

*Labour  
Administration*

**PROFILE ON  
OCCUPATIONAL SAFETY  
AND HEALTH IN  
INDIA**

**EDITED BY H. ONO AND K. ENOMOTO**



**INTERNATIONAL LABOUR ORGANISATION**

**ASIAN AND PACIFIC REGIONAL CENTRE FOR  
LABOUR ADMINISTRATION (ARPLA)**

**BANGKOK**

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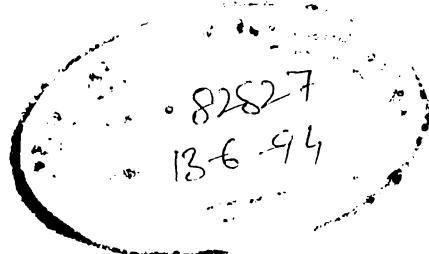
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## PREFACE

Together with improvements in the standard of living and the growing public awareness of the need to enhance the quality of life of workers in the Asian and Pacific region, mainly influenced by consistent economic growth in the past decade, the importance of effecting improvements in working conditions is acquiring significance in labour administration. However, occupational safety and health administration, which is one of the aspects of improvement of working conditions, has not yet been given due attention in most countries in the region.

A study in 14 countries was initiated by ILO/ARPLA in 1990 to fill the vital documentation gap. The series of Profiles on Occupational Safety and Health covers Bangladesh, People's Republic of China, Fiji, India, Indonesia, Republic of Korea, Malaysia, Pakistan, Papua New Guinea, Philippines, Singapore, Solomon Islands, Sri Lanka, and Thailand.

The profiles provide information on the national administrative structure, legislation, activities, trends, and problems. They can be useful to policy-makers, researchers, and national and international development agencies in understanding the current situation and recognising the need to strengthen occupational safety and health administration.

The Profile on Occupational Safety and Health in India is based on a study by an independent consultant, Mr. G. Vaidyanathan, Director (Safety), Regional Labour Institute, Ministry of Labour, India, and does not reflect the views of the Government of India or ILO/ARPLA.

We would like to thank the Ministry of Labour, Japan, and the Japan International Cooperation Agency for their financial support in this undertaking.

We hope the profile will be of interest to all concerned with occupational safety and health issues, specially in developing countries.



**T. Nakamura**  
Assistant Director-General  
responsible for ILO activities  
in Asia and the Pacific

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# 1. FRAMEWORK OF ADMINISTRATIVE AND LEGAL INSTITUTIONS

## 1.1 STATUS OF OCCUPATIONAL SAFETY AND HEALTH MEASURES IN NATIONAL POLICIES

### **Reference in Constitution**

Safety and health aspects occupy a very significant position in the policy framework of India's Constitution. Accordingly, prohibition of employment of children in hazardous employment, safeguarding the health and strength of all workers and providing just and humane conditions of work are very relevant. The scope of the above constitutional provisions are wide enough to take complete legislative and administrative action for ensuring occupational safety and health. In order to give effect to the directive principles of the Constitution, the Government of India has enacted several laws on safety and health which are enforced by the Central and State Governments.

### **Reference in Government's development plan**

India has been following a policy of planned development. Seven Five-Year Plans have already been completed. The 8th Five-Year Plan will be launched soon. The guiding principles of the Plans are modernisation, self-reliance and social justice.

The 6th Five-Year Plan (1980-85) document stressed that safety includes not only protection of workers against accidents at work, but also against occupational diseases. With the rapid strides the country is making in the development of chemicals and process industries, ensuring the safety and health of workers calls for measures not only to prevent accidents, but also to conserve the environment.

The 7th Five-Year Plan (1985-90) document continued to emphasise the importance of industrial safety consistent with the rapid changes in technology and the production processes. It stressed that promotional services in the area of safety should include surveys, research and training and other supporting services by improving the technical competency of Factories Inspectorates. Hazard identification and inspection were also stressed.

Recognising the need to have a General Enabling Act concerning occupational safety and health applicable to all workplaces, a proposal is under active consideration for its enactment. Activities relating to the establishment of a system for chemical safety and a system for monitoring and improving the occupational health status of workers employed in hazardous industries are proposed to be taken up in the 8th Plan period. The facilities and capabilities of the Directorate-General Factory Advice Service and Labour Institutes, State Factories Inspectorates and Directorate-General of Mines Safety have been proposed for upgradation.

## 1.2 MAJOR LEGISLATION ON OCCUPATIONAL SAFETY AND HEALTH

### **Overview**

The major legislation on occupational safety and health are categorised in the legislation on conditions of work covering safety, health and welfare and the legislation on hazardous substances and activities covering safety aspects only. The difference between the legislation on conditions of work and the legislation on hazardous substances and activities is that the approach in the former is pursued from the angle of the safety and health of workers, whereas the approach in the latter is based on the dangers arising out of the hazardous substances or activities.

The legislation on conditions of work, having safety, health and welfare provisions, are enforced by the Labour Department of the Central and State Governments, while those on hazardous substances and activities, having only safety provisions, are administered by the ministries or departments dealing with industries or concerned activities.

The legislation on conditions of work are the Factories Act, 1948, the Dock Workers (Safety, Health and Welfare) Act, 1986, the Mines Act, 1952, and the Plantations Labour Act, 1951.

The legislation pertaining to hazardous substances are the following:

- The Explosives Act, 1884:
  - a. The Explosives Rules, 1983
  - b. The Gas Cylinder Rules, 1981
  - c. The Static and Mobile Pressure Vessels (Unfired) Rules, 1981.
- The Petroleum Act, 1934:
  - a. The Petroleum Rules, 1976
  - b. The Calcium Carbide Rules, 1987.
- The Insecticides Act, 1968, and the Insecticides Rules, 1971
- The Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989, under the Environment (Protection) Act, 1986.

The legislation concerning hazardous activities are:

- The Indian Electricity Act, 1910, and the Indian Electricity Rules, 1956
- The Indian Boilers Act, 1923, and the Indian Boilers Regulations
- The Dangerous Machines (Regulation) Act, 1983
- The Radiological Protection Rules, 1971, under the Indian Atomic Energy Act, 1962.

The gamut of safety and health aspects have a multiplicity of legislative approaches, with different administrative and enforcement arrangements. In order to have a unified approach, a proposal for enactment of a General Enabling Act is being considered.

#### **Characteristics of fundamental and general laws**

- The Factories Act, 1948

The provisions under the Factories Act, 1948, concerning inspecting staff, their powers, responsibilities, etc. give effect to the principles laid down in ILO Convention No.81 Concerning Labour Inspection in Industry and Commerce (1947) and related policies of ILO. Since 1987, the powers of the Inspector have been enhanced by vesting him with powers to seize documents and require the testing of articles or substances involved in an accident, thereby increasing his effectiveness.

The provisions relating to health deal with controlling the working environment to prevent diseases by laying down safety standards for ventilation. Likewise, control of dust, fumes, humidity, and overcrowding; provision of appropriate and adequate illumination; and other measures, such as provision of hygienic drinking water and spittoons, are covered.

The safety provisions give effect to ILO Convention No.119 and Recommendation No.118 Concerning the Guarding of Machinery (1963). The other provisions cover safety in the use of pressure vessels, coping with dangerous fumes and gases and fire safety measures. Further, the safety provisions on safe plant, machinery and buildings empower the Inspector to require testing of defective parts of plant and machinery or call for a stability certificate for building and machinery. The Inspector can prohibit the use of plant and machinery which are dangerous to human life and safety and can serve orders both on the occupier and/or manager.

The provisions relating to hazardous processes deal with the constitution of a Site Appraisal Committee under the Chairmanship of the Chief Inspector of Factories of the State. In consonance with the requirements of ILO Convention No.155 Concerning Occupational Safety and Health and the Working Environment (1981), compulsory disclosure of information is required by the occupier to workers, the Chief Inspector of Factories, local authorities and the general public in the vicinity. Further, the provisions deal with the preparation of an on-site emergency plan and a detailed disaster plan. In order to ensure safety and health, the occupier is specifically required to appoint qualified supervisors and arrange for measures for health monitoring. The other provisions relate to the powers of the Central Government to appoint an Enquiry Committee and declare emergency standards. Also provided are the permissible limits of about 120 chemical substances in Schedule II to the Act and workers' participation in safety management through the constitution of a Safety Committee. The right of workers to warn about imminent danger is quite a significant provision.

Work-related welfare measures, like facilities for washing, storing and drying clothing, sitting, and first-aid; rest shed; and canteen, are covered. The provisions concerning hours of work for adult workers and young persons are framed to give effect to ILO Convention No.1 on Hours of Work (Industry) (1919). Also, the provisions regulating night work for women and children are framed to give effect to ILO Convention No.89 on Night Work (Women) (Revised) (1948) and No.90 on Night Work of Young Persons (Industry) (Revised) (1948).

The management of a factory can request for relaxation of the restrictions imposed with regard to hours of work if it carries out certain processes necessitating relaxation or if it requires exceptional pressures of work. Such relaxation is, however, not total, as a limitation on the maximum number of hours of overtime work is prescribed.

While the provisions concerning annual leave with wages give effect to ILO Recommendation No.98 Concerning Holidays with Pay (1954), the provisions concerning protecting workers in dangerous operations, including the powers to prohibit employment of women and children in dangerous operations, over and above the provisions contained in the Health and Safety Chapter of the Act and the various Schedules under the Section 'Dangerous Operations', deal with special safety and health measures, as well as special work-related welfare measures, such as bathing cubicles, services of a qualified medical officer, etc. Some of the Schedules to the Rules under the provisions concerning dangerous operations are intended to give effect to ILO Convention No.136 on Benzene (1971), Convention No.139 on Occupational Cancer (1974), Convention No.148 on Working Environment (Air Pollution, Noise and Vibration) (1977), etc. In 1987, an amendment in the form of a new Section 87-A was introduced empowering the Inspector to prohibit the employment of workers by serving a written order upon the occupier of the factory if he considers that the factory or part of it may be the cause of serious hazards by way of injury or death to persons employed in it or to the public in the vicinity. This provision also provides the occupier of the factory with an opportunity for appeal against the orders of the Inspector.

While the broad coverage of the legal framework of the Act is described above, some of the significant provisions are definition of the term 'hazardous process' (which itself is based not only on the capability of the process to cause material impairment to health and safety, but also on its

potential to result in general environmental pollution), general responsibility of the occupier and rights of workers. The industries carrying out hazardous processes are to be identified in relation to 29 industries listed in Schedule I of the Act. The provisions relating to general responsibility encompass aspects not specifically covered by laying down the broad objectives for safety and health measures. The provisions concerning the rights of workers confer rights to (i) obtain from the occupier information relating to safety and health at work, (ii) receive training within the factory or in an institution approved by the Chief Inspector of Factories, and (iii) represent to the Inspector, directly or through his representative, on inadequate protection of his health or safety in the factory.

Thus, the various provisions under the Act could be considered comprehensive and effective in affording protection to workers in factories.

#### **Purposes and functions of other related laws**

##### The Mines Act, 1952

The first Mines Act was promulgated in 1923, and was replaced by the Mines Act, 1952. The Act is at present the most important safety and health legislation on conditions of work in mines. It has 10 Chapters and about 92 provisions dealing with aspects like the constitution of Mining Boards and Committees, appointment of Mine Managers, health and safety, hours of work, leave with wages and powers of the Central Government to make Rules and Regulations. In addition, the Regulations cover more detailed requirements concerning aspects like the rescue of miners, inspection of mines, ventilation and lighting in mines, prevention of explosions in mines, collapse of mines and ingress of water in mines. The Act is enforced by the Central Government as the subject matter of mines falls under the purview of the Central Government.

##### The Dock Workers (Safety, Health and Welfare) Act, 1986

The new Dock Workers (Safety, Health and Welfare) Act was passed in 1986, after repealing the old statute. It gives effect to the revised ILO Convention No.152 on Occupational Safety and Health (Dock Work) (1979). The Act provides for the constitution of an Advisory Committee by the appropriate Government for advising on matters arising out of the administration of the Act and Regulations, besides empowering the appropriate Government to make Rules and Regulations. The Central Government has promulgated the Dock Workers (Safety, Health and Welfare) Rules, 1990, covering in detail the safety, health and welfare of dock workers. The Regulations deal with the responsibilities of various agencies for compliance with the provisions of the Act, Rules and Regulations, as well as safety aspects relating to workplaces, warehouses and storing places, means of access, docks and hatchways, lifting appliances and gear transport equipment and operations, handling of cargo, handling of dangerous goods and freight container terminals. The health and welfare of dock workers and special provisions dealing with training of dock workers and emergency action plans are important features of the Regulations.

##### The Plantations Labour Act, 1951

The Plantations Labour Act, 1951, provides for the welfare of labour and regulates conditions of work in plantations. While the Act deals more with the hours of work and welfare of labour, it has two provisions on safety, viz. notice of accidents and registration of accidents. The potential for accidents or diseases is relatively less in work connected with plantations because coffee, tea, rubber and other products are harvested employing mostly manual labour, while factories processing plantation products are already covered under the Factories Act, 1948. The potential for diseases is to an extent involved while using and spraying insecticides, which is dealt with by the Insecticides Act, 1968, and its Rules. The second category of safety legislation deals with safety in the use of hazardous substances. In this category, the Explosives Act, 1884, the Petroleum Act, 1934, the Insecticides Act, 1968, etc. are important.

