious to workers. Manufacturing industries must be constantly on the watch for toxic substances in solids, liquids, dusts and vapour and take the necessary steps to protect the workers from their poisonous effect. Chemical related accidents records shows that more than 100 deaths occurred annually in the United States as a result of carbon monoxide poisoning. Momoh (2004) reported that it was discovered that as a results of

insufficient safety measures more than 250 technical workers of fertilizer blending company in Kaduna were diagnosed to have body disorder. Such as cancer of the lung, infertility, cardiovascular diseases and genetic mutation. Momoh further, said the bane of the industrial workers is that they are not protected or taught by their employers. Even when carbon monoxide is colourless, tasteless, odourless, non-irritating gas, but it kills very fast. Many industrial workers have lost their lives as a result of inhaling it. Industrial workers suffer from radiation accidents, which are caused by radioactive materials or in the exposure of individuals to radiation. The work of Eleke (2003), shows that several workers in the steel manufacturing industries suffer from nausea diarrhea, loss of weight, premature aging, leukemia e.t.c. These are all as a result of the inability of the worker to abide by safety rules or the employers not making sufficient provision for their workers protection.

1.2 Statement of the Problem

Many manufacturing industries in Nigeria are plagued with various problems, which have resulted in loss of man-hour, productivity, lost and damages to materials, equipment, tools and machines. Brown (1999) reported that there is each year over 14400 deaths from work injuries and the annual number of disabling injuries is around 2.5 million and there are a large number of more minor work injuries. The national safety council estimates the total national costs of work injuries and accidents to about $14 billion, property damage other than direct fire damage. Our knowledge of the toll from occupational illness is much less accurate than that for injuries. It has been estimated that there may be at least 100,000 deaths and 300,000 new cases of disabling diseases each year resulting from exposure at work to toxic materials. Recent records show that 17,000 workers are killed every year; over 2,000,000 workers received injuries, 3,000,000 workers are permanently impaired (Marks, 1999). It has lead to lost of both human and financial

resource. Furthermore industries pay substantial bill each year for treatment and cure of workmen disable or injured by on the job accidents.

These expenses are much, which usually run into billions of naira annually by manufacturing industries, the monetary value of damaged equipment and materials, production delays and time losses of other workers indirectly involved in accidents, usually gulp similar amount. These human and financial losses sometimes lead to a complete stoppage of production and closure of the industries at Apapa flourmills. Although industrialization is an essential prerequisite for economic growth and prosperity in developing nations, it cannot be achieved without a threat to the health of workers. Grimaidi, (2002) pointed out that the Nigerian scene is replete with instances of haphazard establishment of industries and industrial estates. The prevailing situation in many of the small and medium size factories which constitute the majority of industrial establishment in Nigeria clearly shows that safety, health, protection of workers and even the work environment is nothing to write home about. Nufi (2005) also observed also that protection of workers from exposure to health hazards is still inadequate, rudimentary or non-existent at all. Stressing the importance of work free environment and its attendant contribution to workers safety, that section 28 of the factories Act specifies that: floors, steps, stairs, passages and gangways must be soundly constructed, property maintained, and as far as is practicable, kept free from obstructions and any substance likely to course persons to slip'. He further maintained that how this specification is met would depend upon the particular working area and its floor.

Oviasyi, (2001) furthermore reported with anguish the cases of over one hundred and fifty staff of the defunct Benue Cement Company who were diagnosed of cancer of the lungs as a result of gradual deposit of cement dust and also the fatal explosions at Apapa flourmills; there

have also been newspaper reports of minor industrial mishaps at oil drilling platforms at Bonny and at the fertilizer plant at Onne. When one think of untimely deaths, accidents rendering many able-bodied men disable, several women and children suddenly turned widows and orphans. This becomes pertinent to embark on a research of this nature. It is in the light of the above therefore that an appraisal of occupational safety and health practices in Nigerian manufacturing industries was carried out in Kaduna and Niger States.

1.3 Purpose of the Study

The main purpose of the study was to appraise the occupational safety and health practices in Nigerian manufacturing industries in Kaduna and Niger States, specifically the study sought to find out.

1. The provision of safety equipment, facilities and accident free environment in the manufacturing industries.
2. The extent of compliance with safety practices, government policies on work environment in manufacturing industries.
3. Management commitment to occupational health and safety education practices.
4. The current strategies for promoting safety and health practices in manufacturing industries.

1.4 Significance of the Study

This study will be of tremendous significance to the workers in the manufacturing industries by identifying unsafe acts and conditions in the workplace as well as aid in making awareness of the use of safety equipment and devices thereby providing opportunities for evolving methods of safeguarding the lives of the workers. The result will equally be of immense benefits to the management of the manufacturing industries in terms of prevention of

damage to equipment and facilities, loss of production time, compensation claims, and loss of skilled manpower through accidents, death and incapacitation. The result will help the industries to reduce accidents, and improve their productivity due to adherence to the appropriate safety regulations and use of safety equipment promptly. The study will help to improve the economic situation of the industries and society at large.

The result will be of immense benefit to the Nigeria Government in terms of knowing the extent to which industries comply with occupational safety and health practices. Occupational safety and health practices will be asses through encouraging the availability of safety equipment, devices and health facilities made available by the manufacturing industries for their workers. Owners of manufacturing industries will benefit more because there will be maximum production of products by the industries which will bring in more money for the owners of the manufacturing industries. While the society at large will enjoy better goods and services from the manufacturing industries in the country. Thereby helping the citizens to work in a good atmosphere in the manufacturing industries if its findings are fully implemented.

1.5 Scope of the Study

This study will be delimited to appraisal of occupational safety and health practices in Nigerian manufacturing industries specifically the study will look into the followings. The provision of safety equipment and accident free environment, the extent of compliance with safety practices, government policies on work environment in manufacturing industries, the extent of management commitment to occupational safety, health, and accident free environment in manufacturing industries, and the strategies for promoting safety and health practices in manufacturing industries. This study does not cover structural set up of management of manufacturing industries.

1.6 Assumption of the Study

The following assumption were held for guiding the study.

1. That a significant number of the distributed questionnaires would be returned.
2. And that utilization of questionnaire would be adequate for the collection of necessary data for the study.
3. That the questionnaires returned would be truthfully completed by classified categories of respondents.

1.7 Research Questions

This study sought answers to the followings:-

1. To what extent are safety equipment and facilities provided in the manufacturing industries?
2. What is the extent of compliance with safety practices and government policies in manufacturing industries?
3. How committed are manufacturing industries to promoting health and safety education practices?
4. What are the current strategies for promoting safety and good health practices in the manufacturing industries?

1.8 Hypotheses

1. There is no significant difference among the mean response of engineers/technician, administrators and craftsmen on the extent of safety equipment, facilities and accident free environment provided by the manufacturing industries.
2. There is no significant difference among the mean response of the engineers/technician, administrators and craftsmen in the extent of compliance with safety practices and government policies in manufacturing industries.
3. There is no significant difference among the mean responses of engineers/technician, administrators and craftsmen on how committed are the governments of manufacturing industries to promoting safety and accident free environment.
4. There is no significant difference among the mean response of engineers/technician, administrators and craftsmen on the strategies for promoting safety and good health practices in the manufacturing industries.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

1. The related literature review for this study is organized under the following sub-headings:-
2. The conceptual frame work of occupational safety and health practices
3. The manufacturing industries in Nigeria.
4. Occupational Safety And Practices in manufacturing industries.
5. The concept of health and work environment in manufacturing industries.
6. Government policies on occupational safety and health practices in industries.
7. Review of empirical study
8. Summary of literature review

2.1 The Conceptual Framework of Occupational Safety and Health Practices

The occupational safety and health practices are those activities that seek either to minimize or to eliminate hazardous conditions that can cause bodily injury. Occupational safety is concerned with risks encountered in areas where people work; offices, manufacturing plants, farms, construction sites. Public safety involves hazards met in the home, in travel and recreation, and other situations not falling within the scope of occupational safety. (Britannica, 2008). Furthermore pointing out that safety was not considered to be a matter or public concern in ancient times, when accidents were regarded as inevitable or as the will of the gods. Modern notion of safety developed only in the 19th century as an outgrown of the industrial revolution, when a terrible toll of factory accidents have seen humanitarian concern for their prevention.

Today the concern for safety is world wide and is the province of numerous governmental and private agencies at the local, national, and international levels.

The frequency and severity rate of accidents vary country to country and from industry to industry as noted by (Britannica, 2008) and in the industrialized nations of the world, accidents now cause more deaths than all infectious diseases and more than any single illness except those related to heart disease and concern. That accident in the home, in public and private transportation, and on farms and in factories are by far the predominant cause of death, in the population under 35 years of age in industrialized nations. Also highlighted that industrial accidents can occur because of improper contact with machinery, the lifting or other handling of bulk materials, and contact with electrical, chemical, or radiation hazards. This leads to several internal organizations to provide means by which national safety organizations can exchange information and pass on new ideas. Among the bodies serving in this capacity are the International Social Security Association (ISSA) and the internal labour organization (ILO). These two bodies have sponsored internal safety congresses every three years since 1955.

A number of organizations, including the ILO, ISSA, the World Health Organization (WHO) and the European Economic Community, (EEC) maintain a joint information bureau in Geneva. The internal organization for standards for numerous areas of activity (Such as nuclear energy) among the many nations that sponsor it (Britannica, 2oo8). And now the most recent trends in safety engineering include increased emphasis on prevention by the anticipation of hazard potentially changing legal concepts with regard to product liability and negligent – design or manufacture, as well as the developing emphasis on consumer – protection and occupational health and environmental control.

Encarta (2004) defined industrial safety as an area of safety engineering and public health that deals with the protection of workers health through control of the working environment to reduce or eliminate hazard, industrial accident and unsafe working conditions that can result into temporary of permanent injury or illness and even death.

2.2 The Manufacturing Industries in Nigerian

The apex organizations in the private sector, such as the Manufacturers Association of Nigeria (MAN), Nigeria Association of Chambers of Commerce, Industry, Mines and Agriculture (NACCIMA), Nigeria Association of Small-Scale Industries (NASSI), Nigerian Employees Consultative Association (NECA), Federation of Farmers Association of Nigerian (FOFN), etc. exist in the country and cater for the health development of the private sector of the economy. There are chambers of commerce and industry located in each state capital and major cities of the country. Memberships of the chambers are open to all individuals and corporate bodies engaged in meaningful commercial activities. The chambers are themselves members of NACCIMA. The apex organizations are the means through which liaise between the government and the organized private sector is established and fostered. The organizations can assist potentials investors and industrialist in finding their way in the field of commerce and industries in the country, (Cooper 2007).

Olebume, (2007) pointed out that the investment climate in the country affords trade protection to domestic industries through Nigeria's tariff system, while Nigeria's membership of the World Bank's Multi-lateral Investment Guarantee Agency (MIGA) as well as the operation of the bilateral investment promotion and protection agreement (IPPA) make for protection of foreign investment in Nigeria. The instrumentality of the patents and Design Decree of 1970 affords protection and transferability of shares of joint owners of patent or design registered in

Nigeria, while that of the trade Mark Act of 1956 affords protection of the exclusive right of a proprietor of a trademark. Also, government is prepare to enter into bilateral investment protection agreement with other countries with respect to the investments by their nationals. And partner to encourage the investors the national research institutes in Nigeria and other Nigerian innovators have developed domestic technologies which use primary raw materials available in the country for industrial production.

The priority area of industrial investment which are favored in the administration of government industrial incentives are industries which can either immediately or in a few years time source their raw materials locally e.g in the agro and agro-allied sub-sectors for which there are abundant natural resources in Nigeria, including food preparations, e.g. fruit drinks, cereal milling, feed mill, and vegetable oil processing. Industries which support food production program through local manufacture of chemicals, equipment and light commercial vehicles in particular and chemical as well as petrochemical based manufacturing industries in general and that industries with multiplier effect such as flat sheet mills and machine tools industries, including foundries and engineering industries for spare parts production, basic industries such as the petrochemical and liquidified natural gas project in which the government welcomes foreign partnership; processing of agricultural produce and minerals available locally into industrial raw materials as manufacture: intermediate goods required by existing industries in Nigeria; investment in research institute particularly in the area of adaptive research and commercialization of local inventions (Ireson, 2001).

Eleke also asserted that efficient management system and programmes on occupational safety and health are primarily responsible for protecting workers from work – related hazards and elimination of work related hazards and their associate cost and noted that from cradle to the

grave, people are exposed to a variety of hazards based on the environment in which they carry out their daily activities. Every activity has its unique environment. The industrial working environment having its own uniqueness is filled with a lot of risks hazards and other agents of anti-work.

Industrial operations/processes invariably involve the conversion of raw materials and resources into semi-finished and finished products. As the conversion can never be completely total, residues in the form of energy and matter will be formed. If the residues are not utilized they become wastes, and, if discharged into the atmosphere, can become pollutants. The degree to which the pollutants affect the physical environment depends upon their quantitative and qualitative characteristics as well, as the receiving media. Some pollutants are readily bio-degradable, while others persist for a long time and may not even decompose. Also, some pollutants have low toxicity, whereas others are highly toxic or carcinogenic in trace quantities (Ajisegiri, Chukwu, Odigure, Jimoh, Adeniyi and Olagunju, 2002).

