SAFETY COMPLIANCE FOR HIHG RISE PROJECTS IN NIGERIAN CONSTRUCTION INDUSTRY

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DEDICATION

This work is dedicated to my late farther, my beloved mother Hajjia Fatimatu Mohammed, my uncles Alh. Muhammad Kaigama, Alh. Abubakar Kaigama Hassan, to all Kaigama's family Brothers and Sisters in general; and to everyone engaged in the daily battle against the poor safety performance of the construction industry.

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ABSTRACT

Health and safety issues had always been a major challenge and concern in the construction industry. Construction is found to be one of the most dangerous on health and safety practice, predominantly in developing countries. As construction accidents continue to dominate the overall construction industry. Despite the programs implemented by government and measures introduced by companies the number of high rise construction accidents still remains alarmingly. This research aim to investigate the safety compliance for high rise construction project in Nigeria. In achieving this aim three (3) objectives has been outlined; to investigate the current level of compliance to safety practice and policies in Nigerian construction site. To investigate the factors that prevent the compliance to safety and health practices in high rise projects of Nigerian construction industry. To recommend appropriate ways to improve the compliance to safety in high rise of Nigerian construction. The interview and questionnaire method was used in this research. Structured Questionnaires was distributed to 108 potential respondents from the construction industry players 90 was returned and Qualitative interview have been conducted to meet the first objective of the project, to investigate the current level of compliance to safety practice In addition, structured interviews were carried out with selected managers from construction industry. The result shows that Bribery and corruption, Lack of training, Absence of safety representatives, Lack of corporate responsibility & Accountability, Weak legal structure were the significant factors affecting safety. Compliance. The result also indicate that Site inspection, Safety seminars (enforcement officers), Building codes of practice, Enforcement of safety act, Workers/labourers training are the effective factors that could improve compliance to safety practice in high rise project of Nigerian construction industry. It is recommended that relevant authorities should checkmate the Safety practices in the Nigerian construction industry.

ABSTRAK

Isu kesihatan dan keselamatan sentiasa menjadi satu kebimbangan dan cabaran yang besar dalam industri pembinaan. Pembinaan didapati menjadi salah satu yang paling berbahaya pada kesihatan dan keselamatan amalan, terutamanya di negara-negara membangun. Kemalangan dalam pembinaan terus menguasai industri pembinaan secara keseluruhan. Walaupun program yang dilaksanakan oleh kerajaan dan langkah yang diperkenalkan oleh syarikat-syarikat, jumlah kemalangan pembinaan bangunan tinggi masih membimbangkan. Kajian ini bertujuan untuk menyiasat pematuhan keselamatan bagi projek pembinaan bangunan tinggi dalam industri pembinaan Nigeria. Dalam mencapai matlamat ini, tiga (3) objektif telah digariskan; (1) Untuk menyiasat tahap semasa pematuhan kepada amalan keselamatan dan dasar di tapak pembinaan Nigeria; (2) Untuk menyiasat faktor-faktor yang menghalang pematuhan kepada amalan keselamatan dan kesihatan dalam projek-projek bangunan tinggi industri pembinaan Nigeria dan (3) Mencadangkan cara-cara yang sesuai untuk meningkatkan pematuhan keselamatan dalam bangunan tinggi pembinaan Nigeria. Temuduga dan soal selidik kaedah telah digunakan dalam kajian ini. Borang soal selidik berstruktur telah diedarkan kepada 108 responden yang berpotensi daripada peserta industri pembinaan dan 90 soal selidik telah dikembalikan, temubual kualitatif telah dijalankan untuk memenuhi objektif pertama kajian itu, untuk menyiasat tahap semasa pematuhan kepada amalan keselamatan. Di samping itu, temubual berstruktur telah dijalankan dengan pengurus dipilih daripada industri pembinaan. Hasilnya menunjukkan bahawa sogokan dan rasuah, kekurangan latihan, ketiadaan wakil keselamatan, kekurangan tanggungjawab korporat & akauntabiliti, struktur undang-undang yang lemah merupakan faktor utama yang menjejaskan pematuhan keselamatan. Hasil kajian juga menunjukkan bahawa pemeriksaan tapak, seminar keselamatan (pegawai penguat kuasa), kod amalan bangunan, penguatkuasaan akta keselamatan, latihan pekerja / buruh adalah faktor-faktor yang berkesan yang boleh meningkatkan pematuhan kepada amalan keselamatan dalam projek bangunan tinggi industri pembinaan Nigeria. Ia adalah disyorkan bahawa pihak berkuasa yang berkaitan harus menggalakkan amalan keselamatan pembinaan dalam industri pembinaan Nigeria

