HAZARD IDENTIFICATION AND RISK ASSESSMENT OF A GARMENT UNIT

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Abstract - *The garment sewing and packing unit conducted hazard identification and risk analysis. The severity, probability, and frequency of recurrence have all been factored into the risk rating. Three risk categories have been established. Depending on the severity, a low, medium, or high risk level was assigned.1 to 7, 8 to 14, and 15 to 20, correspondingly, are the levels of incidence. This research has discovered that the risk of running a garment sewing and packing unit is moderate. Various control procedures were used. Found and recommended to ensure the plant workers' safety.*

Keywords: Low, Severity, Probability, Hazard.

1. INTRODUCTION

Hazard identification is one of the most important aspects of a health and safety management system. It serves as the foundation for defining safe work processes, implementing prevention programs, and taking other measures to remove or control dangers. Any source of possible damage, harm, or adverse health effects on something or someone is considered a danger. A hazard's risk is the probability that it will cause harm. Identifying existing and potential workplace dangers, assessing risks, selecting and implementing controls, and reviewing hazards are all part of the hazard identification process.

The hazards of several actions in a garment unit have been identified. Activities were divided into many categories, and risk assessments were conducted based on the severity, likelihood, and frequency of occurrence. The following are the major activities and subcategories. This research is being conducted, and a risk reduction strategy is being proposed.

1.1 OBJECTIVE

The aim of this analysis on hazards and hazard assessment is to identify and examine dangers, risk sequences, and hazards associated with dangerous activities. To help identify and analyze risks, a variety of tactics are available, ranging from simple qualitative procedures to advanced quantitative strategies. Because each has its own cause, strengths, and weaknesses, using various hazard analysis methodologies is suggested. As a result of implementing the new improved HIRA, worker productivity, safety (physical and mental), and job satisfaction will all improve.

2. METHODOLOGY

Hazard Identification and Risk Assessment is a process that includes a number of sequential steps such as risk identification, result & frequency evaluation, hazard estimation based on existing controls, and recommendations to reduce those risks that aren't within acceptable limits. To be effective, employer methods for HIRA must consider the threat, danger, controls, and documentation.

Fig -1: HIRA Process

3. HAZARD AND RISK IDENTIFICATION

3.1 Parameters of Risk Assessment

The risk assessment is mostly dependent on the hazard's tolerance. The degree of risk is assessed by calculating the potential severity of injury and the chance of damage. When scoring threats and dangers, the effectiveness of existing threat control mechanisms should be assessed. Factors such as the component(s) of the frame affected and the number of personnel at risk must be considered when determining the degree of the harm.

Table -1: Risk assessment – Likelihood rating

LIKELIHOOD	EXAMPLE	RATING
Most likely	The most likely result of the hazard / event being realized	5
Possible	Has a good chance of occurring and is not unusual	4
Conceivable	Might be occur at sometimes in future	3
Remote	Has not been known to occur after many years	2
Inconceivable	Is practically impossible and has never occurred	1

Table -2: Risk assessment – Severity rating

SEVERITY	EXAMPLE	RATING
Catastrophic	Numerous fatalities, irrecoverable property damage and productivity	5
Fatal	Approximately one single fatality major property damage if hazard is realized	4
Serious	Non-fatal injury, permanent disability	3
Minor	Disabling but not permanent injury	2
Negligible	Minor abrasions, bruises, cuts, first aid type injury	1

Elements such as the wide range of exposed employees, the frequency and duration of exposure, probable failure of services, equipment and protection devices, publicity to factors, use of personnel protective equipment, and unsafe activities will all be considered when calculating the risk of damage. The chance degree is determined by multiplying the severity and the probability of occurrence. (Score = Severity x Probability of incidence). Before considering the current controls, the base risk is determined using the severity and likelihood scores. After considering the existing restrictions, the tolerable threat is estimated. After applying the control methods, the rating of perfect danger determines the major hazards. The severity and likelihood of occurrence of recognized hazards are appraised for their tiers of significance through threat evaluation for basic dangers, and residual hazard tiers are determined based on the reduction in rating in chance of prevalence due to the presence of present controls.

3.2 Risk Evaluation Matrix

Fig -2: Risk matrix

Table -3: Risk assessment – Cutting department

Type of operation	Risk Identified	Evaluation of risk	TYPE OF RISK	Severity	Likelihood	Risk score	Eliminate	Substitute of risk work	Isolate the risk	Engineering control	Administrative control	Use PPE,S	Preventive measures
				Risk score			**Corrective Action**						
Band knife machine	Cutting injury during operation	Loss of finger or even hand	HEALTH	4	2	8					√	√	1) Mesh hand gloves shall be provided 2) Provide proper awareness to wear it both hand.
	Guard less grinding wheel	It may effect eye sight due to spark and fire may occur	HEALTH / FIRE	3	3	9			√	√	√		Suitable grinding cover has to be installed
	Prohibition of unauthorized entry	1) May distract the concentration of the concern worker 2) Other person can hit the operator	HEALTH	3	3	9			√				1) Suitable barrigation has to be provided to avoid unauthorized entry

