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M. A. Geography II semester  
C C: 06  
Environment and Disaster Management  
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## **Industrial Accidents in India**

Industrial accidents take place due to some negligence on the part of employer, some carelessness on the part of employees and some natural disasters.

### **Industrial Accidents – Nature of Accidents**

The nature of accidents may vary from industry to industry and from acts of employee concern.

**As per the Workmen's Compensation Act, 1923 the nature of accidents falls under two categories:**

#### **1. Partial Disablement:**

As per section 2 (1) (g) of the Act, partial disablement only reduces the earning capacity of a workman. It may be temporary or permanent in nature.

A temporary partial disablement only temporarily reduces the earning capacity of workman in an employment in which he is engaged at the time of the accident causing the disablement.

A permanent partial disablement permanently reduces the earning capacity of workman in every employment in which he was capable of undertaking at the time of the accident causing the disablement. He is entitled compensation only to extent to which his ability to earn is reduced. Every injury specified in part II of Schedule I of the Act shall be deemed to result in permanent partial disablement.

#### **2. Total Disablement:**

As per Section 2 (L) of the Act, total disablement must be of such a character that the person concerned is unable to do any work and not merely the work which he was performing at the time of the accident. A total disablement may be temporary or permanent in nature.

#### **A permanent total disablement shall be deemed to result from:**

(i) The permanent total loss of the sight or both eyes; or

(ii) from any injury specified in part I of Schedule I or from any combination of injuries specified in part II thereof where the aggregate percentage of the loss of earning capacity as specified in the said part II against those injuries, amounts to one Hundred percent or more.

In this circumstances, the employee is entitled to full compensation as specified in the Act.

1. Unexpected Event – Accidents occur unexpectedly and suddenly without any prior warning. So accidents are unexpected occurrence.

2. Injury – Accident causes injury to a person and damage to the machinery or property. So some loss of men or property is necessary in case of the accident.

3. Work conditions – The accidents occur due to the unsafe or bad working conditions.

### **Industrial Accidents – Classification of Major Industrial Accidents (External and Internal)**

Industrial accidents can be classified into two broad categories—external accidents that affect the environment around the factory and internal accidents that affect the people within the factory or work-site.

External industrial accidents can take the form of fires', chemical spills, discharge of toxic gases, and radiation. These types of accidents can be huge disasters. The causes of these industrial accidents include organizational errors, human factors, component failures, deviation from normal operational conditions, software defects; outside interference, and natural forces.

Internal industrial accidents can involve machines dealing with transmission, metalworking, woodworking, agriculture, construction, textile machines, tyre-making, food-making, printing, lifting equipment, etc. as well as pressure vessels, furnaces, refrigerators, hand tools, etc.

As per the International Labour Organization (ILO), a data bank on industrial accidents recorded 124 fatal accidents involving hazardous substances in the Asian region. Since more than 65 per cent of them took place in only two countries and none in seven, it appears that many more occurred but went unrecorded.

Early action should be taken by governments and employers' and workers' organizations to stem the rising number of accidents. In India, the Ministries of Labour and Environment are carrying out an extensive programme on major hazard control, and legislation for this purpose has been introduced.

Malaysia has set up a unit for major hazard control within the Ministry of Human Resources. Indonesia and Thailand have taken steps to review the safety situation and identify major hazard installations. However, efforts have been scattered and unsystematic in most countries. Where a major hazard control system has been initiated, it needs to be improved, expanded, and completed.

Major risks are recognized, but preventive laws are generally inadequate to cope with hazards and emergencies. The enforcement efforts of the governmental agencies concerned with the protection of workers, the public, and the environment are not properly co-ordinated.

Employers, workers, and the public are not fully aware of the damage that hazardous substances can cause. As a result, when a serious accident occurs, those involved are overwhelmed by its immediate effects, unable to grasp the full dimensions of its consequences.

After the victims have been attended to and the incident brought under control, an assessment has to be made as to how to deal with the consequences of the accident and carry on with the tasks of repairing the damage, restarting the plant, and preventing a recurrence.

