

A Review on –A Case Study of Safety Management In Industrial Construction Project

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Abstract- Cases of accidents at construction projects are more likely to be occurred. In accordance to reduce accidents at construction sites with great efforts, the objectives of this research are filed. First objective of the research covers the detail study of concept of Safety Management for construction projects and current safety practices, which includes the study of basic concepts along with the safety rules and regulation. The safety principles are compared with the realities to know the hazards, risks occurring at construction projects. Also the measures for preventing injuries, accidents and improving safety are discussed. Work is then followed by the case studies i.e. site visits are conducted at which data is collected by site surveys and personnel interviews. General informational data is collected with the project management details. The discussion is done over the management and performance of safety at construction projects. This paper is about review of the findings of this research will minimize the gap of literature and understanding on the aspect of safety practices at construction project sites and can be used as a source of reference in the site safety management. And the conclusion is drawn from the analysis and discussion at the last of the research work. Recommendations are provided as a part of prevention, which will help in maintaining the safe environment at industrial Construction Projects.

I. INTRODUCTION

Construction sites are thus dangerous places wherever injury, death or sickness will cause to labors, engineers and guests. These will happen because of electrocution, injuries from tools, falling from height, machines and equipment's; being hit by moving construction vehicles, injuries by manual handling operations, sickness just because of unsafe substance like chemicals, dust, etc. Even a nail standing up from a discarded piece of wood can cause serious injury if not removed or unheeded. Statistics of accidents within the construction sector in India are scarce. The speed of accidents in construction sector is incredibly high in several countries together with the developed and developing countries additionally. Construction industry has accomplished in depth growth everywhere the globe in past few years. For a construction project to achieve success, safety of the structures together with the personnel is of a lot of

importance. The security problems are to be thought of right from the beginning of design stage till the completion and delivering of the whole structure. Construction industry employs competent and unskilled labours are subjected to construction project site accidents and health risks problems. For safe work conditions that are a great deal of lacking in Indian construction firms, correct coordination between contractors, clients, and men is required. The various accidents happening at construction sites are continued, even when labour safety laws are out there. Management commitment towards health and safety of the staff at construction sites is additionally lagging. A close literature study was applied to know the causes of accidents and their preventive measures, together with development of safe work surrounding.

1.2 Need of Project

1. To find proper upgrading of safety programs and its revision.
2. To identify and deal with potentially hazardous incidents during construction work.
3. To make the accident free and well growing sector.
4. To be sure that all preventive measures are in place, so that the company can complete the work on time and do not face the economic loss.

1.3 Scope of Project

1. Scope of the project is that by adopting the universally discussed safety practices one may achieve its goal.
2. As construction sector is thought to be the most dangerous and accidental sector all among the trade, similarly this only profession which leads to the huge growth of the nation.
3. Application of Safety Management Process at construction project may affect the economic development of the company.

1.4 Objectives of Project

1. To review the thought of safety management for construction project and current safety practices.

2. Collection of data at on-going construction projects.
3. To examine the problems and strategies related to safety on industrial construction project and the above data collected which on the safety practices and provision adopted by the individuals.
4. To give recommendation for better management of safety at construction projects.

1.5 Limitations of Project

1. It is difficult to provide 100% safety at major construction projects.
2. Sometimes unavailability of safety equipment's may cause delay in commencement completion of project.
3. For avoiding repetitive training of safety culture one may appoint the untrained or unskilled labours which will affect the safety management of the company.
4. Skilled supervision regarding safety may not be established at small scale projects or in low developed areas.

II. LITERATURE REVIEW

2.1 General Investigation in 'Safety Management' is a vast topic having a huge research going on several aspects of this topic. Different authors have different contribution in their own respective method or technique. It becomes intense need to learn and understand the opinions of various authors from various parts to give our own contribution on this topic. Purpose of literature review in this report is to highlight the work done on study of Safety Management in construction and give some terms which will be useful further in this report.

