



INDUSTRIAL HAZARDS

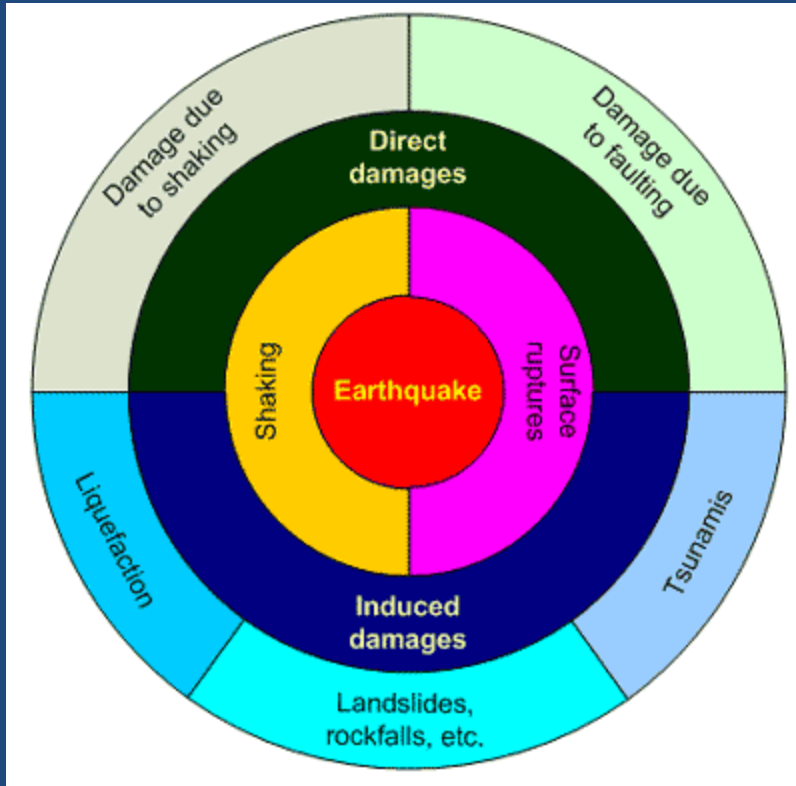


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- Industrial hazards are generally defined as any real or potential conditions produced by industries that can cause injury or death to personal or loss of product or property.

TYPES OF INDUSTRIAL HAZARDS:

- 1. Accident hazards
- 2. Fire hazards
- 3. Electrical hazards
- 4. Noise hazards
- 5. Chemical hazards
- 6. Disease hazards
- 7. Radiation hazards
- 8. Pollution hazard



ACCIDENT HAZARDS

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- Accidents and injuries are not the same things.
- If some thing falls unexpectedly it is an **accident**, if somebody gets hurt by it as an **injury**.
- It usually takes place by the combination of unsafe conditions and carelessness on the part of men to intake accidents that injure people.


ACCIDENTS JUST DO NOT HAPPEN: THEY ARE CAUSED !!

CAUSES OF ACCIDENT HAZARDS

- 1.Slippery floors and steps, ladders and scaffolds.
- 2.Unguarded balcony edges, stairwells and elevator shafts.
- 3.Low hanging overhead objects ,narrow aisles blind corners, producing materials and conveyors.
- 4.Unguarded fast moving machinery, particularly belts, gears and cutting tools.
- 5.Flying particles from grinding wheels.

- 6.Improper handling of heavy materials.
- 7.Poor lightening facility and ventilation.
- 8.Congested work space.
- 9.Insufficient suitable protective devices ,dresses, loose garments etc.
- 10.Presencce of fumes, dust and smoke.
- 11.Smoking by workers .
- 12.Unconditioned boilers and valves.

- 13. Narrow aisles with blind intersections cause accidents to industrial truck drivers.
- 14. Continued use of old, outmoded, poorly maintained or unsafe equipment.
- 15. Using apprentices, untrained or ill trained in safe operating methods, on hazardous jobs.
- 16. Overly fatigued worker that overtax his physical and mental powers.

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- The National Safety Council collects figures on the nature and cause of accidents.
 - They show that 1/3rd of all disabling accidents involve fingers, arms and hands ,legs ,feet are injured in about 1/4th of the accidents.
 - Trunk injuries including injuries to the back ,stomach and abdomen caused for the most parts by lifting account for another quarter of the total.

