

A Proposed System of Safety Management for Successful Indian Construction Activities

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Abstract

Construction Industry in India has changed drastically during the last few decades. It is the second largest employing sector next to agricultural sector, but first in terms of accidents close to the road accidents. From the construction of building simple structures, roads and minor civil work projects, the construction industry has changed significantly over the last few decades. Safety on construction job site has been ignored by construction companies worldwide and particularly in countries where labor force is required. Due to increasing numbers of reported accident and injuries on construction projects, safety is becoming an important issue in construction environment today; also safety is usually discarded by its operator. Hence, safety management plays a very important role in construction industry. Research has shown that false practices by workers and inadequate supervision are the basic causes of an accident. Also failures of management towards safety practices such as safety training, safety education, awareness programme are other consequences of accidents. The aim of this work is to provide a state of safety and health management in various construction activities, study the health and safety of the workers, study the performance and awareness programs of the organization related to safety of the workers. This document depicts the current scenario of Indian labours working the construction industry in terms of health and safety issues. It gives a comparison on the safety principle vs the ground realities happening daily at site. Indicating clearly the need of the professionals to take the responsibility in getting acknowledge the various safety and health rules, regulations, acts and principle at the same time creating the awareness among the each other and train the industry for the betterment of the projects and humanity.

Key Words: Construction Sector, Line Manager, Working Environment, TCSM

1 Introduction

Construction sector is very essential and an integral part of infrastructure development which gives tremendous boost to our country's economy. The construction industry has registered enormous growth worldwide in recent years. Although the development of technology is rapid in most of the sectors, construction work is still labour intensive. In India the construction sector employs around 33 million people, which is next to agriculture. The construction workers are one of the most vulnerable segment of the unorganized labour in our country.

Construction work is a dangerous land-based job. Some construction site jobs include: building houses, roads, workplaces and repair and maintain infrastructures. This work includes many hazardous task and conditions such as working with height, excavation, noise, dust, power tools and equipment. Construction work has been increasing in developing and undeveloped countries over the past few years. With an increase in this type of work occupational fatalities have increased. Occupational fatalities are individuals that pass way while on the job or performing work related tasks. Within this field of construction, it is important to have safe construction sites.

2 Objectives

- Developing and implementing Behaviors Based Safety Program to improve orientation of work force towards safety in work.
- Innovation in the training methodologies to achieve higher effectiveness of training among the contractor employees.
- Implementation of innovative engineering measures to strengthen the safety requirements at design stages to achieve safe working environment during construction.

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- Training and certification, in Industrial Safety requirement, of line managers and others responsible for construction activity essentially to enhance their perception and appreciation for industrial safety.

The role of line managers and safety professionals in preventing the safety- related incidences is quite important. Therefore, it is necessary that safety requirements are assured on regular basis by scrupulous field rounds and the deficiencies identified are attended to promptly. Further the attributes and requirements to achieve effective management of safety right from the design stage to execution and operation must be identified and addressed appropriately through a structured program. To achieve the important objective, it is vital to recognize the important elements of the safety management system and strengthen the same at each stage.

3 Existing Safety Management Techniques in India

There are several techniques adopted for the safety construction activities in India. Some of the important techniques are,

- Safety organization
- Safety related deficiency management
- Job hazard analysis
- Safety training
- Task demand assessment

3.1 Safety Organization

Some of the systems to identify areas of improvement and achieve enhanced industrial safety status are enumerated below:

- Safety surveillance and Safety Related Deficiency Management system.
- Area-wise Task Force for enforcing safety at construction Projects.
- Contractors Safety surveillance and correction programme.
- Entry passes to the work site only after Induction Safety training etc.
- Periodical Safety Audits.

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One of the administrative controls in this view needs to be that contractor safety professionals functionally report to Head, Industrial Safety, of the department. This will help in implementing safety during work. Approval of Industrial Safety requirements and their implementation takes a priority for all of us. Hence, we must develop and institute procedures, work plans and programs that are implemented with a common understanding of utility and contractor team. In this context, the regulatory requirements are equally important which need to be understood and implemented in clear and unmistakable terms by all concerned including the contractor organization.

