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Occupational Safety and Health Issues in Spinning Industry

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Abstract: ***The study of Occupational Safety and Health issues in spinning industry examines to promote Health and safety to the workers in India. The Hazards and risk involved in the spinning industry is high compared with other industries and least importance is given to spinning industries. Most of accident does 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 spinning 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, dust and noise.***

Keywords: MMF- Man Made Fiber, OHS- Occupational Health and Safety, MWF- Metal Working Fluid, RPM-Revolutions per minute.

I. INTRODUCTION

Thousands of workers are employed in Spinning industries under different job categories including Ginning, Carding, combing, spinning, packing. The Spinning industry workers are exposed to a number of chemicals including dyes, solvents, optical brighteners, finishing agents and numerous types of natural and synthetic fiber dusts which affect their health. In this paper an attempt has been made to summarize the self-reported health problems among a group of spinning industry workers. Their lower socioeconomic status, coupled with the lack of other viable livelihood options, puts them at a particular disadvantage while dealing with health related problems.

II. LITERATURE REVIEW

Frequency of hearing loss among textile industry workers of weaving unit in Karachi, Pakistan by Ashraf HD, Younus MA, Kumar P, Siddiqui MT, Ali SS,Siddiqui MI.2009.Noise level is more than acceptable limit of 85 dB (A) for 8 hours exposure stipulated. There is an immediate need to develop and implement noise regulations in Pakistan.

Cotton Dust level in Textile industries and its impact on Human by B.M.Sangeetha M.Rajeswari, S.Atharsha, K.Saranyaa Sri, S.Ramya April 2013. Knitting process produces the maximum dust level compared to other process, so we suggest that the preventive measures in the knitting session particularly should be more effective than other sections.

Occupational Hazards and Illnesses of Filipino Women Workers in Export Processing Zones by Jinky Leilanie Lu, 2008. Many of the small- and large-scale companies reportedly had health and safety committees, none of them functioned properly.

A Study of Occupational Health and Safety in the Garment Industry in Bangalore by Laura Ceresna-Chaturvedi, Anand Kumar October 2015 Health and safety provisions available to workers at their workplace were very rudimentary. Occupational health and safety needs to be also addressed from the care perspective, i.e., through the ESI.

Reduced lung cancer mortality and exposure to synthetic fluids and biocide in the auto manufacturing industry by Mehta AJ,Malloy EJ,Applebaum KM,Schwartz J,Christiani DC,Eisen EA 2010, The protective effect of synthetic MWF(Metal Working Fluid) against lung cancer mortality persisted through the extended period of follow-up, although attenuated, and was observed only among workers with co-exposure to biocide and synthetic MWF.

Unsafe work environment in Garment industries, Tirupur, India by Padmini D.S. Venmathi.A September 2012, The medium and small sized garment industries in Tirupur were found to have poor illumination, improper ventilation, excessive noise, congested work area, unergonomic workstations. Theworkers were exposed to dust, chemicals mainly in the form of solvents, ergonomical problems,psychosocial problems, etc. Vibration and noise caused by lawn maintenance machines in association with risk to health by P. Tint,G. Tarmas,T. Koppel,K. Reinhold and S.Kalle 2012 due to Whole-body vibration levels can often be reduced by using vibration isolation and by installing suspension systems between the operator and the vibrating source.

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A Study Of Pulmonary Functin Tests In Cotton Mill Workers Of Guntur District by Prabhakara Rao.K,srinivasa Rao.CH, Sumangali.P 2013 Inhalation of cotton dust causes release of histamine from mast cells. Histamine acts on the smooth muscles resulting broncho constriction. Air way mucus glands secrete more amount of mucus in the presence of histamine

III. FACTORS FOR PRODUCTION IN SPINNING MILL

In every factory, production efficiency defends on some factors or parameters. As like as other factory, production of Spinning mill defends on some factors. The factors which influence the production of spinning millare mentioned below:

A. Raw Material

Raw material has an important impact on yarn quality and production. Let's see how it affects on yarn production? There are many parameters through which we can easily assess the properties of cotton; first one is the fiber length which is the most important characteristic of cotton and is measured in terms of staple length, span length and effective length. If fibers have good staple length it results in the form of high production. I think while choosing cotton we have to keep in mind all these factors otherwise it results in the form of great loss.