Major accidents may be caused by human failures or errors, technical faults, or external forces. Of these, the predominant cause is human failure on the part of not only the operators but also maintenance personnel, supervisors, and plant and equipment designers and suppliers.

Technical failures usually arise from human errors such as poor maintenance, overloading, and improper use of equipment. Therefore, attention should be directed more towards preventing human errors and failures at all levels.

Often, one event or condition can lead to a number of faults or failures, called common cause failures. A poorly trained and instructed operator is likely to take wrong action. If a company does not have a well-organized training programme, it is probably because its management does

not consider safety a priority and does not devote adequate time and money to it. Both operator training and instruction as well as technical safety and maintenance of the installation tend to be neglected.

The most dangerous common cause failures are of organizational nature: poor commitment of the management to safety; lack of communication among departments, and inadequate instruction and information to workers. The higher a common cause failure is located in the management hierarchy, the more harm it can lead to.

The management should be fully committed to plant safety and its commitment should be made known to all personnel.

### **Immediate Consequences:**

The immediate consequences of a major accident may be large-scale death or injury, heavy damage to installations and buildings, and pollution and damage to the environment. While workers and installations are directly affected, serious accidents can also endanger the nearby population and environment.

### **Long-Term Consequences:**

A serious accident has long-term effects at three levels: the enterprise, the people living in the vicinity, and the environment.

#### **The enterprise is affected by:**

- i. Adverse public reaction.
- ii. Unfavourable publicity in the press and other media.
- iii. Extensive repair or replacement, loss of production, interruption of supply to customers, and break in relations with them.
- iv. Investigations by the judiciary, possibly generating further unfavourable publicity.
- v. Lawsuits resulting in severe punishment of the guilty.
- vi. Indemnification of the victims and their relatives.
- vii. Additional safety measures required by competent authorities.
- viii. Increased insurance rates, expenses for recruitment and training of new personnel.

As a result, the plant may have to be shut down for a long time, perhaps even permanently.

People living in the vicinity of the accident may become permanently disabled or emotionally disturbed. Some chemical substances can cause illnesses that manifest themselves long after actual exposure. Besides damage to property near the plant site, the property value itself may decline as people may not want to live near a potentially unsafe area.

Hazardous substances released in the accident may be detrimental to the environment, animals, and vegetation- crops may be ruined, water supply polluted, and land may not be suitable for grazing or cultivation for a long time.

## **Industrial Accidents – Accident Prone Workers (With Causes)**

There are some people who are accident prone. It means that, however hard they try to avoid them; these people may be more often involved in accident than others. A German Psychologist MARBE at the beginning of this century put forward the hypothesis of accident proneness for the first time. Since then it has attracted a lot of attention of psychologists all over the world. This concept of accident proneness is now being replaced by the concept of accident repeater.

#### **Causes of Accident Proneness:**

1. Degree of Supervision
2. Personality of a person
3. Recklessness, hostility, and indifference
4. Emotional Instability
5. Visual Ability
6. Family Background
7. Muscular weakness
8. Age of a person.

#### **Applicability of Accident Proneness:**

**Although the accident proneness hypothesis has been verified by many studies, but some researchers doubt on their applicability:**

1. An industrial psychologist MAIER says that to think of accident proneness as a single set of bio-psychological traits is going rather too far because if the factors which contribute to accidents are excluded like frustrations, age, fatigue, it is doubtful if such a set of traits only will cause accidents
  2. The different other researchers have found methodological flaws in the studies that have supported the accident proneness hypothesis.
  3. Blum and Naylor argue that there is often a careless reporting of accident data as well as wrong application of probability statistics. According to them 60 to 80% of accidents are attributable to chance and remaining 20 to 40% to the situational factors and personal characteristics of individuals.
- These are the reasons why many researchers have generally tended to de-emphasize the concept of accident proneness.

#### **Industrial Accidents – Causes**

Industrial accidents take place due to some negligence on the part of employer, some carelessness on the part of employees and some natural disasters.

