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Improving Safety Management System by Implementing Effective Safety System in Construction Site

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Abstract: ***Risk management is a concept which promote as safety practice in the work place. Many companies often establish a risk management procedure in their projects for improving the performance and increase the profits. Inadequate or the lack of occupational health and safety not only negatively affects the traditional construction project parameters of cost, quality and schedule, but the sustainability of the environment. Occupational fatalities, injuries and disease constitute defects as they are not project requirements. They also contribute to the cost of construction and development as workers' compensation insurance is included as a labour overhead and the cost of accidents is integrated into the cost structure of contractors. Health and safety at construction sites deals with both physical and psychological well-being of workers on construction sites and other persons whose health is likely to be adversely affected by construction activities. It is of primary concern to employers, employees, governments and project participants. Health and safety therefore is an economic as well as humanitarian concern that requires proper management control. Projects undertaken in the construction sector are widely complex and have often significant budgets, and thus reducing risks associated should be a priority for company. This master thesis presents an application of risk management in the early stage of a project life cycle of a construction project. Undertaking survey of safety aspects used in construction site and identify the lack of risk and safety management system to improve them and analysis the result with newly implemented hierarchy of risk control system.***

Keywords: Implementing Effective Safety system in Construction site

I. INTRODUCTION

Safety and health principles are universal, but how much action is needed will depend on the size of the organization, the hazards presented by its activities, the physical characteristics of the organization, products or services, and the adequacy of its existing arrangements. Many of the features of effective safety and health management are analogous to the sound management practices advocated by proponents of quality management, environmental protection, and business excellence. Commercially successful companies often excel at safety and health management as well, precisely because they apply the same efficient business expertise to safety and health as to all other aspects of their operations. While the quality management of products or services and environmental protection principally protect physical phenomena, safety and health management in the workplace involves protecting people and developing a safety culture between employers and employees. However, there are considerable similarities between the approaches to safety and health described here and those advocated for effective quality management (ISO 9000 series of standards) or environmental protection (ISO 14000 series). For example, quality management systems promote continuous improvement in all aspects of an organization's activities. They are founded on a continuous process of:

A. Identifying the key processes;
B. Setting performance standards;
C. Measuring achievement against these standards;
D. Taking corrective action;
E. Identifying opportunities for improvement.

Success in quality management requires the development of supportive organizational cultures. Quality management systems also stress the importance of the active involvement of all employees in the quality process, and the crucial importance of visible leadership by managers.

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Organizations that manage safety and health successfully invariably have a positive safety culture and active safety consultation programs in place. Successful organizations can establish and maintain a culture that supports safety and health. Practical methods of designing, building, operating, and maintaining the appropriate systems are outlined in this guidance. In the following sections the similarities and strong links between total quality management, environmental protection and effective safety and health management will become increasing apparently.

II. METHODOLOGY

1) Step: 1 Identify common hazards
2) Step: 2 Hazard description
3) Step: 3 Implementing Hierarchy of risk control
4) Step: 4 Analysis
5) Step: 5 Measuring Performance

III.HAZARDS INVOLVED IN WORK PLACES

There are many hazards involved in work place, only specific are explained below

A. *Excavation Hazards*

1) The excavation is dug in unstable soil, or in soil that has been dug in before;
2) There is excessive vibration from construction equipment or vehicle traffic around the excavation;
3) Too much weight near the sides of an excavation, most frequently from equipment or the excavated material (spoil pile) too near to the edge;
4) Water has collected in the excavation;
5) Changes in weather conditions (freezing, melting, sudden heavy rain, etc.)
6) Materials falling on workers in the excavation
7) Falls of people and/or vehicles into the excavation
8) Workers being struck by plant
9) Specialist equipment such as pneumatic drills
10) Hazardous substances particularly near the site of current or former industrial processes
11) Proximity of stored materials, waste materials or plant
12) Proximity of adjacent buildings or structures and their stability
13) The three main causes of such accidents are:
14) Overturning on slopes and at the edges of excavations
15) Poorly maintained braking systems, and
16) Driver error due to lack of training and/or inexperience.



Fig: Excavation Hazard

IV. RISK CONTROL METHODS

A. *Hazards Prevention And Control*

Effective controls protect workers from workplace hazards; help avoid injuries, illnesses, and incidents; minimize or eliminate safety and health risks; and help employers provide workers with safe and healthful working conditions. The processes described in this section will help employers prevent and control hazards identified in the previous section. To effectively control and prevent hazards, employers should:

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1) Involve workers, who often have the best understanding of the conditions that create hazards and insights into how they can be controlled.
2) Identify and evaluate options for controlling hazards, using a "hierarchy of controls."
3) Use a hazard control plan to guide the selection and implementation of controls and implement controls according to the plan.
4) Develop plans with measures to protect workers during emergencies and non-routine activities.
5) Evaluate the effectiveness of existing controls to determine whether they continue to provide protection, or whether different controls may be more effective. Review new technologies for their potential to be more protective, more reliable, or less costly.

