COMPARTIVE STUDY OF MINIMIZE RISK IN HEIGHT WORK BETWEEN EXISTIN PRACTICE AND BRITISH STANDARD

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***Abstract*: This document specifies requirements for an occupational health and safety (OH&S) management system, and gives guidance for its use, to enable organizations to provide safe and healthy workplaces by preventing work-related injury and ill health, as well as by proactively improving its OH&S performance especially during height work. Falls from height are a substantial endangerment to public health and are among the important leading causes of serious and fatal injuries in industrial and construction workers, worldwide. A comprehensive understanding of the causal factors and comparative study of the best practices in prevention of falls from height incidents is urgently required. In this comparative study, 22 articles that contribute to the topic of fall incidents were reviewed and surveyed. The most common factors associated with falls from height are risky activities, individual characteristics (behavioral and attitude issues), site conditions, top management characteristics, agents (scaffolds/ladders, etc.,) and adverse weather conditions. The outcomes contributed to identifying the most significant research area for safety enhancement by improving engineering facilities, Behaviors investigations and fall from heights prevention methods.**

***Keywords*: Height Work, Risk, Hazard, Fall protection and prevention Methods.**

I. INTRODUCTION

The literature review deals with different work done previously by eminent Engineers in the same field. The major areas concentrated by various scientists and its reasons are analyzed. This chapter deals with review of those papers and the existing methods. The following are the few papers which deals them.

Błazik-Borowa (2015) has published a paper titled "The Analysis of Stages of Scaffolding Life With Regard To Decrease in Hazard at Building Works". The paper presents the attempts at determining the reasons for the hazardous incidents which threaten the safety of people working on scaffolds, as well as in their vicinity. The article is divided into two parts, the former referring to the information on the accident rate involving scaffoldings as well as the research on the likelihood of the occurrence of perilous situations, the inspection of their technical state and the breaches of the OSH Regulations included. The latter part is devoted to the thorough analysis on the particular stages of the scaffold operation life, the special attention being paid to the practices, errors and failures while designing scaffolding. Moreover, it concerns the selection of the scaffold elements, the assembly and disassembly of scaffolding as well as their usage which can result in an accident or a building collapse. The range of activities that contribute to the decrease in or even the avoidance of risky situations involving scaffolds is hereby presented in conclusions."Analysis of the safety conditions of scaffolding on construction sites" is the paper that has been published by Juan Carlos Rubio-Romero in the year 2013.This paper presents the results of a study whose aim was to analyse the safety conditions of supported scaffolds (i.e., ground supported scaffolding). In 2007 the authors examined the scaffolding erected on 105 building sites in Spain. The study provides a qualitative assessment of the safety conditions of bracings, anchor ties, toe-boards, guardrails, ladders, struts, long beams, cross beams, platforms, supports, etc .In the European Union there are no legal requirements for the manufacturers of supported scaffolds, but there are some regulations on the use of this type of scaffolding on construction sites. This is the case in particular of the Directive 2001/45/EC, on workplace health and safety. The European norms EN 12810 and EN 12811 also provide some non-compulsory guidance for scaffolding manufacturers. Kadiri (2014) has published a paper titled "Causes and Effects of Accidents on Construction Sites". This study examines the major causes of accidents and suggests ways of mitigating these accidents on construction sites. A designed questionnaire was administered and descriptive statistics tool such as frequency, mean, percentage and relative importance index were used for the analysis. To ensure safety and to reduce the occurrence of construction site accidents to the minimum, management of construction firms must undertake and implement some of the context of this study such as implementation of safety policy, use of safety items and gears, training on safety measures and accident prevention methods, ensuring safe working environment and enforcing safety rules. "Safety Conditions Analysis of Scaffolding on Construction Sites" is the paper that has been published by Pieńko in the year 2018.This paper presents the results of analysis of 100 full- scale scaffolding structures in terms of compliance with legal acts and safety of use. In 2016 and 2017, authors examined scaffolds in Poland located at buildings which were at construction or renovation stage. The basic elements affecting the safety of scaffolding use such as anchors, supports, platforms, guardrails and toe-boards have been taken into account. All of these elements were checked in each of considered scaffolding. Based on the analyzed scaffoldings, the most common errors concerning assembly process and use of scaffolding were collected. Legal acts on the scaffoldings are not always clear, and this causes many issues.

II. HAZARD IDENTIFICATION

During the period of work in the construction the below mentioned problems were identified in the height work activity and to

reduce the hazards and increase the safety of the employees working in the critical heights this work has been taken. Thus the problems while working at height are identified in the following process which is to be corrected to reduce the hazards. Thorough and frequent construction audit, In construction project of Ruby builders construction to understand the various work at height activities in their routine & non routine works. Observed, mainly the physical hazards of fall of person from height and fall object from height risks present in the works such as building painting activities, leak arresting on the roofing activities, attending rectification works in communication tower activities,& glass panel(Facade) cleaning activities in administrative block etc .To overcome the risks of fall from height issue, construction needs to provide fall prevention and protection systems. Thus a comparative study of the fall prevention systems and fall protection systems shall be studied between existing practices in factories and British standard, by developing risk rating matrix observation report and to be compared between both practice and effective risk reduced practices to be adopted. Risk reduction analysis shall be achieved in an quantitative way after optimal risk reduction on comparative results

III. HAZARDS ASSOCIATED WITH SCAFFOLDING

- People and objects falling from height
- Slips, trips, falls, etc.
- Dizziness of people working at height
- Heavy wind / adverse weather conditions
- Overloading
- Collapse / improper material and design /improper modification
- Poor access-egress/simultaneous activities/congested areas: slips, trips, contacts
- Failure of the structure when incomplete

