# UNIT 6 PROVISION RELATING TO HAZARDOUS PROCESSES

**Structure**



## 6.1 INTRODUCTION

Hazardous process, means any process or activity in relation to an industry specified in the First Schedule where, unless special care is taken, raw materials used therein or the intermediate or finished products, bye-products, wastes or effluents thereof would-- (i) cause material impairment to the health of the persons engaged in or connected therewith, or (ii) result in the pollution or the general environment: Provided that the State e-Government may, by notification in the Official Gazette, amend the First Schedule by way of addition, omission or variation of any industry specified in the said Schedule. [Factories Act, 1948 (63 of 1948), s. 2 (cb)] This topic is very important in the context of factories due to the main involvement of big pieces of machinery in production. compulsory disclosure of information by the occupier of every factory involving a **hazardous process** of all information regarding dangers is mandatory, health **hazards** and measures to overcome such **hazards** arising from the exposure to or handling of materials or substances used in manufacture, transportation, storage and other **processes**. This disclosure is required to be made to workers employed in the factory, to the Chief Inspector, the local authority within whose jurisdiction the factory is situate and to the general public in the vicinity.

**Objectives**

After studying this unit, you should be able to

- understand basics about hazardous process
- know the specific responsibilities of the occupier
- understand the compulsory disclosure information's by the occupier
- know the provision relating to hazardous process
- know the provision relating to health

- Know the provision relating to welfare
- Know the provision relating to safety
- Know the Right to workers
- Understand the various case studies.

## 6.2 SPECIFIC RESPONSIBILITY OF THE OCCUPIER IN RELATION TO HAZARDOUS PROCESSES

Every occupier of a factory involving any hazardous process shall—

(a) maintain accurate and up-to-date health records or, as the case may be, medical records, of the workers in the factory who are exposed to any chemical, toxic or any other harmful substances which are manufactured, stored, handled or transported and such records shall be accessible to the workers subject to such conditions as may be prescribed;

(b) Appoint persons who possess qualifications and experience in handling hazardous substances and are competent to supervise such handling within the factory and to provide at the working place all the necessary facilities for protecting the workers in the manner prescribed:

Provided that where any question arises as to the qualifications and experience of a person so appointed, the decision of the Chief Inspector shall be final;

(c) Provide for medical examination of every worker—

*a.* Before such worker is assigned to a job involving the handling of, or working with, a hazardous substance, and

*b.* While continuing in such job, and after he has ceased to work in such job, at intervals not exceeding twelve months, in such manner as may be prescribed.

## 6.3 COMPULSORY DISCLOSURE OF INFORMATION BY THE OCCUPIER

(1) The occupier of every factory involving a hazardous process shall disclose in the manner prescribed all information regarding dangers, including health hazards and the measures to overcome such hazards arising from the exposure to or handling of the materials or substances in the manufacture, transportation, storage and other processes, to the workers employed in the factory, the Chief Inspector, the local authority within whose jurisdiction the factory is situate and the general public in the vicinity.

(2) The occupier shall, at the time of registering the factory involving a hazardous process, lay down a detailed policy with respect to the health and safety of the workers employed therein and intimate such policy to the Chief Inspector and the local authority and, thereafter, at such intervals as may be prescribed, inform the Chief Inspector and the local authority of any change made in the said policy.

(3) The information furnished under sub-section (1) shall include accurate information as to the quantity, specifications and other characteristics of wastes and the manner of their disposal.

(4) Every occupier shall, with the approval of the Chief Inspector, draw up an on-site emergency plan and detailed disaster control measures for his

factory and make known to the workers employed therein and to the general public living in the vicinity of the factory the safety measures required to be taken in the event of an accident taking place.

(5) Every occupier of a factory shall,-

a) if such factory engaged in a hazardous process on the commencement of the Factories Amendment Act, 1987, within a period of thirty days of such commencement; and

b) if such factory proposes to engage in a hazardous process at any time after such commencement, within a period of thirty days before the commencement of such process, inform the Chief Inspector of the nature and details of the process in such form and in such manner as may be prescribed.

(6) Where any occupier of a factory contravenes the provisions of sub-section (5), the license issued under section 6 to such factory shall, notwithstanding any penalty to which the occupier of factory shall be subjected to under the provisions of this Act, be liable for cancellation.

(7) The occupier of a factory involving a hazardous process shall, with the previous approval of the Chief Inspector, lay down measures for the handling, usage, transportation and storage of hazardous substances inside the factory premises and the disposal of such substances outside the factory premises and publicize them in the manner prescribed among the workers and the general public living in the vicinity.

### 6.3.1 PROVISIONS RELATING TO HAZARDOUS PROCESSES

**A. Constitution of Site Appraisal Committees. –**

(1) The State Government may, for purposes of advising it to consider applications for grant of permission for the initial location of a factory involving a hazardous process or for the expansion of any such factory, appoint a Site Appraisal Committee consisting of-

*(i)* The Chief Inspector of the State who shall be its Chairman;

*(ii)* a representative of the Central Board for the Prevention and Control of Water Pollution appointed by the Central Government under section 3 of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974) ;

*(iii)* a representative of the Central Board for the Prevention and Control of Air Pollution referred to in section 3 of the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981);

*(iv)* A representative of the State Board appointed under section 4 of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974);

*(v)* a representative of the State Board for the Prevention and Control of Air Pollution referred to in section 5 of the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981);

*(vi)* A representative of the Department of Environment in the State;

*(vii)* A representative of the Meteorological Department of the Government of India;

*(viii)* An expert in the field of occupational health; and

*(ix)* A representative of the Town Planning Department of the State Government, and not more than five other members who may be co-opted by the State Government who shall be- ,

*a.* A scientist having specialized knowledge of the hazardous process which will be involved in the factory,

*b.* A representative of the local authority within whose jurisdiction the factory is to be established, and

*c.* Not more than three other persons as deemed fit by the State Government

(2) The Site Appraisal Committee shall examine an application for the establishment of a factory involving hazardous process and make its recommendation to the State Government within a period of ninety days of the receipt of such application in the prescribed form.

(3) Where any process relates to a factory owned or controlled by the Central Government or to a corporation or a company owned or controlled by the Central Government, the State Government shall co-opt in the Site Appraisal Committee a representative nominated by the Central Government as a member of that Committee.

(4) The Site Appraisal Committee shall have power to call for any information from the person making an application for the establishment or expansion of a factory involving a hazardous process.

(5) Where the State Government has granted approval to an application for the establishment of expansion of a factory involving a hazardous process, it shall not be necessary for an applicant to obtain a further approval from the Central Board or the State Board established under the Water (Prevention and Control of Pollution) Act, l974 (6 of 1974) and the Air (Prevention and Control of Pollution) Act, 1981 {14 of 1981).

**B. Specific responsibility of the occupier in relation to hazardous processes.-**

Every occupier of a factory involving any hazardous process shall-

1. maintain accurate and up-to-date health records or, as the case may be, medical records, of the workers in the factory who are exposed to any chemical, toxic or any other harmful substances which are manufactured, stored, handled or transported and such records shall be accessible to the workers subject to such conditions as may be prescribed;

2. Appoint persons who possess qualifications and experience in handling hazardous substances and are competent to supervise such handling within the factory and to provide at the working place all the necessary facilities for protecting the workers in the manner prescribed:

Provided that where any question arises as to the qualifications and experience of a person so appointed, the decision of the Chief Inspector shall be final;

3. Provide for medical examination of every worker-

*(i)* Before such worker is assigned to a job involving the handling of, or working with, a hazardous substance, and

*(ii)* While continuing in such job, and after he has ceased to work in such job, at intervals not exceeding twelve months in such manner as may be prescribed.

**SAQ 1**

I. What is the main purpose of hazard identification?

a) To minimize the effect of a consequence

b) for better risk management

c) To reduce probability of occurrence

d) all of the above

II. The _____ process determines whether exposure to a chemical can increase the incidence of adverse health effect.

a) Hazard identification

b) Exposure assessment

c) Toxicity assessment

d) Risk characterization

III. Which of the following data is not required for hazard identification?

a) Land use

b) Contaminant levels

c) Affected population

d) Estimation of risk

## 6.4 PROVISIONS RELATING TO HEALTH

There are various measures under Factories Act 1948 which are taken by factories for health, safety and welfare of their workers. Such measures are provided under Chapters III, IV and V of the Act which are as follows:

**(i) Chapter III of the Act deals with the following aspects.**

Section 11 ensures the cleanliness in the factory. It must be seen that a factory is kept clean and it is free from effluvia arising from any drain, privy or other nuisance. The Act has laid down following provisions in this respect:

All the accumulated dirt and refuse on floors, staircases and passages in the factory shall be removed daily by sweeping or by any other effective method. Suitable arrangements should also be made for the disposal of such dirt or refuse.

1. Once in every week, the floor should be thoroughly cleaned by washing with disinfectant or by some other effective method [Section 11(1)(b)].
2. Effective method of drainage shall be made and maintained for removing water, to the extent possible, which may collect on the floor due to some manufacturing process.