The Explosives Act, 1884

The Explosives Act, 1884, is one of the oldest pieces of legislation dealing with the regulatory aspects concerning the manufacture, possession, use, sale, transport, import and export of explosives. Elaborate Rules, called the Explosives Rules, 1983, covering the above aspects are made under the Act. The Act is the parent Act for two more statutory requirements on safety, viz. the Gas Cylinder Rules, 1981, and the Static and Mobile Pressure Vessels (Unfired) Rules, 1981. The need for regulating safety in the use, storage, handling, identification and transport of gas cylinders, as well as safety in the use of pressure vessels, has been keenly felt and, accordingly, Rules have been made under the Act which enable the control of other causes of explosions by extending the meaning of the term 'explosives'. The Static and Mobile Pressure Vessels Act covers storage vessels and other pressure vessels transported, while process/reaction vessels are covered under the Factories Act, 1948, which deals with the safety requirements of unfired pressure vessels. Since explosion is the potential hazard in the use of gas cylinders and pressure vessels, they are covered under the Explosives Act, 1884.

The Petroleum Act, 1934

The Petroleum Act, 1934, is one of the important safety legislation relating to safety in the refining, import, transport, storage and blending of petroleum products. These aspects are further regulated by a set of Rules called the Petroleum Rules, 1976. The Explosives Act, 1884, as well as the Factories Act, 1948, and the Rules under the above Acts are enacted by the Central Government and enforced by the Central Government through the Controller of Explosives.

The Insecticides Act, 1968

The Insecticides Act, 1968, is intended to regulate the import, manufacture, sale, transport, distribution and use of insecticides with a view to preventing risks to human beings and animals or related matters. The salient features of the Act are the constitution of a Central Insecticides Board and establishment of a Central Insecticides Laboratory. Regulatory measures cover import, manufacture, sale, etc. of insecticides. The Rules under the Act cover the functions of the Central Insecticides Board and Central Insecticides Laboratory, grant of licences, packaging and labelling requirements, medical examination, protective clothing, etc.

The Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989, framed under Sections 6, 8, and 25 of the Environment (Protection) Act, 1986

The Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989, cover the safety measures needed in respect of hazardous chemicals. The Rules apply to industrial activity, including isolated storages. The safeguards cover a wide range of aspects, such as notification of site, preparation of safety reports, on-site and off-site emergency plans, disclosure of information, etc. The Schedules to the Rules list the hazardous chemicals and specify the enforcing authorities.

The Indian Boilers Act, 1923

The safety aspects relating to the construction, operation, maintenance and inspection of steam boilers are covered comprehensively by the Indian Boilers Act, 1923, and the Indian Boilers Regulations, which deal with safety aspects in the manufacture and operation of boilers, for which the Boiler Attendant Rules are also being enforced.

The Indian Electricity Act, 1910

The safety aspects relating to the generation, transmission and distribution of electrical energy, including its use, are comprehensively covered by the Indian Electricity Act, 1910, and the Indian Electricity Rules, 1956. The Rules deal elaborately with safety aspects relating to electrical installations covering specifications for the quality, construction and layout of installations, safety and protective devices, etc.

The Dangerous Machines (Regulation) Act, 1983

The Dangerous Machines (Regulation) Act, 1983, was passed following a series of accidents involving the loss of limbs in agricultural operations. The Act provides for the regulation of trade, commerce, production, supply, distribution, and use of the products of any industry producing dangerous machines, with a view to securing the welfare of labour operating such machines through a system of licensing of the manufacture of such machines operated by a Controller appointed under the Act. The employer is to take out an insurance cover to pay compensation to the operator of the dangerous machine in the event of injury or death.

The Indian Atomic Energy Act, 1962, and Radiological Protection Rules, 1971

The safe use of nuclear energy is the concern of the Central Government and the law dealing with the subject is covered by the Indian Atomic Energy Act, 1962. In view of the express provision under the Act, the provisions of the Factories Act, 1948, in respect of nuclear installations are enforced by the Central Government instead of the State Governments. Further, the Radiological Protection Rules, 1971, are enforced by the Central Government through the Atomic Energy Regulatory Board, which is the regulatory authority for countrywide use of nuclear energy.

A summary of the OSH legislation is given in Annexure "A".

### 1.3 ADMINISTRATIVE ORGANISATION FOR OCCUPATIONAL SAFETY AND HEALTH

#### **Structure and personnel of administrative organisation**

Matters relating to the safety and health of workers are the overall responsibility of the Industrial Safety and Health Branch of the Ministry of Labour, Government of India, which is headed by the Secretary. Some other branches of the Ministry are involved to a limited extent in matters relating to occupational safety and health. Under the Secretary, a Joint Secretary administers the work of the Industrial Safety and Health Branch. He is assisted by a Deputy Secretary and other staff. The Secretary and Joint Secretary are senior-level administrators belonging to the All-India Civil Service Cadre. The Directorate-General Factory Advice Service and Labour Institutes and the Directorate-General of Mines Safety assist the Ministry in the technical aspects of safety and health.

The Directorate-General Factory Advice Service and Labour Institutes, in the technical office attached to the Ministry of Labour located at Bombay, attends to matters relating to the safety and health of workers employed in factories, i.e. manufacturing industries and ports and docks. The Director-General, Factory Advice Service and Labour Institutes, is assisted by three Deputy Directors-General. One Deputy Director-General is in charge of the Dock Safety Inspectorates to enforce the Dock Workers (Safety, Health and Welfare) Act, 1986. The second Deputy Director-General is in charge of factory advisory work and liaising with the various Factory Inspectorates. He is also in charge of three Regional Labour Institutes located at Kanpur, Calcutta and Madras. The third Deputy Director-General is in charge of the Central Labour Institute, located at Bombay which functions as a national institute. It is equipped with facilities and expertise in respect of safety, health, hygiene, physiology, psychology, etc. When needed, the three Regional Labour Institutes can extend services in the other specialised areas. The above four Institutes are staffed with the requisite technical and other supporting staff and equipped with a permanent Industrial Safety, Health and Welfare Centre, where safety appliances, safety devices, etc. are on display, as well as a Mobile Safety Exhibition Van on similar lines as the Safety Centre. The Regional Labour Institutes also have a trainees' hostel.

The safety and health provisions under the Factories Act, 1948, are enforced by the Factories Inspectorates in 31 States and Union Territories.

The Factories Inspectorates in the States and Union Territories are organised in three ways. First, in respect of some major States, the Factories Inspectorate is headed by a full-fledged Technical Head of Department reporting to the Secretary of the Labour Department of the respective State. Second, the Factories Inspectorate is headed by a Labour Commissioner, who is a senior administrator under whom the Chief Inspector of Factories functions. Third, for the Union Territories, enforcement is carried out by the technical person who reports to the administrator who functions as the Chief Inspector of Factories.

The provisions of the Dock Workers (Safety, Health and Welfare) Act, 1986, are directly enforced by the Directorate-General Factory Advice Service and Labour Institutes, through the Inspectorates of Dock Safety located at 10 major ports in the country.

The Directorate-General of Mines Safety is the other technical organisation of the Industrial Safety and Health Branch of the Ministry of Labour which enforces the safety, health and welfare provisions under the Mines Act, 1952 and its Rules and Regulations. The organisation is headquartered at Dhanbad, with 20 Regional and Sub-Regional Offices.

The Controller of Explosives, Central Boiler Board and various State Boiler Inspectorates, and Central Electricity Authority and State Electrical Inspectorates also deal with hazardous substances or activities.

The Controller of Explosives, under the Department of Explosives, Ministry of Industry, Government of India, has 20 local offices, with its headquarters at Nagpur.

The Central Electricity Authority, under the Department of Power, Ministry of Energy, Government of India, is in charge of the Central Electricity Board, which is the apex organisation having members from important Central Government organisations, like the Ministry of Defence, Department of Atomic Energy, Central Public Works Department, etc. This set-up deals with the Indian Electricity Act, 1910, and Rules.

The Indian Boilers Act, 1923, and the Indian Boilers Regulations are enforced by the State Boiler Inspectorates. Co-ordination at the national level is looked after by the Central Boiler Board.

The organisational set-ups dealing with safety and health aspects under the Labour Ministry of the Central and State Governments are shown in Annexure "B".

## 1.4 FUNCTIONS OF ADMINISTRATION FOR OCCUPATIONAL SAFETY AND HEALTH

### **Functions of administrative organisation**

The Ministry of Labour, Government of India, and Labour Departments of the State and Union Territories are responsible for the safety and health of workers. The Industrial Safety and Health Branch of the Ministry discharges the overall functions relating to policy decisions and laying down guidelines for countrywide adoption, as labour is a concurrent subject in the Constitution. As most of the legislation on safety and health are Central Government legislation, the Ministry performs the important function of piloting the bills through Parliament after interministerial consultations and consultations with the State Governments and other organisations of employers and employees. Liaison with the International Labour Organisation and other countries is carried out by the Ministry. Co-ordination at the national level is undertaken by the Ministry by periodically convening the State Labour Ministers Conference and State Labour Secretaries Conference, in which policy matters and issues on uniformity in labour laws are discussed.

The Directorate-General Factory Advice Service and Labour Institutes, being the technical organisation of the Ministry, liaises with the State Factories Inspectorate and advises them on the administration of the Factories Act, 1948, the infrastructural facilities required for the purpose, and issuance of Rules under the Act. Amendments to the Act are dealt with by the Directorate-General, by discussing these aspects during the Conferences of Chief Inspectors of Factories belonging to the State Governments and Union Territories, and their recommendations are communicated to the State Governments through the Ministry for follow-up action by the State Governments. Besides, the Directorate-General, on behalf of the Ministry, carries out the important function of providing training for Factory Inspectors and co-ordinates training outside the country. Considering the number of industries in the country and the fact that the State Governments have the major responsibility for enforcement, training in safety and health for personnel from industries is carried out by the four Labour Institutes of the Directorate-General Factory Advice Service and Labour Institutes. Training is mostly carried out at the Institutes and the requirements for conducting in-plant training programmes are met on a selective basis. Whenever amendments are necessary, the Directorate-General prepares the draft amendments, using the research facilities available at the Central Labour Institute, for consideration by the Ministry.

As the Factories Act, 1948, is a Central Government legislation, the Directorate-General Factory Advice Service and Labour Institutes formulates the draft Model Rules under the various enabling provisions of the Act for consideration by the Ministry with a view to guiding the State Governments and Union Territories in making Rules and enforcing them. This function of the Central Government helps in maintaining the required level of uniformity in safety and health standards enforced by the State Governments and Union Territories.

In addition to the training functions, national research/studies and consultancy studies on safety and health are undertaken by the Labour Institutes, based on the priorities identified by the Government.

Since enforcement of the provisions of safety and health in 10 major ports and docks is the responsibility of the Central Government, the Director-General, Factory Advice Service and Labour Institutes, Ministry of Labour, functions as Chief Inspector and enforces the requirements of the Dock Workers (Safety, Health and Welfare) Act, 1986, through the Dock Safety Inspectorates located at all the major ports.

The Central Labour Institute, Bombay, tests personal protective equipment and the Directorate-General Factory Advice Service and Labour Institutes approves the use of electrical appliances in hazardous locations in factories on behalf of the State Chief Inspectors of Factories. In addition, the Directorate-General Factory Advice Service and Labour Institutes carries out promotional activities by operating the National Safety Awards Scheme and Viswakarma Awards Scheme applicable to factories and ports and docks on behalf of the Ministry of Labour.

The other technical organisation of the Ministry, viz. the Directorate-General of Mines Safety, deals with the safety and health of workers in all types of mines. The functions of the organisation are administration and enforcement of the Mines Act, 1952, and the following Rules and Regulations:

- i) Coal Mines Regulations, 1957
- ii) Metalliferous Mines Regulations, 1961
- iii) Oil Mines Regulations, 1987
- iv) Mines Rules, 1955
- v) Mines Vocational Training Rules, 1966
- vi) Mines Rescue Rules, 1985

Besides, the Directorate-General enforces other statutory requirements dealing with safety and health, such as the Indian Electricity Act, 1910, and its Rules, and the provisions concerning health and safety, as well as the Factories Act, 1948, insofar as they relate to workers in factories attached to mines. The Directorate-General functions as the certifying authority for the Board of Mining Examinations constituted under the Coal Mines Regulation and Metalliferous Mines Regulations. The Director-General is the ex-officio Chairman of the Board, which has other technical members. Besides certification, the Directorate-General approves mine safety equipment and other electrical appliances conforming to the relevant national standards after testing by the Central Mining Research Station, Dhanbad. The Directorate-General also operates, for the Ministry of Labour, the National Safety Awards (Mines), given in recognition of good safety performance by mines.

The Controller of Explosives, under the Department of Explosives, enforces the two principal Acts, namely, the Explosives Act, 1884, and its Rules and the Petroleum Act, 1934, and its Rules. He will also be responsible for testing and certifying the safety devices required to be used as per the above statutes in the testing facilities, which will start functioning shortly.

