

OCCUPATIONAL HEALTH & SAFETY IN TEXTILE INDUSTRY

Praveen Kumar M¹, Mugundhan.K², Visagavel.K³

¹PG Scholar, Department of Mechanical Engineering, Knowledge Institute of Technology, Tamilnadu, India

²Assistant Professor, Department of Mechanical Engineering, Knowledge Institute of Technology, Tamilnadu, India

³ Professor Department of Mechanical Engineering, Knowledge Institute of Technology, Tamilnadu, India

Abstract

The study of Occupational Health and Safety in Textile industry examines to promote Health and safety to the workers in India. The Hazards and risk involved in the textile industry is high compared with other industries and least importance are given to textile industries. Most of accident do not come to the legal formalities. The People are not aware of Health & safety is due to the workers are uneducated and management not given importance due to promote OHS in Textile industry becomes a barriers in implementing OHS. The major hazards happen are physical, chemical, ergonomically & physiologically hazards along with these some of things which can create hazards are more working hours, improper ventilation. The RPN(Risk priority number) has been find out for all the hazards in the textile industry and FEA(fault tree analysis) is done for the hazard with highest RPN no.

Keywords: occupational health safety, Hazards, risk, legal formalities, working hours, RPN.

1. INTRODUCTION

The study of OHS in textile industry in Tamilnadu is studied by checklist method , questionnaire method, workers interaction. There are 1371 mills in Tamilnadu with working employees of 38461 workers. The Study monitor the OHS in textile industry includes five major sectors they are

1. Ginning Industry
2. Spinning Industry
3. Weaving Industry
4. Dyeing Industry
5. Garment Industry

The hazards can be controlled by the industry with the co-operation of the management. Most of management does not aware of Health & safety and other problems is that the working people in the textile industries are uneducated and unaware of OHS. This condition is very difficult to control the HAZARDS and promote OHS to the workers .The hazards are prioritized by the based on the RPN number. The RPN number is calculated by the multiplication of severity, probability and detect ability.

$$RPN = \text{Severity} \times \text{probability} \times \text{Delectability.}$$

RPN is calculated for all the hazards involved which is involved in the textile industry. The maximum value of risk priority number is 1000. The process involved in spinning industries are mixing, blow room, carding, comber, drawing ,simplex, spinning, auto corner ,packing.

The hazards are also controlled by (1) safety Audit (2) safety survey (3) identifying Hazards (4) Risk Analysis (5) Risk estimation (6) Job safety analysis (7) safety promotion (8) emergency preparedness (9) safety sample (10) safety committee (11) safety inspection.

2. LITERATURE REVIEW

The hazards happening in the Textile industries are Mechanical Hazards, physical hazards, chemical hazards, Ergonomic hazards and physiological hazards. Exposure of cotton disease called Bysinosis .The Symptoms are chest tightness, breaking problem, asthma and irritation in the Respiratory track. The study tells about the accumulation of workers, improper condition of the machine, ergonomic problem faced by the worker, dust problems , poor lighting ,ventilation and unaware of personal protective equipment not given OHS in these industries. [padmini D.S et al.,2010]. Education is the fundamental right that helps the Growth of nation. The education help the workers to get knowledge about medical rights, legal and social behavior. The people are uneducated most of them do not know OHS at workplace .The Company unaware and lack of OHS some of them are training, housekeeping, accident prevention ,hospital facility ,safety signs[Nazia Mlik et al.,2010].To control the noise level in the company premises and outside the company necessary action must be taken that noise regulation must be adopted.[Hafiz Danish Ashraf et al .,2009].To maintain the quality and production, the health of worker is essential .The most important Hazard in occupational is noise. To maintain the quality and production ,the health of the worker is essential [Ahmad HO et al.,2001].The Main cause of noise problem in the weaving and spinning industry is due to the poor design, overload and old machinery.[James MG et al.,2009].In industries is noise is a big problem that affects the human peace and increase the stress.[Iqbal SM et al., 2007] . The musculoskeletal disorders are caused by continuous work , lifting high weight, doing job without appropriate procedures.[Tiwari meenaxi et al.,2012].

3. AIM AND OBJECTIVES

The main objective of the study is conducted due to the Reasons :

1. Measure work environment issues such that noise, temperature, lighting humidity.
2. To find out Hazards in the Textile and tell the accurate control measure.
3. Detect unsafe working condition in the Textile industries.

