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Hazard Identification and Risk Assessment in Auto Components Automobile Industry

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Abstract. Hazard Identification and Risk Assessment (HIRA) is a protection device utilized in maximum vehicle Components manufacturing industries to pick out the risks and assess the risks in the plant. The evaluation of the dangers in the place of work is a vital mission to evaluate the reasons of the injuries. This will locate the answer for the hazards and to create a secure running region for the employees. It isn't feasible to do away with all risks, so the intention is to put off and / or manage all the viable hazards with crucial and excessive ability and to lessen the rest of the feasible dangers to the minimum affordable danger degree in order to protect employees from damage. The hazard score became relying upon the multiplication of severity and possibility. The risk stage has been divided in 4 classes low, medium, excessive and medium. The existing control measures and additional control measures had been recognized and ensure secure team of workers inside the Auto Components manufacturing industry.
Keywords: Hazards, severity, possibility, risks.

1. Introduction

HIRA is the primary tool used in most industries to prevent accidents as a proactive approach of safety system. For Auto components manufacturing industry to be successful, it has to be safe, reliable and sustainable in its operations, the industry is to pick out the risks and determine the associated dangers and to bring the hazard to tolerable degree. Hazard identity and hazard assessment (HIRA) is carried for identity of undesirable activities that could result in a hazard, the analysis of risk of this undesirable event, that could occur and usually the estimation of its severity, possibility and risks of harmful effects.

2. Objective

The Objective of this work of hazards and hazard assessment is to pick out and look at hazards, the occasion sequences leading to risks and the hazard related to dangerous activities. Many strategies starting from the easy qualitative techniques to the superior quantitative strategies are to be had to help identify and analyze risks. The use of multiple hazard analysis strategies is recommended because every has its own cause, strengths, and weaknesses. To enhance the worker productivity, provide improved worker safety (physical and mental) and job satisfaction as a result of implementing the new improved HIRA.

3. Methodology

Hazard Identification and Risk Assessment (HIRA) is a process that includes a number of sequential steps inclusive of risk identity, result & frequency evaluation, hazard estimation based on the existing controls and suggestions to lessen those dangers which aren't under suited limits to be powerful, the employer methods for HIRA need to take account of the threat, danger, controls and documentation.

Hazard Identification and Risk Assessment Process

4. General Procedure

The group is headed through EHS and incorporates representatives from production, preservation, exceptional and Security. The Risk Register is compiled based totally on the outcomes of the Initial Status Review performed. Observation has been made to listing the work sports in every procedure. It shall don't forget all routine and non-habitual sports and sports of all personnel having access to place of job. Using a four-through-4 severity of harm and likelihood of harm criteria danger evaluation method to assess the extent of perfect chance assessment form the basis of the Safety and Health Management extensive dangers are based.

5. Hazard and Risk Identification

Initial Status Review: The methodology for evaluating the baseline from which EHS overall performance may be stepped forward and comprises 3 levels: desk examine, website online visit and hazard evaluation. The desk study involves the review of a health and safety prompt list that helps to identify the main hazards of the current operations prior to the site visit. Other applicable records consisting of permits and licenses, fabric safety statistics sheet, tracking effects and different EHS facts have been reviewed. The site visit consists of a comprehensive risk identification exercise which considers the full range of hazards of the services and activities conducted on site.

Work Activities Classification: Geographical areas within and out of doors the premises, Stages in the manufacturing system, or inside the provision of a carrier, deliberate and reactive work, defined venture, and a aggregate of the above. A list of work activities together with Information such as period and frequency of challenge, region of task, employees schooling and cutting-edge risk controls is prepared.

Process of Hazard and Risk Identification: In risk identification, three questions were asked: Is there a source of harm? Who (what) could be harmed? And, How may want to harm occur? The risks are identified for ordinary / non-habitual activities, and for sports concerning all employees along with contractors and traffic having access to work place due to Infrastructure, System and substances on the administrative centre, whether supplied by means of the organization or others. Even Risks originating outdoor the place of job able to adversely affecting the health and safety of men and women below the manager of the corporation within the place of job is identified. Due attention is given to identification of dangers happening due to human behaviour, abilities and other human factors.

6. Identification of Risk

Desk study: The table observe includes the evaluate of health and safety activate list that allows to discover the primary hazards of the contemporary operations prior to the site go to. Other relevant data including permits and licenses, monitoring results and other EHS records were reviewed.

Site Visit: Site Visit which incorporates the following activities: Details of area where paintings is executed, the activities carried by means of employees in place of job, the sports which can be at hazard, Work sports with written commands, machine of work and/or allow to work techniques, organized for unsafe responsibilities, The activities which use of manipulate measures, environmental conditions affecting the place of job, details of get admission and adequacy of emergency procedures, emergency escape plans, and emergency device, emergency break out routes, emergency communication facilities.

7. Risk Assessment

The recognized risks are assessed for his or her tiers of significance through threat assessment based at the severity and opportunity of incidence of the risks for base dangers and residual hazard tiers are calculated based on the reduction of rating in chance of prevalence because of the presence of current controls. The current controls are recognized from 0 to 10 in the guideline.

