

Industrial Safety in Steel Plant

A move towards zero accident

By

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- **Steel plant poses difficult challenges in the area of safety , health & environment when compare to many other Industries due to complex nature of its operation & maintenance activities with wider range of associated hazards**
- **Despite technological advancement, serious efforts are being made for reinforcing safe behavior & improving safety culture at work place**
- **Health & safety of employees are crucial as it affects both economic & social factors**

- **In present scenario, maintaining high standard in the area of occupational safety, health & environment in steel industry is of paramount importance**
- **In an integrated steel plant, steel making process involves a number of hazardous processes starting from raw material handling , melting of iron ore & converting iron into steel till finished products**
- **By product plants, captive power plant, utilities & other auxiliary plants use considerable amount of hazardous materials & these hazardous materials are stored in bulk storages like tanks, cylinders, drum & gas holders etc posing major risks**

- **Equipment used for handling & processing these materials are subjected to hazardous chemical reaction & may cause undesirable accidents**
- **It is therefore mandatory that steel plant recognizes advantages of safe work environment & progressively adopt safety management practices to prevent hazardous events , avoid production & manpower losses**
- **Following safety practices seriously also assist enhancement of employees knowledge of operation, results in improvement of technical procedure, maintenance of accurate process safety information & increase in overall plant productivity**

- **A safe work place also contribute towards plant competitiveness as well as profit growth which is one of the important parameter for any enterprises**

NATURE OF HAZARD SOURCES

Fire Hazard

Release / leakage of oxygen, hydrogen, acetylene , CO / BF / BOF gases, mixed gas, benzene vapor, fuel oil, LSHS, coal tar, hot liquid metal

Fire in acetone, benzene & calcium carbide storage

Explosion Hazard

Release / leakage of hydrogen, acetylene, CO/ BF/ BOF/ Mixed gases

Toxic Hazard

Release of CO/ BF/ Mixed gases & Chlorine

Cold Burns

Exposure to liquid oxygen, liquid nitrogen & liquid argon

Gas Poisoning

Release of CO/ BF/ BOF / mixed gases

Fire / Explosion

Due to spillage of liquid metal, spillage / transfer of liquid metal/ liquid steel & hot slag

Heat Radiation

Due to hot metal / liquid steel handling, hot slag handling

Accidents due to material handling equipment

Road hazards

High because of heavy concentration & heterogeneous nature of road

traffic. This hazard is heaving maximum intensity during shift change timing

Nature of various types of accidents

- ❖ Unsafe actions**
- ❖ Incidents**
- ❖ Minor injuries**
- ❖ Lost time injuries**
- ❖ Serious injuries**
- ❖ Fatalities**

Every steel plants are aiming at zero accident

- **To aim for an accident free working environment is every one's responsibility**
- **It is possible to reduce dramatically number of accidents at work by assigning necessary priority to safety since a safe way of working is a quality & efficient way**

Elements necessary for implementation of safety culture

- **Substantial commitment & leadership of safety by management**
- **Safety consciousness is to be ingrained amongst workforce & top management**

- **Recognition of best practices in safety & exchange of safety related ideas both within & between the department**
- **An appropriate safety organisation structure, well defined by management & well understood by everyone. Organisation is to have well defined role & responsibility**
- **Ambitious goal for improvement of safety by collection of statistic not only from their peers but global plants to o to set bench mark figures**
- **Change in attitude & behaviour of individuals & working group**
- **Through training programs, management should demonstrate that attitude & behaviour to safety is an essential part of professionalism of every employees**

- **Elimination of two tier approach to safety. Contract workers should attain the same level of safety consciousness as the steel plants own employees**

Safety practices adopted by steel plants

Health & safety policy

- **All steel plant has adopted integrated Quality, Environment , Occupational health & safety policy. The policy is displayed at prominent locations across all departments**

Safety & Health Department

- **Department is headed by senior officer & assisted by number of safety officers. In addition each department is having one safety co-ordinator**

Safety Committee

- **A two tier safety committee system is established. Each deptt. has safety committee having equal representation of workers & Management personnel**

Accident Reporting, Investigation & Analysis

- **Every department maintains incident register which includes accidents and near miss/ close call / dangerous occurrences. In case of accidents, joints investigation is carried out by a committee**

Safety inspection

- **Monthly safety inspection of all departments is carried out by safety**

Engineering Deptt. Additionally half yearly Safety Audit is performed including all aspects of Occupational Health & Safety for all areas

Training on Safety Measures

- **Knowledge alone is not sufficient to perform the job in industries. Adequate training is also necessary to perform the job efficiently & effectively. Knowledge gives guidance whereas training give perfection**

Information & communication

- **Effective communication is essential for a positive culture at the workplace. Transparency in communication is mandatory at all levels for better understanding of work & better bonding among individual. Plants are equipped with a wide range of communication facilities.**

Safe Operating Procedure (SOP)

- **Appropriate procedures, work instructions, operating control procedures are established & issued to all concerned for safe & effective operation**

Personnel Protective Equipment (PPE)

