Journal of Advances and Scholarly Researches in Allied Education
Vol. 16, Issue No. 11, November-2019, ISSN 2230-7540

A Study on Construction Safety Management Model System

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Abstract – The research studies because construction site accidents are caused in India and how they can reduce constructional accidents. This Article analyzes in greater detail the factors that affect safety at construction sites. Discuss the strategies that companies in India follow to provide protection at work and, ultimately, look at the best approaches to introduce safety management procedures in the construction industry.

Key Words – Construction Industry, Safety, Management

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INTRODUCTION

Construct health is a big challenge worldwide because of its special existence. To boost this condition, many nations have enacted laws governing on-site healthy workplace conditions such as Canada, Singapore and the United Kingdom. A supporter of self-administration activism. Several building firms have begun to systematically implement effective methods of protection management.

The main part of construction of Finite is built of developing countries including India with an 11at in terms of its infrastructure and manufacturing industry. Building stray is rising as rapidly. Fat is the absence of the wakening protection and health unit. This is partly attributed to the lack of representative structures and the flawless application of uniform rules. A health management program for the building industry must also be built.

TOTAL CONSTRUCTION SAFETY MANAGEMEW SYSTEM (TCSMS) MODEL

In the current research the latest Spurn model was built for Total Construction Safety Management (Figure 1.1). It is a three-phase approach:

1) Stage of strategy and preparing,

2) Stage of deployment and operation;

3) Group intervention and control process.

Health Safety Environment HSE Policy

Top level management defines the protection strategy that encompasses the purpose, reach, legal obligation, obligation to enforce the protection of any individual of a company and quality development by addressing of HSE meetings all staff and staff under the department. Present at project headquarters, boards of note, camp of workers, canteen and extraordinary place.

Customer requirements

It is a condition that the customer sends us before putting an order.

Legal requirements

Onsite review and accordance with the following legal specifications should be provided. If any other customer-specified statutory requirement is also taken into account.

UM of applicable legal Requirements

- Building and Other construction workers (regulation of employment and condition of service) act 1995 and rules
- Petroleum Act 1934 and Petroleum Rules, 2002
- Motor Vehicles Act, 1988
- Explosives Act, 1811

- Gas cylinder Rules, 2004
- Indian Electricity Act, 2003 and Rules, 1955
- Air (Prevention and Control of Pollution) Act, 1951
- Water (Prevention and Control of Pollution) Act 1974, and Rules, 1975
- The Noise Pollution (Regulation and Control) Rules, 2000
- Batteries (Management and Handling) Rules, 2001
- Environment Protection Act. 1985 and Rules, 1985
- Bio-Medical Waste (Management and Handling) Rules, 1998 etc."

Management review

Management will assess the state of occupational health execution and results. Accident reports, regulatory enforcement and company criteria for quality enhancement as regular interval.

Phase 1 - Planning and Preparation Phase (Figure 1.1)

In this phase, the safety program must be initiated by construction organizations, via an effective pm planning and resource development process. During this period, organizations need to establish a vision, develop a strong senior management commitment, and develop a training plan for employees. And will ensure that the software modifications are accommodated by all operational tools. In summary, the recently developed total model for the management of construction safety is shown in Figure 1.1.

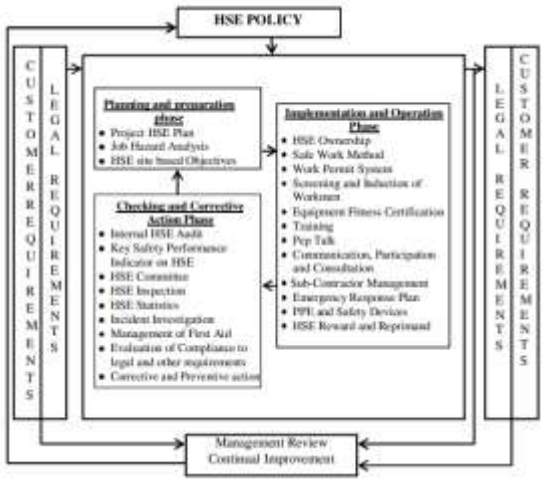

Figure 1.1 Total Construction Safety Management Model

In the planning process it is necessary to consider: i. Plan A site HSE plan is planned as a new work falls along. Project Health Protection Atmosphere (HSE) Program It requires specific protection monitoring criteria to be tracked on location.

