



STANDARDS FOR WORKPLACE SAFETY

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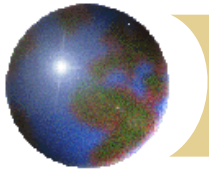
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Role of Standards

- ❖ To bring about the state of the art information on various subjects**
- ❖ To maintain uniform standard of products manufactured by various agencies.**
- ❖ To serve as a bank of updated information to support some mandatory work.**
- ❖ To serve as recommendations of experts in the concerned field etc.**



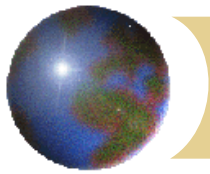
Objectives:

- ✦ **To present the **regulatory standards** on occupational safety & health for workplace safety and their enforcement in the country.**
- ✦ **To assess the extent of coverage offered by **non- regulatory standards** on OSH.**
- ✦ **To evaluate the extent of their use in the industries.**



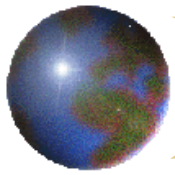
Frequent Updating of Workplace Standards:

- ✦ Every accident brings a new point of view.**
- ✦ New chemicals , machinery, technology etc. add to new types of stresses/ hazards.**
- ✦ Advancement in technology are bringing up better control techniques**



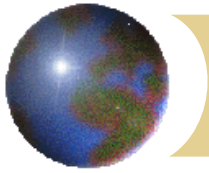
Regulatory Standards

- ✦ **The statutory provisions ,which are mandatory serve as a minimum standard to ensure safety at workplace but its process of amendment is so lengthy & time consuming that it is very difficult to keep it matching with the state of the art.**
- ✦ **In view of the above, some standards /codes are essential to support & provide information/guidelines on state of art on the subject .**
- ✦ **Rules under the Act are intended to such a purpose, but those too are not revised frequently.**



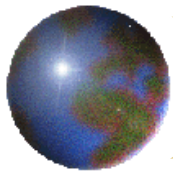
Non regulatory Standards

- ❖ **The non regulatory standards as promulgated by BIS and many other national and international organisations /agencies may serve as **dynamic guidelines** if the organisations controlling the trade or industry make such provisions.**
- ❖ **Otherwise the standards can only be used voluntarily for the sake of product quality or organisational repute.**
- ❖ **It is presumed by the industry that OSH standards are not directly linked with the product quality or organisational repute hence the **managements are reluctant to use them unless related with trade compulsion or are made compulsory.****



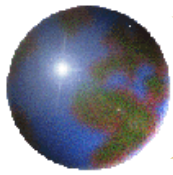
ISO Standards & International Trade

- ✦ **Conformity to ISO Standards related to Safety, Health and Environment have been made compulsory by the some international trade control agencies for the commercial participants.**
- ✦ **This decision was reluctantly accepted initially by Indian industries but to facilitate the trade ISO Standards are applied now are proving to be an important incentive for better safety & health conditions in industry.**



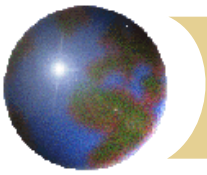
Regulatory Standards in India

- ✦ **Factories Act 1948 & rules their under**
- ✦ **Manufacture, Storage & Import of Hazardous Chemicals Rules 1989 (Under EP Act 1986)**
- ✦ **Indian Explosive Act, 1984 and Rules their under**
- ✦ **Indian Petroleum Act ,1934 & rules their under**
- ✦ **Building & Other Construction Workers Act 1996 & rules their under**
- ✦ **Boiler Act & rules their under**
- ✦ **Indian Electricity Act,1910 & rules their under etc.**



Factories Act 1948

- ❖ **Main statute in India on Occupational Safety ,Health & welfare and framed to protect the workmen from industrial accidents and occupational diseases.**
- ❖ **Administered by Ministry of Labour & Employment through Directorate General Factory Advice Service & Labour Institutes(DGFASLI), Mumbai.**
- ❖ **Enforced by the State Governments through Chief Inspectors of Factories/ Director of Factories (under Labour Departments)**

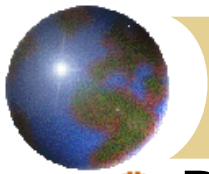


- ❖ **Amended by Central Government with technical support from DGFASLI , who in turn incorporates the views of the Chief Inspectors of Factories of Various States.**
- ❖ **Act provides a broad guidelines in which many details are supplemented by the respective State Factories Rules.**
- ❖ **The guidelines to state Governments on such rules (Model rules) are framed and supplied by the central government.**



Salient Provisions of the Factories Act

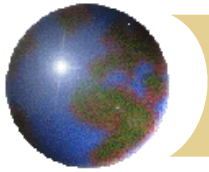
- ✚ Disposal of Wastes and effluent.
- ✚ Ventilation and Temperature.
- ✚ Over crowding
- ✚ Illumination
- ✚ Fencing of Machinery
- ✚ Lifting machines , chains , ropes & lifting tackles
- ✚ Safety in Pressure Plant.



