

Safety Management in Indian Small and Medium Scale Industries - Case Study

B.T.D.Praveen Varma¹ Dalveer Singh² Piyush Shukla³ Naveen Gadde⁴ Bobby Arora⁵

¹M.Tech Scholar ²Assistant Professor

^{1,2,3,4,5}Department of Mechanical Engineering

^{1,2,3,4,5}Lovely Professional University, Punjab, India

Abstract— India is a developing country where small and medium scale industries play a major role in development. Safety is given much importance in companies by having an aim of zero accidents. Major accidents are occurred due to human errors. This paper discusses about the safety precautions to be taken in industries during work. It also explains about the view of employees on safety rules by industry management. The paper concludes with suggestions to management for safety improvement during emergency situations.

Key words: Industrial Safety, Unsafe Acts, Unsafe Conditions, Preventive Measures

I. INTRODUCTION

Generally accidents are caused due to human error or the improper conditions at work.

A. Unsafe Acts and Unsafe Conditions

Unsafe Act	Unsafe condition
Unsafe acts include disabling safety devices and being under the influence on the job.	Poor lighting, lack of machine guards, Defective tools or equipment.
90% of the accidents are caused by unsafe act	10% of the accidents are caused due to unsafe condition
Example: 1. wrong tool usage 2. safety devices Disabling	Example: 1. Defective tools or equipment 2. Lack of guards
Factors for unsafe act: Lack of knowledge or skills.	Factors for unsafe condition: Job factors, such as substandard equipments contribute to unsafe condition.
Employees are the most important factor in eliminating unsafe acts in the workplace	Lack of warning systems Poor housekeeping, slippery surfaces
To prevent future occurrences, accidents are usually handled in three stages: – Accident response – Accident investigation – Corrective action	Hazardous atmospheric conditions Hazardous arrangement, placement, storage. Unexpected movement hazards.

Table 1: Unsafe Act & Unsafe condition

II. SAFETY PRECAUTIONS DURING WORK

A. Mechanical Safety

Mechanical systems are most hazardous to create accidents. Certain precautions should be taken while performing mechanical operations.

- 1) Workman should wear proper uniform suitable for working conditions.
- 2) Never touch the moving parts and belts during your work.
- 3) Oiling or greasing should not be done while machine is being operated.
- 4) Tools should not be handled with the oily hands.
- 5) While handling battery protect your vestures from its liquids as it contains acids.

B. Electrical Safety

Electrical shock is sudden and accidental effect of the body nervous system. The current must enter the body from one point and leave at another. The severity of the shock depends up on the following factors.

- 1) The rate of flow of current through the body.
- 2) The path of the current through the body
- 3) The length of the time the current flow through the body.

Effect of electrical current on man is explained in a table

Current(MA)	Effect
0-4	Slight sensation on hand
1-1	Perception through hold
1-8	Shock not painful, muscular control not cost
9	Shock painful, muscular control not lost
25	Shock painful and severe muscular contraction breathing difficult
100	Shock possible ventricular fibrillation effect

Table 2: Effects

There are few reasons for electrical accidents

- 1) Person touches bare conductor line.
- 2) Person touches poorly insulated conductor.
- 3) Open and short circuit due to equipment failure.
- 4) Static electricity.
- 5) Lightning

III. PHYSICAL AGENTS CAUSING HAZARDS AND THEIR PREVENTION

It is very important to evaluate the working environment and provide necessary safety equipment and to educate him the importance of using them while he is engaged in a particular job.

A. Heat:

1) Effects:

- High exhausted
- Heat cramps
- Heat rash
- Heat stroke

2) Preventive Measures:

- Use of thermal barriers between the heat source and worker.
- Provision of personal protective clothing.
- Provision of air-conditioned rooms.
- Provision of cool drinking water.

B. Effect of Noise:

1) Auditory Effects:

- Temporary hearing loss
- Permanent hearing loss

2) Non-Auditory Effects

- Speech Interference
- Irritability
- Reduced working efficiency
- Increased accidents
- Hypertension

3) Preventive Measures:

- Personal protective equipments
- Proper maintenance of machines.

C. Lighting:

Area	Light(Lux)
canteen	150
Stairs and corridors	100
Rough workshops	150
Medium work	300
Fine work	700
Very fine work	1500

Table 3: Lighting

D. Vibrations:

In industrial area the ill effects are usually due to constant handling of vibration tools

1) Effect:

- Vibration diseases-
White fingers, poly neuritis

2) Prevention:

- Automatic and remote control system.
- Rubber padding of machinery and soved installations.

E. Chemical:

1) Hazards:

- Lead
- Phosphorous
- Mercury
- Manganese
- Arsenic
- Chromium
- Carbon-di-sulphide

2) Preventive measures:

- Prevention of inhalation of dust and fuels.
- Use of exhaust fans
- Follow safe ventilation rules.