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INTRODUCTION

1.1 Introduction

Generally, this research is focused on safety compliance for high rise construction projects. Besides that, this study is also intended to recommend appropriate ways to improve the compliance of safety practice. Basically, this chapter covers the background, problems statement, aims and objectives, and scope of the study. The research methodology involved in conducting this study is also briefly explained.

1.2 Background of the Research

Construction industry in developing countries has performed far below the expectation in the areas of health and safety, the situation in Nigeria is no exception. This is due to the fact that, there is no existing functional legislation with regards to occupational health and safety in Nigeria Isaac *et al.,* (2014). Occupation safety and health (OSH) in Nigeria is traced back from the slave trade period in Nigeria. According to Kalejaiye (2013), records show that the medical examination board of the Liverpool infantry introduced occupational health and safety in Nigeria in 1789.

A current trend in modern cities all over the world is the development of high-rise buildings mainly to overcome the challenges of urban over population, for optimal use of scarce land resources, as status symbol, as tourist attractions and for beautiful skylines (Ede, 2014). Regardless of these advantages, the development of high-rise buildings in Nigeria has been experiencing drawbacks. The retarding

growth translates to the very fewness of high-rise buildings in existence in Nigerian cities just as even most of the few in existence are poorly utilized due to some persistent factors. With the continuous increase in the population of Nigeria (which have moved from 140 million in 2006 to 170 million in 2014), leading to ever increasing surge in rural – urban drift, land scarcity and the consequent high cost of available land can only be expected to be on the increase especially in Abuja. Bearing in mind that tall, thin buildings have smaller footprints than the equivalent number of low-rise housing units, making them occupy less land area; it is a wonder that building high is not growing at some significant rate compared to the galloping growth of Nigerian population. The low rate of building tall will heighten the burdensome challenge of housing in Nigerian urban cities Ede, (2014).

However, in 1981 Nigeria signed the Geneva Convention on OSH (Adeogun & Okafor, 2013), yet 32 years after, implementation of proceedings of the convention the nation has suffered setbacks making it at insignificant level of achievement towards the OSH implementation. Adeogun & Okafor (2013) based on their studies also found that, the implementation and adoption of occupation safety and health (OSH) in Nigeria is still at preliminary stages. Similarly, Diugwu (2012) & Okolie (2012) states that occupational safety and health (OSH) in Nigeria has received little attention from the government. The ill-fated occupation safety and health (OSH) regulatory system in the country does not encourage mandatory reporting of accidents. However, Diugwu *et al*. (2012) blame the big gap in occupational safety and health (OSH) in Nigeria on the dysfunctional health and safety laws in the country. As a result, all the sectors in the country are clearly unregulated in relation to OSH (Diugwu *et al*., 2012).

The protection of safety and welfare of people in the workplace that may be indirectly affected by the activities in the workplace- occupational safety and health (OSH) should be contingent on healthy legal instruments which require optimum compliance (Akpan, 2013). On a Sad note, Idubor (2013) argue that compliance with occupational safety and health (OSH) regulations cannot be isolated in the improvement of Nigerian construction industry. Nigerian Federal Ministry of Labour and Productivity Inspectorate Division (FMLPID) - is the body empowered by the Factories Act F1 LFN 2004 to enforce occupational safety and health (OSH) in Nigeria (Umeokafor *et al*., 2014). Hence, it is quite evident in the literature that enforcement and lack of compliance to OSH in Nigeria cannot be overemphasizing,

as it has resulted in numerous casualties and accidents on site in the Nigerian construction industry. Falls from high elevation has been identified in the literature as the most frequent type of accident that occur. However, it is also evident that most of these accidents occur due to either lack of compliance to OSH and enforcement or both. Therefore, in this research occupational safety and health will be the main theoretical cornerstone in exploring the level of compliance to OSH in Nigerian construction industry.