- ✚ Protection against eye injuries.
- ✚ Dangerous fumes, gases, dusts etc.
- ✚ Explosive or inflammable dust, gas etc.
- ✚ Precautions in case of fire
- ✚ Special Provisions relating to Hazardous Processes. (Any process or activity in relation to an industry which can cause material impairment to the health of the persons engaged in or connected therewith, or result in the pollution of the general environment)
 - ✚ Compulsory disclosure of information by the occupier
 - ✚ Permissible limits of exposure of chemicals and toxic substances for work places.
 - ✚ Worker's participation in safety management



- ⊕ Dangerous Operations and special provisions for them.
- ⊕ Occupational Health Services and Notifiable diseases.
- ⊕ Notice of certain accidents
- ⊕ Appointment of Safety officers. etc.



State Factories Rules

(applicable within the States)

- ✚ Act refers to detailed information provided in the State Factories Rules.
- ✚ Such detailed information given in different schedules for various hazardous operations, equipment or materials. Some important topics on which such detailed provisions are laid down are:

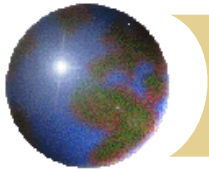


Topics of Detailed Safety Provisions Under Different Schedules

- ✚ Textile machineries.
- ✚ Wood working machineries.
- ✚ Rubber Mills
- ✚ Power presses, shears, guillotines etc.
- ✚ Pressure vessels
- ✚ Confined space working.
- ✚ Fire protection, first aid and fire fighting.



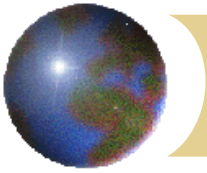
- ✚ Ship Building and repairs.
- ✚ First aid appliances and ambulance rooms.
- ✚ Schedules under dangerous operations:
 - ▣ Manufacture of aerated water.
 - ▣ Electrolytic processes or Oxidation of Metals.
 - ▣ Manufacture of electric accumulators.
 - ▣ Glass manufacture.
 - ▣ Grinding and glazing of metals



- ❑ Generating petrol gas from petrol.
- ❑ Manufacture and handling of lead and lead compounds.
- ❑ Surface cleaning by sand blasting, shot blasting etc.
- ❑ Liming and tanning of leather.
- ❑ Lead process in type foundries.
- ❑ Potteries
- ❑ Chemical works



- ✚ Manufacture of materials containing free silica.
- ✚ Asbestos.
- ✚ Corrosive substances.
- ✚ Cashew nut industries.
- ✚ Compression of oxygen and hydrogen.
- ✚ Oil extraction
- ✚ Manufacture of manganese and its compounds.



- ✦ Pesticides.
- ✦ Benzene.
- ✦ Carbon disulfide.
- ✦ Carcinogenic dye intermediates.
- ✦ Noise.
- ✦ **Rayon Manufacture.**
- ✦ Flammable liquids and compressed gases.
- ✦ Foundry operations.



Non Mandatory Standards on OSH for Workplace Safety

✚ BIS Standards

- ✚ For safety of various industrial machineries and operations, hazardous chemicals, personal protective equipments, transportation, building construction etc.**
- ✚ National Building code**



General









- ❑ Safety Management IS 18001-2000
- ❑ Safety Audit IS 14489-1998
- ❑ Frequency Severity Rates IS 3786-1983
- ❑ Plant Layout IS 8091-1976
- ❑ Mech. guards on machine IS 9474-1980

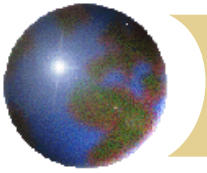
Equipments

- ❑ Hand Operated tools IS 8235-1976 & SP 53-1992
- ❑ Machine tools IS 11016-1984
- ❑ Abrasive grinding wheels IS1991:1987
- ❑ Cranes IS:13367:1992



Operations/ Unit operations:

-  Welding and thermal cutting IS 181-1968
-  Unfired pressure vessels IS 2825-1969
-  Gas cylinders IS 5903-1970
-  LPG Storage IS 6044-2000
-  Pipelines color codes IS 2379-1990
-  Chemical Laboratories IS 4209-1987
-  Rubber & Plastic – Fire Safety IS 11457-1985
-  Wood Working Machine IS 8964:1978