The Central Electricity Authority is the apex body dealing with the Central Government Acts, namely, the Indian Electricity Act, 1910, and the Indian Electricity (Supply) Act, 1948. It arbitrates in matters arising between the State Government or the State Electricity Board and the licensee or other persons as per the Act. Interpretations of the two enactments are provided by the Central Electricity Authority for the guidance of all concerned. The Central Electrical Inspectorate, with four Regional Inspectorates located at Madras, Shillong, Pannji and New Delhi, enforce the Electricity Rules in respect of electrical installations under the Central Government, besides granting approval for issue of electrical contractors' licences and competency certificates to supervisors and wiremen through the Licensing Boards, etc. Every State Government has an Electrical Inspectorate which performs the functions of the Central Electrical Inspectorate in respect of electrical installations under its jurisdiction. The Central and the State Electrical Inspectorates function as licensing authorities under the Cinematograph Rules and issue cinema operators certificates.

As regards safety in the construction, installation, operation and certification of steam boilers, the State Boiler Inspectorates enforce the Indian Boilers Act, 1923, and the Indian Boilers Regulations in their respective jurisdictions. The Boilers Inspectorate enforces the Boiler Attendant Rules framed by the State Governments. This is intended to test the competency of boiler attendants. The Central Boilers Board periodically convenes meetings of the State Boiler Inspectorates and others concerned, in which matters relating to administration of the Indian Boilers Act, 1923, and Regulations and amendments to the statutory requirements are discussed and decided.

### **Authority of administrative personnel**

As regards the Factories Inspectorates of the 31 States and Union Territories, exclusive Inspectorates are not available in about six Union Territories. The State Factories Inspectorates enforces the provisions under the Factories Act, 1948. In six States and Union Territories, the State Factories Inspectorates also enforce the provisions under the Indian Boilers Act, 1923, and the Regulations. In these States, they have either separate Boiler and Factories Wings for enforcing the respective statutes or the same Inspector enforces both the statutory requirements. While the main function of the State Factories Inspectorates is to enforce the provisions of the Factories Act, 1948, and the Indian Boilers Act, 1923, they also enforce the requirements under some of the allied Acts, such as the Payment of Wages Act, the Maternity Benefits Act, and the Minimum Wages Act. They carry out promotional and training activities relating to safety and health and operate the State Safety Awards and Shram Vir Awards.

## 2. COUNTERMEASURES AGAINST INDUSTRIAL INJURIES

### 2.1 MAJOR MEASURES BY PRIVATE SECTOR

Industries in the private sector are of various types, like proprietary concerns, partnership firms (registered or otherwise), private limited companies, public limited companies, public sector undertakings wholly-owned by the Central Government or the State Government, and joint sector undertakings with Government and private equity participation.

#### Performance of employer's duties

Employers should demonstrate their commitment to safety and health by declaring a suitable safety policy applicable to the workplace. Private sector organisations have to abide by enactments like the Factories Act, 1948, the Indian Electricity Act, 1910, the Indian Boilers Act, 1923, the Explosives Act, 1884, and the Petroleum Act, 1934.

Measures to be taken under the laws cover provisions regarding health, safety, working hours, welfare and certain special provisions dealing with dangerous operations and hazardous processes. The health measures are aimed at preventing discomfort and harm to health and providing clean and hygienic working conditions. The nature of work or processes may lead to unhygienic conditions and trade wastes being accumulated at the place of work. If working conditions are in the nature of increasing heat in the work environment, ventilation for thermal comfort should be provided. Ventilation measures are also required for contamination control. In order to safeguard the health of workers, overcrowding is to be prevented by conforming to the minimum breathing space required for a worker. For preventing eye strain and accidents, the standards of illumination are prescribed. The other measures intended to preserve the health of workers deal with the provision of drinking water, latrines, urinals and spittoons.

Employers are required to regulate the hours of work for adults and young persons in accordance with the provisions of the enactments dealing with conditions of work. As regards machinery safety and safety of the work environment, employers have to take measures to safeguard the machinery, prime movers, and transmission systems and provide a means of cutting off power. They are prohibited from employing women and young persons in the use of dangerous machinery and in dangerous operations in factories, as well as in work below ground in mines. They are required to take special measures in factories carrying out hazardous processes or dangerous operations and cover aspects like disclosure of information to workers and others, appointment of competent supervisors for handling hazardous substances and health monitoring. They are required to provide work-related welfare measures, like provisions for washing and cleaning, bathing cubicles, etc., to prevent entry of contaminants and chemical substances into the body. Since the involvement and co-operation of workers are essential for implementation of safety and health measures at the workplace, Safety Committees should be formed to enable workers' participation in safety management. Wherever hazards in the workplace or in the work environment cannot be controlled by permanent engineering control measures, employers are required to provide suitable personal protective equipment free of cost. The outbreak of fire is a potential hazard at the workplace. Employers are required to take adequate measures for preventing and controlling this hazard by provision of means of escape, as well as measures for the control of the fire. Fire safety measures are stipulated elaborately under the Factories Act, 1948, the Petroleum Act, 1934, the Explosives Act, 1884, the Shops and Establishments Act, etc. Further, the Mines Act, 1952, and its Rules and Regulations stipulate elaborate measures for the rescue of miners trapped due to the collapse or subsidence of walls and roofs when they work below ground.

The appointment of Safety Officers is required to help the management in promoting safety at the unit level and to take measures like frequent examinations of the workplace, lifting machinery and equipment, pressure vessels, etc.

### **Activities by related organisations**

The activities promoted by employers' and employees' organisations cover the areas of training, information, publication of literature and liaising with governmental agencies connected with safety and health aspects. Likewise, the Indian Chemical Manufacturers Association, Alkali Manufacturers Association and a few all-India organisations, like the Employers' Federation of India, and All-India Manufacturers Organisations, are active. In addition, the Federation of Chambers of Commerce and Industry advises members on safety and health issues through its Committee of Experts. The Committee organises seminars, symposiums, etc. intended to promote awareness of safety and health amongst members. Some employers' organisations issue safety and health bulletins and have arrangements for information dissemination amongst members. Organisations like the Indian Chemical Manufacturers Association and the Alkali Manufacturers Association also publish material safety data sheets in respect of hazardous chemical substances and safety pamphlets containing information relating to health, fire and explosion hazards.

The Bombay Chamber of Commerce and the Punjab, Haryana and Delhi (PHD) Chamber of Commerce have constituted a separate Committee on Occupational Safety and Health and Environmental Protection. The Committee is active and has requisitioned the services of experts in the field of safety and health to advise members on specific aspects. They organise seminars and symposiums on safety, health and pollution control in collaboration with the governmental agencies and institutions.

Employees' organisations organise safety training programmes for members and bring out publications in the regional language. Likewise, organisations of port and dock workers and mine workers are active in propagating the message of safety. Training programmes amongst union members are conducted in the regional language, to which officials from the concerned governmental organisations are invited to give talks. Since union members actively participate in the Workers' Education Scheme of the Central Board of Workers' Education, worker-teacher trainees are provided separate training programmes on safety and health aspects so that they can organise similar programmes for union members. Both employers' and employees' organisations participate in the Safety Week/Safety Day celebrations organised at the unit level. Occupational Health Centres, organised on a group basis, and certain common facilities for off-site emergency planning, like common fire-fighting arrangements to supplement individual efforts, antidotes for hazardous chemical substances and other emergency-care facilities, are made available by employers' organisations.

## **2.2 MAJOR MEASURES BY PUBLIC SECTOR**

The major safety and health measures taken by the Central and State Governments, as stipulated in the laws, have their origins in the constitutional provisions as the term 'State' includes the Central and State Governments. Details of the measures are outlined below:

### **Performance of Central Government's responsibilities**

The Industrial Safety and Health Branch of the Ministry of Labour, Government of India, and the State Departments of Labour are responsible for all legal and administrative measures taken in the country for ensuring the safety and health of workers (labour). The Central Government has set up technical organisations, like the Directorate-General Factory Advice Service and Labour Institutes, the Central Boiler Board, and the Central Electricity Authority, to provide apex and co-ordinating arrangements in respect of enactments like the Factories Act, 1948, the Plantations Labour Act, 1951, and the Indian Electricity Act, 1910. which are enforced by the State Governments and Union Territories. In respect of the enactments enforced by the Central Government, such as the Mines Act, 1952, the Explosives Act, 1884, and the Petroleum Act, 1934, the machinery and infrastructural facilities and the countrywide field formations have been set up by the Central Government. Besides, the Central Government undertakes the training of enforcement officials connected with safety and health aspects with a view to updating their skills and competence.

Likewise, the Directorate-General of Mines Safety is the examining body for coal and metaliferous mines in respect of Mine Managers' and Surveyors' Certificates and enforces the Mines Vocational Training Rules, 1966. After due deliberations at the National Conference of Heads of Enforcement Wings, Central Government coordinating organisations prepare and process draft amendments to the provisions relating to occupational safety and health for consideration by Parliament. In addition, Central Government organisations, such as the Directorate-General Factory Advice Service and Labour Institutes and Directorate-General of Mines Safety, frame Rules and Regulations under the relevant enabling provisions of the safety and health statutes directly enforced by them.

The Central Government has also taken measures to provide technical advice and information relating to safety and health. The Labour Institutes functioning under the Directorate-General Factory Advice Service and Labour Institutes, the Directorate-General of Mines Safety and the other technical organisations of the Central Government provide advice on matters relating to the methods and types of machinery safeguards, suitability of protective equipment and the devices to be used at the workplace, the toxicity and flammability characteristics of chemicals and hazardous substances and the measures to be undertaken for preventing health and fire hazards.

Facilities for testing respiratory and non-respiratory personal protective equipment are available at the Central Labour Institute. Likewise, the Central Mining Research Station at Dhanbad tests the equipment and devices used in mines. The Controller of Explosives is in the process of installing full-fledged testing facilities at Nagpur for safety equipment and devices required to be used as per the provisions of the Explosives Act, 1884, and the Petroleum Act, 1934. The National Test House is also being recognised as an approved agency.

Further, in order to recognise the competence of a person carrying out testing and certifying work for statutory purposes, there is a system to declare 'Competent Persons'. All statutory authorities are required to investigate into fatal and serious accidents and prepare a report for the Government. Likewise, the Central and State Governments enforcing safety and health legislation are required to constitute High-Level Enquiry Committees to investigate the causes of multi-death accidents or the high incidence of occupational diseases, in accordance with the provisions of the Act.

### **Voluntary administrative services by Central Government**

The voluntary activities of the Central Government are preparation and publication of technical literature on safety and health. Safety posters, booklets and leaflets, for wider circulation amongst workers, are published in various languages of the region by the Central Government. Specific booklets on safety and health, such as 'Safety in Working at Heights', 'Safety in Wood Working Machinery', 'Industrial Ventilation', and 'Exhaust Ventilation', are published by the Central Government for the guidance of the technical personnel from industries.

The Central Government encourages voluntary services in promotional work connected with safety and health. National Safety Awards are presented for good safety performance in factories, ports and docks and mines. Likewise, workers offering suggestions for improving productivity and safety receive the Viswakarma National Award in the form of cash prizes and Certificates of Merit. To commemorate the foundation day of the National Safety Council, which is a national-level tripartite organisation, 4 March is observed as the National Safety Day. On that day, the Central Government encourages all industries and organisations to organise promotional activities at the unit level and seminars and symposiums on specific areas of safety and health. Chapters of the National Safety Council and enforcement agencies of the Central and State Governments participate in the National Safety Week to reinforce awareness amongst all concerned at the workplace and to launch suitable activities for increasing and sustaining awareness.

Senior officials of the Central Government participate in functions organised by employers' organisations to explain the Government's point of view with regard to safety and health. Autonomous governmental organisations, like the National Productivity Council, and research organisations, like the Directorate General, Council of Scientific and Industrial Research, Government of India, organise training programmes on safety and health, pollution control, etc. Central Government officials and the agencies concerned with the safety and health provide faculty assistance in organising the programmes.

Voluntary administrative services of the Central Government are extended to other countries under bilateral arrangements. Officials of Asian countries undergo training-cum-attachment programmes in institutions devoted to the safety, health and allied aspects in India under the aegis of various international aid programmes, like the Colombo Plan and the Special Commonwealth African Assistance Programme. During 1988 to 1991, India has trained 19 officials from 9 countries in various aspects of safety and health. Besides, the Central Labour Institute at Bombay is recognised by the ILO Asian and Pacific Regional Centre on Labour Administration (ARPLA) as a centre of excellence in safety and health. During 1988 to 1991, six programmes have been organised on different topics of safety, such as safety in the engineering and textile industries, benefiting 114 persons from 14 countries.

The Central Board of Workers' Education under the Ministry of Labour, Government of India, integrates safety and health aspects into their training activities. Officials of the Labour Institutes and other concerned Central Government organisations are involved in the training programmes.

#### **Performance of Local Government's responsibilities**

The various State Governments and Union Territories have set up full-fledged Inspectorates of Factories, Boilers, etc., as part of their responsibility to enforce the Central Government legislation concerning safety and health, and have provided the necessary infrastructural facilities for their enforcement, including local offices. The State Governments are constantly improving the enforcement machinery and equipping it with facilities, such as instruments for monitoring the work environment. In this regard, the State Governments are helped and guided to a considerable extent by the Central Government through Central Government schemes. Expert services were requisitioned under UNDP projects and equipment, technical books and publications were made available to the State Governments for the purpose. With this arrangement, the statutory obligations for monitoring the work environment can be fulfilled.