Industrial activities that are a part of our everyday lives often lead to economic gains also degrade the environment and the essential resources upon which humanity depends. Deforestation, land degradation, water pollution and air pollution are now present throughout the world. Grene (2000) observed that the atmosphere through increasing emissions of fuels, and the release of other green house gases, such as methane etc are the most serious environmental problem induced by human activity today. This alteration in the composition of the atmosphere due to global air pollution could lead to lost of lives at a rate unprecedented in human history. Human capital rather than natural resources has become the driver of economic and industrial development. In addition to effects on the physical environment, industry and industrialization also affects industrial workers.

Health line Networks International, (2006), observed that "occupational safety and health" implies that there are two aspects to this field. One is the area of safety, which seeks to make work places safe for workers so that they do not suffer injuries, and further explain that poorly designed or laid –out work places or equipment may pose a serious hazard to workers, and more than 400, 000 injuries occur at work each year. Separate from the concept of safety is that of occupational health, where the goal is to prevent the occurrence of illnesses among workers because of exposures at their place of work.

Castella, (2006) pointed out that Equipment –related injuries are a major source of difficulty and motor vehicles injuries, specifically, make up the largest number of fatalities related to the work place. In addition there are always thousand of broken bones, materials getting into the eyes, burns and similar injuries that occur each year. The nature of this problem will vary by work section, age, gender, and other factors, but hundreds of thousands of individuals suffers from work place-related injuries each year. Many of the injuries go on to have a permanent disability that may threaten their livelihood, also noted that other workers are at risk due to exposure to fumes and gases. Damage to lungs, or even death occur when entering confined spaces where oxygen may be reduced. This includes such diverse settings as grain silos, manure pits or oil storage tanks. Vehicles exhausts are also known to causes harm or death. Simonds, (1999) industries pay a substantial bill each year for the treatment and cure of workmen disable by on the job accidents. The national safety council reported that the direct cost to American industries for injuries amounts to billions of dollars annually while indirect costs, representing the monetary value of damaged equipment and materials production delays, time losses of other workers not involved in the accidents, involve more billions per year. Okorie cited in Otor (2006), 17,000 workers are killed every year over 2,000,000 workers received

injuries, while 300,000 workers are permanently impaired. The trend of injuries and disease from work environment is particularly frightening in developing countries such as ours because of the absence or reasonable research into the economic implications of occupational accidents by epileptic accidents reports. Only on 1st June, 1997, the Sunday concord news papers reported how a stamping machine crushed the head of a factory workers with primotex Nigeria limited, Lagos. What went wrong? The 20 years old man was employed to clean the machine. He was killed in the course of caring out his duty when the machine was accidentally switched on by a colleague.

Similar pattern of accident in workplace are observed in various industries including power holding company of Nigerian (PHCN) plc reported how a staff at Lafia district died on the 8th of February 2003 at about 6.30pm while caring out his job for a manufacturing industry. In the course of re-tensioning the sagged segment of feeder, a luxurious bus on high speed dragged the aluminum conductor and the force pulled the workman on the ladder. He fell off the ladder and died instantly. The cost of accidents is enormous, and we moan for those whose lives have been snuffed out by accidents. But what about the grief and suffering of those who have survived the seemingly less tragic, fatal accidents, the persons who must live with a permanent disability, lost of eyesight, artificial arms or legs and the frustration of thwarted plans for the future – all these must be considered as part of the costs of accidents. The above are grim reminders that for every person killed, there may be five or six people who must face life under varying degrees of permanent disability, (Ademuwagun, Ajalel, Oke Moronkola and Jegede, 2002). Industrial safety is the concern of all those engaged in the engineering industry. It is concerned with the protection and safeguarding of the individuals working in the industry and other members of the society. (Paiko, 2002). In the same vein, Encyclopedia of science and

technology opines that industrial health and safety is concerned with freedom from harm, injury and disease in the work environment.

2.3 Occupational Safety and Practices in Manufacturing Industries

The implementation of safety depends on information and judgment, decision on its behalf are made according to what is known about the problem, unfortunately, knowledge about safety still is gravely limited. One significant area of inadequacy lies in the procedure for classifying the result of safety violations. Normally they are called "accidents" which in this instance is an inadequate label. The majority of cases, which fill safety records, could be predicted and so may not be regarded as wholly accidental. Their causes and remedies already were established by countless similar earlier most harmful events and the result of failure to apply known principles for their control. Persuading people to effect their application is the challenge to safety management and its purpose. (Carter and Sands, 2000). The management of safety in industries involves everyone. The managers include employers, employees, union, and safety specialists.

Ogedengbe (1999) Reported that employers have a general duty under the Health and safety at work Act 1999 (HSW ACT) 'to ensure, reasonably practicable, the safety and welfare at work of their employee. The HSW specifies five areas, which in particular are covered by the employer's general duty.

To provide and maintain machinery, equipment and other plant, and systems of work that are safe and without risk to health (system of work means the way in which the work is organized which includes layout of the work place, the order in which jobs are carried out, or special precautions to be taken before carrying out certain hazardous tasks). Ensure ways in which particular articles and substances (e.g. machinery and chemicals) are used, handled, stored

and transported are safe and without risk to health. Provide information, instruction, training and supervision necessary to ensure health and safety at work. Information means the background knowledge needed to put the instruction and training into context. Instruction is when someone shows others how to do something by practical demonstration. Training means having employees practice a task to improve their performance, supervision is needed to oversee and guide in all matters related to the tasks.

Ensure any place under their control and where their employees work is kept in a safe condition and does not pose a risk to health. This includes ways into and out of the workplace. Ensure the health and safety of their employees working environment (e.g. heating, lighting, ventilation etc). They must also provide adequate arrangements for the welfare at work of their employees (the term 'welfare at work covers facilities such as seating, washing places, toilet etc)

Mohammed (2007) highlighted that each worker has a safety responsibility, of course it is workers and their families who suffer most directly from work injuries. Therefore, the mere fact that the law makes; the employer responsible for workmen's compensation, payment in case of occupational injuries should not warrant the workers failing to look out for themselves and their co workers' safety. This particular employee self interest, however, is a very weak basis for management to rely on. Rather, it must be made clear to all employee by the personnel department, supervisor, top management and the union that they are expected to follow all safety regulations and instructions just as seriously as any other company directives. In other words, the employees must regard safety measures as part of the requirement of their jobs, not as suggestion to be followed unless they are willing to bear personnel risk.

Grimaidi (2002) observed that successful, well –run companies with top safety records commonly have the full cooperation of their employee in safety matters, but they have

regulations with teeth in them so that a few unconvinced workers cannot demoralize the programme. If safety glasses are required in specified area, all employees and executives without exception should wear them, when in that location. Sometimes a system of successively heavier penalties for safety violations is provided for example, the first clear and deliberate violation may bring an official reprimand the second, a short layoff, the third dismissal.

However, also pointed out that safety should be primarily cooperative rather than enforced. After all employees should be willing to act in the interest of their own safety. If it is demonstrated to them that management regards the elimination of hazards and unsafe acts as seriously important, in fact on a par with other objectives such as high output and quality, then the employees are encourage to take seriously their obligations in this line. A bad comment by a supervisor relative to the safety director's activities or a refusal by management to correct a hazard that has been pointed out will sabotage all efforts to lead employees to accept their responsibility for safety.

Anderson (1999) highlights that a safe place to work and safe work procedures are management responsibility and cannot be shifted, nevertheless any union interested in its members welfare must be concerned with working safely. Responsible union officials are showing more and more awareness of their responsibility and cooperating to aid management in safety work or to shoulder properly its safety responsibilities in places where management has failed to do its parts. Wooled (2000) observed that some unions have devoted considerable money to safety research or safety education. On the other hand there are instances where union officials have resisted the adding of guards on machines or the wearing of personal protective equipment that is very shortsighted. As a mater of fact, production actually may be both easier and faster after a guard has been installed and the operator will become accustomed to it. Unions

have also at times opposed management-inflicted penalties on workers for violating safety rules. The more enlightened unions however, usually are inclined to agree with the company in enforcement of safety and because of the need for union support of the safety programme, many labour leaders insist on union management safety committees and a combined attack on the problem. This has led to successful cooperation in some places. In others management has maintained that safety is a part of management and not subject to employees control.

The first line supervisor is the key person in maintaining day-to-day safety requirements in every organization. Particularly with regards to unsafe acts. Safety is one aspect of production, comparable to attaining required precision or elimination of waste. Mohammed, (2007) stated that the foreman or supervisor oversee the labour force which is charged with getting production out and seeing that the day's schedule of work is accomplished, and thus, inevitably is the person directly responsible for seeing that the work is done safely. As highlighted by Nwanko, (2001). A greater part of the work of a safety director involves teaching supervisors and assisting them in their responsibility of management. The safety specialist assists and stimulate, but they do not have line authority over the workers. It is the supervisor from whom the typical employees take their cue as to what is important and what is not. The foreman is on the sport all the time and is in a position to know what the employees are doing, and with some limitations, what they are worrying about, sincerely safety minded supervisors can make a pretty good record despite weakness in engineering or lack of a safety director, while a technical competent safety director would be completely frustrated if the foreman sneered at his or her efforts. On the other hand, he is specially charged with company safety and backed by top management to secure the serious interest of the company. Mohammed, (2007) in his contribution observed that the supervisor is the one who directs the workers, says who shall do

what, when, where, and how and therefore cannot evade responsibility for the results, whether in terms of output, spoilage, or injuries. This does not mean that the supervisor is to blame for every injury. In fact, the proper approach to safety is not one primarily of fixing blame but rather of diagnosing hazardous conditions or conduct and taking steps to correct them so that no injurious events will occur.

Rom (2005) pointed out that the acceptance by supervisor of this responsibility will led them to welcome the ideal of the safety engineer in accomplishing this phase of their duties. Just as people may be held responsible beyond the limits of their authority. Therefore, supervisors in refusing to use unsafe equipments and refusing to accept bad attitudes by their workers. As observed by Grimaidi and Simond, (2005), many times the opinion is held that with the appointment of a safety specialist the organization's responsibility for controlling hazards then becomes the specialist's. This notion is decisively wrong. In fact, its ultimate influence on safety achievement usually is destructive. The safety specialist should be charged with organizing, stimulating and guiding the safety program, as well as keeping materials on safety subjects so as to be a resource person for all those involved in the work. In this capacity the safety specialist functions as a staff having no administrative powers over the operating components of the organization and this is proper. It is of course, primarily under the jurisdiction of "line" officials that the activities occur which result in injuries when hazards are uncontrolled. The strength of the safety specialist lies in the power to use well-marshaled facts to persuade the line managers to act in safety's behalf. Lery, (2004) noted that the safety workers, whether called safety engineer, safety specialist or safety director, and, so on, is merely management representative. The chief operating executive is responsible for the safety conduct of the organization. The safety engineer (or department) only develops the information needed

as a staff or worker that enables the line to exercise its authority effectively in other words, executive and managers will be casual or efficient in their attitudes towards safety according to the posture exhibited by the chief executive.

Wagner (2005) pointed out that the functions of safety specialist includes:

Development and administering the company or industry safety program, designing a complete program, stimulating and coordinating the work of others, taking the lead in setting up safety regulations, inspection to locate unsafe conditions or unsafe practices, investigating injuries, particularly the more serious ones, seeing that corrective action is taken to avoid reoccurrence, or if possible to forestall the first one.

Maintaining work injury and illness records, analyzing records for clues to prevention of future injuries and illnesses, preparing reports for various members of management on the current safety experience of the company and justify safety measures. making hygiene studies to discover and correct such situations e.g. unsafe dust concentration.

2.4 The Concept of Health and Work Environment in Manufacturing Industries

As there is no sustainable development with out health, federal environmental protection agency (FEPA) will work closely with the health sector to ensure the environmental and health improvement of the peoples of Nigeria. So Adewoye, (1999) pointed out the following strategies to be pursued to achieved sustainable development, these include:-

Cooperation with the health sector to improve environmental health within the framework and as a component of primary health care. Placing a high priority on imp[roving environmental services in support of public health programmes. Improvement of environmental health services and conditions relating to water supply, sewage, solid wastes, pollution control and green areas housing together with improving the health and quality of life of people in urban

and rural areas by focusing on developments and the creation of physical, social institutions and economic conditions that support health and well being of rural populations and their leadership to maintain a sustained dialogue concerning health with environmental issues, strengthening local capacity of village, district and other local level authorities and institutions to promote health environmental services for their population. Creating closer ties and contacts in between activities and programmes relating to environmental health primary health care, nutrition, health of women, children and environmental hazards together with supporting and maintaining priority programmes targeted at health and environment problem solving. Compiling and disseminating information on health and environmental risks for various sources e.g education and public awareness programmes in sanitation issues supporting community participation in the preparation and implementation of health, environmental activities and projects that are encouraging and promoting the use of appropriate technology and local expertise to raise community awareness of and standards of health, hygiene education and support for research in the use of local plants, animals for medicinal purposes.

The above strategies have highlighted how the health sector, and the communities with the use of appropriate technology and local expertise can adhered sustainable development for the Nigerian people.

Ojo (1998) in his contribution pointed out that industrial pollution is generally changing the environment of Nigeria, that the inhalation of asbestos dust by worker of asbestos and cement industries can cause cancer and almost all industries dispose off toxic and are therefore, all guilty of environmental pollution. The sources of pollution are steel, paint, plastic, chemicals and textile industries. While the pollutants include highly poisonous waste like hydrogen sulphide,

ammonia salt, phenol, chromium, copper and acids. Others are heavy metals such as lead, arsenic, mercury, zinc, phosphates and textile dyes.

