ASSESSMENT OF RISK IN CONSTRUCTION INDUSTRY USING HIRA

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ABSTRACT

The objective of the Hazard Identification Risk Assessment (**HIRA**) is to identifying and assessing the hazard associated during the construction of the project and thereby controlling the risk by implementing mitigation measures before the start of the work to avoid the incident.

HIRA helps to become proactive rather than just reactive. A **HIRA** is a risk assessment tool that can be used to assess which hazards pose the greatest risk in terms of how likely they are to occur and how great their potential impact may be. It is not intended to be used as a prediction tool to determine which hazard will cause the next emergency. Hazard Identification and Risk Assessment. **HIRA** is a process that consists of a number of sequential steps such as hazard identification, consequence & frequency assessment, risk estimation based on the existing controls and recommendations to reduce those risks which are not under acceptable limits. When we refer to **risk** in relation to occupational **safety** and health the most commonly used definition is '**risk** is the likelihood that a person may be harmed or suffers adverse health effects if exposed to a **hazard**.

1.1 Introduction about industry

The Company **M/S. R.K& Sons** was established as partnership firm In **18th day of December 1979**. The Company is professionally managed by Managing partners **Mr.R.Ganesan, M.E,** Specialized in PSC Structures, **Mr. G. Ashwin Balaji. B Tech** in Civil Engineering We are also Carried out major bridges (ROB,HLB and RUB) and road works (Flexible and Rigid pavement work) with the Department of Highways,Corporation of Chennai, Southern Railways, Airports Authority of India, Chennai Port trust, IIT Madras, CMDA and private work with Social Distriparks Ltd at Chennai and Tuticorin. We have successfully completed number of jobs Ahead of the schedule time and still going ahead with all the Departments We own a fleet of road equipments , Crushing unit for aggregate, Hot Mix Plant & Wet Mix Plant, concrete batching plant etc. We are financially sound and backed with dedicated team of Engineers. We do all the works with our own machineries and materials. No work will be sub –let or given for sub contract. We are well known for Quality and for Timely Completion.

Company's Accreditation:

RK & Sons Salem Unit has got accreditation in respect of ISO9001, Integrated Management System (IMS)– ISO14001:2015, ISO45001:2018 and Information –Security Management System (ISMS) 27001. Accepting the vision of Government of India for the purpose of the program namely MAKE IN INDIA, the management has honestly committed

1.2 Introduction About HIRA

Hazard Identification Risk Assessment (**HIRA**) is to identifying and assessing the hazard associated during the construction of the project and there by

controlling the risk by implementing mitigation measures before the start of the work to avoid the incident. **HIRA** helps to become proactive rather than just reactive. A **Hazard Identification and Risk Assessment** (**HIRA**) assist emergency managers in. answering these questions. It is a systematic R**isk assessment** tool that can be used to.

Assess the **risks** of various **hazards**. A **HIRA** is a risk assessment tool that can be used to assess which hazards pose the greatest risk in terms of how likely they are to occur and how great their potential impact may be. It is not intended to be used as a prediction tool to determine which hazard will cause the next emergency.

1.3 HIRA Elements

Hazard Identification and Risk Assessment **HIRA** is a process that consists of a number of sequential steps such as hazard identification, consequence & frequency assessment, risk estimation based on the existing controls and recommendations to reduce those risks which are not under acceptable limits.

1.3.1 Responsibility of HIRA

At each stage in the work life cycle, are view team questions process experts about possible hazards and judges the risk of any hazards that are identified. Several common methods exist for questioning a design, ranging From simple qualitative check lists to complex quantitative fault tree analysis. There view process are typically documented in a work sheet form, which varies detail, depending on the stage of the work and the evaluation method used. Risk studies on operating processes are typically up dated or revalidated on a regular basis.

The purpose of this work is to identify the hazards and risk by analyzing each steps involved in Various activity in the construction, and to give suggestion in order to Eliminate or reduce the risk assessment (HIRA). Industry becomes the successful by not only meeting the production requirements but also should Have high employee satisfaction by providing the safety requirements in the workplace. The Hazards and risk assessment should be done and actions to be taken to convert the risk to a tolerable level on regular basis.

1.3.2 Need For Risk Assessment

Risk assessments will help the mine operators to identify high, medium and low risk levels. Risk assessments will help to priorities risks and provide information on the probability of harm arising and severity of harm by understanding the hazard, combine assessments of probability and severity to produce an assessment of risk and it is used in the assessment of risk as An aid to decision making. In this way, mine owner sand operators will be able to implement safety improvements. Different types of approaches for the safety in mines various tools and appropriate step shave to be taken to make mining workplace better and safer. A Hazard Identification and Risk (HIRA) analysis is a systematic way to identify and analyze hazards to determine their scope, impact and the vulnerability of the built environment to such hazards and its purpose is to ensure that there is a formal process effectively manage hazards that may occur within the work places.

