Government of India

ATOMIC ENERGY (FACTORIES) RULES, 1996

IndiaCode

Atomic Energy Regulatory Board

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Form 8	Failure mode, effect & criticality analysis
Form 9	Material safety data sheet
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Form 11	Preliminary report of accident etc.
Form 12	Notice of accidents or dangerous occurrence
Form 13	Report of electrical accidents
Form 14	Notice of poisoning or disease
Form 15	half-yearly/annual return

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[To be published in the Gazette of India, Part II Section 3,

sub- section (i)]

Government of India

Department of Atomic Energy

G.S.R. 253 In exercise of the powers conferred by sections 41, 49, 50, 76, 83, 112 and all other enabling sections of the Factories Act, 1948, (63 of 1948), read with sections 23 and 30 of the Atomic Energy Act, 1962, (33 of 1962) and in supersession of the Atomic Energy (Factories) Rules, 1984, except as respect things done or omitted to be done before such supersession, the Central Government hereby makes the following rules, namely :-

ATOMIC ENERGY (FACTORIES) RULES, 1996

CHAPTER I

PRELIMINARY

1. (1) These rules may be called the Atomic Energy (Factories) Rules, 1996.

(2) They shall apply to all the factories owned by the Central Government and engaged in carrying out the purposes of the Atomic Energy Act, 1962 (33 of 1962).

(3) They shall come into force on the date of their publication in the Official Gazette.

2. DEFINITIONS.-In these rules, unless the context otherwise requires,-

(a) "Act" means the Factories Act, 1948 (63 of 1948);

(b) "Certifying Surgeon" means the medical officer of the factory concerned;

(c) "Competent Authority" means any officer or authority appointed by the Central Government by notification in the official Gazette for the purposes of these rules;

(d) "Form" means forms set out in the appendix to these rules;

(e) "Indian Standard" means the Indian Standard as defined in clause (g) of section 2 of the Bureau of Indian Standards Act, 1986 (63 of 1986);

(f) "Inspector" means an officer appointed under section 8 of the Act and includes the Competent Authority;

(g) "Manager" of the factory means the person responsible to the occupier for the working of the factory for the purposes of the Act;

(h) words and expressions used but not defined in these rules shall have the meanings respectively assigned to them in the Factories Act, 1948 (63 of 1948).

3. APPROVAL OF PLANS -

(1) Every proposal for obtaining the previous permission for locating the site on which the factory is to be situated or for the construction or expansion of a factory shall be made to the Competent Authority in writing and shall be accompanied by the document specified in sub-rule (2).

Explanation.- Extension for the purpose of these rules shall include any modification to the process, equipments, alterations in layouts & structures.

(2) The following documents shall accompany every proposal made under sub-rule(1),namely:-

(a) a flow chart of the manufacturing process supplemented by a brief description of the process in its various stages;

(b) plans in duplicate drawn to scale showing-

(i) the site of the factory and lands, buildings and other structures, roads, drains to its North, South, East and West respectively to the extent such particulars can with reasonable accuracy be described;

(ii) the plan, elevation and necessary cross-section of the various buildings, indicating all relevant information relating to lighting, ventilation clearly indicating the position of the plant, machinery, aisles and passageways, and the safety measures provided for escape and evacuation of persons employed in the factory in case of emergency;

(c) details of exhaust ventilation and control of gaseous releases and such other factors controlling the work environment;

(d) arrangements made for effluent treatment and discharges;

(e) safety analysis and emergency plans, and such other particulars as the competent authority may require; and

(f) number of persons likely to be employed during the construction/operation at any particular time.

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(3) The decision of the Competent Authority that the plans are in consonance with the requirements of the Act, subject to such conditions as it may specify, shall be final. Approval shall be communicated to the applicant under the signature of the Competent Authority on one copy of each of the plans. The Competent Authority may if he thinks fit, call for such other particulars required for such certification from the applicant which shall be complied with by the applicant within the period prescribed.