**According to D Hoffmann and A Stetzer, the following cause industrial accidents:**

- (a) Improperly guarded equipment.
- (b) Defective equipment, machines
- (c) Unsafe Storage: Congestion over loading
- (d) Improper illumination in the workshop
- (e) Fall on stairs, ladders, walkways

- (f) Congested workplace
- (g) Unsafe work acts such as throwing materials.
- (h) Unsafe procedures in loading, placing or mixing or by lifting improperly.
- (i) People with impaired vision; under the influence of drugs or alcohol, and who exhibit negative behaviour.

### **Industrial Accidents – Losses Due to Industrial Accidents (Direct and Indirect Costs)**

Accidents are enormously costly, cause loss directly or indirectly and the losses are both visible and invisible. The latter are immeasurable and cannot be valued in monetary terms.

**The various losses which a management suffers because of the time lost due to accidents are:**

- (i) Direct Costs, viz., the wages of employees; compensation and the cost of medical aid; the cost incurred on training a new worker; loss due to waste of raw materials; and loss of production and quality arising out of the inexperience and lack of skill of the new employee.
- (ii) Indirect costs, which include the following-
  - (a) The cost which the government has to incur because it has to maintain a larger number of factory inspectors to check accidents; because it has to spend more on the employee's health insurance and other social security benefits; and because the cost of all these is recovered by imposing higher taxes on the people;
  - (b) The cost to the employee of the time he has been without work because of his accident;
  - (c) The cost of the lost time because other employees stop work out of curiosity, out of sympathy with the injured employee, or because they have to assist the injured worker;
  - (d) The cost of time lost by a foreman, a supervisor or other executive while assisting the injured employee, investigating the cause of the accident, arranging for his replacement, selecting and training a new employee, preparing the accident reports, and attending hearings conducted by government or other officials;
  - (e) The cost incurred on the machine or tools that might have been damaged, and or the cost of the spoilage of material when the accident occurred;
  - (f) The loss of profit on the production which the injured employee\* would have been responsible for, including the loss incurred because the machine on which he was working was idle;
  - (g) The cost incurred on account of the wages paid to an employee during the period in which he was idle following his injury and even after his return to work, when his production would be worth much less than it was before he sustained the injury;
  - (h) The loss following the excitement among, or the weakened morale of, the other employees following the occurrence of the accident and the consequent lower productivity throughout the plant; and
  - (i) Overhead costs – the expense incurred on light, heat, rent and such other items, which continue to be used while the injured employee is a non-producer.

It is obvious, then, that an accident causes a lot suffering and loss to the employees, the employer, the government, and even to society. It is particularly hard on the employee's family,

especially when he is the only bread-winner. Every accident lowers the morale of his fellow-workers.

They become pessimistic and increasingly aware of the hazardous nature of their work, as a result they do not, or cannot put their best efforts to achieve optimum production. Accidents, therefore, increase the over-all cost of production, and adversely affect productivity and morale.

### **Industrial Accidents – Systems for Controlling of Major Accidents Hazards in India**

The worst industrial accident ever, involving the catastrophic release of extremely toxic methyl isocyanate from a pesticide-manufacturing factory, occurred in Bhopal, India, on 3 December 1984, killing more than 2,500 people and affecting the health of several thousand people. The incident drew much attention to the problem of major hazards associated with the operation of certain chemical plants.

In India, a strong need was felt to prevent the recurrence of such accidents by strengthening the country's occupational safety and health system. The Government initiated work to assess the existing safety measures in the chemical industry and to suggest remedial measures. The prevention and control of major accident hazards became a pressing issue.

At the request of the Government of India, the ILO sent a mission to India in April 1985 to identify and advise the government on the early priorities for establishing a system for controlling major accident hazards in the country. The mission, consisting of two experts, carried out a rapid survey of some representative chemical factories in different parts of India, assessed the prevailing situation in the chemical industry, and prepared a report.

#### **The mission made the following recommendations:**

- i. A list of hazardous chemicals and flammable gases should be established, each having a specific quantity such that any factory handling any substance above the stated quantity should be a major hazard work black by definition.
- ii. An inventory of major hazard works should be obtained for each state.
- iii. The list of hazardous chemicals and the inventory of the major hazard works should be maintained in a computerized data bank.

