

## **Safety Management system (SMS) in Construction industries**

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### **1. ABSTRACT**

Construction industries is Hazardous prone industries. Every year several people killed & several injured due to unawareness of safety rule. At construction site day by day activity changes, so need to take adequate control measure to control risk at workplace. Construction industries playing vital role to growth of country. Construction industries has positive and Negative impacts. Positive impacts is good for country development and it create employment opportunities. Negative impacts is injury, Death of person and damage of environment that is very bad for any country. Numbers of people injured and several killed due to ineffective safety management system in construction industries. Effective safety management system always help to create safe healthy work environment. Accident is defined as event that may cause of injury, damage to property, Damage to work place environment or combination of these. Cost of accident are direct & indirect cost and indirect cost of accident are several times more that direct cost. The main objective of the paper is to analyse the effective safety management system at workplace to control Risk and prevent any type of harm that occur at construction site. Hazard is defined as source or situation that have potential to lead cause of injury, Damage to property, Damage to environment or combination of these.

The study indicated the positive impacts of implementing safety norms and procedures for reducing harm. It focuses the standard practices to achieving standard safety culture at construction site. Positive Impacts have greater significance to complete construction work on minor harm or no harm. This help to complete construction work within time frame to achieved better relation with employees & stake holder and negative impacts always effect to construction work and increases project cost. This may be causes of prosecution by legal or govt. authority. Respective country or state Government make rules & regulation to Protect to people and environment and It is responsibility to follow and comply at site is of employer.

## **2. Keywords:**

Safety Management system (SMS) in construction industries, Hazard identification & its control Prevention strategies, Risk Management

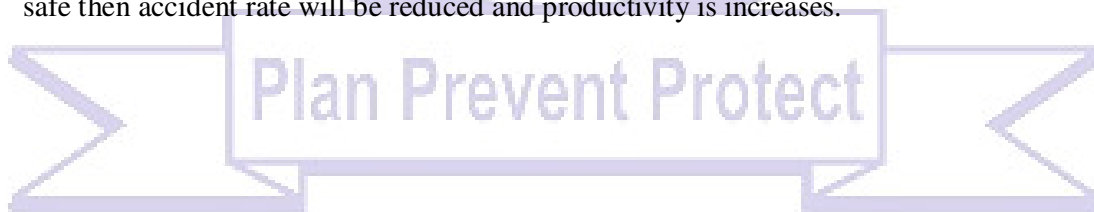
## **3. Introduction:**

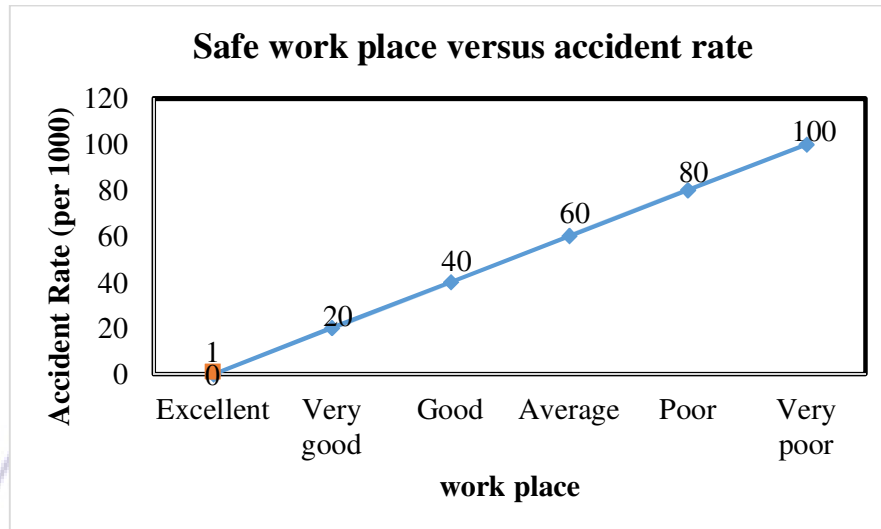
Safety management system is systematically approach to managing health and safety risk at workplace. Safety management system help to minimise risk as low a reasonable practicable (ALARP) and creating safe healthy work environment. Safety Management system (SMS) help to improve safety performance and ensuring Environment Health & Safety (EHS) compliances. Good health and safety management practices encourage higher staff retention and increased productivity. SMS play vital role to create safe healthy work environment, maintain better relation with stakeholders and improve organisation Safety performance. Organisation always effect due to poor SMS system and now a day's effective SMS required for every organisation to manage Safety at workplace and growing their business. Now Numbers of governmental and non-governmental organisation working in field of safety to protect the environment as well as human beings.

Safety is important because it protects to person, organisational property and Environment. Safety Management system (SMS) help to increase profitability of any organisation and help to protect from prosecution, maintain good relation with stakeholder. Management, Legal and Social point of view effective Safety Management system (SMS) required on priority basis for every organisation.

### **3.1 Safe work place versus Accident Rate graph**

Safe work place is inversely proportional to accident Rate. When work place will be safe then accident rate will be reduced and productivity is increases.