- Highlights of the plant.
- Diagram of structure.
- The responsibilities and tasks.
- Statutes, regulations and guidelines available.
- Policies and general workplace health laws.
- Recognition and effective protection procedures in high-risk / hazardous activities.
- Machine Research Helps.
- Collection of reviews and records.
- Disaster response action program.
- Database of on-site work-specific personal security equipment.
- Planning program preparation program.

II. Job Hazard Analysis (JHA)

Site engineers schedule the work threat report in coordination with the protection manager and the boss. There are known essential workers with threats and hazards. Such tasks are split into various phases (i.e. sub-activities). Every stage includes defining threats / hazards and implementing effective precautionary steps. Throughout the purposes of execution, work risk identification is distributed among those involved. It aims to deter and take precautionary steps to avoid danger and dangers involved with a job safely. Table 4.1 indicates the model for this work. The checklist would provide essential steps before doing the job.

Table 1.1 Job Hazard analysis format

Sl. No	Activity	Hazards associated with that activity	Precautionary measure to be taken	Responsibility

III. Health Safety Environment tHSE1 site based objectives

After consultation with contractors' representatives that adhere to the protection policies established by the top level management, site-based goals will be established out by the HSE Committee. Based on the following principles, the goal will be:

a. Determine broad criteria in on-site control in patient protection and the atmosphere (HSE).

b. Defining individual duty, avoidance of hazards and the obligation for health protection, at increasing stage of the construction department.

c. Identify and identify coordinated prevention activities in the sense of high-risk operations in the area of the study.

d. Making sure all the applicable law is complied with.

e. Continuous HSE development by working regularly on the key areas for change.

Phase 2 — Implementation and operation Phase (Figure 1.1)

Through this step, safety goals and priorities are established. Education of strategy and rational decision-making on defense systems. The main problems at this point are described below:

i. Health Safety Environment (HSE) Ownership

The tasks, duty and authority for conducting research on safety issues should be described. The treatment is prescribed for management and other workers in the company. Senior management provides demonstrable guidance and dedication in overseeing operations through constructive involvement in HSE. Their leadership and commitments lead to the resources needed for development.

To run and sustain HSE and to meet HSE objectives and legal specifications. CEOs are committed to managing their entire business. 'As Weak as Irrational' (ALARP) costs.

a. Visibility

Table 1.2 demonstrates the management to have solid, tangible guidance and dedication to HSE by presenting a specific example. Management holds HSE seminars. Conduct checks and HSE assessments to maintain a good HSE mindset.

Table 1.2 Management Commitments in Safety Management Systems

Sl. No.	TASK	ACTION BY	TARGET	VERIFICATION DOCUMENT
1.	Project HSE Committee Meeting (Review performance against HSE plans, HSE Objectives and targets and any HSE issues)	Project Manager (PM)	Min Frequency : 1 month	Minutes of Project HSE Committee Meeting
2.	Project HSE Committee Inspection	HSE Committee Members	Min Frequency : 1 month	HSE Inspection Report
3.	Internal HSE Audit	Project Manager (PM)	Once in two Months	Audit Report Including Non Compliance reports, and Site Observation
4.	Motivation: Giving Safety Certificates, with token gift to the "Best safety conscious personnel" of the month to recognise good HSE practices.	Project Manager (PM)	Monthly	Copies of Certificates

b. Proactive in target setting

Project management demonstrates that in the present job the target is pro-active. Table 1.3 indicates.

Table 1.3 Proactive targets selling

No.	TASK	ACTION BY	TARGET	VERIFICATION DOCUMENT
1.	Jointly develop and discuss improvement targets and indicators for each location with Construction Managers and Safety Officer. (e.g. Training of Workmen – Coverage, Inspection Compliance etc)	Project Manager (PM)	Every Quarter	Minutes of meeting (MOM) of Project HSE Committee Meeting
2.	Jointly review the Incidence rate of First Aid Cases/ dangerous occurrence/ lost time injuries and set a target for reduction.	Project Manager (PM)	Every Quarter	MOM of Project HSE Committee Meeting
3.	Management involvement in Accident review and target setting.	Project Manager (PM)	As required / Monthly	Investigation Report

c. Company Safety Culture

The management will strive to create and sustain a organizational atmosphere under which the workers have a wellbeing dedication. The present research in Table 1.4 demonstrates defense and climate.

Table 1.4 Company safety culture

Sl. No.	TASK	ACTION BY	TARGET	VERIFICATION DOCUMENT
1.	Put HSE as the "First agenda" of all review meetings at Head quarters and projects	Project Manager (PM)	All time	MOM
2.	Empowerment to Stop Work: Employees are empowered to stop work when the situation warrants immediate action in view of imminent danger to life / property / environment.	All	All time	Verbal Verification
3.	PM must appreciate and reward those employees whose prompt action helps avoid potential incident.	All	All time	Verbal Verification

d. Involvement of Senior Management

The management reveals its attention to public protection concerns in the present research in Table 1.5.

