



EVALUATION OF THE LEVEL OF COMPLIANCE WITH CONSTRUCTION DESIGN MANAGEMENT (CDM 2007) REGULATIONS BY CLIENTS IN NIGERIA

By
A. O. Ogunde¹,
D. J. Owolabi¹,
P. O. Kukoyi²
&
O.C. Oloke³

¹Department of Building Technology, Covenant University, Ota

²Department of Building, Bells University, Ota

³Department of Estate Management, Covenant University, Ota

ayodeji.ogunde@covenantuniversity.edu.ng;

james.owolabi@covenantuniversity.edu.ng;

patsimonomega@yahoo.co.uk;

yinka.oloke@covenantuniversity.edu.ng

Abstract: The study evaluated the level of compliance with Construction Design Management (CDM) regulation by Nigerian clients based on the main duties of the client as stipulated in CDM regulation specification. To achieve this goal, sixty (60) questionnaires were distributed among construction firms and clients involved in the execution of projects in Lagos State in Nigeria. The survey showed that the client's level of compliance based on the CDM regulation on client duty's requirement has not been encouraging. The regulation requires that enough information should be given by the client; the study found that clients did not give enough information especially on building and number of the floor to be constructed also on the units of accommodation, land survey and report on soil investigation. Most of the respondents believed that the problem associated with the level of client compliance to CDM, includes poor level of communication and inadequate time allowed by the client at every stage in the construction process. In addition, some of the amenities that exist on the construction site are toilets and changing rooms while the sickbay which is important is the least to be found in the construction sites. Also the necessary amenities and are not place in the construction sites. The level of awareness of CDM regulation among the construction workers is low but client is meant to make the information available adequately as contained in the CDM regulation. It should be noted that however, that the problems on the health and safety might have effect on performance of the construction industry in terms of cost, time and quality of the construction. It is therefore concluded that Construction Design Management (CDM) regulation is not fully known among the construction industry's client, contractors and site workers. The study recommended that for improved services, efforts should be made by project managers to create the awareness

while clients attend short course and seminars on CDM regulation. The consulting firms of the project manager are enjoined to improve on the necessary amenities available on the construction site and at the same time, the construction design management regulation should be conspicuously placed so that construction workers can have access to and be fully aware of the regulations. Finally, the client should appoint a CDM co-coordinator for each project site and that there should be agencies to monitor the implementation of the CDM regulation.

Key Words: Clients, Construction, Design, Management, Regulations.

1. Introduction

Construction involves interaction with diverse group of individuals, trades, equipment and machineries all of which are interdependent on each other to achieve a finished construction work (Otunola, 2008). Construction involves lots of health and safety hazards where the workers are constantly exposed to health risks hence lots of workers both skilled and unskilled lose their lives. Since construction exposes individuals to dangerous and life threatening conditions on site, there is need for safety measures. Health and safety (H&S) is all about identifying risks and eliminating or controlling it to prevent accidents and occupational ill-health (Health and Safety Executive, 2004), therefore everyone involved in construction has a responsibility towards creating a safe working environment. The Construction Design Management 2007 (CDM 2007) was therefore introduced to Nigerian construction industry. The policy was introduced to make our health and safety management practise effective in order to provide a safe work environment which enhances

performance. In the United Kingdom, Health and Safety Executive (2004) discovered that on the average of one to two people were killed every week as a result of construction work.

Also in the United States, the construction industry is ranked the fourth highest in fatalities per worker behind Agriculture, Mining and Transportation (US bureau of Labour Statistics, 2003). Prior research done in construction safety indicates the significance of conducting formal assessment exercises for safety management implementation in the construction industry in general. Such assessment exercises are particularly important in benchmarking safety performance as well as formulating safety management policies and strategies appropriate to the particular work environment under study. The study therefore evaluated the health and safety practices on Nigerian construction sites and reviewed the duties of the client as stipulated in the regulation

2. Related Works

The construction industry is understandably one of the most

hazardous industries in most economies (Edmonds and Nicolas, 2002). Construction industry is both economically and socially important at the same time, is also recognized to be the most hazardous (Suazo and Jaselskis, 1993). Although dramatic improvements have taken place in recent decades, the safety record in the construction industry continues to be one of the poorest (Huang and Hinze, 2006).