Federal Military Government FMG, (1987) decree 58, in addition to the safety rules that could be observed in any work environment, some government agencies are charged with the responsibility of ensuring that the work environment has a standard of ergonomics. The agencies ensure that the observances of the relevant safety rules are mandatorly carried out. Some of the bodies that are statutory empowered to enforce safety culture in work environments include the Federal Ministry of Employment Labour and Productivity and Federal Environment Protection Agency (FEPA).

Omeri, (2000) noted that accidents, occupational diseases and the others are our concern. These are sickness that workers develop because of job conditions. Some are not very serious. For example, cement rash is easily cured. But some other diseases are serious. Examples are lungs and eye diseases caused by too much dust in the air. Great care should be taken to make the site or factory a safe place to work.

Manufacturers association of Nigeria (MAN, 2005) stated that we assess our production support, product development and services on a regular basis regarding their impact on the environment and safety. Further more, we initiate preventive measures in orders to minimize effects on the environment health risks as well as to avoid safety related hazards. Also it is our customs to cultivate a cooperative dialogue with our respective authorities and the public and to advice our customers on all safety and environmental aspects of our products and services. We promote the sense of responsibility in all of our staff regarding occupational health and safety, safety and pollution control in their respective work environment.

MAN, (2005) is in the process of introducing an integrated quality, environment and occupational health/safety management system in accordance with the environmental standard 150 1400, the occupational health and safety standard OHSAS 18001 and the management quality standard 150 9000:2000, with a view to being certified by the spring of 2005 which are:-

Environmental management:- To reduce pollution and resource depletion to think globally and act locally both in management and operations. Occupational health and safety management:- To reduce the number of accidents and injuries sustained in the work place and to have health and safety in mind in the daily management and operation of the company. Quality management:- To increases the quality of the products we produce and deliver by establishing norms for quality both in management and operations.

So with the above management system MAN will strengthen constructive dialogue and favourable cooperation between the company, its customers and public authorities. And will guarantee that our suppliers demonstrate responsibility for the environment and quality standards and show transparency regarding their services and their effects upon the environment in such a way that makes it possible for MAN to maintain the desired standards for both products and services. With a quality, environment and occupational health and safety management system.

Occupational health and safety Asbestos regulations S.R. No. 16/2003, pointed out that:-

An occupier of a work place must eliminate, or where this is not practicable, must reduce, so far as is practicable, the exposure of persons at work to air bone asbestos fibres. An occupier of a work place must ensure that a person at the work place is not exposed to an atmospheric concentration of asbestos above the exposure standard. While employer's duty to ensure exposure standard is not exceeded. An employer or self employed person must eliminate, or where this is not practicable must reduce, so far as is practicable, the exposure of persons at the

work place to air bone asbestos fibers, arising from the conduct of the undertaking of the employer or self-employed. An employer or self-employed person must ensure that a person is not exposed to an atmospheric concentration of asbestos arising from the conduct of the undertaking of the employer or self-employed person above the exposure standard.

National Occupation Research Agenda NORA, (1996) observed that in regulating, work place-related issues, one must note the interactions with normal life events and exposures; and care must be taken to fully understand what is truly work place-related, what is not, and where and to when workplace exposures may have some role in the development of injuries or illnesses common life events such as stress, smoking, drug use, and other factors such as noise may interact with what goes on in the workplace.

Substances abuses another serious workplace issue. There are rules regarding the testing of employees, either at the time of hire and during their employment. Certain federal regulations mandate that specific workers like those in transportation, are required to be tested if there is an accident. Special certification is required as one aspect of drug-testing activities.

The needs for occupational health services (OHS) have increased rather than decreased during the times of globalization in both developing and industrialized countries as asserted by Rautanen, (2007). He observed that both the elimination, prevention, diagnostics and treatment of traditional occupation health and safety problems, occupational diseases, injuries and unreasonable work loads call for wider coverage and higher efficiency of OHS. Also pointing out that "At best only 10-15% of the approximately 3 billion workers of the world have access to OHS and in many cases the content and quality, availability and distribution of services do not meet the real needs. And further pointed out that the ultimate objectives of basic occupational health services (BOHS) initiative is to provide occupational health services for all working

people in the world, regardless of the sector of economy, made of employment, size of the work place or geographical location, i.e. according to the principle of universal provision. The principle of universality is widely applied in the provision of socially important services related to the satisfaction of basic needs and in ensuring the basic rights of the citizens. Occupational safety and health constitute an important part of the basic rights of the working people.

Mohammed, (2007) in his contribution pointed out that the basic occupational health services are an essential service for protection of the people's health at work, for promotion of health, well-being and work ability, as well as for prevention of ill health and accidents. The BOHS provide services by using scientifically sound and socially acceptable occupational health methods through primary health care approach. And that to give a response to the growing and urgent needs of OHS an ILO/WHO/ICO global action for Basic Occupation Health Services (BOHS) was launched in 2003 with an aim to improve the global coverage of OHS as soon as possible with reasonable costs and technologies and methods affordable to the companies, employers, and self-employed and the countries.

The activities of BOHS are planned as a process approach starting from the identification of needs going to information and initiatives for actions for the employers and workers and moving to practical action for prevention, control and correction of condition or work. And finally evaluating the impact of OHS on health and safety. Briscoe, (2007) highlighted on the following activities of OHS:- Orientation and planning of OHS activities which are feasible to the work place and the activities of OHS to the special problems and specific need of the work place is concerned and prioritization of actions. Surveillance of the work environment is made to analyze the actual and health situation of the work place, to identity the most important health hazards and to identify the exposed workers. And surveillance of worker's health is carried out

in the form of health actions. This is a step focusing on the general health situation of the individual workers and particularly on possible health effects of work and the environment. Not only are diseases searched for but also early signs of non-clinical effects, levels of physical and psychological work load and ability of the worker to manage the deviants of his or her job.

Also that assessment of health and safety risk is made on the basis of information obtained in the surveillance of the work environment and workers health. Special systematic risk assessment schemes are available. The risk assessment step provide information on primary risks in the work place and on the needs to undertake control and preventive actions. And that information and education on risks and advice on the need for preventive and control actions needs to be provided. The actions for elimination, control and prevention of occupational health and safety hazards need to be primarily taken by the employers and workers on how to take such actions such interaction should be if possible, continuous.

Healy, (2006) in his contribution noted that, injuries are one of the most common adverse health effects of the work environment and a substantial part of them are server or even fatal. Therefore, accident prevention is one of the priority activities of OHS often in collaboration with safety experts, where they are available often safety of the work place can be substantially improved with relatively simple and cheap methods, for example, by introducing better order and cleanliness. Also that maintaining preparedness for first aid and participation in emergency preparedness. This activity is usually kept at the general practitioner level. These services may be provided also for family members of the workers. In 1984, the ILO annual international labour conference adopted a resolution concerning the improvement of working conditions and environment is an element essential to the promotion of social justice. It stressed that improved working conditions and environment are a positive contribution to national development and

represent a measure of success of any economic and social policy. It spelled out these fundamental principles:-

Work should take place in a safe and healthy environment.

Conditions of work should be consistent with workers well being and human dignity

Work should offer real possibilities for personnel achievement, self-fulfillment and service to society.

Furthermore, the ILO Global strategy on occupational safety and health adopted during the 91st session of the international labour conference in 2003 also calls for the promotion of a preventive safety culture and the need for national tripartite commitment and action. The strategy emphasizes the need to develop a national framework for OSH management systems that is adequately supported by national laws and regulations that promote the development of voluntary arrangement to strengthen compliance leading to continual improvement in OSH performance and the achievement of lasting improvement in safety and health at work.

Kangethe, (2005) in his contribution said all these rules were made to enable the employer and employees, or any other stakeholders, to apply the standards set in order to control the hazards that may exist in the work place. In so doing, the work environment would be safe for workers and the employer, resulting in a reaction in the cost of production and having the overall effect of enhancing workplace productivity. Also in 2004, a legal notice published requiring occupiers to establish safety and health committees in work places. This was intended to enhance self-regulation and participation of workers in the management of occupational safety and health, because it was based on tripartite arrangement where the workers and management are represented equally in the committee.

Ojo, (1998) went further to explain that the integration and participation of workers and management in the safety and health committees is expected to accelerate the understanding and acceptance of safety and health practices in the work place. This situation will encourage the sharing of ideas and experiences by both workers and management. Machida, (2005) pointed out that there is general agreement that the protection of workers is of great importance and that OSH is a priority issue, but it is a fact that OSH has not being given sufficient attention in practice in many countries. The Global strategy refers to the adoption of national programme on OSH as a means to solve this problem by stating that "the endorsement and launching of a national programme on OSH by the highest government authority, for example, by the head of state, government or parliament would have a significant impact on strengthening national OSH capacities and mobilization of national and international resources.

Makhonge, (2005) asserted that the factories and others places of work act makes the employers responsible for ensuring that the work environment is safe and without risks to employees' health. And it is important to note that although the basic occupational health service (BOHS) are intended to support meeting the basic needs of health and safety at work, the content of services still is designed to comprise all the three elements protections, prevention and promotion. Rantanen, (2007). Further explained that curative extent which does not compromise the preventive approach. The BOHS activities are described as a process starting from identification of occupational safety and health needs, going to surveillance of the work environment and workers health, risk assessment, initiation of necessary preventive and control actions, which have been recognized through risk assessment cycle. Evaluation may lead to redesign of activities according to the principle of continuous improvement of services.

The following steps in the BOHS activity process deserve to be briefly mentioned here:-

Orientation and planning of the work place by collecting information on the typical hazards and problems of the economic sector is concern, available data on hygiene measurement, actions taken in the past, records injuries and diseases. The surveillance of the work environment for identification or work place hazards and for planning their prevention control. Also surveillance of worker's health to detect the occupationally determined disease and to assess their consequences. The information and education on risk to the employers and workers and advice on the need for preventive and control actions are given participation in actions and campaigns for prevention of accidents and major hazards. Maintaining and taking preparedness for first aid and participation in the organization for emergency preparedness. Record keeping on activities such as hygienic measurements and outcomes such as occupational diseases and injuries are kept.

2.5 Government Policies on Occupational Safety and Health Practices in Industries.

Policy has been well articulated by researches and social scientists on the subject. Both agree that an organization cannot function effectively without a policy or policies. Policy, therefore is government way of directing the actions or activities of an organization. Government policies on occupational safety and health practice in industries have been presented by authorities on the subject. According to Anderson, (2000) policies could be viewed as a government programs of action. To him, it stands for various degrees of goal articulation and normative regulation of government activities: that is, what government intends to do or achieve (goal) and how it intends to do it (implementation).

Policy has been defined as a course setting involving decisions of the widest ramifications and longest time perspective in the life of an organization. Ogbonnaya (2003). This definition implies that a policy usually has a wider ramification and longer time perspective

than a decision. The definition also implies that an organization cannot function effectively without a policy or policies. Policy, therefore, sort of directs the actions or activities of an organization.

The expression "industry" means any premises in which one person is, or more persons are, employer in manual work in making, altering, repairing, maintenance finishing, clearing, washing breaking up or calculating anything or adapting anything for sale Izawah (1986). Such work must be carried on as a business for the purpose of profit, the owner or his agent must have direct access to it. An open air premises with no buildings are not excluded, and premises may constitute industry even though no machinery may be used, government workshops though they do not exist for making profit, constitute industries when ever they employ ten or more persons.

Before any person occupies or uses a place for industrial premises, he shall apply for the registration of such premises by sending to the director industry on application containing all the particulars set out in schedule 1 of this Act. That is subdivided into parts for the purpose of effective enforcement. These are outline by National Policy on Science and Technology 1986. Industries must be kept clean to check the spread of diseases. Floors and benches must be swept daily; all floors must be washed or otherwise cleaned weekly. All insided walls, partitions and ceiling or top of rooms, and all walls, sides and tops of passages and staircase shall be clean as follows:-

Where they have a smooth impervious surface, at least once in every period of twelve months be washed with hot water and scalp or cleaned by other suitable method;

Where they are kept painted with oil paint or vanished, repainted or re-vanished at least once in every period of five years and at least once in every period of twelve month be washed with hot water and soap or cleaned by other suitable method;

In other cases, be kept white washed or colour washed and the white washing or colour washing shall be repeated at least once in every period of twelve months (Grimaidi and Simon, 2005).

An industry shall not be so overcrowded as to cause risk of injury to health of the workers therein. Each workroom must be at least 2.74% metres (9 feet) high from the floor to the lowest point of the ceiling, and must contain at least $11.3m^3$ ($400ft^3$) of space for every person employed in the room. Effective and suitable provision shall be made for securing and maintaining the circulation of fresh air in each workroom and alarming ventilation of the room. Effective and suitable provision shall be made for securing and maintaining sufficient and suitable lighting, whether natural or artificial in every part of a industry in which persons are working or passing. Windows and skylights must be kept clean and unobstructed unless treated or screened in mitigate heat or glare (Wooled, 2000).

Whenever machining processes are carried out in the industry, the floors are liable to be wet and slippery and damp. The wet floors can be a source of major accident of different kinds e.g fire outbreak, due to electrical sparks or electrical shocks, fallen down due to slippery floors e.t.c. Sufficient and suitable sanitary conveniences, separate for each sex, must be provided and kept clean and lighted. Such convenience shall afford proper separate accommodation for persons of each sex (Ireson, 2001).