Table 1.5.involvement of senior management in safety

Sl. No.	TASK	ACTION BY	TARGET	VERIFICATION DOCUMENT
1.	Review Project HSE Performance and HSE plan implementation in consultation with Project Manager and Safety officer.	Senior Management	Project Duration	-
2.	Ensure adequate professional HSE support is available for effectively implementing the HSE plan, fulfilling HSE targets and attaining HSE objectives.	Head of Department – HSE	Project Duration	No evidence of HSE discrepancy due to lack of resources
3.	Ensure sufficient support and resources are available to meet HSE targets (eg Infrastructure, vehicle, HSE steward, communication etc)	Project Manager (PM)	Project Duration	No evidence of HSE discrepancy due to lack of resources
4.	Impart necessary HSE training for Staff and workmen of the project.	Project Manager (PM)	As required	HSE Training record

e. Responsibilities

HSE management is a line responsibility that requires active involvement of all management and oversight levels.

Individual HSE duties and obligations, mission and aim, as listed below, are discussed with individuals for practice. The protection manager's duties are displayed in Table 1.5 in the current job.

Table 1.5 Responsibility of project manager on safety

Sl. No.	TASK	TARGET	VERIFICATION DOCUMENT
1.	Responsible for completion of the project with total implementation of the company's HSE policy requirement, HSE Management System and requirements of this plan and comply with the relevant legislations.	Project Duration	-
2.	Ensure sufficient resources are available at project. He shall ensure through:	Project Duration	1) MOM – Project HSE Committee

Table 1.5 (continued)

	– Reviewing HSE Plan implementation and discuss any outstanding issues in Project HSE Committee Meeting. – Investigating non-compliance and non implemented items.		Meetings 2) HSE audits
3.	Ensure that all staff and workmen are competent to perform their tasks safely in compliance with HSE Management System and this plan requirement. He shall do so by ensuring: – Screening of workmen is effectively implemented by the time office and site execution engineers. – HSE Induction provided for all staff and workmen by Safety officer before deployment. – Regular monitoring and organise continuous in-house HSE trainings.	Project Duration	Screening Record of workmen HSE Induction for Workmen HSE Training Record
4.	Project HSE Inspection and HSE Plan implementation monitoring	Project Duration	Inspection report
5.	Investigate all high potential incidents and non-compliance and ensure immediate remedial action to stop recurrence.	As and when notified	Investigation Reports and action plans

Safety Officer

The safety officer's accountability for the ongoing job is outlined in Table 1.6.

Table 1.6 Responsibility of safety officer

Sl. No.	TASK	TARGET	VERIFICATION DOCUMENT
1.	Disseminate and Communicate HSE Policy, HSE Management System requirements to project personnel.	Project Duration	-
2.	Provide necessary advice, information and support in the effective implementation of the HSE Management System requirements and this HSE plan.	Project Duration	-
3.	Update the HSE Plan to the requirements of the activities being carried out when there is a revision.	Project Duration	HSE Plan

Table 1.6 (continued)

4.	Plan and conduct Internal HSE training programs, initiate drive to promote HSE awareness and performance.	Project Duration	HSE Training Records
5.	Carry out HSE inspection of Work Area, P&M Equipments and Machineries, etc.	As per Monthly Activity Plan	Inspection Reports
6.	Creating HSE awareness through Tool Box talks.	Every day	Tool box talk Report
7.	Advice and co-ordinate with line management in preparing HSE Risk Assessment (i.e. Job Hazard Analysis) for new activities.	Project Duration	HSE Risk assessment Records (Job Hazard Analysis with checklist)
8.	Conduct investigation of all incidents and recommend appropriate corrective measures.	When reported	Investigation Report
9.	Convene HSE Committee meeting and minute the proceedings for circulation and follow-up action.	Min Frequency – Once in a month	MOM – Project HSE Committee Meeting
10.	Advise and co-ordinate for implementation of Work Permit Systems.	Whenever work requiring WPS is executed	Completed Work Permit
11.	Plan procurement of PPE and safety devices and inspect before use as per laid down norms.	Project Duration	Requirement and Release of Safety Materials, Delivery Challan Records
12.	Facilitate screening of workmen and conduct HSE induction.	Project Duration	Screening and Induction Records
13.	Monitor administration of First Aid.	Project Duration	First Aid Register
14.	Conduct Fire Drill, Procure, inspect and arrange to maintain Fire Extinguishers.	As scheduled in the monthly activity plan	Fire Drill Register, Fire extinguishers inspection register

Section / Area In-charges

The section / area roles for the ongoing research are listed in Table 1.7.