3. To ensure that interior walls and roofs, etc. are kept clean, it is laid down that: (i) white wash or color wash should be carried at least once in every period of 14 months; (ii) where surface has been painted or varnished, repair or re vanish should be carried out once in every five years, if washable then once in every period of six months; (iii) where they are painted or varnished or where they have smooth impervious surface, it should be cleaned once in every period of 14 months by such method as may be prescribed.
4. All doors, windows and other framework which are of wooden or metallic shall be kept painted or varnished at least once in every period of five years.
5. The dates on which such processes are carried out shall be entered in the prescribed register. If the State Government finds that a particular factory cannot comply with the above requirements due to its nature of manufacturing process, it may exempt the factory from the compliance of these provisions and suggest some alternative method for keeping the factory clean. [Section 11(2)]

**(ii) Disposal of waste and effluents –**

Every occupier of a factory shall make effective arrangements for the treatment of wastes and effluents due to the manufacturing process carried on in the factory so as to render them innocuous and for their disposal.
Such arrangements should be in accordance with the rules, if any, laid down by the State Government. If the State Government has not laid down any rules in this respect, arrangements made by the occupier should be approved by the prescribed authority if required by the State Government. (Section 12)

**(iii) Ventilation and temperature –**

- Section 13 provides that every factory should make suitable and effective provisions for securing and maintaining :-
- Adequate ventilation by the circulation of fresh air; and
- Such a temperature as will secure to the workers reasonable conditions of comfort and prevent injury to health. What is reasonable temperature depends upon the circumstances of each case. The State Government has been empowered to lay down the standard of adequate ventilation and reasonable temperature for any factory or class or description of factories or parts thereof. It may direct that proper measuring instruments at such places and in such position as may be specified shall be provided and prescribed records shall be maintained.
- Measures to reduce excessively high temperature: To prevent excessive heating of any workroom following measures shall be adopted:
- Walls and roofs shall be of such materials and so designed that reasonable temperature does not exceed but kept as low as possible.
- Where the nature of work carried on in the factory generates excessively high temperature, following measures should be adopted to protect the workers:

  (a) by separating such process from the workroom; or

  (b) insulating the hot parts; or

  (c) adopting any other effective method which will protect the workers.

- The Chief Inspector is empowered to direct any factory to adopt such methods which will reduce the excessively high temperature. In this regard, he can specify the measures which in his opinion should be adopted. (Section 13)

**(iv) Dust and fume –**

- There are certain manufacturing processes like chemical, textile or jute, etc., which generates lot of dust, fume or other impurities. It is injurious to the health of workers employed in such manufacturing process. Following measures should be adopted in this respect:
- Effective measures should be taken to prevent the inhalation and accumulation of dust, fumes etc., in the work-rooms.
- Wherever necessary, exhaust appliances should be fitted, as far as possible, to the point of origin of dust fumes or other impurities. Such point shall also be enclosed as far as possible.
- In stationery internal combustion engine and exhaust should be connected into the open air.
- In cases of other internal combustion engine, effective measures should be taken to prevent the accumulation of fumes there from. (Section 14) It may be pointed that the evidence of actual injury to health is not necessary. If the dust or fume by reason of manufacturing process is given off in such quantity that it is injurious or offensive to the health of the workers employed therein, the offence is committed under this Section. Lastly the offence committed is a continuing offence. If it is an offence on a particular date is does not cease to be an offence on the next day and so on until the deficiency is rectified.

**(v) Artificial humidification –**

Humidity means the presence of moisture in the air. In certain industries like cotton, textile, cigarette, etc., higher degree of humidity is required for carrying out the manufacturing process. For this purpose, humidity of the air is artificially increased. This increase or decrease in humidity adversely affects the health of workers.

Section 15(1) empowers the State Government to make rules (i) prescribing the standards of humidification, (ii) regulating methods to be adopted for artificially increasing the humidity of the air, (iii) directing prescribed tests for determining the humidity of the air to be correctly carried out, and recorded, and (iv) prescribing methods to be adopted for securing adequate ventilation and cooling of the air in the work-room.

Section 15(2) lays down that water used for artificial humidification should be either purified before use or obtained from a public supply or other source of drinking water.

Where the water is not purified as stated above. Section 15(3) empowers the Inspector to order, in writing, the manager of the factory to carry out specified measures, before a specified date, for purification of the water.

**(vi) Overcrowding –**

Overcrowding in the work-room not only affect the workers in their efficient discharge of duties but their health also. Section 16 has been enacted with a view to provide sufficient air space to the workers.
(1) Section 16(1) prohibits the overcrowding in the work-rooms to the extent it

is injurious to the health of the workers.
(2) Apart from this general prohibition Section 16(2) lays down minimum working space for each worker as 14.2 cubic meters of space per worker in every workroom. For calculating the work area, the space more than 4.2 meters above the level of the floor, will not be taken into consideration.

Posting of notice: Section 16(3) empowers the Chief Inspector who may direct in writing the display of a notice in the work-room, specifying the maximum number of workers which can be employed in that room. According to Section 108, notice should be in English and in a language understood by the majority of the workers. It should be displayed at some conspicuous and convenient place at or near, the entrance. It should be maintained in clean and legible conditions.

Exemptions : The chief Inspector may by order in writing, exempt any work-room from the provisions of this section, subject to such conditions as he may think fit to impose, if he is satisfied that non-compliance of such provision will have no adverse effect on the health of the workers employed in such work-room.

**(vii) Lighting –**

- Section 17 of the Factories Act makes following provisions in this respect:
- Every factory must provide and maintain sufficient and suitable lighting, natural, artificial or both, in every part of the factory where workers are working or passing;
- all the glazed windows and sky lights should be kept clean on both sides;
- effective provisions should be made for the prevention of glare from a source of light or by reflection from a smooth or polished surface;
- formation of shadows to such an extent causing eye-strain or the risk of accident to any worker, should be prevented; and
- The state government is empowered to lay down standard of sufficient and suitable lighting for factories for any class or description of factories or for any manufacturing process.

**(viii) Drinking water -**

- Section 18 makes following provisions with regard to drinking water.
- Every factory should make effective arrangements for sufficient supply of drinking water for all workers in the factory;
- Water should be wholesome, i.e., free from impurities;
- Water should be supplied at suitable points convenient for all workers;

  No such points should be situated within six meters of any washing place, urinals, latrine, spittoon, open drain carrying sewage or effluent or any other source of contamination, unless otherwise approved in writing by the Chief Inspector;
- All such points should be legible marked Drinking Water in a language understood by majority of the workers;
- In case where more than 250 workers are ordinarily employed, effective arrangements should be made for cooling drinking water

during hot weather. In such cases, arrangements should also be made for the distribution of water to the workers; and

- The State Government is empowered to make rules for the compliance of above stated provisions and for the examination, by prescribed authorities, of the supply and distribution of drinking water in factories
- Latrines and urinals every factory shall make suitable arrangement for the provision of latrines and urinals for the workers. These points as stated below are subject to the provisions of Section 19 and the rules laid down by the State Government in this behalf.

The State Government is empowered to make rules in respect of following:

- Prescribing the number of latrines and urinals to be provided to proportion to the number of male and female workers ordinarily employed in the factory.
- any additional matters in respect of sanitation in factories;
- Responsibility of the workers in these matters.

## 6.5 RIGHT OF WORKERS TO WARN ABOUT IMMINENT DANGER

*1)* When the workers employed in any factory engaged in a hazardous process have reasonable apprehension that there is a likelihood of imminent danger to their lives or health due to any accident, they may bring the same to the notice of the occupier, agent, manager or any other person who is in charge of the factory or the process concerned directly or through their representatives in the Safety Committee and simultaneously being the same to the notice of the Inspector.

*2)* It shall be the duty of such occupier, agent, manager or the person in charge of the factory or process to take immediate action if he is satisfied about the existence of such imminent danger and send a report forthwith of the action taken to the nearest Inspector.

*3)* If the occupier, agent, manager or the person in charge referred to in sub-section (2) is not satisfied about the existence of any such imminent danger as apprehended by the workers, he shall, nevertheless, refer the matter Forthwith to the nearest Inspector whose decision on the question of the existence of such imminent danger shall be final

## 6.6 PROVISIONS OF WELFARE UNDER FACTORY ACT 1948

**Section 42. Washing facilities –**

1. In every factory-

a. adequate and suitable facilities for washing shall be provided and maintained for use of the workers therein;

b. separate and adequately screened facilities shall be provided for the use of male and female workers;

c. Such facilities shall be conveniently accessible and shall be kept clean.

2. The State Government may, in respect of any factory or class or description of factories or of any manufacturing process, prescribe standards of adequate and suitable facilities for washing.

**Section 43. Facilities for storing and drying clothing -**

The State Government may, in respect of any factory or class or description of factories make rules requiring the provision therein of suitable place for keeping clothing not worn during working hours and for the drying of wet clothing.

**Section 44. Facilities for sitting.-**

(1) In every factory suitable arrangements for sitting shall be provided and maintained for all workers obliged to work in a standing position, in order that they may take advantage of any opportunities for rest which may occur in the course of their work.

(2) If, in the opinion of the Chief Inspector, the workers in any factory engaged in a particular manufacturing process or working in a particular room, are able to do their work efficiently in a sitting position, he may, by order in writing, require the occupier of the factory to provide before a specified date such seating arrangements as may be practicable for all workers so engaged or working.

(3) The State Government may, by notification in the Official Gazette, declare that the provisions of sub-section (1) shall not apply to any specified factory or class or description of factories or to any specified manufacturing process.

**Section 45. First-aid-appliances.-**

1. There shall, in every factory, be provided and maintained so as to be readily accessible during all working hours first-aid boxes or cupboards equipped with the prescribed contents, and the number of such boxes or cupboards to be provided and maintained shall not be less than one for every one hundred and fifty workers ordinarily employed at any one time in the factory.
2. Nothing except the prescribed contents shall be kept in a first-aid box or cupboard.
3. Each first-aid box or cupboard shall be kept in the charge of a separate responsible person, who holds a certificate in first-aid treatment recognized by the State Government and who shall always be readily available during the working hours of the factory.
4. In every factory wherein more than five hundred workers are ordinarily employed there shall be provided and maintained an ambulance room of the prescribed size, containing the prescribed equipment and in the charge of such medical and nursing staff as may be prescribed and those facilities shall always be made readily available during the working hours of the factory.

