

ANALYSIS OF SAFETY MANAGEMENT IN COMMERCIAL BUILDING CONSTRUCTION

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Abstract: *The construction industry is the second largest industry in India. Construction of any structure includes various danger and critical situations. For implementation of successful construction project an effective safety management system is required. The object of the study is to cover existing safety issues in commercial projects. The study also focused on the factors effecting safety management during construction at site work. To achieve the goal of this study quantitative research approach will be conducted, in which the questionnaire survey can be used. The questionnaire include the mostly questions about safety issues during construction at site. The questionnaires will distribute to the construction workers. The interview method also applied to those workers who unable to understand and read the questions. In questionnaire Likert scale 1 to 5 will be used. Result of this study will be determined through relative importance index method and the rank will be determined. In this study the researcher trying to know about the most affecting factors of safety management. This study will be helpful to know about drawbacks in safety management and to improve the safety issues.*

Keywords: *Safety Management, commercial building, construction*

Introduction

The universal intention of Safety Management Systems (SMS) giving sure protected via advantageous administration of protection risk. The system has to always enhance protection by using figuring out hazards, amassing and examining data, and continually assessing risks. It has been suggested that there ought to first be a detailed grasp of the structure its constituents and the working

environment. This indicates the institution of overall performance prospects putting desires associated to the presentation, figuring out things to do to attain these aims and consistently quantifying and enhancing overall concert to make certain that desires are infant being met. Here are 4 factors of SMS: security analysis and purposes, hazard management, protection assertion and protection upgrade. The other element of SMS—safety assurance (SA) — security overall act in contrast to fabulous goals. An obligatory happening information machine has region alongside by different controls like security lessons, evaluations, checks, and inquiries. Groups need to be capable to decide whether or not the SMS they require in location is fantastic and functioning correctly.

In some situations corporations do not have any formal technique of valuation. Some groups consider the efficiency of the SMS through studying facts and thinking about movements. In maximum cases, traits and records are revised at everyday intervals by using protection divisions and management. In some cases, companies set up suited ranges of misfortunes and occurrences and solely when troubles in a given location exceed these ranges do they mediate. As lengthy as they are now not looking at immoderate numbers, they function below the statement that the SMS

is execution excellently.

Albeit the definite apparatuses of SMS are truly depicted and the stages illustrated, with no unmistakable bearing towards assessing its viability. A few endeavors have been made towards developing evaluation instruments, but shut assessment of this hardware continually uncovers inadequacies. Clear side effects of achievement also appear at be deficient. There are not many generally speaking execution guidelines in any appraisal apparatuses; in this manner, a decent arrangement is passed on to the judgment of the person playing out the evaluation. By coordinating realities saw in the writing with records outfitted through aeronautics bunches through meetings and studies, a powerful differentiation gadget has now been created. The gadget is each real and solid.

Commercial building expected a long-lasting, encased building that is on a never-ending premise and connected with neighborhood sewer and water conveniences or in some other case following area sterile codes, is custom fitted to modern use, and adjusts to local specialists drafting prerequisites. "Commercial building" may furthermore comprise of strip working environment retail chains or carports assuming that a different entry and a different tackle are kept up with and the showroom is practically perceived as a different business.

Research Objectives

1. To study the safety measures adopted by construction site.
2. To study the causes influencing

implementation of safety management in commercial buildings structure.

Review of Literature

Mohd. Aqleem Mir and Bibha Mahto (2015)

The construction business is measured as quite possibly the maximum unsafe modern area where in the advance workers are additional tending to calamities. Regardless of delay events to further develop location safety, expansion actually represents an unequal quantity of term linked sufferers. In made populations there is severe legal need of safety in the progress corporate and moreover in the completing of wellbeing the board backgrounds which are planned to limit or take out mishaps at work places.

P. R. Gajbhiye et.al (2014)

The lean assembling organization viable noted the great mishap amounts for most recent time. These accidents reason the association the weighty gentleman-day calamity, the design trouble and weighty expenses of protection. The target of health and safety workplace at the gathering organization was to fixed and further develop misfortunes avoidance frame. This presents in what way the six-sigma method will assists with assessing the safety and ecological risks in completing of associations.