Parameters of Risk Assessment: The Risk Assessment is primarily based at the tolerability of hazard. The degree of danger is evaluated with the aid of estimating the capability severity of harm and the likelihood of damage. When score dangers and dangers, the adequacy of the threat control measures already applied desires to be considered. When thinking about the severity of harm, factors including component(s) of frame affected and number of personnel at hazard shall be taken into account.

Probability of occurrence	**Frequency**
Highly unlikely (1)	More than once a year and above
Unlikely (2)	Once a month to Year
Likely (3)	Once a week to month
Very Likely (4)	Multiple times a day to week

8. Severity Matrix

When thinking about the chance of damage, elements such because the wide variety of exposed employees, the frequency and duration of exposure, potential failure of offerings, equipment and protection devices, publicity to factors, use of personnel protecting equipment and unsafe acts will be taken into account. Identification of Base danger, Acceptable Risk and Significant Risk The chance degree is decided through the multiplication of severity and Probability of incidence. (Score = Severity x Probability of incidence). The Base risk is calculated based at the score of severity and probability before thinking about the present controls. The acceptable threat is calculated after thinking about the prevailing controls. The substantial risks are decided by the rating of perfect danger after applying the control measures.Risk Evaluation Matrix.

Categorization of Risk Level

TABLE 1. Risk Matrix

9. Recommendations and Implementation

Sl. No	Department	Activity	Hazards	Problem	P	S	R	Additional controls Suggested
1	Injection Molding Machine	Crane Movement	Fall Hazard	Employee not wearing helmet during crane operation	3	3	9	Employee should wear appropriate PPE
2	Injection Molding Machine	Cutting the unwanted skin cover in Dashboard	Cut Injury	Imm Operators using knife without holder	3	4	12	Need to use Retractable Knife
3	Injection Molding Machine Shop stock	Moving trolley with jigs	Injury	In shop stock, jigs stopper is not in a proper condition	3	3	9	All stopers need to check and preventive method to be followed
4	Injection Molding Machine conveyor	Robot arm drop the part on the conveyor	Crush injury	Running nip points not guarded	4	3	12	Emergency button provided. Running nip points covered
5	Injection Molding Machine	Movement of fixtures	Hit Injury	Robot fixture stand may hit body parts	3	3	9	Need to mark marking on Floor and to provide to chain/to cover parts which are projected inside
6	Paint shop	Persons stacking bin	Fall Hazard	Bins are stacked more than 1.8m	4	3	12	Stacking height is 1.8m
7	Paint shop	Conventional Painting	Loaded parts in jig are painted with conventional guns	Fire hazard	3	3	9	Conveyor is grounded to dissipate static charge
8	Paint Storage Area	Paint cans are loaded in trolley for movement	Paint spill - Fires	Person not using trolley properly	4	3	12	Spill kit provided; height of the trolley maintained for minimal effect.

9	Instrumental Panel line	Tool Change	FINGER INJURY	Clamp edges not covered properly	3	3	9	CLAMP'S EDGE MUST BE COVERED
10	Paint shop	Persons moving bin	Fall hazard	Bins moving without trolley	3	5	15	Need to use proper trollies for Bin movement and awareness training to be given
11	Paint Shop	Standing in the pipes during maintenance activity of paint baking oven.	Injury	The pipes carrying sludge are corroded over prolonged usage and easily gets broken	4	3	12	Awareness training to be given
12	Quality Lab	Testing	Fall of objects	Place inside the shell	3	3	9	Portable Platform should be provided
13	Raw Material Store	Truck parking	Hitting of Vehicles	Parking Truck near RM store	4	3	12	convex mirror should be placed in blind corners
14	Raw Material Store	Parking area to RM store	Inadequate handrails	Climbing through ladder	3	3	9	Proper Handrails should be provided
15	Raw water storage	Connecting/Disconnecting hose	Leakage of water	Connecting/Disconnecting the hose from tanker lorry to temporary tanks	4	3	12	Quick release Clamp should be provided
16	Production Control Logistics	lorry parking	Unintentional movement of vehicle	Wheel Stopper not used after vehicle parking	3	3	9	Wheel stopper should be provided
17	Production Control Logistics	Pulling the trolley	Hit Injury	Employee pulling the double stacking trolley	4	2	8	Awareness training to be provided
18	Maintenance	Material unloading	Fall Hazard	Unloading the material from vehicle in a not manner	3	4	12	Kerby wall to be Altered for vehicles entry
19	Covering Area	Glue Containers to be stored	Falling of materials from height	Empty Glue containers are stored without Secondary Containment	3	5	15	Chemical containers should be stored with Secondary containment

10. Conclusion

Hazard Identification and Risk Assessment (HIRA) take a look at have been made on the diverse hazards of different equipment's and process were observed and assessed. This take a look at has been performed in diverse hazards below physical, chemical, ergonomic chance, guide managing, health and electric dangers have been diagnosed and managed by means of the hierarchy of removal, substitution, engineering controls, administrative controls and PPE. Hazards in each activity were identified & the risk level has been assigned. Different existing control measures and additional control measures have been suggested for each activity.

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