The Ministry of Labour implemented the ILO project on the establishment and initial operation of a system for controlling major accident hazards initially in twelve selected states. The immediate objective of the project was to strengthen the national system for preventing occupational accidents in certain industrial activities.

This was done through identification, analysis, and control of industrial activities involving hazardous chemicals and processes that have the potential to cause major accidents.

#### **The system for controlling major accident hazards in India, as established under the ILO project, consists of the following elements:**

- i. Three-tier technical organization on major accident hazards control.
- ii. Rules for the control of major accident hazards.
- iii. Computerized data bank.
- iv. Strengthening of labour institutes and inspectorates of Dock Safety.
- v. Strengthening of the inspectorates of factories.

vi. Training strategy.

**i. Three-Tier Technical Organization:**

A three-tier technical organization, incorporating the national, regional, and state levels, was set up to control major accident hazards. At the national level, a multidisciplinary advisory division to control major accident hazards, staffed with relevant specialists, was set up in the Central Labour Institute, Mumbai.

At the regional level, cells to control major accident hazards were set up in the three Regional Labour Institutes in Kolkata, Chennai, and Kanpur.

The advisory division and the cells function as resource centres for the control of major accident hazards. They also provide technical advice and guidance on hazardous chemicals to industry; investigate major accidents; inspect major accident hazard works; develop technical guidelines and training material; conduct specialized training programmes on the control of major accident hazards and on chemical safety to different target groups; and conduct studies and safety audits of hazardous operations.

**ii. Rules for the Control of Major Accident Hazards:**

Draft regulations on the control of, major accident hazards were first prepared as model rules that were then notified to the states under the Factories Act of 1948.

Through extensive consultations between the Ministry of Labour and the Ministry of Environment and Forests, these regulations were later harmonized with the draft rules prepared by the latter. The Ministry of Environment and Forests included the rules as the 'Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989' under the Environment (Protection) Act of 1986.

These rules to control major industrial accident hazards aim at preventing major accidents in certain industrial activities. In all, eleven authorities have been entrusted with the responsibility of enforcing the provisions in their respective fields.

For example, the Chief Inspectors of Factories were assigned the duty of enforcing the relevant provisions of the rules in factories and the Chief Inspector of Dock Safety assigned the same job in ports. These rules are also being included under their respective workplace-related legislation such as the Factories Act of 1948.

**iii. Computerized Data Bank:**

Computerized data banks, which have appropriate databases on the control of major accident hazards, were established in the Central and the three Regional Labour Institutes. These data banks enable the storage, retrieval, and dissemination of information.

The databases so far created include the inventories of hazardous chemicals; the major accident hazard works/sites and the specialists in the field of major accident hazards control; the CIS database on occupational safety and health; the incidents involving major accident risk; and the details of the specialized training programmes conducted for the control of major accident hazards among the seven target groups within the enforcement authorities and industry.

The databases on the inventories of hazardous chemicals, the major accident hazard sites/works, and the incidents of major risk are updated continuously.

#### **iv. Strengthening of Labour Institutes and Inspectorates of Dock Safety:**

The Central and the Regional Labour Institutes and the Inspectorates of Dock Safety have been strengthened by recruiting/deploying officers with qualifications and experience in chemical engineering to advise on chemical safety and the control of major accident hazards.

The technical competence of these officers and other specialists has been developed by providing them with appropriate training, in India and/or abroad, in the control of major accident hazards.

This has enabled the institutes and the Inspectorates of Dock Safety to develop technical guidelines and training materials, to carry out joint inspections with Inspectors of Factories, to perform studies and safety audits of hazardous operations, to conduct training programmes for the Inspectors of Factories, Inspectors of Dock Safety, and technical personnel from the industry, and to provide technical advice to the major accident hazard sites/works.

