

A Study on Proactive EHS Management System and Its Implementation in Construction Industry

Dhivaagar S*, Raja V K M, Muthu Mariappan P

Department of Civil, C.A.R.E Group of Institutions, Tiruchirappalli, India

Abstract- Construction activity in India has travelled a long distance in a relatively short period of time. The social concern of safety of construction workers and their protection against injury arising out of their employment is quite evident for a long term. Measures are taken to translate social concern into programs of action-legislative. This Projects Aims at Providing a Healthy & Safe job environment for all workers to carry out their tasks and responsibilities and thus by minimizing impacts of accidents. Therefore it develops a workplace- atmosphere where constant improvement and learning from errors are embraced by all employees. It also afford training to all employees to understand the risky hazards and appropriate control measures.

Keywords- *Healthy & Safe work environment, control measures, risky hazards.*

I. INTRODUCTION

Construction activity in India has travelled a long distance in a relatively short period of time. The social concern of safety of construction workers and their protection against injury arising out of their employment is quite evident for a long term. Measures are taken to translate social concern into programmers" of action-legislative, administration, education does not bring desired result thus happened due to peculiar nature of industry.

Construction projects are dynamic they are characterized by many factors such as –frequent work team rotation , exposure to weather conditions , high proportion of unskilled and temporary workers. Construction sites undergo change in topography, topology, working conditions throughout the duration of project. In general, accidents at work occur due to lack of knowledge or training, lack of supervision, lack of means to carry out work safely, carelessness.

The reasons for considering safety include

- i. Humanitarian concern
- ii. Economic reasons
- iii. Laws and regulations
- iv. Organisational image

A. Safety Culture

Accidents cause several damages in terms of materials loss, injury and damage to men and machinery. Apart from being expensive accidents lower the rate and result in lower production rates. As a group companies with excellent safety records probably have more satisfied workers than the companies with high accident occurrence and frequency. Thus, accident prevention becomes vital anxiety in the modern industries. Safety way of life is very

lenient and the persons in the safety department they do not have fundamental engineering skills and qualifications. Concerns must take action to place only capable employees not like safety officers. Most of the persons in the safety department are from non-engineering background. They do not know how to check and inspect the cranes, equipment's and machineries. Mainly the accidents in the construction are related to wrong operation, equipment's failure and lack of experience operator. Around 98% of the identical accidents are preventable and of these 90% occur due to improper faulty inspection, inability of the employee, bad discipline, lack of concentration, mental or physical unfit for the job. These factors can be eliminated by adequate careful supervision and job placement of employees.

B. Causes of Accidents

The main causes for accidents proneness due to differences in physiological and psychological in individuals are responsible for a certain mode of behaviour of people. The demographic factors of workers like Age – Young and old get involved more frequently, Experience, mental ability, Emotional factors – emotionally depressed, fear, nervousness, worry, impulsiveness, etc. , Vision, Health - diseases like T.B, diabetes, sleeping, Physically impaired etc. On the occurrence of any accident, impartial analysis of what had actually triggered the accident, extent of damage, people who were injured, compensation, work damage, safety lapses and then the report to contain safeguards to be adhered to records.

It is roughly estimated that about 8.5 million labours in the country are engaged in construction and other building works. Construction and other building are one of the vulnerable and most numerous segments of the unorganized workers in India. The construction and other building works are categorized by their integral risk to the limb and life of the employees. The job is also categorized by its careless nature, provisional relationship between owner and employee, tentative working hours, inadequate basic amenities and lack of welfare facilities. In the absence of sufficient statutory terms and provisions, the essential information concerning the nature and number of accidents is also not forthcoming. "The building and other construction workers (regulations of employment and conditions of service), act 1996" passed to control and regulate the conditions of service along with employment of construction and other building workers and to render for their health, safety and welfare measures as well as for other affairs associated therewith.

C. Need for this Study

In Construction Industry all accidents are preventable, unless it's thought and executed proactively. Reactive measures are followed and adopted once if accident occurs but proactive thinking can eliminate the accidents well ahead of its occurrence. Hence, a proactive EHS management system is evolved; this system clearly defines roles, responsibilities, actions to be taken to maintain Environment, Health and Safety effectively in a project.

Environmental aspects, impacts, considerations are defined as to eliminate and prevent environment. It ensures employees working in a healthy and a safe environment. It identifies the risk involved in a particular activity. Several proactive safety considerations such as safe to start card, work permits, near miss report, observation reports and pep talks are parameters considered for evaluating proactive EHS performance. It has gained a significant importance for improving safety. If certain implementation procedures and suggestions are improved it will result in a proactive tool to identify, avoid and eliminate construction accidents.

II. RESEARCH OBJECTIVES

- i. To study EHS implementation at different construction sites and employees
- ii. To Identify the environmental and health aspects of the employees that has to be improved
- iii. To identify the project activity that causes permanent disabling injuries and fatalities
- iv. To suggest measure to avoid environmental, health and safety hazards at various construction sites

III. RESEARCH METHODOLOGY

This chapter deals with the methodology followed to identify and analysis the causes of hazards. The methodology of the study is given as a flow chart.