The State Governments and Union Territories, as part of their statutory responsibilities, have to frame Rules under the enabling provisions of the Factories Act, 1948, and other Central Government enactments concerning safety. The State Governments are given guidance by the Central Government, in the form of model Rules, or the Central Government arranges for deliberations on the issuance of Rules in their Annual Conference, like the Conference of Chief Inspectors of Factories, Central Boiler Board Meetings and meetings and conference convened by the Central Electricity Authority. The State Factories Inspectorate is required to declare a person 'competent' for the purpose of testing and examination under the relevant Act. The State Electrical Inspectorate tests and examines the competency of wiremen.

The State Government has to approve sites, register factories and grant licences to factories under the Factories Act, 1948. Permission and approval of electrical installations are issued under the Indian Electricity Act, 1910, by the Electrical Inspectorate of the State Government. Likewise, inspection and certification of steam boilers are carried out by the State Boiler Inspectorate.

The Chief Inspector of Factories approves the on-site emergency plan in respect of factories carrying out hazardous processes. The District Emergency Officer of the State Government, under the Environment (Protection) Act, 1986, is responsible for the off-site emergency plan.

The safety and health legislation vests powers to the enforcement authorities to grant exemptions from compliance with various statutory requirements if alternate means are available for ensuring safety and health. Further, the State Government and senior officials are required to collect statistics of accidents and details regarding working conditions, compile the information annually, and forward it to the Director, Labour Bureau, Simla, for publishing countrywide statistics.

## **Voluntary administrative services by Local Government**

Some of the State Governments having a large number of chemical and process industries which present a major accident hazard potential have set up specialised cells to monitor activities. The State Government has set up a 'task force' consisting of Government, employer and employee representatives and experts in the field of chemical and process safety. With the functioning of the task force, several developmental activities have been speeded up.

The State Factories Inspectorate involves itself in the activities of the Chapters of the National Safety Council in the conduct of training programmes and observance of Safety Week and Safety Day. Some of the State Governments, like Karnataka, give immediate cash relief to victims of accidents in the unorganised sector. Most of the State Governments and Union Territories are operating State Safety Awards for factories on similar lines to the National Safety Awards. The State Governments, through enforcement officials, offer advice on the safeguards to be adopted in machinery, improving the work environment, etc. Some of the State Governments educate the general public, through the media, on the safeguards to be adopted in the use of electrical energy.

### **Activities by other governmental organisations**

#### National Safety Council

The National Safety Council was set up on 4 March 1966 by the Ministry of Labour, Government of India, as a non-profit making, non-political, voluntary organisation. Its main objectives are to supplement and strengthen the Government's efforts. Management of the Council is vested in a tripartite Board of Governors, which has 51 members, besides the Chairman. The Director-General is Chief Executive and Secretary to the Board.

The Council has over 3,000 members who are grouped as organisation members, corporate trade union members and individual life members, with 12 Chapters located in all the major States.

The Council is involved in organising conferences, seminars and training programmes, carrying out safety audits, providing technical advice and producing safety publicity and promotional material. Besides organising national conferences, it has organised two international conferences. One of its important activities is observance of the National Safety Day organised on 15 March every year. It brings out periodicals devoted to safety and health and publishes booklets and other technical literature. It has an ambitious programme for growth, i.e. establishment of a computerised databank and Chapters in all States and Union Territories.

#### Loss Prevention Association of India Limited

The Loss Prevention Association of India Limited is a non-profit organisation set up in 1978 by the General Insurance Corporation of India and its subsidiaries, which are owned by the Government of India. It has on its Board of Directors the Chairman-cum-Managing Director of the General Insurance Corporation of India and its subsidiaries, representatives of the Ministry of Finance, Government of India, industrialists and others. The Chairman of the General Insurance Corporation of India is its Chairman.

Its objectives are to publicise the causes and magnitude of losses, provide education and training in safety and loss prevention, render consultancy and advisory services and build up and maintain a databank on loss prevention.

It has its headquarters at Bombay, with 6 Regional and Branch Offices, staffed by 25 experts in the connected engineering disciplines and 7 specialists in mass communication.

It organises training, seminars and conferences. Its consultancy activities cover the evaluation of technical designs and engineering systems from the hazardous and operational angles and advice on selection and installation of appropriate types of fire protection systems, including preparation of technical specifications for inviting bids and identification, evaluation and control of losses and damages.

It publishes a quarterly newsletter on loss prevention containing useful information on fire safety. Its fire salvage corps offer free service at Bombay. It is active in cargo loss minimisation at ports. It undertakes mass communication programmes on home safety, road safety, fire safety and industrial safety, besides investigation and preparation of reports on road accidents.

### **3. TRENDS OF INDUSTRIAL INJURIES**

#### **3.1 OVERVIEW**

The relevant publications concerning statistics on occupational safety and health published annually by the Labour Bureau, Ministry of Labour, Government of India, are (i) Statistics of Factories, (ii) Indian Labour Year Book, (iii) Indian Labour Statistics, (iv) Pocket Book of Labour Statistics, (v) Standard Reference Note of Directorate-General Factory Advice Service and Labour Institutes Organisation, (vi) Annual Report of Working of the Indian Dock Labourers Regulations, 1948, and the Dock Workers (Safety, Health and Welfare) Scheme, 1961, and (vii) Annual Report of the Directorate-General of Mines Safety. The trends discussed below relate to details mentioned in them.

As may be seen from the statistics on employment, industrial injuries in factories and the frequency rate of fatal accidents have more or less remained the same over 1976 to 1987, in spite of the increase in industrialisation and proportionate increase in employment. Though there was a reduction in fatalities during 1982 and 1983, there was an increase in fatalities during 1984, 1985 and 1986, followed by a decrease during the subsequent years. It is significant to observe that the frequency rates of injuries for fatal and non-fatal accidents have been fluctuating during 1976 to 1982, after which there has been a reduction in the frequency rate for the total number of accidents, a minimum of 12.87 occurring in 1984 (see Table 1 in Annexure "C").

#### **3.2 ACCIDENT CASES, BY INDUSTRY**

##### **a. All Industry**

Details of accidents, industry-wise, relate to 1985, 1986 and 1987. The industry group 'all textiles' accounted for the maximum number of injuries amongst all industries, but it has reduced over the three year period. Next to 'all textiles', the industry group 'manufacture of transport equipment and parts' accounted for a number of accidents, which has also reduced from 16,887 in 1985 to 13,044 in 1987. The third industry group which accounted for a considerable number of accidents during the period was 'basic metal and alloy', with 14,251 accidents in 1985, which again decreased to 9,289 accidents in 1987. The fatalities for this group remained fairly high. The industry group 'manufacture of machinery, machine tools and parts' occupied fourth position in terms of the number of injuries. In regard to the rate of accidents per 1,000 workers, there was some decrease in industry groups like 'manufacture of chemicals', 'manufacture of electrical machinery, apparatus, etc.', but for others the rate remained almost steady, with marginal fluctuations (see Table 2 in Annexure "C").

##### **b. Coal Mines**

The number of fatal accidents and persons killed during 1983 to 1987 fluctuated, with 214 fatalities in 1986, which was the highest in the five-year period. Non-fatal accidents remained more or less steady

during 1983 to 1986, with a decrease in 1987. The death rate by accidents in terms of output also remained steady, except for a decrease in 1987. 1987 generally registered a decrease over the preceding years in all respects (see Table 3 in Annexure "C").

#### c. Non-Coal Mines

There was a fluctuating trend in non-coal mines in terms of the number of persons killed during 1983 to 1987. The number of persons seriously injured showed a steady decrease from 1983 to 1985, which further declined to 397 in 1986. Accidents causing deaths and serious injuries have been more in mining activities below ground than in open-cast mines. The position with regard to above-ground working has been more or less steady, while the overall picture also remained steady over the period of five years (see Table 5 in Annexure "C").

#### d. Ports and Docks

The number of fatalities during 1986 to 1989 was on the increase, from 13 in 1986 to 23 in 1988, with a decrease to 18 in 1989. Non-fatal accidents showed a decreasing trend from 1986 to 1988, followed by an increase in 1989. Significantly, in 1988, non-fatal accidents were the minimum, even though the number of fatalities were the maximum. The frequency rate of accidents showed a steady increase over the four-year period in respect of accidents on board ship, whereas in 1989 there was a high frequency rate of 29.68 accidents on shore. In terms of output per million tonnes of cargo handled, the rate of accidents on board showed a decreasing trend during 1986 to 1988, but an increase in 1989. The rate of accidents on shore in terms of output was 11.60 in 1987, which increased in subsequent years to 16.80 and 17.91 (see Table 7 in Annexure "C").

### 3.3 ACCIDENT CASES, BY CAUSE AND TYPE

#### a. Factories

Published figures of injuries in factories, by cause, are available up to 1981 only. Hence, the pattern of injuries is briefly mentioned. Machinery moved by mechanical power caused the maximum number of fatal and non-fatal injuries, followed by the cause 'person falling'. There was a considerable number of fatal and non-fatal injuries due to 'struck by falling body'. Causes, like 'electricity', and 'explosions', also contributed to a large number of fatalities, but non-fatal injuries due to these causes were very few.

#### b. Coal Mines

The cause 'ground movement' in mines was responsible for the maximum number of fatal accidents, increasing from 57 in 1983 to 78 in 1985, and thereafter decreasing to 72 in 1987. Next, the cause 'transportation machinery (other than winding)' was responsible for a considerable number of fatal and serious accidents, remaining somewhat steady over the period 1983 to 1987. The third cause contributing to the maximum number of accidents in 1983 to 1987 was 'fall other than fall of ground'. The serious accidents were also relatively high for this cause, when compared to 'transportation machinery'. The cause 'explosives' was responsible for a considerable number of fatal accidents, but very few non-fatal accidents (see Table 4 in Annexure "C").

#### c. Non-Coal Mines

In non-coal mines, the maximum number of fatal accidents were due to 'ground movement', followed by the causes 'transportation machinery' and 'fall other than fall of ground'. The number of serious accidents in non-coal mines was not as many as in coal mines due to the fact that work in coal mines is more hazardous than in non-coal mines. The serious accidents were maximum due to the cause 'fall other than fall of ground'. The cause 'explosives' was responsible for a considerable number of fatalities, with very few non-fatal accidents (see Table 6 in Annexure "C").

#### d. Ports and Docks

The cause 'handling of cargo' accounted for a large number of non-fatal accidents, whereas the causes 'person falling' and 'transport' were responsible for more fatalities. The cause 'struck by falling body' ranked second in respect of non-fatal accidents, followed by the cause 'person falling'. The trends of accidents fluctuated during 1986 to 1989 (see Table 8 in Annexure "C").

### 3.4 CASES OF OCCUPATIONAL DISEASES

The incidence of occupational diseases has not been reported in sectors like factories and ports and docks, hence details are not available. In respect of mines, there were 54 cases of pneumoconiosis in coal mines and 5 cases in non-coal mines during 1987. There were 7 cases of silicosis in non-coal mines during the same year.

## 4. DIFFICULTIES IN ADMINISTRATIVE DEVELOPMENT

### 4.1 PROBLEMS RELATED TO SERIOUSNESS OF INDUSTRIAL INJURIES

Industrialisation is taking place at a fast pace and employment is increasing proportionately in all industrial sectors. In spite of the increase in industrialisation and employment, the rates of fatal accidents and injuries have remained more or less steady. The problem is still not controlled in a positive manner in that the rate of fatal accidents has not come down.

In sectors like factories and mines, the accidents caused by machinery accounted roughly for one-third the total number of accidents. In respect of factories, the number of accidents caused by 'machinery moved by mechanical power' was the maximum and for mines the causes 'transportation machinery (other than winding)' and 'machinery other than transportation machinery' together contributed to a large number of accidents.

The cause 'material handling' was responsible for a considerable number of accidents in factories and ports and docks. In factories, the cause 'handling goods or articles', and in ports and docks the cause 'handling of cargo and handling of articles other than cargo', together contributed to the maximum number of accidents. Obviously, the major activity in ports and docks is handling, while in factories this activity accounts for roughly 30-40% of the total activity.

### 4.2 PROBLEMS RELATED TO COUNTERMEASURES AGAINST INDUSTRIAL INJURIES

Measures to control industrial injuries will succeed only if there is a system of accountability which is not in conflict with other interests. Workplaces have a well-established system of accountability for production, productivity and target achievements in other areas of work. If occupational safety and health measures are to be effective, they need to be integrated into work activities. Consequently, it is necessary to introduce a system of accountability for safety matters into performance appraisal at the unit level. This would result in effective integration, as the performance of all concerned would not only be measured by the work output, but also by safe work output.

Built-in safety devices and safety systems for plant, machinery and equipment are insisted upon statutorily wherever there is a risk of serious danger. In certain situations, built-in safety devices, etc. are recommended as optional because every requirement cannot be statutorily insisted upon since non-compliance entails punishment. Such built-in safety measures are often omitted by the users on considerations of economy, resulting in accidents.

