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MANAGEMENT PROCESS OF HEALTH AND SAFETY RISK IN THE NIGERIA CONSTRUCTION INDUSTRY

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ABSTRACT

The study examined the state of health and safety risk management practices in the building sector of the construction industry with the objective to examine the health and safety risk management processes adopted by the construction industry in Nigeria; the study adopted the survey and case study research design. It employed the use of Delphi's technique in the distribution of questionnaire and made use of chi-square analytical technique for the analysis of gathered data. The findings revealed that most of the parties involved in construction projects do not have any significant health and safety risk management process in place. Various improvement strategies have been suggested.

KEYWORDS: Health and Safety Risk; Management Process; Nigeria Construction Industry

I. INTRODUCTION

The relevance of the construction industry in a nation's economy cannot be over emphasized as the development and growth of such nation is inclusively dependent on the performance of the industry (Okeola, 2009). This performance is visible in areas such as the construction roads, bridges, skyscrapers, dams and buildings (Occupational Safety and Health Administration (OSHA), 2011). The National Construction Council (NCC) (2004) observed the construction industry to be a complex fundamental sector of the economy that permeates other sectors in transforming various resources into physical, economic and social infrastructure necessary for economic development; that, it embraces the process by which the physical infrastructure are planned, designed, procured, constructed or produced, altered, repaired, maintained, and demolished.

Infrastructure construction in the process of development has gained a new stimulus, in that construction activities are considered to be one of the major sources of economic growth, development and economic activities (Ehsan, Alam, Mirza & Ishaque, 2010). They also noted that construction and engineering services industry can be regarded as a mechanism of generating employment and offering job opportunities to millions of unskilled, semi-skilled and skilled work force. For a developing nation such as Nigeria, the actualization of the nation's vision partly depends on the existence of a reliable and competitive local construction industry that is capable of delivering quality service and value for money in the development and maintenance of the physical infrastructures. Its role in the socio-economic development goes beyond its share in national output. Adeleka (2012) noted that infrastructure is portrayed by an increasing rate of city development in virtually all parts of the Nigerian economy with notable growth in some areas. He gave the three areas of significant growth in building and construction activities in Nigeria as: Lagos; the commercial nerve-centre of the country, Abuja; the Federal Capital Territory which has witnessed an outstanding increase in construction activities in the past decade, having an unprecedented expansion into new towns due to the population influx into the city and the Niger-Delta region of Port-Harcourt; the Nigeria's oil industry's base.

The nature of the activities going on in the industry makes it one of the most dangerous workplaces with over thousands of people killed in the past years from work related accidents and injuries sustained in the workplace. Characterized by its complexity and hazardous nature; the workers on site are therefore exposed to several risk factors as the project is being executed. On site, most times activities don't work out as planned hence risks should be assessed and kept under control. In unfavorable circumstances, even a minor disturbance could set off a chain of events that may threaten the health and safety of the individuals on site and invariably delays the completion of the project or an outright termination of the project. The need to indoctrinate the management of

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risk during the project planning is of paramount importance since if not indentified and properly accommodated could reflect on the overall assessment of the project (Chapman & Ward, 2003).

Lewis (2002) therefore noted that risk management is the systematic process of identifying, quantifying, analysing and responding to project risk; involving maximising the probability and consequences of positive events and reducing the probability and consequences of adverse events to project objectives. A systematic process of risk management has been divided into risk classification, risk identification, risk analysis and risk response, where risk response has further been divided into four actions, i.e. retention, reduction, transfer and avoidance (Flanagan and Norman, 1993; Berkeley, 1991). However it should be underlined that risk management is not a tool which ensures success but rather a tool which helps to increase the probability of achieving success (Gajewska et al, 2011). Since the Nigerian construction industry is growing in complexity and size; it is therefore imperative that it must not approach construction safety as just another step in avoiding unwanted accidents/costs but as a strategic tool for maximizing competitiveness and profitability as this will enable the industry be competitive at the global level (Agwu, 2012).