**Section 46 Canteens –**

(1) The State Government may make rules requiring that in any specified factory wherein more than two hundred and fifty workers are ordinarily employed, a canteen or canteens shall be provided and maintained by the occupier for the use of the workers.

(2) The without prejudice in the generality of the foregoing power, such rules may provide for-

- The date by which such canteen shall be provided;

- The standard in respect of construction, accommodation, furniture and other equipment of the canteen;
- The foodstuffs to be served therein and the charges which may be made therefore
- The constitution of a managing committee for the canteen and representation of the workers in the management of the canteen;
- The items of expenditure in the running of the canteen which are not to be taken into account in fixing the cost of foodstuffs and which shall be borne by the employer ;
- The delegation to Chief Inspector subject to such conditions as may be prescribed, of the power to make rules under clause (c).

**Section 47. Shelters, rest-rooms and lunch-rooms.-**

- (1) In every factory wherein more than one hundred and fifty workers are ordinarily employed adequate and suitable shelters or rest-rooms and a suitable lunch-room, with provision for drinking water, where workers can eat meals brought by them, shall be provided and maintained for the use of the workers:
- Provided that any canteen maintained in accordance with the provisions of section 46 shall be regarded as part of the requirements of this sub-section:
- Provided further that where a lunch-room exists no worker shall eat any food in the work-room.
- The shelters or rest-room or lunch-room to be provided under sub-section (1) shall be sufficiently lighted and ventilated and shall be maintained in a cool and clean condition.
- The State Government may-

  (a) The prescribe the standards, in respect of construction accommodation, furniture and other equipment of shelters, rest-rooms and lunch-rooms to be provided under this section;

  (b) By notification in the Official Gazette, exempt any factory or class or description of factories from the requirements of this section.

**Section 48 Crèche's –**

- In every factory wherein more than thirty women workers are ordinarily employed there shall be provided and maintained a suitable room or rooms for the use of children under the age of six years of such women.
- Such rooms shall provide adequate accommodation, shall be adequately lighted and ventilated, shall be maintained in a clean and sanitary condition and shall be under the charge of women trained in the care of children and infants.
- The State Government may make rules-

a) The prescribing the location and the standards in respect of construction, accommodation; furniture and other equipment of rooms to be provided, under this section;

b) The requiring the provision in factories to which the section applies, of additional facilities for the care of children belonging to women workers, including suitable provision of facilities for washing and changing their clothing;

c) The requiring the provision in any factory of free milk or refreshment or both for such children;

d) The requiring that facilities shall be given in any factory for the mothers of such children to feed them at the necessary intervals.

**Section 49 Welfare Officers. –**

(1) In every factory wherein five hundred or more workers are ordinarily employed the occupier shall employ in the factory such number of welfare officers as may be prescribed.

(2) The State Government may prescribe the duties, qualifications and conditions of service of officers employed under sub-section (1). 50. Power to make rules to supplement this Chapter. –

(3) The State Government may make rules-

(a) Exempting, subject to compliance with such alternative arrangements for the welfare of workers as may be prescribed, any factory or class or description of factories from compliance with any of the provisions of this Chapter,

(b) The requiring in any factory or class or description of factories that representatives of the workers employed in the factories shall be associated with the management of the welfare arrangements of the workers.

## 6.7 PROVISION OF HEALTH UNDER SECTION 11 TO SECTION 20 OF FACTORY ACT

**Section 11 Cleanliness.-**

(1) Every factory shall be kept clean and free from effluvial arising from any drain, privy or other nuisance, and in particular-

(a) Accumulation of dirt and refuse shall be removed daily by sweeping or by any other effective method from the floors and benches of workrooms and from staircases and passages and disposed of in a suitable manner;

(b) The floor of every workroom shall be cleaned at least once in every week by washing, using disinfectant where necessary, or by some other effective method;

(c) where a floor is liable to become wet in the course of any manufacturing process to such extent as is capable of being drained, effective means of drainage shall be provided as maintained;

(d) All inside walls and partitions, all ceilings or tops of rooms and all walls, sides and tops of passages and staircases shall-

(i) Where they are 'tainted otherwise than with washable water paint or varnished, be repainted or re varnished at least once in every period of five years;

(i-a) where they are painted with washable water paint, be repainted with at least one coat of such paint at least once in every period of three years and washed at least once in every period of six months;

(ii) Where they are painted or varnished or where they have smooth impervious surfaces, be cleaned at least one in every period of fourteen months by such methods as may be prescribed;

(iii) In any other case, be kept whitewashed, or colour washed, and the whitewashing or colour washing shall be carried out at least once in every period of fourteen months;

(e) all doors and window-frames and other wooden or metallic framework and shutters shall be kept painted or varnished and the painting or varnishing shall be carried out at least once in every period of five years;

(f) The dates on which the processes required by clause (d) are carried out shall be entered in the prescribed register.

If, in view of the nature of the operations carried on in a factory or class or description of factories or any part of a factory or class or description of factories, it is not possible for the occupier to comply with all or any of the provisions of sub-section (1), the State Government may by order exempt such factory or class or description of factories or part from any of the provisions of that sub-section and specify alternative methods for keeping the factory in a clean state.

**Section 12. Disposal of wastes and effluents.-**

1. Effective arrangements shall be made in every factory for the treatment of wastes and effluents due to the manufacturing process carried on therein, so as to render them innocuous, and for their disposal.
2. The State Government may make rules prescribing the arrangements to be made under sub-section (1) or requiring that the arrangements made in accordance with sub-section (1) shall be approved by such authority as may be prescribed.

**Section 13. Ventilation and temperature.-**

(1) Effect and suitable provisions shall be made in every factory for securing and maintaining in every workroom-

(a) Adequate ventilation by the circulation of fresh air, and

(b) such a temperature as will secure to workers therein reasonable conditions of comfort and prevent injury to health; and in particular,

(i) Walls and roofs shall be of such material and so designed that such temperature shall not be exceeded but kept as low as practicable;

(ii) Where the nature of the work carried on in the factories involves, or is likely to involve, the production of excessively high temperature, such adequate measures as are practicable shall be taken to protect the workers there from, by separating the process, which produces such temperature from the workroom, by insulating the hot parts or by other effective means.

(2) The State Government may prescribe a standard of adequate ventilation and reasonable temperature for any factory or class or description of factories or parts thereof and direct that proper measuring instruments, at

such places and in such position as may be specified, shall be provided and such records, as may be prescribed, shall be maintained.

(3) If it appears to the Chief Inspector that excessively high temperature in any factory can be reduced by the adoption of suitable measures, he may, without prejudice to the rules made under sub-section (2), serve on the occupier, an order in writing specifying the measures which, in his opinion should be adopted, and requiring them to be carried out before a specified date.

**Section 14. Dust and fume.-**

1) In every factory in which, by reason of the manufacturing process carried on, there is given off any dust or fume or other impurity of such a nature and to such an extent as is likely to be injurious or offensive to the workers employed therein, or any dust in substantial quantities, effective measures shall be taken to prevent its inhalation and accumulation in any workroom, and if any exhaust appliance is necessary for this purpose, it shall be applied as near as possible to the point of origin of the dust, fume or other impurity, and such point shall be enclosed so far as possible.

2) In any factory no stationary internal combustion engine shall be operated unless the exhaust is conducted into the open air, and no other internal combustion engine shall be operated in any room unless effective measures have been taken to prevent such accumulation of fumes there from as are likely to be injurious to workers employed in the room.

**Section 15. Artificial humidification.-**

1) In respect of all factories in which the humidity of the air is artificially increased, the State Government may make rules,-
    a) Prescribing standards of humidification;
    b) Regulating the methods used for artificially increasing the humidity of the air;
    c) Directing prescribed tests for determining the humidity of the air to be correctly carried out and recorded;
    d) Prescribing methods to be adopted for securing adequate ventilation and cooling of the air in the workrooms.

2) In any factory in which the humidity of the air is artificially increased, the water used for the purpose shall be taken from a public supply, or other source of drinking water, or shall he effectively purified before it is so used.

3) If it appears to an Inspector that the water used in a factory for increasing humidity which is required to be effectively purified under sub-section (2) is not effectively purified he may serve on the manager of the factory an order in writing, specifying the measures which in his opinion should be adopted, and requiring them to be carried out before specified date.

**Section 16. Overcrowding.-**

1) No room in any factory shall be overcrowded to an extent injurious to the health of the workers employed therein.

2) Without prejudice to the generality of sub-section (1), there shall be in every workroom of a factory in existence on the date of commencement of this Act at least 9.9 cubic meters and of a factory built after the commencement of this Act at least 14.2 cubic meters of space for every

worker employed therein, and for the purposes of this sub-section no account shall be taken of any space which is more than 4.2 meters above the level of the floor of the room.

3) If the Chief Inspector by order in writing so requires, there shall be posted in each workroom of a factory a notice specifying the maximum number of workers who may, in compliance with the Provisions of this section, be employed in the room.

4) The Chief Inspector may, by order in writing exempt, subject to such conditions, if any, as he may thing fit to impose, any workroom from the provisions of this section, if he is satisfied that compliance therewith in respect of the room is unnecessary in the interest of the health of the workers employed therein.