India is a tropical country. Workplaces cannot completely dispense with the need to resort to the use of personal protective equipment, despite the engineering control measures insisted upon. Therefore, the suitability of personal protective equipment emerges as an important aspect. There is no thrust on development of items of personal protective equipment suited to the climatic conditions.

Barriers in communication on safety and health matters exist generally on account of the low literacy level and multiplicity of languages. Attempts are being made to resolve the problem by producing suitable training, educational and informational material and devising effective methods of dissemination. In such an attempt, the enormity of the problem becomes pronounced, in view of the low literacy level and multiplicity of languages.

#### 4.3 PROBLEMS RELATED TO NATIONAL POLICIES AND LEGISLATION

All important sectors of industries which pose serious hazards, such as construction, agriculture, and forestry, are not covered by occupational safety and health legislation. These industries are also substantially labour-intensive. Therefore, legislative measures should cover all sectors.

Most of the legislative measures for occupational safety and health are not applicable to small units, such as small manufacturing units employing less than 10 workers with power or 20 workers without power. There is need for comprehensive coverage of legislative measures.

So far there has been a fragmented approach to the application of safety and health statutes, which has given rise to discrimination, as some categories of workers do not benefit from protective coverage. A coherent and comprehensive policy on safety and health should be evolved through the enactment of a General Enabling Act on Occupational Safety and Health.

#### 4.4 PROBLEMS RELATED TO ADMINISTRATIVE ORGANISATION AND AUTHORITY OF ADMINISTRATION

Legislative measures for occupational safety and health are administered by different Departments of the Central and State Governments. In certain cases, there is overlapping jurisdiction. The multiplicity of agencies and different statutes for occupational safety and health have resulted in problems of co-ordination and uniformity. These problems should be resolved in the light of the size of the country and the federal set-up.

With the growing number of chemical and process industries, the industries posing serious hazards are also increasing. In this context, the application of sophisticated techniques of hazard identification becomes essential, as also identified in the Plan document. A cadre of specialists and consultants in newly-emerging areas of safety and health, such as risk assessment and preparation of safety reports, should be available to enable governmental and private agencies to seek advice from them.

All workplaces would have to be inspected by enforcement agencies dealing with occupational health and safety measures. This is not feasible in respect of all factories and mines. Therefore, it is necessary to develop effective inspection strategies and priorities at the unit level, based on acceptable criteria, such as the hazard potential, good safety management systems, and safety performance.

Considering the size of the country and location of the industries, enforcement agencies are finding it difficult to reach industries located in far-flung areas. In this context, the enforcement agencies should be provided with modern equipment and facilities, such as transport and communication.

## 4.5 OTHERS

Information on occupational health and safety measures is required promptly by users as and when the need arises. A uniform and needs-based information system on safety and health needs to be developed for ready reference and quick use.

## 5. PROSPECTS FOR FUTURE

The policy of the Central and State Governments is to lay increased emphasis on the safety and health of workers. The policy views safety not only in terms of the prevention of industrial injuries, but also control of occupational diseases. It is recognised that measures for safety and health of workers go beyond benefiting workers, by resulting in conservation of the environment and increased production, which has enabled the Governments to take appropriate legislative and administrative measures. This, coupled with the increased awareness of the need for better safety measures consequent to the occurrence of major industrial disasters all over the world in the recent past, should give the necessary impetus for concerted efforts for accident prevention.

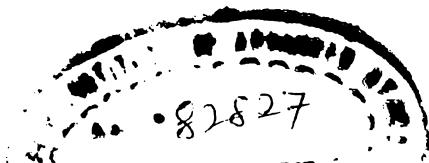
The demands of workers and trade unions for increased safety at the place of work have been growing. Hence, employers have taken measures by not merely meeting the statutory requirements, but also providing more measures to meet their demands.

The Government enforcement agencies have been stepping up efforts to improve the facilities for and capabilities of their officials. Better-trained and better-equipped Inspectors would, in the course of time, bring about the necessary improvements in the conditions of work.

Interest and developments in the field of computers have been helpful in organising information systems for the safety and health of workers.

Co-operation amongst countries in the field of safety and health, under the aegis of ILO, has resulted in the exchange of, information, expertise, training facilities and equipment.

## **ANNEXURES**



## MAIN LAWS ON OCCUPATIONAL SAFETY AND HEALTH

In the absence of a common Act to cover the occupational safety and health aspects which would apply to all sectors of industries, there are a number of legislation on the subject. Of these, some of the legislation on conditions of work cover occupational safety and health aspects, but the remaining legislation concerning hazardous substances and activities deal with safety aspects only. Since the manufacturing industry, namely, factories, account for considerable employment and is one of the oldest sectors of industry, the earliest legislation on occupational safety and health were made applicable to factories. Summaries of the legislation dealing with occupational safety and health are given below:

### (i) THE FACTORIES ACT, 1948

The first Factories Act was enacted in 1881 with limited regulatory purposes, such as regulating the hours of work and employment of children, etc. Some of the landmarks which marked important events were the Acts of 1891, 1911, 1922 and 1934. The Act of 1891 brought under its purview factories employing 50 or more persons, raised the minimum age of children to 9 and further limited the hours of work of women. The Act of 1911, besides effecting further improvements in the provisions relating to hours of work and children, provided for the first time for the appointment of a full-time Inspector for enforcement of the Act. In 1922, the Factories Act was amended to include industrial undertakings using mechanical power and employing 20 or more persons. The Factories Act, 1934, was the forerunner of the present comprehensive legislation. 48 hours of work a week and the grant of ten days' holidays with pay for 12 months approved service were some of its important provisions, besides the other provisions relating to safety and health. The Act underwent several amendments.

Soon after the country attained independence in August 1947, a consolidated new Act, totally revamped, called the Factories Act, 1948, was enacted, which came into force in April 1949. The Act underwent major amendments, in 1954, 1976 and 1987. The amendment in 1954 was intended to strengthen the provisions of safety and health and give effect to some of the ILO Conventions and Recommendations ratified by India. In 1976, the Act was amended in a very significant manner, leading to the compulsory appointment of a Safety Officer who would have to be a qualified safety professional, besides widening the definition of the term 'worker' to cover a large number of workers employed by contractors in factories who had been denied the benefits of the legislation hitherto. The penal provisions of the enactment were strengthened to obtain better compliance with the provisions of the Act. For the first time, the principle of levying a minimum penalty for contravention of the provisions under Chapter IV concerning safety and the provisions under Section 87 concerning dangerous operations was introduced if such contraventions resulted in serious bodily injuries or fatalities. This was a new approach to obtaining effective compliance with the safety and health provisions. The amendment in 1987 had the far-reaching objective of regulating the safe locational aspects of the factory by requiring it to obtain necessary permission from the Government, for which the recommendations of a statutorily-constituted Site Appraisal Committee, as per the provisions of Section 41-A, would be relied upon by the State Government. It is significant to mention that the provisions of the Factories Act, which concerned itself with the safety and health aspects of workers within the premises and precincts of the factory, have now extended their applicability insofar as safe locational aspects are concerned so as not to cause any adverse effects on the neighbouring community, besides covering the aspects of disposal of hazardous substances outside the factory. The amendments also provide for disclosure of information to workers and other categories of personnel, besides enabling workers'

participation in safety management, in consonance with the requirements of the ILO Convention No.155 on Occupational Safety and Health (1981).

As such, the present Factories Act, 1948, as amended in 1987, has 12 Chapters and 140 provisions dealing with matters such as health, safety, special provisions on hazardous process industries, welfare, hours of work, leave with wages and special provisions on dangerous operations.

#### (ii) THE MINES ACT, 1952

The Mines Act, 1952, is one of the important legislation dealing with occupational safety and health. It was first enacted in 1923. The present Act's objectives are to amend and consolidate the laws relating to the regulation of labour and safety in mines. The Act has 10 Chapters and 92 Sections concerning appointment of Inspectors and Certifying Surgeons, constitution of Mining Boards and Committees, mining operations and management of mines, health and safety, hours of work, leave with wages, powers of the Central Government to make Regulations and Rules, etc. Of these Chapters, the provisions relating to health and safety deal mainly with aspects like drinking water, medical appliances, notice of accidents and diseases, etc. When causes of danger not expressly covered exist or when employment of person is dangerous, the Inspector is empowered to issue orders. If the orders are not complied with, he can prohibit employment. This is a comprehensive arrangement dealing with situations not covered by laws. Detailed occupational safety and health measures are covered by the Regulations and the Rules under the Act, which cover machinery safety, safety of the work environment and special measures required for work below ground. The Rules are made separately for coal mines and metalliferous mines. The Regulations cover requirements for rescue of miners, ventilation and lighting in mines and prevention of explosions in mines.

#### (iii) THE DOCK WORKERS (SAFETY, HEALTH AND WELFARE) ACT, 1986

The Indian Dock Labourers Act, 1934, and the Indian Dock Labourers Regulations, 1948, were previously applicable to regulate the safety, health and welfare of workers employed in ports and docks. To cover areas not covered by the Act and Regulations, a comprehensive set of statutory requirements relating to safety, health and welfare for dock workers was formulated as the Dock Workers (Safety, Health and Welfare) Scheme, 1961, under Section 4 of the Dock Workers' Employment Regulation Act, 1948.

With a view to consolidating the Act and giving effect to the ILO Convention No.152 on Occupational Safety and Health (Dock Work) (1979), the new Dock Workers (Safety, Health and Welfare) Act, 1986, was enacted. The Act, under Section 9, provides for the constitution of an Advisory Committee by the appropriate Government for the purpose of advising upon matters arising out of the administration of the Act and Regulations, besides empowering the appropriate Government to make Rules and Regulations under Sections 20 and 21. The Central Government, being one of the appropriate Governments in respect of major ports, has promulgated the Dock Workers (Safety, Health and Welfare) Rules, 1990, detailing the constitution of the Advisory Committee in major ports and covering matters under Section 20. The Dock Workers (Safety, Health and Welfare) Regulations, 1990, cover in detail the safety, health and welfare aspects of dock workers. Part II of the Regulations deals with the responsibilities of various agencies insofar as compliance with the provisions of the Act, Rules and Regulations is concerned. Part III covers safety in workplaces, warehouses and storing places, means of access, docks and hatchways, lifting appliances and gear, transport equipment and operations, handling of cargo, handling of dangerous goods and freight container terminals. Part IV deals with dock workers' health, Part V with welfare and Part VI with special provisions. The special provisions deal with training of dock workers and emergency action plans.

(iv) THE PLANTATIONS LABOUR ACT, 1951

The Plantations Labour Act, 1951, provides for the welfare of labour and regulates the conditions of work in plantations. The Act has 8 Chapters and 57 Sections on aspects such as registration of plantations, inspecting staff, welfare, hours of employment, leave with wages and accidents. The provisions relating to health and accidents deal with occupational safety and health. The provisions relating to drinking water, conservation, medical facilities, notice of accidents and register of accidents are relevant in this connection. By defining the term 'plantation' and providing for their registration, the Act covers one of the important industrial sectors.

(v) THE SHOPS AND ESTABLISHMENTS ACT

The Shops and Establishments Act differs from other enactments in that it is passed in different years by the State Government in the Legislative Assembly and enforced by the State Government. It regulates conditions of work in shops, commercial establishments, restaurants, theatres, etc. through provisions such as appointment of Inspectors and their powers, procedure of applying the Act to shops and establishments, hours of work, holidays and wages, with a separate Chapter on health and safety which has provisions on cleanliness, ventilation, lighting, precautions against fire, etc.

(vi) THE EXPLOSIVES ACT, 1884

The Explosives Act, 1884, one of the most important and oldest enactments of the Central Government, regulates the manufacture, possession, use, sale, transport, import and export of explosives. It has 29 provisions dealing with the definition of explosives, powers of the Central Government to make Rules and prohibit the manufacture, possession and import of specially dangerous explosives, grant of licences, notice of accidents, enquiry into accidents, etc. In order to cover substances which do not come under the definition of explosives, but have the hazards of explosion and can be declared to be explosive by the notification issued under the Act, two separate sets of Rules called the Gas Cylinder Rules, 1981, and Static and Mobile Pressure Vessels (Unfired) Rules, 1981, have been made over and above the Explosive Rules, 1983.

(vii) THE PETROLEUM ACT, 1934

The Petroleum Act, 1934, is intended to consolidate and amend the law relating to the import, transport, storage, production, refining, and blending of petroleum. It has 4 Chapters and 31 provisions. Important aspects of the Act are definition of the term 'petroleum' and provisions for control over import, transport and storage of petroleum requiring the production, refining and blending of petroleum in accordance with the Rules and licensing and storage of petroleum. The Rules under the Act, called the Petroleum Rules, 1976, deal with the safety aspects connected with various activities covered by the objectives outlined in the Act.

(viii) THE INSECTICIDES ACT, 1968

The Insecticides Act, 1968, enacted by the Central Government, deals with hazardous substances. It regulates the import, manufacture, sale, transport, distribution and use of insecticides to protect human beings and animals and related matters. It has 38 provisions on various aspects, i.e. definition of insecticides, setting up of Central Insecticides Board and Central Insecticides Laboratory, licensing the manufacture, sale and use of insecticides, registration of insecticides, prohibition of sale of certain insecticides and powers of Central Government to make Rules. The Schedule to the Act lists the various insecticides covered under the Act. The Insecticides Rules, 1971, deal with safety aspects relating to packing and labelling, storage of insecticides, medical examination, first-aid, protective clothing and precautions to be taken when aerial spraying operations are undertaken.