Research shows that the major causes of accidents are related to the unique nature of the industry, human behaviour, difficult work site conditions, and poor safety management, which result in unsafe work methods, equipment and procedures (Abdelhamid and Everett, 2000). Emphasis in both developing and developed countries needs to be placed on training and the utilization of comprehensive safety programs (Koehn *et al.*, 1995).

The construction industry is no doubt one of the most important sectors of every economy, it accounts for between 5% and 10% of the Gross Domestic Product (GDP) and over 50% of the Gross Capital Formation (GCF) and about 10% of the work force of most countries (Ogunlana, 2002). However, Adeniyi (2002) reported that the Nigerian construction industry loses 5-7% of her workforce annually to avoidable construction accident on

sites due to various reasons and further discovered that at least one person is involved in a minimal injury on the site per day. Evidently, construction accidents and the associated damage caused to the employees, property, equipment and morale have generated negative effects on the industry profitability and, to some extent, the industry productivity.

Etomi (2010), stated that there are no specific health and safety rules regulating the construction industry in Nigeria. In developing countries like Nigeria, Idoro (2008) mentioned that the situation is based on lack of concern; in accurate records and statutory regulations on health and safety thereby contractors are left to use their discretion. One of the important areas that require quick and drastic improvement is safety. It is highly essential that all occupational injuries and illnesses should be given due attention. There should be an effort to raise the level of awareness between both employees and employers of the importance of health and safety at worksites.

According to Kukoyi (2005), traditional measures of safety are after-the-fact measures; namely, that safety is measured after injuries have already occurred. These measures are labelled reactive, trailing, downstream, or lagging indicators because they rely on retrospective data.

Focusing on these measures such as accident rates and compensation costs often means that the “success of safety is measured by the levels of system failure” (Cohen, 2002). According to Idoro (2004), safety performance describes the H&S status of construction work environment. The measures used by researchers for H&S performance can be classified into 2 categories namely: objective measurements which are mostly concerned with accident and injury and subjective measurements which are based on stakeholders’ perception of health and safety status of work environment. The most common measures of H&S performance used by researchers are objective measurements that is, rates of accidents and injuries; (Kartam 1997; OSHA 1999; Koehn *et al.* 2000; HSS 2001; HSE 2002; HSS 2003; Bhutto *et al.* 2004; Carrigan 2005). These two measurements can be described as mandatory measures as emphasized in some H&S regulations such as the Factory Act which stipulate that such cases should be reported. Indeed, the rates of accidents and injuries are the most common measures of H&S performance since they indicate the level of safety on site. However, researchers have criticised these measures and suggest the use of subjective measures. Trethewy (2000) and Mohammed (2003)

emphasised that these measures suffer from three (3) drawbacks: they measure what happens after an event and are reactive in terms of management response; in the absence of any proactive measure, causal relationships cannot be established; they are negative in nature and are acknowledged as being unsuccessful measures of safety performance. In view of these drawbacks, Marosszeky (2004) suggested a shift of focus towards detailed management oriented measurements such as the subjective performance rating used by Jasekris (1996); the Site Safety Meter which is based on traditional site inspection developed by Trethewy *et al.*, (2000) and access to heights, housekeeping and personal protective equipment used by Marsh *et al.* (1995) that have the potential of influencing the processes of the project being assessed.

The duties of the clients and contractors are listed in the Construction Design and Management Regulation 2007. According to the Health and Safety Executive (2007), Clients are either organizations or individuals whom a construction project is carried out. They have substantial influence and contractual control over the project in terms of time, money competence of workforce, co-ordination of work and information needed. For these

reasons, clients are made accountable for the impact their approach has on the health and safety of those working on or affected by the project. The duties of the client under the Construction Design Management 2007 (CDM 2007) are to employ clients to appoint the right professionals for the job and provide adequate information. The code further explains that projects should be practicable and without risks. It should be carried out in a safe environment with the necessary welfare facilities put in place. There should be a CDM coordinator on site to perform special duties as required by the code. The client must ensure a health and safety file is kept and all information handed to the coordinator. He should ensure all team players communicate and cooperate effectively.

