

## QUANTITY SURVEYORS' PERCEPTION OF CONSTRUCTION HEALTH & SAFETY REGULATION IN NIGERIA

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### Abstract

The construction industry business in Nigeria like in other countries cannot be tackled effectively without harnessing the construction health and safety regulations to safeguard the health of the workers and the entire community. This paper seeks to assess quantity surveyors' perception of construction health and safety regulations in Nigeria. Data was collected using the questionnaire survey distributed among Nigerian quantity surveyors and statistical tools employed include percentages and mean score ranking. The study revealed that construction health and safety is still perceived to be more important than the traditional project parameters in the form of cost and quality. Improved quality is discovered to have the greatest impact of construction health and safety on project parameter. The study recommends that health and safety should be included as a project parameter and that related practice notes and guidelines should be evolved for all project stakeholders.

**Keywords:** perception, quantity surveyors, health and safety, Nigeria.

### Introduction

The construction industry exercise is a very competitive and high-risk business according to Mustaffa (2009) resulting in high accidents and fatality rates. The construction industry for infrastructure and buildings is one of the world's largest contributors to global economy, and traditionally many parties are involved in the design, fabrication and construction process (SGS Group, 2009). Smallwood & Haupt (2006) believes that the construction industry has hinged the successful management of construction projects on the traditional parameters of cost, time and quality. The increasing rate of construction accidents has increased the level of awareness of construction health and safety, thereby involving its inclusion as part of project performance criteria.

The highest ranked business environment group factor causing contractor's business failure in developing countries is absence of construction regulations (Adnan, Khalid and Sherif, 2006). Construction regulations are various statutory requirements which construction projects are subject to, due to its relatively hazardous nature. They are planning permission and health and safety laws in the industry, purposed to bear down yet further on unacceptable levels of avoidable accidents, injuries and deaths.

Ayininuola and Olalusi (2004) stated that the non-existent and/or lack of enforcement of construction health and safety regulations, and bylaws is one of the major causes of building failures opining that Health and Safety in Construction is a highly practical guide to help any professional understand the implications of health and safety legislation for their role in a project. This implies that there is expected to be a realistic plan to help adopt a health and safety culture in the construction process meaning that using the people, experience and information to assess and eliminate risk and, where this is not possible, to reduce and communicate risk in such a way that contractors, sub-contractors, site visitors – even the people using the finished building – are able to avoid accidents.

Project delivery requirements are generic and include health and safety – the construction regulations have scheduled a range of specific health and safety requirements relative to both clients and designers (Smallwood & Haupt, 2005). Huang & Hinze (2006) asserts that the involvement of clients (owners) is an essential requirement for the zero injuries objective. Consequently, within the context of health and safety, designers are required to contribute either as designers, or as client-appointed health and safety agents. The relevance of the definition of 'conformance to requirements' to health and safety is obvious, as health and safety legislation, standards, and organization policy and rules constitute requirements (Crosby, 1984).

## **Literature Review**

### **Constructions Regulations**

Construction regulations are statutory instruments setting out the minimum legal requirements for construction works and relate primarily to the health, safety and welfare of the workforce which must be taken into account when planning construction operations and during the actual construction period (Chudley & Greeno, 2006).

Mohammed (2010) is of the opinion that construction regulations must incorporate a provision that the contractor who plans to perform any construction shall before carrying the work notify in writing the competent authority for construction planning, particularly if the construction work includes use of explosives, dismantling of fixed plant, excavation work. Mohammed (2010) also stated that it is incumbent for the client to furnish a documented health and safety specifications for the construction work ensuring that the construction stage of any project does not commence unless a health and safety plan complying with established technical standards has been prepared in respect of that project.

According to Smallwood & Haupt (2006), the Construction Regulations promulgated in the Republic of South Africa on 18 July 2003 require a range of interventions by clients and designers. It states that in order to have a safe and smooth construction environment and process, legal requirements must be met, the client must ensure that appropriate resources and organization are in place, the health and safety reports must routinely inform the project board and the client must lead from the front, embedding the policies through the organization.

### **Health and Safety on construction sites**

Oresegun (2009) views health and safety as an inevitable aspect of construction since the only time an employee will perform his duties is when he is in good health, sure of a safe working condition and assured of good health care even when an accident occurs. Based on this assertion, it is well understood that there will be the need for a higher level of health and safety protection due to rapid technological advancements in the construction industry leading to more fatal construction accidents.

Clients or his representatives should exercise complete control over their employees and ensure strict adherence to safety practices. The company must comply with all provisions of safety and health regulations that pertain to the construction works itself. It should be realized that implementation of safety and occupational health in construction works is not only for compliance purposes. Provision of health and safety plan and policies/programs such as workers welfare arrangements, clear and agreeable compensation plans, good working tools, conducive working environment and use of safety equipment; has positive result in the productivity for the company, hence increase profit. Long-term indicators have it that, lack of health and safety policies and programs not only will affect the company dividend but the worker, family and the community. Making changes to improve health and safety standards and reduce accidents and ill health can also increase

profitability; increase productivity; improve recruitment and retention; and improve quality (Gibson 2002).

