

What is occupational health and safety?

Occupational health and safety is a discipline with a broad scope involving many specialized fields.

It aims at:

1. Promotion ~~of~~ and maintenance of the highest degree of physical, mental and social well being of workers in all occupations.
2. Prevention of adverse effects <sup>workers</sup> on health caused by working conditions.
3. Protection of workers in their employment from risks resulting from adverse health conditions.
4. Placing and maintenance of workers in an occupational environment adapted to physical and mental needs.
5. Adaptation of work to humans.

#### Occupational Safety & Health

Occupational health and safety encompasses the social, mental and physical well-being of workers, that is the "whole person". It encompasses both health and safety in their broadest contexts. successful occupational health and safety practices require the collaboration and participation of both workers & employers in health and safety programmes and involves the consideration of issues relating to occupational medicines, industrial hygiene, toxicology, education, engineering safety, ergonomics, psychology etc.

occupational health issues are often given less attention than occupational safety issues because the former are generally more difficult to confront.

however, when health is addressed so is safety, because healthy workplace is safe workplace. further, safe workplace may not be healthy workplace.

Safety engineering and management principles → What is needed

Safety remedies - Training methods and procedures, PPE.

Who should study?

Business, Engineers, manufacturers, executives, labour leaders,

Academics, Researchers, interested employees.

safety?

It is about people, about how they behave, how they interact with others and machines and about why and how they commit errors. Human factors, people and perception all dictate how effective a safety program can be.

## Occupational Safety and Health Act (1970)

Occupational safety and Health Act (OSHA) was passed on December 29 1970 and became effective in 1971.

This act mainly focusses on prevention of injuries and illness.

The major goal of the Act was to insure "safe and healthful working conditions for both working man and woman in the nation and to preserve human resources!"

Everyone involved with safety must be familiar with the impact of OSHA and compliance procedures.

### Fundamental aims of OSHA

1. Effective enforcement
2. Separate but independent responsibilities and rights of employees and employer w.r.t. achieving safe and healthful worker conditions.
3. mandatory Occupational safety and health standards.
4. Uniform record keeping and reporting procedure
5. Establishment of Occupational safety and health Administration (OSHA) and National Institute of Occupational safety and health (NIOSH).

## Occupational Safety and Health Administration

The responsibility of employer to provide safety and healthful workplace is based primarily on the standards established by OSHA, a responsibility given by OSH Act.

OSHA standard have been categorized as follows:

Safety standards:- Intended to protect against traumatic injury, fire & fatalities

Health standards:- which deals with toxic substances & long term health effects.

Horizontal standards: Applies to wide variety of operations in virtually all industries.

Vertical standards: Developed for a specific type of employment, such as construction or telecommunications.

Many OSHA standards are 'consensus' standards which have been adopted from American National Standards Institute (ANSI), the National Fire Protection Association (NFPA) and American Society of Mechanical Engineers (ASME).

### Steps

1. OSHA proceeds on the basis of its own information, petitions from interested parties and recommendations from other government agencies. Recommendations from NIOSH form an important basis for OSHA health standards.

2. OSHA may establish an advisory committee to make recommendations for the development of standard.
3. If OSHA decides that a standard should be issued, it must publish a proposed standard and give the public at least 30 days to comment in writing. If the objections to the proposal are filed and a public hearing is requested, such a hearing must be held.
4. On the basis of the entire record, OSHA must either promulgate the standard or determine that no standard is needed and must publish a statement outlining its actions.
5. Certain prescribed time-frames for most stages of rule-making must be followed.

#### Characteristics of good standards

1. It must suggest something which can be attained.
2. It should be economically feasible.
3. It should be meaningful, and applicable to the situations in which it is to be used.
4. It should be understood by users.
5. It should be consistent in its interpretations.
6. It should be stable & maintainable.

29 CFR part 1910 of OSHA standards cover following subjects.

General, Adoption and extension of established federal standards, General safety and health provisions, walking-working surfaces, means of egress, powered platforms, Health & environmental control, Hazardous materials, Personal protective equipment, General environmental control, Medical & first aid, Fire protection, compressed gas equipment, Materials handling & storage, Machinery & machine guarding, hand & portable power tools, welding, cutting & brazing, special industries, Electrical, commercial diving, Toxic & Hazardous substances.

