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Improving the Safety Management System and the Health and Safety of Construction Workers in the Workplace

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ABSTRACT: A safety management system (SMS) is described as a set of rules and procedures that businesses use to limit the number of accidents and illnesses that occur on the job. One of the most significant concerns we should make before beginning any building project is the safety of the workers and the general public. It is especially vital in the construction business to maintain health and safety standards since the profession is prone to hazardous situations and may be harmful at times. The SMS was used in the construction sector to decrease the danger of deaths and injuries, as well as to prevent material waste. This study was done to better understand the causes of accidents, the elements that influence safety, and the preventative measures, as well as to enhance the application of SMS on construction sites. The SMS addresses specific causes of accidents, it also addresses the most important concerns regarding accidents. Instead, it ensures that the effort is multifaceted, focused on issues rather than deadlines, and that it continues throughout the project's life cycle, independent of changes in people.

KEYWORDS: Construction, Industry, Health, Safety Management System (SMS), Workers.

1. INTRODUCTION

Due to the poor safety record of the construction sector in India, which is still far from fulfilling the Zero-injury objective, the Indian population as well as its economy have suffered both in terms of human and financial losses. As a consequence, effective safety management systems are critical components of ongoing efforts to improve overall safety performance. Employee health as well as safety, despite advancements in the technological application of good work-related health and safety management systems, continues to be the most crucial area in need of improvement in the construction sector. One of the most important considerations we should undertake before commencing any construction project is health and safety. Excavation, steel erection, and working at varying heights are all considered high-risk activities in the construction industry since they include dangerous and complex procedures such as these. An SMS is a full system that is designed to accomplish the safety elements of the workplace. Policy, goals, strategies, processes, organisations, responsibilities, and other initiatives aimed at improving safety are all included in this category [1], [2].

A hazard is a kind of danger that may manifest itself at any time and without warning. A large number of construction employees are subjected to unsafe working conditions as well as unfair labour practices. Building a culture of health and safety around construction activities is important for the physical and mental well-being of construction workers as well as individuals whose health is likely to be adversely affected by construction operations. To be safe, you must ensure that safety management is carried out correctly. This implies that it must be completed for every aspect of your task, from the beginning of the project to the end of the final employee's shift. The safety of workers in the construction industry is vital since it is a high-risk industry that involves everything from house building and bridge construction to road paving and excavation, to waterproofing and large-scale painting projects, among other things. The establishment of a risk-free workplace and the reduction of pollution are key components of the system's operation.

The long-term success of any company's development is contingent on the health and safety of its personnel at their place of employment. While the hazards associated with running a successful business vary from one workplace to the next, the risks associated with running a successful company are typically the same regardless of the sector in which the company is situated. Management systems are the playbook for how a corporation manages all of its moving parts and components, to put it another way [3]. It provides guidelines to assist you in achieving your operational goals while also promoting a culture of safety in the workplace. The complexity of a system is entirely dependent on the size of your company, the documentation requirements, as well as the business processes that need administration, the many stakeholders, the business sector, and even the regulations that govern your organisation. In the majority of cases, a checklist or safety guideline is not adequate for businesses that must go above and beyond just complying with

legislative requirements. Controlling human factors, raising safety awareness, disseminating safety standards to your employees, and working toward accident prevention are all areas where you want to support.

In the context of safety, a safety management system (SMS) is an intentional, methodical way to build a safety culture inside your organisation. It is not only a collection of regulations based on regulatory requirements, such as those enforced by the Occupational Safety and Health Administration (OSHA) or the Health and Safety Executive (HSE), but is also a set of values and principles [4], [5]. The SMS is a collection of management characteristics that have been found and verified by professionals, and it is used to develop and execute strategies in business organizations. These tactics will aid you in acquiring and keeping control within a process structure.

A safety management system's evaluation process might take a long time to complete and is seldom finished in its entirety. It ought to be a cyclical operation that takes place once a year at the very least. It is doubtful that you would have an understanding of what is successful and what is not if you are not regularly assessing the performance and effectiveness of your SMS. As a result, it will be unable to identify and decrease the number of holes that need to be filled or filled in. SMS deployment will be effective if there is continuous improvement, monitoring, competence, as well as accountability on the part of all parties involved. To conduct a full review of your present practices, you must involve a bigger part of your workforce. A solo effort will not be sufficient to complete the assignment. Because they are accountable for the day-by-day administration of the system, leaders and managers must participate in the process. Participants in this discussion should include those who will be impacted by the management system and those who will be responsible for facilitating change [6].