Table -4: Risk assessment – Cutting department

Type of operation	Risk Identified	Evaluation of risk	TYPE OF RISK	Severity	Likelihood	Risk score	Eliminate	Substitute of risk work	Isolate the risk	Engineering control	Administrative control	Use PPE,S	Preventive measures
				Risk score			**Corrective Action**						
Spreader machine	moving part can hit the human	Can Cause of body injury	HEALTH	4	3	12			√				1)Before start the machine to check whether the sensors is properly working 2) Provide emergency stop button to the machine and check its working condition
Cutting operation	formation of dust during the cutting operation	can cause respiratory problem	HEALTH	3	3	9					√	√	Providing mask and advise to wear it
Manual Cutting	Falling of sharp tools	Can cause legs injury	Health	3	4	12	√	√		√			Awareness shall give to thigh the Scissors with rope
	Damaged or improper handling of sharp tools	Cut injury on hand	Health	3	4	12	√						Replace the broken sharp tools

Table -5: Risk assessment – Sewing department

Type of operation	Risk Identified	Evaluation of risk	TYPE OF RISK	Severity	Likelihood	Risk score	Eliminate	Substitute of risk work	Isolate the risk	Engineering control	Administrative control	Use PPE,S	Preventive measures
				Risk score			Corrective Action						
Sewing operation	Uneven seating position	Can cause long team or mid team Disease	ERGONOMIC	4	4	16				√	√		1) Provide adjustable and rotate type chairs for operators
	It cause eye sight problem	If the lux level is low it may cause eye problem	ERGONOMIC	3	3	9				√	√		1) Proper lux level should be maintained 2) To conduct testing once in 6 months
	1)Needle broken can happen during operation	1)Can Cause eye injury	HEALTH	4	3	12				√	√		Eye guard has to be provided
	Not wearing of face mask of over lock / flat lock operators	Can cause respiration problem	HEALTH	3	3	9					√	√	1) To provide mask to all employees 2)Give awareness to wear mask 3) Check quality of air in floor areas at least once in a year.

Table -6: Risk assessment –Ironing department

Type of operation	Risk Identified	Evaluation of risk	TYPE OF RISK	Severity	Likelihood	Risk score	Eliminate	Substitute of risk work	Isolate the risk	Engineering control	Administrative control	Use PPE,S	Preventive measures
				Risk Score			Corrective Action						
Ironing operation	Steam leakage in pipe lines	Can cause skin injury	Health	4	1	4			√	√	√		1) Proper insulation padding for steam line has to be provided 2) Awareness has been given for safety evacuation in case of excessive steam leakage
	Water leakage in Iron box make wet condition in work place	1) Can cause falling risk	Health	3	3	9				√			Need to maintain Ironing box are properly
		2) Wet area can cause Electrical shock	Health	4	3	12				√			Provide rubber mat for iron box
	Noise on ironing table	Can cause earing loss	Ergonomic	3	3	9				√		√	1) As per standard noise level should be maintained 2) Ear plug provided for ironers

Table -7: Risk assessment – fabric section

RISK ASSESSMENT - FABRIC				Risk score			Corrective action						Preventive measures
Type of operation	**Risk Identified**	**Evaluation of risk**	**TYPE OF RISK**	Severity	Likelihood	Risk score	Eliminate	Substitute	Isolate the	Engineering	Administrati	Use PPE,S	
Loading & Unloading of fabric	Lifting of over weight	Can Cause back pain	Ergonomic	3	2	6		√		√	√	√	1) Employees should lift Permissible lifting weight only (Male - 50 Kgs, Female - 30 Kgs). If Excessive means more the two person can lift. 2) Use Forklift / Pallet truck for lifting the fabric and operators should be trained persons 3) Use appropriate PPE's (Helmet, Shoes)
fork lift operation	1)accident may occur in work place	1)can make injury to employees or property	Health Hazard	3	3	9				√	√		1)Awareness has to given such that an authorized license operator should handle the fork lift 2) Provide proper marking for Forklift movement area 3) Fork lift working conditions need to check before start (E.g.: Side mirror, Horn, Reverse indicators & sound, ...etc.)

Table -8: Risk assessment –Packing section

RISK ASSESSMENT - PACKING				Risk score			Corrective Action						Preventive measures
Type of operation	**Risk Identified**	**Evaluation of risk**	**TYPE OF RISK**	Severity	Likelihood	Risk score	Eliminate	Substitute of risk work	Isolate the risk	Engineering control	Administrative control	Use PPE,S	
Packing operation	Prolong standing and continuous packing of finished materials	Leg pain and wrist pain	Ergonomic	3	4	12					√	√	1) Provide proper rest time to the packers 2) Provide Rest stool for take rest. 3) Proper floor checking mat has to provide
	Continuous packing make eye sigth problem	If the lux level is low it may cause eye problem	Ergonomic	3	3	9				√	√		1) Proper lux level should be maintained 2) To conduct testing once in 6 months
	Prolong standing in front of packing table	May cause back pain	Ergonomic	3	4	12				√			1) Proper height table should provide it will reduce ergonomical effect 2) Provide Rest stool for take rest

4. RESULT AND DISCUSSION

Risk analysis for different activities was undertaken in the Garment unit. It is found that the risk level was ranging from 3 to12 for the Fabric process, 6 to 16 for the cutting process, 9 to 16 for the sewing process, 4 to 12 for the ironing process, 9 to 12 for the packing process and 4 to 10 for the environmental significant. As a result of this study, various hazards were identified and the practical control measures were developed.

5. CONCLUSION

This research has identified several dangers in the areas of mechanical, electrical, material handling, chemical, ergonomics, and temperature extremes, as well as control strategies based on the hierarchy of elimination substitute engineering administration and personal protective equipment (PPE). Several procedures in the garment unit have been identified as having a very high level of risk, necessitating quick control actions. This research also demonstrates that a medium risk rating is linked to a number of activities for which control measures are indicated.

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