❖ **Hazardous Chemicals:**

- ❖ Classification Dangerous Goods IS 1446-2002
- ❖ Pictorial marking Dangerous Goods IS 1260-1973
- ❖ Asbestos IS 11451-1986
- ❖ Pesticide Poisoning
 - First Aid Measures IS:4015 Pt I :1967
 - Symptoms , Diagnosis IS:4015 Pt II :1967 & Treatment



Electrical Safety:

- ❑ Earthing IS 3043-1987
- ❑ Rotating elect. machinery IS:4691:1985
- ❑ Rubber mats IS 5424-1969
- ❑ Equip. for hazardous areas IS 5571-2000
- ❑ Hazardous Area Classification IS 5572-1994
- ❑ Intrinsically safe equipment IS 5780-2002
- ❑ Increased safety equipment IS 6381-2004
- ❑ Encapsulated equipment IS 15451-2004

- ❑ Telephone for Hazardous area IS 6539-1972
- ❑ Electrical measuring equipment for explosive areas
IS 8607-1978 Part 1 & part 2.
- ❑ Dust proof equipment IS 11005-1984



✚ **Transportation**

- ✚ Flash Back arrestor IS:11006:1984
- ✚ Road tanker for LPG IS 10300-1982
- ✚ Fork lift stability test IS 4657-1978
- ✚ Powered Industrial trucks 6305-1980 Pt.1&2

✚ **Material Handling**

- ✚ Conveyors IS 7155 (8 parts)
- ✚ Lifting wire rope inspection IS 8216-1976
- ✚ Wire rope slings 12735-1994
- ✚ Lifting chain & chain slings IS 8324-1988
- ✚ Cranes IS 13367-1992 & IS 13583-1993



✚ **Noise**

- ✚ Noise Measurement IS 7194-1994
- ✚ Noise reduction IS 3483-1965

✚ **Vibration**

- ✚ Assessment – Steam turb.Gen. IS 14817-2004 Pt.2
- ✚ Assessment – Aircraft IS 14817-2004 Pt.4

✚ **Illumination**

- ✚ Interior IS 3646-1992Pt 1; 3646-1996 Pt. 2; 3646-1998 Pt.3; 3787-1983

✚ **Civil Construction**

- ✚ Structural Safety IS 875:1987
- ✚ Building Material IS 7969:1975
- ✚ Demolition IS 4130:1976



Fire safety

- ❑ First aid fire extinguishers IS 2190-1992
- ❑ Fire detection & alarm IS 2189-1999
- ❑ Industrial Buildings - Cotton ginning & pressing
IS 2726-1988
- ❑ Industrial Buildings – Electrical Generating &
distribution IS 3034-1993
- ❑ Industrial Buildings – General Storage &
warehouses IS 3594-1991
- ❑ Fixed CO2 Fire Extinguisher IS 6382-1984
- ❑ Provision & maintenance of water supplies and
fire fighting IS 9668-1990



Personal Protection

Body

- Safety belt & harness IS 3521-1999
- Aprons IS 4501-1981
- Leather clothing IS 6153-1971
- Lead rubber for X-ray IS 7352-1974
- Guide for selection IS 8519 1977
- Maintenance & care of ind.clothing IS 8990-1978

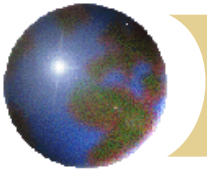


✚ **Ear Protectors**






- ✚ Specifications IS 9167-1979
- ✚ Selection IS 8520-1977
- ✚ Measurement of attenuation IS 6229-1980

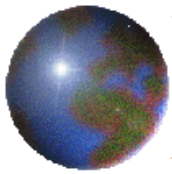
✚ **Eye & Face Protectors**

- ✚ Welding IS 1179-1967
- ✚ Eye protectors IS 5983-1980
- ✚ Non optical test for eye protectors IS 7524-1980
Pt 1
- ✚ Face Shield - plastic visors IS 8521-1994
- ✚ Face Shield – wire mesh visors IS 8521-1994 Pt 2



Feet & leg protectors

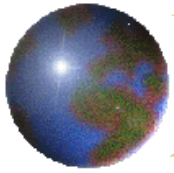
-  Selection Guide IS 10667-1983
-  Leather safety boots & shoes for heavy metal industries IS 1989-1986
-  Safety shoes for Steel Plant IS 10348-1982
-  Rubber boots IS 3738-1998 & 5557-1999
-  And many other types.