If the evaluation is done correctly, it will be able to design and execute an effective SMS inside your organization. A systematic approach paired with effective program monitoring may aid you in decreasing the costs of injury, illness, and property damage, which can help you save money. With a systematic approach, problems in the manufacturing process will be identified much more quickly, which will improve overall productivity. The cost of not implementing these processes within a Safety Management System framework may be much more than the cost of doing so within a non-SMS framework when executed within an SMS framework.

1.1. Difficulties with the Execution of the Safety Management Systems:

He has conducted studies and established which obstacles to the application of the overall SMS are the most effective, and he has completed his analysis and conclusions on the subject [7]. Detailed explanations of the major and sub-components are provided below in Figure 1.

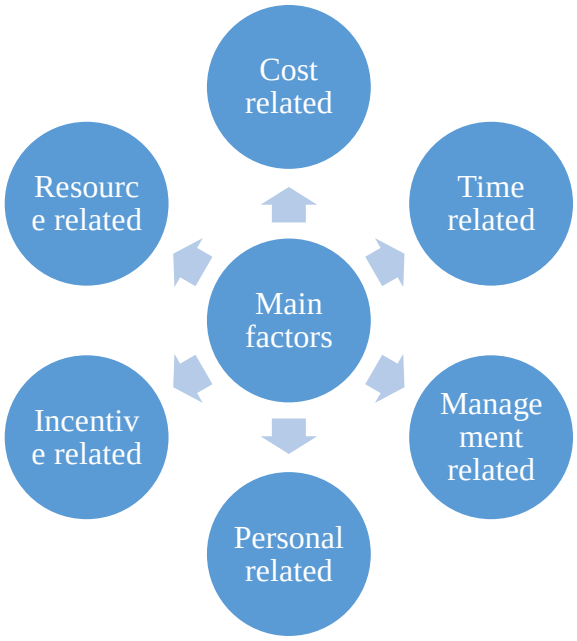

Figure 1: Illustrating the Main Factors of the Safety Management Systems.

A substantial number of obstacles exist in the design and implementation of SMS. In addition to stakeholder perceptions of the relationship between hazards and causes of accidents, some factors influence the design of SMS, including (1) the division of responsibility for risk management among different parties, including principal workers and their employers; (2) the level of financial, scientific, and human resource abilities of an organization; as well as (3) considerations about the cost-benefit ratio of particular approaches or practices.

1.2. A Safety Management System:

HSE risk management is the act of identifying and coping with health and safety risks in a way that reduces the likelihood of their occurring as well as the severity of their consequences when they do occur. SMS is a framework that may be utilized to assist in the management of health and safety risks at the place of employment. It was in 1980 that the Safety Management System (SMS) was introduced into the construction sector to minimize the frequency of accidents, eliminate hazardous working conditions, and avoid material damage from happening [8]. A safety management system requires not only the investment of labor hours, money, and other resources but also implies that the company may be able to eliminate site safety threats, therefore reducing the loss of time and money, as well as the loss of lives.

A wide range of vital problems, such as safety policy, safe work practices, safety inspections, emergency preparedness, and so on, were also discussed in detail. Sections one and two of this document contain specific guidelines for construction businesses on how they should organize and manage their sites to ensure the safety of their personnel as well as the general public. The development and execution of processes that are intended to promote "safe" planning, controlling, performing, as well as checking of work are made possible through the use of safety management practices and systems of practices. Given that workers are directly responsible for putting these processes into action, the level of worker engagement associated with managing or working within a system of safety management practices is a good indicator of the effectiveness of the system [9] as well as processes may be critical to their success in achieving safe performance as shown in Figure 2.

Figure 2: Illustrating the System of Management of Safety (SMS) as well as its necessity to examine the Safety Management System.

When it comes to preventing construction-related fatalities and injuries, a safety management system is essential. According to accident analysis, the vast majority of accidents are caused by a range of variables, with around eighty-five percent of them being attributable to poor management practices. An SMS is a set of activities selected and performed by an organization to help it in achieving its safety goals. While the SMS addresses specific causes of accidents, it also addresses the most important concerns regarding accidents. Instead, it ensures that the effort is multifaceted, focused on issues rather than deadlines, and that it continues throughout the project's life cycle, independent of changes in people. There is no consensus on what SMS is and what it is used for, although the concept has gained popularity in recent years. For example, a safety management system (SMS) may be defined as a set of rules, strategies, practices, responsibilities, procedures, and tasks that are all connected to safety.