**Section 17. Lighting.-**

1) In every part of a factory where workers are working or passing, there shall be provided and maintained sufficient and suitable lighting, natural or artificial, or both.

2) In every factory all glazed windows and skylights used for the lighting of the workroom shall be kept clean on both the inner and outer surfaces and, so far as compliance with the provisions of any rules made under sub-section (3) of section 13 will allow, free from obstruction.

3) In every factory effective provision shall, so far as is practicable, be made for the prevention of-

- glare, either directly from a source of light or by reflection from a smooth or polished surface;
- The formation of shadows to such an extent as to cause eye-strain or the risk of accident to any worker.

4) The State Government may prescribe standards of sufficient and suitable lighting for factories or for any class or description of factories or for any manufacturing process.

**Section 18. Drinking water.-**

1) In every factory effective arrangements shall be made to provide and maintain at suitable points conveniently situated for all workers employed therein a sufficient supply of wholesome drinking water.

2) All such points shall be legibly marked "drinking water" in a language understood by a majority of the workers employed in the factory and no such points shall be situated within 1[six meters of any washing place, urinal, latrine, spittoon, open drain carrying silage or effluent or any other source of contamination unless a shorter distance is approved in writing by the Chief Inspector.

3) In every factory wherein more than two hundred and fifty workers are ordinarily employed, provisions shall be made for cooling drinking water during hot weather by effective means and for distribution thereof.

4) In respect of all factories or any class or description of factories the State Government may make rules for securing compliance with the

provisions of sub-sections (1), (2) and (3) and for the examination by prescribed authorities of the supply and distribution of drinking water in factories.

**Section 19. Latrines and urinals.-**

(1) In every factory-

- sufficient latrine and urinal accommodation of prescribed types shall be provided conveniently situated and accessible to workers at all times while they are at the factory;
- separate enclosed accommodation shall be provided for male and female workers;
- such accommodation shall be adequately lighted and ventilated and no latrine or urinal shall, unless specially exempted in writing by the Chief Inspector, communicate with any workroom except through an intervening open space or ventilated passage;
- all such accommodation shall be maintained in a clean and sanitary condition at all times;
- Sweepers shall be employed whose primary duty it would be to keep clean all latrines, urinals and washing places.

(2) In every factory wherein more than two hundred and fifty workers are ordinarily employed-

- all latrine and urinal accommodation shall be of prescribed sanitary types;
- the floors and internal walls, up to a height of ninety centimeters of the latrines and urinals and the sanitary blocks shall be laid in glazed tiles or otherwise finished to provide a smooth polished impervious surface;
- without prejudice to the provisions of clauses (d) and (e) of sub-section (1), the fioors, portions of the walls and blocks so laid or finished and the sanitary pans of latrines and urinals shall be thoroughly washed and cleaned at least once in every seven days with suitable detergents or disinfectants or with both.
- The State Government may prescribe the number of latrines and urinals to be provided in any factory in proportion to the number of male and female workers ordinarily employed therein, and provide for such further matters in respect of sanitation in factories, including the obligation of workers in this regard, as it considers necessary in the interest of the health of the workers employed therein.

**Section 20. Spittoons-**

- In every factory there shall be provided a sufficient number of spittoons in convenient places and they shall be maintained in a clean and hygienic condition.
- The State Government may make rules prescribing the type and numbers of spittoons to be provided and their location in any factory and provide for such further matters relating to their maintenance in a clean and hygienic condition.
- No person shall spit within the premises of a factory except in the spittoons provided for the purpose and a notice containing this

provision and the penalty for its violation shall be prominently displayed at suitable places in the premises.

- Whoever spits in contravention of sub-section (3) shall be punishable with fine not exceeding five rupees.

**SAQ 2**

I. Hazard is defined as the probability of suffering harm or loss. True or False.

a) True

b) False

II. Why does site history have to be considered for hazard identification?

a) To estimate the risk

b) To calculate carcinogenic exposure

c) To know the probable source and causes of contamination on site

d) For determination of remedial actions

III. What is the main objective of risk assessment?

a) To evaluate hazard and minimize the risks

b) Remediation of contaminated sites

c) Hazard management

d) To know source of pollutants

IV. What is the first stage of risk assessment?

a) Exposure assessment

b) Hazard identification

c) Toxicity study

d) Risk characterization

## 6.8 PROVISIONS OF SAFETY UNDER SECTION 21 TO 41

**Section 21. Fencing of machinery.-**

(1) In every factory the following, namely-

*(i)* Every moving part of a prime-mover and every flywheel connected to a prime-mover, whether the prime-mover or flywheel is in the engine-house or not;

*(ii)* The headrace and tailrace of every water-wheel and water-turbine;

*(iii)* Any part of a stock bar which projects beyond the head stock of a lathe; and

*(iv)* Unless they are in such position or of such construction as to be safe to every person employed in the factory as they would be if they were securely fenced, the following, namely:-

a. Every part of an electric generator, a motor or rotary convertor;

b. Every part of transmission machinery; and

c. Every dangerous part of any other machinery; shall be securely fenced by safeguards of a substantial construction which shall be constantly maintained and kept in position while the parts of machinery they are fencing, are in motion or in use:

Provided that for the purpose of determining whether any part of machinery in such position or is of such construction as to be safe as aforesaid, account shall not be taken of any occasion when-

(i) it is necessary to make an examination of any part of the machinery aforesaid while it is in motion or, as a result of such examination to carry out lubrication or other adjusting operation while the machinery is in motion, being an examination of operation which it is necessary to be carried out while that part of the machinery is in motion. or

(ii) in the case of any part of a transmission machinery used in such process as may be prescribed (being a process of a continuous nature, the carrying on of which shall be or is likely to be substantially interfered with by the stoppage of that part of the machinery), it is necessary to make an examination of such part of the machinery while it is in motion or, as a result of such examination, to carry out any mounting or shipping of belts or lubrication, or other adjusting operation while tile machinery is in motion, and such examination or operation is made or carried out in accordance with the provisions of sub-section (1) of section 22.

The State Government may by rules prescribe such further precautions as it may consider necessary in respect of any particular machinery or part thereof or exempt, subject to such condition as may be prescribed, for securing the safety of the workers, any particular machinery or part thereof from the Provisions of this section.

**Section 22. Work on or near machinery in motion.-**

1. Where in any factory it becomes necessary to examine any part of machinery referred to in section 21, while the machinery is in motion, or, as a result of such examination, to carry out-

   (a) In a case referred to in clause (i) of the proviso to sub-section (1) of section 21, lubrication or other adjusting operation; or

   (b) In a case referred to in clause (ii) of the proviso aforesaid, any mounting or shipping of belts or lubrication or other adjusting operation,

while the machinery is in motion, such - examination or operation shall be made or carried out only by a specially trained adult male worker wearing tight fitting clothing (which shall be supplied by the occupier) whose name has been recorded in the register prescribed in this behalf and who has been furnished with a certificate of his appointment, and while he is so engaged,-

(c) Such worker shall not handle a belt at a moving pulley unless-

(i) The belt is not more than fifteen centimeters in width;

(ii) The pulley is normally for the purpose of drive and not merely a fiy-wheel or balance wheel (in which case belt is not permissible);

(iii) The belt joint is either laced or flush with the belt;

(iv) The belt, including the joint and the pulley rim, are in good repair;

*(v)* There is reasonable clearance between the pulley and any fixed plant or structure;

*(vi)* Secure foothold and, where necessary, secure handhold, are provided for the operator; and

(vii) Any ladder in use for carrying out any examination or operation aforesaid is securely fixed or lashed or is firmly held by a second person;

2. without prejudice to any other provision of this Act relating to the fencing of machinery, every set screw, bolt and key on any revolving shaft, spindle, wheel or pinions and all spur, worm and other toothed or friction gearing in motion with which such worker would otherwise be liable to come into contact, shall be securely fenced to prevent such contact.
3. No woman or young person shall be allowed to clean, lubricate or adjust any part of a prime-mover or of any transmission machinery while prime-mover or transmission machinery is in motion, or to clean, lubricate or adjust any part of any machine if the cleaning, lubrication or adjustment thereof would expose the woman or young person to risk of injury from any moving part either of that machine or of any adjacent machinery.
4. The State Government may, by notification in the Official Gazette prohibit, in any specified factory or class or description of factories, the cleaning, lubricating or adjusting by any person of specified parts of machinery when those plats are in motion.

**Section 23. Employment of young person's on dangerous machines.-**

(1) No young person shall be required or allowed to work at any machine to which this section applies, unless he has been fully instructed as to the dangers arising in connection with the machine and the precautions to be observed, and-

(a) Has received sufficient training in work at the machine, or

(b) is under adequate supervision by a person who has a thorough knowledge and experience of the machine.

(2) Sub-section (1) shall apply to such machines as may be prescribed by the State Government, being machines which in its opinion are of such a dangerous character that young person's ought not to work at them unless the foregoing requirements are complied with.

**Section 24. Striking gear and devices for cutting off power.-**

(1) In every factory-

a) suitable striking gear or other efficient mechanical appliance shall be provided and maintained and used to move driving belts to and from fast and loose pulleys winch form part of the transmission machinery, and such gear or appliances shall be so constructed, placed and maintained so as to prevent the belt film creeping back on to the first pulley;

b) Driving belts when not in use shall not be allowed to rest or ride upon shafting in motion.

2. In every factory suitable devices for cutting off power in emergencies from running machinery shall be provided and maintained in every workroom:
3. Provided that in respect of factories in operation before the commencement of this Act, the provisions of this sub-section shall apply only to workrooms in which electricity is used as power.