B. Labour

Labour is critical to the sector's current competitiveness and long- term viability. Workers' skill levels, productivity and motivation, the industry's ability to attract and retain the right quantity and quality of workers, domestic labor laws and regulations and workers' living conditions and costs in urban areas, are all critical in the context of acontinuously changing economic environment. In South Asia and other emerging economies, where low cost labor is essential for industry competitiveness, the Spinning industry has been subject to various allegations of labor abuse, including long hours, forced overtime and low wages. In light of these factors, there have been many state- and non-state initiatives to try to ensure sound labor and other practices in the sector whilst maintaining its international competitiveness.

C. Machinery

Machinery is the back bone of every industry. In the textile industry machine are working 24 hours so it is important that its efficiency would be excellent. Let's look at the comparison between the old and new machine. In Spinning Mills we analyzed that, "why new machine are better than old machine?" In the simplex department they have erected 10 frames and in which one of them is the old one. If we compare the old machine with the new machine in production point of view then, it is clear that new machines are better than old ones.

D. Maintenance

Proper maintenance of machine is necessary otherwise it results in the form of many problems like sudden shut downs and big production loss. In ATM maintenance is done on daily basis to overcome the problems which they are facing every day. Usually in ATM one machine is opened 30 in every department for maintenance. Proper maintenance results in the form of efficient working of machine and good outputs. For example by proper Maintenance and by proper preparation of roving it results in the form ofminimizing the end breakage rate.

Sl.No	Natural Fiber	Man Made Fiber
1	The fibers which we get from nature recalled natural fiber.	The fibers which are developed by man recalled manmade fiber.
2	Generally fibers are hydrophilic.	Generally fibers are hydrophobic
3	No. of molecule controlled by nature.	No. of molecule controlled by man.
4	Length of the fiber is nature given.	Length of the fiber is controlled by man.
5	We get fibers' as staple or filament.	No question about short or long staplefiber. It depends on man will.

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6	Less strength and durability.	More strength and durability.
7	No need to spinneret for spinningprocess.	Spinneret is essential for filamentproduction.
8	The fabric made from natural fiber iscomfortable and good for health.	Manmade fiber is not comfortable and notgood for health.
9	Natural fiber is not favorable forfinishing.	Manmade fibers are favorable forfinishing.
10	Comparatively less durable thansynthetic fiber.	Manmade fibers are more durable thannatural fiber.
11	Fineness varies from one fiber toanother fiber.	Fineness depends on the manufacturers
12	Natural fiber has a great demand ashumans wear.	Synthetic fiber is widely used in everydaylife except humans wear.
13	Natural fiber is called environmentfriendly.	Manmade fibers are not environment friendly. Some fibers are harmful for theenvironment like: Polypropylene.
14	Natural fibers needs to scouring and Bleaching process before wetprocessing.	Scouring and bleaching is done in very fewcases
15	It is not possible to change in fiberstructure.	It is easy to change in fiber structure.
16	It is expensive.	It is cheaper.
17	Bears crimp naturally.	We have to give crimp manually.
18	It grows with its natural color.	Colors are added in the solution bath asrequired.
19	It is easy to dye the fiber.	Coloration is not so easy as natural fiber.
20	Dust and impurities could be in naturalfiber.	No dust or impurities contain in syntheticfiber.

E. MMF Process on Spinning Mill

Bale Opening
↓
Conditioning of MMF Fibers
↓
Blending
↓
Blow Room
↓
Carding
↓
Drawing
↓
Speed Frame
↓
Ring Frame
↓
Cone Winding

1) *Blow Room:* Blow room is the initial stage in spinning process. The name blow room is given because of the "air flow" And all process is done in blow room because of air flow. Blow room is consisting of different machines to carry out the objectives of blow room. In blow room the tuft size of cotton becomes smaller and smaller. In a word we can say a section in which the supplied compressed bales are opened, cleaned & blending or mixing to form uniform lap of specific length is called Blow room section. During the opening, cleaning, blending or mixing different faults or defects occur in blow room. Now I will discuss about faults/defects, causes and way to remedies in blow room section.



Fig no: 3.1 Blow room

2) *Speed Frame:* Simplex is an intermediate process in which fibers are converted into low twist lea called roving. The sliver which is taken from draw frame is thicker so it is not suitable for manufacturing of yarn. Its purpose is to prepare input package for next process. This package is to prepare on a small compact package called bobbins. Roving machine is complicated, liable to fault, causes defect adds to the production costs and deliver the product. In this winding operation that makes us roving frame complex. There are two main basic reasons for using roving frame.



