SAFETY IN CONSTRUCTION INDUSTRY - CHALLENGES AND SOLUTIONS

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ABSTRACT

Construction industry is the largest employing industry but the most dangerous one. Poor safety in construction results in financial as well as human losses. Thus the development of any construction industry relies on increasing the safety performance. It mainly aims on the implementation of safety management in construction projects. The study was carried out by conducting questionnaire survey for predicting the level of safety in their projects. The survey will include information on safety such as materials, procedures and training for safety practices, management reviews on applying safety practices, safety incentives and penalties, safety approaches. The survey includes designed questionnaire. The purpose of this survey is to examine safety management in construction industry. The result of the study revealed that there are many safety problems in the construction industry such as lack of safety training improper safety regulations and standards, lack of PPE (Personal Protective Equipment) etc. which results in hazards or damages. Higher priority is given to completion of work compromising the quality of work and keeping the safety as the least priority.

KEYWORDS: Safety, Management, Analysis, Construction, Industry.

INTRODUCTION

Safety is very important to all the areas in the building and construction industry. It has been considered as very important as it is the greatly exposed sector when it comes to occupational accidents. Although tremendous improvements have been made in safety performance in many countries, the construction industry still continues to lag behind when compared to other industries. This has been experienced within most of the developed countries. The reality is that construction industry continually has injury and fatalities that make it one of the most dangerous industries to work in, predominantly in developing countries (India). As a result of increasing accidents, the development and publication of Standards and good engineering practices based on experiences and codes started.

LITERATURE REVIEW

Various literatures were studied in order to gain a clear view on safety management and safety practices in construction industry.

S. Santhiya and D. Muthu (2017) conducted questionnaire survey on "Safety management and its application with case study. The survey include information on safety such as procedures training and materials for safety practices, management reviews on applying safety practices, safety incentives and penalties, safety approaches. The study revealed that there are many safety problems in construction industry

such as lack of knowledge about safety measures materials which protect them from safety hazards or damages.[1]

Dishant Shah et al., (2017) carried out research on "Construction safety in Indian scenario and technological advancements in safety tracking" and found that occupational safety in developing countries is lagging behind developed countries due to various aspects such as improper safety regulations and standards lack of safety training and safety is considered as least priority. The study was done after several site visits at construction sites and interviewing the site engineers regarding the safety rules adopted at the site to minimize or eliminate accidents.[3]

K. Mohammad Imthathullah Khan et al, (2015) carried out on "A study on Safety management in construction project". The main objective of this study was to identify critical success factors that are responsible for implementation of safety management in construction projects. The study revealed that there are many problems in the construction industry such as lack of knowledge about the necessity of earth connections for power tools, cables protected from mechanical damages. The study also proposed some recommendations for safety in construction industry.[4]

Karan Singh (2014) carried out research on "Safety in Indian Construction". The study revealed current scenario of Indian labours working in construction industry, in terms of health and safety issues. The study gives comparison on the safety principles versus the ground realities happening daily at site, thereby indicating need of professional to take the responsibilities in getting acknowledged about safety and health rules and regulations, acts and principle at the same time creating the awareness among the each other and the train the train the industry for the betterment of the projects and humanity.[6]

METHODOLOGY

Questionnaire survey was conducted at four different sites to identify opinion regarding safety management in construction industry. The questionnaire was prepared and sent to four zones. The effect of these has been evaluated by adopting a five-point Likert scale with

1= Strongly agree

2= Agree

3= Neutral

4= Disagree

5= Strongly Disagree

The survey was conducted to determine significant factors for safety management within construction industry. Relative importance index and Mean percentage methods are used to evaluate significant factors.

Relative Importance Index= $\frac{5n_5+4n_4+3n_3+2n_2+1n_1}{5\times N}$

RESULTS AND DISCUSSION

In order to reach the objectives of the study, a simple graphical representation was made from questionnaire and responses were collected from employees of four sites

Table 1: Interview details:

Position of person	Number of persons
Site Manager	4
Site Engineer	8
Safety Officer	2
Contractor	2
Labours	100

Table 2: Top Critical success factors

Factors	Percentage	Rank
Workmen trained in material handling	86%	4
Safety plans and procedures executed	92%	1
Employees given safety training where needed	84%	5
Arrangement with hospital for emergency treatment	76%	10
Workers wearing full body safety harness while working at height	81%	7
Workers having suitable PPE as per hazards	88%	2
Proper flooring done with adequate bearing capacity	82%	6
Excavation sloped/ shored properly	78%	8
Cables protected from mechanical damages	87%	3
Scaffolds designed as per load requirements	80%	9
False-work designed by competent person and checked by concerned engineer	86%	4
Fall arresters provided while climbing rope ladders	76%	10