4. METHODOLOGY

4.1 Ginning Industry

The cotton in a machine which is used to separate the cotton fiber from the seeds and the cotton send to the textile for making yarn. The one of main Hazard in ginning industry is fire, the causes of fire happens in the Ginning Industry are Electrical, Manmade Behavior, spark from the Machine and stored Raw cotton in sunlight and other causes.

4.2 Working and Living Condition of Worker

4.2.1 Overworked Labour Force

All workers, whether they are willingly to work or non will to work they are forced to work for 12 hours. These 12 hours does not include overtime. some workers complaint that they are forcing to work more than that time. As per Factories act 1948 under chapter -6 working hours of Adults in section 51 ,no worker should not work more than 48

hours in a week and compensation Holiday must be given for Extra working days..

4.2.2 Unprotected Working Condition

As we know that inhalation of cotton fiber leads to BYSONIS. so It is compulsory to use Masks for these working Environment but no one following these safety Measure. As per factories act 1948,under chapter -4,under section 27 says, prohibition of employment of women and children near cotton opener.

Types of Hazards

- 1) Physical hazards
↓
noise, fire, temperature.
- 2)Electrical hazards
↓
short circuit happens.
- 3) Ergonomically hazards
↓
continuous work, improper work station.
- 4) Physiological hazards
↓
personal problems, financial problem.

Table-1 Details of work environment of Ginning industry

Parameters	Range	Mean
Noise(dBA)	88-92	90
Lightning(lux)	45-63	54
Temperature(c)	28-30	29
Humidity(%)	----	56.41