The Construction (Health, Safety and Welfare) Regulations 1996 sets “goals” for the wellbeing of site personnel, with objectives emphasizing assessment of risk. It broadly covers timbering works; safeguarding excavations; ventilation of workplaces; doors, gates and entrapment; traffic routes, safe access and egress; good site organisation and planning; emergency lighting; segregation of site traffic and personnel; and welfare facilities, accommodation, sanitation, protective clothing, first aid equipment/personnel, means to heat and prepare food (Chudley & Greeno, 2006).

### **The Quantity Surveyor**

Quantity surveyors are called by so many names all over the world such as cost engineers, building economists, cost managers, construction accountants, construction cost consultants, commercial managers among other names which have been adapted by many researchers (AAACE, 2000; Kelly & Male, 2006; NIQS, 2004; Odeyinka, 2006; Ogunsemi, 2004).

Quantity surveyor according to Wikipedia (2008) is “a professional trained, qualified, and experienced in handling construction cost, construction management and construction communication on behalf of the client”. He manages all costs relating to building and civil engineering projects from the initial calculations to the final figure seeking to minimize the cost of the project and enhance value for money while still retaining the quality and required standards specified by statutory building regulations.

Nigerian Institute of Quantity Surveyors (2004) defined a quantity surveyor as the expert professionally trained and experienced in dealing with construction cost, construction management and construction communication; which is exhibited in various types of projects including building construction, civil and structural engineering, mechanical building and engineering services, petrochemicals, mineral extraction, cost and production engineering, environmental economics, planning and urban development, landscaping, interior design and all other relevant areas.

### **Quantity Surveyors role in Construction Health & Safety Regulation**

In terms of the construction regulations, according to Smallwood & Haupt (2006), the definition of the designer includes the quantity surveyor who specifies articles or draws up specifications. Quantity surveying practices therefore need to address health and safety within the confines of their practices. However, quantity surveyors invariably visit projects, and therefore could be exposed to hazards and risk. Furthermore, given that quantity surveyors specify articles and draw up specifications, they are also allocated the responsibility to ensure that such article is safe and without risks to health.

### **Methodology**

Primary source of data collection was through the administration of well-structured questionnaires to quantity surveyors in Lagos State, Nigeria. The total population for this study included all registered quantity surveyors practicing within Lagos state of Nigeria from which a sizeable number was selected to serve as a good representation of the population under study. The population consisted of 155 professional members of the Nigerian Institute of Quantity Surveyors practicing within Lagos State. Since the work forms part of undergraduate research that has a limited time frame, a sizeable number of them were selected using the formula:

$$n = \frac{N}{1 + N(e)^2}$$

Source: Yamane (1967)

where, n is the sample size, N is the population size,  
and e is the level of precision taken as  $\pm 10\%$ .

After using the formula, 61 quantity surveyors were selected and questionnaires sent out to them. 24 questionnaires were returned which indicated a return rate of 39.3%.

The data was analyzed using descriptive statistics to present the frequencies and mean of responses to questions with fixed responses to determine the background information of respondents, degree of importance of various project parameters to respondent's organization, level of contribution of project stakeholders to construction Health and Safety (H&S) regulations, impact and manifestation of the impact of construction H&S regulations. The medium of presenting the findings of the research is the use of tables.

### **Data Presentation and Analysis**

Table 1 reveals the demographic information of quantity surveying firms involved as respondents for this study. Over 50% of the respondents are National Diploma or Higher National Diploma holders, the mean number of years of respondents organization is 11.75 years while mean number of years of respondents experience is 9.25 years and the mean number of projects handled since inception is about 20. This indicates that the respondents involved and their organizations have vast experience in construction projects and activities.

Table 2 indicates the importance of seven project parameters in terms of a mean score ranging from 1 (not important) to 5 (very important). It is notable that the mean scores are all above the midpoint score of 3.00, which indicates that in general the respondents can be deemed to perceive the parameters as important. However, given that the mean scores for all the seven parameters are between 4.50 and 5.00, the respondents can be deemed to perceive them to be between important to very important. It is significant that the traditional project parameters (quality, cost and time) are ranked 2<sup>nd</sup> for both quality and cost and time seen as 7<sup>th</sup>. Furthermore, it is notable that the subject of the study, H&S has a mean score 4.67 which is below that of client's satisfaction which is ranked first; with cost, quality and productivity are effectively as important as H&S.

