

LABOUR SAFETY IN CONSTRUCTION INDUSTRY: A LITERATURE REVIEW

Mr.C.Ravikumar¹, Mr.A.Varadharaj²

¹PG Student, Department of Civil Engineering, RVS .Technical Campus, Coimbatore-641402, India

²Assistant Professor, Department of Civil Engineering, RVS .Technical Campus, Coimbatore-641402, India

Abstract - Construction is the second largest economic activity in India after agriculture. For a construction project to be successful, safety of the structures as well as that of the personnel is of utmost importance. The safety issues are to be considered right from the design stage till the completion and handing over of the structure. Construction industry employs skilled and unskilled labourers subject to construction site accidents and health risks. A proper coordination between contractors, clients, and workforce is needed for safe work condition which is very much lacking in Indian construction companies. A large number of construction workers are exposed to the risks of workplace accidents and occupational health problems. Accidents and illness can be extremely costly for a construction firm.

Though labour safety laws are available, the numerous accidents taking place at construction sites are continuing. Management commitment towards health and safety of the workers is also lacking. A detailed literature study was carried out to understand the causes of accidents, preventive measures, and development of safe work environment.

Key Words: Accidents, risks, labour safety, safety laws, preventive measures.

1. INTRODUCTION

In India the construction industry is the largest among the non-farming sector to generate jobs. But it also is a large contributor of grievous injuries and deaths of its workers in the country. The construction area of civil engineering is one of the most hazardous industries worldwide. The 'fatal four' causes of disastrous incidents in the construction industry are falls, electrocutions, being struck by objects and caught in between.

The rapid growth of construction industry in India today is out of proportion to practical developments in terms of safety and health aspects of the construction workers. Pitfalls in legislation combined with lack of proper implementation is also a significant contributor.

The Indian construction workers form 7.5% of the world labour force, but it contributes to 16.4% of fatal global occupational accidents [1]. It accounts for about 11% of occupational injuries and 20% of deaths resulting from occupational accidents [2]. In the construction industry the possibility of a fatality is five times more likely than in a manufacturing industry, whereas the risk of a major injury is two and a half times higher. Each year, up to 120

people are killed at work place in the developed countries like UK and there are about 3000 workers who suffer from major injuries in construction-related accidents [3], these facts tarnish the image of the construction industry, and making it more difficult to attract skilled labour [4].

In the past decade, need for safety awareness among construction companies has fiscally increased [5]. This is due to the high cost associated with work-related injuries, worker's compensation, insurance premium, indirect costs of injuries, and litigation. Every year, a considerable amount of time is lost due to work-related health problems and site accidents [6].

There are several factors responsible for health problems and construction site accidents. The Occupational Safety and Health Administration (OSHA) examined the causes of construction fatalities, result showed that 33% of fatalities in construction were caused by falls, 22% were struck by objects. 18% were caught in/between incidents, 17% were electrocutions, and 10% were caused by other reasons (1985-89).

1.1 Various Techniques

There are several techniques that can be adopted for labour safety,

Hazard Analysis: Before any construction work takes place, management should assess job site condition to identify potential areas of serious injuries. Many serious injuries are attributed to workers falls, collapse, being struck by vehicles, trench cave-ins and electrical lines. The analysis should address the sequence of work, the hazards of each activity and control measures to eliminate or minimize the hazard.

Safety Training: Training should be at the core of every safety program. It is important to identify the areas in which training is required. All employees should be trained on hazard communication; other training may include electrical lock out, confined space entry, trenching, back-injury prevention, fall protection, fire protection, equipment safety and other safety concerns.

Safety organization: The organization of safety on the construction site will be determined by the size of the work site, the system of employment and the way in which the project is being organized. Safety and health records should be kept which facilitate the identification and resolution of safety and health problems on the site.

Safety officer: One commonly accepted prerequisite for administering a successful safety program is the designation of a safety officer at the project level. It is standard practice on many large projects to require a safety officer. Safety provisions requiring a safety officer should be included in the construction contract.