Okae Adow et.al (2013)

The review into the Management Health and Safety compelling execution on locales stems out of the way that mishaps and passing are turning out to be exceptionally endemic and this makes the development interaction costly to the weakness of both the clients and workers for hire. The point is to research into the

administration of Health and security on the building locales. The targets are to recognize the significant sorts of injury on building site; to distinguish a portion of the administration wellbeing and security standards utilized by workers for hire and to decide the relationship of the board of wellbeing and wellbeing standards further develops project time conveyance.

Mohamad Ridzuan Yahya and Md Najib Ibrahim (2012)

In Malaysia situation, different impediments must be looked by the structure upkeep groups controlling movements of every kind connected with the skyscraper place of business and its framework. The critical issue is to deal with significant issues with wellbeing and security part of the structure. This study plans to assess the wellbeing and security execution of skyscraper places of business, utilizing a fundamental appraisal strategy.

Wameedh A. Khair et.al (2011)

As the world proceeds with its journey to upgrading it looks vast difficulties of the 21st era. The fast development in the business universally has raised worry on security and medical problems at the work environment. Accordingly more word related mishaps and wounds at work environment make feature news all around the universe. The point of this paper is to survey related exact written works and feature the need to research security execution as for the oil and gas industry in Iraq. This paper talks about the job of two principle hierarchical elements that might affect wellbeing execution in the oil and gas industry. They are the executive's practices and administration style. At the finish of the paper, a calculated model portraying the connections among the

boards performs and administration conduct and wellbeing execution will be advertised.

Mohammad S. El-Mashaleh et.al (2010)

The Jordanian culture and economy have encountered human and money related setbacks as a result of the sad prosperity record in the improvement business. The paper closes by giving a lot of proposition to project labourers and regulative bodies to additionally foster prosperity execution. Accumulated data consolidate information concerning definitive security methodology, prosperity planning, prosperity social events, security equipment, security evaluations, prosperity inspirations and disciplines, worker's attitude towards security, work turnover rates and consistence with security guideline. The survey reveals a couple of components of appalling security the board.

Methodology

This defines the lookup procedure agreed for the exceptional parts of the query assignment. The query approach utilized for each part of the query is referenced and characterized with appropriate legitimizations. To propel a hypothetical connection between the query techniques and query philosophy took on in this query project, the resulting region clarifies successive query systems utilized being developed went with through the query procedure embraced to procure the query focuses of this exploration. Considering the objective and reason for the review, each the subjective and quantitative query techniques had been utilized. The two procedures of query according to the query objects are concisely characterized in the main region saw with the guide of an exact

portrayal of the procedures and hardware utilized in the review. This section moreover sheds gentle on the testing system, data assortments and insights investigation.

The policy agreed in work is the series of information in specific approaches as questionnaire survey will be used for amassing principal data. The interviews will be held at construction site with managers, engineers, supervisors and each knowledgeable and unskilled worker.

Quantitative exploration stresses measurement in realities series and assessment. It proceeds a deduct mode to the association between guideline and query and pressure is put away on the certification of speculations. The quantitative query procedure incorporates the standards and performs of the home grown logical life sized prototypical. It sees the common peculiarity as an external object reality (Cooper et al., 2006).

Umar and Egbu (2018), while talking about each the query techniques, expressed that most of the scientists pick to include each subjective and subjective strategies, alluded to as a blended query strategy. This was once of course presently not the exclusively thought process that every technique had been embraced in completing this examination. The key reason for the utilization of each the query strategies in this mission were once the idea of the endeavour and its objectives as alluded to in area.

Data Collection

Data can be collected for the research work is mostly two types of data. The initially data can be combined by the

literature of review, articles, case studies, project work, newspapers, experts review etc. The secondary data can be collected by doing research work on it through questionnaire survey method. The secondary data is the most important and the object of the study. During the collection of secondary data there will be many problems faced by the researcher such as mostly workers are illiterate in construction industry. So questionnaire were distributed among the all employees included contractors, managers, supervisor's skilled and unskilled workers. Most of workers are not comfortable with the questionnaire because they do not know about the language used in questionnaire. So that for that reason researcher also explains the questionnaire to workers in local languages. Some workers were illiterate so researcher helps to fill up their questionnaire by asking the questions to these workers.