(ix) THE INDIAN ELECTRICITY ACT, 1910

The Indian Electricity Act, 1910, was enacted by the Central Government with a view to amending the law relating to supply and use of electrical energy. It has 68 Sections covering procedures for the grant of licences for supply of electrical energy, regulation of electrical installations, appointment of Electrical Inspectors, constitution of Central Electricity Board, powers to make Rules, etc. The Central Electricity Board, having members from each State Electricity Board, along with other members, is the apex body to deal with the electrical safety aspects, besides other aspects concerning electrical energy. The Indian Electricity Rules, 1956, elaborate the safety aspects relating to electrical installations, like specifications for quality, construction and layout of installations, protective devices, clearances to be adopted, etc.

(x) INDIAN BOILERS ACT, 1923

The Indian Boilers Act, 1923, was enacted by the Central Government to consolidate and amend the law relating to steam boilers. It has 41 Sections and cover important aspects like definition of a boiler and its components, limitations of application of the provisions of the Act (marine and locomotive boilers and boilers belonging to the Armed Forces excluded), appointment of inspectors, registration of boilers, examination and certification of boilers, constitution of Central Boiler Board and powers of Central and State Governments to make Rules. The Indian Boiler Regulations cover, in detail, safety aspects relating to construction, registration and certification of boilers, method of determining the maximum pressure at which a boiler may be used, etc.

(xi) THE DANGEROUS MACHINES (REGULATION) ACT, 1983

The Dangerous Machines (Regulation) Act, 1983, is a Central Government enactment to provide for the regulation of trade and commerce and the production, supply, distribution and use of the products of any industry producing dangerous machines with a view to securing the welfare of labour operating such machines and payment of compensation for death or bodily injuries suffered by labourers while operating such machines, and for related matters. It has 8 Chapters and 38 Sections. Important features of the Act are the definition of terms like 'dangerous machine', 'manufacturer', 'operator', etc. to give adequate coverage and meet the objectives of the Act, appointment of Controller and his functions, appointment of Inspectors and licensing of manufacturers and dealers. Special features of the Act are: requiring dangerous machines to conform to standards, specifying the responsibilities of users in registering the machines and taking other precautions and requiring the employer of the operator to take out an insurance policy for payment of annuity to the operator or, in case of death, to members of his family or nominee.

(xii) THE ENVIRONMENT (PROTECTION) ACT, 1986

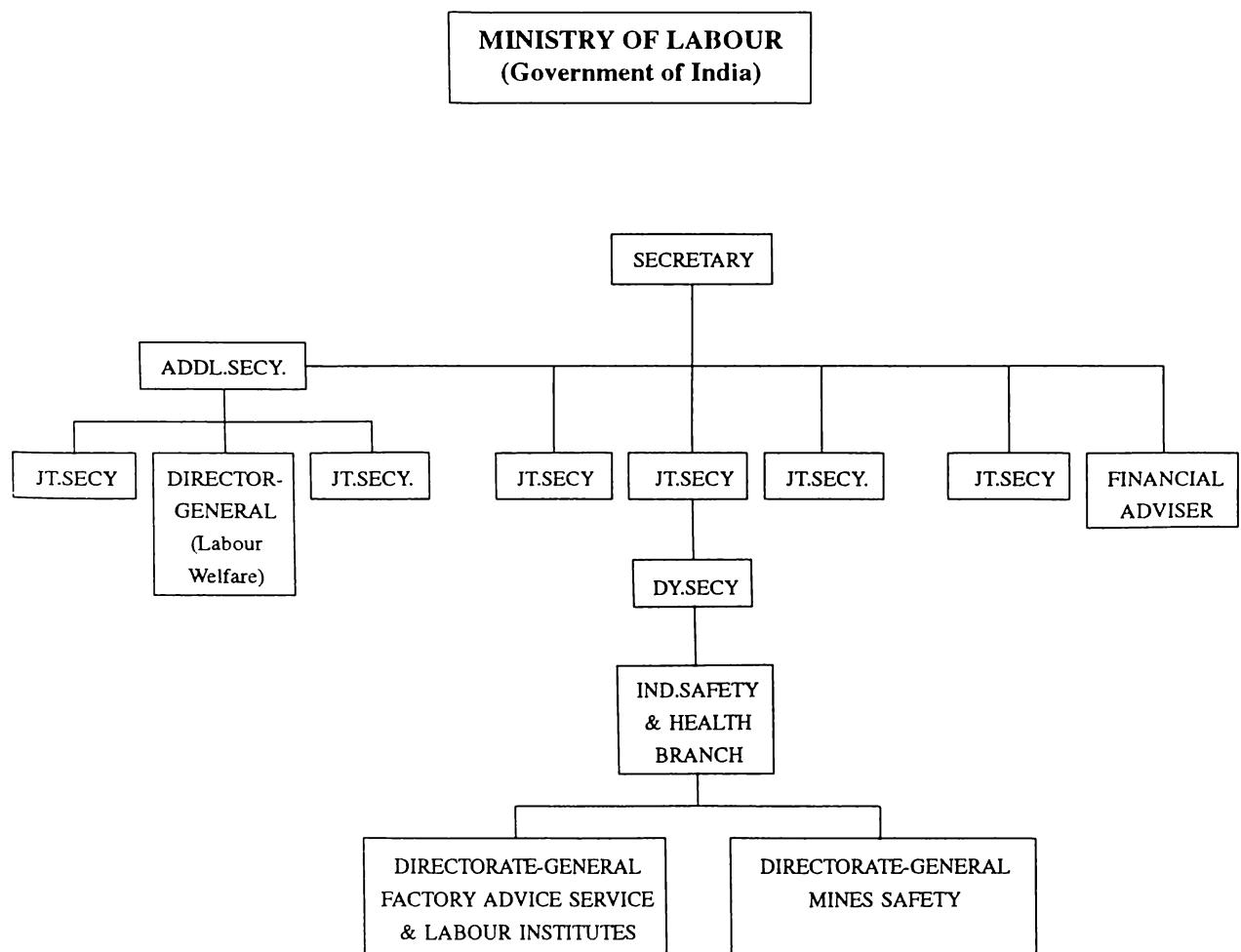
The Environment (Protection) Act, 1986, was passed by the Central Government to provide for the protection and improvement of the environment. It has 4 Chapters and 26 Sections. Under the powers vested in Sections 6, 8, and 25, the Central Government has framed the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989. The Rules apply to 'industrial activity', as defined, which includes 'isolated storages'. The safeguards cover a wide range of aspects, such as notification of sites, preparation of safety reports, preparation of on-site and off-site emergency plans and disclosure of information. The Schedules to the Rules list the hazardous chemicals, their limiting quantities and extent to which the requirements of Rules would apply to them, and the statutory authorities responsible for enforcing the provisions of the Rules, as enforcement would be carried out utilising the available enforcement agencies connected with occupational safety and health.

(xiii) THE INDIAN ATOMIC ENERGY ACT, 1962

The Indian Atomic Energy Act, 1962, was enacted by the Central Government to provide for the development, control and use of atomic energy for the welfare of the people and other peaceful purposes. The provisions under Section 23 of the Indian Atomic Energy Act, 1962, specify that nuclear installations under the purview of the Factories Act, 1948, would be enforced directly by the Central Government, instead of the State Government. Accordingly, the Atomic Energy Regulatory Board of the Central Government is responsible for countrywide safety and health measures in respect of use of nuclear energy.

## ORGANISATION CHARTS

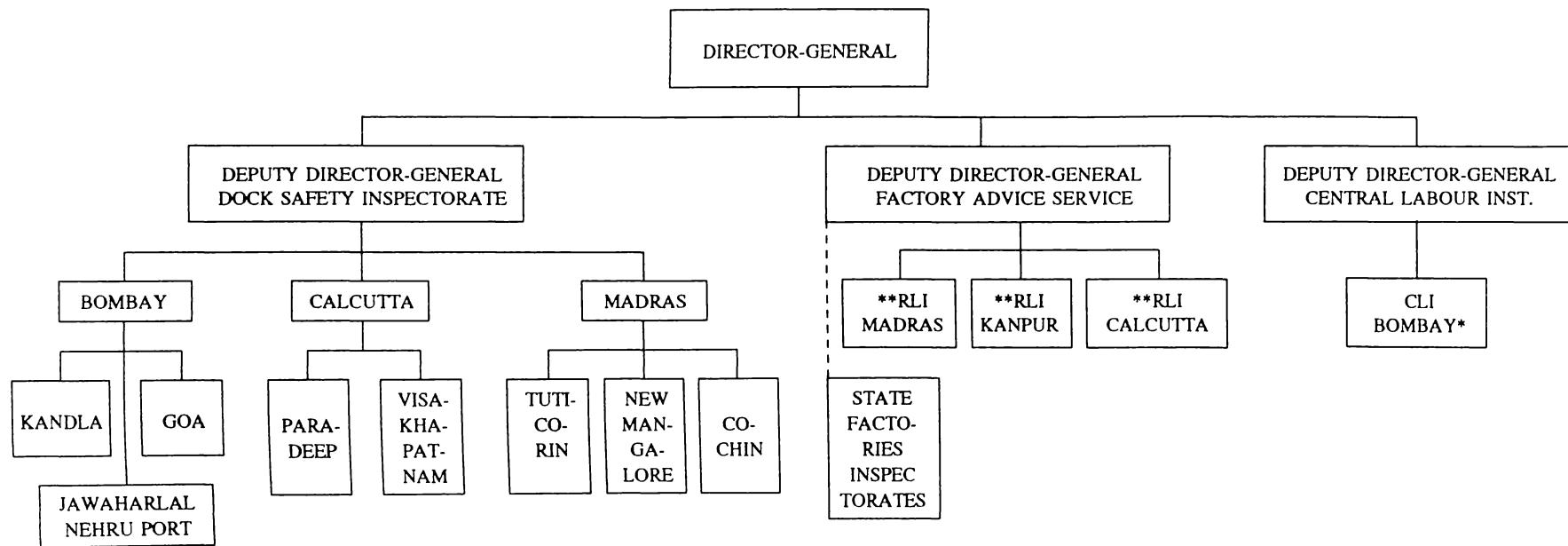
Chart 1: Organisation Chart of Ministry of Labour



**Chart 2: Organisation Chart of Directorate-General Factory Advice Service and Labour Institutes**

**DIRECTORATE-GENERAL FACTORY ADVICE SERVICE & LABOUR INSTITUTES, BOMBAY**

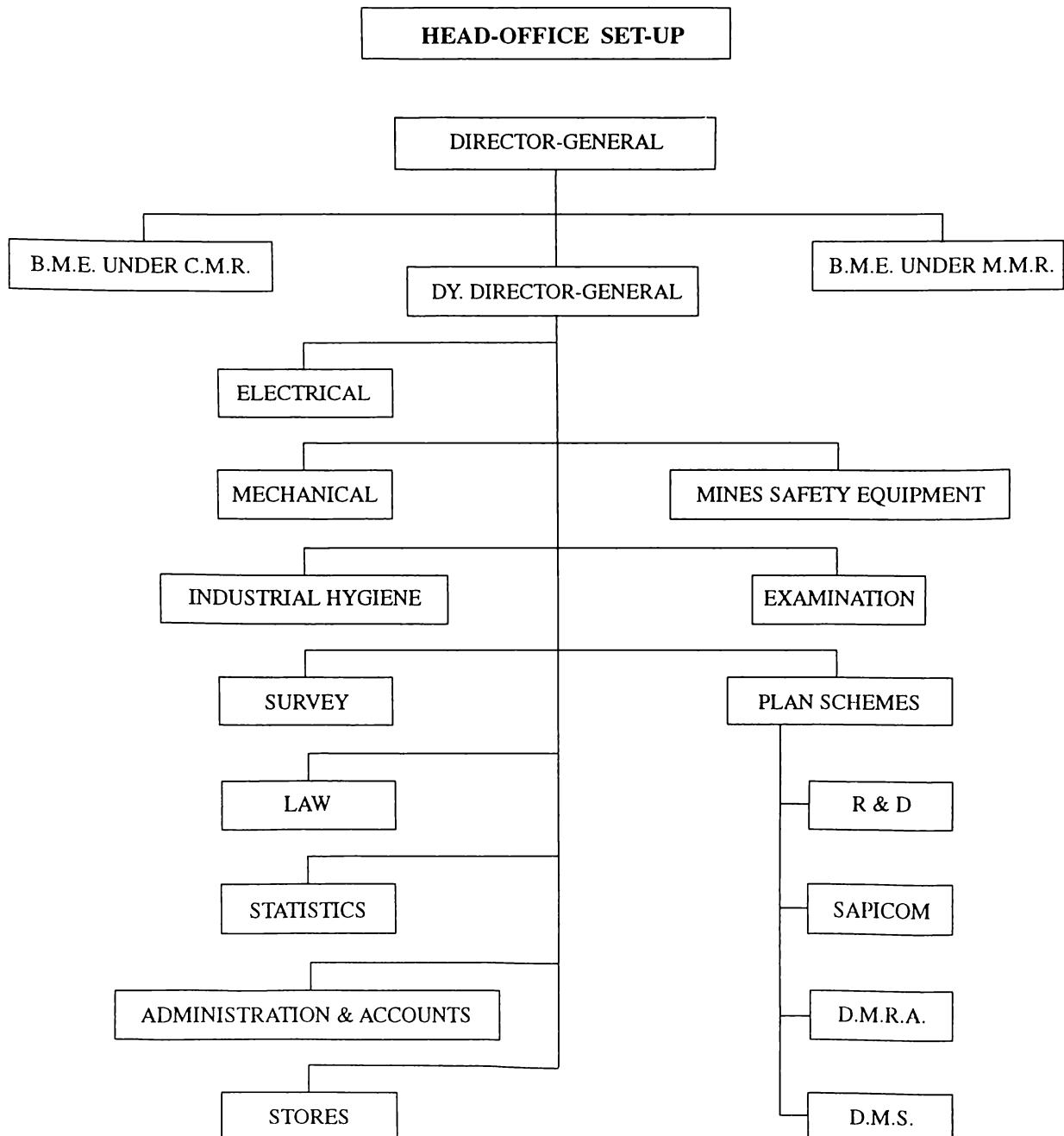
(Government of India, Ministry of Labour)



\* Multi disciplinary set-up having disciplines such as Industrial Safety, Industrial Hygiene, Industrial Medicine, Industrial Physiology, Industrial Psychology, Management Information Service, Ergonomics Laboratory etc.