4. PROHIBITION OF USE OF PREMISES AS FACTORYWITHOUT APPROVAL.-

No occupier shall use any premises as a factory for the purposes of the Atomic Energy Act,1962 except with the approval of the Competent Authority.

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CHAPTER II

INSPECTING STAFF

5. APPOINTMENT OF INSPECTORS.-

(1) No person shall be appointed as an Inspector for the purpose of these rules unless he possesses the qualifications prescribed by the competent authority.

(2) Every Medical Inspector shall be a qualified medical practitioner as specified in section 10 of the Act and also possess such additional qualification as may be specified by the Competent Authority.

6. POWERS OF THE INSPECTOR.-Every inspector shall, for the purpose of the execution of all or any of these rules, have powers to do all or any of the following acts, namely:-

(1) To photograph any worker, to inspect, examine, measure, copy, photograph, sketch or test, as the case may be, any building or room, any plant, machinery, appliances or apparatus, any register or document or anything provided for the purpose of securing the health, safety and welfare of the persons employed in the factory, and living in the neighbourhood and for protecting and securing the environment.

(2) To carry out such medical examinations as may be necessary for the purposes of the Act provided he is a medical inspector.

(3) To enquire into safety and health related accidents & unusual occurrences.

(4) To advise the Manager of the factory against unsafe acts and practices and to point out unsafe conditions, if any, existing in the premises of the factory to enable him to take remedial means forthwith.

(5) To report any unsafe conditions or practices existing in the factory to the competent authority.

7. DUTIES OF CERTIFYING SURGEON.-

(1) The Certifying Surgeon shall visit the factory for the purpose of examination of all persons employed in processes covered by rule 88 of these rules at such intervals prescribed under the same rules and the Schedules attached thereto, such units, factories within the local limits assigned to him.

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Rule 7

(2) The Certifying Surgeon shall, upon request by the Competent Authority, carry out such examination and furnish such report as it may indicate, for any factory or class or description of factories where cases of illness have occurred which, it is reasonable to believe, are due to the inherently hazardous nature of the manufacturing process carried on/ or attributable to other conditions of work prevailing therein, or by reason of any change in the manufacturing process carried on/ or in the substances used therein, or by reason of the adoption of any new manufacturing process, there is a likelihood of injury to the health of the workers employed in that manufacturing process.

(3) During such visits the Certifying Surgeon shall examine the persons employed in such processes and shall record the results of his examination in Form 1 and place it in a medical file which shall be kept by the Manager and produced to the Certifying Surgeon at each visit.

(4) If the Certifying Surgeon finds as a result of his examination that any person employed in such process is no longer fit for medical reasons to work in that process, he shall suspend such person from working in that process for such time as he may think fit and no person after suspension shall be employed in that process without the written certificate of fitness by the Certifying Surgeon in Form 1A and the same shall be placed in the medical file.

(5) The Manager of the factory shall afford to the certifying surgeon all facilities to inspect any process in which any person is employed or is likely to be employed.

(6) The Manager of the factory shall provide for the purpose of any medical examination which the Certifying Surgeon wishes to conduct at the factory (for his exclusive use on the occasion of an examination) a room which shall be properly maintained, adequately ventilated and lighted and furnished with a screen, a table (with writing materials),chairs and other furniture necessary for a medical examination room.

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CHAPTER III

HEALTH

8. RECORD OF WHITEWASHING, ETC.- The record of dates on which whitewashing, colourwashing, varnishing, etc. are carried out shall be entered in a register maintained in a manner specified in Form 2.