**Fig. 1.1: Safe work place versus Accident Rate**

$$\text{Accident Rate} = \frac{\text{Total Nos. of Accident}}{\text{Average Nos. of Employees}} \times 1000$$

In India central government passed The Building & Other Construction Workers (Regulation of Employment and Conditions of Services) Act, 1996 for ensuring safety in construction industries. Apart from This Government have make different rule & regulation Like the Factories Act 1948 to ensuring safety compliance inside factories. Similarly in foreign, respective government make Rule & regulation to ensure compliance to prevent accident & protect environment.

#### 4. Objective

Objective to manage safety in construction industries are

- Controlling Risk at work place.
- Reducing work injury & cost arises due to injury like medical expenses, injured employees wages, Replacement of labour cost, Poor reputation of organisation & legal expenses etc.
- Increasing Employees Moral.
- Protection from prosecution by legal authority.
- Help to improve safety performance & finding opportunities for improvement.
- Maintain better relation with stakeholder & enhancing organisation reputation.

#### **4. Causes of Accident in Construction Industries**

Human & mechanical Failure are root cause of accident. In other terms human failure is known as unsafe acts and mechanical failure is known as unsafe condition. When unsafe acts and unsafe condition meet at one place accident happened. Such condition create due to unawareness of safety, availability of hazard at work place, overconfidence, work load, health problem of working people.

#### **5. Hazard in Construction industries**

Material shifting, Material Loading & unloading, Vehicle movement, Excavation, Civil activity like excavation, Reinforcement, Concrete job, Scaffolding erection & Dismantling Job, shuttering & De-shuttering job, Fabrication, welding, Gas cutting, Grinding, Erection, Lifting, painting work, Electrical power cable laying, panel erection, commissioning, Working at height, working in confined space like activity carried out at construction site. Common types of Hazard found in construction industries are;

- Fall of person due to poor workmanship, loss of balance, uneven surface, floor opening, poor work platform, working at height without using full body harness, Defective ladder or stair, slippery floor, Loose material in assess etc.
- Fall of material due to failure of lifting appliances, Tools & tackles, loose material keeping at edge on height or near floor opening, Poor method of Material lifting & shifting etc.
- Mechanical hazard (entanglement, contact with sharp edge, Ejection of particle during grinding like job).
- Electrical hazard Like Fire, Electrocution, Burn injury, Fall due to electrical shock.
- Fire Hazard due to hot job near flammable material, Inadequate storage of Flammable material metal storage tank, Smoking,
- Physical Hazard like heat, Poor illumination, Cold stress,
- Environmental hazard like dust, fumes, Gases, NO<sub>x</sub>, SO<sub>x</sub>, Noise
- Ergonomical hazard includes repetitive movement, manual handling, workplace/job/task design, uncomfortable workstation and poor body positioning
- Chemical hazard like dust, fumes, gases create central nervous system problem & respiratory problem due to inhalation and create skin problem when come in its contact.

- Vehicle movement may cause of hit to person, Hit to object or Collision or topples  
Long term exposure of Noise create Hearing loss & Known as Noise induced hearing Loss (NIHL). Vibration create vibration induced white finger.

After collection & examined data of Accident of three construction industries in Raipur area, it is found that 65-70 Percent accident happened at construction Site are due to person falling or Material falling on person body and it may lead to cause of injury or fatality.

## **6. Safety Management in Construction Industries**

To Manage Safety at construction site, There is need to identify hazard that are present at site. Hazard at construction site may be identified by specialist, engineers, Supervisor, Safety Personnel and concerns. Numbers of techniques like Site safety inspection, Job Safety Analysis, Hazard identification & Risk assessment, Safety survey, Safety Audit, Near Miss/ Incident investigation like Techniques used to identify hazard. Apart from this Construction work activity safety checklist, previous injury report also help to find work place hazard. Near miss should be investigated to identify root causes and taking corrective & preventive action to avoid similar future incident. Hazard can be controlled at construction site to Eliminate Hazard or Isolate Hazard, or Engineering control or Administrative control. If this method is not applicable to control hazard, then we may use suitable Personnel Protective equipment (PPE's). PPE's not prevent likelihood of hazardous event, it only minimise the severity of Hazardous event.

To avoid any types of undesired event at construction site there is need to prevent human & mechanical failure. Safety culture is important parameter that help to prevent accident or harm. Regular Supervision required of site by competent supervisor and safety Awareness Program including Training must be conducted. Strictly enforcement of safety norms help to make Accident free to construction site. Element of Safety Management System of Construction industries is, Safety Policy, Planning, Implementation & operation, Checking & corrective action, Management Review and continual improvement.

## Conclusion

Safety Management system is major parts to Reducing work injury & cost arises due to injury. Poor Safety Management system effect to business and productivity decreases. Accordingly Priority of Risk, Safety control measure to be taken. High level of supervision by skilled and experience person help to identify hazard and control Risk. Fall hazard may be controlled to ensure suitable access, suitable work platform, use of harness, suitable Planning and use of standard lifting equipments. Proactive approach to be adopted to control risk. All element of Safety management system of Construction industries must be identified and ensure compliance according.

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