#### **v. Strengthening the Inspectorates of Factories:**

The Inspectorates of Factories of the states that have a considerable number of major accident hazard factories were strengthened with the recruitment of inspectors with chemical engineering qualifications. All the inspectors were trained in the control of major accident hazards abroad and/or in India.

In addition, the inspectors were given specialized in-service training on inspecting major accident hazard sites. The criteria for prioritizing the major accident hazard sites were developed. The development of the technical competence of the inspectors and the provision of necessary instruments to the inspectorates has thus enhanced their ability to execute their tasks.

#### **vi. Training Strategy:**

Keeping in mind the emphasis laid in the project on training, a three-pronged training strategy was developed. The three focal points were to identify the target groups, to develop appropriate training material, and to conduct training programmes.

The target groups needing specialized training in the control of major accident hazards were identified. These included inspectors from the Inspectorates of Factories and Inspectorates of Dock Safety; senior executives; safety officers; workers who are members of safety committees; supervisory trainers from the major accident hazard works and port authorities; and trade union leaders at both the national and regional levels.

Training manuals were developed to provide the background reading material needed by these training programme participants. There are manuals available now on the techniques of inspecting chemical plants and on the control of major accident hazards that are meant for the senior Inspectors of Factories, safety officers, supervisory trainers, and workers who are members of safety committees.

Over 100 specialized training programmes and seminars have been held, with nearly 3,500 participants from various target groups. A notable feature has been the input of several ILO experts on various aspects of the control of major accident hazards in these seminars and training programmes.



## **Industrial Accidents – Safety Measures**

In order to avoid accidents on the job, industrial safety is of utmost important. Accident results in partial or permanent disability or even death of an employee involving good amount of cost and social hazards, therefore, safety is needed for –

1. Preventing partial or permanent disability or death of talented workers.
2. Preventing suffering to employees
3. Minimizing damage to equipment and machinery
4. Increasing efficiency in production
5. Reducing cost of production

So it is the responsibility of every management to provide safety to its workers. The industrial safety and work efficiency are directly related to each other. Security measures not only reduce the industrial accidents but also improve the industrial work efficiency.

Therefore, employer must pay special attention to the safety measures. The rules explained in various labour laws are necessary to be followed. These measures ensure the safety of workers, industrial accidents are prevented and the total efficiency of the enterprise increases.

The industrial safety measures also include precautions which are to be observed by the management to prevent the accidents result into loss of property and life. A safety policy should be based on the fact that the well-being of employees is a major concern of an organisation, that people are its most valuable asset and their safety is the greatest responsibility. Hence employees should be trained to do their work in a safe and efficient manner and safety training must be made an integral part of the society.

**Since accidents occur in plant, during processes and operation or due to ignorance and skill of an employee, the safety should be considered from the following angles:**

1. Technical Angle – Buildings, tools, equipment, environment etc.
2. Training and Placement Angle – Selection, training, placement, and motivation for safe work practices etc.

**Four Levels of Safety Interventions:**

**The four levels of workplace safety interventions are:**

**1. Intervention at the Managerial Level:**

**The various components of managerial interventions include:**

- a. Assessing workplace safety aspects and possible threats or hazards.
- b. Drafting safety policy.
- c. Safety policy implementation & follow-up on a regular basis.
- d. Safety Training & drills on a periodic basis.
- e. Legal & statutory compliance
- f. Workload assessment
- g. Equipment and maintenance audit.

## **2. Technological Interventions:**

The technological interventions refer to technology-audit and ensuring that better technologies are used and employed in the organizations that enhance safety aspects.

## **3. Behavioural Interventions:**

Making safety at workplace a way of life rather than a periodic inspection issue is the real challenge. Anything and everything that an employee or a manager does must be in line with the safety practices. Safety should become everyone's agenda rather than being an enforcement issue.

Zero tolerance for any unsafe practice or unsafe act, zero procrastination of safety aspects, prioritizing safety over everything are some of the desired behaviour from employees especially from managers.

## **4. Ethical Interventions:**

In this era of competition, market volatility and uncertainty there may be sometimes a tendency to cut-corners when it comes to safety issues. No such steps must be permitted that endangers lives of the employees or of any other member of the society due to operations of an organization.

