

INDUSTRIAL HAZARD

(MECHANICAL & ELECTRICAL HAZARDS)

TYPES, CAUSES & THEIR PREVENTIVE MEASURES

INTRODUCTION OF HAZARD :

- It is a situation that possesses a level of threat to life, health, property or environment. Or
- **INDUSTRIAL HAZARD** may be defined as any condition produced by industries that may cause injury or death to personnel or loss of product or property.

WHAT ARE INDUSTRIAL HAZARDS ?

- Physical –noise,vibration, heat, cold,pressure, radiation etc.
- Chemical – flammable/explosive materials, toxics, sensitising agents etc.
- Biological – dust , pathogens etc.
- Psychological – work place practices & systems, payment systems etc.

GENERAL HAZARDS IN INDUSTRIES :

- MECHANICAL HAZARDS
- ELECTRICAL HAZARDS
- CHEMICAL HAZARDS
- PHARMACEUTICAL HAZARDS
- RADIATION HAZARDS
- DUST EXPLOSION
- FIRE HAZARDS

MECHANICAL HAZARDS :

- Occurs due to:
 - ✓ Large number of equipments
 - ✓ Crowded work place conditions
 - ✓ Frequent interaction between worker and equipment
 - ✓ Insecurely fixed machines
 - ✓ Worn and teared parts
 - ✓ Failure of SOP (Standard operating procedure)
 - ✓ Dangerous Parts
 - ✓ Negligence or slackness
 - ✓ Improper maintenance of equipment.

Factors responsible are :

- **PHYSICAL FACTORS:**

Physical capability of worker may not meet the job requirement.

- **PHYSIOLOGICAL FACTORS:**

- a) Age

- b) Sex

- c) Time

- d) Experience

Safety measures for Mechanical hazards :

- All machinery must be fenced or mechanical interlocking or photocell.
- Machine should be fitted with emergency shut down system.
- Turn key system for cleaning and for repairing.
- Control system override should be monitored.
- Operator must have a safe distance from the machine.
- Strictly following SOP.
- Stop and lock button for machines.

PREVENTIVE MEASURES :

■ BUILDING PLANNING : –

- Floors must be non slippery type
- Enough space to move easily
- Easy access of workers to the safety switches

■ SAFE MATERIAL HANDLING : –

- All material handling equipments should be repaired and maintained properly.

■ PERSONNEL PROTECTIVE DEVICES: –

- Protection of head by using hard hats and helmets
- Ears by using ear muffs and plugs
- Face by using face masks

ELECTRICAL HAZARDS :

- Electricity is the flow of electrons through a substance which allows transfer of electrical energy from one position to another.

- How Shocks occur?

Current Level Probable Effect on Human body

- ◆ 1 mASlight tingling sensation.
- ◆ 5 mASlight shock felt; not painful but disturbing.
- ◆ 6-30 mAPainful shock, muscular control is lost.
- ◆ 50-150 mAExtreme pain, respiratory arrest, severe muscular contraction and death is possible
- ◆ 1000-4300 mAMuscular contraction and nerve damage occur.
Death is most likely.
- ◆ 10,000 mACardiac arrest, severe burns and probable death

The most frequent causes of electrical injury/death are:

- 1. Contact with power lines**
- 2. Path to ground missing or discontinuous**
- 3. Equipment not used in manner prescribed**
- 4. Improper use of extension and flexible cords**
- 5. Electric shocks and burns due to poor indication facilities**
- 6. wiring faults and improperly wired equipments**
- 7. Sparking at loose connection**

Safety Measures for electrical hazards :

- Design a safer system
- Implement a safe electrical work program
- Observe work practice
- Use protective equipment
- Use warning labels
- Recheck the equipment everyday
- Heat producing electrical equipment
- Overhead electrical wire should have extra care
- Recheck the lines everyday
- Proper training to workers

PREVENTIVE MEASURES :

- **Proper maintenance of wiring and equipments.**
- **High voltage equipments should be properly enclosed.**
- **Indication of danger sign at every high voltage terminal.**
- **Safe work project**
- **Insulation, guarding , grounding, electrical protective devices.**
- **Worker should avoid working with the equipment in wet clothes and shoes.**
- **Water supply should be far away from electrical circuits.**

CONCLUSION :

- Review of safety awareness and safety training requirements of plant employees with respect to hazards present in the plant.
- Review of constructor safety awareness and recommend suitable improvement measures.
- Systematic training of employees is necessary.
- In addition, there should be a committee in each department , responsible for safety in their departments.