The majority of respondents indicated that contractors, architects, project managers, quantity surveyors, clients, engineers, builders and subcontractors contribute to the Construction H&S Regulations. Table 3 indicates the level of contribution of project stakeholders to the implementation of Construction Health and Safety Regulations in terms of a mean score ranging from 1 (very low) to 5 (very high). Majority of the mean scores which are above the midpoint score of 3.00 indicates that in general all stakeholders contribute to construction health and safety regulations. However, given that the mean scores for the first five stakeholders are between 4.20 and 5.00, the respondents can be deemed to perceive them to be between high to very high. Given that the mean scores for Architect, Contractor, Builder, Client and Subcontractor are between 3.65 and 4.20, the respondents can be deemed to perceive them to be moderately high. The mean score of 2.79 relative to the Supplier indicates that respondents can be deemed to perceive it to be very low.

Table 4 indicates the impact of construction health and safety regulations requirements on project performance in terms of mean score ranging from 1 (very low) to 5 (very high). It shows the respondents perceive that construction health and safety regulations will have between high to a very high impact on improved quality, less worries, increased productivity, increased client satisfaction, increased efficiency, reduced absenteeism, increased profitability, enhanced environment, improved maintenance, reduced cost, lower compensation insurance, improved recruitment and retention, and less rework on project performance.

The range relative to the mean score categories follow that between 4.15 and 5.00, the manifestation of the impact of the construction regulation ranges between high to very high; while a mean score between 3.50 and 4.14 shows that the manifestation of the impact is moderately high.

It is notable that all the mean scores for the 31 manifestations are above the midpoint score of 2.50, which indicates that in general the related manifestations can be deemed to be prevalent. The twenty-four (77.4%) manifestations falling within the range of mean scores between 4.15 and 5.00 are discussed first. Quality management system during design and increased H&S awareness, the former marginally ahead of the latter, followed by increased consideration for/reference to H&S by quantity surveyors and project managers, predominate. Increased consideration for/reference to H&S by project managers is a significant manifestation as project managers, in their capacity as project leaders and coordinators, are uniquely positioned to integrate H&S into projects, in particular the design and development, and construction phases (Smallwood, 1998; Hinze, 1997). Given that project managers coordinate design and/or design delivery, they can influence designers, and therefore increased consideration for/reference to H&S by them is likely to result in increased consideration for/reference to H&S by designers. Increased consideration for/reference to H&S by general contractors is notable, as GCs manage and coordinate the physical construction process and therefore should influence the degree of consideration for/reference to H&S by subcontractors. However, the mean score for the latter is 4.35. Increased H&S awareness, ranked second, is a significant manifestation, as awareness is a pre-requisite for commitment and the allocation of resources, and is one of the intended manifestations of the Construction H&S Regulations. Third ranked increased consideration for/reference to H&S by quantity surveyors is notable as quantity surveyors among others, effectively specify materials, and clients are required to ensure that PCs have made adequate allowance for H&S. Reduction in accidents, project specific plan for quality, and improvement in H&S all ranked fifth, Following very closely is increased consideration for/reference to H&S by subcontractors which ranked eighth, contractor's H&S programme, partnering and constructability reviews by designers are ranked ninth. Within 0.01 on the mean score scale, client actions/contributions is ranked twelfth, and pre-qualification of contractors on H&S alongside environmental management system are ranked thirteenth. Review of financial provision is important, as historically budgeting for H&S by contractors has not been facilitated in the form of the inclusion of H&S items in the Preliminaries or a dedicated section of a bill of quantities. Reduction in accidents, together with project specific plan for quality and improvement in H&S are essentially functions thereof, of the nineteenth ranked improved conditions on site. Pre-qualification of contractors on quality, optimum project schedule (time), and more structured/deliberated approach to work ranked fifteenth are all related. Pre-qualification on H&S and choice & review of procurement system & practices are ranked thirteenth and twenty-third. These are notable rankings as the Construction H&S Regulations explicitly and implicitly require a range of procurement related interventions. Furthermore, procurement can impact on among others, H&S, either positively or negatively. The Construction H&S Regulations require the client to ensure that the PC has made adequate financial allowance for H&S. This and other requirements explicitly and implicitly require that the PC and SCs be pre-qualified on H&S.

The second range of manifestations, those with mean scores between 3.50 and 4.14 which are moderately high are discussed below. Contract documentation, is ranked twenty-fifth, together with quality management system during construction and integration of design and construction in terms of H&S. Change in work practices is followed by increased consideration for/reference to H&S by designers. Although the latter is only ranked twenty-ninth, it has a mean score of 4.00 and thus can be deemed a manifestation. Review of forms of contract and provision for H&S, ranked thirtieth with a mean score of 3.96, and are notable in that the standard forms of contract in Nigeria do not make adequate reference to H&S. However, the manifestation is prevalent, which indicates that the Construction H&S Regulations have had an impact.