Sample

Cochran and William (1997) referred to that general person is the finished series of essentials regarding which we want to make a few deductions. The series of all suitable perceptions of one of a kind attributes of leisure activity is alluded to as a populace, while an assortment of perceptions addressing exclusively a component of the general population is known as test.

The outcome was once done on individuals and site supervisors on building locales. In this review, the defendants comprised of representatives on building destinations. These counted in location administrators, workers for hire, foremen, master and incompetent specialists. There are 570 polls dispensed among the respondents,

out of which 426 reactions got. After the concluding and left out the inadequate poll, 380 reactions are picked for last query examination.

Data Analysis

The researcher collects the study data through different questionnaire survey. These collected data were analysed for getting result. The result should be fulfilling the objectives of research topic. To analysis of research data, following methods were used.

Relative Importance Index (RII)

Method

It is decide the relation significance of the number of motives and outcomes of delays. The equal approach is going too adopted in this learn about inside a number of organizations. It is received and also converted to relative importance index (RII) for every issue as follows.

The record accumulated by data collection through questionnaire could be further preceded for generating result. To accumulate received information of the questionnaire filled into an Excel sheet to analysis the filtered data. The relative Importance Index (RII) is obtained to

Result Analysis

Result of the Questionnaire by Responses

The questionnaire for workers explained through rating scale 1 to 5 with disagrees or agrees choices.

Rating Scale

	Strongly Agree	Agree	Moderately	Disagree	Strongly disagree				
	5	4	3	2	1				
S.N.	Questions				5	4	3	2	1
1	How would you rate the Safety Management				76	116	128	38	22

know about the position or rank of the elements and significance of protection in building project.

$$\text{Relative Importance Index} = \frac{\sum W}{AN}$$

Where w is the weightage according to each and every question which are answered by the respondents, varying from 1 to 5, here A show the very fine weight (here A is 5) and N show total varies of respondents.

The Questionnaire

The questionnaire for workers having the general information about the health and safety regards. This questionnaire include the questions about the health and safety such as workers satisfaction with SMS established by the company, safety awareness campaign, form work checking by the safety personal, safety during work as scaffolding, safety tool and equipment provided, safety tool box, circulation of safety regulations, accident analysis, workers agreement, safety procedure adopted, reform after visit of safety officer, safety assessment and workers safety responsibility. Total 380 respondents selected for final result analysis.

	System adopted by the firm?					
2	Has safety alertness drive directed through the company time to time?	84	147	87	33	29
3	Do you think that the formwork and other supports are checked by the safety personal?	88	139	94	36	23
4	Do you think that scaffold is dismantled under supervision of safety personal?	91	144	83	29	33
5	How would you rate the proper safety equipment provided by the company? (Such as protection helmet, goggles face mask, safeguard belt, safety apron, hand gloves, strong shoes etc.)	76	116	95	52	41
6	Have the health and protection guidelines circulated to all employees?	83	99	134	43	21
7	Are safety toolbox talks happened on daily basis?	68	149	72	67	24
8	What do you think about accident analysis adept at construction site?	56	96	135	62	31
9	Does the company establish strong communication between management and worker about safety concern?	102	129	71	52	26
10	Has the company established agreement in hazard control conditions?	54	75	127	76	48

Table: Result of the questionnaire by responses

Analysis: The above questionnaire was considered to learning almost the safety management analysis at commercial construction site for workers. This table represent the result of questionnaire for workers. The table describe the responses of 380 respondents through rating scale 1 to 5. There are total 10 questions designed for workers and their responses given in the table format. The questionnaire includes the questions about safety management, safety practices, training and its implementation, tools and equipment, working environment and responsibility of work etc.