When a device, which can inadvertently shift from "off" to "on" position, is provided in a factory- to cut off power, arrangements shall be provided for locking the device in safe position to prevent accidental starting of the transmission machinery or other machines to which the device it fitted.

**Section 25. Self-acting machines.-**

No traversing part of a self-acting machine in any factory and no material carried thereon shall, if the space over which it runs is a space over which any person is liable to pass, whether in the course of his employment or otherwise, be allowed to run on its outwards or inward traverse within a distance forty-five centimeters from any fixed structure which is not part of the machine:

Provided that the Chief Inspector may permit the continued use of a machine installed before the commencement of this Act which does not comply with the requirements of this section on such conditions for ensuring safety as he may think fit to impose.

**Section 26. Casing of new machinery.-**

1. In all machinery driven by power and installed in any factory after the commencement of this Act,-
    a. every set screw, bolt or key on any revolving shaft, spindle, wheel or pinion shall be so sunk, encased or otherwise effectively guarded as to prevent danger;
    b. all spur, worm and other toothed or friction gearing which does not require frequent adjustment while in motion shall be completely encased, unless it is so situated as to be as safe as it would be if it were completely encased.
2. Whoever sells or lets on hire or, agent of a seller or hirer, causes or procures to be sold or let on hire, for use in a factory any machinery driven by power which does not comply with the provisions of sub-section (1) or any rules made under sub-section (3), shall be punishable with imprisonment for a term which may extend to three months or with fine which may extend to five hundred rupees or with both.
3. The State Government may make rules specifying further safeguards to be provided in respect of any other dangerous part of any particular machine or class or description of machines.

**Section 27. Prohibition of employment of women and children near cotton-openers.-**

No woman or child shall be employed in any part of a factory for pressing cotton in which a cotton-opener is at work:

Provided that if the feed-end of a cotton-opener is in a room separated from the delivery end by a partition extending to the roof or to such height as the Inspector may in any particular case specify in writing, women and children may be employed on the side of the partition where the feed-end is situated.

**Section 28. Hoist and lifts**

1. In every factory-
    a. Every hoist and lift shall be good mechanical construction, sound material and adequate strength;
    b. properly maintained and shall be thoroughly examined by a competent person at least once in every period of six months, and a register shall be kept containing the prescribed particulars of every such examination;
    c. every hoist way and lift way shall be sufficiently protected by an enclosure fitted with gates, and the hoist or lift and every such enclosure shall be so constructed as to prevent any person or thing from being trapped between any part of the hoist or lift and any fixed structure or moving part;
2. The maximum safe working load shall be plainly marked on every hoist or lift, and no load greater than such load shall be carried thereon;
3. The cage of every hoist or lift used for carrying persons shall be fitted with a gate on each side from which access is afforded to a landing;
4. Every gate referred to in clause (b) or clause (d) shall be fitted with inter-locking or other efficient device to secure that the gate cannot be opened except when the cage is at the landing and that the cage cannot be moved unless the gate is closed.

The following additional requirements shall apply to hoists and lifts used for carrying persons and installed or reconstructed in a factory after the commencement of this Act, namely:-

a) where the cage is supported by rope or chain, there shall be at least two ropes or chains separately connected with the cage and balance weight, and each rope or chain with its attachments shall be capable of carrying the whole weight of the cage together with its maximum load;
b) Efficient devices shall be provided and maintained capable of supporting the cage together with its maximum load in the event of breakage of the ropes, chains or attachments;
c) An efficient automatic device shall be provided and maintained to prevent the cage from over-running.

The Chief Inspector may permit the continued use of a hoist or lift installed in a factory before the commencement of this Act which does not fully comply with the provisions of sub-section (1) upon such conditions for ensuring safety as he may think fit to impose.

The State Government may, if in respect of any class or description of hoist or lift, is of opinion that it would be unreasonable to enforce any requirements of sub-sections (1) and (2), by order direct that such requirement shall not apply to such class or description of hoist or lift.

Explanation.- For the purposes of this section, no lifting machine or appliance shall be deemed to be a hoist or lift unless it has a platform or cage, the direction or movement of which is restricted by a guide or guides.

**Section 29. Lifting machines, Chains, Ropes and Lifting tackles. -**

1. In any factory the following provisions shall be complied with in respect of every lifting machine (other than a hoist and lift) and every chain, rope and lifting tackle for the purpose of raising or lowering persons, goods or materials:-

a. all parts, including the working gear, whether fixed or movable, of every lifting machine and every chain, rope or lifting tackle shall be-

*(i)* good construction, sound material and adequate strength and free from defects;

*(ii)* properly maintained; and

*(iii)* Thoroughly examined by a competent person at least once in every period of twelve months, or at such intervals as the Chief Inspector may specify in writing, and a register shall be kept containing the prescribed particulars of every such examination;

b. no lifting machine and no chain, rope or lifting tackle shall, except for the purpose of test, be loaded beyond the safe working load which shall be plainly marked there on together with an identification mark and duly entered in the prescribed register; and where this is not practicable, a table showing the safe working load of every kind and size of lifting machine or chain, rope of lifting tackle in use, shall be displayed in prominent position on the premises;

c. while any person is employed or working on or near the wheel track of a travelling crane in any place where he would be liable to be struck by the crane, effective measures shall be taken to ensure that the crane does not approach within six meters of that place.

2. The State Government may make rules in respect of any lifting machine or any chain, rope or lifting tackle used in factories-

a. Prescribing further requirements to be compiled with in addition to those set out in this section;

b. Providing for exemption from compliance with all or any of the requirements of this section, where in its opinion, such compliance is unnecessary or impracticable.

3. For the purposes of this section a lifting machine or a chain, rope or lifting tackle shall be deemed to have been thoroughly examined if a visual examination supplemented, if necessary, by other means and by the dismantling of parts of the gear, has been carried out as carefully as the conditions permit in order to arrive at a reliable conclusion as to the safety of the parts examined.

Explanation.- In this section,-

a. "Lifting machine" means a crane, crab, winch, eagle, pully block, gin wheel, transporter or runway;

b. "lifting tackle" means any chain sling, rope sling, hook, shackle, swivel, coupling, socket, clamp, tray or similar appliance, whether fixed or movable, used in connection with the raising or lowering of persons, or loads by use lifting machines.

**Section 30. Revolving machinery –**

1. In every factory in which the process of grinding is carried on there shall be permanently affixed to or placed ear each machine in use a notice indicating the maximum safe working peripheral speed of every grindstone or abrasive wheel, the speed of the shaft or spindle upon which the wheel is mounted, and the diameter of the pulley upon such shaft or spindle necessary to secure such safe working peripheral speed.

2. The speeds indicated in notices under sub-section (1) shall not be exceeded.
3. Effective measure shall be taken in every factory to ensure that the safe working peripheral speed of every revolving vessel, cage, basket, flywheel pulley, disc or similar appliance driven by power is not exceeded.

**Section 31. Pressure plant. –**

1. If in any factory, any plant or machinery or any part thereof is operated at a pressure above atmospheric pressure, effective measures shall be taken to ensure that the safe working pressure of such plant or machinery or part is not exceeded.
2. The State Government may make rules providing for the examination and testing of any plant or machinery such as is referred to in sub-section (1) and prescribing such other safety measures in relation thereto as may in its opinion, be necessary in any factory or class or description of factories.
3. The State Government may, by rules, exempt, subject to such conditions as may be specified therein, any part of any plant or machinery referred to in sub-section (1) from the provisions of this section.

**Section 32. Floors, stairs and means of access. –**

**In every factory-**

a. all floors, steps, stairs, passengers and gangways shall be of sound construction, and properly maintained and shall be kept free from obstructions and substances likely to cause persons to slip and where it is necessary to ensure safety, steps, stairs, passages and gangways shall be provided with substantial handrails;
b. there shall, so far as is reasonably practicable, be provided, and maintained safe means of access to every place at which any person is at any time required to work;
c. when any person has to work at a height from where he is likely to fall, provision shall be made, so far as is reasonably practicable, by fencing or otherwise, to ensure the safety of the person so working.

**Section 33. Pits, sumps, openings in floors, etc. –**

1. In every factory every fixed vessel, sump, tank, pit or opening in the ground or in a floor which, by reason of its depth, situation, construction or contents, is or may be a source of danger, shall be either securely covered or securely fenced.
2. The State Government may, by order in writing, exempt, subject to such conditions as may be prescribed, any factory or class or description of factories in respect of any vessel, sump, tank, pit or opening from compliance with the provisions of this section.

**Section 34 Excessive weights -**

1. No person shall be employed in any factory to lift, carry or move any load so heavy as to be likely to cause him an injury.
2. The State Government may make rules prescribing the maximum weights which may be lifted, carried or moved by adult men, adult women, adolescents and children employed in factories or in any class or description of factories or in carrying on in any specified process.

**Section 35 Protection of eyes -**

In respect of any such manufacturing process carried on in any factory as may be prescribed, being a process which involves-

a. risk of injury to the eyes from particles or fragments thrown off in the course of the process, or

b. Risk to the eyes by reason of exposure to excessive light, the State Government may by rules require that effective screens or suitable goggles shall be provided for the protection of persons employed on, or in the immediate vicinity of, the process.