1.3. Workplace Safety As Well As Health

The researcher investigates the factors that lead to the absence of effective occupational health, as well as safety, practices in construction manufacturing. Based on a thorough review of the literature, the key difficulties that are likely to be associated with obstacles to effective occupational health and safety practices by construction firms are given. A management system, according to OHSAS 18001, is a collection of interrelated pieces that are used to define policies and objectives, as well as to achieve them [10], [11].

The author went into further detail on the topic. Workers' compensation claims are filed because of a combination of hazardous exposures and unsafe worker behavior. According to the Occupational Safety as well as Health Administration, workers' inability to recognize dangers and respond appropriately is a primary cause of workplace injuries. IS Occupational Safety and Health 2000 was recognized in India to promote workplace safety and health [12]. To enable an organization to develop a policy and goals for occupational health and safety, this standard specifies the requirements for an occupational health and safety program. It also includes a description of legislative requirements as well as information on significant dangers and risks that the business can manage to protect its employees and other stakeholders. There must be full compliance with all applicable requirements for an occupational health and safety management system, and the system must also include critical instructions on how to utilize the condition.

A major point of emphasis is placed by the study's author on the necessity of workplace health and safety. Occupational health and safety encompass a wide range of activities, including the establishment, promotion, and maintenance of a safe working environment and regulations, as well as the emotional well-being of workers. The significance of occupational health and safety has been raised repeatedly by lawmakers, managers, and employees throughout the years, and it continues to be so (OHS) [7], [13]. In addition to being costly for businesses, occupational accidents, diseases, and illnesses at work have a substantial influence on people's personal and social life as well. He also spoke about key occupational health and safety leading indicators, such as occupational health and safety systems, occupational health and safety prioritization, and occupational health and safety responsibility, as well as the importance of training and education. Leaders from the top down must be committed and determined.

Because of the magnitude and severity of the occupational sickness epidemic, prevention is not being given the attention it needs by policymakers. Occupational health and safety systems must be strong, according to the International Labor Organization (ILO), to ensure that national policies and programs aimed at improving occupational illness prevention are carried out efficiently [14]. Long-term research on occupational health and safety (OHS) management has often concentrated on a limited number of specialized topics. This is changing. This has changed in recent years, though. Among them are policy and practice, human traits and social ties, events and occurrences involving injuries and accidents, management control, and labor relations, to name a few topics.

1.4. Safety Performance:

One of the most serious concerns facing the construction industry right now is improving worker safety and productivity. Companies face intense competition and are under continual pressure to produce more efficiently while working in a safer environment. Safety performance measurement offers information that may be used to help in the decision-making process for preventive measures, the detection of threats, and the identification of chances for improvement. One of the most common issues encountered throughout the construction industry is that measures are selected solely based on their ease of collection and comparison with data from other enterprises in the same sector, rather than based on their usefulness in supporting decision-making on critical activities. If you're looking at safety indicators to help you analyze corporate safety policies and processes, you should approach them with caution. When it comes to measuring safety performance, the total recordable injury rate was deemed to be the only relevant quantitative injury indicator at the time.

The safety policy of the firm is the most essential factor impacting the overall safety performance of the organization in the construction industry. Workers and management are perceived as sharing responsibility for safety issues and concerns. The separation of leading indicators from the following indicators is a prominent method of evaluating occupational health and safety performance. An outgrowth of the over-reliance on lagging measures like accident rates in many occupational health and safety organizational activities, this movement has sprung up. Lagging indicators are measures of occupational health and safety outcomes or outputs that allow for historical comparison.

In general, a variety of elements influence overall safety performance. Unforeseeable events such as accidents occur as a direct result of dangerous activities and conditions that are beyond the control of management. Safety performance has been measured using the recordable injury rate (RIR) [15], [16] of Occupational Safety as well as Health Administration (OSHA), the day’s away, transfer injury rate, and the experience modification rating (EMR) on the workers' compensation claims [17]. As defined by the International Organization for Standardization, leading indicators of safety performance are a collection of selected measurements that reflect the effectiveness of a safety procedure. To evaluate the foundations of a project's or company's safety culture, leading indicators are used.

