Government of Karnataka
Department of Factories, Boilers, Industrial Safety & Health

Standard Operating Procedures (SOPs) for safe operations on hazardous/dangerous manufacturing process

I. Manufacture of aerated water and processes incidental thereto.
II. Electrolytic plating or oxidation of metal articles by use of an electrolyte containing acids, bases or salts of metals such as Chromium, Nickel, Cadmium, Zinc, Copper, Silver, Gold, etc.
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IV. Glass Manufacture.
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XIV. Handling and processing of asbestos, manufacture of any article of asbestos and any other process of manufacture or otherwise in which asbestos is used in any form.
XV. Handling or manipulation of corrosive substances.
XVI. Compression of oxygen and hydrogen produced by the electrolysis of water.
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XVIII. Manufacture of manipulation of manganese and its compounds.
XIX. Manufacture or manipulation of dangerous pesticides.
XX. Manufacture, handling and usage of benzene and substances containing benzene.
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XXVIII. Textile machinery except used in jute mills
XXIX. Cotton Ginning
XXX. Wood working machinery
XXXI. Rubber Mills
XXXII. Centrifugal Machines
XXXIII. Power Press
XXXIV. Shears, Slitter and Guillotine Machines

(I)

Standard Operating Procedures for

Manufacture of aerated waters and processes incidental thereto

1. **Fencing of Machines:-** All machines for filling bottles or syphons shall be so constructed, placed or fenced, as far as may be practicable, a fragment of a bursting bottle or syphon from striking any person employed in the factory.

2. **Face guards and gauntlets:-**

    1) The occupier shall provide and maintain in good condition for the use of all persons engaged in filling bottles or syphons,

        a) suitable face guards to protect the face, neck and throat; and
        b) suitable gauntlets, for both arms to protect the whole hand and arms:

    Provided that the provisions of this sub-paragraph (a) (1) shall not apply where bottles are filled by means of an automatic machine so constructed that no fragment of a bursting bottle can escape:

    Provided further that where a machine is so constructed that only one arm of the bottle at work upon it is exposed to danger, a gauntlet need not be provided for the arm which is not exposed to danger.

    2) The occupier shall provide and maintain in good condition for the use of all persons engaged in corking, crowning, screwing, wiring, foiling, capsuling, sighting or labelling bottles or syphons;

        a) suitable face guards to protect the face, neck and throat; and
        b) suitable gauntlets, for both arms to protect the arm and at least half of the palm and the space between the thumb and forefinger.

3. **Wearing of face guards and gauntlets:-** All Persons engaged in any of the processes specified in paragraph 2 of this schedule shall, while at work in such processes, wear the face guards and gauntlets provided under the provisions of the said paragraph.

(II)

Standard Operating Procedures for

Electrolytic plating or oxidation of metal articles by use of an electrolyte containing acids, bases or salts of metals such as Chromium, Nickel, Cadmium, Zinc, Copper, Silver, Gold, etc.

1. **Definitions:-**

   a) **"Electrolytic process"** means the electrolytic plating or oxidation of metal articles by the use or an electrolyte containing acids, bases or salts of metals such as chromium, nickel, cadmium, zinc, copper, silver, gold, etc.

   b) **"Bath"** means any vessel used for an electrolytic process or for any subsequent process; and

   c) **"Employed"** means employed in any process involving contact with liquid from a bath.

2. **Exhaust draught:-** An efficient exhaust draught shall be applied to every vessel in which an electrolytic process is carried on. Such draught shall be provided by mechanical means and shall operate on the vapour or spray given off in the process as near as may be at the point of origin. The exhaust draught appliance shall be so constructed, arranged and maintained as to prevent the vapour or spray entering into any room or place in which work is carried on.

3. **Prohibition relating to women and young persons:-** No women, adolescent or child shall be employed or permitted to work at a bath.

4. **Floor of work rooms:-** The floor of every work room containing a bath shall be impervious to water. The floor shall be maintained in good and level condition shall be washed down at least once a day.

5. **Protective devices:-**

   1) The occupier shall provide and maintain in good and clean condition the following articles of protective devices for the use of all persons employed on any process at which they are liable to come in contact with liquid from a bath and such devices shall be worn by the persons concerned;

      a) Waterproof aprons and bibs; and
      b) For persons actually working at a bath, loose fitting rubber gloves and rubber boots or other waterproof footwear, and chemical goggles.

   2) The occupier shall provide and maintain for the use of all persons employed suitable accommodation for the storage and drying of protective devices.

6. **Water facilities:-**

   1) There shall be provided and maintained in good repairs for the use of all persons employed in electrolytic process and processes incidental to it:—

      a) A wash place under cover, with either—
         i. a trough with a smooth impervious surface filled with a waste pipe, and of sufficient length to allow at least 60 cms., for every 5 persons employed at any one time, and having a constant supply of water from taps or jets above the trough at intervals or not more than 60 cms., or
         ii. at least one wash basin for every five such persons employed at any one time, fitted with a waste pipe and having a constant supply of water laid on.

      b) Sufficient supply of clean towels renewed daily, and soap or other suitably cleaning material.

2) In addition to the facility in sub-paragraph 1, an approved type of emergency shower with eye fountain shall be provided and maintained in good working order. Wherever necessary, in order to ensure continuous water supply, storage tank of 1500 litres capacity shall be provided as a source of clean water for emergency use.

7. **Cautionary Placard:-** A cautionary placard in the form specified below and printed in the language of the majority of the workers employed shall be affixed in a prominent place in the factory where it can be easily and conveniently read by the workers.

Cautionary Notice

Electrolytic Plating

i. Chemicals handled in this plant are corrossive and poisonous.
ii. Smoking, chewing tobacco, eating food or drinking, in this area is prohibited.
iii. Some of these chemicals may be absorbed through the skin and may cause poisoning.
iv. A good wash shall be taken before meals.
v. Protective devices supplied shall be used while working in this area.
vi. Spillage of the chemicals on any part of the body or on the floor shall be immediately
washed away with water.
vii. All workers shall report for the prescribed medical tests regularly to protect their own health.

8. **Medical facilities and records of examinations and tests:-**

1) The occupier of every factory in which electrolytic processes are carried on shall—

a) Employ a qualified medical practitioner for medical surveillance of the workers employed therein whose appointment shall be subject to the approval of the Chief Inspector of Factories;

b) Provide to the said medical practitioner all the necessary facilities for the purpose referred to in clause (a) and;

c) Maintain a sufficient supply of suitable barrier cream, ointment and impermeable water proof plaster in a separate box readily accessible to the workers and used solely for the purpose of keeping these substances. In case cyanides are used in the bath, the box shall also contain an emergency cyanide kit.

2) The medical practitioner shall examine all workers before they are employed in electrolytic processes. Such examination in case of chrome plating shall include inspection of hands, forearms and nose and will be carried out once at least in every fortnight.

3) The record of the examinations referred to in sub-paragraph (2) shall be maintained in a separate register approved by the Chief Inspector of Factories which shall be kept readily available for inspection by the Inspector.

9. **Medical examination by the Certifying Surgeon:-**

1) Every worker employed in the electrolytic processes shall be examined by a Certifying Surgeon before his first employment. Such examination shall include X-ray of the chest and—

a) in case of chromium plating include examination for nasal septum perforation and test for chromium in urine;

b) in case of nickel plating, test for nickel in urine; and

c) in case of cadmium plating, test for cadmium in urine and 2 micro-globulin in urine.

2) No worker shall be employed in any electrolytic processes unless certified fit for such employment by the Certifying Surgeon.

3) Every worker employed in the electrolytic processes shall be re-examined by a Certifying Surgeon at least once in every year, except in case of the workers employed in cadmium, chromium and nickel plating processes for whom this examination shall be carried out once in every six months. Such re-examination shall, wherever the Certifying Surgeon considers appropriate, include tests as specified under sub-paragraph (1) excluding the X-ray of the chest which shall not be required normally to be carried out earlier than once in three years.

4) The Certifying Surgeon after examining a worker shall issue a Certificate of Fitness in rorm-4. The record of examination and re-examinations carried out shall be kept in the custody of the manager of the factory. The record of each examination carried out under sub-paragraphs (1) and (2), including the nature and the results of the tests, shall also be entered by the Certifying Surgeon in a health register in Form 16.

5) The Certificate of Fitness and the health register shall be kept readily available for inspection by the Inspector.

6) If at any time the Certifying Surgeon is of the opinion that a worker is no longer fit for employment in the electrolytic processes on the ground that continuance therein would involve danger to the health of the worker, he shall make a record of his findings in the said certificate and the health register. The entry of his findings in those documents should also include the period for which he considers that the said person is unfit for work in the said processes. The person declared unfit in such circumstances shall be provided with alternate placement facility unless he is fully incapacitated in the opinion of the Certifying Surgeon, in which case the person affected shall be suitably rehabilitated.

7) No person who has been unfit to work as said in sub-paragraph (6) shall be re-employed or permitted to work in the said processes unless the Certifying Surgeon, after further examination, again certifies him fit for employment in those processes.

(III)

Standard Operating Procedures for
Manufacture and repair of electric accumulators

1. **Savings:-** This shall not apply to the manufacture or repair of electric accumulators or parts thereof not containing lead or any compound of lead or to the repair on the premises of any accumulator forming part of a stationary battery.

2. **Definitions:-**

    a) "first employment" means first employment in a lead process in a factory or workshop and also re-employment there in a lead processes following any cessation of employment in such process for a period exceeding three calendar months;

    b) "lead process" means melting of lead or any material containing lead, casting, pasting, lead burning, or any other work including, trimming or any other abrading or cutting of pasted plates involving the use, movement or manipulation of, or contact with, any oxide of lead;

    c) "manipulation of raw oxide of lead" means any lead process involving any manipulation or movement of raw oxides of lead other than its conveyance in a receptacle or by means of an implement from one operation to another.

3. **Prohibition relating to women and young persons:-** No women or young person shall be employed or permitted to work in any lead process or in any room in which the manipulation of raw oxide of lead or pasting is carried on.

4. **Separation of certain processes:-** Each of the following processes shall be carried on in such a manner and under such conditions as to secure effectual separation from one another, and from any other processes, namely:—

    a) manipulation of raw oxide of lead;
    b) pasting;
    c) drying of pasted plates;
    d) formation with lead burning (tacking) necessarily carried on in connection therewith; and
    e) melting down of pasted plates.

5. **Air space:-** In every room in which a lead process is carried on, there shall be at least 14.2 cubic metres of air space for each person employed therein, and in computing this air space no height over 3.65 metres shall be taken into account.

6. **Ventilation:-** Every work room shall be provided with inlets and outlets of adequate size as to secure and maintain efficient ventilation in all parts of the room.

7. **Distance between workers in pasting room:-** In every pasting room the distance between the centre of the working position of one paster and that of the other paster working nearest to him shall not be less than 1.5 metres.

8. **Floor or workrooms:-**
    1) The floor of every room in which lead process is carried on shall be—

        a) of cement or similar material so as to be smooth and impervious to water;

        b) maintained in sound condition; and

        c) kept free from materials, plant or other obstruction not required for, or produced in the process carried on in the room.

2) In all such rooms other than grid casting shops the floor shall be cleaned daily after being thoroughly sprayed with water at a time when no other work is being carried on in the room.

3) In grid casting shops the floor shall be cleaned daily.

4) Without prejudice to the requirements of sub-paragraphs (1), (2) and (3) where manipulation of raw oxide of lead or pasting is carried on, the floor shall also be—

a) kept constantly moist while work is being done;
b) provided with suitable and adequate arrangements for drainage; and
c) thoroughly washed daily by means of a hose pipe.

9. **Work-benches:-** The work-benches at which any lead process is carried on shall—

a) have a smooth surface and be maintained in sound condition; and
b) to be kept free from all materials or plant not required for or produced in, the process carried on thereat; and all such work-benches other than those in grid casting shops, shall—
c) be cleaned daily either after being thoroughly damped or by means of a suction cleaning apparatus at a time when no other work is being carried on thereat; and all such work-benches in grid casting shops, shall—
d) be cleansed daily, and every work-bench used for pasting shall—
e) be covered throughout with sheet lead or other impervious material;
f) be provided with raised edges; and
g) be kept constantly moist while pasting is being carried on.

10. **Exhaust draught:-**

1) The following processes shall not be carried on without the use of an efficient exhaust draught, namely-

a) melting of lead or materials containing lead;
b) manipulation of raw oxide of lead, unless done in an enclosed apparatus so as to prevent the escape of dust into the workroom;
c) pasting;
d) trimming, brushing, filing or any other abrading or cutting of pasted plates giving rise to dust; and
e) lead burning, other than—

i. tacking in the formation room; and
ii. chemical burning for the making of lead lining for cell cases necessarily carried on in such a manner that the application of efficient exhaust is impracticable.

2) Such exhaust draught shall be effected by mechanical means and shall operate on the dust or fume given off as nearly as may be at its point of origin, so as to prevent it entering the air of any room in which persons work.

11. **Fumes and gases from melting pots:-** The products of combustion produced in the heating of any melting pot shall not be allowed to escape into a room in which persons work.

12. **Container for dross:-**A suitable receptacle with tightly fitting cover shall be provided and used for dross as it is removed from every melting pot. Such receptacle shall be kept covered while in the workroom, except when dross is being deposited therein.

13. **Container for lead waste:-** A suitable receptacle shall be provided in every workroom in which old plates and waste material which may give rise to dust shall be deposited.

14. **Racks and shelves in drying room:-**

1) The racks or shelves provided in any drying room shall not be more than 2.4 metres from the floor nor more than 60 centimetres in width:

Provided that as regards racks or shelves set or drawn from both sides the total width shall not exceed 120 centimetres.

2) Such racks or shelves shall be cleaned only after being thoroughly damped unless an efficient suction cleaning apparatus is used for this purpose.

15. **Protective clothing:-**

1) Protective clothing shall be provided and maintained in good repair for all persons employed in—

a) manipulation of raw oxide of lead;
b) pasting; and
c) the formation room;
and such clothing shall be worn by the persons concerned.

2) The protective clothing shall consist of a waterproof apron and waterproof footwear and in addition, as regards persons employed in the manipulation of raw oxide of lead or in pasting, head coverings. The head coverings shall be washed daily.

16. **Messroom:-** There shall be provided and maintained for the use of all persons employed in a lead process and remaining on the premises during the meal intervals, a suitable messroom which shall be furnished with sufficient tables and benches and adequate means for warming food. The messroom shall be placed under the charge of responsible person and shall be kept clean.

17. **Cloakroom:-** There shall be provided and maintained for the use of all persons employed in a lead process:

a) a cloakroom for clothing put off during working hours with adequate arrangements for drying the clothing 2 wet, which accommodation shall be separate from any messroom; and

b) separate and suitable arrangements for the storage of protective clothing provided under paragraph 15.

18. **Washing facilities:-**

1) There shall be provided and maintained in a cleanly state and in good repair for the use of all persons employed in a lead process—

a) a wash place under cover with either,

i. a trough with a smooth impervious surface fitted with a waste pipe without plug of sufficient length to allow at least 60 centimetres for every five such persons employed at any one time and having a constant supply or water from taps or jets above the trough at intervals of not more than 60 centimetres; or

ii. at least one wash basin for every five such persons employed at any one time, fitted with a waste pipe and plug and having constant supply of water laid on;

b) a sufficient supply of dean towels made of suitable materials renewed daily, which supply, in the case of pasters and persons employed in the manipulation of raw oxide of lead, shall include a separate marked towel for each such worker; and

c) a sufficient supply of soap or other suitable cleansing material arid of nail brushes.

2) There shall in addition, be provided means of washing in close proximity to the rooms in which manipulation of raw oxide of lead or pasting is carried on if required by notice in writing from the Chief Inspector.

19. **Time to be allowed for washing:-** Before each meal and before the end of the days work at least ten minutes, in addition to the regular meal times, shall be allowed for washing to each person who has been employed in the manipulation of raw oxide of lead or in pasting:

Provided that if there be one basin or 60 centimetres of trough for each such person this paragraph shall not apply.

20. **Facilities for bathings:-** Sufficient bath accommodation to the satisfaction of the Chief Inspector shall be provided for all persons engaged in the manipulation of raw oxide or lead or in pasting and a sufficient supply of soap and clean towels.

21. **Food, drinks etc., prohibited in work rooms:-** No food, drink, pan and supari or tobacco shall be consumed or brought by any worker into any workroom in which any lead process is carried on.

22. **Medical facilities and records of the examinations and tests:-**

1) The occupier of every factory in which manufacture and repair of electric accumulators is carried on shall—

a. employ a qualified medical practitioner for medical surveillance or the workers employed therein whose employment shall be subject to the approval of the Chief Inspector; and

b. provide to the said medical practitioner all the necessary facilities for the purpose referred to in clause (a).

2) The record of medical examinations and appropriate tests carried out by the said medical practitioner shall be maintained in a separate register approved by the Chief Inspector which shall be kept readily available for inspection by the Inspector.

22A. **Medical examination by Certifying Surgeon:—**

1) Every worker employed in lead process shall be examined by a Certifying Surgeon within 15 days of his first employment. Such examination shall include tests for lead in urine and blood, ALA in urine, hemoglobin content, stippling of cells and steadiness tests. No worker shall be allowed to work after 15 days of his first employment in the factory unless certified fit for such employment by the Certifying Surgeon.

2) Every worker employed in the set process shall be re-examined by a Certifying Surgeon at least once in every three calendar months. Such re-examination shall, wherever the Certifying Surgeon considers appropriate, include tests specified in sub-paragraph (1).

3) The Certifying Surgeon shall after examining a worker, issue a certificate of fitness in Form 4. The record of the examination and re-examination carried out shall be entered in the certificate and the certificate shall be kept in the custody of the Manager of the Factory. The record of each examination and re-examination carried out under sub-paragraphs (1) and (2) respectively, including the nature and the results of the tests, shall also be entered by the Certifying Surgeon in a health register in Form 16.

4) The Certificate of Fitness and the Health register shall be kept readily available for inspection by the Inspector.

5) If at any time the Certifying Surgeon is of the opinion that a worker is no longer fit for employment in the said process on the ground that continuance therein would involve special danger to the health of the worker he shall make a record of his findings to the set certificate and the health register. The entry of his findings in those documents should also include the period for which he considers that the said person is unfit for work in the said processes.

   The person so suspended from the process shall be provided with alternate placement facilities unless he is fully incapacitated in the opinion of the Certifying Surgeon, in which case the person affected shall be suitably rehabilitated.

6) No person who has been found unfit to work under above sub-paragraph shall be re-employed or permitted to work in the said processes unless the Certifying Surgeon, after further examination, again certifies him fit for employment in those processes.

(IV)
Standard Operating Procedures for Glass Manufacture

1. **Definitions:-**

   a) **"efficient exhaust draught"** means localised ventilation effected by mechanical means for the removal of gas, vapour, dust or fumes so as to prevent them (as far as practicable under the atmospheric conditions usually prevailing) from escaping into the air or any place in which work is carried on. No draught shall be deemed efficient which fails to remove smoke generated at the point where such gas, vapour, fume or dust originate;

   b) **"lead compound"** means any compound of lead other than galena which when treated in the manner described below, yields to an aqueous solution of hydrochloric acid a quantity of soluble lead compound exceeding, when calculated as lead mono-oxide, five percent of the dry weight of the portion taken for analysis. The method of treatment shall be as follows:

   A weighted quantity of the material which has been dried at 100 degrees centigrade and thoroughly mixed shall be continuously, shaken for one hour at the common temperature with 1,000 times its weight of an aqueous solution of hydro-chloric acid containing 0.25 per cent by weight of hydrogen chloride. This solution shall thereafter be allowed to stand for one hour and then filtered. The lead salt contained in the clear filterate shall then be precipitated as lead sulphide and weighed as lead sulphate.

2. **Exhaust draught:-** The following processes shall not be carried on except under efficient exhaust draught or such other conditions as may be approved by the Chief Inspector, namely:—

   a. the mixing of raw materials to form a "batch";

   b. the dry grinding, glazing, and polishing of glass or any article of glass;

   c. all processes in which hydrofluoric acid fumes or ammonical vapours are given off;

   d. all processes in the making of furnace moulds or pots including the grinding or crushing or used "pots"; and

   e. all processes involving the use of a dry lead compound.

3. **Prohibition relating to women and young person:-** No woman or young person shall be employed or permitted to work in any of the operations specified in paragraph 2 or at any place where such operations are carried on.

4. **Floor and work-benches:-** The floor and work-benches of every room in which a dry compound of lead is manipulated or in which any process is carried on giving off silica dust shall be kept moist and shall comply with the following requirements namely—

   a) the floor shall be,

      i. of cement or similar material so as to be smooth and impervious to water;

      ii. maintained in sound condition; and

      iii. cleansed daily after being thoroughly spread with water at a time when no other work is being carried on in the room; and

   b) the work-benches shall,

      i. have a smooth surface and be maintained in sound condition, and

ii. cleansed daily either after being thoroughly damped or by means of a suction cleaning apparatus at a time when no other work is being carried on thereat.

5. **Use of hydroflouric acid:-** The following provisions shall apply to rooms in which glass is treated with hydroflouric acid, namely—

   a) there shall be no inlets and outlets of adequate size so as to secure and maintain efficient ventilation in all parts of the room;

   b) the floor shall be covered with guttaparcha and be tight and shall slope gently down to a covered drain;

   c) the workplaces shall be so enclosed in projecting hoods that openings required for bringing in the objects to be treated shall be as small as practicable; and

   d) the efficient exhaust draught shall be so contrived that the gases are exhausted downwards.

6. **Storage and transport of hydroflouric acid**:- Hydrofluoric acid shall not be stored or transported except in cylinders or receptacles of lead or rubber.

7. **Blow pipes:-** Every glass blower shall be provided with a separate blow pipe bearing the distinguishing mark of the person to whom it is issued and suitable facilities shall be readily available to every glass blower for sterlising his blow pipe.

8. **Food, drinks, etc., prohibited in workrooms:-** No food, drink, pan and supari or tobacco shall be brought into or consumed by any worker in any room or workplace where in any process specified in paragraph 2 is carried on.

9. **Protective clothing:-** The occupier shall provide and maintain in good repair and keep in a clean condition for the use of all persons employed in the processes specified in paragraph 2 suitable protective clothing, footwear and goggles according to the nature of the work and such clothing, footwear and goggles shall be worn by the persons concerned.

10. **Washing facilities:-** There shall be provided and maintained in a cleanly state and in good repair for the use of all persons employed in the processes specified in paragraph 2:

    a) a wash place with either—

       i. a trough with a smooth impervious surface fitted with a waste pipe, without plug and of sufficient length to allow of at least 60 centimetres for every five such persons employed at any one time, and having a constant supply of water from taps or jets above the trough at intervals of not more than 60 centimetres; or

       ii. at least one wash basin for every five persons employed at any one time, fitted with a waste pipe and plug and having an adequate supply of water laid on or always readily available;

    b) a sufficient supply of clean towels made of suitable material renewed daily with a sufficient supply of soap or other suitable cleansing material and of nail brushes; and

    c) a sufficient number of stand pipes with taps the number and location of which shall be to the satisfaction of the Chief Inspector.

11. **Medical facilities and record of examination and tests:-**

1) The occupier of every factory in which glass manufacturing processes are carried out, shall—

a) employ a qualified medical practitioner for medical surveillance of the workers employed therein whose appointment shall be subject to the approval of the Chief Inspector; and

b) provide to the said medical practitioner all the necessary facilities for the purpose referred to in clause (a)

2) The records of medical examinations and appropriate tests carried out by the said medical practitioner shall be maintained in a separate register approved by the Chief Inspector which shall be kept readily available for inspection by the Inspector.

12. **Medical Examination by Certifying Surgeon:-**

1) Every worker employed in processes specified in paragraph 2 shall be examined by a Certifying Surgeon within 15 days of his first employment. Such examination shall include pulmonary function tests and in suspected cases chest X-ray as well as tests for lead and urine. No worker shall be allowed to work after 15 days of his first employment in the factory unless certified fit for such employment by the Certifying Surgeon.

2) Every worker employed in the said processes shall be re-examined by a Certifying Surgeon at least once in every twelve calendar months. Such re-examination shall, wherever the Certifying Surgeon considers appropriate, include tests as specified in sub-paragraph (1).

3) The Certifying Surgeon shall after examining a worker, issue a Certificate of Fitness in Form 4.The record of examination and re-examinations carried out shall be entered in the certificate and the certificate shall be kept in the custody of the Manager of the factory. The record of each examination and re-examination carried out under sub-paragraphs (1) and (2) respectively including the nature and the results of the tests, shall also be entered by the Certifying Surgeon in a health register in Form 16.

4) The Certificate of Fitness and the health register shall be kept readily available for inspection by the Inspector.

5) If at any time the Certifying Surgeon is of the opinion that a worker is no longer fit for employment in the said processes on the ground that continuance therein would involve special danger to the health of worker, he shall make a record of his findings in the said Certificate and the health register. The entry of his findings in those documents should also include the period for which he considers that the said person is unfit to work in the said processes.

The person so suspended form the process shall be provided with alternate placement facilities unless he is fully incapacitated in the opinion or the Certifying Surgeon, in which case the person affected shall be suitably rehabilitated.

6) No person who has been found unfit to work under sub-paragraph (5) shall be re-employed or permitted to work in the said processes unless the certifying Surgeon, after further examination, again certifies him fit for employment in those processes.

13. **Exemption:-** If the Chief Inspector is satisfied in respect of any factory or any class of process that owing to the special methods of work or the special conditions in a factory or otherwise any of the requirements of this schedule can be suspended or relaxed without danger to the persons employed therein, or that the application of this schedule

or any part thereof is for any reason impracticable, he may by certificate in writing authorise such suspension or relaxation as may be indicated in the certificate for such period and on such conditions as he may think fit.

(V)

Standard Operating Procedures for

Grinding or glazing of metals and processes incidental thereto

1. **Exception:-**

   1) Nothing in this shall apply to any factory in which only repairs are carried on except any part thereof in which one or more persons are wholly or mainly employed in the grinding or glazing of metals.

   2) Nothing in this except paragraph 4 shall apply to any grinding or glazing or metals carried on intermittently and at which no person is employed for more than 12 hours in any week.

2. **Definitions:-**

   i. **"abrasive wheel"** means a wheel manufactured of bonded emery or similar abrasive;

   ii. **"glazing"** means the abrading, polishing or finishing by aid of mechanical power, of metal, by means or any wheel, buff, mop or similar appliance to which any abrading or polishing substance is attached or applied;

   iii. **"grinding"** means the abrasion by aid of mechanical power, of metal, by means of a grindstone or abrasive wheel;

   iv. **"grindstone"** means grindstone composed of natural or manufactured sandstone but does not include a metal wheel or cylinder into which blocks of nature of manufactured sandstone are fitted;

   v. **"hacking"** means the chipping of the surface of a grindstone by a hack or similar tool; and

   vi. **"racing"** means the turning up, cutting or dressing of a revolving grind stone before it is brought into use for the first time; and

   vii. **"rodding"** means the dressing of the surface of a revolving grindstone by the application of a rod, bar or strip of metal to such surface.

3. **Equipment for removal of dust:-** No racing, dry grinding or glazing shall be performed without —

   a) a hood or other appliance constructed, arranged, placed and maintained as substantially to intercept the dust thrown off;

   b) a duct of adequate size, air tight and so arranged as to be capable of carrying away the dust, which duct shall be kept free from obstruction and shall be provided with proper means of access for inspection and cleaning, and where practicable, with a connection at the end remote from the fan to enable the Inspector to attach thereto any instrument necessary for ascertaining the pressure of air in the said duct; and

   c) a fan or other efficient means of producing a draught sufficient to extract the dust:

   Provided that the Chief Inspector may accept any other appliance that is in his opinion, is as effectual for the interception, removal and disposal of dust thrown off as a hood, duct and fan would be.

4. **Restriction on employment on grinding operations:-**

Not more than one person shall at any time perform the actual process of grinding or glazing upon a grindstone, abrasive wheel or glazing appliance:

Provided that this paragraph shall not prohibit the employment of persons to assist in the manipulation of heavy or bulky articles at any such grindstone, abrasive wheel or glazing appliance.

5. **Glazing:-** Glazing or other processes, except processes incidental to wet grinding upon a grindstone shall not be carried on in any room in which wet grinding upon a grindstone is done.

6. **Hacking and rodding:-** Hacking or rodding shall not be done unless during the process either an adequate supply of water is laid on at the upper surface of the grindstone or adequate appliances for the interception of dust are provided in accordance with the requirements of paragraph 3.

7. **Examination of dust equipment:-**

    1) All equipment for the extraction or suppression of dust shall at least once in every 6 months be examined and tested by a competent person, and any defect disclosed by such examinations and tests shall be rectified as soon as practicable.