This calls for secure fencing of all transmission machinery and all dangerous parts of machines. All fencing must be of substantial construction, maintained in an efficient state and kept in position while the dangerous parts required to be guarded when in motion or use. Every flywheel directly connected to any prime mover and every moving part of any prime mover, shall be securely fenced, whether the flywheel or prime mover is situated in an engine house or

not. Also considered here are the head and tail rest of every water wheel and water turbine. Every part of any electric motor generator or rotary connected and every flywheel directly connected there to shall also be securely fenced. Fixed vessels, structure, sump or pit etc containing scalding, poisonous or corrosive liquids must be securely fenced to a height of 91cm (3ft) or securely covered. If fencing is impracticable, other suitable protective measures must be taken. (Oviasuyi, 2001).

Floors, passengers, stairs and ladders must be soundly constructed and properly maintained and handrails must be provided on all staircases, which afford a means of exit from the factory. Opening in floors must be fenced wherever practicable. Safe means of access must be provided to every place where a person is asked to work, and if he can fall more than 3 metres (10ft) from that place of work he must be protected and provided with secured foothold and handhold. Clear, unobstructed space must be maintained round machines so that they may worked in safety (Odusanya, 2002)

Goggles or effective screens must be provided to protect the eyes of persons engaged in the processes specified in the fourth schedule where electric arc welding is carried out, there must be effective screening to prevent employees other than the actual welders from being exposed to the electric arc flash. No person may work at any machine or in any process liable to cause him injury unless he has been fully instructed as to all possible dangers, and has received sufficient training in the work, otherwise he must work under the close supervision of a person who has a good knowledge of the machine or process. Where any process or any plant gives rise to dust, gas or vapour to such an extent as to be liable to explode on ignition, all practicable steps must be taken by excluding the accumulation of the dust, gas or vapour, by excluding possible sources of ignition providing baffles, chokes and vents, to prevent the explosion, vessels which

have contained flammable or explosive substances must not be subjected to welding, brazing or any other operation involving the application of heat, until all steps have been taken to render the substances or fumes non-explosive or non inflammable. Every factory must provide and make accessible, adequate means of extinguishing fires. Stocks of highly flammable materials must be kept in a fire-resisting store or in a safe place outside the building and must not, in an event of fire, endanger means of escape from the building. Every factory most provide adequate means of escape in case of fire, which must always be kept free from obstruction, and marked conspicuously. While any person within the industry, either for meals or for employment, doors must not be looked or fastened so that they cannot be opened immediately from the inside. In every industry all exists (unless sliding doors) must open outwards. Effective steps must be taken to ensure that all employees know what to do and where to go in the event of fire out break (Odusanya, 2002).

An adequate supply of drinking water shall be provided and maintained at suitable points conveniently accessible to all persons employed. Adequate and suitable washing facilities, bearing in mind local conditions, must be provided for all persons employed, and kept clean. There shall be provided and maintained for the use of all persons employed adequate and suitable accommodation for clothing not worn during working hours. Nduka, (2001).

A first – aid box of a prescribed standard must be provided for every 150 persons employed in a factory and must contain nothing but first aid requisites. A lower standard is required in smaller industries where less than 50 persons are employed. Each first-aid box must be prominently marked and must be under the charge of a responsible person, who is always available during working hours and whose name must be posted in the workroom. Any accident to a person employed in an industry, which causes loss of life, or disables him for more than

three days from earning full wages at his normal work, must be reported to the nearest inspector of industries forthwith. An official form, form LAB/F/6, asking for certain particulars, must be used for this report should an injured man die later as a result of an accident, the inspector must be informed at once. If the occupier of a industry suspects that a case of occupational disease has occurred in his industry, he must immediately send written notice of the disease on a prescribed form LAB/F/10, to the nearest inspection of industries.

Inspectors are empowered to inspect every part of an industry either by day or night if they believe any person is employed therein and to ask for the production registers, certificates and other documents required under the act. They may examine any person found in the industry, either alone or in the presence of such other persons as they think fit, and require that person to state declaration as to the truth of the matters about which he was examined. It is a punishable offence for the occupier of a industry or his agents to obstruct an inspector in the carrying out of his duties. As inspector, though not a legal practitioner, may prosecute or defend in a court of law, any charge or compliant arising under the Act. The appointment of every inspector is notified in the Federal Government Gazette, and each inspector is issued with a certificate of appointment, which he may be asked to produce to prove his bonafides. An inspector who received a complaint about non-compliance with the Act in any industry is bound under pain of legal proceedings to treat the complain as absolutely confidential. Neither may he divulge details of any processes which come to his knowledge, except in so far as may be necessary or for the purpose of a coroner's request or any enquiry under the commissions of inquiry Act. (Grimaidi and Simon 2005).

An inspector may, after informing the occupier take a sample of any substance in a industry which he thinks may be likely to cause bodily injury, or injury to health of persons

employed. This sample must be analyzed by a government chemist, who may be called as a witness at any subsequent legal proceedings. And a person employed in an industry must not willfully misuse or interfere with any appliance or things provided under the Act for securing his health, safety and welfare, and if such appliance, are provided, he must use them. Therefore he must not removed a guard because he prefers to work without it. He must not willfully do anything likely to endanger himself or others.

Izawah, (1986) in general terms, legislation lays down minimum standards, but the prudent employer always ensures that these minimum standards are adequate to meet the economic and human needs of a particular situation. Legislation in this field of industrial safety/health is devised primarily to protect the employed persons (employers' equipment) and the general public from the hazards of the work activity.

A. It therefore makes the provision of a safe place of work including access, across and very importantly a healthy and safe working environment as requirement and also.

B. The provision of information, instruction, training and effective supervision.

MAN, (2005) stated that, like any other government establishments was set up to achieve certain objectives the most important among them being to play a dynamic role in government's health, safety and welfare promotion and sustaining policy implementation. The policy implementation mentioned earlier is a requirement for social, mental physical and economic development of the country, which in effect, no nation can afford to neglect. Thus a safe and healthy operative in a one-man workshop today may grow to become a industry owner employing more than a thousand workers in future.

2.6 Review of Related Empirical Studies

There have been several research works carried out on industrial accidents which is very essential for the advancement in industrial technology development of any nation. Therefore a continuous appraisal of occupational safety and health practices in Nigeria manufacturing industries is very important.

In a study conducted by Blake (1999) titled: the element of an effective safety programme. The study revealed that both unsafe acts and unsafe conditions are responsible for majority of industrial accidents. Blake therefore suggested that workers should be given safety education in a way they will understand e.g showing of D.V.C., D.V.D, video cassettes and film shows of industrial accidents..

The study conducted by national safety council committee reported by Kudu and Alikali, (2003) made the following observations: that 18% of injuries are due to mechanical causes, 19% injuries are due wholly to personal causes, while 63% are due to a combination of both of these causes.

In another study reported by Timings (1984) accidents in the industrial shops shows that in every eight hour shift nearly 1000 workers become victims of industrial accidents, many of these become blind, many for life are confined to a hospital. Timing further claimed that the average natural causes of accidents are as follows:-

Handling and lifting of goods and materials	=	2.5%.
Machinery	=	19.4%
Persons falling from heights	=	15.9%
Stepping on or striking against objects	=	8.1%
Strucking by falling objects	=	7.5%

Transport	=	7.%%
Use of hand tools	=	7.1%
Others including electric shock	=	9%

The above causes of accident according to him hampered the smooth running of industrial workshops in manufacturing industries.

The fallacy of single causes for a majority of accidents was recognized by Fajimi, (1999) titled fundamental of industrial safety precautions and its implication to technical education in the study it was stated that for years it was thought that unsafe acts were responsible for about 85% of all disable injuries and unsafe acts were responsible for about 85% of all disable injuries and unsafe conditions accounted for the remaining 15%. Fajimi (1999) therefore warned that workers should be taught safety precautions and implications of not adhering to them.

Paiko, (2002) also carried out a study on planning and maintaining of safe environment for workshops revealed that 88% percent of all industrial accidents are caused by the acts of individuals and 10% percent are caused by physical environment.

Levy, (2004) believed that the factors identified as being responsible for the injuries due to mechanical and personal causes. It is therefore pertinent to educate workers adequately on safety at work while performing their daily activities in the industries.

In a survey conducted by James, Everett, Gregg and John (1986) on people and safety claims that everyday over 167,000 people are injured. There are 360, accidents per minute. Some are very serious accidents through most of them happened due to carelessness. Also further pointed out that accidents happen at home, at school, on the job, and while playing anywhere. They pointed out that safety should be taking more seriously in the industries, at home, and even while playing.

Accordingly in a study carried out by Oranu (1996) title management of industrial education laboratory, showed that, 17,000 workers where killed every year, over. 2000,000 workers received injuries and 300,000 workers are permanently impaired. And warn that managers of industries and educational laboratories should be very mindful of safety at all times.

Bies (1988) conducted a study on introduction to accident prevention. And suggested that there are some essential factors that could assist in reducing the occurrence of accidents in laboratories which includes:-

There must be competent and intensive safety minded supervisors.

Plant and equipment must be made safe by the workshop operators.

Full cooperation employees of must be secured and maintained through out.

The above essential factors should be adhered to prevent accidents in the laboratories. However, a research carried out by Edward (1972) shows that in countries such as united states of America, united kingdom and others revealed statistics that approximately nine percent (9%) of all the reported cause of accidents or about one, out of every eleven accident occurred in workshops where technical skills are acquired, like metal work, wood work, electrical, electronic, auto mechanics, building etc. and warned that acquiring technical skill is more prone to accident . safety education should be taught adequately.

In addition, a survey carried out by power holding company of Nigeria (PHCN) 2007) on causes of accidents, revealed that accidents are caused due to the followings:-

Unsafe acts	=	75%
Unsafe conditions	=	20%
Natural occurrence	=	02%

That the workers should be very conscious of their unsafe acts and the unsafe conditions which they carried their operations at all times.

Blake, (1999) reported that high rate of accidents in industries have been traced to violation of standard safety code of practice. This goes to say that accidents do not just occur in isolation without somebody or something being responsible for it. Most accidents which could have otherwise been averted or prevented are thus caused by human actions or inactions. He stresses that standards safety code should be adhered to in the industries.

Similarly Oduntan, (2003) on lack of adequate safety devices in the design of machines or non-provision of safety equipment constitute technical equipment hazards which lead to accidents. Obviously then, when there is no relevant safety devices the next option is to make do with the available alternatives. In most cases these make the personals more exposed to accident which may range from impairment in the use of hand, legs, eyes and in extreme cases lead to death. It is therefore pertinent to provide adequate safety devices in the design of machines and provision of adequate and relevant safety equipment to workers in the manufacturing industries.

In Pita study (as cited in Sunday, 2002) specifically as reported on 17th September 2002 at the super engineering limited at plot 69 Ikorodu had a vital experience of losing about hundred workers, materials and equipment in a fire out break that engulfed the company. This accident was as a result of lack of observation of safety and health practices by the management of the company as there was no fire extinguisher and no emergency exit which would have reduce the casualty. Sunday (2002) pointed out the lack of adequate safety and health practices by the management of the companies, this should not be so.

Nduka, (2001) observed that, while the foreman is the prime ingredient in an industry it is very difficult for even safety conscious foreman to maintain a safety programme in an unsafe

unconditions. He recommended that, all workshops using gasoline, paints and other inflammable liquid should be protected against electrical sparks and other fire hazards. All electrical installations should adhere to both state and federal safety codes.

Machida, (2005) noted that these present technology demands that industries should take up the programme for safety education more seriously than assumption. Therefore industrial managers and foremen in the workshops have a moral legal obligation to keep the tools, equipment and workshop environment assigned for their use in the best possible condition.

2.7 Summary of Literature Review

The literature review examined the manufacturing industries in Nigeria. The review revealed that, the advent of a democratic government has led to a more business friendly environment and prevatization policies have led to an increase in the size of the private sector in the country. That there is little manufacturing for export, but a significant activity exists in the manufacturing of fast moving consumer goods aimed at the domestic market. Primary industries such as steel and aluminum production exist in the country, although production is currently very low.

The review shows that the investment climate in the country affords trade protection to domestic industries through Nigeria's tariff system, while Nigeria's membership of the world bank's multilateral investment Guarantee Agency (MIGA) as well as the operation of the bilateral investment promotion and protection agreement (IPPA) make for protection of foreign investment in Nigeria.

The review extensively examined the state of safety in Nigeria manufacturing industries. It was revealed that employers have a general duty under the health and safety of work Act 1999 (HSW ACT) to ensure, reasonably practicable the safety and welfare at work of their employees.

The successful, well-run companies with the safety records commonly have the full cooperation of their employer in safety matters, but they have regulations with teeth in them so

that a few unconvinced workers cannot demoralize their programme. And that safety should be primarily cooperative rather than enforced, that the first line supervisor is the key person in maintaining day-to-day safety requirements in every manufacturing industry particularly with regards to unsafe acts.

The review examined the concept of health and work environment in manufacturing industries. It revealed that there is no sustainable development with out health, federal environmental protection agency (FEPA) will work closely with the health sector to ensure the environment and improvement of the people of Nigeria. And that industrial pollution is generally changing the environment of Nigeria. So the agencies should ensure that the observances of the relevant safety rules are mandatorly carried out by some of the bodies that are statutory empowered to enforce safety culture in work environments which include the federal ministry of employment labour and productivity and federal environmental protection agency (FEPA) e.t.c.