9. CLEANLINESS OF WALLS, CEILINGS AND COMPOUND AREA.-

(1) Clause (d) of sub-section (1) of section 11 of the Act shall not apply to the class or description of factories or parts of factories specified in the Table to this rule and subject to the condition that they are kept in a clean state by washing, sweeping, brushing, dusting, vacuum cleaning or other effective and adequate means:

Provided the said clause shall continue to apply-

(a) as respects units/factories or parts of units/factories specified in part A of the said Table, to workrooms in which the amount of cubic space allowed for every person employed in the room is less than 14.0 m^3

(b) as respects factories or parts of factories specified in part B of the said Table, to workrooms in which the amount of cubic space allowed for every person employed in the room is less than 70.0 m^3 ;

(c) to engine-houses, fitting shops, lunchrooms, canteens, shelters, creches, cloakrooms, rest-rooms and wash places; and

(d) to such parts of walls, sides and tops of passages and staircases as are less than 6 m. above the floor or stair.

(2) If it appears to the Competent Authority that any part of a factory, to which by virtue of sub-rule (1) any of the provisions of the said clause (d) do not apply or apply as modified by sub-rule (1), is not being kept in a clean state, it may, by written notice, require the occupier to whitewash or colourwash, wash, paint or varnish the same, and in the event of the occupier failing to comply with such requisition within two months from the date of the notice, sub-rule (1) shall cease to apply to such part of a factory, unless the Competent Authority otherwise determines.

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(3) The compound surrounding every factory shall be maintained in a sanitary and clean condition free of rubbish, filth or debris.

TABLE

Part A

1. Chemical works.

2. The following parts of units/factories:-

   (a) Rooms used only for storage of articles.

   (b) Rooms in which the walls or ceilings consist of galvanised iron and/or asbestos cement sheets.

   (c) Rooms in which graphite articles are manufactured / processed

   (d) Parts of walls, partitions, ceilings or tops of rooms which are at least 6 m. above the floor.

Part B

1. Electric generating or transforming stations.

2. Engineering works.

3. Foundries other than foundries in which brass casting is carried on.

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10. DISPOSAL OF WASTES AND EFFLUENTS.- The arrangements made in every factory after the treatment of wastes and effluents due to the manufacturing processes carried on therein shall be in accordance with those approved by the relevant Water and Air pollution Boards appointed under Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environmental Protection Act, 1986 and such other authorities as may be notified by the Central Government in this behalf.

11. ILLUMINATION, TEMPERATURE AND VENTILATION.-

(1) Illumination.-

   (a) General : Adequate lighting is necessary for all buildings and in the open area so as to-

      (i) promote work and other activities carried out in the area;

      (ii) promote safety of the people; and

      (iii) create a pleasing environment conducive for feeling of well-being.

   (b) Adequate lighting will be achieved by,-

(i) planning of brightness in relation to task itself, immediate background of the task and the general surrounding;

(ii) avoiding glare produced by excessive contrast or abrupt and large change in brightness; and

(iii) planning of lighting for movement about a building and around.

(c) The recommended values of illumination for different locations is given in the Table below:

TABLE

Sr.No.	Visual Tasks			Illumination (Lux)
1.	Industrial Buildings & Process			
	(a)	General Factory Areas -canteens, cloakrooms, entrances corridors, stairs		100-150
	(b)	Factory- outside Areas -Stockyards, main entrances		20
	(c)	Assembly, Inspection, Wood working, Welding & Soldering, Machine & Fitting Shops,		
		(i)	Rough Work - Frame assembly	150
		(ii)	Medium Work - Assembly of parts	300
		(iii)	Fine Work - Electronic assembly, inspection	700
		(iv)	Very Fine Work - Assembly of precision parts, optical aids to be provided.	1500
		(v)	Very Precise Work	3000
	(d)	Boiler Houses		
		(i)	Coal & ash handling	100
		(ii)	Boiler rooms-operating area	100
		(iii)	Boiler rooms- other areas	20-50
		(iv)	Outdoor plants	150

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Rule 11(Tab.)