## Conclusion

Based on the findings, it could be concluded that the construction health and safety regulations in Nigeria construction industry have direct impact on project delivery. Its

impact is such that, if the industry lacks health and safety regulations, problems such as low quality, time overrun, cost overrun, absenteeism of workers due to injuries etc. will be prevalent on construction projects due to the hazardous nature of the construction industry. Hence, the unquestionable and non-negotiable need to invest in construction health and safety policies and programmes through the regulations right from the design stage and through the entire construction process.

The construction health and safety regulations are very important in achieving efficiency and effectiveness amongst professionals and even workers in the construction industry because it influences project delivery parameters which are most paramount to the client. The implementation of construction health and safety policies and programmes stipulated in the regulations will remain one of the most important aspects of project planning and management.

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## Appendix

**Table 1: Background information of respondents**

		Frequency	Percentage
Academic Qualification of respondent	ND/HND	13	54.17
	B.Sc/B.Tech	5	20.83
	PGD	1	4.17
	M.Sc/M.Tech	5	20.83
	<b>Total</b>	<b>24</b>	<b>100.00</b>
Number of years of existence of respondent's organization	0-5	4	16.67
	6-10	6	25.00
	11-15	6	25.00
	16-20	8	33.33
	Above 20	0	0.00
<b>Total</b>	<b>24</b>	<b>100.00</b>	
<b>Mean years of respondent organization = 11.75 years</b>			
Number of years of experience of respondent	0-5	7	29.17
	6-10	11	45.83
	11-15	1	4.17
	16-20	3	12.50
	Above 20	2	8.33
<b>Total</b>	<b>24</b>	<b>100.00</b>	
<b>Mean years of respondent experience = 9.25 years</b>			
Number of projects handled since inception	0-5	0	0.00
	6-10	0	0.00
	11-15	2	8.33
	16-20	12	50.00
	Above 20	10	41.67
<b>Total</b>	<b>24</b>	<b>100.00</b>	
<b>Mean number of projects handled = 19.67</b>			

**Table 2: Degree of importance of various project parameters to respondent's organization**

Project parameters	Mean score	Rank
Client's satisfaction	4.79	1
Health & safety	4.67	2
Productivity	4.67	2
Quality	4.67	2
Cost	4.67	2
Environment	4.54	6
Time	4.50	7

**Table 3: Level of Contribution of Project Stakeholders to Construction H&S Regulations**

Project stakeholders	Mean score	Rank
Quantity Surveyors	4.38	1
Electrical Engineers	4.33	2
Project Managers	4.33	2
Structural Engineers	4.33	2
Mechanical Engineers	4.21	5
Architect	4.17	6
Contractors	4.14	7
Builders	4.13	8
Client	3.96	9
Subcontractors	3.67	10
Suppliers	2.79	11

**Table 4: The Impact of Construction H & S Regulations on Project Performance**

Impact	Mean score	Rank
Improved quality	4.50	1
Less worries	4.46	2
Increased productivity	4.46	2
Increased client satisfaction	4.38	4
Increased efficiency	4.38	4
Reduced absenteeism	4.33	6
Increased profitability	4.21	7
Enhanced environment	4.17	8
Improved maintenance	4.17	8
Reduced cost	4.08	10
Lower compensation insurance	4.04	11
Improved recruitment & retention	4.00	12
Less rework	3.96	13

**Table 5: Manifestation of the impact of the Construction Regulations**

Manifestations	Mean score	Rank
Quality management system during design	4.50	1
Increased H&S awareness	4.46	2
Increased consideration for/reference to H&S by quantity surveyors	4.39	3
Increased consideration for/reference to H&S by project managers	4.39	3
Reduction in accidents	4.38	5
Project specific plan for quality	4.38	5
Improvement in H&S	4.38	5
Increased consideration for/reference to H&S by subcontractors	4.35	8
Contractor H&S programme	4.33	9
Partnering	4.33	9
Constructability reviews by designers	4.33	9
Client actions/contributions	4.30	12
Pre-qualification of contractors on H&S	4.29	13
Environmental management system	4.29	13
Pre-qualification of contractors on quality	4.25	15
Optimum project schedule (time)	4.25	15
More structured/deliberated approach to work	4.25	15
Increased consideration for/reference to H&S by general contractors	4.22	18
Contractor programming	4.21	19
Project specific plan for H&S	4.21	19

Prioritization/consideration by designers	4.21	19
Improved conditions on site	4.21	19
Choice & review of procurement system & practices	4.17	23
Review of provision for H&S – Financial	4.17	23
Contract documentation	4.13	25
Quality management system during construction	4.13	25
Integration of design and construction in terms of H&S	4.13	25
Change in work practices	4.08	28
Increased consideration for/reference to H&S by designers	4.00	29
Review of forms of contract	3.96	30
Review of provision for H&S	3.96	30

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