1.3 Problem Statement

High rise structure, faced with several problems and experience accidents that endanger the lives of its occupants, destroy facilities and equipment within them, and affect other neighbouring structures Ede, (2014). The most feared hazards of tall buildings around the world are fire, terroristic attaches and building collapse.

According to Mohamed (1999), accidents on construction sites, causes many human tragedies, de-motivate workers, disrupt site activities, delay project progress, and adversely affect the overall cost, productivity and reputation of the construction industry. In recognition of the problems above, countries all over the world have seen the necessity of improving occupational health and safety management on construction sites, particularly to reduce the number of accidents on construction sites.

Occupational safety and health has been a major sort of concern for employees, employers and government for the past decades globally, effort to reduce the number of occupational injuries, and fatalities the Nigerian government opted to regulate the construction industry Olutuase *et al,* (2014). The Nigerian construction industry has recorded a disproportionate number of fatalities and disabling injuries as shown in Table 1indicates the rates of fall and injuries in Nigerian construction projects for the past decades. Falls from elevation and injuries are among the most costly and damaging categories of accident that occur. Based on the injury and fatality rate report from the Nigerian Federal Ministry of Labor and Productivity.

Table 1: Death, fatality rate and number of accident reported to Nigerian federal ministry of labour and productivity (FMLPID; 2002 -2012).

YEARS	NO OF INJURIES	% OF INJURIES	NO OF DEATH	% OF DEATHS	NO OF ACCIDENTS REPORTED	% OF ACCIDENTS REPORTED	CASE OF FATALITY RATE
2002	50	53.8	29	63	1	2.5	58
2003	1	1.1	1	2.2	1	2.2	100
2004	-	-	-	-	1	2.2	-
2007	4	4.3	1	2.2	3	7.5	25
2008	8	8.6	6	13	2	5	75
2009	3	3.2	2	4.3	16	40	66.7
2010	5	5.4	1	2.2	3	7.5	20
2011	8	8.6	2	4.3	7	17.5	25
2012	14	15.1	4	8.7	6	15	28.6
TOTAL	93	100	46	100	40	100	49.5

Accidents and fatalities rate at construction industries is still high in Nigeria based on the recorded fatality rate of workers from 2002 to 2012 which is very far behind compared to developed countries like Japan, France and the United States of America USA with the rate of below 20 per 100,000 workers (NIOSH, 2010; Kortum, 2011).

The regulations of occupational safety and health OSH in Nigeria has received little attention, with little emphasize to strict adherence to safety in the construction industry and very minimal impact made by the inspection officers towards ensuring strict compliance. The accidents records above indicate an alarming rate of injuries and fatalities on sites (Diugwu *et al*., 2012). Hence, there is need to find a way of minimizing the rate of falls and injuries in Nigerian construction industry. Thus, this research seeks to investigate the level of compliance to occupational safety and health (OSH) in Nigerian construction industry.

1.4 Research Questions

1. What is the current level of compliance to safety regulations and policies in high rise construction projects of Nigerian construction industry?
2. What are the factors that prevent compliance to safety practices in high rise construction projects of Nigerian construction industry?

3. What is the appropriate ways to improve the compliance to safety practices in high rise construction project of Nigerian construction industry?