Fig no: 3.4 Speed Frame

3) Winding: Winding is the process of transferring yarn or thread from one type of package to another to facilitate subsequent processing. The re-handling of yarn is an integral part of the fiber and textile industries. Not only must the package and

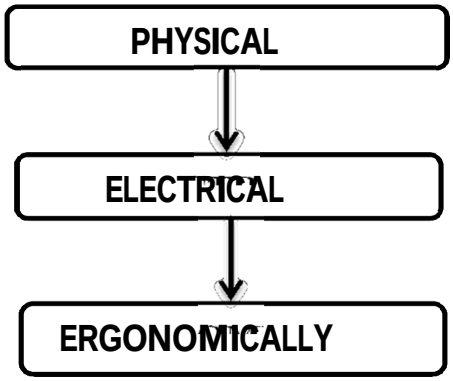


Fig no: 3.6 Winding

the yarn itself be suitable for processing on the next machine in the production process, but also other factors such as packing cases, pressure due to winding tension, etc., must be considered.

IV. HAZARDS

There are several safety and health issues associated with the textile industry. This article aims at studying each of these issues in relation to an Indian textile industry in detail, along with the possible solutions for these problems.



TYPES OF HAZARDS

A. Noise

Noise represents in various departments and above all in weaving mills a problem of primary importance, especially if there is not enough room available and no adequate soundproofing intervention on the machine and on the rooms have been carried out. In such cases the alternative is the use of individual safety devices. A high noise level can entail a reduction in the functions and other secondary collateral effects.

Parameter	Range	Mean
Noise (dBA)	88-92	90
Lighting (Lux)	45-63	54
Temperature (c)	28-30	29

B. Electrical Hazard

Exposed wires or terminals are hazardous. Report these conditions to your supervisor. This electrical panel has missing circuit breakers. Never usea panel that has exposed wires. All openings must be closed. Outer insulation on electrical cords must be intact.

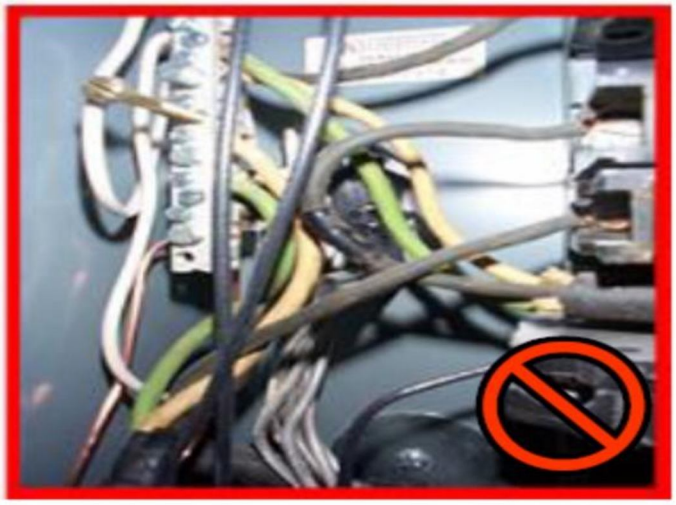


Fig no: 4.1 Exposed Electrical Parts

C. Fire Hazards

INFLAMMABLE AND EXPLOSIVE DUSTS

The three ingredients that cause fires are heat, oxygen and combustible material. When all three components are present, combustion takes place. Many dusts and powders that emanate out of the industrial processes are easily flammable. These dusts carry characteristics that differentiate them such a

