

Safety Management and Audit in Infrastructure Construction Projects

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Abstract- Any enterprise cannot operate on its own. Even a contractor can neither build nor operate on itself. Therefore, it has to be manned by the people who form the backbone of the enterprise, and it is their candid performance on which the success of the whole enterprise depends. Their knowledge and skills are to be scrutinized and analyzed so as to fit the right person in the right place. A large percentage of construction site accidents involve the negligence of someone other than a employee or employer. There are many causes for construction site accidents, including negligent and dangerous construction site practices. Safety management system identifies various hazards and risks present at the site and the safety studies are there identify measures to categorize and minimize or eliminate the risks since it is difficult to eliminate the hazard but the risks can be reduced up to certain level.

Safety audit is carried out to ensure that unsafe acts and unsafe conditions are brought to a minimum level so that there is a safe work environment. The purpose of safety audit is to ensure that there are definitions and safe procedures for works and the set definitions and safe procedures are practiced. Safety Audit is a tool used by the management to promote and ensure the safe work procedures are followed in the premises. Policy statements are prepared and issued by employers to comply with the acts should be in terms of that can be clearly understood by their employees. Any arrangements the company has made for the establishment of safety committees and for consultation with safety representatives should be covered in the policy statement. The health & safety statement should include safety information, instruction, training and supervision shall be provided for all employees as and when necessary.

Indexed Terms- Safety, Accident, Safety Management, Safety, and Safety Audit.

I. INTRODUCTION

It is crystal clear that any enterprise cannot operate on its own. Even a contractor can neither build nor operate on itself. Therefore, it has to be manned by the people who form the backbone of the enterprise, and it is their candid performance on which the success of the whole enterprise depends. Their knowledge and skills are to be scrutinized and analyzed so as to fit the right person in the right place. They are to be led and directed, they are to be motivated, their activities are to be coordinated. So the whole process of these integrated efforts is nothing but management. At the same time it is also important to minimize the risk of accident i.e. the safety of the men who are working for that enterprise. Therefore, there is the need for another branch of management i.e. safety managements which deals with the safety of the men working for that particular enterprise.

The construction workers are one of the most vulnerable members in a project and are faced with a wide variety of hazards during their work. A common approach for prevention of construction accident is to predict the upcoming event under given circumstances. The accuracy of such predictions is based on knowledge about past accidents. It has been proved that the main reasons for accidents in the construction industry are resulted from the unique nature of the industry, human behavior, difficult work-site conditions, and poor safety management which result in unsafe work methods and procedures.

Safety management system identifies various hazards and risks present at the site and the safety studies are there identify measures to categorize and minimize or eliminate the risks since it is difficult to eliminate the hazard but the risks can be. Safety audit is about going through those procedures and finding whether the safety system is on the right track. Safety audit is not about finding the shortcomings in the system but to ensure that the existing loss prevention systems, safe work procedures and other work practices are in place and being followed.

II. SAFETY

Safety means to avoid any unsafe act in order to prevent accidents. It is a very essential factor which is to be considered during construction projects. Negligence of safety measures can prove to be fatal. Hence safety of the workers is given top priority during a construction work. Improper safety measures or negligence have leads to failure of many structures as well as loss of life.

2.1 SETTING UP THE SITE

There should be safe access onto and around the site for people and vehicles. Plan how vehicles will be kept clear of pedestrians, especially at site entrances where it may be necessary to provide doors or gates to achieve this segregation. Doors that open onto traffic routes may need viewing panels or windows. Construction work should be fenced off and suitably signed. This will protect people (especially children) from site dangers and the site from vandalism and theft. Everyone who works on any site must have access to adequate toilet and washing facilities, a place for preparing and consuming refreshments and somewhere for storing and drying clothing and personal protective equipment. Principal contractors and others who have control over construction sites are responsible for providing or making available site welfare facilities. Employers are also responsible for ensuring that welfare facilities are adequate for their employees.

2.2 SAFETY IN SCAFFOLDING

Some major finded hazards in scaffolding

- People falling from the scaffolding.

- People below the working platform being struck by material fall or being thrown from it
- The scaffold or part of it, collapsing i.e., crushing people under it or nearby at ground level.
- Gives workers peace of mind
- Prevents equipment and debris from falling
- Allows unrestricted access with jobsite safety
- Gives workers peace of mind
- Prevents equipment and debris from falling
- The scaffold or part of it, collapsing i.e., crushing people under it or nearby at ground level

The collapsed scaffold causing damage to adjacent property or to the structure associated with the scaffold



Photo.1. Scaffolding for Bridge Span

2.3 SAFETY IN WORK OVER WATER

For work over or in the vicinity of water, the safe methods are

- Fall prevention system to be adopted by using working platforms, places & access gangways to them should be properly constructed to the width as per standards.
- Tripping and slipping hazards must not persist unchecked.
- bringing a person to surface, life buoys with lifelines, life raft, floating plant
- Provide arrangements for rescue such as rescue boat, first aiders, boat hook, and anchor.