For moral, legal and economic reasons, the health and safety of every person, security of goods and protection of the environment, are essential aims which every company shares. These goals are only achieved and guaranteed if there is a policy orientation towards prevention of all health and safety (H&S) risks within each company. Some of the several reasons for a company to develop and implement a more systematic and structured health and safety policy includes to: reduce accidents, limit sick-leave, provide a better working environment, attract the best work force, improve the quality of the final product, gain a competitive advantage, improved image, and facilitates contact with the authorities. It becomes a problem/challenge where the future (e.g. cost, profit, time of completion, etc.) of a project can not be fathomed with relative certainty in the building sector of the construction industry on the ground of no provision for health and safety risk management. Zaynab and Mahmud (2012) opined that managing a project successfully means not just executing it according to specifications within the stipulated time and with budgeted funds but also with optimum safety. Hence, this necessitated the study on the Appraisal of construction: Health and Safety Risk Management in Nigerian construction industries. The aim of this research was actualized in this specific objective: 'to examine the Health and Safety risk management processes adopted by the construction industry in Nigeria'. While the research hypothesis is stated thus:

1. Health and safety risk has no significant management process in the Nigeria construction industry; and
2. The Effectiveness of health and safety risk management practices in the Nigerian construction industry is not dependent on an established framework.

II. REVIEW OF RELATED LITERATURE

The construction industry is viewed as a pillar in national development and several authors has given their definition of the industry with respect to its contribution to nation building. Among them are Rameezdeen, (2007), Hamimah, Kamaruzaman, and Mohd Khairi (2008), Oyedele (2013), and Wibowo (2009). The trend of the industry is therefore the same in both developed and developing countries as the industry is considered as a prime source for employment generation; offering job opportunities to millions of unskilled, semi-skilled and skilled workforce (International Labour Organisation (ILO), 2001), a contributor to the nation's GDP as well as wealth creation. This perception is given by Vetica Capital Management Limited (VCM), (2011), The Office for National Statistics (2012), Dougherty, (1996), ILO, (2001), Ruddock et al, (2010), Haigh (2010) and the UK Contractors Group (UKCG), (2009). Despite the contributions of the industry in terms of development of infrastructures, employment as well as its contribution to the economy's GDP, the industry is prone to risk. Menzel and Gutierrez (2010) are of the opinion that the reasons construction site is risky and prone to health and safety risks includes the condition of the physical environment of the work, nature of the construction work operations, construction methods, construction materials, heavy equipment used, and physical properties of the construction project itself.

There are a lot of definitions of risk in literatures. For some authors, risk is defined as the possible occurrence of negative or adverse effects such that the effect adversely affects the continuity or success of the project in terms of budget cost, quality, completion time, operational use and overall sustainability of the project for present and future generations, whereas other authors define it as the possibility of occurrence of either negative or positive effects such as: Ugwu (1992), Adukia (2006), Darnall & Preston (2010), Siew & Abdul-Rahma (2013), Jaafari (2001), Jannadi (2007), Loosemore et al (2006), Bunni (2003), Esan et al (2010), Hillson, (2002), and PMI, (2004). In this study, risk is considered as an event that has adverse effects on the project objectives.

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Consequently, the definition of risk in project management is adopted, i.e. the probability of an event occurring, such that the effect adversely affects the continuity or success of the project in terms of budget cost, quality, completion time, operational use and overall sustainability of the project for present and future generation (Ugwu, 1992).

Risks which are identifiable in the construction industry and which can be encountered in each construction project regardless of its size and scope; includes, though not restricted to: Financial risks (unavailability and fluctuation in foreign exchange, delays in Payment, inflation, local taxes, repatriation of funds), Management related risk (uncertain productivity of resources, industrial relations problems, lack of proper interface management), Logistical risk (unavailability of sufficient transportation facilities, unavailability of resources-particularly construction equipment spare parts, fuel and labor), Socio-political risks (constraints on the availability and employment of expatriate staff, customs and import restrictions and procedures, difficulties in disposing of plant and equipment, insistence on use of local firms and agents), Technical risk (inadequate site investigation, incomplete design, inappropriateness of specifications , uncertainty over the source and availability of materials), Environmental risk (weather and seasonal implications, natural disasters).