1.5 Objectives of Research

The aim of this research is to investigate the level of compliance to safety in high rise construction project with special focus on safety at construction process in Nigeria. In achieving this aim three (3) objectives has been outlined;

1. To investigate the current level of compliance to safety regulations and policies in high rise construction projects of Nigerian construction industry.
2. To investigate the factors that prevents the compliance to safety practices in high rise project of Nigerian construction industry.
3. To recommend appropriate ways to improve the compliance to safety practices in high rise construction of Nigerian construction industry.

1.6 Significance of Research

This research will be of great significance to the tradesmen that are highly expose to hazard in carrying out their respective duties, as vast majority of tradesmen are ignorant of the safety compliance level. This research will however, alert the relevant authorities in ensuring occupational safety and health compliance in Nigerian construction industry. Hence, minimize the rate of accidents as a result of lack of compliance to occupational safety and health in the industry.

This research will also be of great significance to academia and practitioners in the field of construction management by exploring inadequacies and inefficiencies in occupational and health safety compliance in the Nigerian context. In addition, exploring the potentials for more studies to be conducted towards formulating comprehensive frameworks for ensuring safety compliance most especially in high rise building construction.

1.7 Scope of Research

The research will focus on the safety compliance for high rise construction project at construction stage, in the central district area of Abuja the capital city of Nigerian. Abuja as the capital city of Nigeria has various construction development taking place to achieve the target master plan of the great city The capital city will be selected due to the high number of construction activities going on, which are predominantly high-rise projects associated with both industrialized and conventional concept of construction Iwuagwu (2011).

The research will concentrate on high rise construction project in Nigeria from one to thirty story (1-30) building. The work is to consider Contractor, Site Superintendent, Safety officer, Consultant, Managing Partners as respondent. It is justified by Oladapo (2007).

1.8 Chapter Organization

The research will be sectioned into five (6) main chapters as summarised in the organisation of chapters:

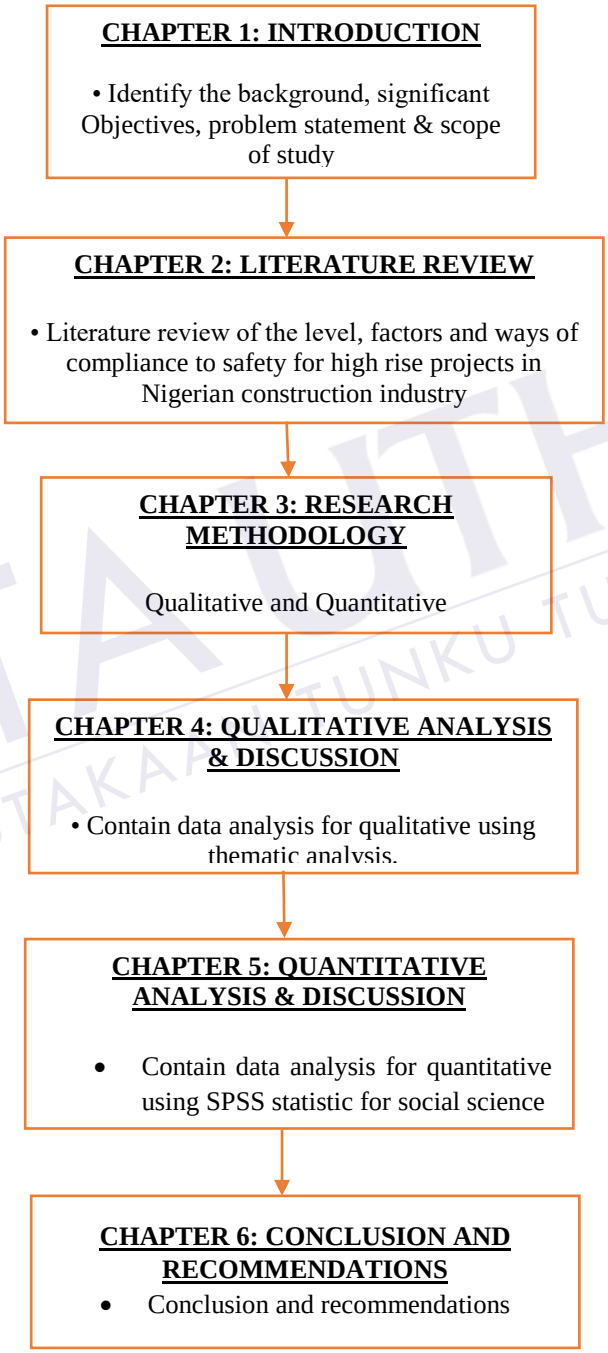

Figure 1 Organisation of Chapters

1.9 Chapters Organisation

The research is consists of five (6) main chapters. The chapters are as follows:

