



IMPROVING INDUSTRIAL SAFETY IN INDIA: THE NEED FOR EFFECTIVE SAFETY MANAGEMENT SYSTEMS AND EMPLOYEE ENGAGEMENT

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Abstract

Industrial safety is major concern in India, with high rate of worker deaths and injuries. Safety Management Systems (SMS) can help reduce the risk of accidents, but small and medium sized enterprises often lack the resources or awareness to implement them effectively. Predictive models such as regression or Data-driven Systematic Accident Models (DSAMs) can help identify risk factors and improve safety. However, SMS can fail if not integrated properly, and a lack of employee engagement and commitment can hinder safety culture. Top management commitment to safety is crucial, and organizations should provide incentives and interact with employees with safety issues. New approaches such as safety intelligence and sensor-based safety management, can also support safety management. Implementing these methods can be complex, but they offer potential benefits in reducing accidents and improving safety performance.

Keywords – Industrial Safety, Safety Management System, Safety Intelligence, Safety performance

I. Introduction

In India industrial safety is the major concern for the management and government. In first half of 2022 199 workers died and 348 injured in India as per the data collected by IndustriAll. Three workers dies and eleven injured every day in Indian factories as per the data obtained from the Ministry of Labour and Employments Directorate General Factory Advice Service and Labour Institutes (DGFASLI). These data are obtained from the registered factories only, but more than 80% of workers are employed in unregistered informal sector. If an industry possesses major safety requirements suggested by the government, then only the workers are motivated to work in high-risk job. Occupational safety mainly achieved through the active involvement of safety management system (SMS). The aim of SMS is to avoid or to reduce the chances of accidents. The quality management ultimately leads to safety in industries. Most of the situation management is concerned about safety when and only an accident happens and treated as non-essential to core profit gaining process. There are mainly two types of safety management systems (Provan et al. 2020). Safety I, which is a centralized procedures and Safety II a decentralized procedure. In first case the management decides what to be done to achieve the safety goal. In second case the worker adopts to the working condition to achieve maximum safety with the available limited facilities and resources.

The majority of small and medium sized enterprises (SMEs) have been found to have insufficient safety management practices in place. Notably the primary drivers of such practices include market competitiveness, increased efficiency, reduced risk and compliance with strict laws. Conversely, financial limitations, insufficient awareness, resistance to change and lack of employee training represent most significant obstacles in implementing these practices (Unnikrishnan et al. 2015).

Predictions of accident rates can be made based on the implementation of safety management systems and level of worker engagement, both independently (Wachter and Yorio 2014). Regression models are mostly used for the accident prediction by identifying dependent and independent variables. DSAMs or Data driven Systematic Accident Models, are models that operate in sequential manner and have a systematic procedure for utilizing precursor data to quantitatively estimate the posterior risk profile. DSAMs also provide updates on the failure probabilities of accident barriers and predict future end states (Al-shanini, Ahmad, and Khan 2014).

II. Problems in implementation of safety management system

Safety Management System has the potential to be viewed as a tool for organizational legitimacy. However, it may only exist on paper, be implemented in accordance with regulations, and still fail to produce the anticipated results. When similar functions and recurring tasks are not integrated properly,



it can lead to breakdown in safety management system. This break down can result in decreased confidence in both safety management system and the authorities responsible for its implementation, as well as increase in workload and paper work, which can ultimately diminish the overall effectiveness of SMS (Gerede 2015). Establishing a positive safety culture is crucial for the successful implementation of SMS, and conversely a lack of such culture can present a significant obstacle.

One of the major challenges faced by the management system is the limited participation and engagement of employees. In this specific process, the most arduous task is to encourage employee's involvement and increase their awareness, which can be difficult due to lack of confidence in such practices. In the absence of strong commitment to improving safety, which stems from the organization's values and beliefs, it can be challenging to garner employee support for safety initiatives. The effectiveness of safety management system and its practices in reducing accident rates is contingent upon the degree of safety focused cognitive and emotional engagement exhibited by workers. According to previous research, if an organization does not prioritize safety, its employees and subunits are likely to feel disconnected from the larger system. As a result, they may be hesitant to take on responsibilities, point fingers at others, including their colleagues, other subunits and top management, and resist any attempts at change. This can lead to lack of positive attitudes towards safety and hinder overall safety culture within the organization.

The commitment to safety demonstrated by top management can significantly affect various aspects of an organization's safety culture. This includes the willingness of employees to report safety incidents, the ability to learn from such incidents, the presence of fair and just culture, and the organization's flexibility in adapting to changing safety needs. Ultimately a positive safety culture within the organization depends on the commitment of top management to safety.

(Varianou-Mikellidou et al. 2019) Identified that the ageing of workers also promotes the chances of accidents. So proper new recruitments should be conducted timely to facilitate safety in organizations.

III. Suggestion for improving Safety Management System

First step in the safety management is the better housekeeping and proper use of personal protective equipment (PPE). (Kim et al. 2019) For successful implementation of safety management system and improvement in safety performance, the organization should provide safety incentives and interact with employees on safety aspects. This will improve safety climate in industry. One of the suggested method is the use of integrated system for quality and safety management (da Silva and Amaral 2019). Drawback of this is the complexity and time to implement, due to change in management methods and culture.

(Wang 2021) Safety intelligence (SI) new concept proposed to convert the available safety data and information in to safety actions. This SI model supports safety management.

To avoid or to reduce the accidents one of the best method is to adopt sensor based safety management system (Asadzadeh et al. 2020). Sensor based safety management in integration with building information modelling is found to be effective in construction industry. So, implementing this we need complete data about the man and material movements in the organization.

IV. Conclusion

Industrial safety is a major concern for the management and government of India, with a high number of worker deaths and injuries occurring each year. The proper implementation of safety management system can help to reduce accidents and create positive safety culture with in the organization. However, the limited participation and engagement of employees, financial limitations, insufficient awareness and resistance to change represent significant obstacles in implementing these practices. The commitment of top management is crucial for the successful implementation of SMS and creating a positive safety culture. The management and the workers should consider the safety as a major requirement for the organization for the satisfied working environment. Proper motivation and training to be provided to the employees to identify the impact of safety procedures and performance. The adoption of proper technologies such as sensor-based safety management system can improve safety



performance in organizations. The integration safety management with quality management can lead to better safety performance.

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