1.5. Causes of Accidents

Accidents of various sorts result in a wide range of injuries to varying numbers of persons. The failure to recognize a harmful state that arises before or after the initiation of an activity, the decision to continue working in an unsafe situation, and the decision to continue regardless of risky site conditions are the three key root causes of workplace accidents. He talked about the factors that contribute to accidents and the fundamental issues that must be addressed to improve the situation. Some of the factors that contribute to accidents are as follows:

- Hit by a touching thing, such as a flying or falling object
- Falls from a height
- Absence of appropriate training
- Lack of safety equipment
- Unsafe methodologies
- Dangerous site conditions
- Poor attitude forward into safety

According to the data on construction site accidents, the construction sector is one of the most important businesses that needs a comprehensive and quick overhaul of current site safety procedures. Accidents are not only inevitable but they may also be avoided if certain precautions are taken. According to statistics, dangerous behavior, unsafe conditions, or a mix of the two are the root causes of 99 percent of all automobile accidents. Accidents may be prevented as a consequence of this. Generally speaking, an unsafe situation is a physically hazardous state or collection of situations that have the potential to cause an accident. In the vast majority of cases, accidents are caused by a combination of contributing variables, as well as one or more potentially hazardous behaviors or situations.

2. DISCUSSION

2.1. Involvement of Labor in Safety:

In the workplace, labor engagement is a method of ensuring that employees are devoted to their organizations' goals and are sufficiently motivated to make contributions to work that are aligned with corporate success while also being able to increase their personal feelings of satisfaction and comfort at the same time. Many efforts are being made to ensure that necessary health and safety criteria for staff on-site are met, but maintaining conditions off-site, particularly for migrant workers on fixed-term labor contracts, is a difficult task. Poor on-site performance, a lack of enthusiasm, a lack of productivity, and a lack of interest in following health and safety rules are all linked to physical and psychological stress brought on by unpaid pay and a lack of welfare services.

An important component of the organization's safety program, which is used to reduce the number of injuries and accidents, is employee engagement in the program. Employees can influence and control occupational health and safety management problems at their place of employment which is referred to as employee engagement or participation. An alternative approach is for employees to participate in the safety management process by participating in the upward communication flow among people or groups, as well as the decision-making process inside the organization. In part, since workers used to offer proposals for safety improvements, especially when new technologies and materials were introduced, and they used to report events, the situation has changed.

Because these companies have a specialized safety department, they can complete building projects on a grand scale while maintaining the highest level of safety possible. Small-scale projects carried out by local contractors, on the other hand, are not aware of the safety regulations that might help prevent accidents on construction sites from occurring. Keeping employees safe at work and protecting them from occupational diseases and injuries should be a top concern for all businesses. Also keep in mind that while work is being done, there is a human person present who is susceptible to making mistakes and who is responsible for ensuring that the job is always integrated with the safety management system. Active mistakes may arise at this critical juncture when the safety management system comes into contact with the worker and the worker comes into contact with the job that has to be completed. A highly significant motivational idea with huge potential to further our knowledge of the mechanisms by which contextual perceptions and behavioral inclinations eventually impact behavior and performance in the workplace is the notion of intrinsic motivation.

2.2. On-Site Hazard Identification:

The identification of possible dangers is often regarded as one of the most effective methods of proactive accident prevention, and this is frequently the case. It has been shown that hazardous behavior is responsible for 70–80 percent of offsite occurrences, but the failure to recognize threats has also been argued as a key source of these mishaps. It is commonly accepted that adequate identification and reporting of hazards may significantly improve the overall level of workplace safety. The practice of modeling risk based on prior injury records is popular in construction safety management, and it is used to assess the likelihood and severity of potential accidents for a specific construction work activity or project.

The ability to detect and effectively monitor potential workplace dangers enables managers to put measures in place to protect the safety of their employees. Among his observations on hazard recognition is the demonstration that the process of analyzing hazard records can be automated through the use of deep learning as well as text learning; hazards can be visualized through the use of a systematic but also data-driven process, and the use of a systematic but instead data-driven process can reduce the number of errors in hazard identification. A hazard is a kind of risk that may occur at any time of day or night, with or without notice, and at any location. It is one of the most critical components of an organization's overall strategy to develop a risk identification plan. This plan comprises the identification and rating of all conceivable risks using a risk matrix as a guide to doing this. As well as individual dangers such as those connected

with occupational illnesses, some hazards cause property damage or environmental losses that need to be handled. Various types of dangers must be considered in various situations. The hazard matrix is constructed by taking into account any incidence that has the potential to influence health, safety, or the environment in the real world.