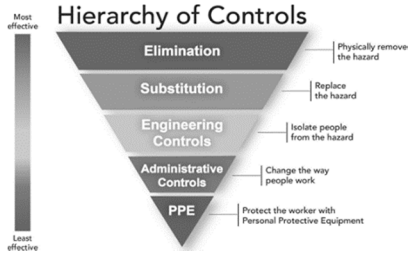


Fig: Hierarchy of Risk Control

The Hierarchy Of Risk Control Implementation (Height Work)

Definitions	Explanation
Activity	Fixing logo on top of the floor
Default Method Statement	Man working above the scaffold to fix the logo
Main Hazard	There will be eject a scaffolding outside of the building. Workers will perform necessary operations on the activity floor.
Main Risk	Fall from height (fall from scaffold)
Effects/Damages	Death, injury
Risk Control Parameters	Using pre-patterned logo to eliminate long time work.
Elimination	Because working on the scaffold is often a risky operation, mast-type risers can be used that are less risky than scaffold.
Changing work methods/ patterns	By changing the isolation method, the factors that cause the main danger can be removed. Precast / insulated facade covering materials can be selected for this.
Reduced or limited time exposure	It may be preferable to reduce the working time at the height according to the working environment conditions (wind, temperature, etc.).
Engineering controls	Consideration should be given to collective protection measures (railing, safety net, ground area limitation, etc.) related to working at high altitude.
Good housekeeping	Cleaning of the work platforms should be provided to reduce the risk of high material dropping.
Safe systems of work	Precautions against the risks to be encountered at each step of the work flow diagram should be described. The work permit system must be applied before starting work.
Training and information	Special training should be given on work on height, manual lifting. Information on the equipment to be used must be provided.
Personal protective equipment	Life line, safety belts, helmets and other personal protective equipment, in particular in accordance with EN norms for working at high altitudes, must be provided.
Welfare	Measures to improve working environment and welfare conditions of employees (meal arrangements, break-in, etc.) should be taken.
Monitoring and supervision	During the operation, it should be ensured that a supervisor checks the rules.
Reviews	All documented work should be reviewed, and necessary improvements should be made in the safe working method.
New Method Statement	As a result of the evaluations made, it was decided to change this construction method as follows: • Precast dressing is not suitable for the project. Although it was decided to use XPS material on the exterior, it was decided that the material installation work should be done by man lift rather than by scaffolding. • It is agreed that other security measures should be followed as described.

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V. RECOMMENDATIONS

A. The Employers and contractors should follow all the consistent with national Laws and Regulations to ensure the health and safety of workers .The maintaining a workplace that has minimal risks and accidents that can result in injury or death. Separate HSE personnel should be employed to monitor Health and Safety at site.

B. Employers must make an risk assessment for the specific work carried out at the construction activities and a significant precautions to be framed and executed and the same has to be recorded for review and improvement.

C. The contractors must take responsibility for the safety of their work force by keeping a policy and executing, monitoring and updating to time to time and record all the injuries and fatal accidents and report the same to enforcing Government authorities within the time limit.

D. The employer must consider safety while assigning a contractor. The cost of Personal Protective Equipment and all Safety gadgets should be covered in the work order itself.

E. The site engineers should be responsible to create awareness regarding Health and Safety to all the work force.

F. Proper Induction should be given to all labours before entering the site regarding the Health and Safety .

G. The PPE'S issued to the workers must be maintained by them and in case of damage or worn-out it should be replaced and supervisors must check for the condition fo the equipment in a regular basis.

H. In order to enhance the role of management in health and safety the existing legislation should be The management should take necessary action to implement the Health and Safety culture to contractors, labours and Staffs and a massive training and motivational program.

VI. RESULT AND DISCUSSION

Occupational fatalities, injuries and disease constitute defects as they are not project requirements. In fact, completing an activity without injury or disease constitutes successful completion. As health and safety also complements the successful completion of a project which includes completion on schedule, within budget, to quality requirements without damaging the environment and without incurring disease, fatalities or injuries, it is an indispensable project parameter. The performance standard for health and safety is 'zero injuries' as with 'zero defect' for quality. The system for health and safety and quality is prevention, as medical care, rehabilitation, pensions payable in the case of fatalities, and rework, all result in increased cost of resources. The system of measurement for quality is the cost of non-conformance , the cost of doing things wrong, and for health and safety, the cost of accidents. Inadequate or the lack of occupational health and safety increases project risk, and negatively affects cost, productivity, quality, schedule, the environment, and client satisfaction; procurement systems, project duration, design, detail and specification influence occupational health and safety, and project managers influence occupational health and safety during all phases of a construction project .Increasing worldwide concern for healthy and safe workplaces and work processes amplifies the need for the inclusion of occupational health and safety and the environment as best practice criteria benchmarked against, among others, zero injuries, disease and defects, and ultimately client satisfaction. Occupational fatalities, injuries and disease result in considerable human suffering and affect not only the workers directly involved, but their families and communities and contribute to the national cost of medical care and rehabilitation. Initially studying all the work involved in construction site and noted. Then the alternative method for safety management system to improving the positive safety culture. Taking the more safety meeting and discussing with corresponding project managers, safety representative and all labours for safe work. Very difficult to implement new work method and procedure in site. With the management support all the possible corrective measurement was taken. After taking correction, improvement in health and safety is noted.