    2) A register containing particulars of such examinations and tests shall be kept in Form No. 25

8. **Medical facilities and Record of examinations and tests:-**

    1) The occupier of every factory in which grinding or glazing of metals are carried out, shall—

        a) Employ a qualified medical practitioner for medical surveillance of the worker employed therein whose appointment shall be subject to the approval of the Chief Inspector; and

        b) provide to the said medical practitioner all the necessary facilities for the purpose referred to in clause (a).

    2) The record of medical examinations and appropriate tests carried out by the said medical practitioner shall be maintained in a separate register approved by the Chief Inspector, which shall be kept readily available for inspection by the Inspector.

9. **Medical Examination by Certifying Surgeon:-**

    1) Every worker employed in grinding or glazing or metal and processes incidental thereto shall be examined by a Certifying Surgeon within 15 days of his first employment. Such examination shall include pulmonary function tests and in suspected cases chest X-rays. No worker shall be allowed to work after 15 days of his first employment in the factory unless certified fit for such employment by the certifying Surgeon.
    2) Every worker employed in the said processes shall be re-examined by a Certifying Surgeon at least once in every 12 calendar months. Such re-examination shall, wherever the Certifying Surgeon considers appropriate, include tests as specified in sub-paragraph (1).

    3) The Certifying Surgeon shall after examining a worker, issue a Certificate of Fitness in Form 4.The record of examination and re-examinations carried out shall be entered in the Certificate and the Certificate shall be kept in the custody of the Manager of the factory. The record of each examination and re-examination carried out under sub-paragraphs (1) and (2) respectively

including the nature and the results of the tests, shall also be entered by the Certifying Surgeon in a health register in Form 16.

4) The Certificate of Fitness and the health register shall be kept readily available for inspection by the Inspector.

5) If at any time the Certifying Surgeon is of the opinion that a worker is no longer fit for employment in the said processes on the ground that continuance therein would involve special danger to the health of the worker, he shall make a record of his findings in the said certificate and the health register. The entry of his findings in those documents should also include the period for which he considers that the said person is unfit for work in the said processes.

   The person so suspended from the process shall be provided with alternative placement facilities unless he is fully incapacitated in the opinion of the Certifying Surgeon, in which case the person affected shall be suitably rehabilitated.

6) No person who has been found unfit to work under sub-paragraph (5) shall be re-employed or permitted to work in the said processes unless the Certifying Surgeon, after further examination, again certifies him fit for employment in those processes.

10. **Exemption:-** The Chief Inspector may by certificate in writing, subject to such conditions as he may specify therein, relax or suspend any of the provisions of this schedule in respect of any factory if owing to the special methods of work or otherwise such relaxation or suspension is practicable without danger to the health or safety of the persons employed.

(VI)

Standard Operating Procedures for

Manufacture and treatment of lead and certain compounds of lead

1. **Application:-** This shall apply to all factories or parts of factories in which any of the following operations are carried on namely:—

    a) work at a furnace where the reduction or treatment of zinc or lead ores is carried on;

    b) the manipulation, treatment or reduction of ashes containing lead, the delivering of lead or the melting of scrap lead or zinc;

    c) manufacture of solder or alloys containing more than ten per cent of lead;

    d) the manufacture of any oxide, carbonate, sulphate, chromate, acetate, nitrate or silicate of lead;

    e) the handling or mixing of lead tetraethyl;

    f) any other operation involving the use of lead compound; and

    g) the cleaning of workrooms where any of the operations aforesaid are carried on.

2. **Definitions:-**

    a) **"efficient exhaust draught"** means localised ventilation, affected by heat or mechanical means, for the removal of gas, vapour, dust or fumes so as to prevent them (as far as practicable under the atmospheric conditions usually prevailing) from escaping into the air of any place in which work is carried on. No draught shall be deemed efficient which fails to remove smoke generated at the point where such gas, vapour, fumes or dust originate.

    b) **"lead compound"** means any compound of lead other than galena which, when treated in the manner described below, yields to an aqueous solution of hydrochloric acid, a quantity of soluble lead compound exceeding when calculated as lead monoxide, five per cent of the "dry weight" of the portion taken for analysis. In the case of paints and similar products and other mixtures containing oil or fat the "dry weight" means the dry weight of the material remaining after the substance has been thoroughly mixed and treated with suitable solvents to remove oil, fats, varnish or other media.

    The method of treatment shall be as follows—

    A weighed quantity of the material which has been dried at 100°C and thoroughly mixed shall be continuously shaken for one hour, at the common temperature with 1,000 times its weight of an aqueous solution of hydrochloric acid containing 0.25 per cent by weight of hydrogen chloride. This solution shall thereafter be allowed to stand for one hour and then filtered. The lead salt contained in the clear filterate shall then be precipitated as lead sulphide and weighed as lead sulphate.

3. **Prohibition relating to women and young persons:-** No woman or young person shall be employed or permitted to work in any of the operations specified in paragraph 1.

4. **Requirements to be observed:-** No person shall be employed or permitted to work in any process involving the use of lead compounds if the process is such that dust or fume from a lead compound is produced herein, or the persons employed therein are liable to be splashed with any lead compound in the course of their employment unless the provisions of paragraphs 5 to 13 are complied with.

5. **Exhaust draught:-** Where dust, fume, gas or vapour is produced in the process, provisions shall be made for removing them by means of an efficient exhaust draught so contrived as to operate on the dust, fume, gas or vapour as closely as possible to the point of origin.

6. **Food, drinks, etc., prohibited in workroom:-** No food, drink, pan and supari or tobacco shall be brought into or consumed by any worker in any workroom in which the process is carried on and no person shall remain in any such room during intervals for meals or rest.

7. **Protective clothing:-** Suitable protective overalls and head coverings shall be provided, maintained and kept clean by the occupier and such overalls and head coverings shall be worn by the persons employed.

8. **Cleanliness of workrooms, tools etc:-** The rooms in which the persons are employed and all tools and apparatus used by them shall be kept in a clean state.

9. **Washing facilities:-**

   1) The occupier shall provide and maintain for the use of all persons employed suitable washing facilities consisting of:—

      a) a trough with a smooth impervious surface fitted with a waste pipe without plug and of sufficient length to allow at least 60 centimetres for every ten persons employed at any one time, and having a constant supply of clean water from taps of jets above the trough at intervals of not more than 60 centimetres; or

      b) at least one wash-basin for every ten persons employed at any one time, fitted with a waste pipe and plug and having a constant supply of dean water together with, in either case, a sufficient supply of nail or brushes, soap or other suitable cleaning material and clean towels.

   2) The facilities so provided shall be placed under the charge of a responsible person and shall be kept clean.

10. **Messroom or canteen:-** The occupier shall provide and maintain for the use of the persons employed suitable and adequate arrangements for taking their meals. The arrangements shall consist of the use of a room separate from any workroom which shall be furnished with sufficient tables and benches, and unless a canteen serving hot meals is provided, adequate means of warming the food. The room shall be adequately ventilated by the circulation of fresh air and shall be placed under the charge of a responsible person and shall be kept clean.

11. **Cloakroom:-** The occupier shall provide and maintain for the use of persons employed, suitable accommodation for clothing not worn during working hours, and for the drying of wet clothing.

12. **Medical facilities and records of examinations and tests -**

   1) The occupier of every factory to which the schedule applies shall—

      a) employ a qualified medical practitioner for medical surveillance of the workers employed there in whose appointment shall be subject to the approval of the Chief Inspector; and

      b) provide to the said medical practitioner all the necessary facilities for the purpose referred to in clause (a).

   2) The record of medical examinations and appropriate tests carried out by the said medical practitioner shall be maintained in a separate register approved by the Chief Inspector which shall be kept readily available for inspection by the Inspector.

13. **Medical examination by Certifying Surgeon:-**

1) Every worker employed in the processes referred to in paragraph 1 shall be examined by a Certifying Surgeon within 15 days of his first employment. Such examination shall include tests for lead in blood and urine, ALA in urine, hemoglobin content, stippling of cells and steadiness test. No worker shall be allowed to work after 15 days of his first employment in the factory unless certified fit for such employment by the Certifying Surgeon.

2) Every worker employed in the said processes shall be re-examined by a Certifying Surgeon at least once in every three calendar months. Such re-examination shall, wherever the Certifying Surgeon considers appropriate, include tests specified in sub-paragraph (1).

3) The Certifying Surgeon shall after examining a worker, issue a Certificate of Fitness in Form 4.The record of examination and re-examinations carried out shall be entered in the Certificate and the Certificate shall be kept in the custody of the Manager of the factory. The record of each examination and re-examination carried out under sub-paragraphs (1) and (2) respectively including the nature and the results of the tests shall also be entered by the Certifying Surgeon in a health register in Form 16.

4) The Certificate of Fitness and the health register shall be kept readily available for inspection by the Inspector.

5) If at any time the Certifying Surgeon is of the opinion that a worker is no longer fit for employment in the said processes on the ground that continuance therein would involve special danger to the Health of the worker, he shall make a record of his findings in the said Certificate and the health register. The entry of his findings in those documents should also include the period for which he considers that the said person is unfit for work in the said processes.

   The person so suspended from the process shall be provided with alternate placement facilities unless he is fully incapacitated in the opinion of the Certifying Surgeon, in which case the person affected shall be suitably rehabilitated.

6) No person who has been found unfit to work under sub-paragraph (5) shall be re-employed or permitted to work in the said processes unless the Certifying Surgeon, after further examination again certifies him fit for employment in those processes.

14. **Exemption:-** Where the Chief Inspector is satisfied that all or any of the provisions of this schedule are not necessary for the protection of the persons employed, he may by certificate in writing exempt any factory from all or any of such provisions, subject to such conditions as he may specify.

(VII)
Standard Operating Procedures for
Generating Petrol gas from petrol

1. **Prohibition relating to women and young persons:-** No women or young person shall be employed or permitted to work in or shall be allowed to enter any building in which the generation of gas from dangerous petroleum is carried on.

2. **Flame traps:-** The plant for generation of gas from dangerous petroleum and associated piping and fittings shall be fitted and maintained as to prevent a flash back from any burner to the plant. One of these traps shall be fitted as close to the plant as possible. The plant and all pipes and valves shall be installed and maintained free from leaks.

3. **Generating building or room**:- All plants for generation of gas from dangerous petroleum shall be erected after the coming into force of the provisions or this schedule, be erected outside the factory building proper in a separate well ventilated building (hereinafter referred to as the 'generating building"). In the case of such plants erected before the coming into force of the provisions of this schedule there shall be no direct communication/specified between the room where such plants are erected (hereinafter referred to as "the generating room") and the remainder of the factory building. So far as practicable, all such generating rooms shall be constructed of fire resisting materials.

4. **Fire extinguishers:-** An efficient means of extinguishing petrol fires shall be maintained in any easily accessible position near the plant for generation of gas from dangerous petroleum.

5. **Plant to be approved by Chief Inspector**:- Petrol gas shall not be manufactured exception a plant for generating petrol gas, the design and construction of which has been approved by the Chief Inspector.

6. **Escape of petrol:-** Effective steps shall be taken to prevent petrol from escaping into any drain or sewer.

7. **Prohibition relating to smoking:-** No person shall smoke or carry matches, fire or naked light or other means of producing a naked light or spark in the generation room or building or in the vicinity thereof and a warning notice in the language understood by the majority of the workers shall be posted in the factory prohibiting smoking and the carrying of matches, fire or naked light or other means of producing a naked light or spark into such room or building.

8. **Access to petrol or container:-** No unauthorised person shall have access to any petrol or to a vessel containing or having actually contained petrol.

9. **Electric fittings:-** All electric fittings shall be of flameproof construction and. all electric conductors shall either be enclosed in metal conduits or be lead-sheathed.

10. **Construction of doors:-** All doors in the generating room or building shall be constructed to open outwards or to slide and no door shall be looked or obstructed or fastened in such a manner that it cannot be easily and immediately opened from the inside while gas is being generated and any person is working in the generating room or building.
11. **Repair of containers:-** No vessel that has contained petrol shall be repaired in a generating room or building and no repairs to any such vessel shall be undertaken unless live steam has been blown into the vessel and until the interior is thoroughly steamed out or other equally effective steps have been taken to ensure that it has been rendered free from petrol or flammable vapour.

(VIII)

Standard Operating Procedures for

Cleaning or smoothing, roughening, etc., of articles, by a jet of sand metal shot, or grit, or other available abrasive propelled by a blast or compressed air or steam

1. **Definitions:-**

   a) **"blasting"** means cleaning, smoothing, roughening or removing of any part of the surface of any article by the use as an abrasive of a jet of sand, metal shot or grit or other material, propelled by a blast of compressed air or steam;

   b) **"blasting enclosure"** means a chamber, barrel, cabinet or any other enclosured designed for the performance of blasting therein;

   c) **"blasting chamber"** means a blasting enclosure in which any person may enter at any time in connection with any work or otherwise; and

   d) **"cleaning of castings"** where done as an incidental supplemental process in connection with the making of metal castings, means the freeing of the casting from adherent sand or other substance and includes the removal of cores and the general smoothening of a casting, but does not include the free treatment.

2. **Prohibition of sand blasting:-** Sand or any other substance containing free silica shall not be introduced as an abrasive into any blasting apparatus and shall not be used for blasting:

   Provided that this paragraph shall come into force two years after the coming into force of this schedule:

   Provided further that no woman or young person shall be employed or permitted to work at any operation of sand blasting.

3. **Precautions in connection with blasting operations:-**

   1) Blasting shall not be done except in a blasting enclosure and no work other than a blasting and any work immediately incidental thereto and cleaning and repairing of the enclosure including the plant and appliances situated therein, shall be performed in a blasting enclosure. Every door, aperture and joint of blasting enclosure, shall be kept closed and air tight while blasting is being done therein.

   2) Blasting enclosure shall always be maintained in good condition and effective measures shall be taken to prevent dust escaping from such enclosure, and from apparatus connected therewith, into the air of any room.

   3) There shall be provided and maintained for and in connection with every blasting enclosure, efficient apparatus for separating, so far as practicable, abrasive which has been used for blasting and which is to be used again as an abrasive, from dust or particles of other materials arising from blasting; and no such abrasive shall be introduced into any blasting apparatus and used for blasting until it has been so separated:

      Provided that this paragraph shall not apply, except in the case of blasting chambers, to blasting enclosures constructed or installed before the coming into force of this schedule, if the Chief Inspector is of opinion that it is not reasonably practicable to provide such separating apparatus.

   4) There shall be provided and maintained in connection with every blasting enclosure efficient ventilating plant to extract, by exhaust draught effected by mechanical means, dust produced in the enclosure. The dust extracted and removed shall be disposed of by such method and in such manner that it shall not escape into the air of every room; and every other filtering or setting device situated in a room in which persons are employed, other than persons attending to such bag or other filtering or settling device, shall be completely separated from the general air of that room in an enclosure ventilated to the open air.

5) The ventilating plant provided for the purpose of sub-paragraph (4) shall be kept in continuous operation whenever the blasting enclosure is in use whether or not blasting is actually taking place therein, and in the case of a blasting chamber, it shall be in operation even when any person is inside the chamber for the purpose of cleaning.

4. **Inspection and examinations:-**

1) Every blasting enclosure shall be specially inspected by a competent person at least once in every week in which it is used for blasting. Every blasting enclosure, the apparatus connected therewith and the ventilating plant shall be thoroughly examined and in the case of ventilating plant, tested by a competent person at least once in every month.

2) Particulars of the result of every such inspection, examination or test shall forthwith be entered in a register which shall be kept in a form approved by the Chief Inspector and shall be available for inspection by any workman employed in or in connection with blasting in the factory. Any defect found in any such inspection, examination or test shall be immediately reported by the person carrying out the inspection, examination or test to the occupier, manager or other appropriate person and without prejudice to the foregoing requirements of this schedule, shall be removed without avoidable delay.

5. **Provision of protective helmets, gauntlets and overalls:-**

1) There shall be provided and maintained for the use of all persons who are employed in a blasting chamber, whether in blasting or in any work connected therewith or in cleaning such a chamber, protective helmets of a type approved and certified by the Chief Inspector; and every such person shall wear the helmet and shall not remove it until he is outside the chamber.

2) Each protective helmet shall carry a distinguishing mark indicating the person by whom it is intended to be used and no person shall be allowed or required to wear a helmet not carrying his mark or a helmet which has been worn by another person and has not since been thoroughly disinfected.

3) Each protective helmet when in use shall be supplied with clean and not unreasonably cold air at a rate of not less than 170 litres per minute.

4) Suitable gauntlets and overalls shall be provided for use of all persons while performing blasting or assisting at blasting, and every such person shall while so engaged, wear the gauntlet and overall provided.

6. **Precautions in connection with cleaning and other work:-**

1) Where any person is engaged in cleaning of any blasting apparatus or blasting enclosure or of any apparatus or ventilating plant connected therewith or the surroundings thereof or in any other work in connection with any blasting apparatus or blasting enclosure or with any apparatus or ventilating plant connected therewith so that he is exposed to the risk of inhaling dust which has arisen from blasting, all practicable measures shall be taken to prevent such inhalation.

2) All practicable measures shall be taken in connection with any cleaning operation referred to in paragraph 5 and the removal of dust from filtering or settling devices, to dispose of the dust in such a manner that it does not enter the air of any room. Vacuum cleaners shall be provided and used wherever practicable for such cleaning operations.

7. **Storage accommodation for protective wear:-** Adequate and suitable storage accommodation for the helmets, gauntlets and overalls required to be provided under the paragraph 5 shall be provided outside, and conveniently near to every blasting enclosure

and such accommodation shall be kept clean. Helmets, gauntlets and overalls when not in actual use shall be kept in this accommodation.

8. **Maintenance and cleaning of protective wear:-** All helmets, gauntlets, overalls and other protective devices or clothings provided and worn for the purposes of this schedule, shall be kept in good condition and so far as is reasonably practicable shall be cleaned on every week day in which they are used. Where dust arising from the cleaning of such protective clothing or devices is likely to be inhaled, all practicable measures shall be taken to prevent such inhalation. Vacuum cleaners shall, wherever practicable, be used for removing dust from such clothing and compressed air shall not be used for removing dust from any clothing.

9. **Maintenance of vacuum cleaning plant:-** Vacuum cleaning plant used for the purpose of this schedule shall be properly maintained.

10. **Medical facilities and records of examinations and tests:-**

    1) The occupier of every factory shall—

        a) Employ a qualified Medical Practitioner for medical surveillance of the workers employed therein whose employment shall be subject to the approval of the Chief Inspector; and

        b) provide to the said Medical Practitioner all the necessary facilities for the purpose referred to in Clause (a).

    2) The record of medical examinations and appropriate tests carried out by the said Medical Practitioner shall be maintained in a separate register approved by the Chief Inspector, which shall be kept readily available for inspection by the Inspector.

11. **Medical examination by Certifying Surgeon:-**

    1) Every worker employed in any of the processes to which this schedule applies shall be examined by a Certifying Surgeon within 15 days of his first employment. Such examination shall include pulmonary function test and chest X-ray. No worker shall be allowed to work after 15 days of his first employment in the factory unless certified fit for such employment by the certifying Surgeon.

    2) Every worker employed in the said processes shall be re-examined by a Certifying Surgeon at least once in every 12 calendar months and such re-examination shall, wherever the Certifying Surgeon considers appropriate include pulmonary function test and chest X-ray once in every three years.

    3) The Certifying Surgeon shall after examining a worker, issue a Certificate of Fitness in Form 4. The record of examination and re-examination carried out shall be entered in the Certificate and the Certificate shall be kept in the custody of the Manager of the factory. The record of each examination and re-examination carried under sub-paragraphs (1) and (2) respectively, including the nature and the results of the tests, shall also be entered by the Certifying Surgeon in a health register in Form 16.

    4) The Certificate of Fitness and the health register shall be kept readily available for inspection by the Inspector.

    5) If any time the Certifying Surgeon is of the opinion that a worker is no longer fit for employment in the said processes on the ground that continuance therein would involve special danger to the health of the worker, he shall make a record of his findings in the said certificate and the health register. The entry of his findings in those documents should also include the period for which he considers that the said person is unfit for work in the said processes.

The person so suspended from the process shall be provided with alternate placement facilities unless he is fully incapacitated in the opinion or the Certifying Surgeon, in which case the person affected shall be suitably rehabilitated.

6) No person who has been found unfit to work in the said processes under sub-paragraph (5) shall be re-employed or permitted to work unless the Certifying Surgeon, after further examination, again certifies him to be fit for employment in those processes.

12. **Restrictions in employment of young persons:-**

1) No person under 18 years of age shall be employed in blasting or for assisting at blasting or in any blasting chamber or in the cleaning of any blasting apparatus or any blasting enclosure or any apparatus or ventilating plant connected therewith or be employed on maintenance or repair work at such apparatus, enclosure or plant.

2) No person under 18 years of age shall be employed to work regularly within a distance of twenty feet of any blasting enclosure unless the enclosure is in a room and he is outside that room where he is effectively separated from any dust coming from the enclosure.

13. **Power to exempt or relax:-**

1) If the Chief Inspector is satisfied that in any factory or any class of factory, the use of sand or other substance containing free silica as an abrasive in blasting is necessary for a particular manufacture or process (other than the process incidental or supplemental to making of metal castings) and that the manufacture or process cannot be carried on without the use of such abrasive or that owing to the special conditions or special method of work or otherwise any requirement of this schedule can be suspended either temporarily or permanently, or can be relaxed without endangering the health of the persons employed or that application of any of such requirements is for any reason impracticable or inappropriate, he may, with the previous sanction of the State Government by an order in writing exempt the said factory or class of factories from such provisions of this schedule, to such an extent and subject to such conditions and for such period as may be specified in the said order.

2) Where an exemption has been granted under sub-paragraph (1), a copy of the order shall be displayed at a notice board at a prominent place at the main entrance or entrances to the factory and also at the place where the blasting is carried on.

(IX)

Standard Operating Procedures for

Liming and tanning of raw hides and skins and processes incidental thereto

1. **Cautionary notices:-**

    1) Cautionary notices as to anthrax in the form specified by the Chief Inspector shall be affixed in prominent positions in the factory where they may easily and conveniently read by the persons employed. A copy of such notice shall also be given to each person employed when he is engaged and subsequently, if still employed, on the first day of each calendar year.

    2) Cautionary notices as to the effects of chrome on the skin shall be affixed in prominent positions in every factory in which chrome solutions are used and such notices shall be so placed as to be easily and conveniently read by the person employed.

    3) Notices shall be affixed in prominent places in the factory stating the position of the first aid box or cupboard and the name of the person in charge of such box or cupboard.

    4) If any person employed in the factory is illiterate, effective steps shall be taken to explain carefully to such illiterate person the contents of the notice specified in sub-paragraphs (1), (2) and if chrome solutions are used in the factory the contents of the notice specified in sub-paragraph (2).

2. **Protective clothing:-** The occupier shall provide and maintain in good condition the following articles or protective clothing, namely:

    i. Waterproof footwear, leg coverings, aprons and gloves for persons employed in processes involving contact with chrome solutions, including the preparation of such solutions;

    ii. gloves and boots for persons employed in lime yard; and

    iii. protective footwear, aprons and gloves for persons employed processes involving the handling of hides or skins, other then; processes specified in clauses (a) and (b):

Provided above that the gloves, aprons, leg coverings or boots may be of rubber or leather, but the gloves and boots to be provided under clauses (a) and (b) shall be of rubber:

Provided further that the gloves may not be provided to persons fleshing by hand or employed in processes in which there is no risk of contact with lime, sodium sulphide or other caustic liquor.

3. **Washing facilities, messroom and cloakroom:-** There shall be provided and maintained in a clean state and in good repair for the use of all persons employed-

    a) a trough with a smooth impervious surface fitted with a waste pipe without plug of sufficient length to allow of at least 60 centimetres for every ten persons employed at any one time, and having a constant supply of water from taps or jets above the trough at intervals of not more than 60 centimetres, or at least one wash basin for every ten persons employed at any one time, fitted with a waste pipe and plug and having a constant supply of water together with, in either case, a sufficient supply of nail brushes, soap or other suitable cleansing materials and clean towels;

    b) a suitable messroom, adequate for the number remaining on the premises during the meal intervals, which shall be furnished with sufficient tables and benches and adequate means for warming food and for boiling water.
    The messroom shall be,

i. separate from any room or shed in which hides or skins are stored, treated or manipulated,
ii. separate from the cloakroom, and
iii. placed under the charge of a responsible person; and

c) suitable accommodation for clothing put off during working hours and another accommodation for protective clothing and also adequate arrangements for drying up the clothing in both the cases, if wet. The accommodation so provided shall be kept dean at all times and placed in the charge of a responsible person.

4. **Food, drinks, etc., prohibited in workrooms:-** No food, drinks, pan and supari or tobacco shall be brought into or consumed by any worker in any workroom or shed in which the hides or skins are stored, treated or manipulated.

5. **Medical facilities and records of examination and tests:-**

1) The occupier of every factory to which this schedule applies shall—

a) employ a qualified medical practitioner for medical surveillance of the workers employed therein whose employment shall be subject to the approval of the Chief Inspectors;

b) provide to the said medical practitioner all the necessary facilities for the purpose referred to in clause (a);

c) arrange for inspection twice a week of the hands of all the persons and keeping in contact with chromium substances; and

d) provide maintain and supply suitable ointment and plaster in a box readily accessible to the workers and solely used for the purpose or keeping the ointment and the plaster.

2) The record of medical examinations and appropriate tests carried out by the said medical practitioner shall be maintained in a separate register approved by the Chief Inspector which shall be kept readily available for inspection by the Inspector.

6. **Medical examination by Certifying Surgeon:-**

1) Every worker employed in any of the processes to which the schedule applies shall be examined by a Certifying Surgeon within 15 days of his first employment. Such examination shall include skin test for dermatomes and detection of anthrax bacillus from local lesion by gram stain. No worker shall be allowed to work after 15 days of his first employment in the factory unless certified fit for such employment by the Certifying Surgeon.

2) Every worker employed in the said processes shall be re-examined by a Certifying Surgeon at least once in every twelve calendar months. Such re-examination, shall, wherever the Certifying Surgeon considers appropriate, include tests as specified in sub-paragraph (1).

3) The Certifying Surgeon shall after examining a worker, issue a Certificate in Fitness in Form 4. The record of examination and re-examination carried out shall be entered in the Certificate and the Certificate shall be kept in the custody of the Manager of the factory. The record of each examination and re-examination carried out under sub-paragraphs (1) and (2) respectively, including the nature and the results of the tests, shall also be entered by the Certifying Surgeon in a health register in Form 16.

4) The Certificate of Fitness and the health register shall be kept readily available for inspection by the Inspector.

5) If at any time the Certifying Surgeon is of the opinion that a worker is no longer fit for employment-in the said processes on the ground that continuance therein would involve special danger to the health of the worker, he shall make a record of his findings in the said certificate and the health register. The entry of his findings in those documents should also include the period for which he considers that the said person is unfit for work in the said processes.

The person so suspended from the process shall be provided with alternate placement facilities unless he is fully incapacitated in the opinion of the Certifying Surgeon, in which case the person affected shall be suitably rehabilitated.

6) No person who has been found unfit to work under sub-paragraph (5) shall be re-employed or permitted to work in the said processes unless the Certifying Surgeon, after further examination, again certifies him fit for employment in those processes.

(X)

Standard Operating Procedures for

Printing presses and type foundries and certain lead processes carried therein

1. **Definitions:-**

   a) **"efficient exhaust draught"** means localised ventilation effected by heat or mechanical means, for the removal of gas, vapour, dust or fumes so as to prevent them from escaping into the air of any place in which work is carried on. No draught shall be deemed efficient which fails to remove gas, vapour, fume or dust at the point where they originate.

   b) **"lead material"** means material containing not less than five per cent of lead;

   c) **"lead process"** means,

      i. the melting of lead or any lead material for casting and mechanical composing,

      ii. the recharging of machines with used lead material,

      iii. any other work including removal of dross from melting pots and cleaning of plungers, and

      iv. manipulation, movement or other treatment of lead material.

2. **Exhaust draught:-**

   1) None of the following processes shall be carried on except with an efficient exhaust draught unless carried on in such a manner as to prevent free escape of gas, vapour, fumes or dust into any place in which work is carried on, or unless carried on in electrically heated and thermostatically controlled melting pots namely:

      a) melting lead material or slugs; and
      b) heating lead material so that vapour containing lead is given off.

   2) Such exhaust draught shall be effected by mechanical means and so contrived as to operate on the dust, fume, gas or vapour given off as closely as may be at its point of origin.

