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ASSESSMENT OF SAFETY PRACTICES IN CONSTRUCTION INDUSTRY

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ABSTRACT

In both developed and developing countries, the construction industry is considered to be one of the most significant industries in terms of its impact on health and safety of the working population. Construction industry is both economically and socially important. However, the construction industry is also recognized to be the most hazardous. The objectives of this research is to investigate the safety performance in the construction sites. The data were collected from the contractors, consultant, and owners by using questionnaire to evaluate the safety performance in the construction sites. The results show that there was still a lack of commitment from the government, the insurance company, the labour ministry, the owners, consultants, and also the contractors to improving safety performance on the construction sites. The suggestion is to improve the safety performance on the construction sites. The government should follow up the safety performance by visiting the construction sites. The insurance company should be more active in visiting the construction sites. The owners should be more active towards the safety by controlling, visiting the process in the construction sites. The contractors have to train the workers and promote the safety culture and follow up the safety performance. The consultants should control all the tools in the construction sites to insure that those tools are safe.

KEYWORDS: *Safety, construction project, risk, accidents ,safety management, safety policy.*

1.INTRODUCTION

The safety performance of the construction industry has been improving. Health and safety has been recognized as an important business performance subject. The factors causing construction site accidents have been addressed by several researchers. These are lack of proper training, deficient enforcement of safety, lack of safety equipment, unsafe methods or sequencing, unsafe site conditions, not using provided safety equipment, poor attitude toward safety, and isolated, sudden deviation from prescribed behaviour. The state of the safety in the construction industry is poor. In the past five years, the numbers of people injured or even died in the construction projects has been increasing .The authority, however, has not been able to keep up with the huge increase in number of construction projects. Many safety issues in the construction projects were overlooked by the authority due to ignorance. This is because the main concern for the authority there has been how to finish as many projects possible to make up for the lost time the country suffered as results of the economic sanctions.

2.CONSTRUCTION ACCIDENTS

The importance of the use of plant and equipment in construction works seems to be increasing on daily basis. Manual methods are fast giving way to mechanical methods in the effort to increase productivity, meet increasing complex specifications, construct or actualize the growing complexity of modern designs, utilize the numerous new construction materials that are being introduced into the industry, meet the tight schedules and targets placed by clients' demands, implement control measures required to bring projects on track and ensure effective and efficient utilization of the numerous resources involved in the construction of projects. New plant and equipment are being developed and produced regularly in response to the needs of the industry. Asserts that increases mechanization of construction work can speed up construction and reduce the overall cost of construction. In appreciation of the important role that plant and equipment play in achieving project objectives, clients are placing greater emphasis on the use

plant and equipment even that before by identifying possession of plant and equipment of prospective contractors as a major criterion for the award of contracts. In response to this development, contractors often embark on efforts to own construction plant and equipment in order to be able to compete favourably with their counterparts during tendering. They do not stop there; hay also stipulate mechanized methods in their production methods statement during tendering. They are also competed to implement the methods stipulated in their tenders when eventually contracts are won and have to be executed. Mechanization goes with hazards as the use of plant and equipment is prone to accidents and injuries. Research studies have confirmed that the construction industry is one of the most hazardous industries all over the world . In most countries, the rates of accident and injury prevailing in the industry are higher that what prevail in other industries.

3.SAFETY MANAGEMENT AND SAFETY POLICY

Management and planning is one way to avoid unplanned events. Since accidents are unplanned events, an effective safety management can help avoid job injuries. Safety management must be through, and it must be applicable to all aspects of the job, from the estimating phase of the project until the last worker has left the premise at the completion of the project. All parties to a construction project must be included in some way in the safety program every party is responsible.

The following points should be included or considered when a health and safety policy statement is being drafted:

• The aims should cover health and safety, welfare and relevant environmental issues.
• The position of the senior person in the organization or company who is responsible for health and safety (normally the chief executive).
• The names of the health and safety adviser and any safety representatives.
• A commitment to the basic requirements of the health and safety at work Act (access
egress, risk assessments, safe plant and systems of work, use handing, transport and
handing of articles and substances, information, training and supervision).
• Using a safety committee or plant council.
• Specific policies of the organization (violence to staff).