- Use of personal protective equipment.
- Gas detectors and alarms.

IV. FIRST AID

A. Chemical Poisoning:

- If the person is conscious, give more water to drink and some commonly used antidotes like milk, barley, raagy.
- If the respiration is shallow give him artificial respiration.

B. Gas Poisoning:

- Shift the patient to open air
- Loosen his clothes
- Give artificial respiration

C. Burns:

- Pour the water over the burnt area.
- Cover the area with dry and clean cloth.
- Shift him to the nearest medical centre.
- Give plenty of oral fluids to drink.

D. Electric Shocks:

- First aid external burns
- Cardio respiratory resuscitation.
- Shift the person to nearest hospital.

V. INDUSTRIAL MEDICAL SERVICES

- 1) Curative
- 2) Preventive

A. Curative:

- Immediate treatment of the medical and surgical emergencies occurring at the place of employment.
- Complete treatment of families and employees.

B. Preventive:

- Pre-employment medical examination.
- Periodical medical examinations.
- Maintenance of individual family health records.
- Follow up of persons suffering from chronic diseases.
- Hygiene of work place.
- Sickness absenteeism.
- Training in first-aid
- Health and safety education of employees.

VI. ROLE OF MANAGERS IN INDUSTRIES ON SAFETY

- 1) Supply protective equipments like safety shoes, helmets, ear muffs, gloves etc.
- 2) To provide training to the employees.
- 3) Daily inspection of machinery by competent engineers to ensure safe machine condition.
- 4) To develop proper work culture to develop good system.
- 5) To manage the workers not to work beyond the statutory limits.

VII. EMPLOYEES VIEW ON SAFETY MANAGEMENT

- Best safety conditions in working environment create confidence in worker.
- If safety is taken as first priority in industry the work is going to be slow as rule is to not to perform unsafe acts.
- Management should not have two priority i.e. safety and production target achievement as their first, because if management force to have production there is much chances to perform unsafe act to full fill the requirement. So management should not have both safety and production on the same priority line.

VIII. CONCLUSION

The knowledge of occupational health and safety which every worker, supervisor, engineer and doctor should be aware of and should give priority in the industry. One should always use safety principles and take safety precautions to avoid accidents in the industry.

REFERENCES

- [1] D.Venu babu /Electrical safety/mines safety week 2k souvenir(2000)
- [2] G.Sambasiva reddy/safety precautions/ mines safety week 2k souvenir(2000)
- [3] K.Chandra mouli/role of mines managers vis-avis contractors labour&machinery in limestone mines/mines safety week 2k souvenir(2000)
- [4] Shahnaz Tabatabaei , Simin Hosseinian, Bahman Gharanjiki/General health, stress associated to the work and job satisfaction of Hormozgan Cement Factory employees in Iran/Procedia - Social and Behavioral Sciences 30 (2011) 1897 – 1901
- [5] Sandeep kumar joshi/Performance Management system: A factorial study of cement industry in Rajasthan.
- [6] K.Dhanasekar, V.S.Manigandan, H. Abdul Zubar, K.Visagavel/characteristic data analysis of occupational accident in heavy engineering industry/International Journal of Research in Engineering and Technology eISSN: 2319-1163 | pISSN: 2321-7308
- [7] Olebogeng Martin Lekutle/Psychometric evaluation of the UWES and OLBI within the cement industry
- [8] V. Archana / Interview based study of Employee Job Satisfaction in Jeyamalli Industries Pvt. Ltd
- [9] Dr.A. Selvaraj/ effective strategies for creating and nurturing team work
- [10] C.W.Cheng ,S.S.Leu .,C.C.Lin.,C. Fan., (2010). Characteristic Analysis Of Occupational Accidents At Small Construction Enterprises. Safety Science (480),698–707.
- [11] Eurostat, 2009a. 8.6% of Workers in the EU Experienced Work-related Health Problems. Statistics on Focus, 63/2009. <http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-09-063/EN/KS-SF-09-063-EN.PDF> (retrieved 07.01.10).
- [12] Eurostat, 2009b. International Sourcing Statistics. <http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/International_sourcing_statistics> (retrieved 04.01.10).
- [13] FAII – The Federation of Accident Insurance Institutions, 2009a. National Database of Occupational Accidents and Diseases.
- [14] Hamalainen, P., 2009. The effect of globalization on occupational accidents. Safety Science 47 (6), 733e742.
- [15] Hinze, J., Gambatese, J., 2003. Factors that influence safety performance of specialty contractors. Journal of Construction Project and Management ASCE 129 (2), 159–164
- [16] Hinze, J., Raboud, P., 1988. Safety on large building construction projects. Journal of Construction Project and Management ASCE 114, 286–293