Not only is the construction industry prone to risk, the health and safety of the workers on site are endangered also. Health and safety (occupational) can be taken as the practice that deals with all aspects of the well-being and the condition of being free from danger of harm in the workplace and has a strong focus on primary prevention of hazards. Therefore the Health and safety at construction sites deals with both physical and psychological well being of workers on sites and other persons whose health is likely to be adversely affected by construction activities on site irrespective of the construction process and project delivery (Kheni, 2008). In all over the world, construction workers are greatly exposed to death and injuries than workers in other occupations as reported by Health and Safety Executive (HSE) (2004, 2012), Hassan, Basha, & Hanafi (2007).

However, it is believed that mankind incessantly seeks to deal with risk, or try to manage it proactively. Consequently, it is not only that risk is found everywhere but also the concept of risk management. Risk management may therefore be described as "a systematic way of looking at areas of risk and consciously determining how each should be treated. It is a management tool that aims at identifying sources of risk and uncertainty, determining their impact, and developing appropriate management responses" (Uher, 2003). This does not necessarily mean avoiding projects that could incur a high level of risk instead it helps the management to go into such projects with their eyes open, such that they know what kind of thing(s) that could go wrong, and make sure they do their best so that those factors would not prevent the ultimate success of the project (Hamimah et al, 2008).

A systematic process of risk management has been divided into risk identification, risk analysis and risk response and control, where risk response has been further divided into four actions, i.e. retention, reduction, transfer and avoidance (Berkeley *et al.*, 1991; Flanagan & Norman, 1993). An effective risk management method can help to understand not only what kinds of risk will be encountered in the project, but also how to manage these risks in different phases of the project. Risk management in construction is traditionally based on the experience and individual judgments made by site managers, especially in smaller projects. The risk management process is grouped into two stages: (a) risk identification (b) risk assessment. Bu-qammaz (2007), gave risk identification process as a critical phase in the risk management cycle, since the result of this phase will have an effect on the succeeding phases; if this stage misses in the cycle; any risk that appears consequently in the following phases will not be taken into account. Therefore, if risk is not identified it will not be evaluated and managed.

There are several ways of identifying risk in a project which many researchers have outlined. Chapman (1998) opined that the various available identification techniques can be grouped under these three distinct classifications: (1) identification conducted solely by the risk analyst, (2) identification by the analyst interviewing a member of the project team, and (3) the analyst leading a working group. The following are various risk identification processes, tools and techniques: risk checklist & matrix, brainstorming, risk breakdown structure, Delphi's technique, assumptions and constraints, document review, fault tree analysis, industry based knowledge, influence diagram, interviews, nominal group, post-project reviews/lessons learned/historical information, prompt list, questionnaire, root cause analysis, SWOT analysis, system dynamics and work breakdown structure review. The second stage in the risk management process is the risk assessment/analysis which is defined as the most important - time consuming part of a risk management process

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(RMP) where collected data about the potential risk are analyzed. Processes of risk assessment would include: the quantitative and qualitative risk assessment. For a risk assessment result to be satisfactorily valid, it has to satisfy uniqueness, reliability, objectivity and repeatability (Infigo, 2006). Simplicity of the analysis is essential for encouraging practitioners to use risk assessment tools.

Baker et al. (1998) surveyed the most successful qualitative and quantitative risk analysis tools in construction as well as the Oil and Gas industries. They found that personal and corporate experience with engineering judgment are the most frequently qualitative risk assessment tool where the Expected Monetary Value (EMV), break-even analysis, scenario analysis and sensitivity analysis are the most widely used tools for quantitative risk assessment. Almost the same results were obtained in similar studies carried out by Wood & Ellis (2003), Lyons & Skitmore (2004), Dikmen et al. (2004) and Warszawski & Sacks (2004). It is notable from these studies that the frequently used quantitative risk assessment tools are not sophisticated.