2.1.1 S. A. Usmani (1999): This paper deals with activities and different stages involved during construction project. This paper also deals with safety standards and IS codes essential for the execution of design, construction work, etc. also it have a brief idea about safety as conceptual term to engineering definition. And this paper also include some noticed incidents occurred at construction project during execution. [1]

2.1.2 Robin Turney, et. al. (2004):

This paper provides an overview of PRISM in order to highlight those areas where human factors techniques are being applied in the process industries and the safety benefits which they provide. It includes study about improving human factors & safety in the process industries. The paper also includes an assessment of those areas where further research or development work is necessary. It deals with the improvement of safety in the European process industries

through raising awareness of, and sharing experience in, the application of human factors approaches. [2]

2.1.3 Dr. S. K. Jain (2007):

This research is worked to meet the challenges of safety management in construction industries. Authors focused on increasing the innovative trainings for better safety management of labours. He also developed and implemented Behaviour Based Safety Program to improve orientation of worker towards workforce safety. To achieve safe working environment he implemented engineering measures regards safety management in construction which affected the economic development of organizations. [3]

2.1.4 Amr A. G. Hassanein, et. al. (2008): They studied Safety Performance in the Egyptian Construction Industry. This study presents the results of a questionnaire survey that was conducted among a selected sample of large-size contractors operating in Egypt, as well as a comparison of the safety approaches in both the United States and Egypt. The results revealed that safety programs applied by large-size contractors in Egypt were less formal than those applied by their American counterparts. Only a few companies out of the surveyed sample had accident records broken down by projects and provided workers with formal safety orientation. The author recommended that reforms in the way of the employer's contribution to social insurance were necessary; thereby linking accident insurance costs to the contractor's safety performance. This is meant to serve as a strong incentive for safety management. [4]

2.1.5 Miguel A. Camino Lopez, et. al. (2008):

They conducted a study on construction industry accidents in Spain. They analyzed industrial accidents that take place on construction sites and their severity. Eighteen variables were studied. They analyzed the influence of each of these with respect to severity and fatality of the accident. The descriptive analysis was grounded in 1,630,452 accidents, representing the total number of accidents suffered by workers in the construction sector in Spain over the period 1990-2000. The authors concluded that age, type of contract, time of accident, length of service in the company, company size, day of the week, and influenced the seriousness of the accident. The research provided an insight into the likely causes of construction injuries in Spain. As a result of the analysis, industries and governmental agencies in Spain started to provide appropriate strategies and training to the construction workers. [5]

2.1.6 Husrul Nizam Husin, et. al. (2009):

This research deals with management of safety in quality construction. A close relationship between quality and safety is worked out. It provides information which indicates unsatisfactory safety culture and lack of responsibility toward safety. It is also observed that lowering of management control may results in inadequate performance standards, which may affect the rising growth of company. [6]

2.1.7 John P. Spillane, et. al. (2011):

A qualitative investigation is carried to know the management of health and safety in this literature. The methodology of this research is based on case studies by carrying data collection of projects. In the section of data collection group discussion along with personal interview of participants. The findings involve the three major point for lagging in safety and health management practices and the points are lack of space, improper c-ordination between site personal and overcrowding at sites. [7]

2.1.8 Hao-Sen Sun, et. al. (2014):

This paper describes the status and analyzes the characteristics and the difficulties of safety management of construction projects and use the experience of the safety management in developed countries for reference. Using qualitative analysis method discourse the necessity and urgency of the construction safety production management. In order to analyze and study how to raise the level in construction safety management and guarantee the goal of construction safety. [8]

2.1.9 Samuel Oladipo Olutuase (2014):

In this paper given the hazardous nature of the construction industry world over, the need for an effective safety management system which aims at forestalling the risks and hazards inherent on site has been reiterated by recent studies and applicable laws. Studies however show that level of effectiveness differs from country to country; industry to industry and from company to company. This study therefore undertakes both qualitative and quantitative investigation into the safety management system of a Nigeriabased construction company with a view of determining how compliant the system is to international standards. [9]

2.1.10 T. Subramani, et. al. (2014):

In this paper author discussed about the safety analysis at Construction industry. The Indian society and economy have suffered human and financial losses as a result of the poor safety record in the construction industry. The

purpose of this study is to examine safety management in the construction industry. The study will collect data from general contractors, who are involved in major types of construction. Collected data include information regarding organizational safety policy, safety training, safety meetings, safety equipment, safety inspections, safety incentives and penalties, workers' attitude towards safety, labor turnover rates and compliance with safety legislation. The study will also reveal several factors of poor safety management. Thus the paper will conclude by providing a set of recommendations and strategies to contractors for improving their safety performance. [10]