## **Industrial Accidents – Safety Consciousness for Engineering, Training and Placement Side**

### **1. Technical i.e. Engineering Side:**

- (i) Design and construction of plant and workplace should be safe.
- (ii) Arrangement of machinery equipment and material should be such as to eliminate risk of accident.
- (iii) Machines and equipments should be kept in good working conditions.
- (iv) Good working environment free from noise, pollution, and other environmental hazards should be ensured.

### **2. Training and Placement Side:**

- (i) Great cares should be taken while selecting persons for the jobs only skilled persons should be selected to handle machinery and equipment.
- (ii) Workers should be given proper in plant training and education regarding safety and use of safety devices.
- (iii) In order to keep workers motivated towards safety rules –
  - (a) Safety rules must keep pace with changing environment and conditions.

- (b) Safety rules should be small, well defined, non-oppressive and acceptable to all employees.
- (c) Safety rules should be publicized among workers.

## **Industrial Accidents – Steps Adopted to Prevent Industrial Accidents**

Accidents can be prevented through various ways. According to the National Safety Council, U.S.A, prevention of accidents depends upon three Es i.e. Education, Enforcement, and Engineering. It means that job should be engineered for safety, employees should be educated about the safe procedures and the safety rules should be properly enforced.

**Some of the steps for ensuring safety and preventing industrial accidents are:**

### **1. Proper Safety Measures:**

For avoiding accidents at the work place there should be proper safety measures. Guidelines are issued by the government from time to time in relation to enacting measures for checking accidents which should be strictly followed. These measures should include that machinery should be properly guarded; danger areas should be fenced etc.

### **2. Proper Selection:**

The selection of the employees should be done on the basis of properly devised tests so that the suitability of the job is determined. Because the wrong selection will create problems as some employees are accident prone and not suitable for the job.

### **3. Enforcement of Discipline:**

The disciplinary action should be taken against the employees who flout the safety measures. The punishments like warnings, fines, layoffs, termination etc. should be enforced which will force the workers to follow the various safety measures.

### **4. Safety Conscious:**

The organisation should make its employees conscious of the safety measures. This can be done through proper working conditions, slogans, advices should be given to the employees from time to time for making them conscious of the measures.

**Following slogans will keep the workers conscious about the safety measures:**

“Accident means Disablement”

“Safety Saves”

“Alertness is the Best Precaution”

### **5. Safety Committees:**

Enforcement and following the safety measures are beneficial for both workers as well as organisation. The committees should be formed comprising of the members from the workers and employees to develop the safety programmes and measures. The safety can easily be ensured through these committees as the safety programmes will be formulated in consultation with the representatives of the workers in the committees.

### **6. Incentives:**

For motivating the workers for adhering safety measures, incentives should be provided to them for maintaining safety. Monetary and non-monetary incentives should be provided to the workers who adhere to the safety measures in toto.

### **7. Safety Training:**

The training should be provided to the workers for providing them information regarding the safety measures. The workers should be provided with the knowledge regarding the hazards of the machines, areas of accident proneness, and the precautions in case of some accidents. This training should be provided to both workers and supervisors.

### **8. Proper Maintenance of Machines and Equipments:**

One of the main reasons for the accidents is the fault in the machines or equipments. So there should be proper maintenance of machines and equipments and these should be properly greased and should be frequently inspected by the personnel's of engineering department.

There should be a Safety Director in every industrial undertaking to design and operate the safety program. The basic objective of the safety program should be safety and security of the lives, health and welfare of the workers employed therein.

### **The following precautionary steps may be adopted to prevent accidents in the industries:**

(i) Safety committee may be constituted in every plant. It should consist of the representatives of both the management and the workers. All the safety programs should be implemented through the safety committee.

(ii) Safety Training – The supervisors should train the new employees in safety methods. The possible causes of accidents should be explained to the new employees and they should be taught habits and motions that will keep them out of danger. Training programs should also be designed for the supervisors.

(iii) Material handling equipment should be installed to carry bulky materials from one place to another. No worker may be required to lift or carry heavy loads which may cause injury.