3. Research Methods

The research area of the study is based on the use of Construction Design Management 2007 health practises by the clients and contracting firms in Lagos State in the south western part of Nigeria. A sample size of 60 indigenous contracting firms and clients were surveyed to achieve the objectives of the study. The main instrument used for the collection of data was by the means of a structured questionnaire Data obtained from the respondents were processed using SPSS version 14 software. The tools used for analysing the

data collected were both descriptive and inferential statistical tools. Descriptive tools involved the use of mean, median and standard deviation to measure the spread of the data..

4. Results and Discussion

Out of the sixty questionnaires administered on the respondents, only fifty one representing 85% of the questionnaires administered were found useful for the analysis. They were made of Civil Engineers (47.1%), Architects (17.8%) and Builders (15.7%) Quantity Surveyors (7.8%) and Project Managers (4.9%) Mechanical Engineer (2.7%), Structural Engineer (2.0%) and Accountants (2.0%). The percentages of projects owned by the public and private clients were 84.3% and 15.7% respectively. While 53.0% of the projects used for the study are residential buildings. 39.2% are commercial buildings and 7.8% are industrial buildings.

The highest workmen on site vary between 11 – 20 workmen accounting for 41.2%, 1-10 workmen with 17.6%, 31-40 workmen with 16.7%, 21 – 30 workmen with 14.7%, 41 – 50 workmen with 5.9% and above 60 workmen with 3.9%. Most of the construction firm studied has 6 – 10 years of experience with 23.5% having a turnover of less than 50 million Naira, while 33.3% is between 50 and 250 million Naira.

The firms with turnover between 251 million Naira and 1 billion are 38%.

4.1 Level of Compliance with CDM Regulation by Nigerian Clients

The duties of a client stipulated on the CDM 2007 regulation were considered, and is summarized as follows: the client must appoint the right people, allow adequate

time, provide information to the team, ensure the team communicate and cooperate, ensure suitable management are in place, ensure adequate welfare facilities are in place, ensure workplaces are designed correctly, appoint a CDM co-coordinator, ensure a safety plan in place and keep the Health and Safety file as reflected in Table 1.

Table 1: Level of Compliance with CDM Regulation by Nigerian Clients

SN	Variable	N	Sum	Mean	Rank
1	Level of communication between project participants	49	109	2.32	1
2	Level of adequacy of time allowed by the clients at every stage of the construction process	46	75	1.63	2
3	Level of involvement of the right professionals	50	32.4	0.65	3
4	Level of information in the statement of brief	51	32.86	0.64	4
5	Level of amenities provided on site	51	27.75	0.54	5

Communication is very relevant since it improves productivity. The level of communication between project participants is very important based on the level of involvement of the right professionals at every stage of the project. The breakdown of the involvement of the right professionals by clients reveals Architects ranked 1st with 76% , followed by Structural Engineer in the second position with 74%,

and Electrical Engineer ranking 3rd with 70%.

In every construction site involved in this study, availability of toilet ranked 1st while changing room ranked 2nd with canteen provision coming third. 45.1% agreed that Site Engineer is the person responsible for health and safety of workers during construction phase with 13.7% recognised Project manager.

4.2: Respondent's Assessment of Level of Communication between the Project Participants

Table 2 revealed the responses of respondent's on assessment of the level of communication between the client and project participants.

Based on the result, 52.9% indicated that the level of communication is poor, 25.5% indicated that is good, while 17.6% agreed that the level of communication is average.

Table 2: Respondent's Assessment of Level of Communication Between the Project Participants

Assessment	Frequency (No)	Percentage (%)
Very good	2	4.0
Good	13	25.5
Average	9	17.6
Poor	27	52.9
Total	51	100.0

Based on the responses most of the respondent agreed that the level of communication is poor and this might have effect on the implementation of construction project.