Average mean of four zones

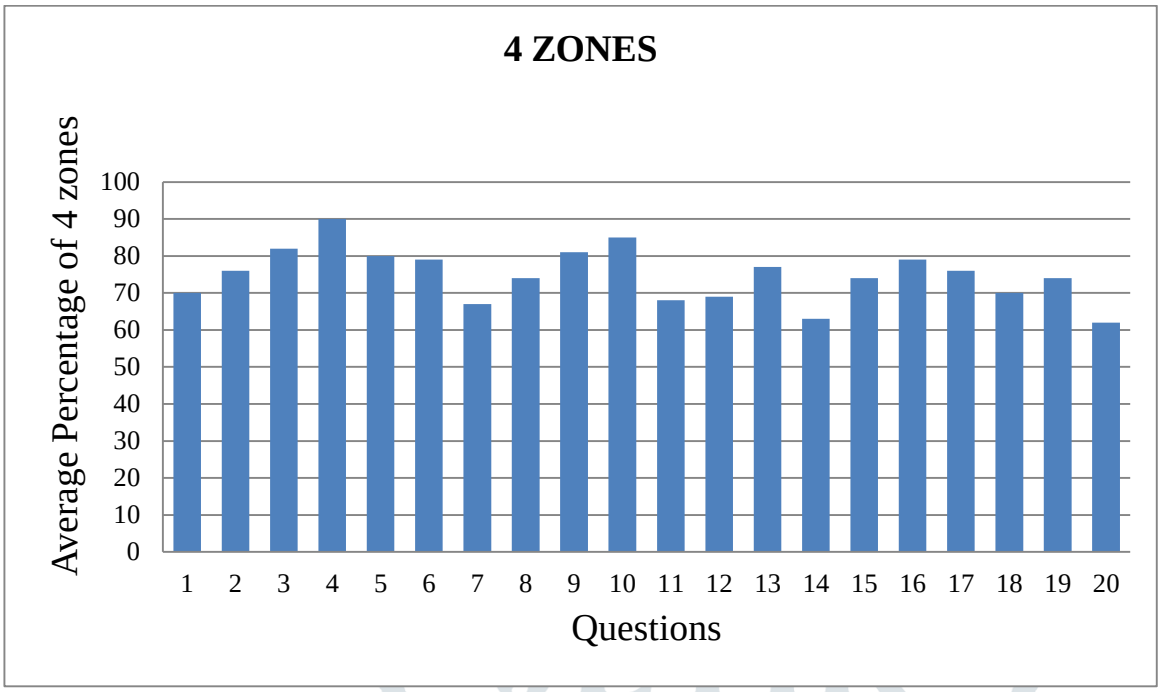

Fig. 1: Bar Chart representing the average percentage of 4 Zones.