1.2 Relevance of the review

Especially in a developing country like India, there must be an effort to raise the level of awareness among both the employers and employees of the importance of health and safety at work sites. It is highly desirable to decrease the rate of labour accidents for employee working in the construction industry all over the world. Many preventive measures to address this problem have been proposed and carried out. However, accidents keep occurring with depressing regularity. Hence, new effective measures for prevention of labour accidents are always keenly anticipated.

It is a general observation that the large scale infrastructure projects command good safety checks and procedures due to statutory requirements of the tender contracts. But construction in everyday life comprises of large number of small scale projects which are local contractors undertakings lacking in compliance of safety requirements and labour laws. It is the high time that the awareness regarding the present scenario of safety and labour conditions should spread adequately.

2. LITERATURE REVIEW

Lingard, (2013) studied the construction sector in industrial countries which employed between 6 and 10% of the workforce but accounts for between 25 and 40% of work-related deaths.

Toole, (2002) determined that site safety expectations should not only be practical in nature and reflect the influential abilities of each construction party, but also should be project and company specific.

Nishgaki et.al., (1994) observed that the major causes of OHS failures were inadequate safety education, inadequate instruction, poor housekeeping and 'wilful transgression'.

Abudayyeh et.al., (2005) randomly surveyed 40 of the top 500 US construction companies with a view to determining whether a relationship exists between management commitment to safety and the frequency of construction-related injuries and illnesses.

Levitt and Parker (1976) and Koehn et.al., (1995) are of the view that management-focused strategies are effective in terms of reducing accidents and improving safety performance.

Carter and Smith, (2006) investigated the hazard identification levels of three construction projects in the UK. These authors observed that construction projects within the nuclear industry identified 89.9% of all hazards, while projects within a railway context identified 72.8%.

The research revealed that knowledge and information barriers, in addition to process and procedural barriers, prevented effective hazard identification.

Xingu Huang and Jimmie Hinze, (2003) analysed the construction worker fall accidents and the result shows that most fall accidents take place at elevations of less than 9.15m (30 ft) occurring primarily on new construction projects of commercial buildings and residential projects of relatively low construction cost.

Edward et.al., (1996) had done safely related research, which tends to be more qualitative in nature, addressing "what" factors are important for success as opposed to "how much" is appropriate to achieve successful safety outcomes.

Osama Ahmed Jannadi and Mohammed S.Bu-khamsin, (2002) had conducted a questionnaire survey, which was distributed among industrial contractors in the Eastern province of Saudi Arabia and formal interviews were taken with the contractors, officials responsible for construction safety. 72% of the companies participated in this survey were the general building construction companies. The paper identifies 20 main factors and 85 sub-factors and determines their level of importance based on the survey results and the analysis.

Pheng and Shiua, (2000) emphasized that quality and safety should be integrated to achieve better co-ordination and utilization of resources.

Wilson and Koehn, (2000) suggested that safety practices vary with construction sites. All construction sites have unique aspects of safety to be considered. Larger construction projects are better organized to manage safety aspects. The larger construction firms have one person responsible for keeping the team members informed about possible safety problems. Small to medium firms do not have an adequate safety program or person to oversee safety criteria. Implementation of their safety management is with project superintendent.

Kumar and Bansal, (2012) conclude in their project that while completing high quality work within specified time and cost, safety of workers requires a significant attention. The paper sensitizes construction professionals regarding the importance of safety aspects and their consequences. The review suggests that there is a lack of responsive tools and resources to assist designers in addressing construction safety. Unsafe acts, unsafe conditions, and failure of management to anticipate hazardous situations are the main causes of accidents.

