

HAZARD IDENTIFICATION AND RISK ASSESSMENT (HIRA) IN THE UTILITIES OF CHEMICAL INDUSTRY

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Abstract - Carrying out a systematic, critical appraisal of all potential hazards involving personnel, plant, services and operation methods. Distinguishing the current shields accessible to control the dangers because of the perils. Set up a Risk register that will help in constantly observing these dangers, identify any progressions and guarantee the controls are successful.

Key Words: Analysis, data collection, research, HIRA report.

1. INTRODUCTION

A Hazard Identification and Risk Assessment (HIRA) help crisis administrators in responding to these inquiries. It is an efficient danger evaluation instrument that can be utilized to survey the dangers of different perils. Hazard is the undesirable result of an occasion or arrangement of occasions. Hazard happens when numerous danger causing factors happen simultaneously causing a mishap showing in an occasion like a fire or blast. Hazard Assessment is a strategy that has demonstrated its worth as an inside and out device for improving the security principles pervasive in each perilous industry. With progressions in-constructed and intrinsic security frameworks, mishaps rates have descended, yet endure at inadmissible levels for more current innovation, new plants and substance taking care of offices. RA is an organized wellbeing appraisal devices intended for high danger enterprises like synthetic, petrochemical, pesticides, drugs, ocean ports, and so on, enhancing other security frameworks apparatuses like HAZOP, wellbeing review, and ordinary occurrence investigation to recognize the potential for episodes (close misses, perilous conditions) and to assess the essential control measures.

2. LITERATURE SURVEY

Hazard Identification is a proactive interaction to recognize perils and wipe out or limit/decrease the danger of injury/sickness to laborers and harm to property, gear and the climate. It additionally permits us to show our responsibility and due perseverance to a solid and safe work environment. We should recognize perils and possible dangers in the working environment to have the option to make a move to wipe out or control.

Table 1: description of likely wood level

L e v e l	Likeli hood	Expected or actual frequency experienced
1	Very low	May just happen in exponential conditions; straightforward cycle; no past occurrence of resistance
2-3	Low	Could happen sooner or later; under 25% possibility of happening; non-complex cycle and/or presence of governing rules
4-5	Mode rate	Might happen sooner or later; 25 – half possibility of happening; past reviews/reports demonstrate resistance; complex interaction with broad checks and equilibriums; affecting components outside control of association
6-8	High	Will likely happen by and large; 50-75% possibility of happening; complex cycle for certain checks and equilibriums; affecting variables outside control of association
9-10	V e r y h i g h	Can be required to happen much of the time; over 75% possibility of happening; complex interaction with negligible checks and equilibriums; affecting elements outside control of association

This is a step by step interaction to manage capable people to a viable danger recognizable proof, evaluation and controls framework. The means includes Hazard Assessment: distinguishing the perils and expected dangers, deciding the dangers and the danger assignment (rating) related to the risk dependent on: Likelihood and seriousness, Hazard control - controlling the dangers and the dangers related with the peril Providing data, instruction, preparing and oversight on the perils, dangers and controls for representatives influenced by the risks, Review of the peril appraisal and control measure.

When seen from the method of information assortment, this investigation is observational on the grounds that analysts get information through perceptions and meetings to laborers and related gatherings in the organization. Furthermore, the articles in this examination were not treated over the span of the observational/observational investigation. In light of the idea of the issue and its information investigation, this examination is remembered for engaging exploration since this exploration doesn't make correlations or associations between factors. This investigation depicts a circumstance dispassionately, Handling methods and information examination led dependent on perception and meeting information. In light of the aftereffects of perception and meetings are known expected danger and worth. Distinguishing proof of potential danger perils in the water treatment plant will be compelling whenever done based on the real states of the work environment and existing work measures, this is an exertion that should be possible so modern wellbeing and natural wellbeing projects should be possible well as per arrangements and Regulations that have been set.

3. HIRA CHARTS

WORK ACTIVITY	OH&S HAZARD	CONTROL IN PLACE	RR
Periodical Maintenance Work in Transformer	Fire on Transformer	*operational Control Measures like SOP for the operation of transformer *use proper PPES. *check voltage, Current, and Other parameter. *check for Winding Resistance, *check oil level And dielectric Strength of oil. *check breather And silica gel *check Insulation Resistance *proper fencing Of transformer	12

		area	
Breakdown maintenance of Transformer	Potential Risk of fire Electrical Short circuits	*operational Control Measures of transformer *test and Maintain Transformer Insulation System, *inspect and Maintain Transformer Auxiliary Devices *maintain Transformer Protective Coating, *maintain Transformer Bushing system *periodically checking the earthling,	18
Periodical testing of Transformer	Potential Risk of fire Electrical Short circuits	*operational Control Measures like SOP for testing of transformer *periodical checking of earthling, *ELCB *training on The operational Control Procedure. Periodical maintenance schedule use proper PPE. *dielectric tests Of transformer *temperature	18