3. **Prohibition relating to women and young persons:-** No woman or young person shall be employed or permitted to work in any lead processes.

4. **Separation of certain processes:-** Each of the following processes shall be carried on in such a manner and under such conditions as to secure effectual separation from one another and from any other processes namely-

      a) melting of lead or any lead material;

      b) casting of lead ingots; and

      c) mechanical composing.

5. **Container for dross:-** A suitable receptacle with tightly fitting cover shall be provided and used for dross as it is removed from every melting pot. Such receptacle shall be kept covered while in the workroom near the machine except when the dross is being deposited therein.

6. **Floor of workroom:-** The floor of every workroom where lead process is carried on shall be -

   a) of cement or similar material so as to be smooth and impervious to water;

   b) maintained in sound condition; and

   c) cleaned throughout daily after being thoroughly damped with water at a time

when no other work is being carried at the place.

7. **Messroom:-** There shall be provided and maintained for the use of all persons employed in a lead process and remaining on the premises during the meal intervals, a suitable mess room which shall be furnished with sufficient tables and benches.

8. **Washing facilities:-** There shall be provided and maintained in a clean state and in good repair for the use of all persons employed in a lead process,

   a) a wash place with either—

      i. a trough with smooth impervious surface fitted with a waste pipe without plug and of sufficient length to allow at least 60 centimetres for every five such persons employed at any one time and having a constant supply of water from taps or jets above the trough at intervals of not more than 60 centimetres, or

      ii. at least one wash basin for every five such persons employed at any one time fitted with a waste pipe and plug and having an adequate supply of water laid on or always readily available; and

   b) a sufficient supply of clean towels made of suitable material, renewed daily with a sufficient supply of soap or other suitable cleansing material.

9. **Food, drinks, etc., prohibited in workrooms:-** No food, drink pan and supari or tobacco shall be consumed or brought by any worker in any workroom in which any lead process is carried on.

10. **Medical facilities and records of examinations and tests:-**

   1) The occupier of every factory to which the schedule applies, shall -

      a) employ a qualified medical practitioner for medical surveillance of the workers employed therein whose employment shall be subject to the approval of the Chief Inspector; and

      b) provide to the said medical practitioner all the necessary facilities for the purpose referred to in clause (a).

   2) The record of medical examinations and appropriate tests carried out by the said medical practitioner shall be maintained in a separate register approved by the Chief Inspector which shall be kept readily available for inspection by the Inspector.

11. **Medical examination by certifying surgeon:-**

   1) Every worker employed in a lead process shall be examined by a Certifying Surgeon within 15 days of his first employment. Such examination shall include tests for lead in urine and blood, ALA in urine, hemoglobin, stippling of cells and steadiness test. No worker shall be allowed to work after 15 days of his first employment in the factory unless certified fit for such employment by the Certifying Surgeon.

   2) Every worker employed in the said process shall be re-examined by a Certifying Surgeon at least once in every six calendar months. Such re-examination shall, wherever the Certifying Surgeon considers appropriate, include tests as specified in sub-paragraph (1).

   3) The Certifying Surgeon shall after examining a worker, issue a certificate of Fitness in Form 4. The record of examination and re-examination carried out shall be entered in the Certificate and the Certificate shall be kept in the custody of the Manager of the factory. The record of each examination or re-examination carried out under sub-

paragraphs (1) and respectively, including the nature and the results of the tests, shall also be entered by the Certifying Surgeon in a health register in Form 16.

4) The Certificate of Fitness and the health register shall be kept readily available for inspection by the Inspector.

5) If at any time the Certifying Surgeon is of the opinion that a worker is no longer fit for employment in the said process on the ground that continuance therein would involve special danger to the health of the worker, he shall make a record of his findings in the said certificate and the health register. The entry of his findings in those documents should include the period for which he considers that the said persons is unfit for work in the said processes.

   The person so suspended from the process shall be provided with alternate placement facilities unless he is fully incapacitated in the opinion of the Certifying Surgeon, in which case the person affected shall be suitably rehabilitated.

6) No person who has been found unfit to work under sub-paragraphs (5) shall be re-employed or permitted to work in the said process unless the Certifying Surgeon, after further examination, again certifies him fit for employment in those processes.

12. **Exemption:-** Where the Chief Inspector is satisfied that all or any of the provisions of this schedule are not necessary for the protection of persons employed, he may, by certificate in writing exempt any factory from all or any of such provisions subject to such conditions as he may specify therein. Such certificate may at any time be revoked by the Chief Inspector.

(XI)
Standard Operating Procedures for Manufacture of Pottery

1. **Savings:-** These provisions shall not apply to a factory in which any of the following articles, but no other pottery, are made, namely:—
   a) unglazed or salt glazed bricks and tiles; and
   b) architectural terra-cotta made from plastic clay and either unglazed or glazed with a leadless glaze only.

2. **Definitions:-**

   a) **"efficient exhaust draught"** means localised ventilation effected by mechanical or other means for removal of dust or fume so as to prevent it from escaping into air or any place in which work is carried on. No draught shall be deemed efficient which fails to remove effectively dust or fume generated at the point where dust or fume originates;

   b) **"fettling"** includes scalloping, towing sand papering, sand sticking, rushing or any other process of cleaning of pottery ware in which dust is given off;

   c) **"ground or powdered flint or quartz"** does not include natural sands;

   d) **"leadless glaze"** means a glaze which does not contain more than one per cent of its dry weight, of a lead compound calculated as lead monoxide;

   e) **"low solubility glare"** means a glaze which does not yield to dilute hydrochloric acid more than five per cent of its dry weight, of a soluble lead compound calculated as lead monoxide when determined in the manner specified below:

   A weighed quantity of the material which has been dried at 100 degrees centigrade and thoroughly mixed shall be continuously shaken for one hour at the common temperature with 1000 times its weight of an aqueous solution of hydrochloric acid containing 0.25 percent by weight of hydrogen chloride. This solution shall thereafter be allowed to stand for one hour and then filtered. The lead salt contained in the dear filterate shall then be precipitated as lead sulphide and weighed as lead sulphate;

   f) **"pottery"** includes earthenware, stoneware, porcelain, china tile and any other articles made from such clay or from a mixture containing clay and other materials such as quartz, flint, feldspar and gypsum;

   g) **"potter's shop"** includes all places where pottery is formed by pressing or by any other process and all places where shaping, fettling or other treatment of pottery articles prior to placing for the biscuit fire is carried on.

3. **Efficient exhaust draught:-** The following processes shall not be carried on without the use of an efficient exhaust draught, namely—

   a) all process involving the manipulation or use of a dry and unfretted lead compound;

   b) fettling operations of any kind, whether on green ware or biscuit, provided that this shall not apply to the wet fettling and to the occasional finishing of pottery articles without the aid of mechanical power;

   c) shifting of clay dust or any other material for making tiles or other articles by pressure, except where—

i. this is done in a machine so enclosed as to effectually prevent the escape of dust; or

ii. the material to be shifted is so damp that no dust can be given off;

d) pressing of tiles from clay dust, an exhaust opening being connected with each press and pressing from day dust of articles other than tiles, unless the material is so damp that no dust is given off;

e) fettling of tiles made from day dust by pressure, except where the fettling is done wholly on, or with, damp material and fettling of other articles made from day dust, unless the material is so damp that no dust is given off;

f) process of loading and unloading of seggars where handling and manipulation of ground and powdered flint, quartz, alumina or other materials are involved;

g) brushing or earthenware biscuit, unless the process is carried on in a room provided with efficient general mechanical ventilation or other ventilation which is certified by the Inspector as adequate having regard to all the circumstances of the case;

h) fettling of biscuit ware which has been fired in powdered flint or quartz except where this is done in machines so enclosed as to effectually prevent the escape of dust;

i) cleaning after the application of glaze by dipping or other process;

j) crushing and dry grinding of materials for pottery bodies and seggars, unless carried on in machines so enclosed as to effectively prevent the escape of dust or is so damp that no dust can be given off;

k) sieving or manipulation of powdered flint, quartz, clay grog or mixture of these materials unless it is so damp that no dust can be given off;

l) grinding of tiles on a power driven wheel unless an efficient water spray is used on the wheel;

m) lifting and conveying of materials by elevators and conveyors unless they are effectively enclosed and so arranged as to prevent escape of dust into the air in or near to any place in which persons are employed.

n) Preparation or weighing out of flow material, lawning of day colours, colour dusting and colour blowing;

o) mould making unless the binds or similar receptacles used for holding plaster of paris are provided with suitable covers; and

p) manipulation of calcined material unless the material has been made and remains so wet that no dust is given off.

4. **Separation of processes:-** Each of the following processes shall be carried on in such a manner and under such conditions as to secure effectual separation from one another and from other wet processes, namely—

a) crushing and dry grinding or sieving of materials, fettling pressing of tiles, drying or day and green ware loading an3 unloading of seggars; and

b) all processes involving the use of a dry lead compound.

5. **Prohibition on use of glaze:-** No glaze which is not a leadless glaze or a low solubility glaze shall be used in a factory in which pottery is manufactured.

6. **Prohibition relating to women and young person:-** No woman or young person shall be employed or permitted to work in any of the operations specified in paragraph 4, or at any place where such operations are carried on.

7. **Provisions of screen to potter's wheel:-** The potter's wheel (Jolly and Jigger) shall be provided with screens or so constructed as to prevent clay scrapings being thrown off beyond the wheel.

8. **Control of dust during cleaning:-**

    a) All practical measures shall be taken by damping or otherwise to prevent dust arising during cleaning of floors.

    b) Damp saw-dust or other suitable material shall be used to render the moist method effective in preventing dust rising into the air during the cleaning process which shall be carried out after work has ceased.

9. **Floor of certain workrooms:-** The floors of potter's shops, slip houses, dipping houses and ware cleaning rooms shall be hard, smooth and impervious and shall be thoroughly cleaned daily by an adult male using a moist method.

10. **Protective equipment:-**

    1) The occupier shall provide and maintain suitable overalls and head coverings for all persons employed in process included under paragraph 3.

    2) The occupier shall provide and maintain suitable aprons of a waterproof or similar material, which can be sponged daily, for the use of the dippers, dippers assistants, throwers, jolly workers, casters mould makers and filter press and pug mill workers.

    3) Aprons provided in pursuance of paragraphs 10(2) shall be thoroughly cleaned daily by the wearers by sponging or other wet process. All over shall and head coverings shall be washed, cleaned and mended at least once a week and this washing, cleaning or mending shall be provided for by the occupier.

    4) No person shall be allowed to work in emptying sacks of dusty materials, weighing out and mixing of dusty materials and changing of ball mills and plungers without wearing a suitable and efficient dust respirator.

11. **Washing facilities:-**

    1) The occupier shall provide and maintain, in a clean state and in good repair for the use of all persons employed in any of the processes specified in paragraph 3—

        a) a wash place under cover with either—

            i. a trough with smooth impervious surface fitted with a waste pipe without plug and of sufficient length to allow at least 60 centimetres for every five such persons employed at any one time and having a constant supply of clean water from taps or jets above the trough at intervals of not more than 60 centimetres.

            ii. at least one tap of stand pipe for every five such persons employed at any one time and having a constant supply of dean water, the tap of stand pipe being spaced not less than 120 centimetres apart; and

        b) a sufficient supply of dean towels made of suitable material changed daily, with sufficient supply of nail brushes and soap.

12. **Time allowed for washing:-** Before each meal and before the end of the day's work, at least ten minutes, in addition to the regular meal times, shall be allowed for washing to each person employed in any of the processes mentioned in paragraph 3.

13. **Messroom:-**

    1) There shall be provided and maintained for use of all persons remaining within the premises during the rest intervals, a suitable messroom providing accommodation of 0.93 square metre per head and furnished with—

        a) a sufficient number of tables and chairs on benches with back rest;

        b) arrangements for washing utensils;

        c) adequate means for warming food; and

        d) adequate quantity of drinking water.

    2) The room shall be adequately ventilated by the circulation of fresh air and placed under the charge of a responsible person and shall be kept clean.

14. **Food, drinks, etc., prohibited in workrooms:-** No food, drink, pan and supari or tobacco shall be brought into or consumed by any worker in any workroom in which any of the processes mentioned in paragraph 3 are carried on and no person shall remain in any such room during intervals for meals or rest.

15. **Cloakroom etc:-** There shall be provided and maintained for the use of all persons employed in any of the processes mentioned in paragraph 3—

        a) a cloakroom for clothing put off during working hours and such accommodation shall be separate from any messroom; and

        b) separate and suitable arrangements for the storage of protective equipment provided under paragraph 10.

16. **Medical facilities and records of examination and test:-**

    1) The occupier of every factory in which manufacture of pottery is carried on, shall—

        a) employ a qualified medical practitioner for medical surveillance of the workers employed therein whose employment shall be subject to the approval of the Chief Inspector; and

        b) provide to the said medical practitioner all the necessary facilities for the purpose referred to in clause (a).

    2) The record of medical examinations and appropriate test carried out by the said medical practitioner shall be maintained in a separate register approved by the Chief Inspector, which shall be kept readily available for inspection by the Inspector.

17. **Medical examination by Certifying Surgeon:-**

    1) Every worker employed in any process mentioned under paragraph 3 shall be examined by a Certifying Surgeon within 15 days of his first employment. Such examination shall include tests for lead in urine and blood, ALA in urine, hemoglobin content, stippling of cells and pulmonary function tests and chest X-ray for workers engaged in processes mentioned in clauses (a) and (b) of paragraph 3 and pulmonary function tests and chest X-ray for the others. No worker shall be allowed to work after 15 days of his first employment in the factory unless certified fit for such employment by the Certifying Surgeon.

    2) All persons employed in any of the processes included under clauses (a) and (n) paragraph 3 shall be examined by a Certifying Surgeon once in every 3 calendar

months. Those employed in any other processes mentioned in the remaining clauses of paragraph 3 shall be examined by a Certifying Surgeon once in every twelve calendar months. Such examinations in respect of all the workers shall include all the tests as specified in sub-paragraph (1) except chest X-ray which shall be done once in 3 years.

3) The Certifying Surgeon shall after examining a worker, issue Certificate of Fitness in Form 4. The record of examination and re-examination carried out shall be entered in the Certificate and the Certificate shall be kept in the custody of the Manager of the factory. The record of each examination carried out under sub-paragraphs (1) and (2), including the nature and the results of the tests, shall also be entered by the Certifying Surgeon in a health register in Form 16.

4) The Certificate of Fitness and the health register shall be kept readily available for inspection by the Inspector.

5) If at any time the Certifying Surgeon is of the opinion that a worker is no longer fit for employment in the said processes on the ground that continuance therein would involve special danger to the health of the worker, he shall make a record of his findings in the said certificate and the health register. The entry of his findings in those documents should also include the period for which he considers that the said person is unfit for work in the said processes.

   The person so suspended from the process shall be provided with alternate placement facilities unless he is fully incapacitated in the opinion or the Certifying Surgeon, in which case the person affected shall be suitably rehabilitated.

6) The person who has been found unfit to work under sub-paragraph (5) shall be re-employed or permitted to work in the said processes unless the Certifying Surgeon, after further examination again certifies him fit for employment in those processes.

18. **Exemption:-** If in respect of any factory, the Chief Inspector is satisfied that all or any of the provisions or this schedule are not necessary for the protection of the persons employed in such factory, he may by a certificate in writing exempt such factory from all or any of such provisions, subject to such conditions as he may specify therein. Such Certificate may at any time be revoked by the Chief Inspector without assigning any reasons.

(XII)
Standard Operating Procedures for
Chemical Works

Part I

1. **Application:-** This apply to all manufacture and processes incidental there to carried on in chemical works.

2. **Definitions:-**

a) **"chemical works"** means any factory or such parts of any factory as are listed in appendix 'A' to this schedule.

b) **"efficient exhaust draught"** means localised ventilation effected by mechanical or other means for the removal of gas, vapour, fume or dust to prevent it from escaping into the air of any place in which work is carried on;

c) **"bleaching powder"** means the bleaching powder commonly called chlorideof lime;

d) **"chlorate"** means chlorate or perchlorate;

e) **"caustic"** means hydroxide of potassium or sodium;

f) **"chrome process"** means the manufacture of chromate or bichromate of potassium or sodium, or the manipulation, movement or other treatment of these substances;

g) **"nitro or amino process"** means the manufacture of nitro or amino derivatives of phenol and of benzene or its homologues, and the making of explosives with the use of any of these substances;

h) the term **"permit to work"** system means the compliance with the procedures laid down under para 20 of part II;

i) **"toxic substances"** means all those substances which when they enter into the human body, through inhalation or ingestion or absorption through skin, in sufficient quantities cause fatality or exert serious affliction of health, or chronic harmful effects on the health of persons exposed to it due to its inherent chemical or biological effects. In respect of substances whose TLV is specified in Rule 131-A exceeding the concentration specified therein would make the substance toxic;

j) **"emergency"** means a situation or condition leading to a circumstance or set of circumstances in which there is danger to the life or health of persons or which could result in big fire or explosion or pollution to the work and outside environment, affecting the workers or neighbourhood in a serious manner, demanding immediate action;

k) **"dangerous chemical reactions"** means high speed reactions, run-away reactions, delayed reactions, etc., and are characterised by evolution of large quantities of heat, intense release of toxic or flammable gases or vapours, sudden pressure build-up etc.;

l) **"manipulation"** means mixing, blending, filling, emptying, grinding, sieving, drying, packing, sweeping, handling, using, etc.;

m) **"approved personal protective equipment"** means items of personal protective equipment conforming to the relevant ISI specifications or in the absence of it, personal protective equipment approved by the Chief Inspector of Factories;

n) **"appropriate personal protective equipment"** means that when the protective equipment is used by the worker, he shall have no risk to his life or health or body; and

o) **"confined space"** means any space by reason of its construction as well as in relation to the nature of the work carried therein and where hazards to the persons entering into or working inside exist or are likely to develop during working.

Part II
General Requirements
Applying to all the works in Appendix 'A'

1. **Housekeeping:-**

   1) Any spillage of materials shall be cleaned up before further processing.

   2) Floors, platforms, stairways, passages and gangways shall be kept free of any obstructions.

   3) There shall be provided easy means of access to all parts of the plant to facilitate cleaning.

2. **Improper use of chemicals:-** No chemicals or solvents or empty containers containing chemicals or solvents shall be permitted to be used by workers for any purposes other than in the processes for which they are supplied.

3. **Prohibition on the use of food, etc:-** No food, drink, tobacco, pan or any edible item shall be stored or heated or consumed on or near any part of the plant or equipment.

4. **Cautionary notices and instructions:-**

   1) Cautionary notices in a language understood by the majority of workers shall be prominently displayed in all hazardous areas drawing the attention of all workers about the hazards to health, hazards involving fire and explosion and any other hazard such as consequences or testing of material or substances used in the process or using any contaminated container for drinking or eating, to which the workers' attention should be drawn for ensuring their safety and health.

   2) In addition to the above cautionary notice, arrangement shall be made to instruct and educate all the workers including illiterate workers about the hazards in the process including the specific hazards to which they may be exposed to, in the normal course of their work. Such instructions and education should also deal with the hazards involved in unauthorised and unsafe practices including the properties of substances used in the process under normal conditions as well as abnormal conditions and the precautions to be observed against each and every hazard. Further, an undertaking from the workers shall be obtained within 1 month of their employment and for old workers employed, within one month of coming into operation of the rules, to the effect that they have read the contents of the cautionary notices and instructions, understood them and would abide by them. The training and instructions to all workers and all supervisory personnel shall include the significance of different types of symbols and colours used on the labels stuck or painted on the various types of containers and pipe lines.

5. **Evaluation and provision of safeguards before the commencement of process:-**

   1) Before commencing any process or any experimental work, or any new manufacture covered under Appendix 'A, the occupier shall take all possible steps to ascertain definitely all the hazards involved both from the actual operations and the chemical reactions including the dangerous chemical reactions. The properties of the raw materials used, the final products to be made, and any by-products derived during manufacture, shall be carefully studied and provisions shall be made for dealing with any hazards including effects on worker which may occur during manufacturing.

2) Information in writing giving details of the process, its hazards and the steps taken or proposed to be taken from the design stage to disposal stage for ensuring the safety as in sub-para (1) above should be sent to the Chief Inspector at the earliest but in no case less than 15 days before commencing manufacture, handling, or storage of any of items covered under Appendix 'A', whether on experimental basis, or as pilot plant or as trial production, or as large scale manufacture.

3) The design, construction, installation, operation, maintenance and disposal of the buildings, plant and facilities shall take into consideration effective safeguards against all the safety and health hazards so evaluated.

4) The requirements under the sub-paras (1) to (3) shall not act in lieu of or in derogation to, any other provisions contained in any act governing the work.

6. **Authorised entry:-** Authorised persons only shall be permitted to enter any section of the factory or plant where any dangerous operations or processes are being carried on or where dangerous chemical reactions are taking place or where hazardous chemicals are stored.

7. **Examination of instruments and safety devices: -**

1) All instruments and safety devices used in the process shall be tested before taking into use and after carrying out any repair to them and examined once in a month by a competent person. Records of such tests and examinations shall be maintained in a register.

2) All instruments and safety devices used in the process shall be operated daily or as often as it is necessary, to ensure its effective and efficient working at all times.

8. **Electrical installations:-** All electrical installations used in the process covered in Appendix 'A' shall be of an appropriate type to ensure safety against the hazard prevalent in that area such as suitability against dust, dampness, corrosion, flammability and explosivity etc. and shall conform to the relevant ISI specifications governing their construction and use for that area.

9. **Handling and storage of chemicals:-**

1) The containers for handling and storage of chemicals shall be of adequate strength taking into consideration the hazardous nature of the contents. They shall also be provided with adequate labelling and colour coding arrangements to enable identification of the containers and their contents indicating the hazards and safe handling methods and shall conform to the respective ISI standards. The instructions given in the label shall be strictly adhered to. Damaged containers shall be handled only under supervision of a knowledgeable and responsible person and spillage shall be rendered innocuous in a safe manner using appropriate means.

2) The arrangements for the storage of chemicals including charging of chemicals in reaction vessels and containers shall be such as to prevent any risk of fire or explosion or formation of toxic concentration of substances above the limits specified in Rule 131-A.

3) Without prejudice to the generality of the requirements in sub-para (2) above, the arrangements shall have suitable ventilation facilities and shall enable the maintenance of safe levels in vessels and containers. Such arrangements shall also take into consideration, the type of flooring and the capacity of flooring and the compatibility requirements of substances with other chemicals stored nearby.

4) a) Storage of chemicals and intermediate products, which are highly unstable or reactive or explosive shall be limited to the quantities required for two months use.

b) Whenever the quantities laid down in the above clause (a) are to be exceeded, the permission of the Chief Inspector shall be obtained.

c) Not withstanding anything contained in clause (a) and (b) above, the Chief Inspector of Factories may direct any factory carrying out processes covered in Appendix 'A' to further limit to storage of hazardous substances to quantities less than two months on considerations of safety.

5) Stand-by arrangements equal to the biggest container shall always be available to transfer the toxic substances quickly into the stand-by storage facility if any defect develops in any of the container resulting in the release of toxic substances.

6) Any storage facility constructed using non-metallic material such as Fiberglass Reinforced Plastics (FRP), all glass vessels etc., shall have adequate strength to withstand the stress, if any, exerted by the contents and shall be properly anchored, working platforms, access ladders, pipe lines, etc., used in such storage facility shall not have any support on the structure of the storage facility and shall be independently supported.

10. **Facility for isolation:-** The plant and equipment shall be so constructed and maintained as to enable quick isolation of plant or part of plant or equipment, with appropriate indication. One copy of the layout plan indicating the isolation facilities shall always be available with the security personnel, the maintenance and the health and safety personnel and these isolation facilities shall be checked for its effectiveness once in a month.

11. **Personal protective equipment:-**
    1) All workers exposed to the hazards in the processes covered by this Schedule shall be provided with appropriate and approved type of personal protective equipment. Such equipment shall be in a clean, sterile and hygienic condition before issue.

    2) The occupier shall arrange to inform, educate and supervise all the workers in the use of personal protective equipment while carrying out the job.

    3) As regards any doubt regarding the appropriateness of any personal protective equipment, the decision of the Chief Inspector will be final.

12. **Alarm Systems:-**

    1) Suitable and effective alarm systems giving audible and visible indications, shall be installed at the control room as well as in all strategic locations where process control arrangements are available so as to enable corrective action to be taken before the operational parameters exceed the predetermined safe levels or lead to conditions conducive for an outbreak of fire or explosion to occur. Such alarm systems shall be checked daily and tested every month at least once to ensure its performance efficiency at all times.

    2) The Chief Inspector of Factories may direct such system to be installed in case of plants or processes where toxic materials are being used and spillage or leakage of which may cause wide spread poisoning in or around the plant.

13. **Control of escape of substances into the work atmosphere:-**

    1) Effective arrangements such as, enclosure, or by pass, of efficient exhaust draught, maintenance of negative pressure etc., shall be provided in all plants, containers, vessels, sewers, drains, flues, ducts, culverts and buried pipes and equipment, to control the escape and spread of substances which are likely to give rise to fire or explosion or toxic hazards during normal working and in the event of accident or emergency.

2) In the event of the failure of the arrangements for control resulting in the escape of substances in the work atmosphere immediate steps shall be taken to control the process in such a manner, that further escape is brought down to the safe level.

3) The substance that would have escaped into the work atmosphere taking immediate steps as required in sub-para (2), shall be rendered innocuous by diluting with air or water or any other suitable agent or by suitably treating the substances.

14. **Control of dangerous chemical reactions:-** Suitable provisions, such as automatic and or remote control arrangements, shall be made for controlling the effects of 'dangerous chemical reactions'. In the event of failure of control arrangements automatic flooding of blanketing or other effective arrangements shall come into operation.

15. **Testing, examination and repair of plant and equipment:-**

1) All parts of plants, equipment and machinery used in the process which in the likely event of their failure may give rise to an emergent situation shall be tested by a competent person before commencing process and retested at an interval of two years or after carrying out repairs to it. The competent person shall identify the parts of the plant, equipment and machinery required to be tested as aforesaid and evolve a suitable testing procedures. In carrying out the test as mentioned above in respect of pressure vessels or reaction vessels the following precautions shall be observed, namely—

a) before the test is carried out, each vessel shall be thoroughly cleaned and examined externally, and as far as practicable, internally also for surface defects, corrosion and foreign matters. During the process of cleaning and removal of sludge, if any, all due precautions shall be taken against fire or explosion, if such sludge is of pyropheric nature or contains spontaneously combustible chemicals;

b) as soon as the test is completed, the vessels shall be thoroughly dried internally and shall be clearly stamped with the marks and figures indicating the person by whom testing has been done and the date of test; and

c) any vessel which fails to pass the test or which for any other reason is found to be unsafe for use shall be destroyed or rendered unusable under intimation to the Chief Inspector.

2) All parts of plant, equipment, machinery which in the likely event of failure may give rise to an emergent situation shall be examined once in a month by the competent person.

3) Records of testing and examination referred to in paragraphs (1) and (2) shall be maintained as long as that part of the plant, equipment and machinery are in use.

4) All repair work including alteration, modification and addition to be carried out to the plant, equipment and machinery shall be done under the supervision of a responsible person who shall evolve a procedure to ensure safety and health of persons doing the work. When repairs or modification is done on pipelines, and joints are required to be welded, but welding of joints shall be preferred. Wherever necessary, the responsible person shall regulate the aforesaid work through a 'permit to work system'.

16. **Staging:-**

1) All staging that is erected for the purpose of maintenance work or repair work or for work connected with entry into confined spaces and used in the process included in Appendix 'A' shall be stable, rigid and constructed out of substantial material of adequate strength. Such staging shall conform to the respective Indian Standard specifications.

2) Staging shall not be erected over any closed or open vessel unless the vessel is so constructed and ventilated to prevent exposure of persons working on the stages.

3) All the staging constructed for the purpose of this para shall have appropriate access which are safe and shall be fitted with proper hand rails to a height of one metre and to a board.

17. **Seating Arrangements;-** The seating arrangements provided for the operating personnel working in processes covered in Appendix 'A' shall be located in a safe manner as to prevent the risk of exposure to toxic, flammable and explosive substances evolved in the work environment in the course of manufacture or repair or maintenance, either due to failure of plant and equipment or due to the substances which are under pressure, escaping into the atmosphere.