- Head injuries including eye injuries ,constitutes 1/10th of all accidents.
- 22% of all accidents are suffered by manual handling of objects .Falls cause 20% of all accidents.
- Being struck by moving or falling objects causes 14% and moving machinery causes 10% vehicles

ACCIDENT PREVENTION

Accident prevention is highly essential in industries, in order to.....


1. Eliminate accident- caused work stoppages and lost production.
2. Achieve lower workman's compensation insurance rates and reduce all other direct and indirect costs of accident.
3. Prevent injuries and premature deaths of employees.
4. Elevate employee morale by providing a safe workspace.
5. Reduce operating and production costs.
6. Have good employer-employee relationship.

ENGINEERING A SAFE PROCESS

- Accident prevention does not occur by itself, there should be consistent implementation of safety measures emphasizing for –
 - 1. Building planning for safe working condition.
 - 2. Safe material handling.
 - 3. Personal protective devices.


1) BUILDING PLANNING FOR SAFE WORKING CONDITION

- A good layout must have the following facilities in order to avoid accidents.
 1. Floors must be of nonskid type, satisfactorily plane and must possess such properties that they can easily cleaned.
 2. Every employee should have enough space to move an operate.
 3. Passage ways between working Places, roads, tracks etc. must never be obstructed.

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4. Windows must be of adequate dimensions in order to make full use of natural daylights.
 5. A worker operating on the machine should have easy access safety switches provided on the machine near the provided work space.
 6. Proper ventilation is a must if the manufacturing processes give rise to dust, smoke, fume etc.,
 7. Sufficient illumination of adequate color of light.
 8. Reduced noise level produced by machinery.

2.SAFE MATERIAL HANDLING

- 1.Careless handling of heavy materials and components in a major source of break and foot injuries.
- 2.To avoid premature fatigue of transport workers, full use should be made of mechanized material handling equipment.
- 3.During transport, sharp materials , sharp edge goods, poles etc., should be covered, placed in stable holders.

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4. Goods should be piled up such that they do not collapse due to impact or vibration.
 5. Use of proper material handling equipment depending upon the condition of the material.
 6. All material handling equipment should be properly repaired and adequately maintained on priority basis.
 7. Containers or vessels employed to transport liquids should not be defective or leaking.

3. PERSONAL PROTECTIVE DEVICES

I. PROTECTION OF HEAD:

- ✓ Safety hard hats.
- ✓ Rubberized hats for protection against liquids or chemicals.
- ✓ Ear protectors.

II. PROTECTION OF FACE:

- ✓ Face Mask.
- ✓ Face Shields.
- ✓ Welding Helmets.

III. PROTECTION OF EYES:

- ✓ Goggles of case hardened and clear glass for protection against impact.

IV. PROTECTION OF BONES

- ✓ Air lines respirator.
- ✓ Oxygen or air breathing apparatus.
- ✓ Gas mask.

V. PROTECTION OF OTHER PARTS OF BODY : (Hand, foot, leg ...etc.,)

- ✓ Protective asbestos clothing.
- ✓ Gloves.
- ✓ Safety shoes and body belts.
- ✓ Apron.
- ✓ Ear plug.



FIRE & EXPLOSION HAZARDS

CAUSES OF FIRE AND EXPLOSION HAZARDS:

- Improper storage of flammable oils, greases and fluids, combustible wastes etc.,
- Smoking by employees.
- Poor house keeping.
- Defective heating equipment, electrical equipment and wiring.
- Explosive gas leakage.
- Ignition of gases, vapors are combustible dust.
- Inadequate protection of electrical motors.
- Sparking in electric wires and equipment.


PROTECTION AND PREVENTION

1. Prohibition of smoking in manufacturing areas.
2. Oxygen present in a flammable atmosphere may be reduced by dilution with gases nitrogen, carbon dioxide, steam or combination of these inerts in exhaust gases from fuels, automobile engines or jet engines.
3. Operating outside the range of flammability.

4) Eliminating the ignition sources.

- a) Electrical sparks and arcs.
- b) Flames such as burner flames, matches and cigarette lighters and heaters.
- c) Hot surfaces such as heated wires, rods or fragments.
- d) Hot gases brought about by shock compression and hot gas jets.
- e) Lasers.