III. METHODOLOGY

The study adopted the Descriptive research design using the case study and survey research methods. Within the ambit of the survey research design, the Delphi survey method was employed to get in-depth information on the health and safety risk management practices from the respondents. This was achieved through the distribution of both structured and unstructured questionnaire administered to the construction companies in Abuja, Lagos, Port-Harcourt and Enugu via self and e-mails. These areas are located in four of the six geopolitical zones of the country with significant growth in building and construction activities. The participants were engineers, architects, safety officers and project managers; having individual working experience of at least 5years on building projects. The selected construction companies have been in operation for at least 5years in the building sector of the construction industry with a minimum workforce capacity of 20 workers. The profile of the respondents varied but few were mid-to-upper level management, some of the respondents had management responsibilities or provided professional services such as employing the services of a professional safety officer for their projects. The data used in this study are primary data, they are essentially, data gathered from the survey. Technique for the analysis is the Pearson's *chi*-square technique to examine the risk management practices in the building sector of the construction industry. The Pearson's *chi*-square is given as $X^2 = \sum \frac{(F_O - F_E)^2}{F_E}$

Where F_O = Observed frequency

F_E = Expected frequency which is gotten by $\frac{(R_T)(C_T)}{N_T}$

R_T = Total value of frequencies in a row.

C_T = Total value of frequencies in a column.

N_T = Total number of sample.

X^2 = chi-square which is given as: $X^2 = \frac{(F_O - F_E)^2}{F_E}$

Df = degree of freedom = (r – 1)(c – 1), r = number of rows, c = number of columns.

IV. DATA ANALYSIS

The response from the distributed questionnaire were gathered and tabulated in the appendices. The gathered data were analyzed with respect to the study's aim; this was achieved through testing the stated hypothesis.

Ho: Health and safety risk has no significant management process in the Nigeria construction industry.

H1: Health and safety has a significant management process in the Nigeria construction industry.

Ho: The Effectiveness of health and safety risk management practices in the Nigerian construction industry is not dependent on an established framework.

H_1: The effectiveness of health and safety risk management practices in the Nigeria construction industry is dependent on an established framework.

To test for the first two hypotheses, tables 8 and 9 in the appendices will be used.

Using level of significance $\alpha = 0.05$

Degree of Freedom (df) = (r – 1)(c – 1) = (3-1)(4-1) =6

Chi- square critical value $X^2_{\text{critical}} = 12.51916$

Chi- square calculated value will be gotten from table 8.

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TABLE 12A: Observed and Expected Frequencies of table 8

	CATEGORY A		CATEGORY B		CATEGORY C		CATEGORY D		TOTAL
POSSIBLE ANSWERS	F_O	F_E	F_O	F_E	F_O	F_E	F_O	F_E	
Existing analysis/ management process	4	4.02	2	2.29	2	1.72	1	0.96	9
Use of a Risk analysis/ management consultant	6	5.36	3	3.06	2	2.3	1	1.28	12
No risk management	11	11.62	7	6.64	5	4.98	3	2.77	26
TOTAL	21		12		9		5		47

Table 12B: Computation of Chi-square Test Statistic from table 12A

Observed Frequencies (F_O)	Expected Frequencies (F_E)	$F_O - F_E$	$(F_O - F_E)^2$	$\frac{(F_O - F_E)^2}{F_E}$
4	4.02	-0.02	4×10^{-4}	9.95×10^{-5}
6	5.36	0.64	0.4096	0.0764
11	11.62	-0.62	0.3844	0.0330
2	2.29	-0.29	0.0841	0.0367
3	3.06	-0.06	3.6×10^{-3}	1.1×10^{-3}
7	6.64	0.36	0.1296	0.0195
2	1.72	0.28	0.0784	0.0456
2	2.3	-0.3	0.09	0.0391
5	4.98	0.02	4×10^{-4}	8.03×10^{-5}
1	0.96	0.04	1.6×10^{-3}	1.67×10^{-3}
1	1.28	-0.28	0.0784	0.0613
3	2.77	0.23	0.0529	0.019
			X^2 =	0.3335

$X^2_{\text{calculated}}$ from table 8 = 0.3335

TABLE 12C: Observed and Expected Frequencies of table 9

	CATEGORY A		CATEGORY B		CATEGORY C		CATEGORY D	
	F_O	F_E	F_O	F_E	F_O	F_E	F_O	F_E
Qualitative Analysis	-	0.894	1	0.511	-	0.383	1	0.213
Quantitative Analysis	2	2.681	1	1.532	1	1.149	2	0.638
Both	-	0.447	-	0.255	-	0.191	1	0.106
Aware but not in use	9	8.489	5	4.851	4	3.638	1	2.02
Unaware	10	8.489	5	4.851	4	3.638	-	2.02
Total	21		12		9		5	

Using $\alpha = 0.05$
Degree of Freedom (df) = (r – 1)(c-1= (5-1)(4-1)=12
Chi- square critical value X^2critical = 21.026.