18. **Entry into or work in confined spaces:-**

1) The occupier of every factory to which the provisions of this schedule apply, shall ensure the observance of the following precautions before permitting any person to enter or work inside the confined spaces—

a) Identify all confined spaces and the nature of hazards that are encountered in such spaces, normally or abnormally and arrange to develop the most appropriate safeguards for ensuring the safety and health of persons entering into or working inside, the confined spaces;

b) regulate the entry of work inside the confined spaces through a 'permit to work system' which should include the safeguards developed as required under sub-clause (a) above;

c) before testing the confined space for entry into for work, the place shall be rendered safe by washing or cleaning with neutralizing agents; or purging with steam or inert gases and making adequate forced ventilation arrangements or such measure which will render the confined space safe;

d) shall arrange to carry out such tests as are necessary for the purpose by a competent person and ensure that the confined space is safe for the persons to enter or work. Such testing shall be carried out as often as is necessary during the course of work to ensure its continued safety;

e) shall arrange to educate and train the personnel who would be required to work in confined spaces about the hazards involved in the work. He shall also keep in readiness the appropriate and approved personal protective equipment including arrangements for rescue, resurrection and first aid, and shall arrange supervision of the work at all times by a responsible and knowledgeable person.

2) The manager shall maintain a log of all entry into or work in confined spaces and such record shall contain the details of persons assigned for the work, location of the work and such other details that would have a bearing on the safety and health of persons assigned for this work. The log book so maintained shall be retained as long as the concerned workers are in service and produced to the inspector when demanded.

19. **Maintenance work, etc:-**

1) All the work connected with the maintenance of plants and equipment including cleaning of empty containers which nave held hazardous substances used in the processes covered in this schedule, shall be carried out under 'permit to work system' employing trained personnel and under the supervision of responsible person, having knowledge of the hazards and precautions required to deal with them.

2) Maintenance work shall be carried out in such a manner that there is no risk to persons in the vicinity or to persons who pass by. If necessary, the place of such work shall be cordoned off or the presence of unconnected persons effectively controlled.

20. **Permit to work system:-** The permit to work system shall inter and include the observance of the following precautions while carrying out any specified work to be subjected to the permit to work system—

    a) all work subject to the permit to work system shall be carried out under the supervision of acknowledgeable and responsible person;
    b) all parts of plant or machinery or equipment on which permit to work system is carried out, shall remain isolated from other parts throughout the period of permit to work and the place of work including the parts of plant, machinery shall be rendered safe by cleaning, purgings, washing, etc.;

    c) all work subject to the permit to work system shall have pre-determined work procedures which integrate safety with the work. Such procedures shall be reviewed whenever any change occurs in material or equipment so that continued safety is ensured;

    d) persons who are assigned to carry out the permit to work system shall be physically fit in all respects taking into consideration the demands and nature of the work before entering into the confined space. Such person shall be adequately informed about the correct work procedures as well as the precautions to be observed while carrying out the permit to work system;

    e) adequate rescue arrangements wherever considered necessary and adequate first aid, rescue and resurrection arrangements shall be available in good working condition near the place of work while carrying out the permit to work system, for use in emergency;

    f) appropriate and approved personal protective equipment shall be used while carrying out the 'permit to work system';

    g) after completion of work subject to the 'permit to work system' the person responsible shall remove all the equipment and tools and restore to the original condition so as to prevent any danger while carrying out regular process.

21. **Safety sampling personnel:-** The occupier shall ensure the safety of persons assigned for collecting samples by instructing them on the safe procedures. Such personnel shall be provided with proper and approved personal protective equipment, if required.

22. **Ventilation:-** Adequate ventilation arrangements shall be provided and maintained at all times in the process area where dangerous or toxic of flammable or explosive substances could be evolved. These arrangements shall ensure that concentrations, which are either harmful or could result in explosion, are not permitted to be built up in the work environment.

23. **Procedures for meeting emergencies:-**

    1) The occupier of every factory carrying out the works covered in Appendix 'A', shall arrange to identify all types of possible emergencies that could occur in the processes during the course of work or while carrying out maintenance work or repair work. The emergencies so identified shall be reviewed every year.

    2) The occupier shall formulate a detailed plan to meet all such identified emergencies including arrangements for summoning outside help for rescue and fire fighting and arrangements for making available urgent medical facilities.

    3) The occupier shall send the list of emergencies and the details of procedures and plans formulated to meet the emergencies, to the Chief Inspector of Factories.

    4) The occupier shall arrange to install distinctive and recognizable warning arrangements to caution all persons inside the plant as well as the neighboring community, if necessary to enable evacuation of persons and to enable the observance of emergency procedures by the persons who are assigned emergency

duties. All concerned must be well informed about the warning arrangements and their meaning. The arrangements must be checked for its effectiveness every month.

5) Alternate power supply arrangements shall be made and interlocked with normal power supply system so as to ensure constant supply of power to the facilities and equipment meant for compliance with requirements of paragraphs 10, 11, 12, 13, 14, 18, 22 and this paragraph on Part II, Part III, Part IV, and Part VI of this schedule.

6) The occupier shall arrange to suspend the further process work in place where emergency is established and shall forthwith evaluate all persons in that area except workers who have been assigned emergency duties.

7) All the employees of the factory shall be trained about the action to be taken by them including evacuation procedures during emergencies.

8) All emergency procedures must be rehearsed every three months and deficiencies, if any, in the achievement of the objectives shall suitably be corrected.

9) The occupier shall arrange to have ten per cent of the workers trained in the use of First Aid, Fire fighting appliances and in the rendering of specific First Aid measures taking into consideration the special hazards of the particular process.

10) The occupier shall furnish immediately on request the specific chemical identity of the hazardous substance to the treating physician when the information is needed to administer proper emergency or first-aid treatment to exposed persons.

24. **Danger due to effluents:-**

1) Adequate precautions shall be taken to prevent the mixing or effluents from different processes and operations which may cause dangerous or poisonous gases to be evolved.

2) Effluents which contain or give rise in the presence of other effluents to poisonous gases shall be provided with independent drainage systems to ensure that they may be trapped and rendered safe.

Part III
Fire and Explosions Risks

1. **Sources of ignition including lighting installation:-**

1) No internal combustion engine and no electric motor or other electrical equipment, and fittings and fixtures capable of generating sparks or otherwise causing combustion or any other source of ignition or any naked light shall be installed or permitted to be used in the process area where there could be fire and explosion hazards.

2) All hot exhaust pipes shall be installed outside a building and other hot pipes or hot surface or surfaces likely to become hot shall be suitably protected.

3) The classification of work areas in terms of its hazard potential and the selection of electrical equipment or other equipment that could constitute a source of ignition shall be in accordance with the respective Indian Standard.

4) Where a flammable atmosphere may be prevalent or could occur, the soles of footwear worn by workers shall have no metal on them and the wheels of trucks or conveyors shall be conductive type.

5) All tools and appliances used for work in this area shall be of non-sparking type.

6) Smoking in process area where there are risks of fire and explosion shall be prohibited, and warning notices in the language understood by majority of workers shall be posted in the factory prohibiting smoking in the specified area.

2. **Static Electricity:-**

1) All machinery and plant, particularly, pipe lines and belt drives, on which static charge is likely to accumulate, shall be effectively earthed. Receptacles for flammable liquids shall have metallic connections to the earthed supply tanks to prevent static sparking. Where necessary, humidity shall be regulated.

2) Mobile-tanker wagons shall be earthed during filling and discharge, and precautions shall be taken to ensure that earthing is effective before such filling or discharge takes place.

3. **Lightening protection:-** Lightening protection arrangements shall be fitted where necessary, and shall be maintained.

4. **Process heating:-** The method of providing heat for a process likely to result in fire explosion shall be as safe as possible and where the use of naked flame is necessary, the plant shall be so constructed as to prevent any escaping flammable gas, vapour, or dust coming into contact with the flame, or exhaust gases, or other sources likely to cause ignition. Wherever possible, the heating arrangement shall be automatically controlled at a pre-determined temperature below the danger temperature.

5. **Leakage of flammable liquids:-**

1) Provisions shall be made to confine by means of bund walls, dykes, sumps etc., possible leakages from storage vessels containing flammable liquids.

2) Waste material in contact with flammable substances shall be disposed off suitably under the supervision of knowledgeable and responsible person.
3) Adequate and suitable fire-fighting appliances shall be installed in the vicinity of such vessels.

6. **Safety valves:-** Every still and every closed vessel in which gas is evolved or into which gas is passed, and in which the pressure is liable to rise above the atmospheric pressure, shall have attached to it a pressure gauge, and a proper safety valve or other equally efficient means to relieve the pressure. These appliances shall be maintained in good condition.

7. **Installation of pipeline etc:-** All pipelines carrying flammable or explosive substances shall be protected from mechanical damage and shall be examined by a responsible person once in a week to detect and deterioration or defects, or accumulation of flammable or explosive substances, and record kept of any defects found and repairs made.

8. **Fire fighting systems:-**

1) Every factory employing 500 or more persons and carrying out processes listed in Appendix 'A' shall provide—

a) Trained and responsible fire fighting squad so as to effectively handle the fire fighting and life saving equipment in the event of fire or other emergency. Number of persons in this squad will necessarily depend upon the size of risk involved, but in no case shall be less than 8 such trained persons to De available at any time. The squad shall consist of watch and ward personnel, fire pumpman and departmental supervisors and operator trained in the operations of fire and emergency services.

b) Squad leaders shall preferably be trained in recognised Government Institution and their usefulness enhanced by providing residence on the premises.

c) Squad personnel shall be provided with clothing and equipment including helmets, boots and belts.

2) A muster roll showing the duties allocated to each member of the squad shall be prepared and copies supplied to each leader as well as displayed in prominent places so as to be easily available for reference in case or emergency.

3) The pumpman shall be thoroughly conversant with the location of all appliances. He shall be responsible for maintaining all fire fighting equipment in proper working order. Any defect coming to his notice shall be immediately be brought to the notice of squad leader.

4) As far as is practicable, the fire pump room and the main gate (s) of the factory be connected to all manufacturing or storing areas through telephone interlinked and placed in a convenient location near such area.

PART IV
Risks of Toxic Substances

1. **Leakage:-**

    1) All plants shall be so designed and constructed as to prevent the escape of toxic substance, where necessary, separate buildings, rooms or protective structures shall be used for the dangerous stages of the process and the buildings shall be so designed as to localise any escape of toxic substances.

    2) Catch pits, bund walls, dykes, or other suitable safeguards shall be provided to restrict the serious effects of such leakages. Catch pits shall be placed below joints in pipelines where there is danger involved to maintenance and other workers from such leakage.

2. **Drainage:-** Adequate drainage shall be provided and shall lead to collection tanks specificity provided for this purpose wherein deleterious material shall be neutralised, treated or otherwise rendered safe before it is discharged into public drains or sewers.

3. **Covering of vessels:-**

    1) Every fixed vessel or structure containing any toxic substance and not so covered as to eliminate all reasonable risk of accidental contact of any portion of the body of a worker, shall be so constructed as to avoid physical contact.

    2) Such vessel shall, unless its edge is at least 90 centimetres above the adjoining ground or platform, be securely fenced to a height of at least 90 centimetres above such adjoining ground or platform.

    3) Where such vessel adjoin and the space between them, clear of any surrounding brick or other work is either less than 45 centimetres in width or is 45 or more centimetres in width, but is not securely fenced on both sides to a height of at least 90 centimetres, secure barriers shall be so placed as to prevent passage between them:

        Provided that sub-paragraph (2) of this paragraph shall not apply to—

        a) saturators used in the manufacture of sulphate of ammonia; and

        b) that part of the sides of brine evaporating pans which require raking, drawing or filling.

4. **Continuous exhaust arrangement:-**

    1) Any process evolving toxic vapour, gas, fume and substance shall have efficient continuous exhaust draught. Such arrangement shall be interlocked in the process control wherever possible.

    2) In the event of failure of continuous exhaust arrangement means shall be provided to automatically stop the process.

5. **Work Bench:-** All the work benches used in processes involving the manipulation of toxic substances, shall be graded properly and shall be made of smooth impervious surface which shall be washed daily after the completion of work.

6. **Waste disposal:-**

1) There shall be provided a suitable receptacle made of non-absorbable material with a tightly fitting cover for depositing waste material soiled with toxic substances and the contents of such receptacle shall be destroyed by burning or using other suitable methods under the supervision of a responsible person.

2) During the course of manufacture, whenever any batch or intermediate products having toxcity is rejected on considerations of quality, sufficient precautions shall be taken to render them innocuous or otherwise treat them or inactive them, before disposal.

3) The empty containers of toxic substances shall be cleaned thoroughly before disposal under the supervision of a responsible person.

Part V
Special Provisions

1. **Special precautions for Nitro or Amino Processes:-**

1) Unless the crystalised nitro or amino substances or any of its liquor is broken or agitated in a completely enclosed process so as not to give rise to dust or fume, such process shall be carried on under an efficient exhaust draught or by adopting any other suitable means in such a manner as to prevent the escape of dust or fume in the working atmosphere.

2) No part of the plant or equipment or implements which was in contact with nitro or amino compounds shall be repaired, or handled unless they have been emptied and thoroughly cleaned and decontaminated.

3) Filling of containers with nitro or amino compounds shall be done only by using a suitable scoop to avoid physical contact and the drying or the containers in the stove shall be done in such a manner that the hot and contaminated air from the stove is not drawn into the work room.

4) Processes involving the steaming into or around any vessel containing nitro or amino compounds or its raw materials shall be carried out in such a manner that the steam or vapour is effectively prevented to be blown back into the working atmosphere.

5) Suitable antidotes such as methylene blue injections shall always be available at designated places of work for use during emergency involving the poisoning with nitro or amino compounds.

2. Special precautions for 'chrome processes:-

1) Grinding and sieving of raw materials in chrome processes shall be carried on in such a manner and under such condition as to secure effective separation from any other processes and under an efficient exhaust draught.

2) There shall be washing facilities located very near to places where wet chrome processes such as leaching, acidification, sulphate settling, evaporation, crystallisation, centrifugation or packing are carried out, to enable quick washing of affected parts of body with running water.

3) Weekly inspection of hand and feet of all persons employed in chrome process shall be done by a qualified nurse and record of such inspections shall be maintained in a form approved by the Chief Inspector of Factories.

4) There shall be always available at designated places of work suitable ointment such as glycerine, vaceline etc., and water proof plaster in a separate box readily accessible to the workers so as to protect against perforation of nasal septum.

3. **Special precautions for processes carried out in all glass vessels:-**

1) Processes and chemical reactions such as manufacture of vinyl chloride, benzyl chloride etc., which are required to be carried out in all glass vessels shall have suitable means like substantial wire mesh covering to protect persons working nearby in the event of breakage of glass vessel.

2) Any spillage or omission of vapour from the all glass vessel due to breakage, shall be immediately inactivated or rendered innocuous by suitable means such as dilution with water or suitable solvents so as to avoid the risks of fire or explosion or health hazards.

4. **Special precautions for processes involving chlorate manufacture:-**

1) Crystallisation, grinding or packing of chlorate shall not be done in a place used for any other purpose and such places shall have hard, smooth and impervious surface made of non-combustible material. The place shall be thoroughly cleaned daily.

2) The personal protective equipment like overall, etc., provided for the chlorate workers shall not be taken from the place of work and they shall be thoroughly cleaned daily.

3) Adequate quantity of water shall be available near the place of chlorate process for use during fire emergency.

4) Wooden vessels shall not be used for crystallisation of chlorate or to contain crystallised ground chlorate.

Part VI
Medical requirements

1. **Decontamination facilities:-** In all places where toxic substances are used in processes listed in Appendix 'A' the following provisions shall be made to meet an emergency—

a) fully equipped first aid box;

b) readily accessible means of drenching with water persons, parts of body of persons and clothing or persons who have been contaminated with such toxic and corrosive substances and such means shall be as shown in the Table below:

	No. of persons employed at any	**No. of drenching showers**
	Up to 50 persons	2
Between	51 to 100	3
	101 to 200	3 +1 for every 50 persons thereafter
	201 to 400	5 +1 for every 100 persons thereafter
	401 and above	7 +1 for every 200 persons thereafter

c) a sufficient number of eye wash bottles filled with distilled water or suitable liquid, kept in boxes or cupboards conveniently situated and clearly indicated by a distinctive sign which shall be visible at all times.

2. **Occupational health centre:-** In all the factories carrying out processes covered in Appendix 'A' there shall be provided and maintained in good order an occupational health centre with facilities as per scale laid down hereunder—

1) **For factories employing up to 50 workers—**

a) the services of a qualified medical practitioner herein after known as Factory Medical Officer, available on a retainership basis, in his notified clinic near to the factory, for seeking medical help during emergency. He will also carry out

the pre-employment and periodical medical examinations as stipulated in paragraph 4 of this part.

b) A minimum of five persons trained in first aid procedures, amongst whom at least one shall always be available during the working period.

c) A fully equipped first aid box.

2) **For factories employing 51 to 200 workers—**

a) The occupational health centre shall have a room having a minimum floor area of 15 Sq.mt. with floors and walls made of smooth, hard and impervious surface and shall be adequately illuminated, ventilated and equipped.

b) A part-time Factory Medical Officer will be in over all charge of the Centre who shall visit the factory minimum twice in a week and whose services shall be readily available during emergencies.

c) There shall be one qualified and trained dresser-cum-compounder on duty throughout the working period.

d) A fully equipped first aid box.

3) **For factories employing above 200 workers—**

a) There shall be one full-time Factory Medical Officer for factories employing 500 workers and one more Medical Officer for every 1000 workers or part thereof.

b) The occupational health centre in this case shall have a minimum of 2 rooms each having a minimum floor area of 15 sq. mt. with floors and walls made of smooth, hard and impervious surface and shall be adequately illuminated, ventilated and equipped.

c) There shall be one qualified and trained nurse, one dresser-cum-compounder and one sweeper-cum-ward boy throughout the working period.

d) The Occupational Health Centre in this case shall be suitably equipped to manage medical emergencies.

3. **Ambulance van:-**

1) In every factory carrying out processes covered in Appendix 'A' there shall be provided and maintained in good condition, a suitably constructed and fully equipped ambulance van as per Appendix 'C manned by a full time driver-cum-mechanic and a helper, trained in first aid for the purposes of transportation of serious cases of accidents or sickness unless arrangements for procuring such facility at short notice during emergencies have been made with the nearby hospital or other places. The ambulance van shall not be used for any purpose other than the purpose stipulated herein and will always be available near the Occupational Health Centre.

2) The relaxation to procure Ambulance Van from nearby places provided for in sub-para (1) above will not be applicable to factories employing more than 500 workers.

4. **Medical examination:-**

1) Workers employed in processes covered in Appendix 'A' shall be medically examined by a Factory Medical Officer in the following manner:

a) Once before employment, to ascertain physical suitability of the person to do the particular job;

b) Once in a period of 6 months, to ascertain the health status of the worker; and

c) The details of pre-employment and periodical medical examinations carried out as aforesaid shall be recorded in the prescribed form.

2) Any findings of the Factory Medical Officer revealing any abnormality or unsuitability of any person employed in the process shall immediately be reported to the Certifying Surgeon who shall in turn, examine the concerned workers and communicate his findings within 30 days. If the Certifying Surgeon is of the opinion that the person so examined is required to be suspended from the process for health protection he will direct the occupier accordingly, who shall not employ the said worker in the same process. However, the person so suspended from the process shall be provided with alternate placement facilities unless he is fully incapacitated in the opinion of the Certifying Surgeon, in which case the person affected shall be suitably rehabilitated:

Provided that the Certifying Surgeon on his own may examine any other workers whom he feels necessary to be examined for ascertaining the suitability of his employment in the process covered in Appendix 'A' or for ascertaining the health status of any other worker and his opinion shall be final.

3) No person shall be newly appointed without the Certificate of Fitness granted by the Factory Medical Officer. If the Factory Medical Officer declares a person unfit for being appointed to work in the process covered in Appendix 'A', such person shall have a right of appeal to the Certifying Surgeon, whose opinion shall be final in this regard.

4) The worker suspended from the process owing to the circumstances covered in sub-para shall be employed again in the same process only after obtaining the Fitness Certificate from the Certifying Surgeon and after making entries to that effect in the health register.

Part VII
Additional Welfare Amenities

1. **Washing facilities:-**

1) There shall be provided and maintained in every factory for the use of all the workers taps for washing, at the rate of one tap for every 15 persons including liquid soap in a container with tilting arrangements and nail brushes or other suitable means for effective cleaning. Such facilities shall be conveniently accessible and shall be kept in a clean and hygienic condition.

2) If washing facilities as required above are provided for women, such facilities shall be separate for them and adequate privacy at all times shall be ensured in such facilities.

2. **Mess room facilities:-**

1) The occupier of all the factories carrying out processes covered in Appendix 'A' and employing 50 workers or more, shall provide for all the workers working in a shift mess room facilities which are ventilated and provided with tables and sitting facilities along with the provision of cold and hygienic drinking water facilities.

2) Such facilities shall include suitable arrangements for cleaning and washing and shall be maintained in a clean and hygienic condition.

3. **Cloakroom facilities:-**

1) The occupier of every factory carrying out any process covered in Appendix 'A' shall provide for all the workers employed in the process cloakroom facilities with lockers. Each worker shall be provided with two lockers, one for work clothing and another separately for personal clothing and the lockers should be such > as to enable the keeping of the clothing in a hanging position.

2) The cloakroom facilities so provided in pursuance of sub-para (1) shall be located as far as possible near to the facilities provided for washing in pursuance of para 1(1). If it is not possible to locate the washing facilities the cloakroom facilities shall have adequate and suitable arrangements for cleaning and washing.

4. **Special bathing facilities:-**

1) The occupier of any factory carrying out the processes covered under Appendix 'B' shall provide special Bathing facilities for all the workers employed and such facilities shall be provided at the rate of 1 for 25 workers and part thereof, and shall be maintained in a clean and hygienic condition.

2) The occupier shall insist all the workers employed in processes covered in Appendix 'B' to take bath after the completion of the day's or shift work using the bathing facilities so provided and or also effectively prevent such of those workers taking bath in any place other than the bathing facilities.

3) Notwithstanding anything contained in sub-para (1) above, the Chief Inspector may require in writing the occupier of any factory carrying out any other process for which in his opinion bathing facilities are essential from the health point of view, to provide special bathing facilities.

Part VIII

1. **Duties of workers:-**

1) Every worker employed in the processes covered in Appendix 'B' shall not make any safety device or appliance or any guarding or fencing arrangement, inoperative or defective and shall report the defective condition of the aforesaid arrangements as soon as he is aware of any such defect.

2) Before commencing any work, all workers employed in processes covered in Appendix 'A shall check their work place as well as the machinery, equipment or appliance used in the processes and report any mal-function or defect immediately to the supervisor or any responsible person of the management.

3) All workers shall co-operate in all respects with the management while carrying out any work or any emergency duty assigned to them in pursuance of this schedule and shall always used and the personal protective equipments issued to them in a careful manner.

4) All workers employed in the processes covered in Appendix 'A' or Appendix 'B' shall not smoke in the process area or storage area. If special facilities are provided by the management only such facilities should be used.

5) All workers employed in the processes covered in Appendix 'A' shall not remain in unauthorised place or carry out unauthorised work or improvise any arrangements or adopt short cut method or misuse any of the facilities provided in pursuance of this schedule, in such a manner as to cause risk to themselves as well as or to others employed.

6) The workers shall not refuse undergoing medical examinations as required under these rules.

Part IX

Restrictions on the employment of young persons under 18 years of age and women:-

1) The Chief Inspector of Factories may by an order in writing restrict or prohibit the employment of women and young persons under the age of 18, in any of the processes covered in appendix 'A' of this schedule on considerations of health and safety of women and young persons.

2) Such persons who are restricted or prohibited from working in the process due to the order issued in pursuance of sub-para (1) above shall be provided with alternate work which is not detrimental to their health or safety.

Part X
Exemptions

1. **Power of exemption:-** The State Government or subject to the control of the State Government, the Chief Inspector may exempt from the compliance with any of the requirements of this Schedule partly or fully, any factory carrying out processes covered in Appendix 'A' if it is clearly and satisfactorily established by the occupier that the compliance with any of the requirement is not necessary to ensure the safety and health of persons employed suitable and effective alternate arrangements are available to any of the requirements covered in this schedule.

Appendix "A"

Any works or that part of works in which —

a) the manufacture, manipulation or recovery of any of following is carried on—

i. sodium, potassium, iron, aluminium, cobalt, nickel, copper, arsenic, antimony, chromium, zinc, selenium, magnesium, cadmium, mercury, beryllium and their organic and inorganic salts, alloys, oxides and hydroxides;

ii. ammonia, ammonium hydroxide and salts of ammonium;

iii. the organic or inorganic compounds of sulphurous, sulphuric, nitric, nitrous, hydrochloric, hydrofluoric, hydriodic, hydrosulphuric, hydrobromic, boric;

iv. cyanogen compounds, cyanide compounds, cyanate compounds;

v. phosphorous and its compounds other than organo phosphorous insecticides;

vi. chlorine;

b) hydrogen sulphide is evolved by the decomposition of metallic sulphides, or hydrogen sulphide is used in the production of such sulphides;

c) bleaching powder is manufactured or chloride gas is produced in chlor-alkali plants;

d) (i) gas tar or coal or bitumen or shale oil asphalt or any residue or such tar is distilled or is used in any process of chemicals manufacture;

(ii) tar based synthetic colouring matters or their intermediates are produced;

e) nitric acid is used in the manufacture of nitro compounds;

f) explosives are produced with the use of nitro compounds;

g) aliphatic or aromatic compounds or their metallic and non-metallic derivatives or substitutes, such as chloroform, ethylene glycol, formaldehyde, benzyle, chloride, phenol, methyl ethyl keytone peroxide, cobalt carbonyl tungsten carbide etc., are manufactured or recovered.

Appendix 'B'

Concerning Special Bathing Accommodation in pursuance of para 4 of Part IV

1. Nitro or amino processes

2. All chrome processes

3. Processes of distilling gas or coal tar or processes of chemical manufacture in which tar is used

4. Processes involving manufacture, manipulation, handling or recovery of cyanogen compound, cyanide compound, cyanate compounds

5. Processes involving manufacture of bleaching powder or production of chlorine gas in chlor-alkali plants

6. Manufacture, manipulation or recovery of nickel and its compounds

7. All processes involving the manufacture, manipulation or recovery of aliphatic or aromatic compounds or their derivatives or substituted derivatives.

Appendix 'C'

Ambulance

Ambulance shall have the following equipments:

General:

i. An wheeled stretcher with folding and adjusting devices; Head of the stretcher must be capable or being tilted upward;

ii. Fixed suction unit with equipments;

iii. Fixed oxygen supply with equipments;

iv. Pillow with case;

v. Sheets;

vi. Blankets;

vii. Towels;

viii. Emesis bag;

ix. Bed pan

x. Urinal;

xi. Glass;

xii. Safety Equipment

xiii. Flares with life of 30 minutes;

xiv. Flood lights;

xv. Flashlights;

xvi. Fire extinguisher dry powder type;

xvii. Insulated gauntlets;

Emergency care equipments:

Resuscitation:

i. Portable suction unit;

ii. Portable Oxygen unit;

iii. Bag-valve-mask, hand operated artificial ventilation unit;

iv. Airways;

v. Mouth gags;

vi. Tracheostomy adaptors;

vii. Short spine board;

viii. I.V. Fluids with administration unit;

ix. B.P. Manometer;

x. Cuggi;

xi. Stethoscope;

Immobilization:

i. Long and short padded boards;

ii. Wire ladder splints;

iii. Triangular bandage;

iv. Long and short spine boards;

Dressings:

i. Gauze pads-4"x 4";

ii. Universal dressing 10'x 36';

iii. Roll of aluminium foils;

iv. Soft roller bandage 6'x 5'yards;

v. Adhesive tape in 3' roll;

vi. Safety pins;

vii. Bandage sheets;

viii. Burn sheet.

Poisoning:

I. Syrup of Ipecac

II. Activated charcoal | Pre pacin doses

III. Snake bite kit

IV. Drinking water

Emergency Medicines:

— As per requirement (under the advice of Medical Officer only).

(XIII)
Standard Operating Procedures for
Manipulation of stone or any other material containing free silica

1. **Application:-** This shall apply to all factories or parts of factories in which manipulation of stone or any other material containing free silica is carried on.

2. **Definitions:-**

   a) "manipulation" means crushing, breaking, chipping, dressing, grinding, sieving, mixing, grading or handling of stone or any other material containing free silica or any other operation involving such stone or material;

   b) "stone or any other material containing free silica" means a stone or any other solid material containing not less than 5% by weight of free silica;

3. **Precautions in manipulation:-** No manipulation shall be carried out in a factory or part of a factory unless one or more of the following measures, namely —

   a) dumping the stone or other material being processed,

   b) providing water spray,

   c) enclosing the process,

   d) isolating the process, and

   e) providing localised exhaust ventilation, are adopted so as to effectively control the dust in any place in the factory where any person is employed at a level equal to or below the maximum permissible level for silica dust as laid down in Table 2 to the schedule appended to Rule 133-A:

   Provided that such measures as above said are not necessary if the process or operation itself is such that the level of dust created and prevailing does not exceed the permissible level referred to.