Chapter 1: Introduction

This chapter is basically a general overview of the research. This chapter introduces the report outlining the problem statement, research objectives, research limitation/scope, research importance and the brief research methodology. The summary of each chapter also included in this chapter.

Chapter 2: literature review

The second chapter is about literature reviews. This chapter describes the essential definitions as well as a brief history of high-rise buildings. This chapter also includes the safety features for high rise building and the current facets of safety features in Nigerian high-rise building project.

Chapter 3: Research Design and Methodology

Third chapter discusses on the type of research methodology and its procedures. The technique of data collection and analysis is also explained in this chapter. Professional interviews are conducted with the relevant people involved in high-rise construction to obtain their opinions and feedback.

Chapter 4: Qualitative Analysis and Discussion

Chapter four discusses the current safety practice and analysis of results finding, using interview from three different respondent.

Chapter 5: Data Analysis Quantitative and Discussion

Chapter fifth discusses about the suggested recommendations to enhance the level safety for high-rise construction projects in Nigeria

Chapter 6: Conclusion and Recommendation

Lastly, the six chapter highlights the result and the conclusions made from the research and the recommendations for further studies.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

According to Mohammad *et al.* (2012). Stated that construction industry is one of the industries that provides important ingredients for the development of an economy. Salleh (2009) defines construction industry as a subdivision of the economy that is responsible for the planning, design, construction, maintenance and sometimes demolition of buildings. The definition further states that it is basically service industry, which obtains its inputs and outputs from the subdivisions of economy that they are interrelated and inter-linked.

2.2 High-Rise Building

According to the Council of Tall Buildings and Urban Habitat High rise are buildings whose height creates different conditions in the design, construction, and use than those that exist in common buildings of a certain region and period." There is no precise definition of high-rise building that is universally accepted. Nevertheless, various bodies have tried to define what 'high-rise' means:

The National Fire Protection Association (NFPA 2000) defined a high-rise building as a building taller than 75 feet (23 meters) in height measured from the lowest level of fire department vehicle access to the floor of the highest occupyable storey. Whilst, in another opinion says a high-rise structure is one that extends higher than the maximum reach of available fire-fighting equipment and it is between 75

feet and 100 feet. A particular building is deemed a high-rise specified by the fire and building codes in the area in which the building is located (Craighead, 2003).

In addition Patterson (1993) stated that a building is defined by the Uniform Building Codes as a high- rise building when it has floors for human occupancy which are more than 75 feet above the lowest level of fire department access. Second definition as stated in under the Nigerian Uniform Building Codes of practice, high rise is the building that meet the definition, to be equipped with an automatic fire sprinkler system designed in accordance with requirements in Uniform Building Codes Building codes vary in their definition of high-rise buildings, but the intent is to define buildings in which fires cannot be fought successfully by ground-based equipment and personnel.

Furthermore, High-rise buildings are not inherently dangerous structures, but they do require additional systems and features that other buildings do not' (Craighead 2003). It is common that when a building exceeds a certain size (high-rise), the inspection must be made by the construction licensing and supervisory authorities after corresponding plans have been submitted to them. This inspection procedure not only encompasses aspects under the building code such as building compliance with specified distance and the specified height and size of a building or its type of use, but also the safety of the people (Mansor, 2012).