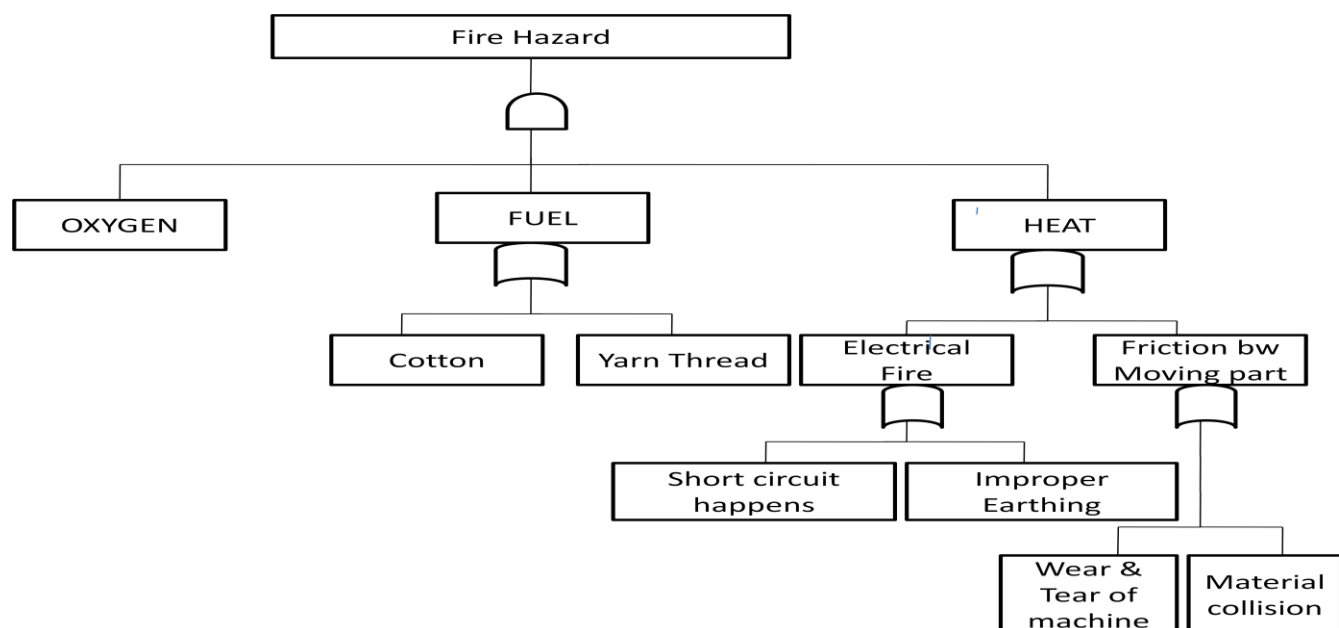


Chart-1 FEA for Fire hazard in ginning industries

Table 2: Hazards involved in Ginning & spinning industries

S.NO	HAZARD	CONSEQUENCES	ACTION REMEDIAL ACTION	RPN NO = Severity x detect ability x probability.
1	Physical hazards a)Noise	Noise induced hearing loss, Tinnitus	1)Isolation of the machine and Silencer must be kept. 2)Inverted drive control noise in ring frame. 3)proper maintenance lubricating control noise	9x9x8 = 648
2	b)Dust	Causes respiratory problems and causes Byssinosis(a disease caused by cotton dust)	1)Dust collector 2)proper House keeping and 3)necessary PPE should were by worker	10X10X10=1000
3	c)Light	Eye strain and glaring	Proper lightning condition	7x8x7 = 392
4	d)Lifting Heavy weight	Muscular-Skeletal Disorders	1)keep your backbone straight while lifting load. 2)pull the load as close to the body. 3)Lift and carry loads with straight arms	10X7X9 =630
b).	Fire Hazards	Loss of life, Damages to the equipments.	Fire hydrant system and sprinkler system	10x10x9 =900
	a)Welding operation	Spark ignition is very dangerous.	Restrict unauthorized person to do welding	10x9x10=900
	b)Electrical short circuit happens	If no trip occurs its get sparks and get fire.	ACB (Air circuit breaker),MCB (motor circuit breaker).	8x8x8 =512
	c) Smoking	Easily gets fire	Safety signs & workers must aware of not using any ignition product	10x10x9 =900
S.NO	HAZARD	CONSEQUENCES	ACTION REMEDIAL ACTION	RPN NO = Severity x detectability x probability.
ii). 1.	Electrical hazards: a)Improper Earthing	Trip occurs	Avoid improper ear thing and loose connection,	10x7x9 =630
2.	b)Improper isolation	Electric shock	All circuits to be enclosed in a proper circuit.	9x10x8 =720
3.	c)Moisture	Proper wiring Proper wiring	Moisture to kept in control.	9x9x7 =567

4.	d)Motor high speed rotating Due to high voltage	Causes problem to the machine	Circuit breaker must be individual	8x7x8 =448
5.	e)Usage of old wire	Not proper current flow	Use of wires as per Electrical standard.	7x9x7 =441
6.	f)Input power cable exceeds More output	Cable melting & switch becomes heat	Input wire must be more power than output wire.	8x7x8=448
7.	g)Looping in the running line.	Electronics PCB	Avoid looping	8x9x7=504
8.	h)Electrical Maintenance	ECB board Check the connection Grease the motor frequently,	Needs preventive maintenance	8x7x8=448

* FTA is drawn for hazards with maximum rpn no as shown in Chart-1 and 2.

Spinning industry:

Spinning is the major part of textile industry. The textiles are fabricated into clothes. Noise is the main hazard in textile industry. The noise pollution (Regulation and control) rule 2000 in industrial area was 75db at Day Time [6 AM to 10 AM] and Night time [10 PM to 6 AM]. The fire accidents

occurs in textile mills are often. The Hazards in the spinning mills are more compared to other sectors of textile industry because the Raw material cotton is exposed to fire easily. In spinning, a major hazard is cotton dust, which causes many health problems for the workers. RPN (Risk Priority Number) was high for this hazard.

Table -3 Ergonomically Hazards:

1	Uncomfortable work station and height.	Pain in hand and legs.	Importance to ergonomics	8x8x7 =448
2	Repetitive strain injuries	Wrist, Neck, Shoulder, Neck, Knee, Angle.	Proper working procedure	8x9x8=576
Physiological hazards:				
1	Not interested to work	Physiological problem	Give counseling.	8x6x6=288
2	Production target	Stress to the worker	Set achievable Target.	6x8x6=288

Table - 4 Details of working environment in spinning industries

Parameters	Location of the reading	Range	Mean
Lighting(lux)	Blow room	78-109	93.5
	Spinning area	51-60	55.5
Noise (dBA)	Spinning area	90-95	92.5
	Auto corner (off end & rear end)	86-89	87.5
Temperature(*c)	Preparatory unit	24 -30	27
	Spinning room	28-35	31.5
Humidity(%)	Preparatory unit	-----	51.61
	Spinning room	-----	56.41