4. **Maintenance of floors:-**

   1) All floors or places where fire dust is likely to settle on and whereon any person has to work or pass shall be of impervious material and maintained in such conditions that they can be thoroughly cleaned by a moist method or any other method which would prevent dust being airborne in the process of cleaning.

   2) The surface of every floor of every work room or place where y work is carried on or where any person has to pass during the course his work, shall be cleaned of dust at least once during each shift after being sprayed with water or by any other suitable method so as to prevent dust being airborne in the process of cleaning.

5. **Prohibition for employing young persons:-** No young person shall be employed or permitted to work in any of the operations involving manipulation or at any place where such operations are carried out.

6. **Medical facilities and records of examinations and tests:-**

   1) The occupier of every factory to which this schedule applies shall—
      a) employ a qualified medical officer for medical surveillance of the workers employed therein whose employment shall be subject to the approval of the Chief Inspector, and

b) provide to the said medical officer all the necessary facilities for the purpose referred to in clause (1).

2) The record of medical examination and appropriate tests carried out by the said medical officer shall be maintained in a separate register approved by the Chief Inspector which shall be kept readily available for inspection by the Inspector.

7. **Medical examination by Certifying Surgeon:-**

1) Every worker employed in the processes specified in paragraph 1 shall be examined by a Certifying Surgeon within 15 days of his first employment. Such medical examination shall include pulmonary function tests and chest X-ray. No worker shall be allowed to work after 15 days of his first employment in the factory unless certified fit for such employment by the Certifying Surgeon.

2) Every worker employed in the processes shall be re-examined by a Certifying Surgeon at least once in every twelve months. Such examination shall, wherever the Certifying Surgeon considers appropriate, include all the tests as specified in sub-paragraph (1) except chest X-ray which will be once in 3 years.

3) The Certifying Surgeon shall after examining a worker, issue a Certificate of Fitness in Form 28. The record of re-examinations carried out shall be entered in the Certificate and the certificate shall be kept in the custody of the Manager of the Factory. The record of each examination and re-examination carried out under sub-paragraphs (1) and (2) respectively, including the nature and the results of the tests, shall also be entered by the Certifying Surgeon in health register in Form 16.

4) The Certificate of Fitness and the health register shall be kept readily available for inspection by the Inspector.

5) If at any time the Certifying Surgeon is of the opinion that a worker is no longer fit for employment in the said processes on the ground that continuance therein would involve special danger to the health of the worker, he shall make a record of his findings in the said certificate and the health register. The entry of his findings in those documents should also include the period for which he considered that the said person is unfit for work in the said processes.

The person so suspended from the process shall be provided with alternate placement facilities unless he is fully incapacitated in the opinion of the Certifying Surgeon, in which case the person affected shall be suitably rehabilitated.

6) No person who has been found unfit to work sub-paragraph (5) shall be re-employed or permitted to work in the said processes unless the Certifying Surgeon, after further examination, again certifies him fit for employment in those processes.

8. **Exemption:-** If in respect of any factory, the Chief Inspector is satisfied that owing to the exceptional circumstances or in frequency of the processes or for any other reason, all or any of the provisions of this schedule are not necessary for protection of the workers in the factory, the Chief Inspector may by a certificate in writing, which he may in his discretion revoke at any time, exempt such factory from all or any of such provisions subject to such conditions, if any as he may specify therein.

(XIV)

Standard Operating Procedures for

Handling and processing of asbestos, manufacture of any article of asbestos and any other process of manufacture or otherwise in which asbestos is used in any form

1. **Application:-** This shall apply to all factories or parts of factories in which any of the following processes is carried on, namely—

    a) breaking, crushing, disintegrating, opening, grinding, mixing or seiving of asbestos and any other processes involving handling and manipulation of asbestos incidental thereto;

    b) all processes in the manufacture of asbestos textiles including preparatory and finishing processes;

    c) making of insulation slabs or sections, composed wholly or partly of asbestos and processes incidental thereto;

    d) making or repairing of insulation mattresses, composed wholly or partly of asbestos and processes incidental thereto;

    e) manufacture of asbestos cardboard and paper;

    f) manufacture of asbestos or cement goods;

    g) application of asbestos by spray method;

    h) sawing, grinding, turning, abrading and polishing in the dry state or articles composed wholly or partly of asbestos; and

    i) cleaning of any room, vessel, chamber fixture or appliances for the collection of asbestos dust; and

    j) any other processes in which asbestos dust is given off into the work environment.

2. **Definition:-**

    a) **"asbestos"** means any fibrous silicate mineral and any admixture containing actionlite, amosite, anthophyllite, dhrysotile, croddolite, tremolite or any mixture thereof, whether crude, crushed or opened;

    b) **"asbestos textiles"** means yarn or doth composed of asbestos or asbestos mixed with any other material;

    c) **"approved"** means approved for the time being in writing by the Chief Inspector;

    d) **"breathing apparatus"** means a helmet or face piece with necessary connection by means of which a person using it breaths air free from dust or any other approve apparatus;

    e) **"efficient exhaust draught"** means localised ventilation by mechanical means for the removal of dust so as to prevent dust from escaping into air of any place in which work is carried in and no draught shall be deemed to be efficient which fails to control dust produced at the point where such dust originates;

    f) **"preparing"** means crushing, disintegrating and any other processes in or incidental to the opening of asbestos;

    g) **"protective clothing"** means overall and head covering which (in either case) will when worn exclude asbestos dust.

3. **Tools and Equipment:-** Any tools or equipment used in processes to which this schedule apply shall be such that they do not create asbestos dust above the permissible limit or are equipped with efficient exhaust draught.

4. **Exhaust draught:-**

    1) An efficient exhaust draught shall be provided and maintained to control dust from the following processes and machines manufacture and conveying machinery, namely—

        a) preparing, grinding or dry mixing machines;

        b) carding, card waste and ring spinning machines, and looms;

        c) machines or other plant fed with asbestos; and

        d) machines used for the sawing, grinding, turning, drilling, abrading or polishing; in the dry state, or articles composed wholly or partly of asbestos;

        e) cleaning and grinding of the cylinders or other parts of a carding machine;

        f) chambers, hoppers, or other structures into which loose asbestos is delivered or passes;

        g) work-benches for asbestos waste sorting or for other manipulation of asbestos by hand;

        h) filling or emptying of sacks, skips or other portable containers, weighing or other process incidental thereto which is affected by hand or is carried on in any work place;

        i) sack cleaning machine;

        j) mixing and blending of asbestos by hand; and

        k) any other process in which dust is given off into the work environment.

    2) Exhaust ventilation equipment provided in accordance with sub-paragraph (1) shall, while any work of maintenance or repair to the machinery, apparatus or other plant or equipment in connection with which it is provided is being carried on, be kept in use so as to produce an exhaust draught which prevents the entry of asbestos dust into the air of any work place.

    3) Arrangements shall be made to prevent asbestos dust discharged from exhaust apparatus being drawn into the air of any workroom.

    4) The asbestos bearing dust removed from any workrooms by the exhaust system shall be collected in suitable receptacles or filter bag which shall be isolated from all work areas.

5. **Testing and examination of ventilating systems:-**

    1) All ventilating systems used for the purpose of extracting or suppressing dust as required by this schedule shaft be examined and inspected once in a week by a responsible person. It shall be thoroughly examined and tested by a competent person once in every period of 12 months. Any defects found by such examinations or test shall be rectified forthwith.

2) A register containing particulars of such examination and tests and the state of the plant and the repairs or alternations, if any found to be necessary shall be kept and shall be available for inspection by an Inspector.

6. **Segregation in case of certain process:-** Mixing or blending by hand of asbestos, or making or repairing of insulating mattresses composed wholly or partly or asbestos shall not be carried on in any room in which any other work is done.

7. **Storage and distribution of loose asbestos:-** All loose asbestos shall while not in use, be kept in suitable closed receptacles which prevent the escape of asbestos dust there from and such asbestos shall not be distributed within a factory except in such receptacles or in a totally enclosed system of conveyance.

8. **Asbestos sacks:-**

1) All sacks used as receptacles for the purposes of transport of asbestos within the factory shall be constructed of impermeable materials and shall be kept in good repair.

2) A sack which has contained asbestos shall not be cleaned by hand heating but by a machine, complying with paragraph 4.

9. **Maintenance of floors and workplaces:-**

1) In every room in which any of the requirements of this schedule apply—

a) the floors, work-benches, machinery and plant shall be kept in a clean state and free from asbestos debris and suitable arrangements shall be made for the storage of asbestos not immediately-required for use; and

b) the floors shall be kept free from any materials, plant or other articles not immediately required for the work carried on in the room which would obstruct the proper cleaning of the floor.

2) The cleaning as mentioned in sub-paragraph (1) shall, so far as practicable, be carried out by means of vacuum cleaning equipment so designed and constructed and so used that asbestos dust neither escapes nor is discharged into the air of any work place.

3) When the cleaning is done by any method other than that mentioned in sub-paragraph (2), the persons doing clearing work and any other person employed in that room shall be provided with respiratory protective equipment and protective clothing.

4) The vacuum cleaning equipment used in accordance with provisions of sub-paragraph- (2) shall be properly maintained and after each cleaning operations, its surfaces kept in a clean state and free from asbestos waste and dust.

5) Asbestos waste shall not be permitted to remain on the floors or other surfaces at the work place at the end of the working shift and shall be transferred without delay to suitable receptacles. Any spillage of asbestos waste occurring during the course of the work at any time shall be removed and transferred to the receptacles maintained for the purpose without delay.

10. **Breathing apparatus and protective clothing:-**

1) An approved breathing apparatus and protective clothing shall be provided and maintained in good conditions for use of every person employed,

a) in chambers containing loose asbestos;

b) in cleaning, dust settling or filtering chambers of apparatus;

c) in cleaning the cylinders including the doffer cylinders or other parts of a carding machine by means of handstrickles;

d) in filling, beating or levelling in the manufacture or repair, of insulating mattresses; and

e) in any other operation or circumstances in which it is impracticable to adopt technical means to control asbestos dust in the work environment within the permissible limit.

2) Suitable accommodation in conveniently accessible position shall be provided for the use of persons when putting on or taking off breathing apparatus and protective clothing provided in accordance with this paragraph and for the storage of such apparatus and clothing when not in use.

3) All breathing apparatus and protective clothing when not in use shall be stored in the accommodation provided under sub-paragraph (2). All protective clothing in use shall be de-dusted under an efficient exhaust draught or by vacuum cleaning and shall be washed at suitable intervals.

4) The cleaning schedule and procedure should be such as to ensure the efficiency in protective the wearer.

5) All breathing apparatus shall be cleaned and disinfected at suitable intervals and thoroughly inspected once in a month by a responsible person.

6) A record of the cleaning and maintenance and of the condition of the breathing apparatus shall be maintained in a register provided for that purpose which shall be readily available for inspection by an Inspector.

7) No person shall be employed to perform any work specified in sub-paragraph (1) for which breathing apparatus is necessary to be provided under that sub-paragraph unless he has been fully instructed in the proper use of that equipment.

8) No breathing apparatus provided under sub-paragraph (1) which has been worn by a person shall be worn by another person unless it has been thoroughly cleaned and disinfected since last being worn and the person has been fully instructed in the proper use of that equipment.

11. **Separate accommodation for personal clothing:-** A separate accommodation shall be provided in a conveniently accessible position for all persons employed in operations to which this schedule applies for storing of personal clothing. This should be separated from the accommodation provided under sub-paragraph (2) of paragraph 10 to prevent contamination of personal clothing.

12. **Washing and bathing facilities:-**

1) There shall be provided and maintained in a clean state and in good repair for the use of all workers employed in the processes covered by the schedule, adequate washing and bathing places having a constant supply of water under cover at the rate of one such place for every 15 persons employed.

2) The washing places shall have standpipes placed at intervals of not less than one metre.

3) Not less than one half of the total number of washing places shall be provided with bathrooms.

4) Sufficient supply of clean towels made of suitable material shall be provided.

5) Sufficient supply of soap and nail brushes shall be provided.

13. **Messroom:-**

1) There shall be provided and maintained for the use of all workers employed in the factory covered by this schedule, remaining on the premises during the rest intervals, a suitable messroom which shall be furnished with—

a) sufficient tables and benches with back rest, and

b) adequate means for warming food.

2) The messroom shall be placed under the charge of a responsible person and shall be kept
clean.

14. **Prohibition of employment of young persons:-** No young person shall be employed in any of the process covered by this schedule.

15. **Prohibition relating to smoking:-** No person shall smoke in any area where processes covered by this schedule are carried on. A notice in the language understood by majority of the workers shall be posted in the plant prohibiting smoking at such areas.

16. **Cautionary notices:-**

1) Cautionary notices shall be displayed at the approaches and along the perimeter of every asbestos processing area to warn all persons regarding—

a) hazards to health from asbestos dust,

b) need to use appropriate protective equipment,

c) prohibition of entry to unauthorised persons or authorised persons but without protective equipment.

2) Such notices shall be in the language understood by the majority of the workers.

17. **Air-monitoring:-** To ensure the effectiveness of the control measures, monitoring or asbestos fibre in air shall be carried out once atleast in every shift and the record of the results so obtained shall be entered in a register specially maintained for the purpose.

18. **Medical facilities and records of medical examinations and tests:-**

1) The occupier of every factory or part of the factory to which this schedule applies, shall—

a) employ a qualified medical practitioner for medical surveillance or the workers covered by this schedule those employment shall be subject to the approval of the Chief Inspector, and

b) provide to the said medical practitioner all the necessary facilities for the purpose referred to in clause (a).

2) The record of medical examinations and appropriate tests carried out by the said medical practitioner shall be maintained in a separate register approved by the Chief Inspector which shall be kept readily available for inspection by the Inspectors.

19. **Medical examination by Certifying Surgeon:-**

1) Every worker employed in the processes specified in paragraph 1 shall be examined by a Certifying Surgeon within 15 days of his first employment. Such examination shall include pulmonary function tests, tests for detecting asbestos fibres in sputum and chest X-ray. No worker shall be allowed to work after 15 days of his first employment in the factory unless certified fit for such employment by the Certifying Surgeon.

2) Every worker employed in the process referred to in sub-paragraph (1) shall be re-examined by a Certifying Surgeon at least once in every twelve calendar months. Such examinations shall wherever the Certifying Surgeon considers appropriate, include all the tests specified in sub-paragraph (1) except chest X-ray which will be carried out once in 3 years.

3) The Certifying Surgeon shall after examining a worker, issue a certificate of fitness in form A. The record of examination and re-examinations carried out shall be entered in the certificate and the certificate shall be kept in the custody of the manager of the factory. The record of each examination and re-examination carried out under sub-paragraphs (1) and (2) respectively including the nature and the results of the tests, shall also be entered by the Certifying Surgeon in a health register in Form 16.

4) The Certificate of Fitness and the health register shall be kept readily available for inspection by the Inspector.

5) If at any time the Certifying Surgeon is of the opinion that a worker is no longer fit for employment in the said processes on the ground that continuance therein would involve special danger to the health of the worker, he shall make a record of his findings in the said certificate and the health register. The entry of his findings in those documents should also include the period for which he considers that the said person is unfit to work in the said processes.

   The person so suspended from the process shall be provided with alternate placement facilities unless he is fully incapacitated in the opinion or the Certifying Surgeon, in which case the person affected shall be suitably rehabilitated.

6) No person who has been found unfit to work under sub-paragraph (5) shall be re-employed or permitted to work in the said processes unless the Certifying Surgeon, after further examination, further certifies him fit for employment in those processes.

20. **Exemptions:-** If in respect of any factory, the Chief Inspector is satisfied that owing to the exceptional circumstances or infrequency of the processes or for any other reason, all or any of the provisions of this schedule are not necessary for protection of the workers in the factory, the Chief Inspector may, by a certificate in writing, which he may at his discretion revoke at any time, exempt such factory from all or any of such provisions subject to such conditions, if any, as he may specify therein.

(XV)
Standard Operating Procedures for
Handling of Manipulation of corrosive substances

1. **Definitions:-**

    a) **"corrosive operation"** means an operation of manufacturing, storing, handling, processing, packing, or using any corrosive substance in a factory; and

    b) **"corrosive substance"** includes sulphuric acid, nitric acid, hydrochloric acid, hydrofluoric acid, carbolic acids, phosphoric acid, liquid chlorine, liquid bromine ammonia, sodium hydroxide and potassium hydroxide and a mixture thereof and any other substance which the State Government may by notification specify to be a corrosive substance.

2. **Flooring:-** The floor of every workroom of a factory in which corrosive operation is carried on shall be made of impervious, corrosion and fire resistant material and shall be so constructed as to prevent collection of any corrosive substance. The surface of such flooring shall be smooth and cleaned as often as necessary and maintained in a sound condition.

3. **Protective equipment:-**

    1) The occupier shall provide for the use of all persons employed in any corrosive operation suitable protective wear for hands and feet, suitable aprons, face shields, chemical safety goggles and respirators. The equipments shall be maintained in good order and shall be held in clean and hygienic condition by suitably treating to get rid of the ill effects of any absorbed chemicals and by disinfecting. The occupier shall also provide suitable protective creams and other preparations wherever necessary.

    2) The protective equipment and preparations provided shall be used by the persons employed in any corrosive operations.

4. **Water facilities:-** Where any corrosive operations is carried on, there shall be provided as close to the place of such operation as possible, a source of clean water at a height of 210 centimeters from a pipe 1.25 centimeters diameter and fitted with a quick acting valve so that in case of injury to the worker by any corrosive substance the injured part can be thoroughly flooded with water. Whenever necessary in order to ensure continuous water supply a storage tank having a minimum length, breadth and height of 210 centimeters, 120 centimeters and 60 centimeters respectively or such dimensions as are approved by the Chief Inspector shall be provided as the source of clean water.

5. **Cautionary notice:-** A cautionary notice in the following form and printed in the language which majority of the workers employed understand, shall be displayed prominently close to the place where a corrosive operation is carried out and where it can be easily and conveniently read by the workers. If any worker is illiterate, effective steps shall be taken to explain carefully to him the contents of the notice so displayed.

Cautionary Notice **Danger** "Corrosive substances cause severe burns and vapours thereof may be extremely hazardous. In case of contact, immediately flood the part affected with plenty of water for at least 15 minutes. Get medical attention quickly"

6. **Transport:-**

    1) Corrosive substances shall not be filled, moved or carried except in containers or through pipes and when they are to be transported in containers they shall be placed in crates of found construction and of sufficient strength.

2) A container with a capacity of 11.5 litres or more of a corrosive substance shall be placed in a receptacle or crate and then carried by more than one person at a height below the waist line unless a suitable rubber wheeled truck is used for the purpose.

3) Containers for corrosive substances shall be plainly labelled.

7. **Devices for handling corrosives:-**

1) Suitable tilting or lifting derile or pumping arrangements shall be used for emptying jars, carboys and other containers of corrosives.

2) Corrosive substance shall not be handled by bare hands but by means of a suitable scoop or other devices.

8. **Opening of valves:-** Valves fitted to containers holding a corrosive substance shall be opened with great care. If they do not work freely, they shall not be forced open. They shall be opened by a worker suitably trained for the purpose.

9. **Cleaning tanks, stills etc:-**

1) In cleaning out or removing residues from stills or other large chambers used for holding any corrosive substance, suitable implements made of wood or other material shall be used to prevent production of arseniuretted hydrogen (arsine).

2) Whenever it is necessary for the purpose of cleaning or other maintenance work for any worker to enter chamber, tank, vat, pit or other confined space where a corrosive substance had been stored, all possible precautions required under Section 36 of the Act shall be taken to ensure the workers safety.

3) Wherever possible, before repairs are undertaken to any part of equipment in which a corrosive substance was handled such equipment, or part thereof shall be freed of any adhering corrosive substance by adopting suitable methods.

10. **Storage:-**

1) Corrosive substances shall not be stored in the same room with other chemicals such as turpentine, carbides, metallic powders and combustible materials, the accidental mixing with which may cause a reaction which is either violent or gives rise to toxic fumes and gases.

2) Pumping or filling overhead tanks, receptacles, vats or other containers for storing corrosive substances shall be so arranged that there is no possibility of any corrosive substance overflowing and causing injury to any person.

3) Every container having a capacity of twenty litres or more and every pipeline, valve and fitting used for storing or carrying corrosive substances shall be thoroughly examined every year for finding out any defects and defects so found out shall be removed forthwith. A register shall be maintained of every such examination made and shall be produced before the Inspector whenever required.

11. **Fire extinguishers and fire fighting equipment:-** An adequate number of suitable type of fire extinguishers or other fire fighting equipment depending on the nature of chemicals stored, shall be provided. Such extinguishers or other equipment shall be regularly tested and refilled. Clear instructions as to now the extinguishers or other equipment should be used, printed in the language which majority of the workers employed understand, shall be affixed near each extinguisher or other equipment.

12. **Exemption:-** If in respect of any factory, the Chief Inspector, on an application made by the manager is satisfied that owing to the exceptional circumstances, or the infrequency of

the process or for any other reason to be recorded by him in writing, all or any of the provisions of this schedule are not necessary for the protection of the persons employed therein, he may by a certificate in writing, which he may at any time revoke, exempt the factory from such of the provisions and subject to such conditions as he may specify therein.

(XVI)

Standard Operating Procedures for

Compression of oxygen and hydrogen produced by the electrolysis of water

1. **Location of electrolyser plant:-** The room in which electrolyser plant is installed shall be separate from the plant for storing and compressing the oxygen and hydrogen and also the electric generator room.

2. **Testing of purity:-**

    1) The purity of oxygen and hydrogen shall be tested by a competent person at least once in every shirt at the following posts; namely:

        a) in the electrolysis room;

        b) at the gasholder inlet; and

        c) at the suction end of the compressor.

    2) The purity figures shall be entered in a register and shall be signed by the persons carrying out such tests:

    Provided however, that if the electrolyser plant is fitted with automatic recorder of purity of oxygen and hydrogen with alarm lights, it shall be sufficient if the purity of gases is tested at the suction end of the compressor only.

3. **Restriction as to the compression:-** The oxygen and hydrogen gases shall not be compressed if their purity as determined under paragraph 2 above falls below 98% at any time.

4. **Limit switch for gasholder:-** The bell of any gasholder shall not be permitted to go within the 30 centimeters of its lowest position when empty and a limit switch shall be fitted to the gasholder in such a manner as to switch off the compressor motor when the limit is reached.

5. **Provisions of negative pressure switch:-** In addition to the limit switch in the gas holder a sensitive negative pressure switch shall be provided in or adjacent to the suction main for hydrogen close to the gasholder and between the gasholder and the hydrogen compressor to switch off the compressor motor in the event of the gasholder being emptied to the extent as to cause vacuum.

6. **Purity of caustic soda:-** The water and caustic soda used for making lye shall be chemically pure within pharmaceutical limits.

7. **Precautions against reversal of polarity:-** Electrical connections at the electrolyser cells and at the electric generator terminals shall be so construed as to preclude the possibility or wrong connections leading to the reversal of polarity and in addition an automatic device shall be provided to cut off power in the event of reversal of polarity owing to wrong connections either at the switch board or at the electric generator terminals.

8. **Colouring of gas pipes:-** Oxygen and hydrogen gas pipes shall be painted with distinguishing colours and in the event of leakage at the joints of the hydrogen gas pipe, the pipe after reconnection shall be purged of all air before drawing in hydrogen gas.

9. **Use of flameproof fittings:-** All electrical wiring and apparatus in the electrolyser room shall be of flameproof construction or enclosed in flameproof fittings and no naked light or flame shall be allowed to be taken either in the electrolyser room or where compression and filling of the gases is carried on and such warning notices shall be exhibited in prominent places.

10. **Prohibition of hot work:-** No part of the electrolyser plant and the gasholders and compressor shall be subjected to welding, brazing, soldering or cutting until steps have been taken to remove explosive substance from that part and render the part safe for such

operations and after the completion of such operations no explosive substance shall be allowed to enter that part until the metal has cooled sufficiently to prevent risk of explosion.

11. **Repair, etc., to be done under supervision:-** No work of operation, repair or maintenance shall be undertaken except under the direct supervision of a person who is by his training, experience and knowledge of the necessary precautions against risk or explosion is competent to supervise such work. No electric generator after erection or repairs shall be switched on to the electrolyser unless the same is certified by the competent persons under whose direct supervision erection or repairs are carried or to be in a safe condition and the terminals have been checked for the polarity as required by paragraph 7.

12. **Checking of plant:-** Every part of the electrolyser plant and the gasholders and compressor shall have a regular schedule of overhaul and checking and every defect noticed shall be rectified forthwith.

(XVII)

Standard Operating Procedures for

Process of extracting oils and fats from vegetable and animal source in solvent extraction plants

1. **Definitions:-**

a) **"competent persons"** means a person who is a member of the Institution of Engineers (India) or an Associate member of the said institution with 10 years experience in a responsible position as may be approved by the Chief Inspector:

Provided that a graduate in mechanical engineering or chemical technology with specialized knowledge of oils and fats and with minimum experience of 5 years in a solvent extraction plant shall also be considered to be a competent person:

Provided further that the State Government may accept any other qualifications if in its opinion they are equivalent to the qualifications aforesaid.

b) **"flame proof enclosure"** as applied to electrical machinery or apparatus means an enclosure that will withstand, when covers or other access doors and properly secured, an internal explosion of the flammable gas or vapour which may enter or which may originate inside the enclosure without suffering damage and without communicating internal inflammation or explosion to the external flammable gas or vapour;

c) **"solvent"** means a flammable liquid such as pentane, hexane and heptane used for the recovery of vegetable oils;

d) **"solvent extraction plant"** means a plant in which the process of extracting oil sand fats from vegetable and animal sources by use of solvents is carried on.

2. **Location and layout:-**

1) No solvent extraction plant shall be permitted to be constructed or extended to within a distance of 30 metres from the nearest residential locality.

2) A continuous wire fencing of the height of 1.5 metre shall be provided around the solvent extraction plant upto a minimum distance of 15 metres from the plant.

3) No person shall be allowed to carry any matches or an open flame of fire inside the area bound by the fencing.

4) Boiler houses and other buildings where open flame processes are carried on shall be located at least 30 metres away from the solvent extraction plant.

5) In godowns and preparatory processes are at a distance of less than 30 metres from the solvent extraction plant, these shall be atleast 15 metres distance from the plant and a continuous barrier wall of non-combustible material of 1.5 metres height shall be erected at a distance of not less than 15 metres from the solvent extraction plant so that it extends to at least 30 metres of vapour travel around its ends from the plant to the possible sources of ignition.

3. **Electrical installations:-**

1) All electrical motors and wiring and other electrical equipment installed or housed in solvent extraction plant shall be of flame proof construction.

2) All metal parts of the plant and building including various tanks and containers where solvents are stored or are present and all parts of electrical equipment not required to be energised shall be properly bonded together and connected to earth so as to avoid accidental rise in the electrical potential of such parts above the earth potential.

4. **Restriction on smoking:-** Smoking shall be strictly prohibited within 15 metres distance from solvent extraction plant. For this purpose, 'No Smoking' signs shall be permanently displayed in the area.

5. **Precautions against friction:-**

    1) All tools and equipment including ladders, chains and other lifting trackle required to be used in solvent extraction plant shall be of non-sparking type.

    2) No machinery or equipment in any solvent extraction plant shall be belt driven unless the belt used is of such a type that it does not permit accumulations of static electricity to a dangerous level.

    3) No person shall be allowed to enter and work in the solvent extraction plant if wearing clothes made of nylon or such other fibre that can generate static electrical charge, or wearing footwear which is likely to cause sparks by friction.

6. **Fire fighting apparatus:-**

    1) Adequate number of portable fire extinguishers suitable for use against flammable liquid fires shall be provided in the solvent extraction plant.

    2) An automatic water supply spray sprinkler system on a wet pipe or open head deluge system with sufficient supply or storage water shall be provided over solvent extraction plant and throughout the building housing such plant.

7. **Precautions against power failure:-** Provision shall be made for the automatic cutting off of steam in the event of power failure and also for emergency overhead water supply for feeding water by gravity to condensers which shall come into play automatically with the power failure.

8. **Magnetic separators:-** Oil cake shall be fed to the extractor by a conveyer through a hopper and a magnetic separator shall be provided to remove any pieces of iron during its transfer.

9. **Venting:-**

    1) Tanks containing solvents shall be protected with emergency venting to relieve excessive internal pressure in the event of fire.