Table 1.7 Responsibility of section / area in-charges on safety

Sl. No.	TASK	TARGET	VERIFICATION DOCUMENT
1.	Ensure that all the workmen engaged under him are selected through the screening system and have undergone HSE Induction before assigning any task at site.	Project duration	Screening and HSE induction records
2.	Ensuring compliance of organisation HSE rules and applicable specifications by – Taking prompt action of project inspection and hazard findings. – Closing all the points identified in inspection reports – Ensure Job Hazard analysis with checklist is done for all the jobs under him and implementation in the field.	Project duration	HSE Inspection report, Job Hazard Analysis records
3.	Ensure that all near miss cases / Reportable LTI / Dangerous Occurrence / Fatality are reported promptly.	As and when notified	Reports
4.	Participate regularly in HSE meetings.	As scheduled	MOM

All Employees

Table 1.8 indicates the roles of all workers in this job.

Table 1.8 Responsibility of all employees in organization on Safety

Sl. No.	TASK	TARGET	VERIFICATION DOCUMENT
1.	Report all unsafe acts and condition to the immediate supervisor.	Continuous	-
2.	Start work only when conditions are safe and stop work when it is unsafe.	Continuous	-
3.	Operate equipment only when authorised and in prescribed manner. (If applicable)	Continuous	Inspection records
4.	Report any incident immediately.	Continuous	Reports

Site Engineers

Table 1.9 demonstrates the roles of the site engineer in this series of research.

Table 1.9 Responsibility of site engineer on safety

Sl. No.	TASK	TARGET	VERIFICATION DOCUMENT
1.	Understand the HSE requirements of the Project from this Plan, HSE Management Systems, HSE Manual and follow the same in work execution.	Continuous	No. of findings in the HSE Inspection
2.	Give Tool box talk to the workmen under him.	Daily	Tool box Report
3.	Ensure the workmen under him wear the necessary personal protective equipments relevant to the job.	Continuous	Subcontractor Evaluation Report
4.	Eliminating all unsafe conditions in the workplace.	Continuous	HSE Inspection Report
5.	Keeping the workplace neat and clean	Continuous	HSE Inspection Report
6.	Know the critical activities of his job based on HSE Risk Assessment and ensure implementation of the control measures.	Project Duration	Job Hazard Analysis and Safe work method
7.	Participating with the Safety officer or the committee Members in the Project HSE Inspection.	As per schedule	HSE Inspection Report
8.	Follow all work permit system as per HSE Management System before starting of work.	As and when required	Work Permit System
9.	Report all near miss cases / reportable Lost Time Injuries /dangerous occurrences / fatality to safety officer immediately verbally and submitting the preliminary incident report within 12 hours.	As and when required	Preliminary Incident Report
10.	Inform the concerned authority as per the emergency response plan.	As and when required	Emergency Response Plan

Project IISE Committee Members

The duties of the HSE committee leader of the project; Table 1.10 indicates the ongoing research.

Table 1.10. Responsibility of project HSE committee member on safety

Sl. No.	TASK	TARGET	VERIFICATION DOCUMENT
1.	Attend meeting regularly as per schedule to discuss and decide the ways and means of eliminating the factors affecting HSE.	Minimum once in a month	MOM – HSE Committee Meeting
2.	Analyse all the activities of the forthcoming period and identify the possible hazards and finalizing the precaution to be taken.	Minimum once in a month	MOM – HSE Committee Meeting
3.	Monitor the HSE Performance of the project and suggesting improvements whenever needed.	Minimum once in a month	MOM – HSE Committee Meeting
4.	Actively participate in the HSE Committee Inspections and assess Key Safety Performance Indicators (KSPI) on Health, Safety and Environment.	As per Schedule	HSE Inspection Report, KSPI report

Sub-Contractors

This program provision shall extend to all Subcontractors / vendors / Providers / Third Parties that provide the Project Services. The Project Subcontractor's duty in the present job arc of Table 1.11

Table 1.11 Responsibility of subcontractors on safety

Sl. No.	TASK	TARGET	VERIFICATION DOCUMENT
1.	Understand the HSE code of practice for subcontractors and sign the same as a token of acceptance before starting the activity.	Before starting the activity	HSE Code for Sub contractors
2.	Subcontractor, his Supervisor and his workmen shall adhere all the laid down HSE rules and regulations while working at site, follow the instruction / advice of Site engineer and safety officer from time to time.	Continuous	Key Safety Performance indicator (KSPI)

ii. Safe work =died

A Safe Work Method (SWIM) is a document containing:

- List the forms of construction work being undertaken at elevated risk
- Specifies dangers and threats correlated with health and safety
- Describes the management of the risk. And then
- Describes the application of risk management interventions.