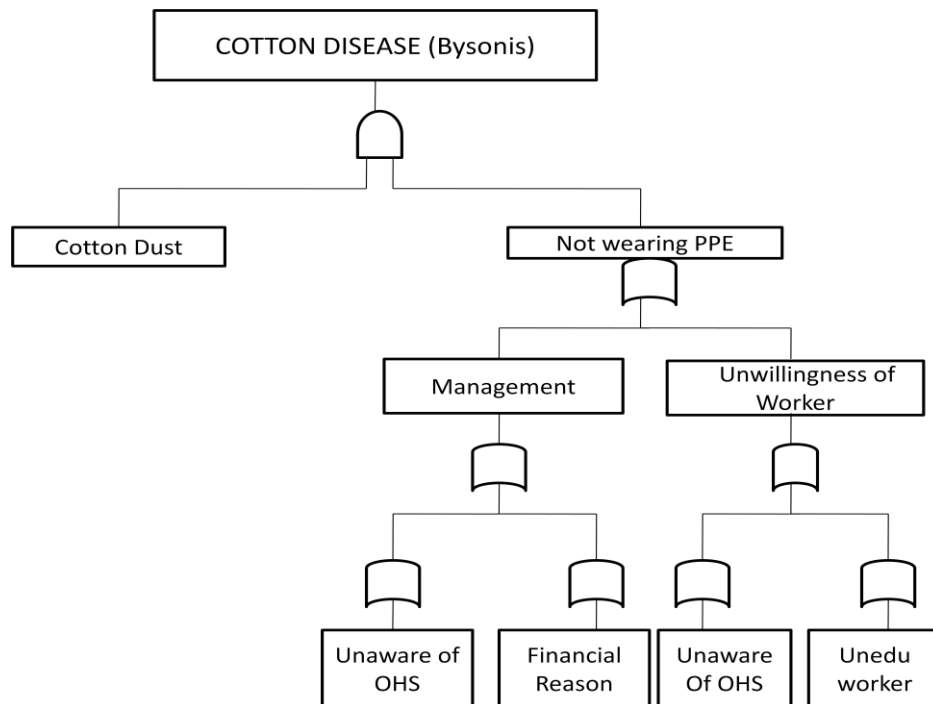


Chart-2 FEA for cotton disease in ginning Industries

Dust Control

The workroom should not be more than $0.2\text{mg}/\text{m}^3$ and controlled by some specific task. The cotton dust should be dumped with proper care and avoid storing in open container. The TWA(Time weighted average) of wool dust is $10\text{mg}/\text{m}^3$ at 8 year exposure. Excessive drying should be avoided ,if it dry the cotton dust will fly fast. The following methods to control dust is (a) proper education about cotton dust affects health.(b) proper health checkup to the affected workers (c) effective dust control method should be implement from further affecting.

5. CONCLUSIONS

The presented study has demonstrated the hazards and risk involved in the spinning and ginning industries. The main hazards are noise, dust, fire and electrical hazards is found by calculated RPN number ,comparing to other hazards the maximum RPN is found to be harmful to the workers. so Immediate action must be taken to control these hazard to save workers health and promote safety to worker.

REFERENCES

- [1]. C.W Kan.,”Occupational safety and health management system in textile industry” , international lconference textile & fashion 2012 july 3-4-12 bangok Thailand.
- [2]. D.S Padmini.,” Unsafe work environment in garments industries”,journal of environment research and development, volume 7 no.1A 2012.
- [3]. Nazia malik.,” Role of hazard control measure in occupational health and safety in the textile industry of Pakistan, pak j.agri sci vol 47(1), 72-76,2010.
- [4]. Hafiz Danish asraf.,”frequency of hearing loss among textile workers of wearing units in Karachi, Pakistan.

[5]. Tiwari meenaxi.,” Causes of musco- skeletal disorders in textile industry”, Issn 2329-3563.vol 1(4),48-50,December 2012.

[6]. Vasim khatik.,” The pioneer study on identification of fire hazards in cotton ginning industries of nandurbar region of Maharashtra”, volume-2,Issn 2277-8179.