Result of the Questionnaire through Relative Importance Index Method

The result by the Relative Importance Index method is given here

S.N.	Questions	RII	Rank
1	How would you rate the Safety Management System adopted by the firm?	0.698	5

2	Has safety alertness drive directed through the company time to time?	0.718	4
3	Do you think that the formwork and other supports are checked by the safety personal?	0.723	1
4	Do you think that scaffold is dismantled under supervision of safety personal?	0.722	2
5	How would you rate the proper safety equipment provided by the company? (Such as protection helmet, goggles face mask, safeguard belt, safety apron, hand gloves, strong shoes etc.)	0.671	8
6	Have the health and protection guidelines circulated to all employees?	0.695	6
7	Are safety toolbox talks happened on daily basis?	0.689	7
8	What do you think about accident analysis adept at construction site?	0.644	9
9	Does the company establish strong communication between management and worker about safety concern?	0.721	3
10	Has the company established agreement in hazard control conditions?	0.606	10

Table: Result of the questionnaire through Relative Importance Index method

Analysis

The questionnaire contains the questions about construction worker. The above table shows the result of second questionnaire through the Relative Important Index (RII) method. The table shows the RII value and rank wise result of questions. The RII value lies between 0.606 and 0.723. The table shows that the question about training related to health and protection at building sites secure the highest rank and the question about the improvements occur after the visit of safety authorities secure the lowest rank.

Conclusion

Construction places are quite possibly the most extreme danger area because of the reality of the unreasonable assurance examples articulated at advancement

locales. Assuming that these components are tended to and checked intently, security examples at improvement sites can be limited. The ramifications of the discoveries are that the mission team can utilize the system which will be inspected in this review, to control improvement assurance with the perspective on bringing down mishaps and security cases. This system manages the cost of the stray pieces which organization can rely on to control security on their structure locales. This give result about explores a lot moves toward that organization may likewise take in line to make their sites more secure. These find out with regards to dissected every one of the factors that outstandingly gave effect on hand security. The results of this learn about are exceptionally essential because of the reality the components that

influencing security have been distinguished.

The result analysis consists of the questionnaire end result from specific respondents. The end result of this thesis is represented in excel table and graph format. The questionnaire for workers was generated with 10 questions and selects 380 workers for result discussion. The responses of these 380 respondents are described in excel sheet and graph format. The result of this questionnaire was generated through RII method and rank wise explained with each question. Out of 380 responses and 10 questions the highest RII rank secure question was about training correlated to health and safety. This question has the 25.3 % respondents strongly agree with the statement that safety training is provided at site while only 7.4 % respondents strongly disagree about safety training. The question which secure the lowest RII rank was about improvements happened after visit of safety authority, in which only 8.7 % respondents strongly agree that safety has improved after the official visit of safety concern and 13.7 % respondents strongly disagree that no improvement made after safety visit.

References

- *Mohd. Aqleem Mir and Bibha Mahto (2015) "Site Safety and Planning for Building Construction", International Research Journal of Engineering and Technology, ISSN: 2395-0072, Vol. 2, 2015, pp. 650-656*
- *P. R. Gajbhiye et.al (2014) "Safety Management in Manufacturing Industry: A Lean Six Sigma Approach", All India Manufacturing Technology, Design and Research Conference, 2014, pp. 646-1 to 646-6*
- *Okae Adow et.al (2013) "The Management of Health and Safety of Construction Sites in Accra", Civil and Environmental Research, ISSN: 2224-5790, Vol. 3, 2013, pp. 127 – 131*
- *Mohamad Ridzuan Yahya and Md Najib Ibrahim (2012) "Sustainable Strategy of Health and Safety Assessment in High Rise Commercial Buildings", OIDA International Journal of Sustainable Development, ISSN: 2278-0181, Vol. 6, 2012, pp. 71-76*
- *Wameedh A. Khdair et.al (2011) "Improving Safety Performance by Understanding Relationship between Management Practices and Leadership Behavior in The Oil and Gas Industry in Iraq: A Proposed Model", International Conference on Management and Artificial Intelligence, Vol. 6, 2011, pp. 85-93*
- *Mohammad S. El-Mashaleh et.al (2010) "Safety Management in the Jordanian Construction Industry", Jordan Journal of Civil Engineering, Vol. 4, 2010, pp. 47-54*