Mean Percentage of all Zones

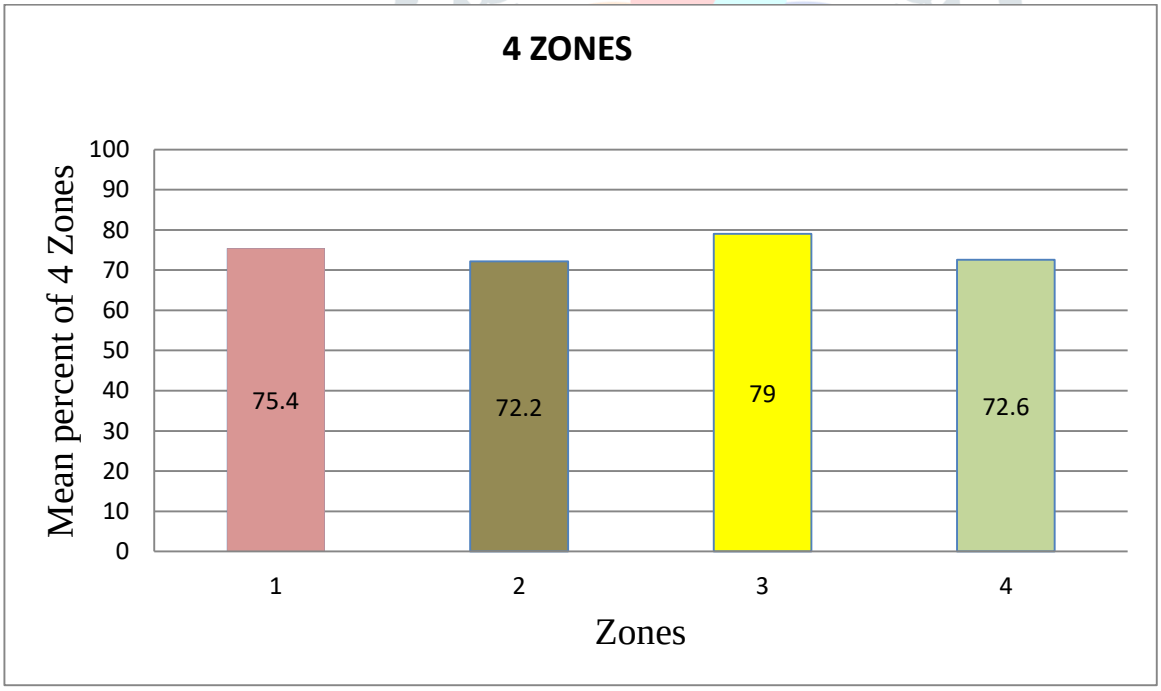

Fig. 2: Bar chart representing the mean percentage of 4 Zones.

Cumulative Percentage of workers knowing about the facilities

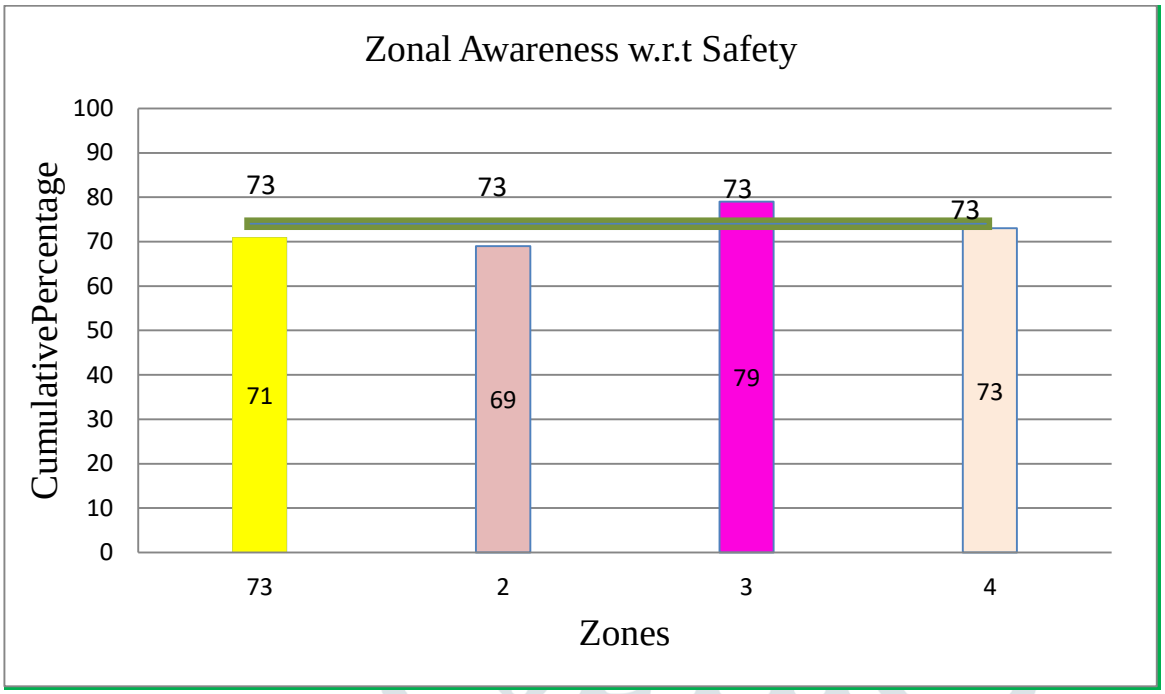

Fig. 3: Bar Chart representing the cumulative percentage awareness with respect to safety facilities at the zone 1-4.

