

## **A Study about Safety Management**

**S. Pravin Kumar, PG Scholar**

### **Abstract**

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.

**Keywords:** Safety, Management, Analysis, Construction, Industry

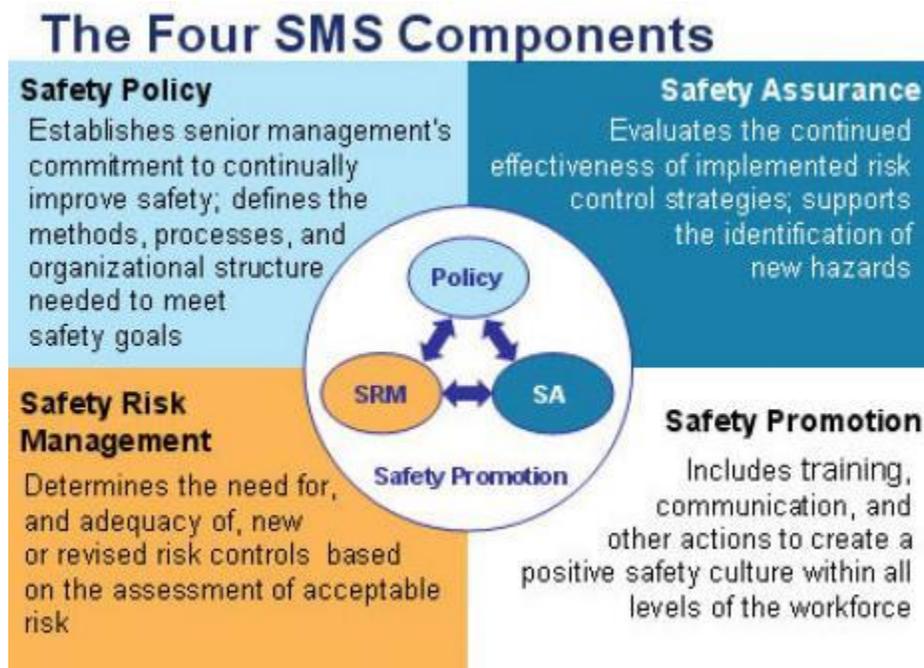
### **Introduction**

The significance of the construction industry to the economic and social life of the country is noteworthy. The industry needs much investment and involves various types of stakeholders and participants. From the point of view of safety the conditions normally encountered in the construction industry does not lend themselves to the degree of control, Possible in other industries where more stable conditions are generally obtained. The construction industry is usually very large, complex, and different from other industries. Hence it is prone to numerous health hazards.

The safety paradigm is that although food is safer, consumers` attitude is dominated by high levels of uncertainty. In this changing climate we however, need to recognize the effort EU authorities make to restore consumers` trust and enforce new regulations and better communicate food safety related issues. An important feature of food industry is that producers, in order to cope with market needs and legal requirements, have to satisfy both safety and quality criteria for their products. Having multiple options in the form of different quality and/or management systems, food producers should decide the most appropriate one for its specific activity and should establish, document and implement effective systems for managing quality and safety (van der Spiegel et al., 2003).

## Safety

For many years safety professional have been aware that the majority of workplace accidents are triggered by unsafe behaviors, and that their control is one of the keys to successful accident prevention. However, many organizations, even those companies with low accident rate have been frustrated by their inability to control unsafe acts.



If a worker is injured on the job, it costs the company in lost work hours, increased insurance rates, workers' compensation premiums and possible litigation. Productivity is lost when other workers have to stop work to deal with the injury.

Even after the injured employee has been sent home or taken to the hospital, other employees may be distracted or need to take time off from work in the aftermath of the incident. Even a single injury can have far-reaching and debilitating effects on your business.

### Need for Safety Management

The construction industry has some special features which have a direct bearing on the accident potential. In this trade the pattern of work is ever changing. The operations and physical circumstances change constantly unlike in the factories where the process, the method and the operations are generally respective.

Timings and schedules vary considerably from place to place. The most important changing factor is the change of men themselves. The inherent nature of construction jobs combined with the above factors make this industry as one with accident risks.