4. ROLE OF THE GOVERNMENT TOWARDS SAFETY

Every contractor is required to contact the safety department of the concerned municipality when starting new projects and submit necessary documents such as building permit, area location. The safety department provides safety information regarding the proposed job or activity, and a safety representative conducts a site visit to ensure safe places for storage, temporary site offices, and services. Safety posters with major instructions are given to the contractor to be hung at the job site, in addition to safety interaction procedures and accident prevention methods for each activity related to the proposed job. The municipality charges a certain fee as insurance for safety and work completion. This amount is returned to the contractor at the completion date of the project along with a clearance .The practice of safety in construction in the USA is regulated by governmental agencies such as the occupational safety and health administration (OSHA), which provides strict rules and regulations to enforce safety and health standards on job sites.

5. INSURANCE COMPANIES TOWARDS SAFETY

Insurance companies play an important role in the improvement of health and safety standards. Since 1969, it has been a legal requirement for employers to insure against liability for injury or disease to their employees arising out of their employment. This is called employers' liability insurance. Certain public sector organizations are exempted from this requirement because any compensation is paid from public funds. Other forms of insurance include fire insurance and public liability insurance (to protect members of the public). Premiums for all these types of insurance are related to levels of risk which is related to standards of health and safety. In recent years, there has been a considerable increase in the number and size of compensation claims and this has placed further pressure on insurance companies. Insurance companies are becoming effective health and safety regulators by weighing the premium offered to an organization according to its safety and/or fire precaution record .

6. ADVANTAGES OF APPLYING SAFETY ON CONSTRUCTION SITES.

Applying safety on the construction projects has many advantages, as summarized below:

- Reduce the accidents on the construction sites.
- Help end projects in the early time.
- Increase employee morals
- Increased productivity.
- Decreased the number of compensation.

7. DATA COLLECTION

7.1 PRIMARY DATA

The source of the primary data is in the form of questionnaire and structured interviews, designed together. A large volume of data from Consultants, building contractors , site engineers as well as insurance companies were collected. The primary function of the survey is to collect information that can be analysed, and inference made to produce conclusion about major risk factors in construction, the importance of safety in the construction industry, the interactions between construction players and insurance companies with respect to risk management.

7.2 SECONDARY DATA

Secondary data which involves information from published text such as academics periodicals, research journals, government publications, dictionaries, past dissertations and Internet resources were used to compliment the primary data.

7.3 SAMPLING

The questionnaires were sent to randomly selected Contractors, site engineers ,Consultants and insurance companies in the Construction industry .The type and size of projects they have handled, which were normally involved with high risks as well as insurance covers.

8. TECHNIQUES USED FOR RANKING THE SELECTED FACTORS FROM THE SURVEY

Structured interviews were supplemented where necessary. Finally, the results of the questionnaire were analysed by sorting them using tables and the results were used to form basis for recommendations as well as areas for further research. The following methods of analysis were used in analysing the data:

a. Relative Importance Index (RII)

b. Weighted Average

8.1 RELATIVE IMPORTANCE INDEX TECHNIQUE:

Relative Importance Index method is used to determine the relative importance of the various causes and effects of the factors considered. The same method is adopted in this study within various groups (i.e. clients, consultants or contractors). The five-point scale ranged from 1 (not important) to 5 (extremely important) which will be adopted and will be transformed to relative importance indices (RII) for each factor as follows:

$$RII = (\Sigma W) / (S \times N)$$

; $0 \leq INDEX \leq 1$

Where ,

ΣW = the summation of the weighting given to each factor

S = maximum score = 5

N = total number of firms that responded in the sample

The RII value had a range from 0 to 5 (0 not inclusive), higher the value of RII, more important was the factor. The RII was used to rank (R) the different causes. These rankings made it possible to cross-compare the relative importance of the factors as perceived by the different groups of respondents (i.e. clients, consultants and contractors). Each individual cause's RII perceived by all respondents should be used to assess the general and overall rankings in order to

give an overall picture of the risk factors in the construction industry in India.