**Section 36 Precautions against dangerous fumes, gases, etc.-**

1. No person shall be required or allowed to enter any chamber, tank, vat, pit, pipe, flue or other confined space in any factory in which any gas, fume, vapour or dust is likely to be present to such an extent as to involve risk to persons being overcome thereby, unless it is provided with a manhole of adequate size or other effective means of egress.
2. No person shall be required or allowed to enter any confined space as is referred to in sub-section (1), until all practicable measures have been taken to remove any gas, fume, vapour or dust, which may be present so as to bring its level within the permissible limits and to prevent any ingress of such gas, fume, vapour or dust and unless-
    a. a certificate in writing has been given by a competent person, based on a test carried out by himself that the space is reasonably free from dangerous gas, fume, vapour or dust: or
    b. Such person is wearing suitable breathing apparatus and a belt securely attached to a rope the free end of which is held by a person outside the confined space.

**Section 36 A . Precautions regarding the use of portable electric light.-**

In any factory-

a. no portable electric light or any other electric appliance of voltage exceeding twenty-four volts shall be permitted for use inside any chamber, tank, vat, pit, pipe, flue or other confined space unless adequate safety devices are provided; and

b. if any inflammable gas, fume or dust is likely to be present in such chambers tank, vat, pipe, flue or other confined space, no lamp or light other than that of flame-proof construction shall be permitted to be used therein.

**Section 37. Explosive or inflammable dust, gas, etc. –**

Where in any factory any manufacturing process produces dust, gas, fume or vapour of such character and to such extent as to be likely to explode on ignition, all practicable measures shall be taken to prevent any such explosion by-

a. Effective enclosure of the plant or machinery used in the process;

b. Removal or prevention of the accumulation of such dust, gas, fume or vapour;

c. Exclusion or effective enclosure of all possible sources of ignition.

*1.* Where in any factory the plant or machinery used in a process such as is referred to in sub-section (1), is not so constructed as to withstand the probable pressure which such an explosion as aforesaid would produce, all practicable measures shall be taken to restrict the spread and effects of the explosion by the provision in the plant or machinery of chokes, baffles, vents or other effective appliances.

*2.* Where any part of the plant or machinery in a factory contains any explosive or inflammable gas or vapour under pressure greater than atmospheric pressure, that part shall not be opened except in accordance with the following provisions, namely:-

a. before the fastening of any joint of any pipe connected with the part or the fastening of the cover of any opening into the part is loosened, any flow of the gas or vapour into the part of any such pipe shall be effectively stopped by a stop-valve or other means;

b. Before any such fastening as aforesaid is removed, all practicable measures shall be taken to reduce the pressure of the gas or vapour in the part or pipe to a atmospheric pressure;

c. Where any such fastening as aforesaid has been loosened or removed effective measures shall be taken to prevent any explosive or inflammable gas or vapour from entering the part or pipe until the fastening has been secured, or, as the case may be, securely replaced:

Provided that the provisions of this sub-section shall not apply in the case of plant or machinery installed in the open air.

*3.* No plant, tank or vessel which contains or has contained any explosive or inflammable substance shall be subjected, in any factory, to any welding, brazing, soldering or cutting operation which involves the application of heat unless adequate measures have first been taken to remove such substance and any fumes arising there from or to render such substance and fumes non- explosive or non-inflammable and no such substance shall be allowed to enter such plant, tank or vessel after any such operation until the metal has cooled sufficiently to prevent any risk of igniting the substance.

***4.*** The State Government may by rules exempt, subject to such conditions as may be prescribed, any factory or class or description of factories from compliance with all or any of the provisions of this section.

**Section 38. Precautions in case of fire. –**

1. In every factory, all practicable measures shall be taken to prevent outbreak of fire and its spread, both internally and externally, and to provide and maintain-

   (a) Safe means of escape for all persons in the event of a fire, and

   (b) the necessary equipment and facilities for extinguishing fire.

2. Effective measures shall be taken to ensure that in every factory all the workers are familiar with the means of escape in case of fire and have been adequately trained in the routine to be following in such cases.

3. The State Government may make rules, in respect of any factory or class or description of factories, requiring the measures to be adopted to give effect to the provisions of sub-sections (1) and (2).

4. Notwithstanding anything contained in clause (a) of sub-section (1) or sub-section (2), if the Chief Inspector, having regard to the nature of the work

carried on in any factory, the construction of such factory, special risk to life or safety, or any other circumstances, is of the opinion that the measures provided in the factory, whether as prescribed or not, for the purposes of clause (a) of sub-section (1) or sub-section (2), are inadequate, he may, by order in writing, require that such additional measures as he may consider reasonable and necessary, be provided in the factory before such date as is specified in the order.

**Section 39 Power to require specifications of defective parts or tests of stability -**

If it appears to the Inspector that any building or part of a building or any part of the ways, machinery or plant in a factory is in such a condition that it may be dangerous to human life or safety, he may serve on the occupier or manager or both of the factory an order in writing requiring him before a specified date-

(a) to furnish such drawings, specifications and other particulars as may be necessary to determine whether such buildings, ways, machinery or plant can be used with safety, or

(b) to carry out such tests in such manner as may be specified in the order, and to inform the Inspector of the results thereof.

**Section 40. Safety of buildings and machinery. -**

(1) If it appears to the Inspector that any building or part of a building or any part of the ways, machinery or plant in a factory is in such a condition that it is dangerous to human life or safety, he may serve on the occupier or manager or both of the factory an order in writing specifying the measures, which in his opinion should be adopted and requiring them to be carried out before a specified date.

(2) If it appears to the Inspector that the use of any building or part of a building or any part of the ways, machinery or plant in a factory involves imminent danger to human life or safety he may serve on the occupier or manager or both of the factory an order in writing prohibiting its use until it has been properly repaired or altered.

**Section 40A. Maintenance of buildings. –**

If it appears to the Inspector that any building or part of a building in a factory is in such a state of disrepair as is likely to lead to conditions detrimental to the health and welfare of the workers, he may serve on the occupier or manager or both of the factory an order in writing specifying the measures which in his opinion should be taken and requiring the same to be carried out before such date as is specified in the order.

**Section 40B. Safety Officers. -**

(1) In every factory-

(i) Wherein one thousand or more workers are ordinarily employed, or

ii) wherein, in the opinion of the State Government, any manufacturing process or operation is carried on, which process or operation involves any risk of bodily injury, poisoning or disease or any other hazard to health, to the person employed in the factory, the occupier shall, if so required by the State Government by notification in Official Gazette, employ such number of Safety Officers as may be specified in that notification.

(2) The duties, qualifications and conditions of service of Safety Officers shall be such as may be prescribed by the State Government.

**Section 41. Power to make rules to supplement this Chapter. -**

The State Government may make rules requiring the provision in any factory or in any class or description of factories of such further devices and measures for securing safety of persons employed therein as it may deem necessary.

## 6.9 CASE STUDY

Vst Industries Canteen Workers' ... Vs Vazir Sultan Tobacco Co. Ltd. And ... on 30 October, 1995

Equivalent citations: 1995 (3) ALT 644, (1998) IIILLJ 450 AP

Author: M B Naik

Bench: M B Naik

JUDGMENT Motilal B. Naik, J.

1. This writ petition is filed by the VST Industries Canteen Workers' Union represented by its Secretary P. Navaneetham seeking a mandamus directing the first respondent to treat the members of the petitioner-Union who are the employees of the Canteen, established under Section 46 of the Factories Act by the first respondent, as the employees of the first respondent-Company and seeks a consequential direction to tender all monetary and other benefits accrued and acquired by treating them as employees of the first respondent.

2. The claim of the petitioner is that it is a union registered under Trade Unions Act vide. Regd. No. B. 1421 and by their resolution dated April 19, 1992 authorised the Secretary Sri P. Navaneetham to file the present writ petition seeking a direction to direct the respondents to treat the canteen workers and the members of the petitioners-Union numbering 65 (the said list is described in Annexure-I of the material papers) as the employees of the first respondent-Company.

3. It is stated that VST Company Limited, the first respondent herein, is a company engaged in the activity of manufacturing cigarettes since 1937 and is associated with ITC Limited. The respondent-Company employs nearly 2050 persons for the said activity of manufacturing cigarettes excluding the canteen staff. Section 46 of the Factories Act, a statutory requirement is to establish and maintain a canteen in the Factory premises for its employees. In fulfillment of the requirement contemplated under said Section 46 of the Factories Act, the First respondent has also established a canteen and is maintaining it within the factory premises. The first respondent had been managing the canteen upto the year 1982. After 1982, the first respondent-Company introduced the contract system for maintaining the canteen so established.

4. Presently, the canteen is run by the Blue Star Enterprises. It is stated that though the management of the canteen has been entrusted to the contractors from time to time, the personnel working in the canteen are retained by all these contractors and they have been paid the salaries through the Contractors. It is stated that the members of the petitioner-Union have been continued though the management of the canteen is entrusted to private contractors. They

have been tendered ESI benefits under the code number of VST and they have also been given EPF benefits under the Employees' Provident Funds Act under code number of VST. It is further stated that the contractors have not issued any appointment orders to the members of the petitioner-Union. The members of the petitioner-Union have also been issued identity cards by the Welfare Officer of VST which is renewable from year to year.

5. It is stated that the workmen employed by the first respondent for maintaining the canteen from 1937 till 1982 are adjusted in various departments by the first respondent. The respondent has five other associate units. In those units also, canteen is established and maintained by regular staff and they are all given all benefits excepting the members of the petitioner-Union working in VST Company Limited at Hyderabad. It is further stated that the salaries of the members of the petitioner-Union are paid through the Contractor and the same is also counter-signed by the nominee of the principal employer as required under the Factories Act.