2.2.1 Demand for High-Rise Buildings

The first requirement for the construction of any types of building are planning and construction safety. Planning is important for the construction of high rise building to complete the work in time (Kerzner, 2013). The estimation of material and the requirement of the material must be mention before the construction work. Before the construction starts, how the works should go, what are the requisites and steps to be followed, what kind of problems may arrive and how to tackle them; are the important task one need to include in the planning and scheduling of work from excavation, construction of foundation to finishing through erection of frame and walls (Nayar, 2014) . The demand for purpose of high rise are based on following listed below

- Increasing demand for business and residential space
- Economic growth
- Technological advancements
- Innovations in Structural Systems
- Desire for aesthetics in urban settings
- Concept of city skyline
- Cultural significance and prestige
- Human aspiration to build higher

2.3 Occupational Safety and Health (OSH) in Nigeria

The Nigerian construction industry lacks of statistical records on health and safety performance of its construction industry (Idoro, 2011). This absence of reliable information about the incidences of occupational accidents and diseases is generally a major obstacle to curbing the appalling toll of work-related deaths and injuries. (Okojie, 2010). Information is needed, particularly by those charged with the task of remedying the appalling situation, in order to understand what preventive action is necessary. This information must be sufficiently comprehensive and above all accurate (ILO, 2002). For any preventive measure at any level to be evidence-based and meaningful, the data required depend heavily on the reporting of occupational diseases, dead and injuries which assists in measuring performance (Bowling, & Ebrahim, 2005).

Investigating the problem of high accident and injury rates in the construction industry and similar others such as lost time injury frequency rate are traditional measures of health and safety performance and do actually report performance (Idoro, 2007). Regular and accurate reports can assist in the provision of measures that can reduce them. This situation is blamed on lack of concern from the government, lack of accurate records, inadequate and old statutory regulations governing the health and safety in the country (Idoro, 2004).

Furthermore, the new Factories Act Cap 126 of the Laws of the Federation of Nigeria, 2004 is the legislation for the enforcement of H&S standards in Nigerian workplaces. It stipulates minimum standards of H&S for Nigerian factories and further provides for the enforcement of the Act by occupational H&S officers in the

Inspectorate Department of the Federal Ministry of Labour and Productivity (Okojie, 2010). Sections 51, 52 and 53 of Part VI of the Factories Act make provision for reporting of occupational diseases and accidents. This section 53 of the law is entitled Notification of Industrial Disease and it states that ’he occupier of any factory who believes, suspects or has reasonable ground for believing or suspecting, that a case of occupational disease has occurred in the factory, shall forthwith send written notice of such a case, in the prescribed form and accompanied by the prescribed particulars, to the nearest inspector; and the provisions of this Act with respect to the notification of accidents shall apply to any such case in like manner as to any such accident as is mentioned in those provisions(Okojie, 2010).

According to 99 of the Federal Ministry of Labour and Productivity (Okojie, 2010). Sections 51, 52 and 53 of Part VI of the Factories Act make provision for reporting of occupational diseases and accidents. This section 53 of the law is entitled Notification of Industrial Disease and it states that ’the occupier of any factory who believes, suspects or has reasonable ground for believing or suspecting, that a case of occupational disease has occurred in the factory, shall forthwith send written notice of such a case, in the prescribed form and accompanied by the prescribed particulars, to the nearest inspector; and the provisions of this Act with respect to the notification of accidents shall apply to any such case in like manner as to any such accident as is mentioned in those provisions (Okojie, 2010). Similarly, to (Adeniyi, 2001). Also accord that Occupational safety and health deals with the well-being, safety and comfort in the workplace.

2.3.1 Construction Accidents

Accident is defined by the Health and safety Executive (HSE, 2003) as any unplanned event that results in injury or ill health of people, or damage or loss to property, plant, materials or the environment or a loss of a business opportunity‘. In the United Kingdom UK, the Health and Safety Executive (HSE) is responsible for the enforcement of the Health and Safety at Work (HSW) Act and carrying out the day-to-day work to enable the Health and Safety Commission (HSC) to carry out its functions

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