1 (a) Write briefly on the history and development of occupational safety and health in India.

The development of occupational safety and health in India from ancient period are as follows:-

► 2000 B.C : The ruler Hammurabi developed a "code of Hammurabi" for all the laws of the land at that time.

With respect to safety & health, the code contained

(i) the clauses dealing with injuries.

(ii) allowable fees for physicians.

(iii) damages assessed against those who injured others.

One of the clause from the said code, will show that how much Hammurabi was concerned for the proper handling of injuries - "If a man has caused the loss of a gentleman's eye, his own eye shall be caused to be lost".

► 1500 B.C : During the construction of a huge temple in his name, the King Rameses created an industrial medical service to care for the workers. They were required to bathe daily in the 'Nile' river and were given regular medical examinations. Sick workers were isolated.

3) As civilization progressed, so did safety & health development

4) In 1567 :- Various treatises were published i.e :-

(i) The pulmonary diseases on miners.

- (iii) Diseases of smelter workers.
- (iii) Diseases associated with the handling of an exposure to mercury.
- (iv) The need for ventilation in mines.
- (v) The various devices, that could be used to introduce fresh air into mines.

5> 18<sup>th</sup> Century : B. Ramazzini - related the occupational diseases

- i) to the handling of harmful materials
- ii) to the irregular movements of body.

6> The Industrial Revolution : changed the methods of Producing the goods for ever. These are:-

- i) Introduction of steam power to replace man & animal Power
- ii) Substitution of machines for people.
- iii) Introduction of new methods for converting the raw materials.
- iv) Organisation & specialization of work - resulting in a division of labour.

2(a) List the various acts and regulations promulgated by Indian Parliament related to occupational safety and health.

The various acts & Regulations promulgated by Indian Parliament related to occupational safety and health are:

### Indian Environmental Acts

1948 → Factories Act

1956 → River Boards Act

1974 → Water (Prevention & Control of Pollution Act)

1977 → Water Cess Act

1980 → Establishment of Department of Environment

1981 → The Air (Prevention and Control of Pollution Act)

1982 → Department of Environment forest & wildlife establishment

1984 → Minimal National Standards (MINAS)

1986 → Environmental protection Act

1987 → Air (Prevention & Control of Pollution Amendment Act)

1988 → Water (Prevention & Control of Pollution) Amendment Act

1989 → Hazardous Waste (Handling & Management rules)

1991 → Public Liability Insurance Act

1992 → National Environmental Tribunal bill & Environment Audit notification.

1993 → Ecomark notification

1994 → Environmental clearance notification

1999 → Environmental (siting for industrial Project rules)  
Regulations.

1. The factories act 1948, amended 1954, 1970, 1976, 1987.
2. The mines Act, 1952.
3. The Dock Workers (Safety, Health & Welfare act, 1986)
4. The plantation Labour Act, 1951
5. The explosives Act, 1884.
6. The Petroleum Act, 1934
7. The Insecticide Act, 1968
8. The Indian Boilers Act, 1923
9. The Electricity Act, 1910
10. The Dangerous machines (Regulations) Act, 1983
11. The Indian Atomic Energy Act, 1962
12. The Radiological Protection Rules, 1971

2(b) State different principles of safety as per Heinrich. Also explain Heinrich's triangle of damage deviation relationship.

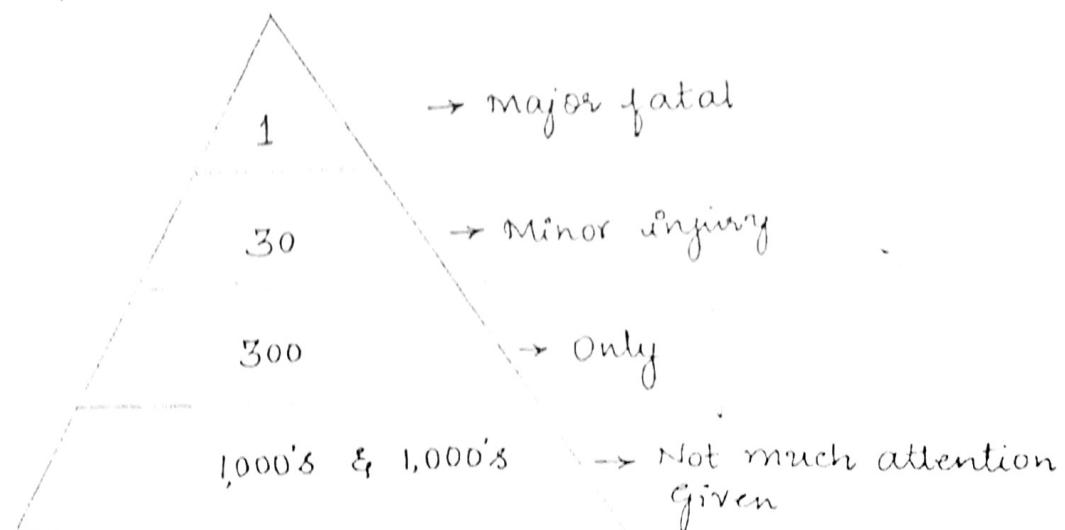
The four principles of safety as per Heinrich are :-