6. It is further stated that the respondent-Company has provided building along with furniture, utensils, gas, electricity, water supply and other cutlery. The contractor is only instrumental in preparing the food and serving it to the employees. The rates of such items are also prescribed by the management. It is, in this background, stated that the contractor has no role to play and it is only the respondent-company which runs the canteen in fulfillment of the requirement contemplated under Section 46 of the Factories Act. It is, therefore, contended that the first respondent shall treat the members of the petitioner-Union as employees of the first respondent-Company and pay them regular salaries and other benefits as are-given to the other regular employees.

7. On behalf of the first respondent, a detailed counter has been filed, inter alia, contending that the requirement contemplated under Section 46 of the Factories Act is only to provide a canteen. There is no further requirement for managing the Canteen as contended by the Writ Petitioner. The first respondent also disown the claim of the members of the petitioner-Union that they have to be treated as employees of the first respondent. The company has categorically come out that the Canteen Workers are not the employees of the management as they are only appointed by the Contractor. The respondent-company deny the existence of any nexus with the employees working in the Canteen. It is further stated in the counter that the management of the canteen is entrusted to the Blue Star Enterprises and the salaries are also paid by the Blue Star Enterprises as they are engaged by the said Blue Star Enterprises and as such the respondent-Company cannot be held to be employer for the members of the petitioner-Union. It is also denied that the first respondent-Company has anything to do with I.T.C. Limited.

8. Apart from the main relief of treating the members of the petitioner-Union as employees of the first respondent-Company, the petitioner has also sought a direction to participate in the elections which were proposed to be held at the time of filing of the writ petition. However, in the interlocutory application, the relief of participation in the elections was denied to the petitioner-Union as by that time it was made known to the Court that elections were already completed.

9. I have heard both the learned counsel at considerable length.

10. The main grievance of Sri Subrahmanyam, counsel appearing for the petitioner-Union is that the members of the petitioner-Union are all engaged in the canteen established and managed by the first respondent-Company and as

such they are to be necessarily treated as employees of the first respondent and are entitled to seek regularization and payment of salaries on par with the other regular employees. It is contended by Sri Subrahmanyam, as required under Section 46 of the Factories Act, the management has to provide a canteen and maintain it for the benefit of the workers wherever the strength of the workers exceeds 250. It is stated that the first respondent-Company employs more than 2000 workers and therefore, the management has provided a canteen in fulfillment of a requirement contemplated under Section 46 of the Factories Act. Though the management of the canteen has been with the respondent-Company right from the time of its establishment, it is only from 1982 onwards, the respondent-Company entrusted the running of the Canteen to private Contractors on certain terms and conditions. Ail the Food items are provided at subsidized rates. Proper quantity and quality is also maintained. There is no change in the staff working in the canteen. The Contractor has not removed the existing workers. The entire system is continued as it is except change in the Contractor. The wages of the canteen-workers are paid through the contractor by the management. Some of the canteen workers in other units established by the respondent-Company have been accommodated in regular vacancies. However, the members of the petitioner-Union at Hyderabad unit have not been treated as regular employees of the respondent-Company and are not given other benefits which the other regular employees are getting. Entrustment of the management of the canteen to Contractor is only an internal arrangement between the first respondent-Company and the contractor and as such, the contractor has nothing to do with the workers who are in the canteen service.

11. On the contrary, it is the case of Sri K. Srinivasa Murthy, counsel appearing for the first respondent-Company that the writ petition itself is not maintainable as the respondent-Company is a management and no writ petition lies against it under Article 226 of the Constitution of India. This apart, it is contended that the canteen workers are appointed by the contractor and as such there is no nexus between the canteen workers and the regular employees appointed by the first respondent-Company. In this background, it is contended that the employees of the canteen cannot be equated as regular employees of the management and the relief sought in this Writ Petition cannot be granted. It is further contended by establishing a canteen by the management, the requirement contemplated under Section 46 of the Factories Act is fulfilled. There is no obligation to maintain the canteen by the respondent-Company. It is denied that the respondent-Company has to do anything with the V.S.T. Units.

12. The learned counsel for the petitioner-Union, in support of his contentions, has cited the following decisions in R.K. Panda v. Steel Authority of India (1997-III-LLJ-(Suppl.)-1207) (SC), A.P. Dairy Development Co-operative Federation Limited v. Shivadas Pillay (1992-I-LLJ-153) (AP), The Saraspur Mills Co. Ltd.

V. Ramanlal Chimanlal (1973-II-LLJ-130) (SC), S.D. Ramanadham v. I.D.P. L. Hyderabad 1983 (2) ALT (NRC) 49, Indian Explosives Limited v. State of U. P. (1981-I-LLJ-423) (All), M.M.R. Khan v. Union of India (1995-III-LLJ(Suppi.)-166).

13. Sri K. Srinivasa Murthy, learned counsel for the respondent-Company has also placed reliance on the following decisions in support of his contentions viz.,in Konaseema Co-operative Central Bank Ltd. v. N. Seetharama Raju AIR 1990 A.P, 171, B.H.E.L.Workers' Association v. Bharat Heavy Electricals

Karmachari Sangh and in Kanpur Suraksha Karmachari Union v. Union of India (1989-I-LLJ-26) (SC).

14. On the basis of the above contentions, two questions emerge for consideration before this Court, viz.

(1) Whether the writ petition is maintainable against the first respondent-Company and if so (2) Whether a mandamus could be issued directing the respondent-Company to treat the members of the petitioner-Union as its employees and tender all monetary benefits which are extended to the other regular employees under the respondent-Company?

15. As far as the preliminary objection as to the maintainability of the writ petition against the private management is concerned, this issue need not detain this Court any more in view of the dictum laid down by this Court in T. Gattaiah v. Commissioner of Labour (1981-TI-LLJ-54) (AP). In this case, establishment of a canteen and its maintenance is a statutory requirement provided under Section 46 of Chapter V of the Factories Act, 1948. Under the said Chapter V of the Factories Act, 1948, a public duty is imposed on the respondent-Company to establish and maintain the canteen. Since the members of the petitioner-Union are working in the canteen without being treated as regular employees of the respondent-Company, they are seeking a mandamus directing the first respondent-company to discharge a public duty imposed on it by the statute to treat them as its regular employees. I am therefore, of the view, that when a public duty called upon to be discharged by a private management, a writ of mandamus under Article 226 of the Constitution of India could be issued even against a private Management. In view of the said decision, the preliminary objection raised by. Sri K. Srinivasa Murthy, counsel for the respondent-Company is rejected. Therefore, I hold that the writ petition is maintainable against the first respondent-Company.

16. Coming to the crucial question as to whether the workers engaged in the canteen established under Section 46 of the Factories Act and maintained by the respondent are to be treated as employees of the respondent-Company, this aspect has been elaborately considered by the Supreme Court in Parimal Chandra Raha v. Life Insurance Corporation of India (1995-II-LLJ-339). The Supreme Court while considering the contentions of the canteen workers in the Life Insurance Corporation Office, examined various decisions in this regard with special reference to the implication of Sections 46 and 47 of the Factories Act, 1948 and formulated few issues to examine the claims as to whether canteen workers employed in a Company, which establishes and manages the said canteen as provided under Section 46 of the Factories Act could be treated as employees of the management/company and whether they are entitled to seek regular pay on par with the regular employees of the Company.

17. The Supreme Court in the said case cited supra, formulated the following issues:

i. Where, as under the provisions of the Factories Act, it is statutorily obligatory on the employer to provide and maintain canteen for the use of his employees, the canteen becomes a part of the establishment and, therefore, the workers employed in such canteen are the employees of the management.

ii. Where, although it is not statutorily obligatory to provide a canteen, it is otherwise an obligation on the employer to provide a canteen, the canteen becomes a part of the establishment and the workers working

in the canteen, the employees of the management. The obligation to provide a canteen has to be distinguished from the obligation to provide facilities to run canteen. The canteen run pursuant to the latter obligation does not become a part of the establishment.

iii. The obligation to provide canteen may be explicit or implicit. Where the obligation is not explicitly accepted by or cast upon the employer either by an agreement or an award etc. it may be inferred from the circumstances, that the provision of the canteen may be held to have become a part of the service conditions of the employees. Whether the provision for canteen services has become a part of the service conditions or not, is a question of fact to be determined on the facts and circumstances in each case.

Where to provide canteen services has become a part of the service conditions of the employees, the canteen becomes a part of the establishment and the workers in such canteen become the employees of the management.

iv. Whether a particular facility or service has become implicitly a part of the service conditions of the employees or not, will depend, among others, on the nature of the service facility, the contribution the service in question makes to the efficiency of the employees and the establishment, whether the service is available as a matter of right to all the employees in their capacity as employees and nothing more, the number of employees employed in the establishment and the number of employees who avail of the service, the length of time for which the service has been continuously available, the hours during which it is available, the nature and character of management, the interest taken by the employer in providing, maintaining, supervising and controlling the service, the contribution made by the management in the form of infrastructure and funds for making the service available etc."

18. The Supreme Court while keeping the above principles in view, examined the facts on hand and held that the employees working in the canteen of the Life Insurance Corporation Office are employees of Life Insurance Corporation and directed the Life Insurance Corporation to absorb them as regular employees and directed fixation of minimum wages.

19. Applying the test laid down by the Supreme Court in the above case, it is, now to be examined, whether the members of the petitioner-Union fulfill the criterion as laid down by the Supreme Court in the above case.