(e)	Chemical Works			
	(i)	Hand furnace, boiling tanks, driers, evaporators etc.		150
	(ii)	Controls, gauges, valves etc. (Supplementary lighting for viewing)		100
	(iii)	Control rooms		200-300
(f)	Electricity Generating Station (indoor)			
	(i)	Turbine halls		200
	(ii)	Auxiliary equipment areas	100	
	(iii)	Boiler houses		70-100
	(iv)	Boiler house & Turbine house		100
	(v)	Basement areas		70
	(vi)	Conveyer areas		70-100
	(vii)	Control rooms		200-300
	(viii)	Nuclear reactors & steam generating plants		150-200
	(g)	Engraving		1000
	(h)	Foundries		
		(i) Charging floors, tumbling etc.		150
		(ii) Fine moulding, core making & inspection		300
		(iii) Repairs		300
	(i)	Garages		
		(i) Parking areas		70
		(ii) Washing, polishing etc.		150
		(iii) Repairs		300
	(j)	Gauge & Tool room (Supplementary lighting if required)		700

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Rule 11(Tab.)

(k)	Laboratories & Test Rooms		
	(i)	General Labs & balance rooms	300
	(ii)	Electronic & Instrument Labs	450
(l)	Laundries, Dry cleaning & ironing		200-300
(m)	Paint Shops & Spraying Booths		
	(i)	Dipping, rubbing	150-300
	(ii)	Fine painting & retouching	450-700
(n)	Plating Shops		
	(i)	Vat & baths	150
	(ii)	Final buffing & polishing	Special lighting
(o)	Structural Steel Fabrication Plants		
	(i)	General	150
	(ii)	Marking off	300
(p)	Libraries		
	(i)	Shelves	70-150
	(ii)	Reading rooms	150-700
	(iii)	Cataloguing, sorting	150-300
	(iv)	Book binding etc.	300-700
(q)	Offices		
	(i)	Entrance & Reception	150
	(ii)	Conference rooms & Gen. office	30
	(iii)	Drawing offices	300-450
	(iv)	Corridors & Lifts	70
	(v)	Stairs, Lift landing	100-150
	(vi)	Telephone exchanges	150-200

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Rule 11(Tab.)

(r)	Hospitals		
	(i)	General & Wards	150
	(ii)	Operating Theatres General	300
	(iii)	Operation table	Special lighting
	(iv)	Laboratories	300
	(v)	Radiological rooms	100
	(vi)	Other areas	100-300
(s)	Restaurants		
	(i)	Dining room tables	100
	(ii)	Self service counters	300
	(iii)	Kitchen	200
	(iv)	Cloak room & toilets	100

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(2) Temperature.- It is essential to provide such temperature in work environment so that workers can be exposed to it repeatedly without adverse health effects. The nature of work can be light , moderate or heavy and the corresponding heat loads for the type of work are 200, 200-350 & 350-500 K Cal/hr. The heat stress is measured in terms of Wet Bulb Globe Temperature (WBGT) Index.* (* Note - on page 12)

The permissible WBGT index in degrees Celsius is given in the following WBGT Table.

WBGT TABLE

	Work Load		
Work-Rest Regimen in each hour	Light	Moderate	Heavy
Continuous Work	30.0	26.7	25.0
75% Work - 25% Rest	30.6	28.0	25.9
50% Work - 50% Rest	31.4	29.4	27.9
25% Work - 75% Rest	32.2	31.1	30.0

The Competent Authority shall specify the optimum working temperature & humidity and also the rest periods for specific factories & jobs.

Rule 11(Tab.)

(3) Ventilation.- Ventilation shall be provided in buildings to supply fresh air for respiration & to dilute inside air to prevent vitiation by body odours & to remove any other products of combustion or other air contaminants. Contaminants from concentrated sources such as smoke, heat & fumes shall be collected separately by local exhaust ventilation. The recommended air changes per hour for various areas is given in the Table below:

TABLE

Area	Air Changes/hour
Factories	3 - 6
Dining Hall	12 - 15
Garages	12 – 15
Kitchen	6 - 9
Laboratories	3 – 6
Offices	3 – 6
Bathrooms & Toilets	6 - 12