2.1.11 K. Mohammed Imthathullah Khan, et. al. (2015):

This paper presents a study in construction industry to improve the safety performance. The main objective of this study is to identify the critical success factors which are responsible for the implementation of safety management in construction projects. This study was carried out by conducting questionnaire survey among the contractors and clients of various construction projects, for testing their experience in safety management system. Questionnaire survey was analyzed by using SPSS software. The results of the study revealed that there are many safety problems in the construction industry, such as lack of knowledge about the necessity of earth connection for power tools and lack of knowledge about cables protect from mechanical damages. Furthermore, the study also proposes some recommendations for safety in construction industry. [11]

2.1.12 Dilipkumar Arvindkumar Patel, et. al. (2016):

This paper attempts to estimate fatal accidents of construction sector for all states in India. These estimates are based on reliable information derived for the construction sector of National Capital Territory (NCT) Delhi region using different sources. This study further projects the fatal accidents for all states based on working population data obtained from Census. The quantum of construction work in all states are differentiated based on their data on cement consumption using linear inter and extrapolation methods. In line with this estimate the minimum number of people that would have died annually in Indian construction sector from 2008 to 2012 was 11,614. The estimates presented here would help in drawing attention of all stakeholders to take remedial measures. [12]

2.1.13 Chandan Mehra, et. al. (2016):

In this paper author discussed about importance of safety in Indian construction. This research paper illustrates

the present scenario of the labours working in the construction firms with respect to health and safety issues. It gives the information about safety principles compared to the construction field ground reality based on daily routines at site. Lucidly, the safety professionals are required at site to take responsibility in getting acknowledge the discrete safety and health rules, regulations, acts and principle simultaneously creating attention among each other and entourage the industry for the advancement of the project and mankind. [13]

2.1.14 Hariharan Pethaperumal, et. al. (2017):

In this article authors studied about effectiveness of material handling equipment safety in construction sites for operation safety and environmental health. This paper studies and analyses safety management in the construction sites through means of safety survey, interviews with different level of employees and accident data analysis with specific reference to the mechanical material handling equipment and recommendations are suggested for enhancing the overall safety in the construction sites. The results are then statistically tested for significance through at' test analysis. [14]

2.2 Project Research Gap

Fulfilment From the study of all the literature, concept of safety and all its related term is cleared. Review provides the thorough knowledge about the method of analysis of safety, practices to be brought for increasing the GDP of the firms. The ways to prevent injuries, risks, accidents, damages, etc. is very well explained in some reviews. In all the above literatures authors worked on various concepts related to safety and its management. The basic safety management is discussed in these literatures. Various safety management rules and regulations are also studied by them. Some of them worked on accident rate analysis at construction projects. Most of the authors studied organizational safety and health management as a literature review. Preparation of safety checklist is also done by them. This study will further deal with prepare safety observation summary and audit report of industrial construction project.

III. CONCLUSION

1. Organizations involved in this study have generally shown a commitment to providing a reasonable to high level of safety management activities. This, however, has not been reflected in the way they view their safety performance and pro-activeness with respect neither to the industry's norm nor on how they implement these activities as a safety management package.

2. It is clear that what is needed is a change in the safety culture, i.e. redesigning how organizations view and approach safety management activities.
3. The process of on-site hazard detection and management, in particular, needs to be thoroughly analyzed in the terms of its basic activities, i.e. planning, detection, action and feedback to employees with a view to examine how these four activities interact with each other.
4. After careful discussion with safety supervisors and project managers on various sites, it became apparent the safety management assessment methods of analysis used in this project could be easily applied on construction projects. It can efficiently reflect safety management performance on site. By using these methods, reasons that lead to poor safety management on site can be easily detected, and countermeasures can be implemented.

IV. ACKNOWLEDGMENT

I would sincerely like to thank our Professor P. J. Wankhede, Department of Civil Engineering, SSBGCOET, Bhusawal for his guidance, encouragement and the interest shown in this project by timely suggestions in this work. His expert suggestions and scholarly feedback had greatly enhanced the effectiveness of this work.

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