\*\* Part of the multi disciplinary set-up having disciplines such as Industrial Safety, Industrial Hygiene, Industrial Medicine.

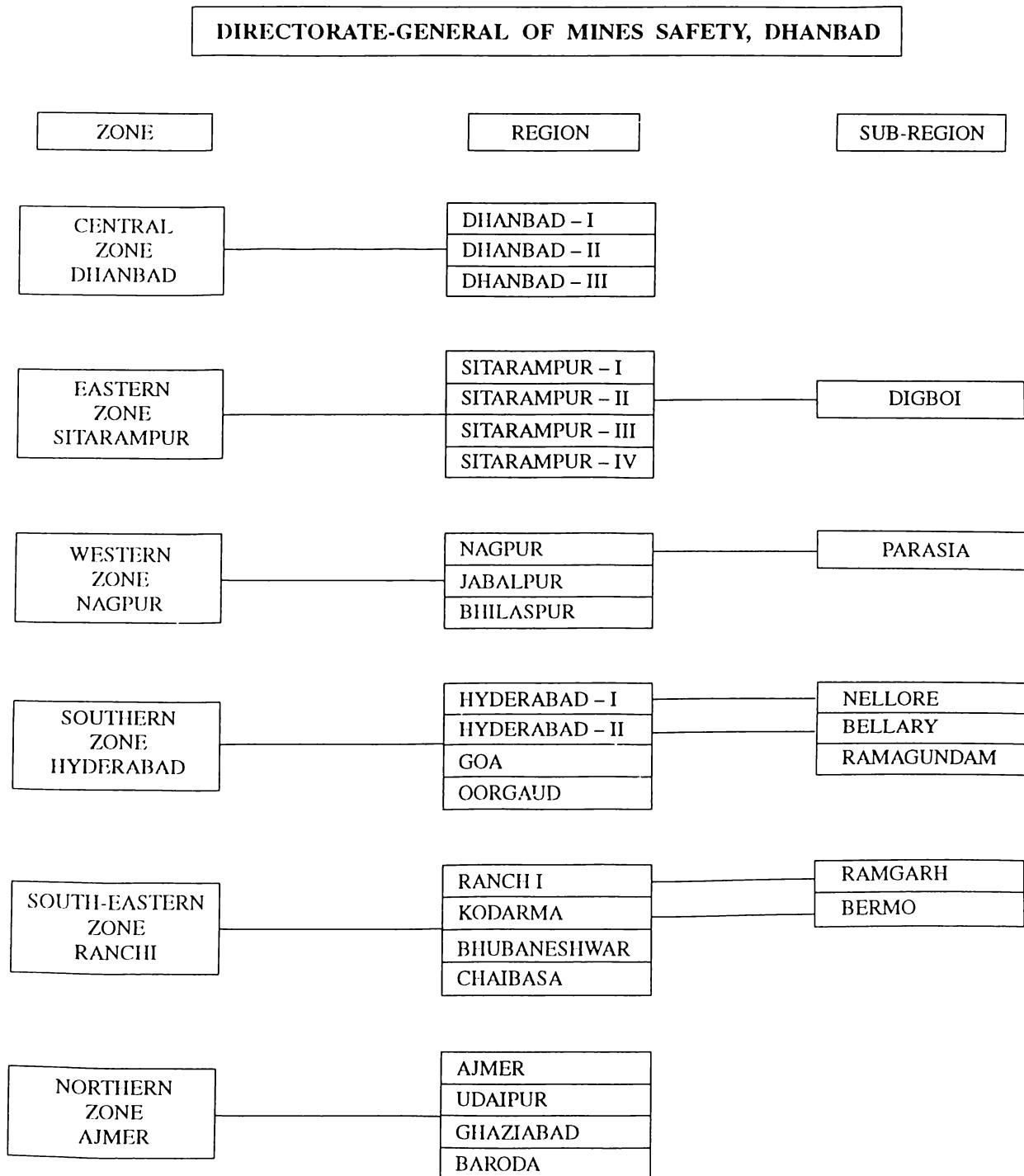
**Chart 3: Organisation Chart of Directorate-General of Mines Safety**



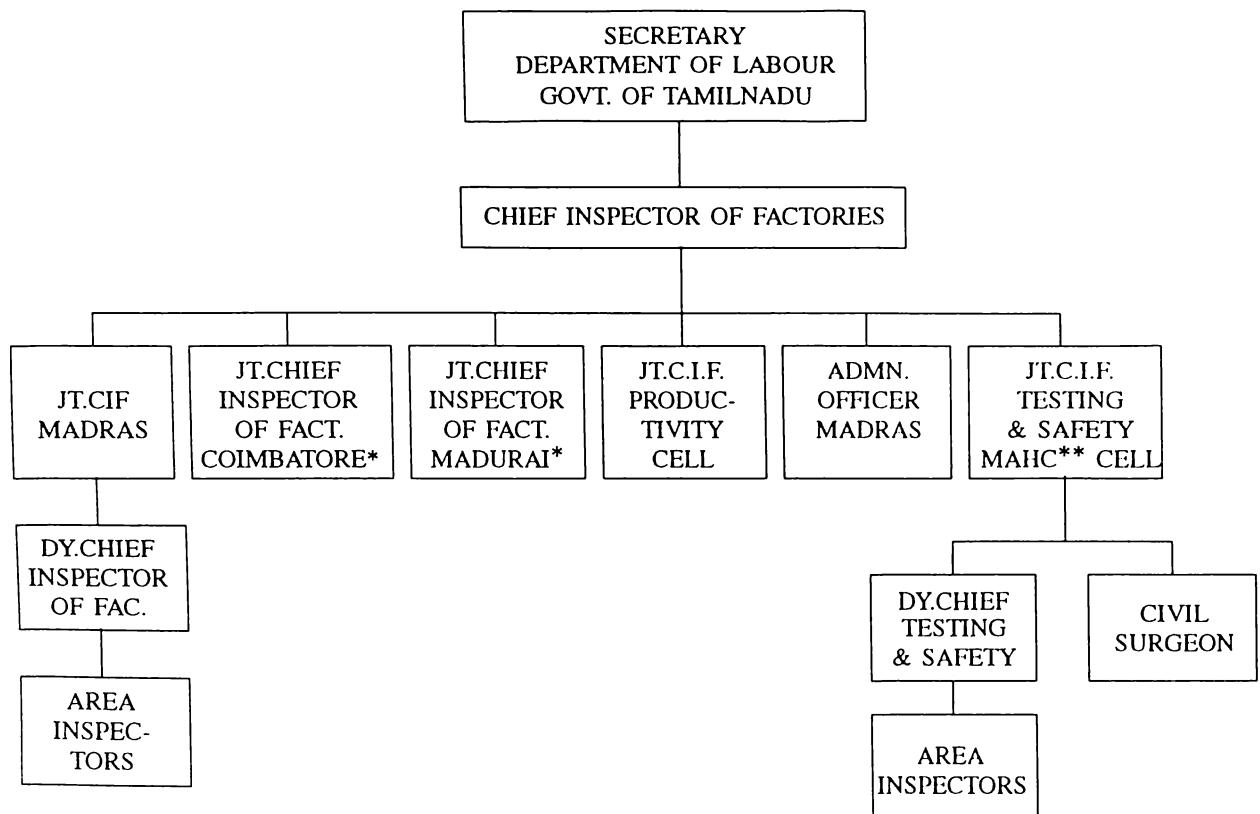
**Abbreviations:**

- D.G.M.S. – Directorate-General of Mines Safety
- B.M.E. – Board of Mining Examinations
- C.M.R. – Coal Mining Regulations
- M.M.R. – Metalliferous Mines Regulations
- R&D – Research and Development
- SAPICOM – Survey of Accident Prone Mines & Identification of Corrective Measures
- D.M.R.A. – Development of Mine Rescue Apparatus
- D.M.S. – Development of Mines Statistics

**Chart 4: Organisation Chart of Directorate-General of Mines Safety, DHANBAD**

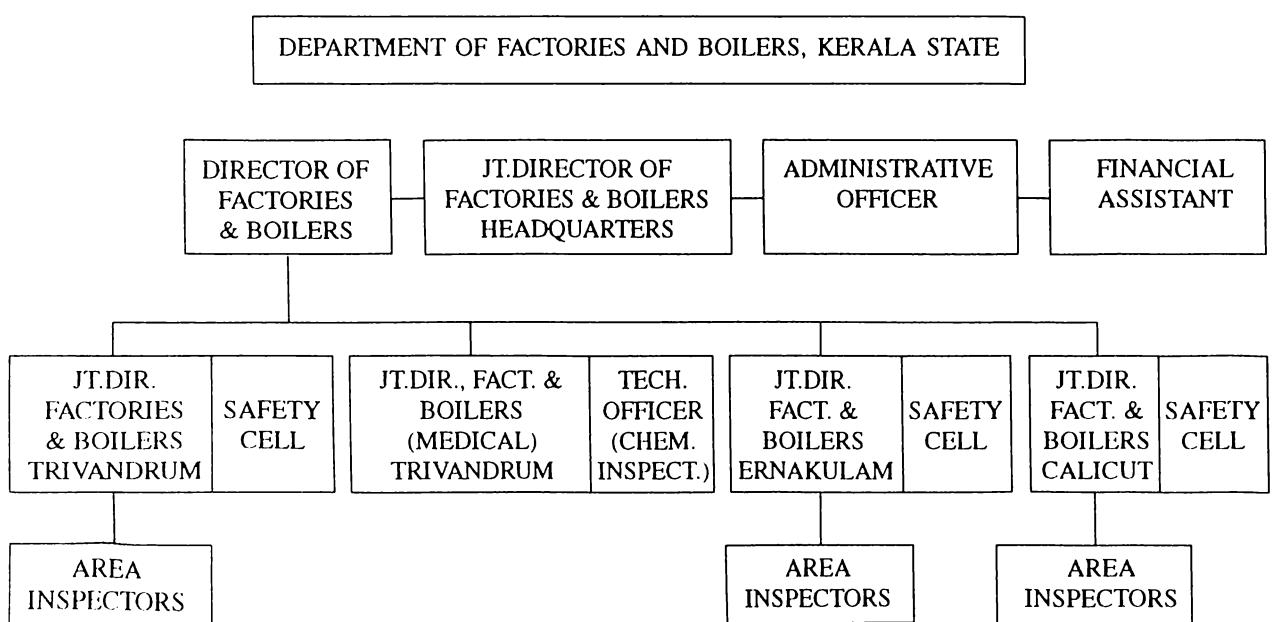


**Chart 5: Organisation Chart of Department of Labour, Government of Tamilnadu**

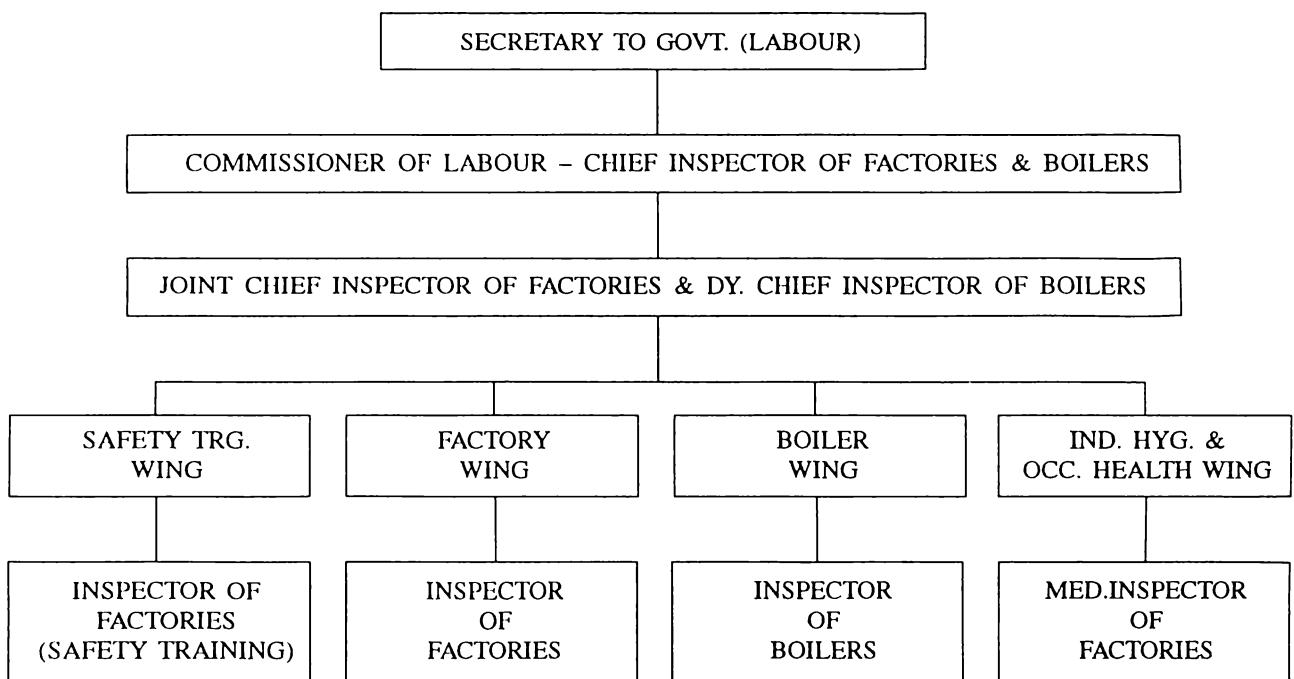


\* Similar set-up as for Jt.CIF, Madras, is functioning in respect of the Jt.C.I.F., Coimbatore & Madurai  
 \*\* MAHC = Major Accident Hazard Control