## **Importance of Safety in Construction**

The construction industry has traditionally been considered as a hazardous occupation due to the high incidence of occupational injuries and fatal accidents. The number of fatal occupational accidents in construction all users the world is not easy to quantify, as information on this issue is not available for most countries. The outlay on construction in successive live year plans of India has been in the range of 36% to 50%

## **Similarities between Safety and Quality Management Safety research**

Early concepts of safety management were developed by Heinrich in the 1930s, and espoused in his book 'Industrial Accident Prevention'. Heinrich realized that industrial accidents were more likely to be caused by unsafe acts 'by people' than 1174 T. W. Loushine, et al. caused by physical hazards. This concept ushered in an innovative management system approach, which addressed both physical hazards and the behavior of workers. Petersen (1988) elaborated on Heinrich's work, and published a text of safety management concepts that address the 'human element' of occupational safety. Research has shown a strong correlation between successful safety programs and management commitment in the safety program; more humanistic approach in dealing with employees; better employee selection procedures; more frequent use of lead workers performing training; greater degree of housekeeping; better plant environmental qualities; and a stable workforce (Smith et al., 1978). Results of the Smith et al. (1978) study are similar to the recommended safety program elements from the occupational safety and health administration's 'safety and health program management guidelines' (OSHA, 1989).

Those program elements include: management leadership and employee participation, workplace analysis, accident and record analysis, hazard prevention and control, emergency response, and safety and health training. This list of safety program elements is also used as headings for OSHA's voluntary protection program (VPP) assessment tool (OSHA, 1996). It is also interesting to note that in addition to previously mentioned safety program characteristics, recent advances in safety and health management research has opened the door to a host of new

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perspectives in safety management. A short list of these new perspectives includes, but is not limited to: behavioral safety (Krause, 1994), safety culture (Petersen, 1988, 1997), safety climate (Zohar, 1980; Prussia et al., 2003), and human error theory (Reason, 1990; Dekker, 2002).

### **Statement of Constructs**

The goal of quality management is the identification and correction of variance (or unwanted outcomes) in a process. For safety management, variance is in the form of workplace hazards, unsafe behavior, and causes of human error. The similarities of safety and quality management are evident by the shared characteristics of each system's design (see Figure 1). For example, OSHA (1996) recommends that a successful safety management program be based on: management commitment; employee involvement; hazard identification and control, training, and accident investigation.

Smith, et al. (1978) made similar conclusions in a study that compared safety characteristics of high and low accident companies, whereas Dean & Bowen (1994) and Hackman & Wageman (1995) identified customer satisfaction, team work, continuous improvement, training and education, Figure 1. Conceptual framework: similarities between safety and quality management, and outcomes 1176 T. W. Loushine et al. employee empowerment, and organizational culture as keys to a successful quality management system. Non-construction research literature supports the similarities of quality and safety management programs (Krause, 1994; Curtis, 1995; Rantanen et al., 1999).

In fact, some authors have demonstrated how quality and safety can be integrated and benefits result from a successful integrated quality and safety management system (Power & Fallon, 1999; Wilkinson & Dale, 1999; Wittman, 1999; Herrero et al., 2002). Most of the research investigating the integration of quality and safety management indicates that while quality improvement methods strive to minimize the variability inherent in product qualities, safety management minimizes the chance of occurrence, and the severity of those non-planned events or incidents that can cause harm to workers.

## **The Four Pillars of Safety Management**

### **Safety Policy - First SMS Pillar**

Safety policy is concerned with the structure and outline of how safe operations will be conducted. Among other things, it involves planning, organizing, compliance with regulations and law, documentation, and emergency preparedness and response. It is at this level that upper-level management must buy-in and continuously support the SMS. Without management buy-in and support, the SMS is bound to fail. Employees are highly influenced by management behavior examples and therefore if employees see management intentionally breaking rules or ignoring policy it is likely the employees will emulate this behavior.