20. It is not disputed that under Section 46 of the Factories Act it is a statutory requirement, that every management where more than 250 employees are working, has to necessarily 1 establish and manage a canteen. Admittedly, in this case, the respondent-Company has engaged more than 2000 employees in the cigarette manufacturing process. The requirement under Section 46 of the Factories Act is applicable to the respondent-Company which mandates establishing and managing the canteen. It is evident from the pleadings that the management has provided a canteen within the premises of the factory and was maintaining the same upto the year 1982. It is only from 1982 onwards, the management of the canteen has been entrusted to a private contractor. The reasons set forth in the counter are that the canteen was run by the respondent-Company on its own by its own workers upto 1982. But, during that period, only snacks and tea were supplied. When supply of food was introduced with

effect from June 1, 1982, the respondent felt that preparation of food items is a skilled job of specialization which a regular worker would not do and hence, preparation and supply of food and other items was entrusted to a specialist so that not only better quality of food stuffs is supplied to the workers but also maintain industrial peace in the company.

Establishing and maintaining the canteen is a statutory requirement. By such establishment, the workers are provided with regulated quantity of food items at cheaper rates. Whether the management of the canteen is with the principal I employer or with the contractor, it does not matter as long as items are supplied at subsidized rates. The agreement is directly between the management and the contractor. No worker of the company or the union representing workers are party to the agreement. The Company reimburses the difference of costs between supply and production. The management also provides for running such a canteen, premises, furniture, electricity, water etc. for the Contractor.

21. The submission of Sri K. Srinivasa Murthy that the respondent-Company by providing a canteen has fulfilled the requirement contemplated under Section 46 of the Factories Act and there is no further obligation on the management to manage the canteen, cannot be accepted by this Court in view of the fact that providing facilities to the workers is an implicit obligation provided under the statute. Providing canteen, rest-house and recreation facilities to the workers are well recognized norms in the legislative enactment concerning the welfare of the workers employed in industrial establishments. Whether the canteen being run by the management or by any private contractor has no significance as long as the requirement of providing and managing the canteen remain in the statute. This aspect has been made clear by the Supreme Court in the (1995-II-LLJ-339) cited supra.

22. The specific case of the members of the petitioner-Union is that they have been continued as canteen workers irrespective of the change in the contractors from time to time. Their wages are paid by the management through the contractors. The respondent-Company has not placed any record to show that the wages to the members of the petitioner-Union are paid only by the contractor. The respondent-management has also not placed anything before this Court to show that they are not releasing any subsidy to the contractor for supplying the food items to the workers engaged in factory. It is not denied that the contractor is not provided with accommodation, furniture, water supply, electricity and cutlery etc. The contractor is required to maintain certain standard in the quality and quantity of the food items supplied to the employees engaged by the first respondent-Company. The rate on each item of supply is also settled. Therefore, it goes to show that the contractor is only an agent acting under the instructions and on an understanding-arrived at between the company and the contractor.

23. It is common knowledge that no contractor will supply the items at subsidized rates and incur loss unless he is compensated through agreed terms. The contractor is compensated by the Company on reimbursing the difference in rates by way of subsidy. Therefore, in reality, it is the management which is running the canteen through the contractor, in full filament of the statutory requirement provided under Section 46 of the Factories Act. It has been categorically stated by the members of the petitioner-Union that despite change in Contractors, the members of the petitioner-Union are continued to work in the canteen. It has further been stated that in the five other units under the same management employees working in the canteen have been accommodated

suitably in permanent vacancies by the management. In the counter filed by the first respondent at page-5, it is stated that "even if the allegation that canteen in five other manufacturing units of I.T.C. Company being run by regular staff, it has no relevance for the disposal of the present writ petition." This attempt seems to be to disown that first respondent-Company has nothing to do with I.T.C. I do (not sic.) think, this stand, in any way makes any difference while considering the question as to whether the members of the petitioner-Union are entitled to be treated as the employees of the company. When the contractor discharges his functions as per the agreed terms with the management, it cannot be said that contractor is an independent person and is employing his own workers in the canteen. Nothing is placed before this Court to justify the stand of the respondent in this direction. Therefore, it is hard to accept the submissions made on behalf of the management that the workers in the canteen are directly appointed by the contractor and their salaries are paid by the contractor alone. It is well known fact that in all these factories, food items in canteen are supplied on subsidized rates. The management would compensate the difference of amount by way of subsidy to the contractor. Unless, this nexus is denied by the respondent, it would be impossible to say that the employer has no say in the management of the canteen. I therefore, hold that the members of the petitioner-Union working in the canteen established by the first respondent-Company are the employees of the first respondent-Company only.

24. The petitioner-Union has sought for a mandamus to direct the respondent-management to treat the canteen employees as its regular employees and extend all benefits to them on par with its other regular employees. But these canteen workers are classified as cleaners, cooks, managers, servers etc. There is no difficulty in directing the respondent-Company to treat the members of the petitioner-Union as employees of the respondent-Company. However, difficulty would arise while directing payment of salaries to these canteen employees on par with other employees unless the categorization is completed. There are different categories of canteen workers such as General 1 Manager, Canteen Manager-cum-Salesman, Kitchen clerk, Canteen clerk, cook, bearer, water boy, sweeper etc. It is therefore, not possible for this Court to evaluate the work done by each of the categories. Hence, different service1 conditions will have to be prescribed for different categories. The canteen employees do get free tea, free food and other facilities and their hours of service are different. Therefore, taking all these aspects into consideration, the respondent-Company shall prescribe different service conditions to these canteen workers. While prescribing different categories and fixing wages for these different categories, the first respondent, if necessary, takes the assistance of the wage fixing Authority under the relevant Act. The entire exercise, in all probability, shall be completed within a period of six months from the date of receipt of a copy of this order. Once, the different categories, as indicated above, is prescribed and the pay structure is evolved, the members of the petitioner-Union who are canteen employees, are entitled for the difference of pay. However, the question is from which date the members of the petitioner-Union shall be deemed to have become the employees of the respondent-management and are entitled to the minimum salary and other benefits? In the decision of the Supreme Court (1995-II-LLJ-339) cited supra, it was held that the canteen employees shall be treated as employees of the Life Insurance Corporation from the date of filing of the writ petition. I am of the view, the memebrs of the petitioner-Union could be held to be regular employees of the first respondent-Company from the date of filing of the writ petition before this Court and they shall be paid the arrears of salaries and other monetary benefits

from the said date after adjusting the wages and other monetary benefits, if any, received from time to time. The years of continuous service put in by them even prior to the aforesaid dates as canteen workers shall, however, be taken into account for the purpose of calculating the retirement benefits.

25. It is further made clear that the above direction to treat the members of the petitioner-Union who are continuing as such as on today as regular employees of the respondent-Company is subject to the following conditions :

(a) that they were above the minimum and below the maximum age limit and medically fit as per the regulations of the respondent-Company as on the date of filing of the writ petition; and

(b) that on the date of filing of the writ petition before this Court, they had put in a minimum of three years continuous service as canteen workers in the canteen in question. For the purposes of calculating the said three years qualifying service and the retiral benefits, the service prior to the attainment of the minimum qualifying age under the respondent-Company shall be ignored.

26. The petitioner-Union has also sought a direction to permit them to participate in the election process. Since I have held that the members of the petitioner-Union are to be treated as employees of the respondent-management, and when once they are treated as employees of the respondent-management, they are entitled to other incidental benefits on par with other regular employees.

27. Though both the learned Counsel cited series of decisions in support of their rival contentions, in view of the Supreme Court decision (1995-II-LLJ-339) cited supra, I do not think it necessary to refer to all these decisions individually as the said decision of the Supreme Court covers the entire field of controversy raised in this writ petition.

28. Having regard to the above discussion, the writ petition is allowed in the above terms. No costs.

Questions :

1) State the basic amenities provided by the company to the canteen contractor?

2) Briefly explain the judgement.

**SAQ 3**

I. An incident can be called hazardous only when

a) Stressor has the potential to cause harm to humans and ecological systems

b) Poses threat to surrounding

c) Monitoring is failed

d) Outburst of chemicals

II. The purpose of risk management is to identify potential problems before they occur so that risk-handling activities may be planned. True or False

a) False

b) True

III. Hazard identification mainly focus on

a) Chemical source and concentration

b) Chemical exposure

c) Chemical analysis

d) Chemical pathway

IV. According to Hippocrates, the' humorous' impacted on health status in what way?

a) They were affected by dietary factors

b) They were linked to personality

c) They were affected by seasonal change

d) All of the above

## 6.10 LET US SUM UP

In general terms, the word 'hazardous' means 'dangerous'. If we talk about the dangerous or hazardous processes then it means the processes which may cause damage to life or health. This topic is very important in the context of factories due to the main involvement of big pieces of machinery in production. This section states that every occupier of a factory involving any hazardous process should: accurately maintain the health and medical records of all the workers in a factory. It is mainly for those workers who are working in the manufacturing of toxic or harmful substances.

## 6.11 KEY WORDS

Hazardous Process, health, hazard identification, exposure assessment, toxicity assessment, risk characterization, risk- handling activities.

## 6.13 ANSWER TO SAQ'S

**SAQ 1.**

I (d) All of the above.

II. (c) Toxicity assessment.

III. (d) Estimation of risk.

**SAQ 2.**

I (b) False.

II. (c) To know the probable source and causes of contamination on site.

III. (a) To evaluate hazard and minimize the risks.

IV. (b) Hazard identification.

**SAQ 3**

I. (a) Stressor has the potential to cause harm to humans and ecological systems.

II. (b) True.

III. (a) Chemical source and concentration

IV. (d) all of the above.