- **All employees are provided with adequate nos. of PPE**

Fire Protection

- **A good fire fighting system is provided in plant with quarterly inspection & testing of all fire extinguishers. Periodic mock drills are conducted as per annual plan**

Pressure vessel

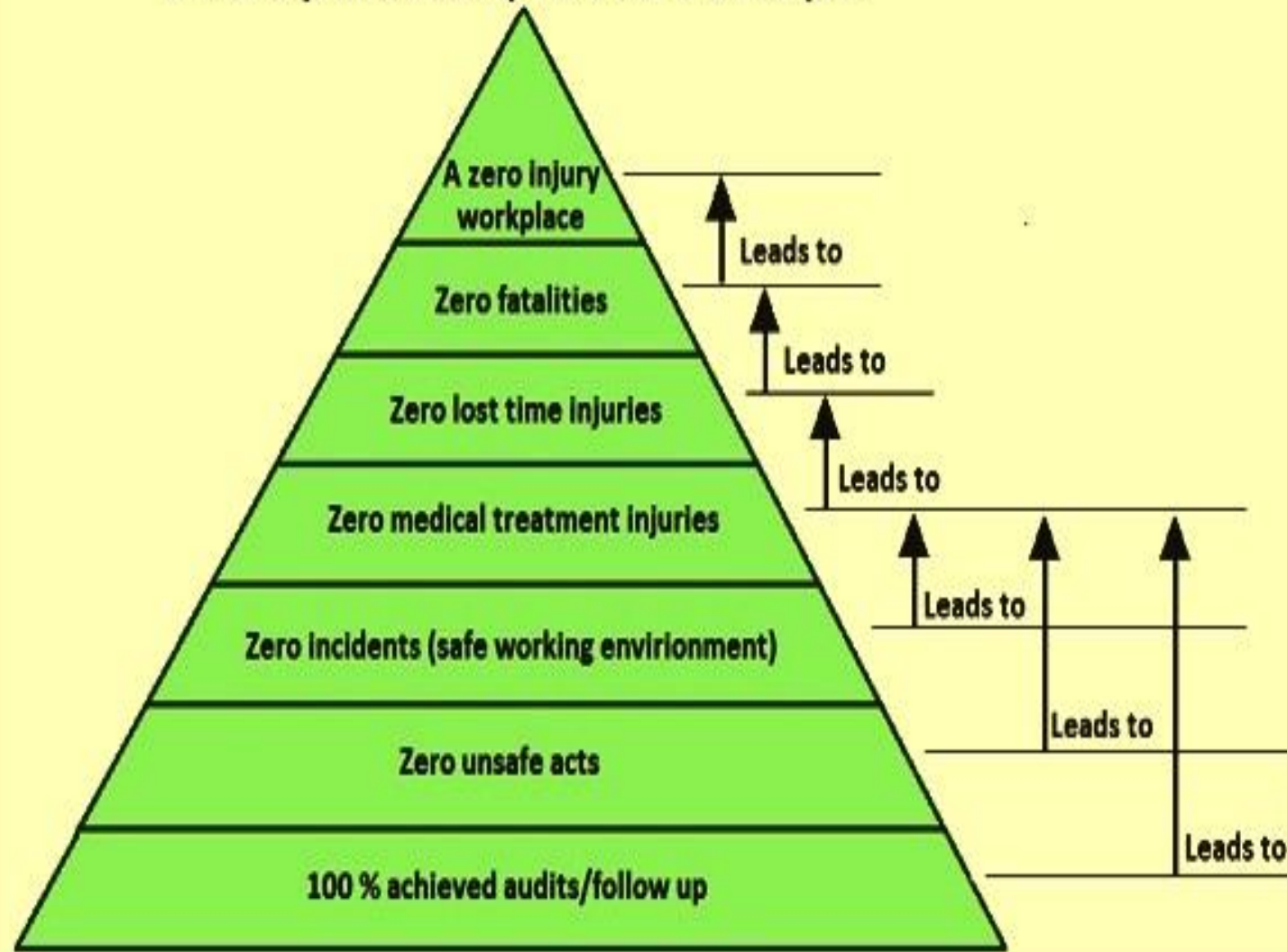
- **All pressure vessels are identified & covered under annual testing by competent authority. Hydro test is conducted once in 3/5 years & records maintained**

Safety Audit

- **Conducted internally & externally by qualified & competent authorities.**
- **Internal audits of OHSMS are carried out in all the areas to determine whether OHSMS is effectively implemented & maintained as per standard of ISO 45001**
- **Safety audit help in early detection of equipment deterioration, deviation &/or procedure that can degrade or deteriorate safety levels**

Pyramid of overall objective of zero accident

Overall objective of safety in the iron and steel plant



- **With adoption of above mentioned safety measures in steel plants, a reduction of 80-85 in lost time injury frequency rate has been achieved**
- **A lost time Injury (LTI) is an incident that causes an injury that prevent the person from returning to his next scheduled shift or work period.**
- **Lost time Injury Frequency Rate (LTIFR) is the number of lost time injury per million man hours**