Various strategies are mapped out by government policies on occupational safety and health practices in industries as revealed that a person employed in a industry must not willfully interfere with any appliance or things provided under the act for securing his/her safety and welfare and if such appliance, are provided, he must use them. therefore he/she must not willfully do anything likely to endanger himself or others. The policy implementation mentioned above is a requirement for social, mental, physical and economic development of the workers, which in effect, no nation can afford to neglect.

Most of the studies carried out as reviewed above, laid emphasis on manufacturing industries, in Nigeria, occupational safety practices in industries with the concept of work environment and government policies on occupational safety and health practices in Nigeria. This study appraise occupational safety and health practice in Nigerian manufacturing industries and the shortcomings. While other neglected approaches for effective management of safety and health practices in the manufacturing industries were examined.

CHAPTER THREE

METHODOLOGY

This chapter contains a description of the procedure for conducting the research. It describes the research design, area of study, population of the study, sample, instrument for data collection, validation of the instrument, reliability of the instrument, administration of the instrument and methods of data analysis.

3.1 Research Design

The design for this study is a survey research because of the nature of the information needed for the investigation, survey research design is the research method which a group of people or items are studied by collecting and analyzing data from a few people or items considered to be a good representation of the entire group under study, (Nworgu, 1991). This study seek to appraise occupational safety and health practices in manufacturing industries in Kaduna and Niger States.

3.2 Area of the Study

This study covered functional manufacturing industries located in two states Kaduna and Niger states. North central states represent the former middle belt states, which comprises of Benue, Kogi, Kwara, Nasarawa, Plateau, Kaduna and Niger States.

3.3 Population of the Study

The target population for this study will consisted of all management staff, technical personnel's and craftsmen working in the manufacturing industries in Niger and Kaduna states.

3.4 Sample

The sample for this study will be 270 subjects consisting of all the 50 management staff, 70 engineer/technical and 150 craftsmen. The simple random sampling technique was used to select the manufacturing industries in Kaduna and Niger states. The break down of the sample is as shown in Table 1.

Table 1: Distribution of Sample of Respondents from Functional Manufacturing Industries in Kaduna and Niger State.

S/no	States	Sample of manufacturing industries	*Craftsmen*	Management staff	Technical personnel
1.	Niger	5	45	20	30
2.	Kaduna	10	105	30	40
	Total	15	150	50	70
	Grand total				**270**

3.5 Instrument for Data Collection

The instrument for data collection in this study was a structured 83 item questionnaire. The questionnaire items were generated from ideas from literatures reviewed. The questionnaire (Appendix B) was in two sections: section A sought for personal data and section B is designed to appraise occupational safety and health practices. Section B was further divided into four sub-sections I,II, III and IV, each corresponding to one research question. The items were organized for respondents to express their opinions on occupational safety and health practices.

3.6 Validation of the Instrument

The research instrument was subjected to both face and content validation by three lecturers in Industrial and Technology Education Department in School of Science and Science Education Federal University of Technology (FUT) Minna. The comment and suggestions of the lecturers was used in producing a final draft. The question items were reduce in number and that they should flow after each other. Also the question items should be very relevant to the research questions respectively

3.7 Reliability of the Instrument

Reliability of the instrument was determined using the cronbach Alpha formula. The pilot test was conducted with (20) respondents comprising of management, Engineers/Technicians and craftsmen working in Scientific Equipment Development Institute Minna. Five subjects were sampled in the pilot study from each category classified above making a total of twenty subjects or respondents.

3.8 Administration of the Instrument

The researcher administered the questionnaire with the help of research assistants to all the 270 respondents to be used in the study.

Table 2: Distribution and Return rate of Questionnaire

S/No	States	Manufacturing	Distributed	Returned	c/o Returned
1.		Peugeot Automobile Nigeria ltd (PAN) kaduna	21	21	100
2.		Queens Aluminum Nigeria Limited Kaduna	17	15	88
3.		Coca cola bottling company, Kaduna	20	16	80
4.		All state Aluminum company Kaduna	17	16	88
5.		R.S.H. plastic company Kaduna	20	20	100
6.		Kaduna Furniture carpentry craft company Kaduna	20	20	100
7.	Kaduna	Locca Wire Limited, Inuwa Abdulkadir Road Kaduna	20	16	80
8.		7up Bottling company Kaduna	10	08	80
9.		Tower Steel Company Ltd Kaduna	20	20	100
10.		International Bewering and breverages industries (IBBI Kaduna)	20	20	100
11.		Royal ceramics Suleja	25	25	100
12.		Shelter clay products Chanchaga, Minna	17	15	88
13.		Minna Pharmaceutical company Chanchaga Minna	13	11	83
14.	Niger	Dana Pharmaceutical company Minna	20	16	80
15.		Imurate plastics company Minna	20	20	100
		Total	**280**	**259**	**1367**

3.9 Method of Data Analysis

The data collected for this study was analyzed using the mean and One-Way Analysis of Variance (ANOVA). The mean was used to answer the research questions, while one-way analysis of variance (ANOVA) was used to test the hypotheses in the study.

3.10 Decision Rule

To determine the acceptance, the resulting mean scores was interpreted relative to the concept of the real lower and upper limits of numbers 1-4 as used on the rating scale adopted for the study. The decision points is between the upper limit of 4 and lower limits being 2.49 and 2.50 respectively. This means that items with mean values of 2.50 and above were considered as agreed. While items with values of 2.49 and below were considered as disagreed.

The four hypotheses for this study were tested using one-way analysis of variance (ANOVA) at .05 level of significance. One-way ANOVA is the most appropriate method of comparing mean of more than 2-variables (groups of respondents). As a basis for decision, the null-hypotheses were accepted if the values of f-ration (calculated) were less than F-ratio (table-value) at .05 level of significance. The numerical values assigned to the rating is as follows.

Strongly agree (SA)	-	4 points
Agree (A)	-	3 points
Disagree (D)	-	2 points
Strongly Disagree (SD)	-	1 point

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF DATA

This chapter presents an analysis of the data collected. The data collected were used to answer the research questions and test the hypotheses formulated for the study.

4.1 Research Question 1

To what extent are safety equipment, facilities and accident free environment provided in the manufacturing industries?

In determining the adequacy of the equipment, facilities and accident free environment in the manufacturing industries all categories of respondents were involved. The data were analyzed and presented in Table 3.

Table 3: Respondents Mean Scores on the Extents to which of Safety Equipment and Facilities provided by the Manufacturing Industries in Kaduna and Niger States.

$N_1 = 40, N_2 = 60, N_3 = 150$

S/NO	ITEMS	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_t$	*REMARKS*
1.	Adequate numbers of fire extinguishers are available in the industry to fight fire out break.	1.6	1.2	4.9	3.06	Agreed
2.	All machines and equipment in the industry are equipped with adequate safety guards.	1.4	1.2	4.5	2.87	Agreed
3.	All machines in the industry are equipped with emergency stop switches.	1.5	1.2	4.2	2.76	Agreed
4.	Appropriate hand gloves are available to all personnel in the industry.	1.5	1.2	4.2	2.77	Agreed
5.	Appropriate protective eye goggles are available to all the personnel in the industry	1.6	1.2	4.2	2.80	Agreed

Continuation of table 2

S/NO	ITEMS	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_t$	*REMARKS*
6.	Appropriate protective footwear (metal toe-leather shoes or boot) are available to all personnel in the workshops.	1.4	1.2	4.1	2.68	Disagreed
7.	First aid boxes are well equipped with necessary drugs, and equipment in all the workshops in the industry.	1.4	1.2	3.3	2.36	Disagreed
8.	Danger signs are available for use at designated danger-zones and on damaged equipment and machines.	1.5	1.2	3.3	2.38	Disagreed
9.	The workshops in the industry are well lighted (illuminated).	1.8	1.1	4.4	2.90	Disagreed
10.	The workshops in the industry are well ventilated.	1.6	1.2	3.3	2.40	Disagreed
11.	Appropriate Aprons/overalls are available for the workers.	1.4	1.2	3.3	2.33	Disagreed
12.	Appropriate head protection (helmet) are provided for the workers in the industry.	1.7	1.2	4.2	2.81	Agreed
13.	Appropriate provision of cranes (mobile and overhead) are available to ease movement of heavy loads or materials.	1.7	1.2	4.2	2.81	Agreed
14.	Adequate chains, hauling, binding and sling are available for the workers to facilitates assembling work.	1.6	1.2	3.8	2.60	Agreed
15.	Adequate rollers are available in the industry to transfer heavy equipment or materials.	1.6	1.2	3.9	2.68	Agreed
16.	Adequate wash hand basins are available in the industry for the employee.	1.6	1.2	3.6	2.56	Agreed
17.	Adequate sewers or waterways are available in the industry to avoid water log.	1.7	9.6	3.8	2.58	Agreed

Continuation of table 3

S/NO	ITEMS	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_t$	*REMARKS*
18.	Functional respirators are available in the industry for workers.	1.5	1.0	3.5	2.38	Disagreed
19.	Fault alarms are mounted on faulty machines in the industry.	1.7	1.2	3.9	2.72	Agreed
20.	Adequate compressors are available in the industry for the workers.	1.7	1.0	3.6	2.53	Agreed
21.	The gang-ways and doors are kept clean and unobstructed.	1.7	1.6	4.1	2.75	Agreed
22.	Maintenance culture for equipment and machineries are encouraged.	1.3	1.3	3.9	2.57	Agreed

Key: $\bar{X}_1$ = Mean Responses of administrators

$\bar{X}_2$ = Mean Responses of Engineer/Technicians

$\bar{X}_3$ = Mean Responses of Craftsmen

$\bar{X}_t$ = Mean Responses of all respondents

$(\sum\bar{X}/N)$ = Where N is total Number of respondents N_1, N_2, & N_3 = Number of Administrators, Engineers/Technicians and Craftsmen respectively.

The mean responses of administrators, Engineers/Technicians. And craftsmen as shown in table 3 indicates that all the items were agreed except item 18 with mean score of 2.43; on the adequacy of equipment, facilities and accident free environment provided in the manufacturing industries all the mean agreed had a mean score ranging from 2.50 - 2.93.

4.2 Research Question 2

What is the extent of compliance with safety practices and government policies in manufacturing industries?

Answering this research question 2 was based on 26 items by the three categories of respondents. Administrators, engineers/technicians and craftsman. The mean responses were presented in Table 4, which shows that all the items were agreed.

Table 4: Respondents Mean Scores on the Extent of Compliance with Safety Practice and Government Policies in Manufacturing Industries.

$N_1 = 40, N_2 = 60, N_3 = 150$

S/NO	ITEMS	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_t$	REMARKS
23.	No person work on any machine unless he has been fully instructed as to all possible dangers, and has received sufficient training in its operation.	1.7	1.2	4.1	2.75	Agreed
24.	The government monitors the company's environment to enhance safety and health practices	1.6	1.0	3.5	2.42	Disagreed
25.	The company do not strictly follow all the government's industrial policies	1.6	1.0	3.6	2.50	Agreed
26.	Government occupational safety and health policy are not followed by the company strictly.	1.5	1.2	3.9	2.7	Agreed
27.	Industries do not comply with minimum legislative standard in the establishment of industries.	1.6	1.2	4.0	2.75	Agreed
28.	The industry is properly registered by the government.	1.7	1.2	3.9	1.50	Disagreed
29.	The company duly pays her tax to the government always.	1.7	1.2	3.9	1.60	Disagreed
30.	Gangways, compartment such as control rooms are adequately lighted.	1.7	1.2	4.1	1.60	Disagreed
31.	Functional fire extinguishers are made available in the workshops.	1.5	1.2	3.8	1.50	Disagreed
32.	Fire extinguisher are service as at when due and are easily assessable to workers.	1.7	1.2	3.00	1.69	Disagreed

Continuation of table 4

S/NO	ITEMS	$\bar{X}_1$	$\bar{X}_2$	X_3	$\bar{X}_t$	*REMARKS*
33.	There are adequate emergency exists in the workshops.	1.6	1.2	3.9	1.61	Disagreed
34.	Cautions and danger tags are displayed on equipment that must not be operated.	1.6	1.2	3.9	1.62	Disagreed
35.	Approved protective wears are always worn by all workers, where moving or falling material are being worked upon in the workshop to prevent hazard.	1.6	1.2	4.5	1.80	Disagreed
36.	Easy assess is provided around the machines for workers to carried out their tasks/jobs.	1.7	1.0	4.8	1.91	Disagreed
37.	Toilets and washing rooms are provided, maintained, kept clean and lighted for employees accordingly.	1.7	1.0	3.9	2.61	Agreed
38.	The industry is kept clean to check the spread of diseases by washing the floor, benches and cleaning the surround at least weekly.	1.7	1.0	4.1	2.70	Agreed
39.	Workers are trained to improved their practical skills.	1.7	1.0	3.9	1.02	Disagreed
40.	Workers are prohibited from making and receiving calls while working on the machines.	1.7	1.2	3.8	2.70	Agreed
41.	Supervisors enforce strict compliance with safety rules and regulations.	1.7	1.2	3.9	2.70	Agreed
42.	Serious fatal industrial accidents are reported to the nearest inspector of industries.	1.7	1.2	4.2	1.31	Disagreed

Continuation of table 5

S/NO	ITEMS	$\bar{X}_1$	$\bar{X}_2$	X_3	$\bar{X}_t$	*REMARKS*
43.	Out break of serious occupational disease are urgently reported to industry inspection office.	1.7	1.2	3.6	2.61	Agreed
44.	Inspectors are usually not prevented during inspection of premises.	1.6	1.2	3.6	2.63	Agreed
45.	Industry inspectors sometimes charge to court industries that do not comply with government policies on safety.	1.7	1.2	3.5	2.63	Agreed
46.	There is a standard medical center in my industry.	1.6	1.3	3.8	2.71	Agreed
47.	Workers who do not comply with safety practices are usually disciplined within the industries.	1.5	1.3	3.6	2.63	Agreed
48.	Workers are sent for medical check up from time to time.	1.5	1.3	3.6	2.63	Agreed

Key: $\bar{X}_1$ = Mean Responses of administrators

$\bar{X}_2$ = Mean Responses of Engineer/Technicians

$\bar{X}_3$ = Mean Responses of Craftsmen

$\bar{X}_t$ = Mean Responses of all respondents ($\sum\bar{X}/N$) = Where N is total Number of respondents N_1, N_2, & N_3 = Number of Administrators, Engineers/Technicians and craftsmen respectively.