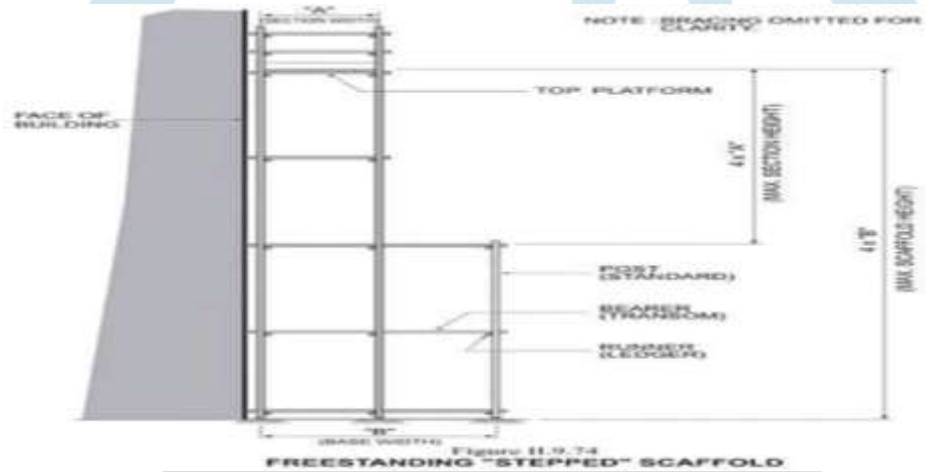

Fig 1.Typical Saffolding Erection

Fig 2 Typical Erection of Scaffold

Conclusion for problems identified**:** Observed, mainly the physical hazards of fall of person from height and fall of object from height risks present in the works such as chimney painting activities, leak arresting on the roofing activities, attending rectification works in communication tower activities, DG Stack accessing for monitoring and measurement activities, maintenance activities in EOT cranes, & glass panel (Facade) cleaning activities in administrative block etc.

IV. METHODOLOGY PROPOSED

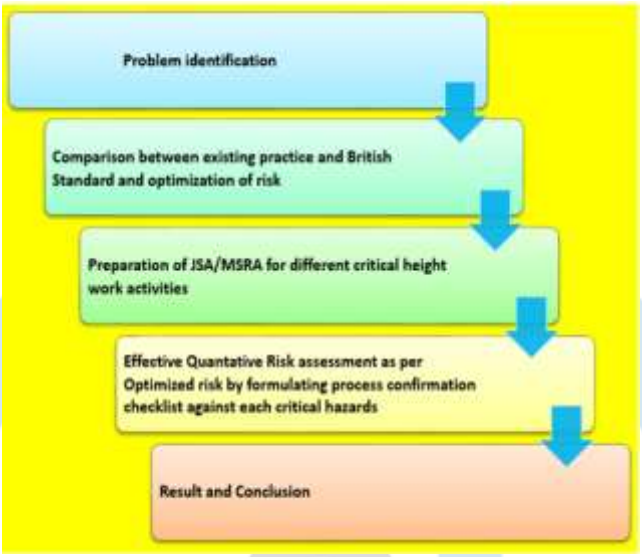

Fig 3.Methodology Flow Chart

Comparison between existing Indian standard practice and British standard (IRATA)-22 journal papers were collected for the study. The literature review was done and finally got the idea for comparing and evaluating the reduced risk assessment quantitvely. A patrol was done in the factory to absorb the works where the critical height work hazards present that poses serious threat to human. The major hazards were present in chimney painting activities(50 metres), leak arresting on the roofing activities(30 meters), attending rectification works in communication tower activities(25 metres), DG Stack accessing for monitoring and measurement activities(25 metres), maintenance activities in EOT cranes(22 metres), & glass panel(Facade) cleaning activities in administrative block(15 metres).Control measures for reducing the risk-Prior to the start of the activity each day, the responsible engineer shall check the physical status of the each rope access descender kits accessories as per the check sheet. Process confirmation checksheet shall be verified before starting the activity and safe & effective procedures for completing work tasks can reduce the fall from height risk. In addition, workers should be trained on proper work techniques and encouraged to accept their responsibilities for accident prevention

Fig 4.spider safety full body harness

Rope Access Descender Accessories Self-braking descender with anti-panic function for rescue The I'D L self-braking descender is primarily designed for rescue. It has an ergonomic handle that allows comfortable descent control. The integrated anti-panic function and anti-error catch limit the risk of an accident due to user error. The AUTO-LOCK system allows users to position themselves without having to manipulate the handle or tie off the device. Once locked, the rope can be taken up without having to manipulate the handle. The safety gate allows the rope to be installed with the device remaining connected to the harness. I'D L is

compatible with 12.5 to 13 mm ropes and allows handling of loads up to 280 kg.

Fig 5 Rope Access Descended Accessories

V. CONCLUSION

Result obtained from the comparison of the standards between Indian standard and British Standard(IRATA) shall be taken into account and the optimized risk reduced activity shall be recommended and the effectiveness shall be verified by an Emergency preparedness plan, Showed that the workers taking the following high risk activity in heights. Mainly concentrated on the workers fall from height and considering the adverse environmental conditions involved during the process while painting activity in furnace chimney, we can lower the level of fall from height risks of workers. For the high risk rating calculated works where the control measures in the Indian Standard are compared with the reduced risk calculated pertaining to British Standard (IRATA)given for the consideration and effectiveness verified and cross checked by an emergency rescue during the course of process. The Rope access descended kit check sheet and process confirmation were implemented and given to the responsible engineers and supervisors engaging in the critical height work activities. This will help to maximize efficiency of maintenance activity and to minimize human errors thereby achieving zero accidents in industry.

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