4.3: Respondents Assessment of the Adequacy of Time Allowed by the Client at Every Stage in the Construction Process

Based on the result in Table 38% accepted that the time allowed by the client is highly inadequate, while 37.3% indicated that the time allowed is adequate and only 9.8% agreed that the time allowed is highly adequate.

Table3: Respondents Assessment of the Adequacy of Time Allowed by the Clients at Every Stage in the Construction Process

Assessment	Frequency (No)	Percentage (%)
Highly inadequate	22	43.1
Adequate	19	37.3
Highly adequate	5	9.8
Unspecified	5	9.8

Following the result, most of the respondents agreed that the time allowed by the client at every stage in the construction process is inadequate. This is against the regulation of CDM policy which stated that adequate time should be allowed.

4.4: Comparing the Level of Communication between Client and Project Participants

The Comparison between the level of communication client and project participant and assessment of adequacy of time allowed by the client at every stage in construction process is established in Table 4.

Table 4: Descriptive Statistics of Level of Communication and Adequacy of Time

Variable	N	Mean	Rank
Respondent’s assessment of the level of communication among project participants	47	2.32	1
Respondents assessment of the adequacy of time allowed by clients at every stage in the construction process	46	1.63	2

Table 4 shows that the mean of level of communication is 2.32 and it ranked 1st, while the mean of adequacy of time allowed is 1.63 and it ranked 2nd. This result implies that the level of communication is more than time allowed by clients. Since the mean indicate that level of communication is higher than the time allow is quite alright as issues of adequate communication will reduce the level of time spend on a project and this will reduce the issue of cost overrun and time overrun. Based on the Construction Design Management (CDM) 2007 regulation both supply of communication and adequate time allow are important. Also Table 5 shows the content of health and safety files on the site.

Table 5: Content of Health and Safety Files on the Site

Amenities	Frequency	Percentage (%)	Rank
Information on risk reduction in H & S	23	45.1	1
Information on cost of future task	6	11.8	2
Information on maintenance work alternation, refurbishment, demolition	2	3.9	3
Information on site clearing method	1	2.0	4

Respondents were asked to identify what is normally contained in the health and safety

file. Based on the response, supply of information on risk reduction in health and safety

ranked 1st with 45.1%, followed by supply of information on cost of future task in health and safety with 11.8% while supply of information on maintenance work alternation, refurbishment and demolition with 3.9% and finally supply of information on cost of future task in health and safety. This result shows that contractors give information on how risk can be reduced among workers through adequate compliance with CDM regulation. The information in the file is a record of useful health and safety information and helps manage health and safety risks during any future maintenance, repair, construction work or demolition.

5. Conclusion and Recommendations

The study evaluated the level of compliance with Construction Design Management (CDM) regulation by Nigerian clients based on the main duties of the client as stipulated in CDM regulation specification. The survey showed that the client's level of compliance based on the CDM regulation on client duty's requirement has not been encouraging. The regulation requires that enough information should be given by the client; the study found that clients did not give enough information especially on building and number of the floor to be constructed also on the units of accommodation,

land survey and report on soil investigation. Most of the respondents believed that the problem associated with the level of client compliance to CDM, includes poor level of communication and inadequate time allowed by the client at every stage in the construction process. In addition, some of the amenities that exist on the construction site are toilets and changing rooms while the sickbay which is important is the least to be found in the construction sites. Also the necessary amenities are not place in the construction sites. The level of awareness of CDM regulation among the construction workers is low but client is meant to make the information available adequately as contained in the CDM regulation .it should be noted that however, that the problems on the health and safety might have effect on performance of the construction industry in terms of cost, time and quality of the construction. It is therefore concluded that Construction Design Management (CDM) regulation is not fully known among the construction industry's client, contractors and site workers For improved services, efforts should be made by project managers to create the awareness while clients should demonstrative skill in leadership, communication and decision-making. It is advisable that clients attend short course and seminars

on CDM regulation. The consulting firms of the project manager are enjoined to improve on the necessary amenities available on the construction site and at the same time, the construction design management regulation should be conspicuously placed so that

construction workers can have access to and be fully aware of the regulations. Finally, agencies, whether from government parastatals or private organisation need to monitor the implementation of PPE and CDM regulations.

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