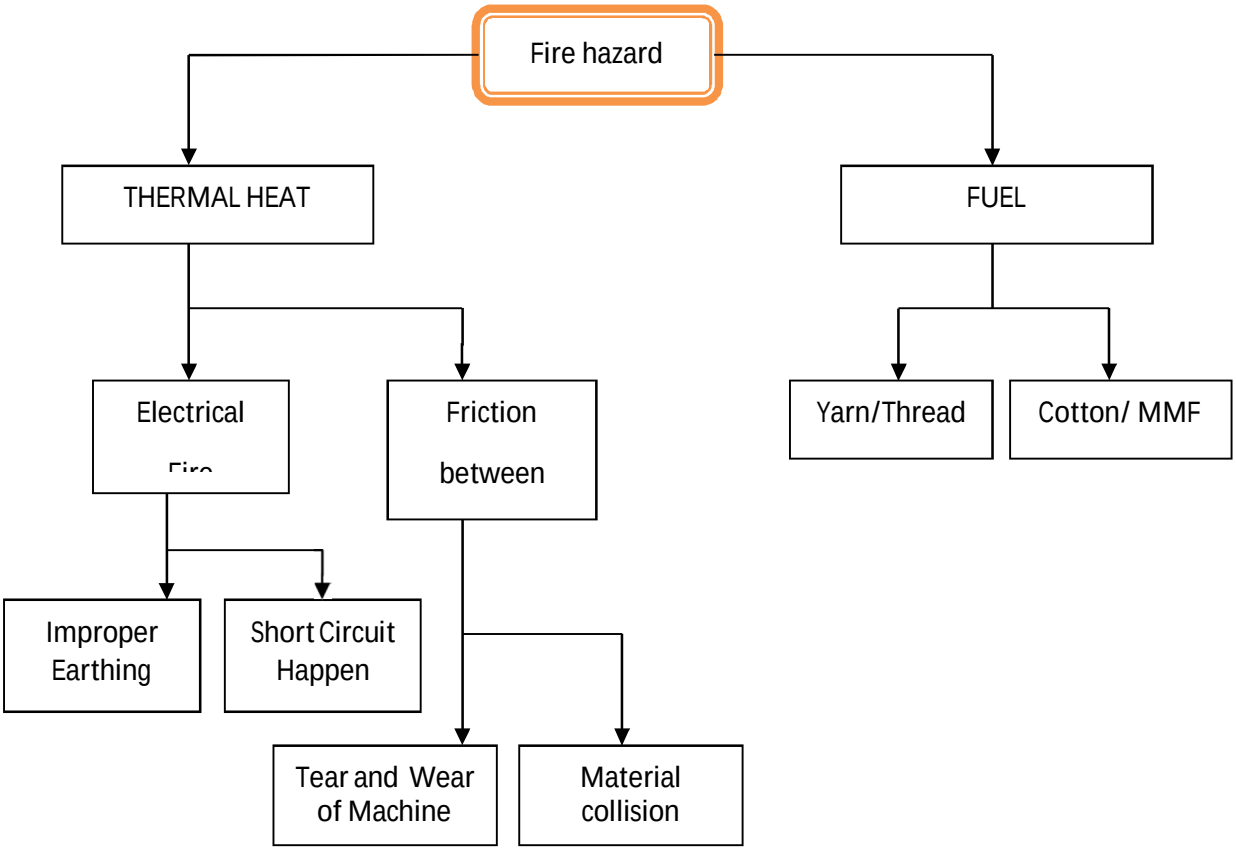


Table No: 4.2 Problem identification

S.No	HAZARD	CONSEQUENCES	MEDIAL ACTION	RPN NO= Severity X Occurrence X Detectability
1	Physical hazards a)Noise	Noise makes hearingloss	Proper maintenance lubricating control noise Isolation of the Machine	7x8x7=392
2	b)Dust	Causes Byssinosis	1. Workers shouldwear PPE. 2. Increase the no.of Dust collector 3.Proper Housekeeping	8x9x8=576
3	c)Light	Eye pain and getting visibility loss	1. Increase the bulb luminance. Increase visibility roofing sheet	6x7x6=252
4	d)Lifting Heavyweight	Muscular-SkeletalDisorders	Lift by 2 persons. 2. Keep your backbone straight while lifting load. Use Lifting vehicle	7x6x7=294
5	e)Improper Ventilation voltage	Gets Tired	Increase the ventilation fans andDepartment wise.	8x10x9=720
6	f)Usage of old wire	Not proper current flow	Use of wires as per Electrical standard.	8x9x9=648
7	g)Looping in the running line.	Gets electrical shock and gets trip due to over load	Avoid looping in main line	9x10x9=810
8	h)Electrical Maintenance	ECB board Check the connection Grease the motor frequently.	Monitor maintenance routinecard by floor supervisor	8x9x9=648
9	Chemical	Not good to health,Eye, skin	1. Wear proper safety gloves and equipments. 2. Check the blood samples of the workers and advised to remedial action.	9x10x9=810