Work permit system

Via Working Permit Schemes, appropriate protection measures against defined hazards are planned and arranged for the execution of such safety measures in order to guarantee stable job efficiency in the specified workplace. The following schemes for job authorization will be considered

- Near room job
- Hot job done at the specified location.
- Granting fitness approval.
- Allow blowing.
- Industrial Radiography results.
- Overhead friction line job.
- P&M and other electricity powered machines are awoken.
- Electrical operation (high voltage (111)1 ILTI low voltage).

- Removal of coven from the barricades / openings.

iv. Screening and recruitment of employees all prospective staff are screened before they are involved in the workplace, i.e., the diagnostic examination. Their limes and previous knowledge are checked to see if they are suited to a specific mission. The safety engineer provides new staff health training, including information regarding specific threats and associated steps. Health engineer It guarantees correct citizens to operate and sell properly.

v. Equipment anew certification

The equipment shall have historical certificates and the required authorization for the third party (if appropriate) during activation of the equipment.

The dimension of the bad features should be tested before implementation at this location.

vi. Training

A safety management feature is an essential part of instruction. Personnel preparation requirements are defined and preparation matrix configured as seen. The curriculum changes will be carried out periodically or according to the training plan.

- Breast of health at height.
- Public protection (e.g. drilling, franking, concreting, etc.).
- Secure forms of erection and mounting.
- Plant and equipment health in service.
- Gas cutting and welding protection.
- Scraper protection.
- Fire protection and control.
- Secondary support.
- Safety of energy.
- Security control and security infrastructure update.

vii. Pep Calk

Jobs are made conscious of the possible risks in the work by means of pep talks before they begin every job. We are demonstrated through operating procedures and different precautions. It alerts them about the dangers involved and trains them for appropriate measures. Project mechanics and service technicians hold pep talks.

viii. Communication participation and consultation

The company will still have sufficient contact open. The management of the top level will take part in all the promotional activities in the field of defense, in order to pass the knowledge Iron. In critical activities, lob risk analysis or a safe method of work is prepared. The boss will be contacted by engineers. Workers alms to bring their minds to work. Cascading any ILSE message down the line is essential for the success and the adoption of the following technique by all staff in every IISE management system. The successful defense coordination techniques in Table 1.12.

Table 1.12 Effective communication strategies on safety

Sl. No.	TASK	ACTION BY	TARGET	VERIFICATION DOCUMENT
1	HSE NOTICE BOARD: Fix HSE Notice board at project office and other conspicuous locations for cascading HSE messages such as HSE Notices, Safety Alerts, Posters and incident evaluation etc., and regularly update. Install and maintain HSE performance board showing Safety statistics i.e. days without Lost time injuries etc.	Safety Officer	Daily / Weekly update	HSE Notice Board
2	PROMOTION: Monthly Incentive Select "Safe Man of the month" on the basis of HSE performance evaluation and award certificate of commendation along with a token gift.	PM / Safety Officer	Monthly	–

ix. Sub-contractor management

Key Safety Performance Indicator (KSPI) is the instruments that can clearly show the position of sub-contractors in terms of health. The main protection success measure tests the management of the sub-contractor for health. y. Plan of Emergency Action

A plan for various fire-like emergencies has been developed. Emergencies in the medical sector. Structural failure, the natural catastrophe, etc ... this can contribute to an immediate response plan and management liability. (xi) Personal protection and safety equipment (PPE)

The least preferred method of safeguarding staff from danger is often identified as personal protective equipment (PPE). This is not to be employed where other measures have failed to eliminate or separate the risk. "Against dangerous substances or energies.

CONCLUSION

Within this analysis for the construction industry, a new comprehensive construction protection

management model was created. Throughout the quantitative and qualitative research it has been noted that a model for the safety management of Indian construction industry factors is needed. It work has also introduced a modern general comprehensive protection control paradigm for building sites exclusively. In this study, the proposed design paradigm would slash the rates of injuries (ie. overall structures health management scheme) in the construction industry. i. It is a clear model: if all the precautions are taken, the incident risk on construction sites will be that. Overall, this holistic approach to safety management should boost construction site protection efficiency.

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