The analysis of the data as presented in table 4 revealed that the respondent agreed with all the items with mean raging from 2.60-2.90 on extent of compliance with safety practice and government policies in manufacturing industries.

4.3 Research Question 3

How committed is the management of manufacturing industries to promoting occupational health and safety education practices.

Answering this research question 3 was based on 11 items by the three categories of respondents. The mean response were shown in table 5 which revealed that all the items were accepted with a mean score ranging from 2.50-2.80 on how committed are the management of manufacturing industries promoting safety and accident free environment in manufacturing industries.

Table 5: Respondents Means Scores on the Extent of Managements Commitment to Occupational Safety Health and Accident Free Environment in Manufacturing Industries.

$N_1 = 40, N_2 = 60, N_3 = 150$

S/NO	ITEMS	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_t$	REMARKS
49.	The company allows, recognize and reward employees who under go new safety and Health practice training programme.	1.6	1.2	3.8	2.61	Agreed
50.	There are safety and health precaution symbols, chart and pictures within and out of companies premises.	1.4	1.2	3.6	2.50	Agreed
51.	The company do organize and in-house training programme for employees on safety and health practices.	1.4	1.2	3.8	2.62	Agreed
52.	Outside training programmes on safety and health practices are sponsored by the company when required.	1.6	1.2	3.8	2.62	Agreed
53.	There is an effective training department on safety and health for the employees.	1.6	1.3	3.9	2.71	Agreed
54.	Employees are up-to-date with current safety and health practices in the industries.	1.6	1.3	3.9	2.71	Agreed

Continuation of table 6

S/NO	ITEMS	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_t$	*REMARKS*
55.	There is routine for re-training every employee on safety and health practices.	1.6	1.3	3.8	2.71	Agreed
56.	Special training is always giving to the employees whenever new machines are acquired.	1.4	1.1	4.1	2.62	Agreed
57.	New employees are giving orientation before being assigned to the primary tasks	1.6	1.1	2.7	4.10	Accepted
58.	Safety and health training are giving whenever new product are to be produced.	1.6	1.0	3.5	2.00	Disagreed
59.	Adequate ventilation are provided for fresh air in each workshop and other rooms in the industry.	1.7	1.2	3.8	7.20	Agreed

Key: $\bar{X}_1$ = Mean Responses of administrators

$\bar{X}_2$ = Mean Responses of Engineer/Technicians

$\bar{X}_3$ = Mean Responses of Craftsmen

$\bar{X}_t$ = Mean Responses of all respondents ($\sum\bar{X}/N$) = Where N is total Number of respondents N_1, N_2, & N_3 = Number of Administrators, Engineers/Technicians and craftsmen respectively.

Responses of the respondent revealed that 11 items is provided for identification, were all identified as the extent of management's commitment to promoting safety and accident free environment in manufacturing industries with a mean score ranging between 2.50-2.80 for the respondents.

4.4 Research Question 4

What are current strategies for promoting safety and good health practices in the manufacturing industries?

Answering this research question 4 was based on 24 items by the three categories of respondents. The mean were presented in table 6, which shows that all the items were accepted except item 64 with mean score of 2.43 on the strategies for promoting occupational safety and health practices in manufacturing industries. All the items accepted had a mean score ranging from 2.53-3.00.

Table 6: Respondents Mean Score on the Current Strategies for Promoting Occupational Safety and Health Practice in Manufacturing Industries.

$N_1 = 40, N_2 = 60; N_3 = 150$

S/NO	ITEMS	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_t$	REMARMS
60.	The company receive supervisors from regulatory bodies, regularly.	1.7	1.6	3.5	2.70	Agreed
61.	The company do welcome supervision from regulatory bodies.	1.7	9.6	3.9	6.10	Agreed
62.	The company usually effect corrections on observations made by the regulatory bodies during visits.	1.3	9.4	3.9	5.81	Agreed
63.	The company always accepts new rules and regulations given by the regulatory bodies.	1.7	9.6	3.9	2.51	Agreed
64.	The company always try to provide new facilities/equipment recommended by the regulatory bodies.	1.6	8.8	3.6	3.71	Disagreed
65.	Safety posters are used to alert people on safe practices.	1.6	1.2	3.9	2.70	Agreed
66.	Safety contexts are organized between the departments and divisions in the companies within the industry.	1.6	9.6	3.4	6.01	Agreed

Continuation of table 7

S/NO	ITEMS	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_t$	*REMARKS*
67.	Introduction of safety advisers who will help employers by auditing and offering advise on the most effective means of complying with safety regulations.	1.7	1.4	3.6	2.61	Agreed
68.	Equipping the information centre for easy dissemination of safety and health materials to enhance the performance of health and safety inspectors and workers.	1.6	1.1	3.8	2.61	Agreed
69.	Showing of video cassettes, CD, VCD of industrial accident and their victims to the workers at regular intervals in the industry.	1.6	1.1	4.1	6.80	Agreed
70.	Provide diagnosis of workers health and referrals to assigned clinics.	1.6	1.1	3.6	2.51	Agreed
71	The industry organizes in-house workshops/seminars for staff on regular basis on occupational safety and health practices.	1.3	1,2	3.8	2.51	Agreed
72.	The company sends staff for workshops/seminars on occupational safety and health practices out of the industries.	1.5	1.0	3.9	6.20	Agreed
73.	The company invites professionals to lecture the staff from time to time on occupational safety and health practices.	1.6	1.0	3.8	2.60	Agreed
74.	We have had at leaśt, an enlightenment program on safety this year	1.6	1.0	3.9	2.60	Agreed
75.	Only some categories of workers are selected for training on safety.	1.6	1.2	3.61	2.6	Agreed
76.	Every technical staff is provided with the company's safety code.	1.7	1.2	4.2	2.81	Agreed

Continuation of table 8

S/NO	ITEMS	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_t$	*REMARKS*
77.	All the workers can operate at least a portable fire extinguishers.	1.7	1.3	4.2	2.90	Agreed
78.	All the staff are trained on how to administer first aid treatment.	1.7	1.3	4.4	2.90	Agreed
79.	Mandatory induction course on safety is organized for every new staff upon employment.	1.7	1.3	3.6	2.61	Agreed
80.	Workers are trained on how to identified potential hazards in the workshops	1.7	1.2	3.6	2.61	Agreed
81.	All accidents, whether major, minor or near miss are promptly reported and documented.	1.7	1.1	3.9	2.68	Agreed
82.	The industry organized health safety day annually to create safety consciousness among the workers.	1.7	1.0	3.8	2.62	Agreed
83.	Occupational health and safety department are established in every business unit.	1.7	1.0	4.1	2.70	Agreed

Key: $\bar{X}_1$ = Mean Responses of administrators

$\bar{X}_2$ = Mean Responses of Engineer/Technicians

$\bar{X}_3$ = Mean Responses of Craftsmen

X_t = Mean Responses of all respondents ($\sum X/N$) = Where N is total Number of respondents N_1, N_2, & N_3 = Number of Administrators, Engineers/Technicians and craftsmen respectively.

Table 6 revealed that the respondents for this study accepted all the items provided except, item 64 with mean score of 2.43 on current strategies for promoting safety and good health practices in manufacturing industries. The mean score of the respondents on all the items accepted ranges between 2.53 and 3.00.

4.5 Testing of Hypotheses

The data collected and analyzed for this study formed the basis for testing the hypotheses. The hypotheses were tested using one-way, analysis of variance (ANOVA) and there was no group comparison test as the hypotheses were found to be significant among the groups and there was need to carry out comparison test among the groups.

4.6 Hypothesis 1

Ho_1: There will be no significant difference between the mean responses of administrators, Engineers/Technicians and craftsmen with respect to adequacy of equipment, facilities provided by the manufacturing industries.

The result of the test of significance difference of the facilities and equipment provided by the manufacturing industries is presented in Table 7.

Table 7: One-way Analysis of Variance (ANOVA) of the Means Responses of Respondents on the Adequacy of Equipment and Facilities Provided in Manufacturing Industries.

Sources of variation	df	Sum of squares	Mean squares	f-cal	Critical value of F	Decision
Between groups	2	1.444	0.722			
Within groups	63	3.434	0.05451	13.242	3.15	Significant
Total	65	4.878				

The result of analysis as presented in table 7 shows that there is significant difference in the mean responses of the three groups at 0.05 level of significance (F value cal. = 13.242, F value critical 3.15, $df_B = 2$, $df_W = 63$, $P > 0.05$) Therefore null hypothesis 1 is rejected. Thus, there

is no significance difference between the mean responses of administrators, engineers/Technicians and craftsmen on the extent of equipment, facilities and accident free environment provided in the manufacturing industries. These revealed that the three groups are of similar views on the above.

4.7 Hypothesis 2

Ho_2: There will be no significant difference between the mean responses of administrators, engineers/technicians and craftsmen on the adequacy of compliance with safety practice and government policies in manufacturing industries.

The result of the one-way analysis of variance of the mean responses of the respondents on the extent of compliance with safety practices and government policies in manufacturing industries is presented in Table 8.

Table 8: One-way Analysis of Variance (ANOVA) of the Mean Responses of Respondents on the Extent of Compliance with Safety Practice and Government Policies in Manufacturing Industries.

Sources of variation	df	Sum of squares	Mean squares	f-cal	Critical value of F	Decision
Between groups	2	1.737	.869			
Within groups	75	2.245	0.02993	29.017	3.15	Significant
Total	77	3.982				

The result of analysis as presented on Table 8 revealed that there is significant difference in the mean responses of the three groups at 0.05 level of significance ($F_{cal} = 29.017$, $F_{val} = 3.15$, $df_B = 2$, $df_W = 75$, $P < .005$).. therefore null hypothesis 2 is rejected. Thus, there is significance difference among the mean responses of administrators, engineers/technicians and craftsmen on

the extent of compliance with safety practice and government policies in manufacturing industries. Shows that the groups are of divergence views as show above.

4.8 Hypothesis 3

The result shown on Table 8 revealed that there is significant difference between the mean response of the three groups at 0.05 level of significant ($F_{cal.} = 29.017$, $F_{val.} = 3.15$, $df_B = 2$, $df_w = 75$, $P>0.05$).

H_{O3}: There will be no significant different between the mean responses of administrators Engineers/Technicians and craftsmen on how committed are the governments of manufacturing industries to promoting safety and accident free environment.

Thus, the null hypothesis is rejected. Hence there is no need for group comparison test.

The result of the one-way analysis of variance of the mean responses of the respondents on how committed are the governments of manufacturing industries to promoting occupational health and safety education is presented in Table 9.

Table 9: **One-way Analysis of Variance (ANOVA) of the Mean Responses of Respondents on how Committed are the Governments of Manufacturing Industries to Promoting Occupational Health and Safety Education.**

Sources of variation	df	Sum of squares	Mean squares	f-cal	Critical value of F	Decision
Between groups	2	1.355	.678			
Within groups	3	1.755	0.2448	2.7673	3.15	Not significant
Total	32	7.070				

The result of analysis as presented in table 10 shows that there is no significant difference ($p > 0.05$) in the mean responses of administrators, engineers/technicians and craftsmen on how committed are the government of manufacturing industries to promoting safety and accident free environment. Since $F_{calculated} = 2.7673$ and $F_{critical} = 3.150$.

Thus, the null hypothesis is rejected. Hence there is no need for group comparison test.

4.9 Hypothesis 4

Ho_4: There will be no significant difference between the mean responses of administrator Engineers/Technicians and craftsmen on strategies for promoting safety and good health practices in the manufacturing industries.

The result of the one-way analysis of variance of the mean responses of the respondents on strategies for promoting safety and good health practices in the manufacturing industries is presented in Table 10.

Table 10: One-way Analysis of Variance (ANOVA) of the Mean Responses of Respondents on current Strategies for Promoting Safety and Good Health Practices in the Manufacturing Industries.

Sources of variation	df	Sum of squares	Mean squares	f-cal	Critical value of F	Decision
Between groups	2	0.702	0.351			
Within groups	69	2.971	0.04306	3.150	3.15	Significant
Total	71	3.673				

The result of analysis as presented in table 10 shows that there is significant no difference ($P > .05$) in the mean responses of administrators Engineers/Technicians and craftsmen on

strategies for promoting safety and good health practices in the manufacturing industries. Thus, the null hypotheses is not rejected. $F_{calcualted\ =3.150}$ and $F_{critical\ =\ 3.150}$ Hence there is need for group comparison test below.