    2) All emergency relief vents shall terminate at least 6 metres above the ground and be so located that vapours will not re-enter the building in which solvent extraction plant is located.

10. **Waste water:-** Process waste water shall be passed through a flash evaporator to remove any solvent before it is discharged into a sump which should be located within the fenced area but not closer than 8 metres to the fence.

11. **Ventilation:-** The solvent extraction plant shall be well ventilated and if the plant is housed in a building, the building shall be provided with mechanical ventilation with provision for at least six air changes per hour.

12. **Housekeeping:-**

    1) Solvents shall not be stored in an area covered by solvent extraction plant except in small quantities which shall be stored in approved safety cans.

    2) Waste materials such as oily rags, other wastes and absorbents used to wipe off solvent and paints and oils shall be deposited in approved containers and removed from the premises at least once a day.

3) Space within the solvent extraction plant and within 15 metres from the plant shall be kept free from any combustible materials and any spills of oil or solvent shall be cleaned up immediately.

13. **Examination and repairs:-**

    1) The solvent extraction plant shall be examined by the competent person to determine any weakness of corrosion and wear once in every 12 months. Report of such examination shall be supplied to the Inspector with his observation as to whether or not the plant is in safe condition to work.

    2) No repairs shall be carried out to the machinery or plant except under the direct supervision of the competent person.

    3) Facility shall be provided for purging the plant with inert gas or steam before opening for cleaning or repairs and before introducing solvent after repairs.

14. **Operating personnel:-** The operation of the plant and machinery in the solvent extraction plant shall be in the charge of such duly qualified and trained persons as are certified by the competent person to be fit for the purpose and no other person shall be allowed to operate the plant and machinery.

15. **Employment of women and young persons:-** No women or young person shall be employed in the solvent extraction plant.

16. **Vapour detection:-** A suitable type of flameproof and portable combustible gas indicator shall be provided and maintained in good working order and a schedule of routine sampling of atmosphere at various locations as approved by the Chief Inspector shall be drawn out and entered in a register maintained for the purpose.

17. **Exemption:-** If in respect of any factory, the Chief Inspector is satisfied that owing to the exceptional circumstances or in frequency of the processes or for any other reason, all or any of the provisions of this schedule are not necessary for the protection of the workers in the factory, he may, by a certificate in writing which he may in his discretion revoke at any time exempt such factory from all or any of such provisions subject to conditions, if any, as he may specify therein.

(XVIII)

Standard Operating Procedures for

Manufacture or manipulation of manganese and its compounds

1. **Application:-** This shall apply to every factory in which or in any part of which any manganese process is carried on.

2. **Definitions:-**

    1) **"efficient exhaust ventilation"** means localised ventilation effected by mechanical means for the removal of dust or fume or mist at the source of origin so as to prevent it from escaping into the atmosphere of any place where any work is carried on, and no draught shall be deemed to be efficient which fails to remove the dust or fume or mist at the point where it is generated and fails to prevent it from escaping into and spreading into the atmosphere of a work place.

    2) **"first employment"** means first employment in any manganese process following any cessation of employment for a continuous period exceeding 3 calendar months;

    3) **"manganese process"** means processing, manufacture or manipulation of manganese or any compound of manganese or any ore or any mixture containing manganese;

    4) **"manipulation"** means mixing, blending, filling, emptying, grinding, sieving, drying, packing, sweeping or otherwise handling of manganese or a compound of manganese or any ore or any mixture containing manganese.

3. **Isolation of a process:-** Every manganese process which may give rise to dust, vapour, or mist containing manganese shall be carried on in a totally enclosed system or otherwise effectively isolated from other parts of the factory and persons employed on other processes so that they may not be affected by the same.

4. **Ventilation of process:-** No process in which any dust, vapour or mist containing manganese is generated, shall be carried out except under an efficient exhaust ventilation which shall be applied as near to the point of generation as practicable.

5. **Personal protective equipment:-**

    1) The occupier of the factory shall provide and maintain in good and clean condition suitable overalls and head coverings for all persons employed in any manganese process and such overalls and head coverings shall be worn by the persons while working on a manganese process.

    2) The occupier of the factory shall provide suitable respiratory protective equipment for use by workers in emergency to prevent inhalation of dusts, fumes or mists. Sufficient number of complete sets of such equipment shall always be kept near the work place and the same shall be properly maintained and Kept always in a condition to be used readily.

    3) The occupier shall provide and maintain for the use of all persons employed, suitable accommodation for the storage and make adequate arrangements for cleaning and maintenance of personal protective equipment.

6. **Prohibition relating to women and young persons:-** No women or young persons shall be employed or permitted to work in any manganese process.

7. **Food, drinks, etc., prohibited in the work rooms:-** No food, drink, pan and supari or tobacco shall be allowed to be brought into or consumed by any worker in any work room in which any manganese process is carried on.

8. **Messroom:-** There shall be provided and maintained for the use of the persons employed in a manganese process a suitable messroom which shall be furnished with sufficient tables and benches and adequate means for warming of food. The messroom shall be placed under the charge of a responsible person and shall be kept clean.

9. **Washing facilities:-** There shall be provided and maintained in a clean state and in good condition for the use of persons employed in manganese process—

    a) a wash place under cover, with either,

    b) a trough with a smooth impervious surface fitted with a waste pipe without plug and sufficient length to allow at least 60 centimetres for every ten such persons employed at any one time and having a constant supply of water from taps or jets above the trough at intervals of not more than 60 centimetres, or

    c) at least one wash basin for every five such person employed at any one time, fitted with a waste pipe and plug and having a constant supply of water; and

    d) sufficient supply of soap or other suitable cleaning material and nail brushes and clean towels.

10. **Cloakroom:-** If the Chief Inspector so requires there shall be provided and maintained for the use or persons employed in manganese process a cloakroom for clothing put off during working hours with adequate arrangements for drying the clothing.

11. **Cautionary placard instructions:-** Cautionary notices in the form specified in the appendix to this schedule and printed in the language of the majority of the workers employed, shall be affixed in prominent places in the factory where they can be easily and conveniently read by the workers and arrangement shall be made by the occupier to instruct periodically all workers employed in a manganese process regarding the health hazards connected with their duties and the best preventive measure and methods to protect themselves. The notices shall always be maintained in a legible condition.

12. **Medical facilities and records of examination and tests:-**

    1) The occupier of every factory to which the schedule applies, shall—

        a) Employ a qualified medical practitioner for medical surveillance of the workers employed therein whose employment shall be subject of the Chief Inspector; and

        b) Provide to the said medical practitioner all the necessary facilities for the purpose referred to in clause (a).

    2) The record of medical examinations and appropriate tests carried out by the said medical practitioner shall be maintained in a separate register approved by the Chief Inspector which shall be kept readily available for inspection by the Inspector.

13. **Medical examination by Certifying Surgeon:-**

    1) Every worker employed in any manganese process shall be medically examined by a Certifying Surgeon within 15 days of his first employment. Such examination shall include tests for detection of serum calcium, serum phosphate and manganese in blood and urine and also include steadiness tests and other neuromuscular coordination tests. No worker shall be allowed to work after 15 days of his first employment in the factory unless certified for such employment by the Certifying Surgeon.
    2) Every worker employed in a manganese process shall be re-examined by a Certifying Surgeon at least once in every three calendar months and such examination shall, wherever the Certifying Surgeon consider appropriate, include all the tests in sub-paragraph (1).

    3) The Certifying Surgeon shall after examining a worker, issue a Certificate of Fitness in Form 4. The record of examination and re-examinations carried out shall be entered in the Certificate and the Certificate shall be kept in the custody of the Manager of the Factory. The record of each examination and re-examination carried out under sub-paragraphs (1) and (2) respectively including the nature and the results of these tests, shall also be entered by the Certifying Surgeon in a health register in Form 16.

4) The Certificate of Fitness and the health register shall be kept readily available for inspection by the Inspector.

5) If at any time the Certifying Surgeon is of the opinion that the worker is no longer fit for employment in the said process on the ground that continuance therein would involve special danger to the health of the worker, he shall make a record of his findings in the said certificate and the health register. The entry of his findings in those documents should also include the period for which he considers that the said person is unfit to work in the said process.

The person so suspended from the process shall be provided with alternate placement facilities unless he is fully incapacitated in the opinion of the Certifying Surgeon, in which case the person affected shall be suitably rehabilitated.

6) No person who has been found unfit to work under sub-paragraph (5) shall be re-employed or permitted to work in said processes unless the Certifying Surgeon, after further examination, again certifies him fit for employment in these processes.

14. **Exemption:-** If in respect of any factory, the Chief Inspector is satisfied that owing to any exceptional circumstances, or infrequency of the process, or for any other reason application of all or any of the provisions of this schedule is not necessary for the protection of the persons employed in such factory, he may, by an order in writing which he may at his discretion revoke, exempt such factory from all or any of the provisions on such conditions and for such period as he may specify in the said order.

Appendix
Cautionary Notice
Manganese and Manganese Compounds

1. Dust fumes and mists of manganese and its compounds are toxic when inhaled or when ingested.
2. Do not consume food or drink near the work place.
3. Take a good wash before taking meals.
4. Keep the working area dean.
5. Use the protective clothing and equipment provided.
6. When required to work in situations where dusts, fumes or mists are likely to be inhaled, use respiratory protective equipment provided for the purpose.
7. If you get severe head-aches, prolonged sleeplessness or abnormal sensations on the body report to the manager who would make arrangements for your examination and treatment.

(XIX)
Standard Operating Procedures for
Manufacture or manipulation of dangerous pesticides

1. **Application:-** This shall apply in respect of all factories or any part thereof in which the process of manufacture or manipulation of dangerous pesticides (hereinafter referred to as the said manufacturing process) is carried on

2. **Definitions:-**

    a) "dangerous pesticides" means any product proposed or used for controlling, destroying or repelling any pest for preventing growth or mitigating effects of such growth including any of its formulations which are considered toxic under the provisions of the Insecticides Act, 1968 and the rules made there under, and any other product as may be notified from time to time by the State Government.

    b) "efficient exhaust draught" means localised mechanical ventilation for removal or smoke, gas, vapour, dust, fume or mist so as to prevent them from escaping into the air of any work room in which work is carried on, and no exhaust draught shall be considered efficient if it fails to remove smoke generated at the point where such gas, fume, dust, vapour or mist originates from the process.

    c) "first employment" shall mean first employment manufacturing process to which this schedule applies and : also include re-employment in the said manufacturing process following any cessation of employment for a continuous period exceeding three calendar months; and

    d) "manipulation" includes mixing, blending, formulating, filling, emptying, packing or otherwise handling.

3. **Instruction to workers:-** Every worker on his first employment shall be fully instructed on the properties including dangerous properties of the chemicals handled in the said manufacturing process and the hazards involved. The employees shall also be instructed in the measures to be taken to deal with any emergency. Such instructions shall be repeated periodically.

4. **Cautionary notice and placards:-** Cautionary notices and placards in the form specified in appendix to this schedule and printed in the language of the majority of the workers shall be displayed in all work places in which said manufacturing process is carried on so that they can be easily and conveniently read by the workers. Arrangements shall be made by the occupier and the manager of the factory to instruct the workers periodically regarding the health hazards arising in the said manufacturing process and methods of protection. Such notices shall include brief instructions and methods of periodical clinical tests required to be undertaken for protecting health of the workers.

5. **Prohibition relating to employment of women and young persons:-** No women or young person shall be employed or permitted to work in any room in which the said manufacturing process is carried on or in any room in which dangerous pesticide is stored.

6. **Food, drinks and smoking prohibited:-**

    1) No food, drink, tobacco, pan or supari shall be brought into or consumed by any worker in any work room in which the said manufacturing process is carried out.

    2) Smoking shall be prohibited if any workroom in which the said manufacturing process is carried out.

7. **Protective clothing and protective equipment:-**

    1) Protective clothing consisting of long pants and shirts or overalls with long sleeves and head coverings shall be provided for all workers employed in the said manufacturing process.

2) Protective equipment consisting of rubber gloves, gum boots, rubber aprons, chemical safety goggles and respirators shall be provided for all workers employed in the said manufacturing process: Provided that where a pesticide contains oil, gloves, boots and aprons shall be made from synthetic rubber.

3) Protective clothing and equipment shall be worn by the workers who are supplied with such clothing and equipment.

4) Protective clothing and equipment shall be washed daily from inside and outside if the workers handle pesticides containing nicotine or phosphorous and shall be washed frequently if handling other pesticides.

5) Protective clothing and equipment shall be maintained in good repair.

8. **Floors and work-benches:-**

1) Floors in every workroom where dangerous pesticides are manipulated shall be of cement or other impervious material giving a smooth surface.

2) Floors shall be maintained in a good repair, provided with adequate slope leading to a drain and thoroughly washed once a day with hose pipe.

3) Work-benches where dangerous pesticides are manipulated shall be made of smooth, non-absorbing material preferably stainless steel and shall be cleaned at least once daily.

9. **Spillage and waste:-**

1) If a dangerous pesticide during its manipulation splashes or spills on the work bench, floor or on the protective clothing worn by a worker, immediately action shall be taken for thorough decontamination of such areas or articles.

2) Cloth, rags, paper or other material soaked or soiled with a dangerous pesticide shall be deposited in a suitable receptacle with tight fitting cover. Contaminated waste shall be destroyed by burning at least once a week.

3) Suitable deactivating agents, where available, shall be kept in a readily accessible place for use while attending to a spillage.

4) Easy means of access shall be provided to all parts of the plant for cleaning, maintenance and repairs.

10. **Empty containers used for dangerous pesticides:-** Containers used for dangerous pesticides shall be thoroughly cleaned of their contents and treated with an inactivating agent before being discarded or destroyed.

11. **Manual handling:-**

1) A dangerous pesticide shall not be required or allowed to be manipulated by hand except by means of a long handled scoop.

2) Direct contact of any part of the body with a dangerous pesticide during its manipulation shall be avoided.

12. **Ventilation:-**

1) In every workroom or area where a dangerous pesticide is manipulated, adequate ventilation shall be provided at all times by the circulation of fresh air.

2) Unless the process is completely enclosed, the following operations during manipulation of a dangerous pesticide shall not be undertaken without an efficient draught; namely—

a) emptying a container holding a dangerous pesticide;

b) blending a dangerous pesticide;

c) preparing a liquid or powder formulation containing a dangerous pesticide; and

d) changing or filling a dangerous pesticide into a container, tank hopper or machine or small sized containers.

In the event of a failure of the exhaust draught provided on the above operation, the said operations shall be stopped forthwith.

13. **Time allowed for washing:-**

1) Before each meal and before the end of the day's work at least ten minutes in addition to the regular rest interval shall be allowed for washing to each worker engaged in the manipulation of dangerous pesticides.

2) Every worker engaged in the manipulation of dangerous pesticides shall have a thorough wash before consuming any food and also at the end of the day's work.

14. **Washing and bathing facilities:-**

1) There shall be provided and maintained in a clean state and in good repair for the use of all workers employed in the factory where the said manufacturing process is carried on adequate washing and bathing places having a constant supply of water under cover at the rate of one such place for every 5 persons employed.

2) The washing place shall have stand pipes placed at intervals of not less than one metre.

3) Not less than one half of the total number of washing places shall be provided with bathrooms.

4) Sufficient supply of clean towels made of suitable material shall be provided:

Provided that such towels shall be supplied individually for each worker if so ordered by the Inspector.

5) Sufficient supply of soap and nail brushes shall be provided.

15. **Cloakroom:-** There shall be provided and maintained for the use of all workers employed in the factory where the said manufacturing process is carried on—

a) a cloakroom for clothing put off during working hours with adequate arrangements for drying clothing, if wet; and

b) separate and suitable arrangements for the storage of protective clothing provided under paragraph 7.

16. **Messroom:-**

1) There shall be provided arid maintained for the use of all workers employed in the factory in which the said manufacturing process is carried on and remaining on the premises during the rest intervals, a suitable messroom which shall be furnished with -

a) sufficient tables and benches with back rest, and

b) adequate means for warming food.

2) The messroom shall be placed under the charge of a responsible person and shall be kept clean.

17. **Manipulation not to be undertaken:-** Manufacture or manipulation of a pesticide shall not be undertaken in any factory unless a certificate regarding its dangerous nature or otherwise is obtained from the Chief Inspector.

18. **Medical facilities and records of examinations and tests.—**

1) The occupier of every factory to which the schedule applies, namely—

a) employ a qualified medical practitioner for medical surveillance of the workers employed therein whose employment shall be subject to the approval of the Chief Inspector; and

b) provide to the said medical practitioner all the necessary facilities for the purpose referred to in clause (a).

2) The record of medical examinations and appropriate tests carried out by the said medical practitioner shall be maintained in a separate register approved by the Chief Inspector, which shall be kept readily available for inspection by the Inspector.

19. **Medical examination by Certifying Surgeon:-**

1) Every worker employed in the processes mentioned in paragraph 1 shall be examined by the Certifying Surgeon within 15 days of his first employment. Such examination in respect of halogenated pesticides shall include tests for determination of the chemical in blood and in fat tissues, EEG abnormalities and memory tests. In respect of the organo phosphorous compounds, such examinations shall include test for depression of cholinesterase in plasma and red blood cells. No worker shall be allowed to work after 15 days of his first employment in the factory unless certified fit for such employment by the Certifying Surgeon.

2) Every worker employed in the said processes shall be re-examined by a Certifying Burgeon at least once in every six calendar months. Such examination shall, wherever the Certifying Surgeon considers appropriate, include the tests specified in subparagraph (1). Further every worker employed in the said processes shall also be examined once in every three months by the factory medical officer.

3) The Certifying Surgeon shall after examining a worker, issue a Certificate of Fitness in Form 4. The record or examination and re-examinations carried out shall be entered in the Certificate and the Certificate shall be kept in the custody of the manager of the factory. The record of each examination and re-examinations carried out under sub-paragraphs (1) and (2) respectively, including the nature and the results of these tests, shall also be entered by the Certifying Surgeon in a health register in Form 16.

4) The Certificate of Fitness and the health register shall be kept readily available for inspection by the Inspector.

5) If at any time the Certifying Surgeon is of the opinion that a worker is no longer fit for employment in the said processes on the ground that continuance therein would involve special danger to the health of the worker, he shall make a record of his findings in the said certificate and the health register. The entry of his findings in those documents should also include the period for which he considers that the said person is unfit to work in the said processes.

The persons so suspended from the process shall be provided with alternate placement facilities unless he is fully incapacitated in the opinion of the Certifying Surgeon, in which case the person affected shall be suitably rehabilitated.

6) No person who has been found unfit to work as said in sub-paragraph (5) shall be re-employed or permitted to work in the said processes unless the Certifying Surgeon, after further examination, again certifies him for employment in those processes.

20. **Exemption:-** If in respect of any factory the Chief Inspector is satisfied that owing to the exceptional circumstances or the infrequency of the said manufacturing process or for any other reason which he shall record in writing all or any of the provisions or this schedule are not necessary for the protection of the workers employed in the factory, he may by a certificate in writing exempt such factory, from all or any of the provisions on such condition as he may specify therein. Such certificate may at any time be revoked by the Chief Inspector after recording his reasons therefore.

Appendix

Cautionary Notice

Insecticides and Pesticides

1. Chemicals handled in this plant are poisonous substances.
2. Smoking, eating food or drinking, chewing tobacco in this area is prohibited. No rood stuff or drink shall be brought in this area.
3. Some of these chemicals may be absorbed through skin and may cause poisoning.
4. A good wash shall be taken before meals.
5. A good bath shall be taken at the end of the shift.
6. Protective clothing and equipment supplied shall be used while working in this area.
7. Containers of pesticides shall not be used for keeping food stuffs.
8. Spillage of the chemicals on any part of the body or on the floor, or work-bench shall be immediately washed away with water.
9. Clothing contaminated due to splashing shall be removed immediately.
10. Scrupulous cleanliness shall be maintained in this area.
11. Do not handle pesticides with bare hands, use scoops provided with handle.
12. In case of sickness like nausea, vomiting, giddiness, the manager should be informed who will make necessary arrangements for treatment.
13. All workers shall report for the prescribed medical tests regularly to protect their own health.

(XX)

Standard Operating Procedures for

Manufacture, handling and usage of benzene and substances containing benzene

1. **Application:-** This shall apply in respect of factories or parts thereof in which benzene or substances containing benzene are manufactured, handled or used.

2. **Definitions:-**

   a) **"efficient exhaust draught"** means localised ventilation effected by mechanical means for the removal of gases, vapours, dusts or fumes so as to prevent them from escaping into the air or any workroom. No draught shall be deemed to be efficient if it fails to remove smoke generated at the point such gases, vapours, fumes or dusts originate.

   b) **"enclosed system"** means a system which will not allow escape of benzene vapours to the working atmosphere.

   c) **"substances containing benzene"** means substances wherein benzene content exceeds 1 per cent by volume; and

   d) **"substitute"** means a chemical which is harmless or less harmful than benzene and can be used in place of benzene;

3. **Prohibition of use of benzene and certain substances:-**

   1) Use of benzene and substances containing benzene is prohibited in the following processes, namely—

      a) manufacture of varnishes, paints and thinners; and

      b) cleaning and degreasing operations

   2) Benzene or substances containing benzene shall not be used as a solvent or diluent unless the process in which it is used is carried on in an enclosed system or unless the process is carried on in a manner which is considered equally safe as if it were carried out in an enclosed system.

   3) Where suitable substitutes are available, they shall be used instead of benzene or substances containing benzene. This provision, however, shall not apply to the following processes, namely-

      a) production of benzene;

      b) process where benzene is used for chemical synthesis; and

      c) motor spirits (used as fuel).

4) The Chief Inspector may, subject to confirmation by the State Government, permit exemptions from the percentage laid down in clause (c) of paragraph 2 and also from the provisions of sub-paragraph (2), of this paragraph temporarily under conditions and within limits of time to be determined after consultation with the employees and workers concerned.

4. **Protection against inhalation:-**

1) The process involving the use of benzene or substances containing benzene shall as far as practicable be carried out in an enclosed system.

2) Where however it is not practicable to carry out the process in an enclosed system the workroom in which benzene or substances containing benzene are used shall be equipped with an efficient exhaust draught or other means for the removal of benzene vapours to prevent their escape into the air of the workroom so that the concentration of benzene in the air does not exceed 25 parts per million by volume or 80 milligrams per cubic metre.

3) Air analysis for the measurement of concentration of benzene vapours in air shall be carried out every 8 hours or at such intervals as may be directed by the Chief Inspector at places where process involving use of benzene is carried and the result of the analysis shall be entered in a register specially maintained for this purpose, if the concentration of benzene vapours in air as measured by air analysis, exceeds 25 parts per million by volume or 80 milligrams per cubic metre, the manager shall forthwith report the concentration to the Chief Inspector stating the reasons for such increase.

4) Workers who for special reasons are likely to be exposed to concentration of benzene in the air of the workroom exceeding the maximum referred to in sub-paragraph shall be provided with suitable respirators or face masks. The duration of such exposure shall be limited as far as possible.

5. **Measures against skin contact:-**

1) Workers who are likely to come in contact with liquid benzene or liquid substances containing benzene shall be provided with suitable gloves, boots and where necessary vapour tight chemical goggles made of material not affected by benzene or its vapours.

2) The protective wear referred to in sub-paragraph (1) shall be maintained in good condition and inspected regularly.

6. **Prohibition relating to employment of women and young persons:-** No women or young person shall be employed or permitted to work in any workroom involving exposure to benzene or substances containing benzene.

7. **Labelling:-** Every container holding benzene or substances containing benzene shall have

the word Benzene" and approved danger symbols clearly visible on it and shall also display information on benzene content, warning about toxicity and warning about the inflammability of the chemical.

8. **Improper use of benzene:-**

    1) The use of benzene or substances containing benzene by workers for cleaning their hands or their work clothing shall be prohibited.

    2) Workers shall be instructed on the possible dangers arising from such misuse.

9. **Prohibition of consuming food etc., in workrooms:-** No worker shall be allowed to store or consume food or drink in the workroom in which benzene or substances containing benzene are manufactured, handled or used. Smoking and chewing tobacco or pan shall be prohibited in such workrooms.

10. **Instructions as regards risks:-** Every worker on his first employment shall be fully instructed on the properties of benzene or substances containing benzene which he has to handle and of the dangers involved. Workers shall also be instructed on the measures to be taken to deal with in an emergency.

11. **Cautionary notices:-** Cautionary notices in the form specified in appendix to this schedule and printed in the language easily read and understood by the majority of the workers shall be displayed in prominent places in the workrooms where benzene or substances containing benzene are manufactured, handled or used.

12. **Washing facilities, cloakroom and messroom:-** In factories in which benzene or substances containing benzene are manufactured, handled or used, the occupier shall provide and maintain in a clean state and in good repair-

    a) washing facilities under cover, of the standard of at least one tap for every 10 persons having constant supply of water with soap and a clean towel provided individually to each worker if so ordered by the Inspector;

    b) a cloakroom with lockers for for each worker having two compartments; one for work-clothing and one for work-clothing; and

    c) a messroom furnished with tables and benches with means for warming food, provided that where a canteen or other proper arrangements exist for the workers to take their meals, the requirements of messroom shall be dispensed with.

13. **Medical facilities and records of examinations and tests:-**

    1) The occupier of every factory to which the schedule applies, shall

        a) employ a qualified medical practitioner for medical surveillance of the workers employed therein whose employment shall be subject to the approval of the Chief Inspector; and

        b) provide to the said medical practitioner all the necessary facilities for the purpose referred to in clause (a).

    2) The record of medical examination and appropriate tests carried out by the said medical practitioner shall be maintained in a separate register approved by the Chief Inspector which shall be kept readily available for inspection by the Inspector.

14. **Medical examination by the certifying Surgeon:-**

1) Every worker employed in processes mentioned in paragraph 1, shall be examined by a Certifying Surgeon within 15 days of his first employment. Such examination shall include tests for detection of phenol in urine and determination of urinary sulphide ratio and C.N.S. and hematological tests. No worker shall be allowed to work after 15 days of his first employment in the factory unless certified fit for such employment by the Certifying Surgeon.

2) Every worker employed in the said processes shall be re-examined by a Certifying Surgeon at least once in every twelve calendar months and such examination shall, wherever the Certifying Surgeon considers appropriate, include all the tests specified in sub-paragraph (1). Further, every worker shall also be examined once in every three calendar months by the factory medical officer.

3) The Certifying Surgeon shall after examining a worker, issue a Certificate of Fitness in Form 4. The record of examination and re-examination carried out shall be entered in the Certificate and the Certificate shall be kept in the custody of the manager of the factory. The record of each examination and re-examination carried out under sub-paragraphs (1) and (2) respectively, including the nature and the results of these tests, shall also be entered by the Certifying Surgeon in a health register in Form 16.

4) The Certificate of Fitness and the health register shall be kept readily available for inspection by the Inspector.

5) If at any time the Certifying Surgeon is of the opinion that a worker is no longer fit for employment in the said processes on the ground that continuance therein would involve special danger to the health of the worker, he shall make a record of his findings in the said Certificate and the health register. The entry of his findings in those documents should also include the period for which he considers that the said person is unfit to work in the said processes.

   The persons so suspended from the process shall be provided with alternate placement facilities unless he is fully incapacitated in the opinion of the Certifying Surgeon, in which case the person affected shall be suitably rehabilitated.

6) No person who has been found unfit to work under sub-paragraph (5) shall be re-employed or permitted to work in the said processes unless the Certifying Surgeon, after further examination, again certifies him fit for employment in those processes.

Appendix

Cautionary Notice

Benzene and substances containing benzene

1. **Hazards:-**
   a) benzene and substances containing benzene are harmful.
   b) Prolonged or repeated breathing of benzene vapours may result in acute or chronic poisoning.
   c) Benzene can also be absorbed through skin which may cause skin and other diseases.
2. **Preventive measures:-**
   a) Avoid breathing of benzene vapours.

b) Avoid prolonged or repeated contact of benzene with the skin.

c) Remove benzene soaked or wet clothing promptly.

d) If any time you are exposed to high concentration of benzene vapours and exhibit signs and symptoms such as dizziness, difficulty in breathing, excessive excitation and losing of consciousness, immediately inform your factory manager.

e) Keep all the containers of benzene closed.

f) Handle, use and process benzene and substance containing benzene carefully in order to prevent their spillage on floor.

g) Maintain good housekeeping.

3. **Protective equipment:—**

a) use respiratory protective equipment in places where benzene vapours are present in high concentration.

b) In emergency, use self generating oxygen mask or oxygen or air cylinder masks.

c) Wear hand gloves, aprons, goggles and gum boots to avoid contact of benzene with your skin and body parts.

4. **First-aid measures in case of acute benzene poisoning:-**

1) Remove the clothing immediately if it is wetted with benzene.