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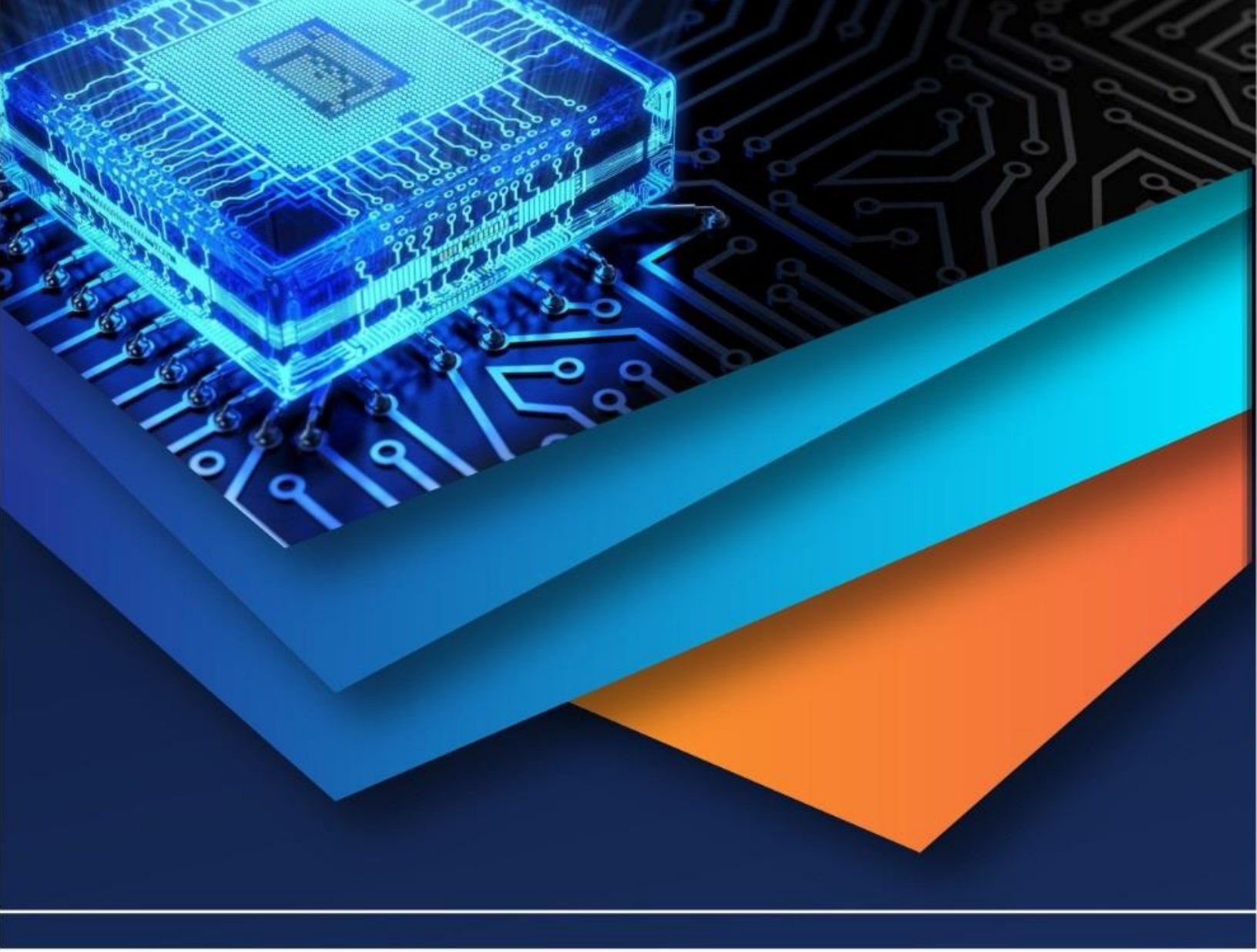
V. CONCLUSION

The Project was done with an intention to study the hazardous effects over people working in the Spinning industry. The major hazards happen arephysical, Electrical, Chemical , ergonomically & physiologically Hazards, along with these some of things which can create hazards are more working hours, noise, dust and improper ventilation.The human body capacity and the proper design of the equipment are effective only if the environment is congenial. With aiming for continual improvement the project work will focusing give the solution for manmade fiber spinning industry workers to realize their health and safety at work place.

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