Cumulative percentage of workers knowing about safety benefits

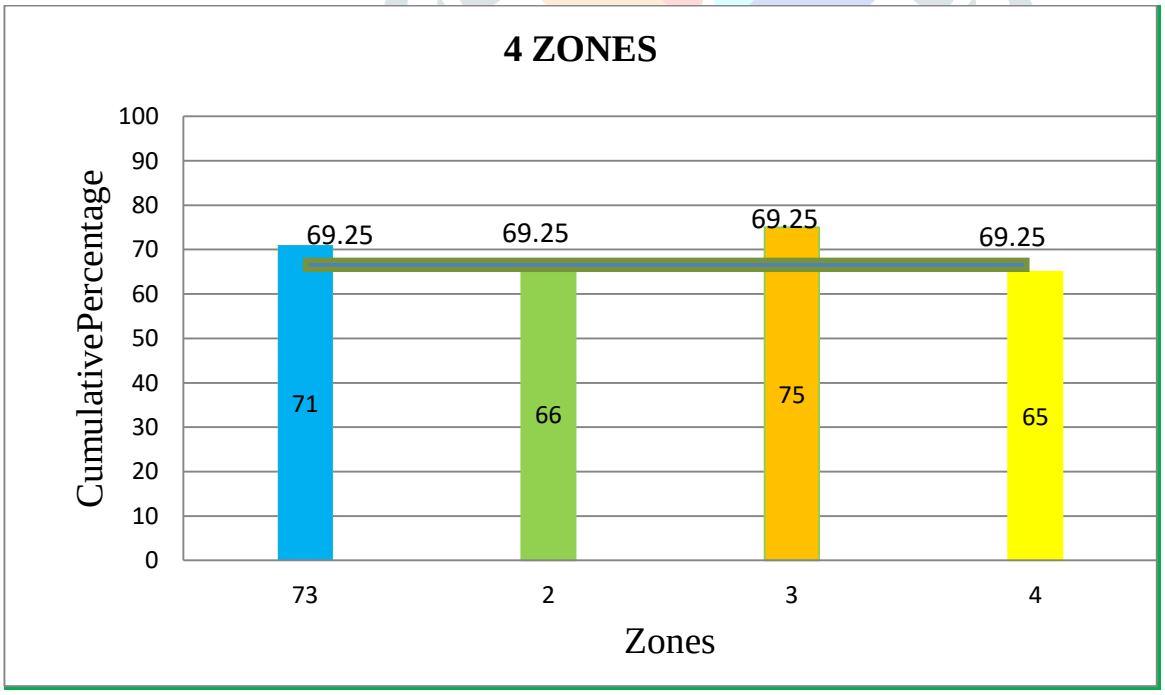

Fig. 4: Bar Chart representing the cumulative percentage knowing the safety benefits.

DISCUSSION ON RESULTS

Table 2: reveals the following eleven factors as critical success factors: workmen trained in material handling, safety plans and procedures executed, employees providing specialized training as needed, arrangement with the hospital for emergency treatment, workers wearing full body safety harness while working at heights, proper flooring done with adequate bearing capacity, excavation sloped/shored properly, cables protected from mechanical damages, scaffolds designed as per load requirements, false work designed by competent person and rechecked by concerned engineer and fall arresters provided while climbing rope ladders, indicate the most significant areas where respondents need to take into account when implementing safety management in their construction industry.

Fig. 1 display average of four Zones and it clearly shows that more number of labourers/ workers are aware about Q4 as compared to other questions i.e. 90%. Similarly less number of workers are aware about Q20 i.e. 62% as compared to other questions.

Fig. 2 display Mean Percentage of all the Zones and it is clearly evident from the graph that 74.8% labourers/ workers are aware about safety at construction sites.

Fig. 3 displays labourers/ workers at Zone 1, Zone 2 & Zone 3, Zone 4 of Site A & B are aware about 71%, 69% & 79%, 73% respectively of the facilities provided at construction sites. Therefore, the average percentage of labourers/ workers at all zones knowing about the facilities provided at the construction site A & B is 73% collectively.

Fig.4 displays labourers/ workers at Zone 1, Zone 2 & Zone 3, Zone 4 of Site A & B are aware about 71%, 65% & 76%, 65% respectively of the accident benefits provided to them in construction industry. Therefore, the average percentage of labourers/ workers in all four zones knowing about the safety benefits provided to them in construction industry is 69.25% collectively.

CONCLUSION

The main objective of the study is to understand the safety management within the construction industries and to develop a framework of recommendations for improving safety performance at the construction site. In pursuing, a multi- strategy was adopted, within which safety management take place, is considered. The role of safety officer is to identify the hazards that results in loss of production, compile risk assessments, advise upper management with regard to legal requirements related to safety plans and to execute accident investigation as well as safety training programmes. With regard to proposed changes to safety plans of sites to make them more effective. It was found that there was a need to develop a protocol for testing competency, education, experience and skills. The implementation of a successful safety plan will be essentially up to the management of the construction industry. If top management lead by example and reveal their employees that they are serious about achieving high standards with regards to safety, then this attitude will filter the entire industry and will ultimately bring the desired consequences changing he attitudes of employers and employees of any industry must not be underestimated as it would represent the first level of change in the attempt to achieve a zero accident rating.

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