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Table 12D: Computation of Chi-square Test Statistic from table 12C

Observed Frequencies (F_O)	Expected Frequencies (F_E)	$\frac{(F_O-F_E)^2}{F_E}$
-	0.894	0.894
2	2.681	0.173
-	0.447	0.447
9	8.489	0.031
10	8.49489	0.269
1	0.511	0.468
1	1.532	0.185
-	0.255	0.255
5	4.851	4.58×10^{-3}
5	4.851	4.58×10^{-3}
-	0.383	0.383
1	1.149	0.019
-	0.191	0.191
4	3.638	0.036
4	3.638	0.036
1	0.213	2.908
2	0.638	2.908
1	0.106	7.539
1	2.02	0.515
-	2.02	0.515
	X^2 calculated=	17.781

$X^2_{calculated}$ from table 9 = 17.781

Decision rule: Accept Ho: if $X^2_{critical} > X^2_{calculated}$, Reject Ho: if $X^2_{critical} < X^2_{calculated}$

V. DECISION

From the outcomes of the two tests above, the values of the $X^2_{critical}$ (12.5916 and 21.026) from tables 8 and 9 are greater than the $X^2_{calculated}$ (0.3335 and 17.781) gotten from the chi-square distribution table. The alternate hypothesis is rejected and we accept the null hypothesis that Health and safety risk has no significant management process in the Nigeria construction industry.

Testing for hypothesis 2

H_O: The Effectiveness of health and safety risk management practices in the Nigerian construction industry is not dependent on an established framework.

H_1: The effectiveness of health and safety risk management practices in the Nigeria construction industry is dependent on an established framework.

The data from Table 11 row 5 will be used to test this hypothesis.
Using level of significance $\alpha = 0.05$
Degree of Freedom (df) = (n – 1) = 4 – 1 = 3
Chi- square critical value $X^2_{critical} = 7.81473$
Chi- square calculated value will be gotten from table 14B

Table 13A: Data from table 11 row 5

	CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY D
Lack of government established safety regulatory institution	7	5	2	2

Since the total respondent is 47; the expected frequency will be 47/4 = 11.75

This is represented further as thus:

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Observed and Expected Frequencies and chi-square of table 13A

CATEGORY	F_O	F_E	$F_0 - F_E$	$(F_O\text{-Fe})2 /Fe$
A	7	11.75	-4.75	1.920
B	5	11.75	-6.75	3.877
C	2	11.75	-9.75	8.090
D	2	11.75	-9.75	8.090
			$X^2_{calculated}$ =	21.977

$X^2_{calculated} = 21.977$

Decision rule: Accept Ho: if $X^2_{critical} > X^2_{calculated}$, Reject Ho: if $X^2_{critical} < X^2_{calculated}$

From the test above, the value of the $X^2_{critical}$ (7.81473) is less than the $X^2_{calculated}$ (21.977) gotten from the *chi*-square distribution table. The null hypothesis of the effectiveness of health and safety risk management practices in the Nigerian construction industry is not dependent on an established framework is rejected. The alternate hypothesis that the effectiveness of health and safety risk management practices in the Nigeria construction industry is dependent on an established framework is accepted.

The results from the chi-square tests of tables 8 and 9 showed that the construction industry in Nigeria has no significant health and safety risk management process. The finding is consistent with the response gotten from the respondents in table 9 revealing that the percentage of the respondents that are aware of the risk management process but do not use it equals the number of respondents that is unaware of the process. This finding justifies the essay written by Swindoll (1997) as cited in Hillson and Murray-Webster (2007b) that the attitude of the project actors to risk goes a long way in determining how well they will respond to its existence and effect on the project hence its management. This attribute was also evident as most of the respondents who admitted having used a risk management process could not outline briefly either the qualitative or quantitative process of risk analysis. Some of the respondents whose companies adopt a certain percentage of risk management admit that the company does so based on the policy stipulated by the government of its parents nation example of such is the Julius Berger Nig ltd. Literally table 8 presented a greater percentage of respondents who have not adopted any risk management process in their projects to be 55% of all the respondents. The figure is outrageous as it depicts more than half of the respondents.

