

Assessing Potential Hazards and Carrying Out Risk Assessments in Heavy Construction Projects through the Application of Health and Safety Management Systems

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Abstract: For any industry to thrive, it must not only focus on production goals but also uphold the highest standards of safety for everyone involved. This requires continuously identifying potential hazards, evaluating the risks linked to them, and reducing those risks to acceptable levels. The construction sector, in particular, is inherently hazardous and poses significant safety challenges for workers. Unsafe site conditions and poor practices often result in accidents that cause injuries, loss of life, property damage, and disruptions to developmental activities. Risk assessment serves as a structured approach to pinpointing and analyzing hazards tied to specific tasks, while also determining the level of risk each hazard presents. Since it is impossible to eliminate all hazards completely, it becomes essential to define and estimate accident risk levels, whether expressed in quantitative or qualitative terms. Because construction sites record a high number of fatalities, the industry is recognized as one of the most hazardous occupations globally. Despite its crucial role, the construction sector is often associated with elevated accident rates and health issues that affect workers, professionals, and even end users. The industry faces considerable safety risks and financial losses as a result. Accurately estimating these risks, however, remains challenging due to the absence of comprehensive quantitative safety databases and the inherent uncertainty in construction projects. Many of the safety risk assessment tools currently used in this field do not always deliver reliable results, as it is difficult to evaluate hazardous events quantitatively. This limitation stems from the lack of detailed safety data, which makes it challenging to determine the likelihood and potential consequences of such incidents. Hazard identification and risk analysis involve recognizing undesirable events that may give rise to hazards, examining the mechanisms through which such events could occur, and estimating the extent, severity, and likelihood of their potential harmful effects. The purpose of this study is to examine current practices in health and safety risk assessment, risk communication, and risk control, while also seeking ways to strengthen the Environmental Health and Safety (EHS) management plan for construction sites. To achieve this, a case study approach was applied, with a construction site selected using convenience sampling. This research further investigates the methods adopted by organizations in India to ensure workplace safety and evaluates how risk assessment can be effectively employed to optimize safety management practices in the construction industry.

Keywords: Health and Safety Management Systems, Risk Assessment, Hazard Identification, Heavy Construction Projects, Occupational Safety, Construction Risk Management, Safety Compliance, Accident Prevention etc