1.3.3 Methodology of HIRA

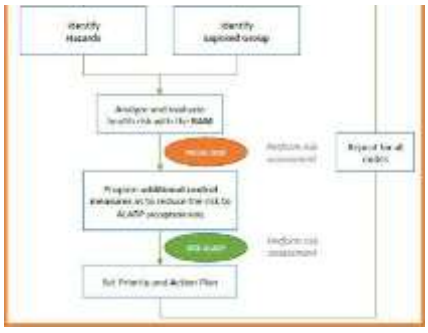
The HIRA review is the structured multi disciplinary hazard identification, risk assessment, and methodology that provides a detailed review of hazard, risk, and control of the construction activities. The review is facilitated by the relevant

construction personnel in the brainstorming session

1.3.4 Operating Procedures

The employer must develop and implement written operating procedures that provide clear instructions for safely conducting activities in the plant.

Procedures must be thorough, well thought out and must be completely relevant to the existing system in the plant. Such procedures must be reviewed periodically with relevant personnel and the procedures must be updated accordingly. The employees must be trained to operate systems and equipment that they will be involved in. Likewise, periodical refresh her trainings must be provided and documented as well.



1.4Training

All employees must be adequately trained to execute their responsibilities. Yearly refresher trainings must be provided to employees such that they do not deviate from the actual stipulated operating procedures. Employees' performance must monitored closely, and adequate constructive feedback must be provided on a regular basis. It is also required to cross train employees to perform multiple functions in the organization. Wherever necessary, employees must be cross trained such that the organization is able to handle serious emergency situations.

1.5 Contractor Safety

Contractors are not usually aware of all the systems and hazards in the plant. Hence, a thorough orientation must be given for contractors to handle emergency situations. Likewise, contractors may not be aware of the required permits, checks, etc. before executing a job. Likewise, they may not be aware of the required standards for systems. Such information must be clearly communicated and documented before the execution of their workpermit.

1.6 Mechanical Integrity

Mechanical Integrity module plays amajor role during the operational phase of the system. Necessary audits and monitoring pertaining to the maintenance of systems must be executed per the engineering requirements. Likewise, maintenance must be executed per the engineering standards and code son allprocess critical equipment and control systems. Maintenance activities and reports must be documented for future reference as well. Likewise, all necessary parts must be procured per the engineering standard sand re-ports are documented forfuture requirements. HIRA requirements apply to the following.

1.7 Hot Workpermit

A permit must be issued for hot work operations conducted on or near a covered process. The permit must document that the fire prevention and protection requirements in OSH A regulations have been implemented prior to beginning the hot work operations. It must indicate the date authorized for hot work and identify the object on which hot work is to be performed. The permit must be kept on file until completion of the hot work.

1.8 Incident Investigation

When ever a safety incident is reported in

the plant, a thorough investigation must be necessitated to determine the root causes for an incident. Such an investigation must be initiated immediately after the incident so that the facts are fresh in the mind soft concerned employees.Usually there are multiple causes that contribute to wards a safety incident. Incident investigation usually bring so interesting facts that may not other wise be considered during there operation of the plant. Investigation must be conducted by a certified employee and must not be pre judiced but must rather capture the items contributing towards the incident. Five why analysis and fish bone analysis are usually employed during incident investigations. An investigation report

Conclusion

The first step for emergency preparedness and maintaining a safe workplace is defining and analyzing hazards. Although all hazards should bead dressed, resource limitations usually do not allow this to happen at one time. Hazard identification and risk assessment can be used to establish priorities so that the most dangerous situations are addressed first and those least likely to occurand least likely to cause major problems can be considered later. The study also revealed that' systematic methods were used and risk was assessed by brainstorming, check list and health and safety regulations. Working at height, and manual handling observed to be most critical hazards in Indian Industry construction site. They also require that health and safety risk to be communicated to workers and that PPE be provided for worker. Thus the main 'mantra' is that every job on the construction site must be carried out with at-most activity.

References

1. Handia A dul Aziz and Mohd Shariff Dec 2017, A journey of risk assessment program for Construction Industry.
2. K Naicker May 2014 effective implementation of HIRA In Construction Industry
3. Karthikeyan. S Sep 2013 Implementing hira in India – Challenges and opportunities.
4. Mohammad Amin Norozil, Mehdi Jahagiri, Alireza Choobineh, Alireza Narimannejad March 2013 feasibility study of implementing risk assessment in construction industry requirements.
5. 2015 Risk assessment using HIRA for managing contractors construction industry.
6. OSHA 332 risk assessment standard.
7. OSHA 333, HIRA in construction industry guidance for compliance
8. OSHA 3896 the use of metrics in construction industry using HIRA facilities
9. OSHA 3908 HIRA should used for small business
10. OSHA 3909 HIRA should for storage facilities
11. OSHA 3902 Risk assessment for explosives used in construction industry
12. Rick Hoffman, HIRA implementation in construction in industries compliance is even harder.
13. Combined Drilling and Tapping Machine by using Cone Mechanism
14. OSHA398 HIRA should for petroleum refineries