8.2 WEIGHTED AVERAGE –

An average in which each quantity to be averaged is assigned a weight. These weightings determine the relative importance of each quantity on the average. Weightings are the equivalent of having that many like items with the same value involved in the average.

For each factor the weighted average was achieved by adding the products of –

(a) The RII of each group and

(b) The proportion of the total respondents

Weighted average = n1 X RII (1) / N + n2 X RII (2)/ N + n3 X RII (3) / N + n4 X RII (3) / N +..

Where ;

n1 = No of respondents for contractors

n2 = No of respondents for consultants

n3 = No of respondents for owners

n4 = No of respondents for site engineers

RII = Relative importance index for contractors

RII = Relative importance index for consultants

RII = Relative importance index for owners

RII = Relative importance index for site engineers.

9. SURVEY RESULTS, ANALYSIS AND DISCUSSION

A total of 25 questionnaires were sent to a selected sample of respondents in the construction industry .A sample of the questionnaire can be seen in the . The questionnaires were sent to different organizations in the construction industry. These include Consultants, Insurance Companies, Site engineers and Contractors.

9.1 ANALYSIS OF RESPONSE

A total of 25 questionnaires were sent to the four groups of respondents in the construction industry of which 13 were collected. The 13 uestionnaires collected comprised of 5 from client / consultants, 4 from owners, 2 from site engineers and 2 from contractors. This gives a responds rate of 52%. Below is the breakdown of responses from the various sample groups.

9.1.1 The Contractors

A total of 6 questionnaires were sent out to the various contractors in the building construction industry of which 2 were returned. Three of these questionnaires were considered invalid and therefore rejected on grounds that they were not adequately completed. This puts the total number of valid questionnaires at 2, representing 33.33% of total number of questionnaires sent out.

9.1.2 The Consultants

Out of a total of 7 questionnaires sent out to the consultants , about 5 questionnaires were received and considered valid for analysis. Thus the total survey response comes to 71.42 %from consultants which served the highest contribution for the analysis.

9.1.3 The Owners

A total of 6 questionnaires were sent out to the various Owners in the building construction industry of which 4 were returned. This represents a total 66.66% of total number of questionnaires sent out. This served the second highest contribution for the analysis.

9.1.4 Site engineers

Out of a total of 6 questionnaires sent out to the consultants , only 2 questionnaires were received

and considered valid for analysis. Thus, the total survey response comes to 33.33% from site engineers.

9.1.5 Insurance firms

Few questionnaires were sent out to the Insurance fraternity. Out of which no firms responded . The reason was found to be genuine as they said they couldn't reveal the number or cause of the accident claims. But they contributed to this survey by giving data about important risk factors in the construction industry and the commonly used insurance policies in this sector.

Question was raised about the experience of the respondents in years . The response was as follows-

- 2 respondents each with experience of less than 1 year , 3 years and between 5 -10 years were there.
- 1 respondent had experience of 5 years.
- There were 6 respondents who had experience of more than 10 years .
- Contractors – 2 respondents had an experience of more than 10 years .
- Consultants – 2 respondents had experience of less than 1 year , 1 respondent with 3 years and between 5 to 10 years and 1 with more than 10 years of experience in the construction industry.
- Owners – 1 respondent with experience of 5 to 10 years and 3 respondents had experience of more than 10 years.

Site engineers – 1 respondents each with 3 and 5 years of experience.

The number of projects executed by the various groups in the construction industry in the last five years -

- 6 respondents executed less than 10 number of projects.
- 5 respondents handled 11- 20 projects .
- 1 each respondents handled 21 to 30 projects and more than 30 .
- Only 1 consultant had an experience of more than 30 years.
- 1 contractor, 3 consultants and 2 site engineers have an experience of less than 10 years.
- 1 contractor , 1 consultant and 3 owners had an experience of 11 to 20 years.
- Only owner had an experience of 21 to 30 years .