(iv) Guarding of Machines – Safety guards should be designed, constructed and used to provide positive protection, prevent access to the danger zones during operations, avoid inconvenience in operation and give protection against unforeseen contingencies. These are in the form of hard insulated covers provided to the moving or rotating parts of machines.

(v) Maintenance of Plant – The plant should be maintained in good condition. All objects likely to obstruct the passages meant for movement by workers should be removed. Passages should not be used to store goods or materials. Dry, clean and ventilated store rooms with suitable racks, shelves, etc. should be provided for keeping electrical and other hazardous equipment.

(vi) Regular Inspection – There should be regular inspection of machines and equipment and electricity cables to check any leakage.

(vii) Equipment Redesign – Industrial engineers should be engaged to improve the man-machine system. Equipment, machinery and work procedures should be redesigned to cut down accident rate.

(viii) Proper Clothing – The workers should be provided with proper clothing and other protective things such as hand gloves, masks, helmets, safety footwear, etc. while at work. The clothings should serve a dual purpose of providing convenience as well as protection at work. The use of articles made of inflammable material must be prohibited while working on operations that involve risk of fire. Chemicals should be carefully handled.

(ix) Clean Floors – There should be no trailing of telephone cables on the floors. Floors, passages and stairs must be kept clear of obstructions.

(x) Safety Campaign – Safety program must be given a wide publicity through posters and hoardings. ‘Work Safety’ and ‘Safety Saves’ are illustrations of the slogans which may be displayed at critical points. Safety contests may also be held between the plants as a part of the safety campaign. Plant with lowest accident rate may be given some reward.

### **Safety Education:**

Workers should be educated in safety precautions and rules. Every employee should be advised about the safety devices. Safety in industry can be achieved only if the employees appreciate the need for them and understand the safety methods provided. Safety education is essential to new entrants as well as old employees.

When accidents occur, there is no point in blaming the workers that they violated the safety rules without making sure that they understood those rules.

Safety depends on the education of the workers about safety regulations. A safety code for workers is necessary in all undertakings. This can be done in conjunction with the Safety First Association of India and the National Productivity Council.

Posters, leaflets, bulletins, films and talks are all effective methods of safety education of workers.

A new recruit after selection goes down to the line and meets his immediate supervisors. The first duty of the Supervisor is to impress upon the new entrant, the idea that his life is going to be a daily play with machine. As long as he observes the rules of the game, the machine is a good servant. But should he lose respect for the machine, he runs grave danger. He may also be responsible for mishap to his colleagues.

It is not only the machine that requires care and attention. The factory is a huge family house and just as adjustments and care are necessary in the house, the factory also demands good housekeeping.

“Order is Heaven’s first law”. Order in a factory not only prevents accidents, disablement and misery, but also helps the smooth flow of production.

## **Industrial Accidents – Safety Schemes for Workers**

**Essential factors of safety scheme in a factory can be summarised as follows:**

1. Appointment of a full time or part time safety officer delegated with the work for safety of workers.
2. Instructions to all new employees on safe working methods through personal talks, films, lectures, demonstrations, and pamphlets.
3. Careful and frequent inspection of works to ensure that gangways are clear, passages adequately lighted, materials well stacked, etc.
4. Inspection of machines and plant in co-operation with the technical staff to ensure that adequate guarding is provided, maintained and used and that proper lighting provided and good colour scheme introduced.
5. Provision of overalls, special protective clothing, helmets, goggles and respirators, wherever necessary and ensure that these are properly used.

6. Accident prevention or safety committee which should investigate every accident and advise on measures to prevent recurrence.
  7. Safety first campaigns by means of posters, films, inter-departmental competitions, articles and notices in house magazine, etc.
  8. Training in first aid and arranging refresher courses.
  9. Ensure that even trivial accidents are reported to the first aid room.
  10. Keep full and accurate records of all accidents and maintain accidents analysis reports.
- Accident prevention is one of the essential prerequisites that help the creation of an industrial climate, wholesome and congenial.