**Chart 6: Organisation Chart of Department of Factories and Boilers, Kerala State**



**Chart 7: Organisation Chart of Commissioner of Labour, Pondicherry**



## STATISTICS ON INDUSTRIAL INJURIES

**TABLE 1: STATISTICS OF EMPLOYMENT AND INDUSTRIAL INJURIES  
IN FACTORIES, 1976-89**

Year	No. of working factories	Estimated average daily employment (in thousands)	Industrial injuries		Frequency rate of injuries per lakh man-days worked		Rate of injuries per 1,000 workers employed in factories submitting returns	
			Fatal	Total	Fatal	Total	Fatal	Total
1	2	3	4	5	6	7	8	9
1976	113,216	6,127	831	300,319	0.06	21.50	0.17	61.54
1977	119,715	6,311	705	303,757	0.05	22.50	0.13	63.96
1978	126,229	6,540	792	332,195	0.05	24.01	0.15	63.62
1979	135,331	6,802	830	318,268	0.06	21.71	0.16	62.19
1980	141,789	7,000	774	333,883	0.05	22.02	0.15	65.59
1981	154,370	7,379	762	355,535	0.06	25.30	0.15	71.75
1982	157,711	7,388	549	296,027	0.04	22.02	0.13	69.10
1983	162,587	7,476	456	213,160	0.04	19.58	0.13	55.63
1984	167,541	7,603	824+	302,726+	0.04	12.87	0.10	36.72
1985(P)	176,303	7,711	807+	279,126+	0.05	18.44	0.15	53.16
1986(P)*	178,749	7,795	924+	276,416+	0.05	16.48	0.14	49.31
1987(P)*	183,586	7,835	895+	236,596+	0.05	14.25	0.14	41.54
1988(P)*	NA	NA	696+	123,780	NA	NA	NA	NA
1989(P)*	NA	NA	649+	160,363+	NA	NA	NA	NA

Note: (i) NA = Not Available (ii) (P) = Provisional (iii) \* = Incomplete Information  
 (iv) + 1985, 1986, 1987, 1988 & 1989 = Compiled by the Directorate-General Factory Advice Service and Labour Institutes from the data received

Source: 1976 to 1987 = Labour Bureau, Shimla, from the Chief Inspectors of Factories.

**TABLE 2: ACCIDENTS AND THEIR INCIDENCE RATE PER THOUSAND WORKERS EMPLOYED, BY IMPORTANT INDUSTRIES, 1985-87**

S1. no.	Industry	1985		1986		1987*	
		Total no. of injuries	Rate per 1,000 workers	Total no. of injuries	Rate per 1,000 workers	Total no. of injuries	Rate per 1,000 workers
1	2	3	4	5	6	7	8
1.	Manufacture of food products	4,611 (72)	8.92 (0.13)	NA	NA	NA	NA
2.	All textiles	147,677 (84)	123.75 (0.07)	107,265 (64)	133.17 (0.09)	84,656 (46)	112.62 (11.58)
3.	Manufacture of paper and paper products and printing, publishing and allied products	4,915 (43)	30.56 (0.24)	4,000 (186)	30.81 (0.11)	2,802 (16)	24.15 (0.13)
4.	Manufacture of chemicals and chemical products (except products of petroleum and coal)	10,714 (80)	28.31 (0.22)	5,846 (57)	22.63 (0.24)	4,252 (41)	18.69 (0.17)
5.	Manufacture of non-metallic mineral products	8,830 (73)	34.42 (0.26)	5,455 (29)	24.31 (0.14)	4,390 (40)	18.08 (0.16)
6.	Basic metal and alloy industries	14,251 (110)	36.94 (0.29)	10,022 (96)	30.29 (0.30)	9,289 (98)	32.97 (0.32)
7.	Manufacture of metal products and parts, except machinery and transport equipment	7,574 (23)	48.20 (0.14)	6,585 (15)	60.35 (0.13)	6,261 (22)	60.95 (0.15)
8.	Manufacture of machinery, machine tools and parts, except electrical machinery	12,067 (33)	37.27 (0.10)	8,654 (26)	38.80	7,655	34.72
9.	Manufacture of electrical machinery, apparatus, appliances and parts	5,173 (13)	26.42 (0.06)	3,022 (5)	20.28 (0.04)	2,672 (10)	15.67 (0.06)
10.	Manufacture of transport equipment and parts	16,887 (29)	53.72 (0.10)	12,269 (30)	45.04 (0.12)	13,044 (13)	62.63 (0.06)
11.	Repairs	9,715 (19)	53.85 (0.11)	NA	NA	NA	NA
Total for all industries		254,567	53.16	181,223	49.31	151,808	41.54

Note: (i) \* = Incomplete Information. (ii) NA = Not Available  
 (iii) Figures in brackets indicate fatalities and are included in the total.

Source: Labour Bureau, Shimla

**TABLE 3: FATAL AND SERIOUS ACCIDENTS,  
IN COAL MINES, 1983-87**

Sl. no.	Year	Fatal accidents	Persons killed	Serious accidents	Persons injured	Per 1,000 persons employed		Per 100,000 man-shifts worked		Per 1,000,000 tonne output (coal)	
						D.R.	S.I.R.	D.R.	S.I.R.	D.R.	S.I.R.
1.	1983	156	191	1,169	1,188	0.36	2.26	0.12	0.80	1.35	8.64
2.	1984	160	176	1,196	1,201	0.32	2.24	0.10	0.71	1.14	8.13
3.	1985	176	204	1,007	1,029	0.36	1.92	0.12	0.63	1.29	6.75
4.	1986	180	214	1,167	1,180	0.39	2.20	0.13	0.71	1.25	7.02
5.	1987	162	176	910	922	0.32	1.72	0.10	0.56	0.93	5.04

Note: D.R. = Death Rate  
S.I.R. = Serious Injury Rate

**TABLE 4: FATAL AND SERIOUS ACCIDENTS,  
BY CAUSE, IN COAL MINES, 1983-87**

Sl. no.	Cause	1983		1984		1985		1986		1987	
		F.A.	S.A.								
1.	Ground movement	57	164	75	164	78	155	70	180	72	136
2.	Winding in shaft	2	4	5	7	4	3	5	4	2	5
3.	Transportation machinery (other than winding)	47	297	48	294	54	273	55	267	54	257
4.	Machinery other than transportation machinery	10	33	5	48	7	23	12	29	3	27
5.	Explosives	14	8	4	9	5	10	7	9	7	12
6.	Electricity	4	5	7	3	4	1	6	2	4	4
7.	Gas/dust, etc.	—	—	2	—	2	—	2	—	2	—
8.	Fall other than fall of ground	19	508	9	518	16	420	17	540	15	328
9.	Other causes	3	150	5	153	6	122	6	136	3	141

Note: F.A. = Fatal Accidents  
S.A. = Serious Accidents

**TABLE 5: FATAL AND SERIOUS ACCIDENTS  
IN NON-COAL MINES, 1983-87**

Sl. no.	Year	Fatal accidents	Persons killed	Serious accidents	Persons seriously injured	Below ground		Open- cast		Above ground		Overall	
						-----		-----		-----		-----	
						D.R./ 1,000	S.I.R./ 1,000	D.R./ 1,000	S.I.R./ 1,000	D.R./ 1,000	S.I.R./ 1,000	D.R./ 1,000	S.I.R./ 1,000
1.	1983	64	75	453	456	0.52	7.67	0.40	0.70	0.08	1.99	0.31	1.96
2.	1984	62	75	436	438	0.59	8.01	0.30	0.56	0.22	2.03	0.31	1.93
3.	1985	67	69	418	431	0.66	6.48	0.21	0.69	0.29	2.06	0.29	1.80
4.	1986	70	86	391	397	0.93	6.24	0.31	0.50	0.24	2.07	0.35	1.66
5.	1987	68	74	402	404	0.54	5.88	0.28	0.55	0.24	2.08	0.29	1.64

Note: D.R. = Death Rate  
S.I.R. = Serious Injury Rate

**TABLE 6: FATAL AND SERIOUS ACCIDENTS, BY CAUSE,  
IN NON-COAL MINES, 1983-87**

Sl. no.	Cause	Fatal accidents					Serious accidents				
		1983	1984	1985	1986	1987	1983	1984	1985	1986	1987
1.	Ground movement	24	13	16	16	22	15	22	16	14	11
2.	Transportation machinery (winding in shaft)	1	-	-	3	2	3	1	2	3	3
3.	Transportation machinery (other than winding in shaft)	13	15	17	18	15	61	64	51	55	35
4.	Machinery other than transportation machinery	3	3	7	4	9	36	79	59	45	40
5.	Explosives	9	7	5	4	4	2	1	5	4	1
6.	Electricity	-	-	-	-	-	-	1	1	-	-
7.	Dust, gas and other combustible material	-	2	1	1	-	3	-	-	-	-
8.	Fall other than fall of ground	13	21	18	21	14	207	178	194	172	207
9.	Other causes	1	1	3	3	2	126	90	90	98	105
Total		64	62	67	70	68	453	436	418	391	402

**TABLE 7: ACCIDENTS IN PORTS AND DOCKS, 1986-89**

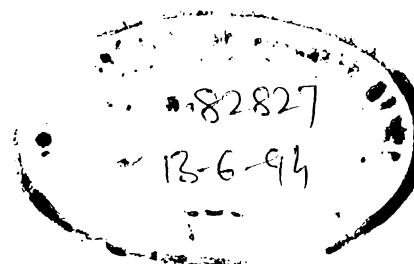
Sl. no.	Year	Reported accidents		Frequency rate of accidents		Average rate of accidents per million tons of cargo handled	
		Fatal	Non-fatal	On board	On shore	On board	On shore
1.	1986	13	1009	21.59	NA	16.80	14.86
2.	1987	15	949	22.57	13.31	14.50	11.60
3.	1988	23	908	23.85	12.28	11.69	16.80
4.	1989	18	963	22.10	29.68	13.39	17.91

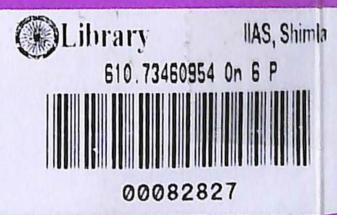
Note: NA = Not Available

**TABLE 8: REPORTED ACCIDENTS IN PORTS AND DOCKS, BY CAUSE, 1986-89**

Cause	Accidents			
	1986	1987	1988	1989
A. Lifting machinery and gear	10	11(2)	22(1)	18(2)
B. Transport	52(5)	25(2)	31(5)	23(2)
C. Struck by falling body	193(2)	150(5)	144(3)	163(2)
D. Person falling	106(3)	88(1)	109(5)	130(2)
E. Handling of cargo	410(1)	481(1)	411(6)	387(4)
F. Stepping on or striking against object	87	104(1)	118	91
G. Handling of article other than cargo	46	22	34	58
H. Harmful contact	6	6	8	8(2)
I. Failure of staging	4	9	5	12
J. Struck by suspended object	62(1)	43(1)	15(1)	52(4)
K. Miscellaneous	46(1)	25(2)	34(2)	39
<b>Total</b>	<b>1,022(13)</b>	<b>964(15)</b>	<b>931(23)</b>	<b>981(18)</b>

Note: Figures in bracket indicate fatalities and are included in the main figures





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