Group comparisons test

(i) VARSPOSH	(J) VARSPOSH	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1.0	2.00	2.5000E.02	5.990E-02	817	-1749	1249
	3.00	1958*	5.990E-02	007	4.596E.02	3457
2.0	1.00	2.500E-02	5.990E-02	917	-1249	1749
	3.00	2208*	5.990E-02	002	7.096E-02	3797
3.00	1.00	-1958*	5.990E-02	007	-3457	-4.59862-02
	2.00	-2208*	5.990E-02	002	-3797	07.0963E-02

* The mean difference is significant at the .05 level

Table 11 above shows the multiple comparison test which revealed that there is .917 significant difference among the Engineers/Technicians to Craftsmen at .007. administrators has .917 significant difference to .002 of craftsmen. While craftsmen has .007 significant difference to .002 of Engineers/Technicians on current strategies for promoting safety and good health practices in the manufacturing industries.

4.10 Major Findings

The findings of the study on provision of safety equipment and facilities in the manufacturing industries as shown in Table 3

There is no appropriate aprons/overalls available for the workers.

First aid boxes are not well equipped with necessary drugs, and equipment in all the workshops in the industries.

The workshops in the industries are not well ventilated.

Danger signs are not available for use at designated danger-zones and on damaged equipment and machines.

There are adequate numbers of fire extinguishers available in the industries to fight fire out break.

Appropriate protective eye goggles are available to all the personal in the industry.

Table 4 revealed findings respondent mean scope on the extent of compliance with safety practice and government policies in manufacturing industries.

- Workers are not trained to improved their practical skills.
- Serious fatal industrial accidents are not reported to the nearest inspector of industries.
- There are no adequate emergency exists in the workshops.
- Industries do not comply with minimum legislative standard in the established of industries.

Workers are prohibited from making and receiving calls while working on the machines.

- Findings on Table 5 on how committed is the management of manufacturing industries to promoting occupational health and safety education practices are revealed.
- Safety and health training are not giving whenever new product are to be provided.
- There are no safety and health precaution. Symbols, chart and pictures within and outside the companies premises.
- The company do not recognize and reward employees who under go new safety and health practice training programme.
- New employees are given orientation before being assigned to the primary tasks.

- Adequate ventilation are provided for fresh air in each workshop and other rooms in the industry.

Table 6 shows the respondents means scores on the current strategies for promoting occupational safety and health practice in manufacturing industries.

- The company do not always accepts new rules and regulations given by the regulatory bodies during visits.
- The companies do not invites professionals to lecture the staff from time to time on occupational safety and health practices.
- The companies paid less attention to equipping the information center for easily dissemination of safety and health materials to enhance the performance of health and safety inspector and workers.
- The company sends staff for workshop/seminars on occupational safety and health practices out of the industries.
- The company do welcome supervision from regulatory bodies.

4.11 Findings on Hypotheses

Findings on hypothesis 1 as revealed in table 7 indicated that there was no significant difference in the mean responses of administrators, engineers/technicians and craftsmen with regards to the provision of safety equipment facilities and accident free environment in the manufacturing industries at 0.05 level of significance.

The findings in table 8 revealed that there was no significant different in the mean responses of administrators, engineers/technicians and craftsmen on the extent of compliance with safety practice and government policies in manufacturing industries.

The findings on hypothesis 3 as revealed in table 9 also indicated that there was no significant difference in the mean responses of administrators, engineers/technicians and craftsmen with regard to the extent of managements commitment to occupational safety health and to accident free environment in manufacturing industries.

The findings in table 10 revealed that there was no significant difference in the mean responses of administrators, engineers/technicians and craftsmen with regards to the strategies for promoting occupational safety and health practices in manufacturing industries.

CHAPTER FIVE

DISCUSSIONS, CONCLUSION AND RECOMMENDATIONS

In this chapter, summary of major findings of the study, discussion of findings, findings on hypothesis, discussion of findings on hypothesis, summary of the study, implication of the study, conclusion, recommendations and suggestion for further research are presented.

5.1 Discussion of Findings

In this section, the findings of this study are discussed in line with the organization of the instrument used for data collection for this study.

The Provision of Safety Equipment, Facilities and Accident Free Environment in the Manufacturing Industries to Fight Fire out Break.

The findings indicated that majority of the manufacturing industries have adequate number of fire extinguishers to fight fire out break as revealed in table 4. This is in line with Izawah (1986) that every factory must provide and make accessible, adequate means of extinguishing fires. Stocks of highly flammable material must be kept in a fire resisting store or in a safe place out side the building and must not in an event of fire or in a safe place outside the building endanger means of escape in case of fire, which must always be kept free from obstruction and marked conspicuously and effective steps must be taken to ensure that all employees know what to do and where to go in the event of fire out break.

Functional respirators are not adequate in the industries for workers. This is in line with Nufi (2005) observation that protection of workers from exposure to health hazards is still in adequate rudimentary of non-existence at all. Stressing the importance of work free environment

and its attendant contribution to workers safety. This findings were also supported by Momoh (2004) reported that it was discovered that as a results of insufficient safety measures more than 250 technical workers of fertilizer blending company in Kaduna were diagnosed to have body disorder such as cancer of the lug infertility, cardiovascular diseases and genetic mutation. Momoh further, said the bane of the industrial workers is that they are not protected or taught by their employers.

The findings on the extent of compliance with safety practice and government policies in manufacturing industries shown as revealed in table 4 that respondents agreed with 30, 35 and 43 listed on extent of compliance with safety practice and government policies in manufacturing industries. The findings shows that gang ways, compartment such as control rooms are adequate, approved protective wears are always worn by all workers, where moving or falling material are being worked upon in the workshop to prevent hazard and out break of serious occupational disease are urgently reported to industry inspection office. These findings were in consonance with the opinion of (Ademuwagu, Ajalel, Okemoronkola and Jegede, 2002) that industrial safety is the concern of all those engaged in the engineering industry. It is concerned with the protection and safe guarding of the individuals working in the industry and other members of the society (Paiko 2002). In the same vein, opines that industrial health and safety is concerned with freedom from harm, injury and disease in the work environment.

The findings also shows that government do not monitor the company's environment to enhance safety and health practices adequately as table 3 is likely to have a negative effect on the industries. According to Adewoye (1999) that Nigeria is committed to a national environmental policies that will ensure sustainable development based on proper management of industries particularly and the environment.

The extent of management's commitment to occupational safety, health and accident free environment in manufacturing industries.

The findings of this study as revealed in table 4 shows that items 52, 53 and 54 agreed that outside training programme on safety and health practices are sponsored by the companies when required. There is an effective training department on safety and health for the employees and employees are up to date with current safety and health practices in the industries.

The findings indicated that majority of the manufacturing industries have adequate training programmes, effective training department on safety and health for employees and up-to date with current safety and health facilities in the industries.

These findings are in consonance with Ogedenge (1999) who reported that employers have a general duty under the health and safety at work Act 1999 (HSW ACT) to ensure reasonable, practicable the safety and welfare of their employees. The HSW specifies five area, which in particular are covered by the employees general duty one of which is provision of information, instruction training and supervision necessary for ensure health and safety at work. Information means the background knowledge needed to put the instruction and training into context. Instruction is when someone shows others how to do something by practical demonstration. Training means having employees practice a task to improve their performance, supervision is needed to oversee and guide in all matters related to the tasks.

Findings also shows that safety and health training are not given wherever new product are to be produced. This finding is not in consonance with the opinion of Rantanen (2007) in his contribution pointed out that the basic occupational health services are an essential service for protection of the people's health at work, for promotion of health well-being and work ability as well as for prevention of ill health and accident.

The strategies for promoting occupational safety and health practices in manufacturing industries.

The findings in table 5 revealed that respondents agreed with the item 78 that all the staff are trained on how to administers first aid treatment. Rantanen (2004) in support of the findings observed that both the elimination, prevention, diagnostics and treatment of traditional occupational health and safety problems, occupational disease, injuries and unreasonable work loads call for wider coverage and highest efficiency of OHS pointing out that "At best only 10-15% of the approximately 3 billion workers of the world have access to OHS and in many cases the content and quality availability and distribution of services do not meet the real needs. He further pointing out that the ultimate objectives of basic occupational health services (BOHS) initiative is to provide occupational health service for all working people in the world, regardless of the sector of economy, made of employment, size of the work place or geographical location, i.e according to the principle of universal provision.

The findings also shows that the companies sending staff for workshops/seminars on occupational safety and health practices out of the industries is not adequate. Britanica (2008) highlighted that industrial accidents can occur because of improper contact with machinery, the lifting or handling of bulk materials and contact with electrical, chemical or radiation hazards. This leads to several internal organization to provide means by which national safety organizations can exchange information and pass on new ideas. Among the bodies serving in this capacity are the international social security organization (ISSA) and the internal labour association (ILO). These two bodies have sponsored internal safety congresses every three years since 1955.

The above-mentioned strategies, if well implemented, would improve the effective management of occupational safety and health practices in Nigerian manufacturing industries in Kaduna and Niger states in particular.

Discussion of Findings on Hypotheses

H_{01}: The analysis of hypothesis one shown on Table 7 indicated the comparison in the mean responses of administrators, Engineers/Technicians and Craftsmen with regards to the provision of safety equipment and facilities in the manufacturing industries at 0.05 level of significance. The findings show on provision of equipment and facilities is based on the F-calculated 13.242 of the items of the cluster, which were greater than the F-value 3.15. Therefore, the respondents did not differ significantly on the provision of equipment and facilities in the manufacturing industries in Kaduna and Niger States.this finding is in agreement with Aina (1991) that, the major problem of facing factory workers is inadequacy equipment and facilities in the industries. This findings were also supported by Castella, (2006) that the problems of industrial workers and made worse by the poor condition/inadequate safety training facilities. Adequate safety programmes are necessary of the employees in the industries and for batter products for the general publics.

In the same vain Blake (1999) laments that where safety equipment and facilities are not functional or adequately provided, the training programes will suffer and will lead to high risks for the industrial workers and even low productively for the industries as well.

H_{02}: The analysis of hypothesis two revealed on Table 8 indicated the comparison in the mean ratings of respondents on the extent of compliance with safety practice and government policies in manufacturing industries tested with one-way analysis of variance (ANOVA) at 0.05 level of significance. The findings show that the f-calculated 29.17 of the items of the cluster

which is less than f-value 3.15. therefore the respondents differ significantly on the extend of compliance with safety practice, and government policies in manufacturing industries in manufacturing industries in Kaduna and Niger States. This findings is in consonance with the study of Mark (2005) which explained that continue training if industrial workers helps to keep them up to date with the use of modern safety devices which helps to increase their productivity for the company and for the protection of their life while at work. This is inline with Bello (1995) who said seminar should be used to help the industrial workers to be up to date with modern safety managements in the industries and educating them on how to handle new safety facilities and equipment. Waklin (1998) maintained that good and up to date instruction materials with new safety devices should do used in training the factory workers. So that they will be caprent within the use of new and modern tools and facilities will reduce or control accidents in the industries during production of goods and services.

H_{03}: The analysis of hypothesis three on Table 9 indicated the comparison in the mean rating of the respondents on how committed are the Government of manufacturing industries to promoting occupational health and safety analysis of variance (ANOVA) at 0.05 level of significance. The finding is based on the result of the F-calculated 2.7673 of items of the cluster which is less than F-value 3.15. Therefore the respondents did not differ significantly on how committed are the government of manufacturing industries to promoting occupational health and safety education in manufacturing industries in Kaduna and Niger States. Bricker (1972) in support of the findings maintained that accidents in the industries can be reduced or minimized by the industries by mean of improving safe environment in which the workers are caring out their production activities Okories (2000) in his explanation, that he said most of the accident which could have been otherwise been avoided or prevented are caused by human actions or in

actions it was explained that such accident could arise from when there is he periodic inspection of the workshops. Timings and Alabio (1989) also supported the above statement that accidents are caused by either unsafe practices and unsafe conditions, unsafe practice on the part of worker which may result from ignorance of operating procedures, by not wearing correct dressing or clothing, by not obeying safety rules. In view of the above, therefore, periodic inspection of the workshops and general rules be boldly written for in there respective workers workshops.

H_{04}: The analysis of hypothesis four shown on Table 10 indicated the comparison in the mean responses of Administrators, Engineers/Technicians and Craftsmen with regards to the current strategies for promoting safety and good health practice in the manufacturing industries at 0.05 significance. The finding is based on F-calculated 3.150 of the cluster which is the same with F-value 3.15. Therefore, the respondents did not differ significantly on the current strategies for promoting safety and good health practice in the manufacturing industries in Kaduna and Niger States. These finding is in consonance with the work of Sunday (2002) that an unsafe working environment is a threat to the life of the workers and potentially a liability to the employer. He further said that unsafe physical conditions may prevent in the work-situation as inadequate illumination and ventilation or a result of radiation heat. Oladimeji (1999) supported that the tragic truth is that the accidents associated with the industrial workers are causes by mere acts of laziness or ignorance, which can be avoided by simple carefulness and discipline in the use of material, tools and machines. He further explained that if people are made to become closely aware of the realities of the hazardous nature of these causes of accidents measures can be observed strictly to avert them. To him if safety measures can be observed like proper storage, proper disposal, sound knowledge of chemicals, equipment and machines with following of rules and regulations were success will be achieved by the workers in the manufacturing industries

5.2 Implications of the Study

The findings of this study have far reaching implications for manufacturing industries in general and to the workers. Also the findings have implication for government and administrators in the manufacturing industries and the society at large. A major finding of the study was that respondents for the study accepted that majority of facilities in the manufacturing industries were in adequate to for the workers. The implications of these findings is that if the equipment, facilities are provided for the workers, they will be able to play an important role of improving occupational safety and health practices in Nigerian manufacturing industries.