- This was an important question raised to the respondents and their responses were as follows –
- 9 out of 13 responded that lack of safety knowledge was an important factor for the accidents happening in the construction site .
- 8 respondents reported that careless workers attitude is the main reason .
- 4 of them found out the reason to be lack of legislation.

3 respondents each were of the opinion that management carelessness and carelessness of the consulting are the reasons for construction accidents.

- Certain factors or faults from the management part can lead to accidents on site , they are as follows-
- 7 respondents found that reason to be lack of employing a safety officer and lack of safety training.
- While 2 responded that the reason is due to lack of a safety policy.

Only 1 responded that the reason is due to lack of a safety motivation.

- Apart from the management reasons, certain faults from workers can also lead to accidents-
- 10 out of 13 respondents found the reason to be lack of training.
- 8 of them said that accidents occur due to lack of safety culture.
- While 4 of them said that it can happen due to lack of experience in using equipment.
- Only 2 among 13 said that the reason is found to be lack of safety motivation.
- 7 out of 13 said that the workers on site are responsible for industrial accidents.
- While 5 of them said that contractors are responsible for accidents during construction on site,

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- 1 each responded that government and owners are responsible for this act.
- Whereas, 3 out of 13 responded that all people mentioned above are responsible for this act and it does not belong to a single individual's fault.

- 4 responded that the cost for safety considerations can be 0.5 % - 1%.
- While 3 each responded it can be less than 0.5 % and between 1% - 2%.
- Only 1 responded telling that it can be between 2% to 3 %.
- 2 respondents were of the opinion From the above table it is clear that first aid bag and emergency telephone numbers are the only essentials found in a work site .
- Hard hats and safety footwear are used sometimes in the site depending on the work undertaken.
- Least importance is given to eye protection and fire protection that it can go beyond 3 %.
- Question was raised about the regularity of safety meetings during the execution of projects-
- Majority conducted safety meetings depending on the nature of accidents.ie; 5 respondents.
- 3 of them organised monthly meetings.
- 1 each of the respondents organised meetings weekly and only after an accident.

Below are the results of various questions that were included in the questionnaire. Here are the ranks allotted for various factors by majority of the construction players –

- **Degree of injury –**

  Rank 1 - light injury
  Rank 2 - partial injury

- **Reason for high accident rates –**

Rank 1 - Lack of safety
Rank 2 - Careless workers attitude
Rank 3 - Lack of legislation
Rank 4 - Management carelessness
Rank 5 - Carelessness of the consulting

- **Major reasons that the management is short of –**

Rank 1 - Lack of employing a safety officer
Rank 2 - Careless workers attitude
Rank 3 - Lack of safety motivation
Rank 4 - Lack of safety policy

- **Major reasons that the workers are short of -**

Rank 1 - Lack of training
Rank 2 - Lack of safety culture
Rank 3 – lack of experience in using equipment
Rank 4 - Lack of safety motivation

- **People responsible for industrial accidents-**

Rank 1 – Workers
Rank 2 – Contractors
Rank 3 – All
Rank 4 - Government
Rank 5 – Owners

- **Suggested expense in implementing safety expenses-**

Rank 1 – 0.5%-1%
Rank 2 – Less than 0.5%
Rank 3 – 1%-2%
Rank 4 – 2%-3%
Rank 5 - More than 3%

- **Regularity of safety meetings –**

Rank 1 – Depending on the nature of accident

Rank 2 – Monthly

Rank 3 – Other

Rank 4 - Weekly

Rank 5 – After an accident

10. FUTURE RESEARCH

Construction insurance plays an important role in transferring risks in the construction industry. Future research can focus on the issues of motives for construction insurance purchase, special risk

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considerations, changing environment, interaction to risk management, and alternative risk transfer solutions. They will contribute a better understanding for both industries, i.e. the insurance industry and especially the construction industry because the changing business environment needs the construction industry to improve its ability to manage construction risks.

Safety management in the construction industry is also an important factor to be considered . In this survey, details have been collected and analysed from various construction groups . This could help to provide an awareness to various groups regarding how much safety measures are being practised in the industry. This clearly shows that construction safety and construction insurance are interlinked which together can help in mitigating the risk involved in this sector

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