2.4 FALL PROTECTION EQUIPMENT

Safety netting

- It protects workers from falls and stops injuries and damage from dangerous falling debris.
- Saves lives - stops deadly worker falls

- Improves jobsite safety and morale
- Replaces troublesome sidewalk sheds and platforms
- Prevents workers from falling off scaffolding

2.5 WORKING AT HEIGHTS

Falls are the largest cause of accidental death in the construction industry. They account for 50% of all fatalities. There is no distinction between low and high falls. This means that for any work at height, precautions are required to prevent or minimize the risk of injury from a fall. To prevent or minimized risk when planning for work at height, consider the work to be done and take a sensible risk-based approach to identify suitable precautions. There is a hierarchy of control measures for determining how to work at height safely. The hierarchy has to be followed systematically and only when one level is not reasonably practicable may the next level be considered. Where it is reasonably practicable to prevent a fall, precautions should be taken to do so. It is not acceptable to select work equipment from lower down the hierarchy in the first instance.

2.6 GENERAL

- Drink water only from approved drinking water containers or dispensers.
- Proper housekeeping is essential and will be part of every job. □ Clean up all spills or leaks promptly. The Contractor is responsible for containing and cleaning up all spills caused by its workforce.
- Obey all posted speed limit signs.
- Pedestrians will have the right-of-way.
- Yield right-of-way to emergency vehicles.
- Smoking is permitted in designated areas only.
- No firearms or weapons are allowed on the job site.
- Riding on any equipment that is not designed for personnel transport is prohibited.
- Ride in vehicles with seats firmly attached.
- Employees must obey all danger and caution signs.
- Correct all unsafe conditions when possible. Report all unsafe conditions to your immediate supervisor or safety personnel.
- No running is permitted on the job site.
- All material raised and lowered from any height must be done by rope (No dropping or throwing).

- No horseplay will be tolerated. No fighting. All involved will be subject to being removed from the site.

III. SAFETY MANAGEMENT

Project safety is a primary responsibility of all management and supervisors and all employees on this site. Effective management of work activities and competent site supervision are essential in maintaining healthy and safe conditions. It should be made clear to supervisors exactly what it is they are expected to do and how they are expected to do it. The greater the risk, the greater the degree of control and supervision required. Ensure the level of site supervision provided is adequate. Site managers and supervisors should be trained to help them discharge their health and safety responsibilities. On larger sites, site managers may require the support of assistant site managers. On smaller sites, if the supervisor or manager is sometimes not present, they (or a deputy) should be contactable by phone and a responsible person should be left in charge of the site.

IV. AUDIT

Safety audit is carried out to ensure that unsafe acts and unsafe conditions are brought to a minimum level so that there is a safe work environment. The purpose of safety audit is to ensure that there are definitions and safe procedures for works and the set definitions and safe procedures are practiced. Components of a Safety audit may depend upon the type of occupancy but it surely indicates that the management has an attitude towards safety. Safety management system identifies various hazards and risks present at the site and the safety studies are there identify measures to categorize and minimize or eliminate the risks since it is difficult to eliminate the hazard but the risks can be. Safety audit is about going through those procedures and finding whether the safety system is on the right track. Safety audit is not about finding the shortcomings in the system but to ensure that the existing loss prevention systems, safe work procedures and other work practices are in place and being followed.

Safety Audit may be either internal or external. Internal safety audit is carried out in-house while

external safety audit is through an external source. Safety audits are sometimes for certifications, sometimes for complying with the internal management guidelines and sometimes as a result of good management attitude. Internal safety audits are conducted by either the safety committee members or safety representatives or the safety officer. The procedure followed generally is going through the records, matching their standard with the established targets and physical observations at the workplace. External safety audit is conducted by external competent person. The person is generally an experienced person holding certificates for auditing from certifying agencies. Procedure followed is almost the same, the only difference may be is that external auditor may point out something that internal team may miss out as routine procedure.

CONCLUSION

It is clear that enhancing safety execution in construction site is not easy but possible. In this paper we mentioned different elements and strategies to improve construction safety execution such as risk analysis and assessment in design stage, training strategy and management Commitment, etc. In all these strategies the important attitude for increasing safety performance and declining risk is to identify the root causes of construction hazard and accident and also manipulating proper precaution tool and equipment related to kind of construction project and site condition. Therefore, we tried to introduce continuous safety development. Increasing safety execution and creating safer condition in construction projects need more attention to find hazard and kind of risk that can cause any damage to the properties and humans.

Overall, the employer is responsible for health and safety at any work location, and may designate a supervisor or manager to coordinate those efforts. They are the ones responsible for following safety guidelines and providing the right safety equipments and PPE or personal protective equipments. But workers too have a responsibility in managing their own and their co-workers health and safety.

While planning and establishing a system are important, it is also important to maintain the system.

Safety audit not only ensures that the system is maintained but also ensures that the standards go stringent enough to restrict the accidents from occurring in the concerned premises.

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