The *chi*-square test result for the second hypothesis using table 11 row 5 revealed that the construction industry in Nigeria has witnessed a lot of problems militating against the implementation of health and safety practices during project conception and delivery. The result from the analysis corresponds to the findings of Okojie (2010), David (2013), Kheni (2013) and Enaruna et al (2013) that attributed the low level of health and safety implementation to the presence of militating factors in the industry and the country at large. This therefore reveals that if 50% of the problems are resolved, the industry will go a long way in adopting the use of health and safety risk management in the planning of their projects.

VI. CONCLUSION

The main objective of this study was to examine the Health and Safety risk management processes adopted by the construction industry in Nigeria. The effort was spurred by the increasing number of abandoned projects as well as the loss of lives of the construction workers and sustenance of temporal and permanent injuries from their place of work which is as a result of what they are exposed to. From the results and discussion of the respondents' responses we can conclude that the establishment of health and safety risk management enforcement agency and the adoption of safety policy in the workers act of the Nigerian constitution will help to improve the image of the industry and as well eradicate quacks from the system. Any construction company that fails to recognize the essence of adequate provision of health and safety risk management practices especially as it affects the interaction between human, plants and the construction environment is doing a lot of disservice to itself. For the industry to progress and improve, the health and safety of all the parties involved in the everyday construction activities should be adequately taken care of so as to actualize the desired project objectives.

The result of this study have provided evidence to make a convincing case that an effective implementation of health and safety risk management in the construction industry in Nigeria will improve the image of the industry

and as well help monitor the activities of the industry. In view of the foregoing, the following recommendations were made:

i) The construction companies should adopt aggressive safety campaigns/workshops on workplace hazards.
ii) The companies should form safety circles at the operational level to identify and address workplace hazards.
iii) They should organize regular training/re-training of safety personnel and the entire workforce on safe work procedures.
iv) The top management personnel's of the companies should get adequately committed to health and safety risk management issues.
v) There should be continuous safety audit of equipment and work site to identify and eliminate work place hazards.
vi) The government of the nation should adopt a continuous review of corporate safety policies to accommodate changes in the construction environment.
vii) There should be government enactment of safety legislations with stiffer penalties on companies that are not safety conscious in their operations.

The related professional institutions to the field of construction should establish faculties that will regulate and monitor the practice of health and safety risk management within the ambit of the association.

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Appendices

Table 1: Distributed Questionnaire

QUESTIONNAIRE	FREQUENCY	% OF DISTRIBUTION
Number of questionnaires not returned	33	41.25
Number of returned questionnaires	47	58.75
Total number of distributed questionnaire	80	100

Table 2: Profile Of Respondents

S/No.	DESIGNATION OF RESPONDENT IN COMPANY	ABUJA	ENUGU	RIVERS	LAGOS	TOTAL	% OF DISTRIBUTION
1	SAFETY CORDINATOR/ SUPERVISOR		2	2	2	6	12.77
2	PLANNING ENGINEER	2			2	4	8.51
3	PROJECT MANAGER	2	3			5	10.64
4	SITE ENGINEER	13	7	3	5	28	59.57
5	ARCHITECT	2	2			4	8.51
6							
	TOTAL	19(40.4%)	14(29.79%)	5(10.64%)	9(19.15%)	47(100%)	100

Table 3: Categorization Of Respondents Companies

CATEGORY A (0 – 100 WORKERS, 5 – 10 YEARS)	CATEGORY B (101–1000WORKERS, 11YEARS – ABOVE)	CATEGORY C (0 – 100 WORKERS, 11YEARS – ABOVE)	CATEGORY D (101 – 1000 WORKERS, 5 – 10 YEARS)
21	12	9	5

Table 4: Respondents Work Experience

WORK EXPERIENCE	CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY D	TOTAL	% Distribution
5 – 10 years	21	10	7	5	43	91.48
11 -15 years		2			2	4.26
16 – 20 years			2		2	4.26
TOTAL	21	12	9	5	47	100