2) If liquid benzene enters eyes, flush thoroughly for atleast 15 minutes with clean running water and immediately secure medical attention.

3) In case of unusual exposure to benzene vapour, call a physician immediately. Until he arrives, do the following—

I. If the exposed person is conscious,—

a) move him to fresh air in open,

b) lay down without a pillow and keep him quiet and warm

II. If the exposed person is unconscious—

a) lay him down preferably on the left side with the head low.

b) remove any false teeth, chewing gums, tobacco or other foreign objects which may be in his mouth.

c) provide him artificial respiration in case difficulty is being experienced in breathing.

d) in case of shallow breathing or cyanosis (blueness of skin, lips, ears, finger, nail beds), he should be provided with medial oxygen or oxygen carbon-dioxide mixture. If needed, he should be given artificial respiration. Oxygen should be administered by a trained person only.

(XXI)

Standard Operating Procedures for

Manufacturing process or operations in carbon disulphide plants

1. **Application:-** This shall apply to all electric furnaces in which carbon disulphide is generated and all other plants where carbon disulphide after generation is condensed, refined and stored. This schedule is in addition to and not in derogation of any of the provisions of the Act and rules made there under.

2. **Construction, installation and operation:-**

    1) The buildings in which electric furnaces are installed and carbon disulphide after generation is condensed and refined shall be segregated from other parts of the factory and shall be of open type to ensure optimum ventilation and the plant layout shall be such that only a minimum number of workers are exposed to the risk of any fire or explosion at any one time.

    2) Every electric furnace and every plant in which carbon disulphide is condensed, refined and stored with all their fittings and attachments shall be of good construction, sound material and of adequate strength to sustain the internal pressure to which the furnace or the plant may be subjected to and shall be so designed that carbon disulphide liquid and gas are in closed system during their normal working.

    3) The electric furnace supports shall be firmly grouted about 60 centimeters in concrete or by other effective means.

    4) Every electric furnace shall be installed and operated according to manufacturer's instructions and these instructions shall be clearly imparted to the personnel in charge of construction and operation.

    5) The instructions regarding observance of correct furnace temperature, sulphur dose, admissible current or power consumption and periodical checking of charcoal level shall be strictly complied with.

3. **Electrodes:-**

    1) Where upper ring electrodes made of steel are used in the electric furnace, they shall be of seamless tube construction and shall have arrangement for being connected to cooling water system through a siphon built in the electrodes or through a positive pressure water-pump.

    2) The arrangement for cooling water referred to in sub-paragraph (1) shall be connected with automatic alarm system which will actuate in the event of interruption of cooling water in the electrodes and give visible and audible alarm signals in the control room and simultaneously stop power supply for the furnace operation and to stop the further supply of water. The alarm system and the actuating device shall be checked every day.

4. **Maintenance of charcoal level:-** When any electric furnace is in operation, it shall been ensured that the electrodes are kept covered with charcoal bed.

5. **Charcoal separator:-** A cyclone type of charcoal separator shall be fitted on the off take between the electric furnace and sulphur separator to prevent entry of pieces of charcoal into the condensers and piping.

6. **Rupture discs and safety seal:-**

    1) At least two rupture discs of adequate size which shall blow off at a pressure twice the maximum operating pressure shall be provided on each furnace and shall either be mounted directly on the top of the furnace or each through an independent pipe as close as possible to the furnace.

    2) A safety water seal shall be provided and tapped from a point between the charcoal separator and the sulphur separator.

7. **Pyrometer and manometers:-**

    1) Each electric furnace shall be fitted with adequate number of pyrometers to give an indication of the temperature as correctly as reasonably practicable at various points in the furnace. The dials for reading the temperatures shall be located in the control room.

    2) Manometers or any other suitable devices shall be provided for indicating pressure—

        a) in the off take pipe before and after the sulphur separator; and

        b) in primary and secondary condensers.

8. **Check valves:-** All piping carrying carbon disulphide shall be fitted with check valves at suitable positions so as to prevent gas from flowing back into any electric furnace in the event of its shut down.

9. **Inspection and maintenance of electric furnaces:-**

    1) Every electric furnace shall be inspected internally by a competent person—

        a) before being placed in service after installation;

        b) before being placed in service after reconstruction or repairs; and

        c) periodically every time the furnace is opened for cleaning or de-ashing or for replacing electrodes.

    2) When an electric furnace is shut down for cleaning or de-ashing—

        a) the brick lining shall be checked for continuity and any part found defective removed;

        b) after removal of any part of the lining referred to in (a) the condition of the shell shall be closely inspected; and

        c) any plates forming shell found corroded to the extent that safety of the furnace is endangered shall be replaced.

10. **Maintenance of records:-** The following hourly records shall be maintained in a log book namely—

    a) manometer readings at the points specified in sub-paragraph 7(2) of paragraph 7;

    b) gas temperature indicated by pyrometers and all other vital points near the sulphur separator and primary and secondary condensers;

    c) water temperature and flow of water through the syphon in the electrodes; and

    d) primary and secondary voltages and current and energy consumed.

11. **Electrical apparatus, wiring and fittings:-** All buildings in which carbon disulphide is refined or stored shall be provided with electrical apparatus, wiring and fittings which shall afford adequate protection from fire and explosion.

12. **Prohibition relating to smoking:-** No person shall smoke or carry matches, fire or naked light or other means of producing a naked light or spark in buildings in which carbon disulphide is refined or stored, and a notice in the language understood by a majority of the workers shall be pasted in the plant prohibiting smoking and carrying matches, fire or naked light or other means or producing naked light spark into such rooms.

13. **Means of escape:-** Adequate means of escape shall be provided and maintained to enable persons to move to a safe place as quickly as possible in case of an emergency. At least two independent staircases of adequate width shall be provided in every building housing the furnaces at reasonable intervals at opposite ends. They shall always be kept clear of all obstructions and so designed as to afford easy passage.

14. **Warnings in case of fire:-** There shall be adequate arrangements for giving warnings in case of fire or explosion which shall operate on electricity and in case of failure of electricity, by some mechanical means.

15. **Fire-fighting equipment:-**

    1) Adequate number of suitable fire extinguishers or other fire fighting equipment shall be kept in constant readiness for dealing with risks involved and depending on the amount of nature of materials stored.

    2) Clear instructions as to how the extinguishers or other equipment should be used; printed in the language which the majority or the workers employed understand, shall be affixed to each extinguisher or other equipment.

16. **Bulk sulphur:-**

    1) Open or semi-enclosed spaces for storage of bulk sulphur shall be sited with due regard to the dangers which may arise from sparks given off by nearly locomotives, etc., and precautions shall be taken to see that flames, smoking and matches and other sources of ignition do not come into contact with the clouds of dust arising during handling of bulk sulphur.

2) All enclosures for bulk sulphur shall be non-combustible construction, adequately ventilated and so designed as to provide a minimum of ledges on which dust may lodge.

3) The bulk sulphur in the enclosures shall be handled in such a mariner as to minimize the formation of dust clouds and no flame, matches or other sources of ignition shall be employed during handling and non-sparking tools shall be used whenever sulphur is shovelled or otherwise removed by hand.

4) No repairs involving flames, heat or use of hand or power tools shall be made in the enclosure where bulk sulphur is stored.

17. **Liquid sulphur:-** Open flames, electric sparks, matches, smoking, and other sources of ignition shall be excluded from the vicinity of molten sulphur.

18. **Training and supervision:-**

1) All electric furnaces and all plants in which carbon disulphide is condensed, refined or stored shall be under adequate supervision at all times while the furnaces and plant are in operation.

2) Workers in charge of operation and maintenance of electric furnaces and the plants shall be properly qualified and adequately trained.

19. **Washing facilities:-**

1) The occupier shall provide and maintain in a clean state and in good repair for the use of all persons employed wash place under cover with at least one tap or stand-pipe, having a constant supply of clean water for every five such persons, the taps or stand-pipes being spaced not less than 120 centimeters apart with a sufficient supply of soap and clean towels; provided that towels shall be supplied individually to each worker if so ordered by the Inspector.

2) All the workers employed in the sulphur storage, handling and melting operations shall be provided with a nail brush.

20. **Personal protective equipment:-**

1) Suitable goggles and protective clothing consisting or overalls without pockets, gloves and foot-wear shall be provided for the use of operators—

a) when operating valves or cooks controlling fluids etc;

b) drawing off of molten sulphur from sulphur pots; and

c) handling charcoal or sulphur.

2) Suitably respiratory protective equipment shall be provided and stored in the appropriate place for use during abnormal conditions or in an emergency.

3) Arrangements shall be made for proper and efficient cleaning of all such protective equipment.

21. **Cloakroom:-** There shall be provided and maintained for the use of all persons employed in the processes a suitable cloakroom for clothing put off during work hours and a suitable place separate from lie cloakroom for the storage of overalls or working clothes. The accommodation so provided shall be placed in the charge of a responsible person and shall be kept clean.

22. **Unauthorized persons:-** Only maintenance and repair personnel, persons directly connected with the plant operation and those accompanied by authorised persons shall be admitted into the plant.

(XXII)

Standard Operating Procedures for

Manufacture or manipulation of carcinogenic dye intermediates

1. **Application:-** This shall apply in respect of all factories or any part there of where processes in which the substances mentioned in paragraphs 3 and 4 are formed, manufactured, handled or used and the processes incidental thereto in the course of which these substances are formed, are carried on. The processes indicated in this paragraph shall be herein after referred to as the said processes and such a reference shall mean any or all the processes described in this paragraph.

2. **Definition:-**

    a) "controlled substances" means chemical substances mentioned in paragraph 4 of this schedule;

    b) "efficient exhaust draught" means localised ventilation effected by mechanical means for the removal of gas, vapour, dust or fume so as to prevent them from escaping into the air of any place in which work is carried on, and no draught shall be deemed to be efficient which fails to remove, smoke generated at the point where such gas, vapour, fume or dust originates;

    c) "first employment" means first employment in the said processes and also re-employment in such processes following any cessation of employment for a continuous period exceeding three calendar months;

    d) "prohibited substances" means chemical substances mentioned in paragraph 3 of this schedule.

3. **Prohibited substances:-** For the purpose of this schedule, the following chemical substances shall be classified as "prohibited substances" except when these substances are present or are formed as a product of a chemical reaction in a total concentration not exceeding one percent, namely—

    a) beta-naphthylamine and its salts;

    b) Benzedrine and its salts;

    c) 4-amino biphenyl and its salts;

    d) 4-nitro biphenyl and its salts; and

    e) any substances containing any of these compounds.

4. **Controlled substances:-** For the purpose of this schedule, the following chemical substances shall be classified as "controlled substances" namely—

    a) alpha-naphthylamine or alpha-naphthylamine containing not more than one per cent of beta-naphthylamine either as a by-product of chemical reaction or otherwise, and its salts;

    b) ortho-tolidine and its salts;

c) dianisidine and its salts;

d) dichlorobenzidine and its salts; and

e) auramine; and

5. **Prohibition of employment:-** No person shall be employed in the said processes in any factory in which any prohibited substance is formed, manufactured, processed, handled or used except as exempted by the Chief Inspector under paragraph 23.

6. **Requirements for processing or handling controlled substances:-**

1) Wherever any of the controlled substances referred to in paragraph 4 are formed, manufactured, processed, handled or used all practical steps shall be taken to prevent inhalation, ingestion or absorption of the said controlled substances by the workers while engaged in processing that substance and its storage or transport within the plant or in cleaning or maintenance of the concerned equipment, plant, machinery and storage areas.

2) As far as possible all operations shall be carried out in a totally enclosed system. Wherever such enclosure is not possible, efficient exhaust draught shall be applied at the point where the controlled substances are likely to escape into the atmosphere during the process.

3) The controlled substances shall be received in the factory in tightly closed containers and shall be kept so except when these substances are in process or in use. The controlled substances shall leave the factory only in tightly closed containers of appropriate type. All the containers shall be plainly labeled to indicate the contents.

7. **Personal protective equipment:-**

1) The following items of personal protective equipment shall be provided and issued to every worker employed in the said processes; namely:

a) long trousers and shirts or overalls with full sleeves and head coverings, the shirt or overall shall cover the neck completely; and

b) rubber gumboots.

2) The following items of personal protective equipment shall be provided in sufficient numbers for use by workers employed in the said processes when there is danger or injury during the performance of normal duties or in the event of emergency, namely—

a) rubber handgloves

b) rubber aprons; and

c) airline respirators or other suitable respiratory protective equipment.

3) It shall be the responsibility of the manager to maintain all items of personal protective equipment in a clean and hygienic condition and in good repair.

8. **Prohibition relating to employment of women and young persons:-** No women or young person shall be employed or permitted to work in any room in which the said processes are carried on.

9. **Floors of workroom:-** The floor of every workroom in which the said processes are carried on shall be—

    a) smooth and impervious to water and that asphalt or tar shall not be used in the composition of the floor;

    b) maintained in a state of good repair;

    c) with a suitable slope for easy draining and provided with gutters; and

    d) thoroughly washed daily with the drain water being led into sewer a through a closed channel.

10. **Disposal of empty containers:-** Empty containers used for holding controlled substances shall be thoroughly cleaned of their contents and treated with an inactivating agent before being discarded.

11. **Manual handling:-** Controlled substances shall be allowed to be mixed, filled, emptied or handled by means of a scoop with a handle. Such scoop shall be thoroughly cleaned daily.

12. **Instructions regarding risk:-** Every worker on his first employment in the said processes shall be fully instructed on the properties of the toxic chemicals to which he is likely to be exposed to, of the dangers involved and the precautions to be taken. Workers shall also be instructed in the measures to be taken to deal with an emergency.

13. **Cautionary Placards:-** Cautionary placards in the form specified in the appendix to this schedule and printed in the language of the majority of the workers employed in the said process frequented by them in the factory, where the placards can be easily and conveniently read. Arrangements shall be made by the manager to instruct periodically all such workers regarding the precautions contained in the cautionary placards.

14. **Obligations of the workers:-** It shall be the duty of the persons employed in the said processes to submit themselves for the medical examination including exfoliative cytology of urine by the Certifying Surgeon or the qualified medical practitioner as provided for under these paragraphs.

15. **Washing and bathing facilities:-**

    1) The following washing and bathing facilities shall be provided and maintained in a clean state and in good repair for the use of all workers employed in the said processes, namely—

        a) a wash place under cover having constant supply of water and provided with clean towels, soap and nail brushes and with at least one stand pipe for every five such workers;

b) 50 per cent of the stand pipes provided under clause (a) shall be located in bathrooms where both hot and cold water shall be made available during the working hours of the factory and for one hour thereafter;

c) the washing and bathing facilities shall be in dose proximity of the area housing the said processes;

d) clean towels shall be provided individually to each worker; and

e) in addition to the taps mentioned under clause (a), one stand pipe in which warm water is made available shall be provided on each floor.

2) Arrangement shall be made to wash factory uniforms and other work clothes everyday.

16. **Food, drinks, etc., prohibited in workroom:-** No worker shall consume food, drink, pan, supari or tobacco or shall smoke in any workroom in which the said processes are carried on and no worker shall remain in any such room during intervals for meals or rest.

17. **Cloakroom:-**

1) There shall be provided and maintained in a clean state and in good repair for the use of the workers employed in the said process—

a) a cloakroom with lockers having two compartments - one for street clothes and the other for work clothes; and

b) a place separate from the locker room and the messroom, for the storage of protective equipment provided under paragraph 7.

2) The accommodation so provided shall be under the care of a responsible person and shall be kept clean.

18. **Messroom:-** There shall be provided and maintained for the use of workers employed in the said processes who remain on the premises during the meal intervals, a messroom which shall be furnished with tables and benches and provided with suitable means of warming food.

19. **Time allowed for washing:-** Before the end of each shift 30 minutes shall be allowed for bathing for each worker who is employed in the said processes. Further, at least 10 minutes shall be allowed for washing before each meal in addition to the regular time for meals.

20. **Restriction on age of person employed:-** No worker under the age of 40 years shall be engaged in the factory in the said processes for the first time after the date on which this schedule comes into force.

21. **Medical facilities and records of examinations and tests:-**

1) The occupier of every factory to which this schedule applies, shall—

a) employ a qualified medical practitioner for medical surveillance of the workers employed therein whose employment shall be subject to the approval of the Chief Inspector; and

b) provide to the said medical practitioner all the necessary facilities for the purpose referred to in clause (a).

2) The record of medical examinations and appropriate tests carried by the said medical practitioner shall be maintained in a separate register approved by the Chief Inspector which shall be kept readily available for inspection by the Inspector.

22. **Medical examination by the Certifying Surgeon:-**

1) Every worker employed in the said processes shall be examined by a Certifying Surgeon within 15 days of his first employment. Such examination shall include tests for detection of mathemoglobin in blood (hematological tests), paragitrophenol in urine, pulmonary function tests and CN.S. tests. No worker shall be allowed to work after 15 days of his first employment by the Certifying Surgeon.

2) Every worker employed in the said processes shall be re-examined by a Certifying Surgeon at least once in every six calendar months and such re-examination shall, wherever the Certifying Surgeon, considers appropriate, include all the tests specified in sub-paragraph The Certifying Surgeon shall after examining a worker issue a Certificate of Fitness in Form 4. The record of examination and re-examinations carried out shall be entered in the Certificate and the Certificate shall be kept in the custody of the manager of the factory.

3) The record of each examination and re-examination carried out under sub-paragraphs (1) and (2) respectively including the nature and the results of these tests, shall also be entered by the Certifying Surgeon in a health register in Form 16.

4) The Certificate of fitness and the health register shall be kept readily available for inspection by the Inspector.
5) If at any time the Certifying Surgeon is of the opinion that a worker is no longer fit for employment in the said processes on the ground that continuance therein would involve special danger to the health of the worker, he shall make a record of his findings in the said certificate and the health register. The entry of his findings in those documents should also include the period for which he considers that the said person is unfit to work in the said processes.

The person so suspended from the process shall be provided with alternate placement facilities unless he is fully incapacitated in the opinion or the Certifying Surgeon, in which case the person affected shall be suitably rehabilitated.

6) No person who has been found unfit to work as said in sub-paragraph. (5) shall be re-employed or permitted to work in the said processes unless the Certifying Surgeon, after further examination, again certifies him fit for employment.

23. **Exemptions relating to prohibited substances:-**

1) The Chief Inspector may, by a certificate in writing which he may at his discretion revoke at any time, subject to such conditions, if any, as may be specified therein,

exempt any process in the course of which any of the prohibited substances is formed, processed, manufactured, handled or used from the provisions of paragraph 5 if he is satisfied that the process is carried out in a totally enclosed and hermetically sealed system in such a manner that the prohibited substance is not removed from the system except in quantities not greater than that required for the purpose of control of the process or such purposes as is necessary to ensure that the product is free from any of the prohibited substances.

2) The Chief Inspector may allow the manufacture, handling or use of benzidine hydrochloride provided that all the processes in connection with it are carried out in a totally enclosed system in such a manner that no prohibited substance other than benzidine hydrochloride is removed from except in quantities not greater than that required for the purpose of control of the processes or such purposes as is necessary to ensure that the product is free from prohibited substances and that adequate steps are taken to ensure that oenzidine hydrochloride is, except while not in a totally enclosed system, kept wet with not less than one part of water to two parts of benzidine hydrochloride at all times.

24. **Exemptions-General:-** If in respect of any factory, the Chief Inspector is satisfied that owing to the exceptional circumstances or infrequency of the processes or for any other reason, all or any of the provisions of this schedule is not necessary for the protection of the workers in the factory, the Chief Inspector may by a certificate in writing which he may in his discretion revoke at any time, exempt such factory from all or any of such provisions subject to the such conditions, if any, as he may specify therein.

Appendix
Cautionary Placard Notice
Carcinogenic dye intermediates

1. Dye intermediates which are nitro amino derivatives or aromatic hydrocarbons are toxic. You have to handle these chemicals frequently in this factory.

2. Use the various items of protective wear to safeguard your own health.

3. Maintain scrupulous cleanliness at all items. Thoroughly was hands and feet before taking meals.It is essential to take a bath before leaving the factory.

4. Wash off any chemical falling on your body with soap and water. If splashed with a solution of the chemical, remove the contaminated clothing immediately. These chemicals are known to produce cyanosis. Contact the medical officer or appointed doctor immediately and get his advice.

5. Handle the dye intermediates only with long handled scoops, never with bare hands.

6. Alcoholic drinks should be avoided as they enhance the risk of poisoning by the chemicals.

7. Keep your food and drinks away from work place. Consuming food, drinks or tobacco in any form at the place of work is prohibited.

8. Serious effects from work with toxic chemicals may follow after many years. Great care must be taken to maintain absolute cleanliness of body, clothes, machinery and equipment.

(XXIII)
Standard Operating Procedures for
Operation involving high noise levels

1. **Application:-** This shall apply to all operations in any manufacturing process having high noise level.

2. **Definitions:-**

   a) **A-weighting"** means making graded adjustments in the intensities of sound of various frequencies for the purpose of noise measurement, so that the sound pressure level measure by an instrument reflects the actual response of the human ear to the sound measured;

   b) **"dBA"** refers to sound level in decibels as measured on a sound level meter operating on the A-weighing net-work with slow meter response;

   c) **"decibel"** means one-tenth of "Bel" which is the fundamental division of a logarithmic scale used to express the ratio of two specified or implied quantities, the number of "Bels" denoting such a ratio being the logarithm to the base of 10 of this ratio.

      Explanation:- The noise level (or the sound pressure level) corresponds to a reference pressure of(20 x 10-6 newtons per square metre or 0.0002 dynes per square centimeter which is the threshold of hearing, that is, the lowest sound pressure level necessary to produce the sensation of hearing in average health listeners. The decibel in abbreviated form is dB.

   d) **"frequency"** is the rate of pressure variations expressed in cycles per second or hertz.

   e) **"high noise level"** means any noise level measure on the A-weighted scale is 90 dB or above;

   f) **"noise"** means any unwanted sound

3. **Protection against noise:-**

   1) In every factory, suitable engineering control or administrative measures shall be taken to ensure so far as is reasonably practicable, that no worker is exposed to sound levels exceeding the maximum permissible noise exposure levels specified in Tables 1 and 2.

Table 1

(Permissible Exposure in cases of continuous noise)

Total time of exposure (continuous or a number of short term	Sound pressure level in dBA
1	2
8	90
6	92
4	95
3	97
2	100
1 & ½	102
1	105
¾	107
½	110
¼	115

Notes:

i. No exposure in excess of 115 dBA is to be permitted.
ii. For any period of exposure falling in between any figure and the next higher or lower figure as indicated in column 1, the permissible sound pressure level is to be determined by extrapolation on a proportionate basis.

Table 2

(Permissible Exposure Levels of Impulsive or Impact Noise)

Pealk sound pressure level in dB	Permitted number of impulses or impacts per day
140	100
135	315
130	1,000
125	3,160
120	10,000

Notes:

i. No exposure in excess of 140 dB peak sound pressure level is permitted.
ii. For any peak sound pressure level falling in between any figure and the next higher or lower figure as indicated in column 1, the permitted number of impulses or impacts per day is to be determined by extrapolation on a proportionate basis.

2) For the purposes of this schedule, if the variations in the noise level involve maximum at intervals of one second or less, the noise is to be considered as a continuous one and the criteria given in Table 1 would apply. In other cases, the noise is to be considered as impulsive or impact noise and the criteria given in Table 2 would apply.

3) When the daily exposure is composed of two or more periods of noise exposure at different levels their combined effect should be considered rather than the individual

effect of each. The mixed exposure should be considered to exceed the limit value if the sum of the fractions C1 /T1 + C2/T2.. Cn / Tn exceeds unity.

Where the C1, C2 etc., indicate the total time of actual exposure at a specified noise level and T1, T2, etc., denote the time or exposure permissible at that level. Noise exposure of less than 90 dBA may be ignored in the above calculations.

4) Where it is not possible to reduce the noise exposure to the levels specified in sub-paragraph (1) by reasonably practicable engineering control or administrative measures the noise exposure shall be reduced to the greatest feasible by such control or measures and each worker so exposed shall be provided with suitable ear protectors so as to reduce the exposure to noise to the levels specified in sub-paragraph (1).

5) Where the ear protectors provided in accordance with sub-paragraph (2) and worn by a worker cannot still attenuate the noise reaching near his ear, as determined by subtracting the attenuation value in dBA of the ear protectors concerned from the measured sound pressure level to a level permissible shall be suitably reduced to correspond to the permissible noise exposures specified in sub-paragraph (1).

6) (a) In all cases where the prevailing sound levels exceed the permissible levels specified in sub-paragraph (1) there shall be administered an effective hearing conservation programme which shall include among other hearing conservation measures pre-employment and periodical auditory surveys conducted on workers, exposed to noise exceeding the permissible levels and rehabilitation of such workers either by reducing the exposure to the noise levels or by transferring them to places where noise levels are relatively less or by any other suitable means.

(b) Every workers employed in areas where the noise exceeds the maximum permissible exposure levels specified in sub-paragraph. (1) shall be subjected to an auditory examination by Certifying Surgeon within 14 days of his first employment and thereafter, shall be re-examined at least once in a year. Such initial and periodical examinations shall include tests which the Certifying Surgeon may consider appropriate, and shall include determination of auditory thresholds for pure tones of 125,250, 500,1000,2000,4000 and 8000 cycles per second.

(XXIV)
Standard Operating Procedures for
Manufacture of Rayon by Viscose Process

1. **Definitions:-**

a) **"approved"** means approved for the time being in writing by the Chief Inspector;

b) **"breathing apparatus"** means a helmet or face piece with necessary connections by means of which the person using it in a poisonous, asphyxiating or irritant atmosphere breathes unpolluted air or any other approved apparatus;

c) **"churn"** means the vessel in which alkali collulose pulp is treated with carbon disulphide;

d) **"dumping"** means transfer of cellulose xanthate from a duty churn to a dissolver;

e) **"efficient exhaust draught"** means localised ventilation by. mechanical means for the removal of any gas or vapour so as to prevent it from escaping into the air of any place in which work is carried on and no draught shall be deemed to be efficient if it fails to control effectively any gas or vapour generated at the point where such gas or fume originates;

f) "fume process" means any process in which carbon disulphide or hydrogen sulphide is produced, used or given off;

g) "life belt" means a belt made of leather or other suitable material which can be securely fastened round the body with a suitable length of rope attached to it, each of which is sufficiently strong to sustain the weight of a man;

h) "protective equipment" means apron, goggles, face shields, foot wear, gloves and overalls made of suitable materials.

2. **Ventilation:-**

1) In all workrooms where a fume process is carried on, adequate ventilation by natural or mechanical means shall be provided so as to control, in association with other control measures, the concentration of carbon-di-sulphide and hydrogen sulphide in the air of every work environment within the permissible limits.

2) "Notwithstanding the requirements in sub-paragraph (1) an efficient exhaust draught shall be provided and maintained to control the concentration of carbon-di-sulphide and hydrogen sulphide in the air at the following locations namely—

a) dumping hoppers of dry churns,

b) spinning machines,

c) trio rollers and cutters used in staple fibre spinning,

d) hydro-extractors for yarn cakes,

e) after treatment processes, and

f) spin baths

3) In so far as the spinning machines and trio rollers and cutters used in staple fibre spinning are concerned, they shall for the purpose of ensuring the effectiveness or the exhaust draught to be provided as required in sub-paragraph be enclosed as fully as practicable and provided with suitable shutters in sections to enable the required operations to be carried out without giving rise to undue quantities of carbon-di-sulphide and hydrogen sulphide escaping to the work environment.

4) No dry churn shall be opened after completion of reaction without initially exhausting the residual vapours of carbon-di-sulphide by operation or a suitable and efficient arrangement for exhausting the vapours which shall be continued to be operated as long as the churn is kept opened.

5) Whenever any ventilation apparatus normally required for the purpose of meeting the requirements in sub-paragraphs (I), (2), (3) and (4) is ineffective, fails or is stopped for any purpose whatsoever all persons shall be required to leave the work areas where the equipment or processes specified in the said sub-paragraphs are in use, as soon as possible and in any case not later than 15 minutes after such an occurrence.

6) (i) All ventilation systems provided for the purposes as required in sub-paragraphs (2), (3) and (4) shall be examined and inspected once in every work by a responsible person. It shall be thoroughly examined and tested by a competent person once in every period of 12 months. Any defects found by such examinations or test shall be rectified forthwith.

(ii) A register containing particulars of such examinations and tests, and the state of the systems and the repairs or alterations if any, found to be necessary shall be kept and shall be available for inspection by an Inspector.

3. **Waste from spinning machines:-** Waste yarn from the spinning machines shall be deposited in suitable containers provided with close fitting covers. Such waste shall be disposed off as quickly as possible after decontamination.