The perception of hazards and safety-related issues by construction personnel must be influenced by a variety of factors, including but not limited to the implementation of an on-site SMS, site conditions and characteristics, position and many years of experience, previous incidents, and personal motivation, among other things. Considerations for this include but are not limited to, the following factors: Before the present project, which was a first of its kind, none of the following challenges had been tackled in a single research effort: One, none had previously been addressed in a single research endeavor; and two, none had ever been taken into consideration when analyzing a survey that dealt with on-site staff rather than other construction workers before this research effort. It is estimated that a substantial number of events occur because people do not understand how to keep themselves and others safe, do not comply with safety standards, do not have first aid kits, and do not have the necessary safety equipment.

2.3. Important Safety Factors For SMS In Indian Construction:

For example, it was determined that roles and duties were "critical" for obtaining high standards of safety performance. When obtaining high levels of safety performance, two types of responsibilities were discovered to be crucial, according to the research results. Occupation health and safety was, first and foremost, a management duty, with project managers taking an active role in the process. Aside from this, investigators discovered that the individual had been heavily involved in occupational health and safety activities and coordination in at least one of the jobs with special responsibility for occupational health and safety (e.g., project coordinator for the project's execution stage; OHS leader; OHS coordinator; and so on) in which they had been employed.

To classify the four main sections may be divided into four categories: directives, operations, reviews, and promotions. These categories may be further subdivided to provide a more detailed breakdown. When it comes to safety policy and organizational structure, the company's leadership is committed to it, and competent safety practitioners assist in the development of internal safety and health rules, in organizing training programs, and in the implementation as well as execution of an emergency preparedness plan, among other things. For the normal operation of a construction project, the installation of a well-organized safety inspection program, risk evaluation program, and accident/incident investigation program is necessary to ensure a better operation of the project overall.

A framework and guideline for the execution of SMS were often provided as a standard service for countries that have specific needs for the conception, deployment, and maintenance of SMS. Four sections of his plan are presented, and the Labor Department and contractors will assess when it is appropriate to put these pieces into effect after the implementation of SMS. Here are a few factors to keep in mind: an evaluation of the risks connected with the project it is referred to as a safety and health awareness program when it is designed to increase, develop, and maintain employee understanding of workplace hazards and hazards prevention. Plan for preventing and controlling accidents as well as eliminating hazardsThe establishment of a program for occupational health as well as safety.

According to the survey, a high proportion of designers are not aware of the potential influence on safety that their designs may have on the surrounding environment while creating their ideas. Some roadblocks to designing success have been highlighted, including a lack of resources and time, cost, client needs, and a lack of tacit knowledge within the design community. In the construction industry, which employs a large number of people from a diverse range of various countries, some other languages may be spoken in addition to English, depending on the situation. The fact that managers and migrant workers speak different languages may result in miscommunications between the two groups of individuals. The goal is to improve communication regarding safety among all parties involved. It is well recognized that providing adequate health and safety training and instruction is one of the most important factors in decreasing and avoiding accidents and other events from happening. Another common reason for this is working on a scaffold or platform that does not have guardrails or that does not have a safety harness that has been properly fastened to the platform or scaffold. An additional risk is working on unstable roofs and ladders that have not been properly maintained, positioned, and secured, among other things Slips, trips, and falls are the most common forms of accidents that occur in all industries and vocations. They affect people of all ages and backgrounds.

3. CONCLUSION

Even while the vast majority of individuals understand the need of having a well-designed safety management program, not everyone puts it into action. The ability of an organization to keep its employees safe is based on the organization's ability to develop, implement, and improve safety management processes and programs inside the organization. A safety management system's evaluation process might take a long time to complete and is rarely finished in its entirety. It ought to be a cyclical operation that takes place once a year at the very least. It is doubtful that you would have an understanding of what is successful and what is not if you are not regularly assessing the performance and effectiveness of your SMS. As a result, you will be unable to identify and decrease the number of holes that need to be filled or filled in. SMS deployment will be effective if there is continuous improvement, monitoring, competence, and accountability

on the part of all parties involved. Upon review of the existing literature, it is clear that the health and safety of construction workers is the most important aspect of the sector.

To secure the safety of construction workers on the working site, it is also necessary to establish and strengthen a safety management system. It is also used to identify a wide range of threats and risks that may arise throughout the activity's execution. Occupational health and safety are also extremely significant issues to consider when it comes to managing and understanding the health and safety of employees at their places of employment. Employee safety may be enhanced in a variety of methods that have been documented in the literature. These include a review, investigation, and minimization of the risk of harm as well as a discussion of the most significant feature or components of safety management. When it comes to improving SMS, the literature has employed a range of strategies to achieve so.

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