### **Safety Risk Management - Second SMS Pillar**

Possibly the most important component of the SMS, safety risk management is the process by which risks are identified, mitigated, or eliminated before they become a visible (surfaced) accident or incident. This is a proactive (as well as predictive) approach to error prevention and mitigation, which is a paradigm shift from the strictly reactive approach that has been used in the past. Risk can be thought of as the consequence of a hazard and is measured in terms of severity and probability. You will develop a Preliminary Hazard Analysis (PHA) that will be used to identify the hazards that exist in your operation. Hazard identification can be accomplished by a variety of methods that include observations, audits, safety surveys, investigations, and research. Other sources can include factual briefings from frontline personnel, subject matter experts, brainstorming, and analysis tools such as event trees, fault trees, FMECA's, and so on. Once the hazards are identified you will then need to analyze the data to determine what type of controls may need to be put in place. Risks that have a high severity and high likelihood rating would be the ones you want to address as a priority. On the other hand, risks that have a low severity rating and a low likelihood of occurrence may be classified as acceptable risks that you can just live with.

### **Safety Assurance and Internal Evaluation - Third SMS Pillar**

The well-known Heinrich Ratio states that, for every fatal accident, there will be three to five nonfatal accidents and 10 to 15 incidents; but there will also be hundreds of unreported occurrences. Unreported occurrences are extremely problematic since no defense can be employed if nobody knows that these occurrences exist. There are quite a few subcomponents in this category, one of the most important being error reporting; however, an error reporting system may be one of the most challenging SMS components to implement. Employees may feel that while there are clear advantages to error reporting, at the same time they may also feel that embarrassment and potential personal punitive implications far outweigh the organizational advantages. Yet, a good and effective safety culture must include an error reporting system. In order to attain this goal you will need to ensure that your organization has a Just Culture.

### **Safety Promotion - Fourth SMS Pillar**

Subcomponents of this category include the development and continuous reinforcement of a healthy safety culture, communication, training, and feedback of lessons learned. The most important point about safety promotion is that there needs to be an ongoing, palpable presence to the SMS. This requires, among other things, open communication between management and employees, feedback offered on a regular basis, and appropriate employee training on the SMS.



### **Safety Inspections**

Respondents were asked about the frequency of safety inspections conducted by either the safety supervisor or the project manager. Thirteen percent of the firms conduct these inspections biweekly, 20% monthly and 67% occasionally. Deficient enforcement of safety is recognized as a major cause of accidents. Safety inspections are the usual means used to enforce safety at the jobsite. The results show that the majority of the participating firms "occasionally" conduct these inspections. The expected direct consequence for low frequency of safety inspections is more safety violations, which result in an increased possibility of accidents. Hinze and Gambatese (2003) indicate that safety inspections are one of the means by which project managers and site supervisors can become acquainted with the nature of the safety conditions on the site. Toole (2002) argues that to effectively enforce safety on the jobsite, the entity must be able to monitor the work on a frequent basis. Wong et al. (1999) argue that safety performance is affected by monitoring of safety compliance. Jaselisks et al. (1996) recommend increasing site safety inspections. Their analysis show that firms with better safety performance conducted more site safety inspections compared with firms of poor safety performance. Hinze and Figone (1988) and Hinze and Talley (1988) showed better safety performances when contractors monitored

project safety performance. Hinze and Wilson's (2000) respondents recommend more jobsite visits to improve safety performance. Safety Incentives and

### **Safety Clauses in Contract Documents**

All Contract documents signed by the Owner and contractor contains various safety clauses wherein the contractor is obligated to make Provisions for the safety of men and structure and the consequences for failure to do so. The contractor is already mandated by law to comply with state and national regulations. The owner has to demand that the contractor document and implement the proper safety programs that will protect employees working on the job site. Owners sometimes hesitate and feel that they are interfering with the contractor's say of doing business if they express concern over safety at a jobsite. In reality owners have the absolute right to mandate that a quality safety program be an important part of the selected contractor's culture.

### **Conclusion**

The work environments in construction activities are generally more hazardous, than other industries due to the use of heavy equipment, dangerous tools, and hazardous materials, all of which increase the potential for serious accidents and injuries. Therefore, it is evident that a focused dedication inwards safety is needed from construction at all levels. It can be inferred from the survey data that safety managers have the opportunity to influence and enhance the sense of safety and the quality of the work environment. Owners of large projects can more actively participate in construction safety management in each stage of project execution including project design contract selection, contract development, the construction phase, selecting safe contractors, and developing the safety culture on the projects through safety training and safety recognition programs.

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