- 1) Hazard is an inherent part of human existence.
- 2) We cannot eliminate hazard but we can only contain, control & manage.
- 3) Accidents are not random happenings, but are patterned & have combination of causative factors.
- 4) All accidents are caused either due to unsafe conditions or unsafe acts or both.

Accidents by human error → 88%

Accidents by Unsafe act → 10%

Accidents by Nature → 2%



3(a) Write briefly on 'Right to Know laws' and its advantages with respect to OSHA.

In recent years a great deal of time & money has been spent complying with hazard communication law better known as the Right-to-Know laws. Although there are many state & local laws, the oldest & best known is the OSHA Hazard Communication Standard enacted in 1983. This standard requires all companies & employers handling any hazardous substance in any form to assess the hazards associated with the substance in the work area to inform workers of those hazards & to train them in safe handling procedures.

The Environmental Protection Agency (EPA) has also become involved with the Right-to-Know laws as a result of the Superfund amendments & Re-authorization act of 1986 (SARA-III), which requires companies to provide authorities with information concerning toxic chemical releases & other potential chemical hazards to the community.

SARA III also encourages emergency planning efforts in response to emergencies arising from chemical incidents.

All of the right-to-know laws have 3 primary objectives:-

- <1> The dangerous properties of materials used or produced in the workplace are determined.
- <2> Employees are to be trained in the recognition & safe handling of these materials.
- <3> The laws force companies to disclose the presence of hazard substance thereby making employees & others aware of possible dangers.

Compliance to OSHA hazard standard or SARA-<sup>III</sup> is expensive sometimes confusing & endless & steps should be taken to meet the requirements & do it on a cost-effective basis by using the following as building blocks :-

1. Hazard Determination :- the material safety data sheet (MSDS)
2. The Written Program &
3. Training

#### M.S.D.S

An MSDS is a key for communication & compliance to right to know laws. Each MSDS must identify particular material or mixture, its physical & chemical characteristics, any health hazard & other identifying criteria. Every company should develop an internal review process for MSDS forms received with orders to ensure that it contains the following minimum information:-

- 1) The chemical & common name of the hazardous substance & for a mixture the proportion of each chemical & its hazardous ingredients.
- 2) The hazards posed by the substance including Potential for fire, explosion & reactivity.
- 3) Health hazards including symptoms of exposure & medical conditions aggravated by exposure.
- 4) Precautions for safe handling & use including Procedures for cleaning up of spillages & leaks.

#### Written Program :-

All Employers use hazardous substance regardless of size, must comply with the written program requirement of OSHA's hazard communication std's.

This includes developing, implementing & maintaining a written hazard communication program. The program must describe the presence & location of hazardous substance in workplace, as well as identify the location & availability of the written program & where to find how to use MSDS labelling procedure & other matter related to Hazardous substance.

#### Training :-

Training is required by OSHA's hazard communication standard & other OSHA's std's & generally by other

right to know laws.

It is left to the discretion of individual companies to decide what training programme to introduce. The end result of this policy is to yield excellent results through inexpensive training program which have been developed internally & therefore they are well suited to the need of individual companies. The training should be approach in a general fashion on the first day of the employment & then for specific assignment at the time of assignment & then annually. Training programs should include, lectures, group discussion & prepare presentations each of which can be supplemented by the use of slides or videos which are produced in house or purchased from outside. The choice are numerous but the goal is the same i.e. the safe handling of substances by employees.