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Provided that the competent authority may relax the requirements regarding the number of air changes if it is satisfied that having regard to the location of the factory, orientation of the workroom, prevailing winds, roof height and the nature of manufacturing process carried on, sufficient supply of fresh air into the workroom is afforded during most part of the working time:

Provided further that in the regions where in summer (15th March-15th July) dry-bulb temperatures of outside air in the shade during most part of the day exceed 35 degrees Celsius and simultaneous wet-bulb temperatures are 25 degrees Celsius or below and in the opinion of the Inspector the manufacturing process carried on in the workroom of a factory permits thermal environments with relative humidity of 50% or more, the Inspector may serve on the manager of the factory an order to have sufficient supply of outside air for ventilation cooled by

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* (a) Outdoors with Solar load

WBGT = 0.7NWB + 0.2GT + 0.1DB

(b) Indoor or Outdoor without Solar load

WBGT = 0.7 NWB + 0.3GT

Where NWB = Natural Wet Bulb Temperature

DB = Dry Bulb Temperature

GT = Globe Thermometer Temperature

passing it through water sprays either by means of unit type of evaporative air coolers(desert coolers) or, where supply of outside air is provided by mechanical means through ducts in a plenum system, by means of central air washing plants.

12. QUANTITY OF DRINKING WATER.- The quantity of drinking water to be provided per day for the workers in every factory shall be at least 5 litres per worker employed in the factory and such drinking water shall be readily available at all times during working hours.

13. SOURCE OF SUPPLY.- The water provided for drinking shall be supplied,-

(a) from the public water supply system, or

(b) from any other source approved in writing by the local Health Officer concerned.

14. MEANS OF SUPPLY.- If drinking water is not supplied directly from taps either connected with public water supply system or any other water supply system of the factory approved by the local Health Officer concerned, it shall be kept in suitable vessels, receptacles or tanks fitted with taps and having dust proof covers, and placed on raised stands or platforms in shade and having suitable arrangement of drainage to carry away the spilt water. Such vessels, receptacles or tanks shall be kept clean and the water renewed at least once every day. All practicable measures shall be taken to ensure that the water is free from contamination.

15. CLEANLINESS OF WELL OR RESERVOIR.-

(1) Drinking water shall not be supplied from any open well or reservoir unless it is so constructed, situated, protected and maintained as to be free from the possibility of pollution by chemical, or bacterial and extraneous impurities.

(2) Where drinking water is supplied from such a well or reservoir, the water in it shall be sterilised once a week or more frequently if the inspector by written order so requires, and the date on which sterilising is carried out shall be recorded:

Provided that this requirement shall not apply to any such well or reservoir if the water therein is filtered and treated to the satisfaction of the local Health Officer concerned before it is supplied for consumption.

16. REPORT FROM LOCAL HEALTH OFFICER CONCERNED.- The Inspector may by order in writing direct the manager to obtain, at such time or at such intervals as he may direct, a report from the local Health Officer concerned as to the fitness for human

consumption of the water supplied to the workers, and to submit to the Inspector a copy of such report as soon as it is received from the local Health Officer.

17. COOLING OF WATER.- In every factory wherein more than two hundred and fifty workers are ordinarily employed,-

(1) The drinking water supplied to the workers shall be cooled by an effective method for the period specified by the Inspector;

(2) The cool drinking water shall be supplied in every canteen, lunchroom and rest-room and also at conveniently situated points throughout the factory which for the purpose of the rules shall be called "water centres";

(3) The water centres shall be sheltered from the weather and adequately drained and shall be located outside the work-places where toxic materials are handled or processed;

(4) The number of water centres to be provided shall be one "centre" for every 150 persons employed at any one time in the factory:

Provided that in the case of a factory where the number of persons employed exceeds 500 it shall be sufficient if there is one such "centre" as aforesaid for every 150 persons up to the first 500 and one for every 500 persons thereafter:

Provided further that its distance between the place of work shall be such as may be specified by the Inspector.