VII. CONCLUSION

Many construction company has no proper safety management system. Inadequate safety causes health related issues to the workers and economically high risk to the organization. This construction site have adopted Safety systems, but due to non-implementing the same, the system is ineffective. Initially discuss with management about health and safety management system and non-compliance in current safety systems and procedures which includes, inadequate training and motivation for both supervisors and labours, lack of awareness about hazard, risk, property damage, time loss, indirect cost, etc. Finding the alternative training methods instead of existing method and implemented in construction site. All staffs and labours were trained by classroom training and mock drill training at the site and they should be educated about the importance of safety systems, which is a life protector and also safe guards the economic status of the firm. After the creating awareness about the importance of safety to workers, possible alternative work procedure, training, and to employ a Safety person to implement, to monitor and update the Safety culture at site. Implementing the alternative training methods instead of existing method in the construction site and to give motivation to staff and workers will also improve the safety culture.

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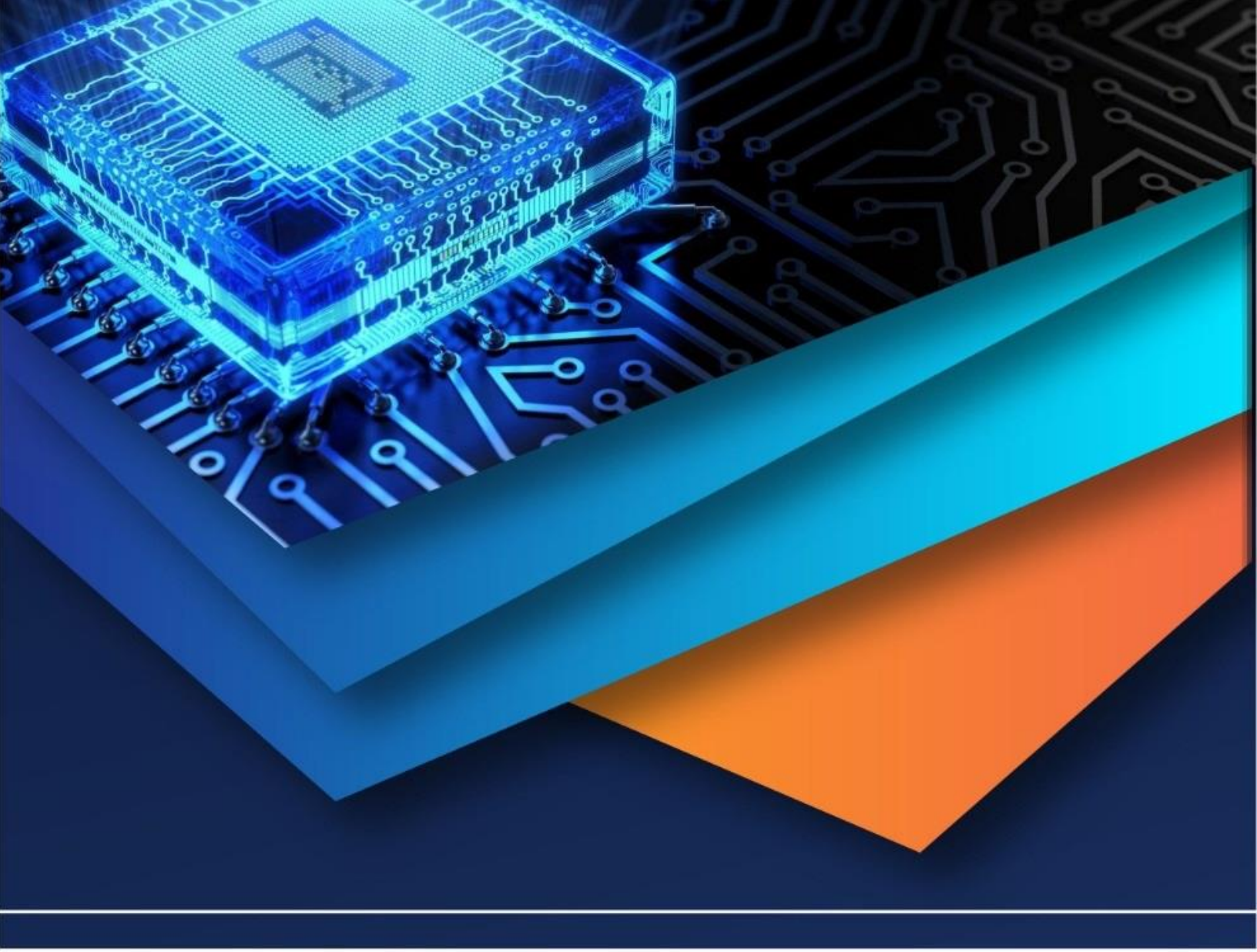
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