4. **Lining of dry churns:-** The inside surface of all dry churns shall be coated with a non-sticky paint so that cellulose xanthate will not stick to the surface of the churn. Such coating shall be maintained in good condition.

5. **Air monitoring:-**

1) To ensure the effectiveness of the control measures, monitoring of carbon-di-sulphide and hydrogen sulphide in air shall be carried out once atleast in every shift and the record of the results so obtained shall be entered in a register specially maintained for the purposes.

2) For the purpose of the requirement in subparagraph (1), instantaneous gas detector tubes shall not be used. Samples shall be collected over duration of not less than 10 minutes and analysed by an approved method. The locations where such monitoring is to be done shall be as directed by the Inspector.

3) If the concentration of either carbon-di-sulphide or hydrogen sulphide exceeds the permissible limits for such vapour or gas as laid down in rule 133-A, suitable steps shall be taken for controlling the concentration in air of such contaminants. A report of such occurrences shall be sent to the Chief Inspector forthwith.

6. **Prohibition to remain in fume process room:-** No person during his intervals for meal or rest shall remain in any room wherein fume process is carried on.

7. **Prohibition relating to employment of young persons:-** No young person shall be employed or permitted to work in any fume process or in any room in which any such process is carried on.

8. **Protective equipment:-**

1) The occupier shall provide and maintain in good condition protective equipment as specified in the Table below for use of person employed in the processes referred to therein.

Table

	Process	**Protective Equipment**
1.	Dumping	Overalls, face-shields, gloves and foot-wear all made of suitable material.
2.	Spinning	Suitable aprons, gloves and foot-wear.
3.	Process involving or likely to involve contact with viscose situation	Suitable gloves and footwear
4.	Handling of sulphur	Suitable chemical goggles
5.	Any other process involving contact with hazardous chemicals	Protective equipment as may be directed by the Chief Inspector by an order in writing.

2) A suitable room, rooms or lockers shall be provided exclusively for the storage of all the protective equipment supplied to workers and no such equipment shall be stored at any place other than the room, rooms or lockers so provided.

9. **Breathing apparatus:-**

1) There shall be provided in every factory where fume process is carried on, sufficient supply of -

a) breathing apparatus;

b) oxygen and a suitable appliance for its administration; and

c) lifebelts;

d) the breathing apparatus and other appliances referred to in sub-paragraph (1) shall be maintained in good condition and kept in appropriate locations so as to be readily available.

2) The breathing apparatus and other appliances referred to in clauses (a) and (b) of sub-paragraph (1) shall be cleaned and disinfected at suitable intervals and thoroughly inspected once in every month by a responsible person.

3) A record of the maintenance and the condition of the breathing apparatus and other appliances referred to in sub-paragraph (1) shall be entered in a register provided for that purpose which shall be readily available for inspection by an Inspector.

4) Sufficient number of workers shall be trained and periodically re-trained in the use of breathing apparatus and administering artificial respiration so that at least 2 such trained persons would be available during all the working hours in each room in which fume process is carried on.

5) Breathing apparatus shall be kept properly labelled in clean, dry, light-proof cabinets and if liable to be effected by fumes, shall be protected by placing them in suitable containers.

6) No person shall be employed to perform any work specified in sub-paragraph (1) for which breathing apparatus is necessary to be provided under that sub-paragraph unless he has been fully instructed in the proper use of that equipment.

7) No breathing apparatus provided under sub-paragraph (1) which has been worn by a person shall be worn by another person unless it has been thoroughly cleaned and disinfected since last being worn and the person has been fully instructed in the proper use of that equipment.

10. **Electric fittings:-** All electric fittings in any room in which carbon-di-sulphide is produced, used or given off or is likely to be given off into the work environment other than a spinning room shall be of flame-proof construction and all electric conductors shall either be enclosed in metal conduits or be lead sheathed.

11. **Prohibition relating to smoking etc:-** No person shall smoke or carry matches, fire or naked light or other means of producing a naked light or spark in a room in which fume process is carried on. A notice in the language understood by the majority of the workers shall be pasted at prominent locations in the plant prohibiting smoking and carrying of matches, fire or naked light or other means of producing naked light or spark into such rooms:

Provided that fire, naked light or other means of producing a naked light of spark may be carried on in such room only when required for the purposes of the process itself under the direction of a responsible person.

12. **Washing and bathing facilities:-**

1) There shall be provided and maintained in a clean state and in good repair for the use of all workers employed in the processes covered by this schedule, adequate washing and bathing places having a constant supply of water under cover at the rate of one such place for every 25 persons employed.

2) The washing places shall have stand pipes placed at intervals of not less than one metre.

3) Not less than one half of the total number of washing places shall be provided with bathrooms.

4) Sufficient supply of clean towels made of suitable material shall be provided:

Provided that such towels shall be supplied individually for each worker if so ordered by the Inspector.

5) Sufficient supply of soap and nail brushes shall be provided.

13. **Rest room:**

1) A rest room shall be provided for the workers engaged in doffing operations of filament yarn spinning process.

2) Such rest room shall be provided with fresh air supply and adequate seating arrangement.

14. **Cautionary notice and instructions:-**

1) The following cautionary notice shall be prominently displayed in each fume process room namely—

"Cautionary notice"

1. Carbon-di-sulphide (CS2) and Hydrogen sulphide (H2S) which may be present in this room are hazardous to health.

2. Follow safety instructions.

3. Use protective equipment and breathing apparatus as and when required.

4. Smoking is strictly prohibited in this area.

2) The notice shall be in a language understand by the majority of the workers and displayed where it can be easily and conveniently read. If any worker is illiterate, effective steps shall be taken to explain carefully to him the contents of the notice so displayed.

3) Arrangements shall be made to instruct each worker employed in any room in which fume process is carried on regarding the health hazards connected with their work and the preventive measures and methods to protect themselves. Such instructions shall be given on his first employment and repeated periodically.

4) Simple and special instructions shall be framed to ensure that effective measures will be carried out in case of emergency involving escape of carbon-di-sulphide and hydrogen sulphide. These instructions shall be displayed in the concerned areas and workers shall be instructed and trained in the actions to be taken in such emergencies.

15. **Medical facilities and records of examinations and tests:-**

1) The occupier of each factory to which this schedule applies, shall—

   a) employ a qualified medical officer for medical surveillance of the workers employed in the fume process whose employment shall be subject to the approval of the Chief Inspector, and

   b) provide to the said medical officer all the necessary facilities for the purpose referred to in clause (a).

2) The record of medical examination and appropriate tests carried out by the said medical officer shall be maintained in a separate register approved by the Chief Inspector which shall be kept readily available for inspection by the Inspector.

16. **Medical examination by the Certifying Surgeon:-**

1) Every worker employed in the fume process shall be examined by a Certifying Surgeon within 15 days of his first employment. Such examination shall include tests for estimation of exposure coefficient (iodine azide test or urine), and cholestorol, as well as electrocardiogram (ECG) and Central Nervous System (CNS) tests. No worker shall be allowed to work after 15 days of his first employment in the factory unless certified fit for such employment by the Certifying Surgeon.

2) Every worker employed in the fume process shall be re-examined by a Certifying Surgeon at least once in every twelve calendar months. Such examination shall, wherever the Certifying Surgeon considers appropriate, include all the tests as specified in sub-paragraph (1).

3) The Certifying Surgeon shall after examining a worker, issue a Certificate of Fitness in Form 4. The record of re-examinations carried out shall be entered in the Certificate and the Certificate shall be kept in the custody of the Manager of the factory. The record of each examination and re-examination carried out under sub-paragraphs (1) and (2) respectively, including the nature and the results of the tests, shall also be entered by the Certifying Surgeon in a health register in Form 16.

4) The Certificate of Fitness and the health register shall be kept readily available for inspection by the Inspector.

5) If at any time the Certifying Surgeon is of the opinion that a worker is no longer fit for employment in the fume process on the ground that continuance therein would involve special danger to the health of the worker, he shall make a record of his findings in the said certificate and the health register. The entry of his findings in those documents should also include the period for which he considers that the said person is unfit for work in the fume process.

   The person so suspended from the process shall be provided with alternate placement facilities unless he is fully incapacitated in the opinion or the Certifying Surgeon, in which case the person affected shall be suitably rehabilitated.

6) No person who has been found unfit to work under sub-paragraph (5) shall be re-employed or permitted to work in the fume process unless the Certifying Surgeon, after further examination again certifies him fit for employment in such process.

17. **Exemptions:-** If in respect of any factory, the Chief Inspector is satisfied that owing to the exceptional circumstances or infrequency of the processes or for any other reason, all or any of the provisions of this schedule are not necessary for protection of the workers in the factory, the Chief Inspector may by a Certificate in writing, which he may at his discretion revoke at any time, exempt such factory from all or any of such provisions subject to such conditions, if any, as he may specify therein.

(XXV)

Standard Operating Procedures for
Highly flammable Liquids and Flammable Compressed Gases

1. **Application:-** This shall apply to all factories where highly flammable liquids or flammable compressed gases are manufactured, stored, handled or used.

2. **Definition:-**

    a) **"flammable compressed gas"** means flammable compressed gas as defined in Section 2 of the Static and Mobile Pressure Vessels (Unfired) Rules, 1981.

    b) **"highly flammable liquid"** means any liquid including its solution, emulsion or suspension which when tested in a manner specified by Section 14 or 15 of the Petroleum Act, 1934 gives off flammable vapour at a temperature less than 32 degrees centigrade.

3. **Storage:-**

    1) Every flammable liquid or flammable compressed gas used in very factory shall be stored in suitable fixed storage tank or in suitable closed vessel located in a safe position under the ground, in the open or in a store room of adequate fire resistant construction.

    2) Except as necessary for use, operation or maintenance every vessel or tank which contains or had contained a highly flammable liquid or flammable compressed gas shall be always kept closed and all reasonably practicable steps shall be taken to contain or immediately drain off to a suitable container any spill or leak that may occur.

    3) Every container, vessel, tank, cylinder or store room used for storing highly flammable liquid or flammable compressed gas shall be clearly and in bold letters marked "Danger-Highly Flammable Liquid" or "Danger Flammable Compressed Gas".

4. **Enclosed systems for conveying highly flammable liquids:-** Wherever it is reasonably practicabe, highly flammable liquids shall be conveyed within a factory in totally enclosed systems consisting of pipe lines, pumps and similar appliances from the storage tank or vessel to the point of use. Such enclosed systems shall be so designed, installed, operated and maintained as to avoid leakage or the risk of spilling.

5. **Preventing formation of flammable mixture with air:-** Wherever there is a possibility for leakage or spill of highly flammable liquid or flammable compressed gas from an equipment, pipe line, valve, joint or other part of a system all practicable measures shall be taken to contain, drawn off or dilute such spills or leakage as to prevent formation of flammable mixture with air.

6. **Prevention of ignition:-**

    1) In every room, work place or other location where highly flammable liquid or flammable combustible gas is stored, conveyed, handled or used or where there is danger of fire or explosion from accumulation of highly flammable liquid or flammable compressed gas in air, all practicable measures shall be taken to exclude the sources of ignition. Such precautions shall include the following namely—

a) all electrical apparatus shall either be excluded from the area of risk or they shall be of such construction and so installed and maintained as to prevent the danger of their being source of ignition;

b) effective measures shall be adopted for prevention of accumulation of static charges to a dangerous extent;

c) no person shall wear or be allowed to wear any foot wear haying iron or steel nails or any other exposed ferrous materials which is likely to cause sparks by friction;

d) smoking, lighting or carrying of matches, lighters or smoking materials shall be prohibited;

e) transmission belts with iron fasteners shall not be used; and

f) all other precautions as are reasonably practicable shall be taken to prevent initiation of ignition from all other possible sources such as open flames, frictional sparks, overheated surfaces of machinery or plant, chemical or physical-chemical reaction and radiant heat.

7. **Prohibition of smoking:-** No person shall smoke in any place where highly flammable liquid or flammable compressed gas is present in circumstances that smoking would give rise to a risk of fire. The occupier shall take all practicable measures to ensure compliance with this requirement including display of a bold notice indicating prohibition of smoking at every place where this requirement applies.

8. **Fire fighting:-** In every factory where highly flammable liquid or flammable compressed gas is manufactured, stored, handled, or used, appropriate and adequate means of fighting a fire shall be provided. The adequacy and suitability of such means which expression includes the fixed and portable fire extinguishing systems, extinguishing material, procedures and the process of fire fighting, shall be to the standards and levels prescribed by the Indian Standards applicable, and in any case not inferior to the stipulations under rule 71.

9. **Exemptions:-** If in respect of any factory, the Chief Inspector is satisfied that owing to the exceptional circumstances or infrequency of the processes or for any other reason, all or any of the provisions of this schedule are not necessary for protection of the workers in the factory, the Chief Inspector may by a certificate in writing, which he may at his discretion revoke at any time, exempt such factory from all or any of such provisions subject to such conditions, if any, as he may specify therein.

(XXVI)
Standard Operating Procedures for Operations in Foundries

1. **Application:- T**his shall apply to all parts of factories where any of the following operations or processes are carried on—

    a) the production of iron castings or, as the case may be, steel castings by casting in moulds made of sand, loam, moulding composition or other mixture of materials, or by shall moulding, or by centrifugal casting and any process incidental to such production;

    b) the production of non-ferrous castings by casting metal in moulds made of sand, loam, metal, moulding composition or other material or mixture of materials, or by shall mouldings, die-casting (including pressure die casting), centrifugal casting or continuous casting and any process incidental to such production; and

    c) the melting and casting of non-ferrous metal for the production of ingots, billets, slabs or other similar products, and the stripping thereof;

    but shall not apply with respect to—

    a) any process with respect to the smelting and manufacture of lead and the Electric Accumulators;

    b) any process for the purpose of a printing works; or

    c) any smelting process in which metal is obtained by a reducing operation or any process incidental to such operation; or

    d) the production of steel in the form of ingots; or

    e) any process in the course of the manufacture of solder or any process incidental to such manufacture; or

    f) the melting and casting of lead or any lead based alloy for the production of ingots, billets, slabs or other similar products or the stripping thereof, or any process incidental to such melting, casting or stripping.

2. **Definitions:-**

    a) **"approved respirator"** means a respirator of a type approved by the Chief Inspector;

    b) **"cupola or furnace"** includes a receiver associated therewith;

    c) **"dressing or fettling operations"** includes stripping and other removal of adherent sand, cores, runners, risers, flash and other surplus metal from a casting and the production of reasonably clean and smooth surface, but does not include (a) the removal of metal from a casting when performed incidentally in connection with the machining or assembling of castings after they have been dressed or fettled, or (b) any operation which is a knockout operation within the meaning or this schedule;

d) **"foundry"** means those parts of a factory in which the production of iron or steel or non-ferrous casting (not being the production of pig iron or the production of steel in the form of ingots) is carried on by casting in moulds made of sand, loam, moulding composition or other mixture of materials, or by shall moulding or by centrifugal casting in metal moulds lined with sand, or die casting including pressure die castings, together with any part of the factory in which any of the following processes are carried on as incidental processes in connection with an in due course of such production, namely, the preparation and mixing of materials used in foundry process, the preparation of moulds and cores, knock out operations and dressing or fettling operations;

e) **"knock-out operations"** means all methods of removing castings from mould sand the following operations, when done in connection therewith, namely stripping, coring-out and the removal of runners and risers;

f) **"pouring aisle"** means an aisle leading from a main gangway or l cupola or furnace to where metal is poured into directly from a moulds.

3. **Prohibition of use of certain materials as parting materials:-**

1) A material shall not be used as a parting material if it is a material containing compounds of silicon calculated as silica to the extent more than 5 per cent by weight of the dry materials:

Provided that this prohibition shall not prevent the following being used as a parting material if the material does not contain an admixture of any other silica—

a. Zircomium silicate (Zircon)

b. Calcined china day

c. Calcined aluminous fireclay

d. Silimanite

e. Calcined or fused alumina

f. Olivine

g. Natural sand

2) Dust or other matter deposited from a fettling or blasting process shall not be used as a parting material or as a constituent in a parting material.

4. **Arrangement and storage:-** For the purposes of promoting safety and cleanliness in work rooms the following requirements shall be preserved—

a) moulding boxes, loam plates, ladles, patterns, pattern plates, frames, boards, box weights, and other heavy articles shall be so arranged and placed as to enable work to be carried on without unnecessary risk;

b) suitable and conveniently accessible racks, bins or other receptacles shall be provided and used for the storage of other gear and tools;

c) where there is bulk storage of sand, fuel, metal scrap or other materials or residues, suitable bins, bunkers or other receptacles shall be provided for the purpose of such storage.

5. **Construction of floors:-**

1) Floors of indoor workplaces in which the processes are carried on, other than parts which are of sand, shall have an even surface of hard material.

2) No part of the floor of any such indoor workplace shall be of sand except where this is necessary by reason of the work done.

3) All parts of the surface of the floor of any such indoor workplace which are of sand shall, so far as practicable be maintained in an even and firm condition.

6. **Cleanliness of indoor workplaces:-**

1) All accessible parts of the walls of every indoor work place in which the processes are carried on and of everything affixed to those wall shall be effectively cleaned by a suitable method to a height of not less than 4.2 metres from the floor at least once in every period of fourteen months. A record of the carrying out of every such effective cleaning in pursuance of this paragraph including the date (which shall be not less than five months nor more than nine months after the last immediately preceding washing, cleaning or other treatment).

2) Effective cleaning by a suitable method shall be carried out at least once every working day or all accessible parts of the floor of every indoor workplace in which the processes are carried on, other than parts which are of sand; and the parts which are of sand shall be kept in good order.

7. **Manual operations involving molten metal:-**

1) There shall be provided and properly maintained for all persons employed on manual operations involving molten metal with which they are liable to be splashed, a working space for that operation—

a) which is adequate for the safe performance of the work, and

b) which, so far as reasonably practicable, is kept free from obstruction.

2) Any operation involving the carrying by hand of a container holding molten metal shall be performed on a floor all parts of which where any person walks while engaged in the operation shall be on the same level:

Provided that, wherever necessary to enable the operation to be performed without undue risk, nothing in this paragraph shall prevent the occasional or exceptional use of a working space on a different level from the floor, being a space provided with a safe means of access from the floor for any person while engaged in the operation.

8. **Gangways and pouring aisles:-**

1) In every workroom to which this paragraph applies constructed, reconstructed or converted for use as such after the making of this schedule and, so far as reasonably practicable, in every other workroom to which this paragraph applies, sufficient and clearly defined main gangway shall be provided and properly maintained which—

    a) shall have an even surface of hard material and shall, in particular, not be of sand or have on them more sand than is necessary to avoid risk of flying metal from accidental spillage;

    b) shall be kept, so far as reasonably practicable, free from obstruction;

    c) if not used for carrying molten metal, shall be at least 920 millimeters in width;

    d) if used for carrying molten metal shall be—

        i. where truck ladles are used exclusively at least 600 millimeters wider than the overall width of the ladle.

        ii. where hand shanks are carried by not more than two men, at least 920 millimeters in width;

        iii. where hand shanks are carried by more than two men, at least 1.2 metres in width; and

        iv. where used for simultaneous travel in both directions by men carrying shanks, at least 1.8 metres in width.

2) In workroom to which this paragraph applies constructed, reconstructed or converted for use as such after the making of this schedule, sufficient and clearly defined pouring aisles shall be provided and properly maintained which—

    a) shall have an even surface of hard material and shall, in particular, not be of sand or have on them more sand than is necessary to avoid risk of flying metal from accidental spillage;

    b) shall be kept so far as reasonably practicable free from obstruction;

    c) if molten metal is carried in hand ladles or bull ladles by not more than two men per ladle, shall be at least 460 millimeters wide, but where any moulds along side the aisle are more than 510 millimeters above the floor of the aisle, the aisle shall be not less than 600 millimeters wide;

    d) if molten metal is carried in hand ladles or bull ladles by more than two men per ladle, shall be at least 760 millimeters wide;

    e) if molten is carried in crane, trolley or truck ladles, shall be of a width adequate for the safe performance of the work.

3) Requirements of sub-paragraphs (1) and (2) shall not apply to any workroom or part of a workroom if, by reason of the nature of the work done therein, the floor of that workroom or, as the case may be, that part of a workroom has to be of sand.

4) In this paragraph "workroom to which this paragraph applies" means a part or a ferrous or non-ferrous foundry in which molten metal is transported or used, and a workroom to which this paragraph applies shall be deemed for the purposes of this paragraph to have been constructed, reconstructed or converted for use as such after the making of this schedule if the construction, reconstruction or conversion thereof was begun after the making of this schedule.

9. **Work near cupolas and furnaces:-**

1) No person shall carry out any work within a distance of 4 metres from a vertical line passing through the delivery end of any spout of a cupola or furnace, being a spout used for delivering molten metal, or within a distance of 2.4 metres from vertical line passing through the nearest part of any ladle which is in position at the end of such a spout, except, in either case, where it is necessary for the proper use of maintenance of a cupola or furnace that work should be carried out within that distance of that work is being carried out at such a time and under such conditions that there is no danger to the person carrying it out from molten metal which is being obtained from the cupola or furnace or is in a ladle in position at the end of the spout.

2) No open coal, coke or wood fires shall be used for drying moulds except in circumstances in which the use of such fires is unavoidable.

3) Mould stoves, core stores and annealing furnaces shall be so designed constructed, maintained and worked as to prevent, so far as practicable, offensive or injurious fumes from entering into any workroom during any period when a person is employed therein.

4) All knock-out operations shall be carried out—

a) in a separate part of the foundry suitably partitioned off, being a room or part in which, so far as reasonably practicable, effective and suitable local exhaust ventilation and a high standard of general ventilation are provided; or

b) in an area of the foundry in which, so far as reasonably practicable, effective and suitable local exhaust ventilation is provided, or where compliance with this requirement is not reasonably practicable, a high standard of general ventilation is provided.

5) All dressing or fettling operations shall be carried out—

a) in a separate room or in a separate part of the foundry suitably partitioned off; or

b) in an area of the foundry set apart for the purpose;

and shall so far as reasonably practicable, be carried out with effective and suitable local exhaust ventilation or other equality effective means of suppressing dust, operating as near as possible to the point of origin of the dust.

10. **Maintenance and examination of exhaust plant:-**

1) All ventilation plant used for the purpose of extracting, suppressing or controlling dust or fumes shall be properly maintained.

2) All ventilating plant used for the purpose of extracting, suppressing or controlling dust or fumes shall be examined and inspected once every week by a responsible person. It shall be thoroughly examined and tested by a competent person at least once in every period of twelve months; and particulars of the results of every such examination and test shall be entered in an approved register which shall be available for inspection by an Inspector. Any defect found on such examination and test shall be immediately reported in writing by the person carrying out the examination and test to the occupier or manager of the factory.

11. **Protective equipment:-**

1) The occupier shall provide and maintain suitable protective equipment specified for the protection of workers,

    a) suitable gloves or other protection for the hands for workers engaged in handling any hot material likely to cause damage to the hands by burn, scald or scar, or in handling pig iron, rough castings or other articles likely to cause damage to the hands By cut or abrasion;

    b) approved respirators for workers carrying out any operations creating a heavy dust concentration which cannot be dispelled quickly and effectively by the existing ventilation arrangements.

2) No respirator provided for the purposes of clause 1 (b) has been worn by a person shall be worn by another person if it has not since been thoroughly cleaned and disinfected.

3) Persons who for any of their time—

    a) work at a spout of or attend to, a cupola or furnace in such circumstances that material there from may come into contact with the body, being material at such a temperature than its contact with the body would cause a burn; or

    b) are engaged in, or in assisting with, the pouring or molten metal; or

    c) carry by hand or move by manual power any ladle or mould containing molten metal; or

    d) are engaged in knocking-out operations involving material at such a temperature than its contact with the body would cause a burn;

shall be provided with suitable footwear and gaiters which worn by them prevent, so far as reasonably practicable, risk or burns to his feet and ankles.

4) Where appropriate, suitable screens shall be provided for protection against flying materials (including splashes of molten metal and sparks and chips thrown off in the course of any process).

5) The occupier shall provide and maintain suitable accommodation for the storage and make adequate arrangements for cleaning and maintaining or the protective equipment supplied in pursuance of this paragraph.

6) Every person shall make full and proper use of the equipment provided for his protection in pursuance of sub-paragraphs (1) and (4) and shall without delay report to the occupier, manager or other appropriate person any defect in, or loss of, the same.

12. **Washing and bathing facilities:-**

1) There shall be provided and maintained in clean state and good repair for the use of all workers employed in the foundry—

a) a wash place under cover with either—

i. a trough with impervious surface fitted with a waste pipe without plug, and of sufficient length to allow at least 60 centimeters for every 10 such persons employed at any one time and having a constant supply of clean water from taps or jets above the trough at intervals of not more than 60 centimeters; or

ii. at least one tap or stand pipe for every 10 such persons employed at any one time, and having a constant supply of clean water, the tap or stand pipe being spaced not less than 1.2 metres apart; and

b) not less than one half of the total number of washing places provided under clause (a) shall be in the form of bath rooms.

c) a sufficient supply of clean towels made of suitable material changed daily, with sufficient supply of nail brushes and soap.

2) The facilities provided for the purposes of sub-paragraph (1) shall be placed in charge of a responsible person or persons and maintained in a clean and orderly condition.

13. **Disposal of dross and skimming:-** Dross and skimming removed from molten metal or taken from a furnace shall be placed forthwith in suitable receptacles.

14. **Disposal of waste:-** Appropriate measures shall be taken for the disposal of all waste products from shell moulding (including waste burnt sand) as soon as reasonably practicable after the castings have been knocked-out.

15. **Material and equipment left out of doors:-** All material and equipment left out of doors(including material) and equipment so left only temporarily or occasionally shall be so arranged and placed as to avoid unnecessary risk. There shall be safe means or access to all such material and equipment and, so far as reasonably practicable, such access shall be by roadways or pathways which shall be properly maintained. Such roadways or pathways shall have a firm and even surface and shall, so far as reasonably practicable be kept free from obstruction.

16. **Medical facilities and records of examinations and test:-**

1) The occupier of every factory to which the schedule applies, shall—

   a) employ a qualified medical practitioner for medical surveillance of the workers employed therein whose employment shall be subject to the approval of the Chief Inspector of Factories; and

   b) provide to the said medical practitioner all the necessary facilities for the purpose referred to in clause (a).

2) The record of medical examinations and appropriate tests carried out by the said medical practitioner shall be maintained in a separate register approved by the Chief Inspector of Factories, which shall be kept readily available for inspection by the Inspector.

17. **Medical examination by Certifying Surgeon:-**

1) Every worker employed in a foundry shall be examined by a Certifying Surgeon within 15 days of his first employment. Such medical examination shall include pulmonary function tests and chest X-ray. No worker shall be allowed to work after 15 days of his first employment in the factory unless certified fit for such employment by the Certifying Surgeon.

2) Every worker employed in the said processes shall be re-examined by a Certifying Surgeon at least once in every twelve months. Such examination shall, wherever the Certifying Surgeon considers appropriate, include all the tests as specified in sub-paragraph (1) except chest X-ray which will be once in 3 years.

3) The Certifying Surgeon after examining a worker, shall issue a Certificate of Fitness in Form 4. The record of examination and re-examinations carried out shall be entered in the Certificate and the Certificate shall be kept in the custody of the manager of the factory. The record of each examination carried out under sub-paragraphs (1) and (2), including the nature and the results of the tests, shall also be entered by the Certifying Surgeon in a health register in Form 16.

4) The Certificate of Fitness and the health register shall be kept readily available for inspection by the Inspector.

5) If at any time the Certifying Surgeon is of the opinion that worker is no longer fit for employment in the said processes on the ground that continuance therein would involve special danger to the health of the worker, he shall make a record of his findings in the said certificate and the health register. The entry of his findings in those documents should also include the period for which he considers that the said person is unfit for work in the said processes. The person so suspended from the process shall be provided with alternate placement facilities unless he is fully incapacitated in the opinion of the Certifying Surgeon, in which case the person so affected shall be suitably rehabilitated.

6) No person who has been found unfit to work as said in sub-paragraph (3) above shall be re-employed or permitted to work in the said processes unless the Certifying Surgeon, after further examination, again certifies him fit for employment in those processes.

18. **Exemption:-** If in respect of any factory, the Chief Inspector is satisfied that owing to the exceptional circumstances or infrequency of the processes or for any other reason, all or any of the provisions of this schedule is not necessary for protection of the workers in the factory, the Chief Inspector may by a certificate in writing, which he may at his discretion revoke at any time, exempt such factory from all or any of such provisions subject to such conditions, if any, as he specify therein.