Non Mandatory Standards in Industrial Safety (Contd.)

✦ Guidelines Issued by the DGFASLI, Ministry of Labour & Employment for the Factories and State Governments from time to time, such as:

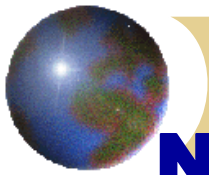
- ✦ Model Factories Rules
- ✦ Guide notes & Safe Practice Pamphlets on selected hazardous chemicals.
- ✦ Guidelines issued for preparation of Safety Reports and inspection Major Hazard Installations etc.



Non Mandatory Standards in Industrial Safety (Contd.)

✦ Guidelines Issued by NGOs and Industry associations, such as:

- **MSDS published by Indian Chemical Council (earlier ICMA)**
- **Guidelines on handling of chlorine by Alkali Manufacturers Association.**
- **Standards and guidelines issued by International agencies like ISO, ILO, WHO**
- **Renowned agencies of other countries, like ACGIH, British Standards, HSE Guidelines, American Society for Testing and Materials(ASTM) codes of practices**



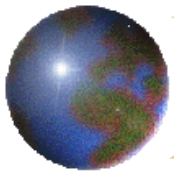
Need for Uniform Standards of Sampling & Analysis for Airborne Chemical Contaminants present at the workplace

- ❖ **The Factories Act /Rules has prescribed permissible limits of Exposure of about 120 hazardous chemicals for work environment & there is the need to bring out uniform **methods of sampling & analysis for these airborne chemical contaminants** for the use**
 -
- ❖ **BIS may consider to develop these methods as standards & these will be useful reference for the industry.**



Manufacture Storage and Import of Hazardous Substances (MSIHC) Rules & Support of BIS Standards

- ❖ Rules were framed under the provisions laid down in EP Act.
- ❖ Enforcement agency for the factories is Chief Inspectors of Factories of various states.
- ❖ The rules are applicable in isolated storage installations, docks and cross country pipelines though the enforcement agencies are different.

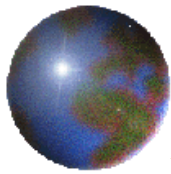


Salient Provisions of the MSIHC Rules

- ✦ For each hazardous material capable of leading to toxic or explosion or bulk fire hazard certain threshold quantities have been prescribed. If these quantities are exceeded, the installation is regarded as an identified **major hazard**.
- ✦ All the users of these substances will have to keep **MSDS** available for these substances as per the format prescribed in the rules.
- ✦ All the identified units will have to prepare '**on site emergency plans**' and ensure emergency preparedness by regular rehearsals.

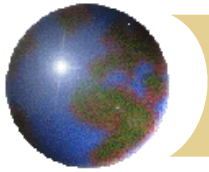


- ✚ For specially hazardous substances second stage quantities have been prescribed, which if exceeded following additional provisions are to be ensured:
 - ❏ Preparation of **safety report** as per the format prescribed in the rules.
 - ❏ Preparation of **off site emergency plan** (by the district emergency authority)
 - ❏ Safety audit by an external agency once in a year.



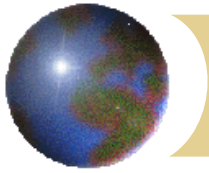
BIS Standards to Support MSIHC Rules

- ❖ **Safety audit** introduced in the MSIHC Rules did not provide any guidelines on methods of conducting the safety audit.
- ❖ **IS 14489 –1998** framed by the BIS served as a useful instrument to guide the specialists on the method of conducting the audit. This also brought about uniformity in the approach.
- ❖ However, there is **need to update the standard** to make it more comprehensive covering all applicable statutes.



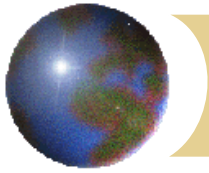
Need for Uniform Guidelines for Emergency Plans

- ✦ There is no guideline to draft the document in uniform pattern. Some states have issued there own patterns but there is a need to develop standard on it to bring uniformity in approach**



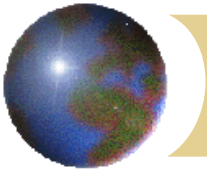
to sum up

Safe & healthy working conditions provides **sense of security among the employees of the industry/organization which in turn **increases the productivity & profitability****



BIS has developed large number of standards on OSH for workplace safety beyond the legal requirements

Industry should derive maximum benefit out of it to develop & maintain safe & healthy work conditions .



Organizations controlling the trades should also insist upon the use of proper standards both for products as well as for safety & health of employees in their factories.



Thanks