3.2 Safety Related Deficiency Management

Safety Related Deficiencies (SRD) emerges either due to change in status at work floor or multiple agencies working in parallel. SRD also get emerge due to decline in safety culture. It is so required that SRDs are detected and corrected punctually on a routine basis. Presently a LAN based system of communicating SRD is in practice in our plants. The system is called “SRD Management System”. In this system, the detected SRD’s are communicated through e-mail and reminders are automatically sent depending upon the severity assigned to the SRD. The safety professionals/safety group is also able to get timely feedback of corrective actions, which are verified to close the SRD. It is intended that no SRD remains for more than 24 hrs and thus safe work conditions and safety culture would be ensured.

3.3 Job Hazard Analysis

The dynamicity, complexity and parallel activities in construction are unavoidable at times. These activities, though planned, are carried out by the work force which is skilled in the execution of work but lack of awareness of safety requirements overconfidence, complacency, at times, leads to breach in safety requirements. So, a regular monitoring and surveillance program along with coaching and mentoring of employees during execution becomes necessary to correct the aberrations in safety implementation.

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The main objective is to assure safe working conditions to prevent accidents, hence it is necessary to understand and implement proactive control measures at work place prior to execution of the work. Training to the executing team members needs to be imparted on risk management. Therefore, risk assessment/hazard analysis has to be carried out for all significant works.

3.4 Safety Training

The importance of training cannot be undermined. Over a period of time standard training modules have been evolved. In addition to this Pre Job Briefing and PEP talk also are given to bring in requisite awareness to the contract and departmental employees. But for enhanced effectiveness of training, it is necessary to develop such training modules and methodology in a lucid manner, which can provide the required safety.

3.5 Task Demand Assessment

It is a new technique for measuring the safety risk of construction activities and analyzing how changes in operation parameters can affect the potential for accidents. TDA is similar to observational ergonomic methods—it does not produce estimates of probabilities of incidents, but it quantifies the “task demand” of actual operations based on characteristics of the activity and independent of the workers' capabilities. The task demand reflects the difficulty to perform the activity safely. It is based on (1) the exposure to a hazard and (2) the presence and level of observable task demand factors—that is, risk factors that can increase the potential for an accident.

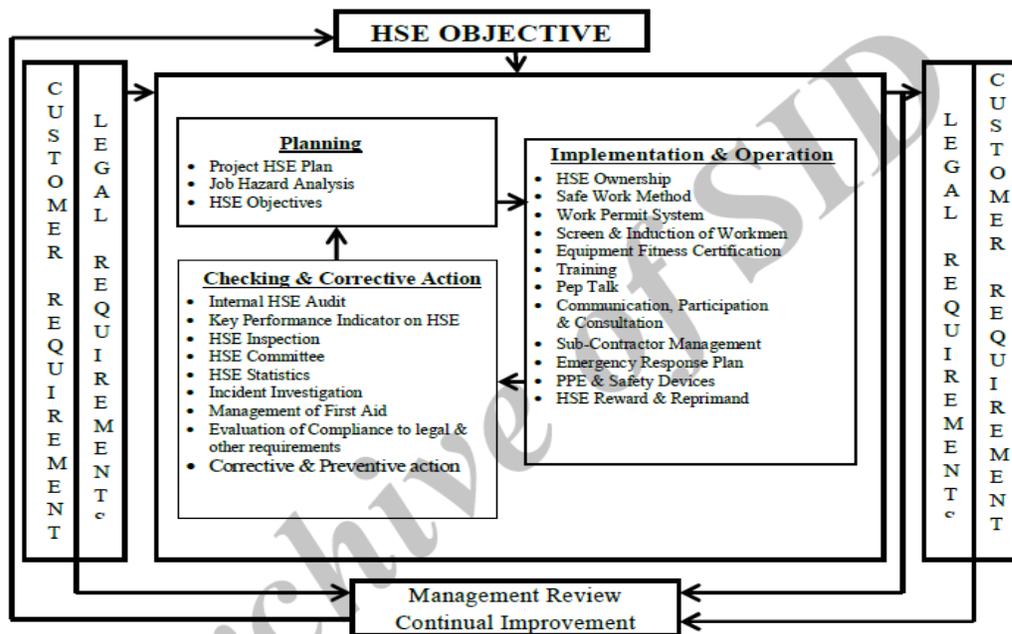


Figure 1. Total safety management model

5 Way to Improve the Safety Management

- Accident statistics and causes of construction injuries or fatalities.
- On site accident prevention methods.
- The role of stakeholders, apart from contractors, in preventing accidents.
- Institutional aspects of construction safety.