3. CONCLUSION

Different aspects presented by various authors on labour safety in construction were discussed and analysed. Detailed analysis of data provides the causes of fatalities in construction industry. Falls are the single most common cause, followed by struck-by-incidents, caught-in/between cases and electrocution. Some studies mention issues like poor quality work, unsafe working conditions, and lack of

environmental control can be improved by adopting safety rules and regulations. Major causes of occupational and safety failures were inadequate safety education, inadequate instruction, poor housekeeping and 'wilful transgression'. In one study, it is mentioned that all construction sites have unique aspects of safety to be considered. Larger construction projects are better organized to manage safety aspects. The larger construction firms have one person responsible for keeping the team members informed about possible safety problems. Small to medium firms do not have an adequate safety program or person to oversee safety criteria.

REFERENCES

- [1] Kulkarni G.K (2007). 'Construction industry: more needs to be done', Indian Journal of Occupational and Environmental Medicine, vol.11, No.1,pp. 1-2.
- [2] Seetharaman . S (2008). Construction Engineering and Management, fourth edition. Umesh Publications, Delhi.
- [3] Sawacha. E, Nabum, and Fong. D (1999). 'Factors affecting safety performance on construction sites'. International Journal of Project Management. vol.17. No.5, pp.309.
- [4] Everett J.G and Frank P.B (1996), 'Costs of accidents and injuries to the construction industry'. Journal of Construction Engineering and Management. vol.122, No. 2, pp.158-164.
- [5] Wilson Jr J.M., and Koehn .E. (2000). 'Safety management: problems encountered and recommended solutions'. Journal of Construction Engineering and Management vol. 126. No.1. pp. 77-79.
- [6] Anumba. C. and Bishop .G. (1997). 'Importance of safety considerations in site layout and Organization', Canadian Journal of Civil Engineering and Management, vol. 24, No. 2, pp. 229-236.
- [7] Lingard . H. (2013), 'Occupational health and safety in the construction industry'. Construction Management and Economics, Vol. 31, No.6, pp.505-514.
- [8] Toole, T. (2002), 'Construction Site Safety Roles'. Journal of Construction Engineering and Management'. Vol.128, No.3, pp. 203-210. Alkilani .
- [9] Nishgaki . S., J. Vavrin, N. Kano, T. Haga, J. Kunz and K. Law. (1994). Humanware, Human Error, and Hiyari-Hat: 'A Template of Unsafe Symptoms'. Journal of Construction Engineering and Management. Vol.120, No.2, pp. 421-441.
- [10] Abudayyeh, O., T. Fredericks, S. Butt and A. Shaar. (2006). 'An Investigation of Management's Commitment to Construction Safety'. International Journal of Project Management. Vol.24, No.2, pp. 167-174.
- [11] Levitt, R. and H. Parker. (1976). 'Reducing Construction Accidents - Top Management's Role'. Journal of the Construction Division. Vol.102, No.3, pp. 465-478
- [12] Carter, G. and S. Smith. (2006). 'Safety Hazard Identification on Construction Projects', Journal of Construction Engineering and Management. Vol.132, No.2, pp. 197-205.
- [13] Xingu Huang and Jimmie Hinze (2003), 'Analysis of Construction Worker Fall Accidents', Journal of Construction Engineering and Management, Vol.129, No.3, pp. 262-271.
- [14] Edward J.Jaselskis, Stuart D.Anderson and Jeffrey S.Russell (1996), 'Strategies for Achieving Excellence in Construction Safety Performance', Journal of Construction Engineering & Management, Vol.122, No.1, pp.61-70.
- [15] Osama Ahmed Jannadi and Mohammed S.Bu-khamsin (2002), 'Safety Factors Considered by Industrial Contractors in Saudi Arabia', Building and Environment 37, pp. 539-547.
- [16] Pheng .L.S. and Shiua .S.C.(2000). 'The maintenance of construction safety: riding on ISO 9000 quality management systems'. Journal of Quality in Maintenance Engineering. vol. 6. No. 1, pp. 28-44.
- [17] Kumar. S and Bansal V.K,(2013)'Construction safety knowledge for practitioners in the construction industry', Journal of Frontiers in Construction Engineering, vol. 2, no. 2, pp. 34-42.