Table 5: Factors That Affects Project Duration

CATEGORIES OF COMPANIES	Health and safety risk	Community crises	Weather condition	Funding	Procurement system	Security	Scope change	Bureaucracy	Soil test	Total	% of distribution
CATEGORY A	7	7	9	12	7	2	2	2	-	48	33
CATEGORY B	2	5	10	5	-	2	-	5	2	31	21
CATEGORY C	7	5	5	7	-	5	-	-	-	29	20
CATEGORY D	8	-	5	11	3	3	3	-	5	38	26
TOTAL	24	17	29	35	10	12	5	7	7	146	100

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Table 6: List Of Identified Project Risks

S/No	IDENTIFIED RISKS	CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY D	TOTAL	% OF DISTRIBUTION
1.	Financial risk	9	10	7	5	31	25.62
2	Health and safety risk	12	5	5	4	26	21.48
3	Environmental risk	5	5	2	4	16	13.22
4	Socio-political risk	5	2			7	5.79
5	Technical risk	5	7	7	2	21	17.36
6	Logistical risk		2	2	2	6	4.96
7	Management related risk	5	2	5	2	14	11.57
	TOTAL	41	33	28	19	121	100

Table 7: Processes Of Risk Identification

PROCESSES OF RISK INDENTIFICATION	CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY D	TOTAL	% OF DISTRIBUTION
Assumptions & constraints analysis	7				7	11.11
Post-project reviews/lessons learned (experience)	12	7	5		24	38.09
Use of risk consultant/officer	5		2	2	9	14.29
During project execution		5			5	7.94
Job hazard analysis				2	2	3.17
Questionnaire	2			3	5	7.94
No existing process	7	2	2		11	17.46
TOTAL	33	14	9	7	63	100

Table 8: processes of managing the identified risk.

POSSIBLE ANSWERS	CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY D	TOTAL	% of Distribution
Existing analysis/ management process	4	2	2	1	9	19.15
Use of a Risk analysis/ management consultant	6	3	2	1	12	25.53
No risk management	11	7	5	3	26	55.32
TOTAL	21	12	9	5	47	100

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Table 9: Methods Of Risk Analysis

POSSIBLE ANSWER	CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY D	TOTAL	% OF DISTRIBUTION
Qualitative Analysis	-	1	-	1	2	4.26
Quantitative Analysis	2	1	1	2	6	12.76
Both	-	-	-	1	1	2.13
Aware but not in use	9	5	4	1	19	40.42
Unaware	10	5	4		19	40.42
Total	21	12	9	5	47	99.99

Table 10: Level Of Implementation Of Safety Measures

SAFETY MEASURES	Adequately provided				Not adequately provided				Not provided				Total	% of distribution
CATEGORIES OF COMPANIES	A	B	C	D	A	B	C	D	A	B	C	D		
Organizing safety trainings	2	1	1	2	8	5	3	2	11	6	5	1	47	16.67
Provision of first aid treatment	5	3	2	3	9	6	4	2	6	4	3	-	47	16.67
provision of protective wears (PPE)	6	3	3	4	6	4	2	1	9	5	4	-	47	16.67
On-site safety supervisor	3	2	1	1	9	4	4	2	9	6	4	2	47	16.67
On-site safety signs	1	0	2	3	8	5	3	2	11	6	5	1	47	16.67
Standby vehicle/ambulance	-	-	1	2	4	1	1	1	17	10	7	3	47	16.67
TOTAL	17	9	10	15	44	25	17	10	63	37	28	7	282	100

Table 11: Factors That Hinder The Implementation Of Health And Safety Risk Management Practice In Nigeria Construction Industry

FACTORS	CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY D	TOTAL	% OF DISTRIBUTION
Ignorance	5		2	2	9	10.59
Inadequate proper information on safety	5	2			7	8.23
Lack of trained and qualified safety officers	7	2		2	11	12.94
Poor top management commitment	7	2	2	2	13	15.29
Lack of government established safety regulatory institution	7	5	2	2	16	18.82
Lack of government established policies on safety	2	2	2	2	8	9.42
Lack of clients commitment	5		2	2	9	10.59
Funding	5	5		2	12	14.12
TOTAL	43	18	10	14	85	100

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