Another important findings of this study on compliance with safety practice and government policies in manufacturing industries that safety and health training are not giving whenever new product are to be produced. Also that companies do not provided adequate, safety and health precaution symbols, chart and pictures within and outside of the company premises for the workers safety education.

Additional findings of this study on strategies for promoting occupational safety and health practices in manufacturing industries indicate that the respondents considered very important, that the company should always try to provided new equipment/facilities recommended by the regulatory bodies, every technical staff should be provided with the company safety code.

The findings of this study revealed that the company should usually effect corrections on observations made during visits, the company should always accepts new rules and regulations given by the regulatory bodies. The implication is that the standard of occupational safety and health practices of manufacturing industries will be improved. Therefore, various approaches

need to be adopted for effective management of occupational safety and health practices in Nigerian manufacturing industries.

5.3 Summary of the Study

This study was accomplished through descriptive survey research design, which was employed to appraises occupational safety and health practices in Nigerian manufacturing industries. To accomplished this objective a questionnaire containing 83 items was developed and used for the data collection. The instrument was validated by the three lecturers from Department of Industrial and Technology Education, Federal University of Technology Minna.

The reliability of the instrument was determined using Cronbach's Apha method of determining internal consistency, which yielded a reliability coefficient of 0.80. The questionnaire used for the study was divided into A and B section B is further sub-divided into I,II,III and IV.

Section A dealt with position of the three respondent in the industry, highest qualification held, area of specialization state and town in which the industry is located and years of working experience section B.I with 22 items dealt with prevention of safety equipment, facilities and accident free environment in the manufacturing industries, section B II with 26 item dealt with the extent of compliance with safety practice and government policies in manufacturing industries, section B III with 11 items dealt with the extent of management's commitment to occupational safety health and accident free environment in manufacturing industries. Section B IV with 24 items dealt with the strategies for promoting occupational safety and health practices in manufacturing industries.

A total of 270 copies of the questionnaire were distributed to the respondents and 250 were returned presenting a return rate of 93%. Mean statistic was used to answer the four

research questions of the study. While one way analysis of variance (ANOVA) was employed to test the four null hypotheses at 0.05 probability level.

The findings revealed that there is no adequate functional facilities i.e respirators in the industries for workers. Adequate respirators should be provided for workers to use when ever the need arise. First aid boxes with necessary drugs, danger signs be made available for designated danger zones and on damaged equipment and machines, appropriate aprons/overall be made available for workers.

Government should monitors the company's environment to enhance safety and health practices. Adequate ventilation should be provided for fresh air in each workshop and other rooms in the industry. There should be adequate diagnosis of worker health and referral to assigned clinics by the manufacturing industries.

5.4 Conclusion

As evident from this study are the following conclusions, safety equipment/facilities and accident free environment in manufacturing industries are not adequate and extent of compliance with safety practices and government policies in manufacturing industries. The management's commitment to occupational safety, health and accident free environment in manufacturing industries, along side with strategies for promoting occupational safety and health practices in manufacturing industries has various roles to play to effectively managed occupational safety and health practices in Nigeria manufacturing industries were identified.

5.5 Recommendations

Based on the findings of this study the following recommendations have been proffered in order to effectively managed occupational safety and health practices in Nigeria manufacturing industries.

Adequate safety should be provided for the workers to enable them carry out their jobs effectively.

Adequate maintenance culture for the machines, equipments and tools should be encouraged by the manufacturing industries.

Proper training on safety and health should be given to workers whenever new products are to be produced.

The companies should always accept new rules and regulations given by the regulatory bodies.

Adequate provision of diagnosis of workers health and referrals should be made to assigned clinics.

The companies should always try to send staff for workshops/seminars on occupational safety and health practices in the industries.

Every technical staff should be given the company's code

The company should invite professionals to lecture on safety from time to time at least once a year.

The company should organize health safety day annually to create safety consciousness to among the workers.

5.6 Suggestion for further research

The following suggestions have been made fir further research.

1. Strategies for improving human resources management in manufacturing industries.
2. Attitudes of manufacturing industries on provision of equipment and facilities for their employees.
3. Attitudes of workers towards the use of safety equipment / facilities in manufacturing industries.

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APPENDIX A

SOME FUNCTIONAL MANUFACTURING INDUSTRIES IN THE AREA OF STUDY

KADUNA

1. Peugeot Automobile Nigeria Ltd (PAN) Kaduna
2. Queen Aluminum express road Kaduna
3. Coco cola Bottling company Kaduna
4. All states Aluminum company Kaduna
5. R.S.H. Plastic company, Kaduna
6. Kaduna Furniture carpentry craft company Kaduna
7. Locca wire limited, Inuwa Abdulkadir road, Kaduna
8. 7up Bottling company Kaduna
9. Tower steel company ltd, Kaduna
10. International brewuring and breverages industries (IBBI) Kaduna

NIGER

1. Royal ceramics Suleja
2. Shelter clay products Chanchaga, Minna
3. Minna pharmaceutical company Chanchaga, Minna
4. Dana Pharmaceutical company Minna
5. Imurat plastics company Minna.

APPENDIX B

LETTER OF INTRODUCTION

Department of Industrial Technology
Education,
Federal University of Technology
Minna.
April, 2007.

Dear Sir,

I am a Postgraduate Student of the above named institution undertaking a study on occupational safety and health practices in the manufacturing industries in Kaduna and Niger States.

You are please kindly requested to assist in this endeavour by responding to the attached questionnaires. Any information given will be treated as highly confidential and used strictly for the purpose of the study.

Thanks for your co-operation.

Yours Sincerely.

Salawu, J.C.

APPENDIX C

SECTION: A PERSONAL DATA

Questionnaire on occupational safety and health practices in manufacturing industries in Kaduna and Niger States.

INSTRUCTION: Please complete the blanks or use a check mark to indicate your answers to the following.

1. Please indicate your position in the industry

   Administrator ( ) Engineer ( )

   Technicians/Technologists ( ) Craftsmen ( )

2. Highest qualification held

   (a) C & G/NTC/SSCE ( )

   (b) NCE (TECH) ( )

   (c) OND/Full Tech. Cert (FTC) ( )

   (d) B.Sc, HND and PGD, B.Eng. ( )

   (e) M.SC/M.Tech/M.Eng. ( )

   (f) Ph.D ( )

   (g) Others (Please specify).....

3. Area of specialization

   .....

4. State and town in which your industry is located

   State ( ).....Town.....

5. Working experience

   (a) 13 years---above ( )

(b) 10 years---12 years ( )

(c) 7 years --- 9 years ( )

(d) 4 years --- 6 years ( )

(e) Below 3 years ( )

SECTION B

The provision of safety equipment, facilities and accident free environment in the manufacturing industries.

KEY

Strongly Agreed	-	SA
Agreed	-	A
Disagreed	-	DA
Strongly Disagreed	-	SD

S/NO	ITEMS	SA	A	D	SD
1.	Adequate numbers of fire extinguishers are available in the industry to fight fire out break.				
2.	All machines and equipment in the industry are equipped with adequate safety guards.				
3.	All machines in the industry are equipped with emergency stop switches.				
4.	Appropriate hand gloves are available to all personnel in the industry.				
5.	Appropriate protective eye goggles are available to all the personnel in the industry				
6.	Appropriate protective footwear (metal toe-leather shoes or boot) are available to all personnel in the workshops.				
7.	First aid boxes are well equipped with necessary drugs, and equipment in all the workshops in the industry.				
8.	Danger signs are available for use at designated danger-zones and on damaged equipment and machines.				
9.	The workshops in the industry are well lighted (illuminated).				
10.	The workshops in the industry are well ventilated.				
11.	Appropriate Aprons/overalls are available for the workers.				
12.	Appropriate head protection (helmet) are provided for the workers in the industry.				
13.	Appropriate provision of cranes (mobile and overhead) are available to ease movement of heavy loads or materials.				
14.	Adequate chains, hauling, binding and sling are available for the workers to facilitates assembling work.				
15.	Adequate rollers are available in the industry to transfer heavy equipment or materials.				
16.	Adequate wash hand basins are available in the industry for				

	the employee.				
17.	Adequate sewers or waterways are available in the industry to avoid water log.				
18.	Functional respirators are available in the industry for workers.				
19.	Fault alarms are mounted on faulty machines in the industry.				
20.	Adequate compressors are available in the industry for the workers.				
21.	The gang-ways and doors are kept clean and unobstructed.				
22.	Maintenance culture for equipment and machineries are encouraged.				

SECTION – II

What is the extent of compliance with safety practice and government policies in manufacturing industries

S/NO	ITEMS	SA	A	D	SD
23.	No person work on any machine unless he has been fully instructed as to all possible dangers, and has received sufficient training in its operation.				
24.	The government monitors the company's environment to enhance safety and health practices				
25.	The company strictly follow all the government's industrial policies				
26.	Government occupational safety and health policy are not followed by the company				
27.	Industries comply with minimum legislature standard in the establishment of industries and safety.				
28.	The industry is properly registered by the government.				
29.	The company duly pays her tax to the government always.				

30.	Gangways, compartment such as control rooms are adequately lighted.				
31.	Functional fire extinguishers are made available in the workshops.				
32.	Fire extinguisher are service as at when due and are easily assessable to workers.				
33.	There are adequate emergency exists in the workshops.				
34.	Cautions and danger tags are displayed on equipment that must not be operated.				
35.	Approved protective wears are always worn by all workers, where moving or falling material are being worked upon in the workshop to prevent hazard.				
36.	Easy assess is provided around the machines for workers to carried out their tasks/jobs.				
37.	Toilets and washing rooms are provided, maintained, kept clean and lighted for employees accordingly.				
38.	The industry is kept clean to check the spread of diseases by washing the floor, benches and cleaning the surround at least weekly.				
39.	Workers are trained to improved their practical skills.				
40.	Workers are prohibited from making and receiving calls while working on the machines.				
41.	Supervisors enforce strict compliance with safety rules and regulations.				
42.	Serious fatal industries accidents are reported to the nearest inspector of industries.				
43.	Out break of serious occupational disease are urgently reported to industry inspection office.				
44.	Inspectors are usually not prevented during inspection of premises.				

45.	Industry inspectors sometimes charge to court industries that do not comply with government policies on safety.				
46.	There is a standard medical center in my industry.				
47.	Workers who do not comply with safety practices are usually disciplined within the industries.				
48.	Workers are sent for medical check up from time to time.				

SECTION –III

The extent of management's commitment to occupational safety, health and accident free environment in manufacturing industries.

S/NO	ITEMS	SA	A	D	SD
49.	The company allows, recognize and reward employees who under go new safety and Health practice training programme.				
50.	There are safety and health precaution symbols, chart and pictures within and out of companies premises.				
51.	The company do organize and in-house training programme for employees on safety and health practices.				
52.	Outside training programmes on safety and health practices are sponsored by the company when required.				
53.	There is an effective training department on safety and health for the employees.				
54.	Employees are up-to-date with current safety and health practices in the industries.				
55.	There is routine for re-training every employee on safety and health practices.				
56.	Special training is always giving to the employees whenever new machines are acquired.				
57.	New employees are giving orientation before being assigned to the primary tasks				

58.	Safety and health training are giving whenever new product are to be produced.				
59.	Adequate ventilation are provided for fresh air in each workshop and other rooms in the industry.				

SECTION – IV

The strategies for promoting occupational safety and health practices in manufacturing industries

S/NO	ITEMS	SA	A	D	SD
60.	The company receive supervisors from regulatory bodies, regularly.				
61.	The company do welcome supervision from regulatory bodies.				
62.	The company usually effect corrections on observations made by the regulatory bodies during visits.				
63.	The company always accepts new rules and regulations given by the regulatory bodies.				
64.	The company always try to provide new facilities/equipment recommended by the regulatory bodies.				
65.	Safety posters are used to alert people on safe practices.				
66.	Safety contexts are organized between the departments and divisions in the companies within the industry.				
67.	Introduction of safety advisers who will help employers by auditing and offering advise on the most effective means of complying with safety regulations.				
68.	Equipping the information centre for easy dissemination of safety and health materials to enhance the performance of health and safety inspectors and workers.				
69.	Showing of video cassettes, CD, VCD of industrial accident and their victims to the workers at regular intervals in the				

	industry.				
70.	Provide diagnosis of workers health and referrals to assigned clinics.				
71	The industry organizes in-house workshops/seminars for staff on regular basis on occupational safety and health practices.				
72.	The company sends staff for workshops/seminars on occupational safety and health practices out of the industries.				
73.	The company invites professionals to lecture the staff from time to time on occupational safety and health practices.				
74.	We have had at least, an enlightenment program on safety this year				
75.	Only some categories of workers are selected for training on safety.				
76.	Every technical staff is provided with the company's safety code.				
77.	All the workers can operate at least a portable fire extinguishers.				
78.	All the staff are trained on how to administer first aid treatment.				
79.	Mandatory induction course on safety is organized for every new staff upon employment.				
80.	Workers are trained on how to identified potential hazards in the workshops				
81.	All accidents, whether major, minor or near miss are promptly reported and documented.				
82.	The industry organized health safety day annually to create safety consciousness among the workers.				
83.	Occupational health and safety department are established in every business unit.				