5) Factory building should be made of fire resistant materials like steel and Ferro concrete.

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- 6) In order to exit in the emergency suitable exit facilities to be provided.
 - 7) Adequate ventilation facilities.
 - 8) Installation of combustible gas indicators.
 - 9) In dust generating process areas arrangement must be made for extraction of dust.
 - 10) Fire alarms and fire fighting equipment or fire extinguishers to be installed in factory at suitable locations .

For fires of combustible materials water sprays, soda, acid and foam extinguishers to be installed in factory at suitable locations~

For fires of flammable liquids and gases foam, carbon dioxide, vaporizing liquid and dry extinguisher may be used.



11) Provide automatic sprinklers with adequate and reliable water supply.

11) Proper storage of combustible materials and removal of waste materials.




ELECTRICAL HAZARDS

- Following are the hazards due to electricity.....
 1. Shocks by AC and burns by DC due to poor indication facilities.
 2. Wiring faults.
 3. Fire from circuits (if not properly equipped with fuses and circuit breakers)
 4. Improperly wired equipment and defective installation of wires.
 5. Static electricity discharges.
 6. Accidental reactivation of an electrical system during repair and maintenance.

PREVENTION OF ELECTRICAL HAZARDS

1. Proper maintenance of wiring & equipment.
2. High voltage equipments should be properly enclosed.
3. Indication of DANGER at every high voltage terminal.
4. Workers should be trained to handle & operate the equipments effectively.
5. Any joints in the wiring should be left open.
6. Good housekeeping.

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- 7) Designing of chemical & electrical equipment with all electrical circuit designed according to an approved code.
 - 8) As much as possible the wiring should be outside the production area.
 - 9) Workers should avoid working an electrical circuits or equipment in wet clothing or shoes.
 - 10) Water should not be used for dousing electrical fire.



CHEMICAL HAZARDS

- Following are the causes for Chemical Hazards.....

1. Improper handling of some chemicals may be irritant, hazardous and toxic to the skin, eye & body.
2. Inhalation of fumes, vapors & dust of few chemicals may be dangerous.
3. Corrosive chemicals like acids & alkalis may give rise to inflammation reactions.
4. Improper storage of chemicals.
5. Direct exposure of skin to many chemicals may result

PREVENTION OF CHEMICAL HAZARDS

- Wearing Apron coats, goggles, caps, gloves, shoe covers, face mask, car plug... when handling dangerous chemicals.
- Proper storage of chemicals.
- Equipment and pipe lines that are to handle corrosive chemicals should be resistant to the corrosive action.
- Pumps, Siphons and other equipment should be guarded. The liquid end of such pumps should be entirely enclosed.

Noise



NOISE HAZARDS

NOISE HAZARDS

- Noise can be defined as **unwanted sounds**.
- Effects of Noise
 - Nuisance effects
 - Interference with communication
 - Impaired hearing
 - Extra auditory effects

- **Nuisance effects:**

- Workers exposed to undue noise may complain of disturbances to their concentration, irritability, sleeplessness & fatigue, these effects, in turn, may cause loss of productivity, poor job morale & a high rate of sickness absence.

- **Interference with communication:**

- Loud noise may prevent normal conversation cause misinterpretation of instruction & predispose workers to accidents as a consequence.

- **Impaired hearing:**
 - Temporary exposure to loud noise usually above 85 dB may cause a transient reduction of hearing ability.
- **Extra auditory effects:**
 - Workers exposed ultrasonic noise have complained of transient noised malaise & headache.

CONTROL OF NOISE HAZARDS

1. AT SOURCE:

Noise can be reduced at its source by ...

- The enclosure of the source of noise with an insulation material or a concrete wall.
- Adequate & regular maintenance of machinery to minimize noise caused by the lack of lubrication & wear & tear.
- The use of noise dampeners.

2) By Distance:

- Noisy machinery should be kept as far as away from workers as possible

3) Personal protection against noise:

- Wearing ear plugs, acoustic glass wool, ear muffs & helmets (in extremely noise situations, insulated helmets for encasing the whole head could be used together with breathing apparatus & micro phone system for communication)











