		Rise test of Transformer *winding resistance test of transformer *measurement Of no-load loss And current (open circuit Test)	
Maintenance on switch yard	Slip / trip from height	*use of anti slip Equipment, *use of proper PPE * Trained Personnel Only Allowed to attend the Problem. *periodic inspection of oil level and oil leakage *checking and Adjusting of Spark gap Whatever it gets Disturbed *periodic Inspection Hydraulic oil Pressure	36
Starting of Generator	Electric shock	*Periodical Checking of Earth leakage Circuit breaker (ELCB), *earthling	Electric shock
Operating AC plant	Potential Chances of Freon gas Leakage	*Annual Preventive Maintenance *periodic checking of leakage with the help of sensor. *operational Control Procedure On the usage And the leakage of Freon gas use proper PPE.	

Refrigerant Removal and handling	*explosion *asphyxiation *fire	*standard Operating procedure * Annual Preventive Maintenance *periodic checking of leakage with the help of sensor.	
brazing of Copper pipes/ Welding of steel pipes	*fire *exposure to Fumes	*use proper PPE, *Work to be Done by the Competent Person *standard Operating procedure	
Pressure testing Of refrigerant pipe	explosion Exposure to refrigerant	*use of proper PPE, *Work to be Done by the Competent person * standard operating procedure	
Oil changing In Compressor	*spillage *leakage * exposure to High pressure air	* Work to be Done by the Competent Person	
Inspection and Testing of electrical Terminals, Fuse and overload	*Electrocution *Electrical Shock *Fire and Explosion	*Work to be Done by the Competent Person *periodical checking of earthling *training on the Operational Control Procedure.	

		*use of PPE	
Change of electrical motor	*electro-cution *electrical Shock	*Work to be Done by the Competent Person *periodical checking of earthing	
Unloading of Diesel in Diesel yard	*Fire *explosion due to Generation of static Electricity.	*provision of Connecting Wires during Unloading, *operational control Procedure on Diesel handling (loading & Unloading)	18
Maintenance work inside vaporizer room	Explosion Due to LPG Vapors.	*testing of Pressure *water level Indicator	18
Distribution of LPG from LPG storage room	Fire/ explosion	*leakage Detector *performance Monitoring And Measurement Plan *emergency Shutoff valve *training on LPG safety *LPG pipeline To be provided With jumpers For all flanges Though out the Pipelines	18

4. RESULTS AND DISCUSSION

Hazard Assessment is performed utilizing the Risk Matrix as portrayed in the writing study, the outcomes acquired from this danger evaluation are the 11 potential perils present in the chemical utilities industry, table 1. Concurring the current classifications of outrageous danger, high danger, medium danger and generally safe then the discoveries are assembled into each hazard classification. Risks chemicals can be retained through

the skin and cause copies going from gentle to extreme contingent upon the length of the contact further more chemical can likewise be ingested through the eye, causing copying or uneasiness, sporadic flickering, oblivious conclusion of eyelids, redness, and tearing, Therefore workers in storage must conduct a well-scheduled inspection so that the presence of chemicals can be safely maintained, besides that it is also necessary to have an emergency management control system that refers to leakage of chemicals and industrial fires, Prevention efforts from known potential hazards.

5. CONCLUSION

Potential occupational hazards in the utilities of chemical industry are presented to synthetics to laborers; the likely peril of spilling chemicals can likewise enormously influence the security and strength of the mechanical climate. Control measures attempted to dodge potential risks are to apply the utilization of individual defensive hardware, yet the executives will likewise be better overseen as per danger control perils, hazard related wellbeing and wellbeing projects, for example, giving work grants, crisis reaction preparing is required, helpful in beating potential risks that have been resolved.

6. REFERENCE

- [1] Capital Health. *Hazard Assessment Control Form*. www.cdha.nshealth.ca/.../hazard-assessment-program (Accessed 2 July 2017).
- [2] www.e3s-conferences.org/articles/e3sconf/pdf/2018/06/e3sconf_icenis_2018_06011.pdf.
- [3] S. T. Bahn, (pp. 1-9). Gold Coast, Queensland. Griffith University. (2012).
- [4] N. J. Brown, Ithaca, NY: *Cornell University, Chemical Hazard Information Program*. (2016).
- [5] SJ. Moja, CS. Van Zuydam, Mphephu. *J Geogr Nat Disast* S6: 006 (2016)
- [6] A. Vantarakis, S. Paparrodopoulos, P. Kokkinos, G. Vantarakis, K. Fragou, and I. Detorakis. *Journal of Environmental and Public Health* Volume 2016 Article ID 8467023 (2016)
- [7] Hazard Identification and Risk Analysis Code of Practice, BIS IS 15656: 2006, Bureau of Indian Standards.
- [8] European Agency for Safety and Health at Work, *Safety and health at work is everyone's concern*, Numburg, Germany, (2007).