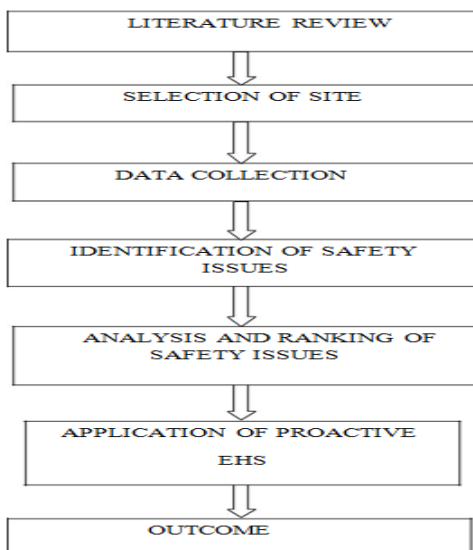


Fig.1. Summary of Methodology Used In This Research

A. Methods of Data Collection

There are two types of data collection namely primary and secondary data to ensure the values to some extent.

Primary Data

Primary data is the data collected for the first time through field survey. Such data are collected with specific set of objectives to assess the current status of any variable studied. This has been used to collect the data for the purpose of this study. The method followed in obtaining the primary data was through the structured questionnaire.

Secondary Data

These are the data, which are previously gathered by the researchers and authors. These are more readily available and often help refine the research questions. Here the data pertinent to the migrant workers has been taken from various sources.

B. Risk Assessment Matrix

		Severity				
		Minor	Moderate	High	Very High	Extreme
		Results in negligible emissions to air, water or land; use of natural resources, significantly reduced	Results in well controlled & minimal emissions to air, water or land; use of natural resources reduced by conservation measures	Results in controlled emissions to air, water or land; use of natural resources not controlled	Results in uncontrolled emissions to air, water or land; significant use of energy, water, natural resources	Results in severe ecological damage; large scale use of nonrenewable energy, water, natural resources
Likelihood		1	2	3	4	5
Limited	Impact not expected at this site; control in place to minimize impact;	1	2	3	4	5
Possible	Impact not expected at this site, but could still occur;					
Occasional	Impact can occur at a frequency not more than once in a year					
Periodic	Impact can occur at regular intervals; once in a month					
Routine	Impact can occur through everyday operations;					
		Low		Medium		High

Fig.2 EHS Risk Assessment Matrix

- The assessment matrix is a 5 by 5 matrix that is used for qualitative assessments of Aspect & Impact.
- The vertical axis represents increasing likelihood

(levels 1 to 5) of the occurrence. The horizontal axis represents increasing consequences (severity levels 1 to 5) in terms of harm to people.

- Boxes in the matrix represent levels of risk, increasing from top left to bottom right corners of the matrix.
- The matrix is divided into blue, yellow and red areas to illustrate the increasing level of risk.
- Once the likelihood and severity have been established, the risk level can be determined from the risk matrix.
- The intersection of Severity column and likelihood row indicates risk level.

IV. IDENTIFICATION OF FACTORS

The major hazard factors identified in the residential projects are illustrated below

- i. Safety
- ii. Labour
- iii. Environmental
- iv. Electrical
- v. Equipment
- vi. Quality
- vii. Scaffolding
- viii. Excavation

V. ANALYSIS AND RESULTS

The preliminary questionnaire survey was made with the following list of companies to understand the EHS management system used in construction.

TABLE II: SITE DETAILS

LIST OF COMPANIES	LOCATION
RED CORAL PROPERTIES	BANGALORE
NCC LTD	BANGALORE
SHRIRAM EPG LTD	THIRUNELVELI
SHREE BUILDERS	CHENNAI
P S BUILDERS	MADURAI
URC INFOTECH PVC LTD	ERODE
R.K.BUILDERS	CHENNAI
ICON BUILDERS	COIMBATORE
SHARAN BUILDERS	CHENNAI
L & T CONSTRUCTION	CHENNAI

A. EHS risk assessment matrix

Hazard:

Source, situation or act with a potential in terms of human injury or ill health

Risk:

Combination of likelihood of a happening of

hazardous incident or exposures and the severity of ill health or injury so as to can be caused by incident or exposure

Environmental Aspect:

Elements of organization activities or services that can interact with environment

Example – Emission, Spillage, Oil, water, Noise

Environmental Impact:

Any change to surroundings whether beneficial or adverse, partially or wholly resulting from organizational environmental aspect

Example – Pollution, Depletion of resources

Activity	Environmental Aspect	Frequency	Risk Impact Level	Remedial Control measure
Batching Plant	Excessive Noise	Weekly	HIGH	Regular maintenance is carried out.
Batching Plant	Dust	Daily	HIGH	Water sprinkling system is implemented.
Earth Moving Equipment	Excessive Noise	Daily	HIGH	Silencer of the equipment shall be in good condition to suppress the noise of the engine and the workmen and the operator shall use earplugs.
Earth Moving Equipment	Exhaust Emission	Daily	HIGH	Engine of the earthmoving equipment shall be maintained to control emission to air.

TABLE II: EHS CONTROL MEASURES

VI. RESULTS AND CONCLUSION

The conclusions of the study that made are:

This Project intended to provide a Healthy & Safe work atmosphere for all workers to conduct their tasks and responsibilities and thus by reducing impacts of accidents. Therefore recommended a workplace- atmosphere where constant improvement and learning from errors are embraced by all workers. It also afford training to all employees to understand the risky hazards and appropriate control measures.

- i. EHS management system implementation at different construction sites are observed and studied through a questionnaire survey.
- ii. Existing environmental and health aspects of the employees are assessed as well as recommendations are provided to improve it.

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