5.1 Accident Statistics

The categories used for classifying fatal accidents were: Falls, Falling material and objects, Electrical hazards, Transport and mobile plants

Most of the accidents that involved falls occur during work on roofs, scaffolds and ladders. Moreover, collapses of structures and falling materials also contribute for a large proportion of victims. Many of the safety hazards are particular to the different trades, and usually construction workers underestimate the hazards in their own work which affects the motivation for adopting safe work procedures. The establishment and use of procedures and regulations to enhance safety can avoid a large proportion of these accidents. There are also

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forceful monetary incentives in construction safety as it is estimated that construction accidents amount to about 6 per cent of total building costs; this should encourage the industry as well as the regulatory agencies to invest in construction safety. The study concluded that:

- Falls are the most serious hazard.
- Research on safety motivation shows that hazard recognition is an essential element.
- Many accidents involve hand tools. Ergonomics can improve safety through better design.
- Protective equipment needs to be comfortable.
- Dealt with the psychological aspects of safety, such as motivation.

5.2 Accident Prevention

The six most important factors were:

- Maintaining safe work conditions
- Establishing safety training
- Safety education to support good safety habits amongst workers and supervisors
- Effective control of the main contractors on site
- Maintaining close supervision of all work
- Assigning safety responsibility to all levels of management and workers

5.3 Stakeholders in Safety Prevention

The useful strategies which have an impact on contractor's safety were:

- Use of short-term permits to regulate hazardous operation
- Stressing safety during periodic visits
- Maintenance of safety records
- Incorporating detailed job-specific safety requirements in the specification
- Periodic inspections
- Awards for safe practices

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- Considering safety as a criterion in pre-selection of contractors for bids.

The way to prevent injuries and improve safety includes,

- Management safety
- Integrate safety as a part of the job
- Create accountability at all levels
- Take safety into account during the project planning process
- Make sure the contractors are prequalified for safety
- Make sure the workers are properly trained in appropriate areas
- Have a fall protection system
- Prevent and address substance abuse to employees
- Make safety a part of everyday conversation
- Review accidents and near misses, as well as regular inspections

6 Proposed Operational Excellence Model to Improve Safety for Construction Organizations

There are 13 safety drivers associated with this model to improve safety for construction organizations:

- Recognition & Reward
- Employee Engagement
- Subcontractor Management
- Training & Competence
- Risk Awareness, Management & Tolerance
- Learning Organization
- Human Performance
- Transformational Leadership
- Shared Values, Beliefs, and Assumptions
- Strategic Safety Communication
- Just & Fair Practices and Procedures

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- Worksite Organization
- Owner's role

7 Conclusion

Owing to increase in complexity of operations, the construction industry has become more dangerous than ever before. Construction organizations are faced with the challenge of having to closely monitor their safety management systems to minimize occupational hazards, while simultaneously trying to sustain profits in a competitive marketplace. In the United States, government agencies such as OSHA have done their part to promote a zero injury environment. However, in India effective safety construction management is not available. Moreover, the key to proper safety execution is not necessarily through strict guidelines and standards, but through an effective total safety management initiative, first supported by an organizations senior management, then integrated via specific safety management implementation tools/ systems, and finally by continuous follow up and monitoring to ensure quality and continuous improvement. Construction organizations interested in maximizing safety and competitiveness must look to TQM initiatives for inspiration. Quality focus, total commitment, and continual improvement must be the mantra of choice. Only those companies that take on an aggressive safety management approach will sustain profit margins and achieve world-class competitiveness. that the single most important determinant of the success of an organization in implementing TCSM is its ability to translate, integrate, and ultimately institutionalize TCSM behaviors into everyday practice on the job.

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