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(5) Every water centre shall be maintained in a clean and orderly condition; and

(6) The means of supply of cooled drinking water shall be either directly through taps connected to water coolers or any other system for cooling of water, or by means of vessels, receptacles or tanks fitted with taps and having dust proof covers and placed on raised stands or platforms in shade, and having suitable arrangement of drainage to carry away the spilt water. Such vessels, receptacles or tanks shall be kept clean and the water refilled at least once every day.

18. LATRINE ACCOMMODATION.- Latrine accommodation shall be provided in every factory on the following scale, namely:-

(a) where females are employed, there shall be at least one latrine for every 25 females;

(b) where males are employed, there shall be at least one latrine for every 25 males;

Provided that where the number of males exceeds 100, it shall be sufficient if there is one latrine for every 25 males up to the first 100 males, and one for every 50 males thereafter.

Note:- In calculating the number of latrines required under this rule, any odd number of workers less than 25, or 50 as the case may be, shall be reckoned as 25 or 50.

19. **TOILET BLOCKS .-** The toilet block shall consist of wash basins, latrines and urinals (in case of male workers). The number of wash basins will the same as number of latrines. Each wash basin shall be provided with mirror and liquid/cake soap. Each toilet block shall be provided with clean towel or electric hand drier. The number, size and location of the toilet block shall be as per the decision of Inspector & Public Health Authority.

20. **PRIVACY OF TOILET.-** Every latrine shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings, which shall be maintained in good working order at all time.

21. **SIGN BOARDS TO BE DISPLAYED**.- Where workers of both sexes are employed, there shall be displayed outside each latrine block a notice "For Men Only" or "For Women Only" as the case may be, in the language understood by the majority of the workers. The notice shall also bear the figures of a man or of a woman as the case may be.

22. **URINAL ACCOMMODATION.-** Urinal accommodation shall be provided for the use of male workers and there shall be at least one urinal for every 50 males:

Provided that where the number of males employed exceeds 500, it shall be sufficient if there is one urinal for every 50 males up to the first 500 employed, and one for every 100 thereafter.

Note:- In calculating the urinal accommodation required under this rule any odd number of workers less than 50, or 100, as the case may be, shall be reckoned as 50 or 100.

23. **URINALS TO CONFORM TO PUBLIC HEALTH REQUIREMENTS.-** Urinals other than those connected with an efficient water-borne sewage system, and urinals in a factory wherein more than two hundred and fifty workers are ordinarily employed shall comply with the requirements of the Public Health Authorities.

24. **CERTAIN LATRINES AND URINALS TO BE CONNECTED TO SEWERAGE SYSTEM.-** When any general system of underground sewerage with an assured water supply for any particular locality is provided in a municipality, all latrines and urinals of a factory situated in

such locality shall, if the factory is situated within 30 metres of an existing sewer, be connected with that sewerage system suitably.

25. WHITEWASHING, COLOURWASHING OF LATRINES AND URINALS.- The walls, ceilings and partitions of every latrine and urinal shall be whitewashed or colourwashed and the whitewashing or colourwashing shall be repeated at least once in a period of four months. The dates on which the whitewashing or colourwashing is carried out shall be entered in the prescribed register (Form 2):

Provided that this rule shall not apply to latrines and urinals, the walls, ceilings or partitions of which are laid in glazed tiles or otherwise finished to provide a smooth, polished, impervious surface and that they are washed with suitable detergents and disinfectants at least once in every period of four months.

26. CONSTRUCTION AND MAINTENANCE OF DRAINS.- All drains carrying waste or sullage water shall be constructed in masonry or other impermeable material and shall be regularly flushed and the effluent disposed of by connecting such drains with a suitable drainage line:

Provided that where there is no such drainage line, the effluent shall be deodorized and rendered innocuous and then disposed of in a manner suitable to the satisfaction of the local Health Officer concerned.

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27. WATER TAPS IN LATRINES.- Where piped water supply is available, a sufficient number of water taps, conveniently accessible, shall be provided in or near latrine accommodation. A tap per each latrine is to be preferred. There shall be at least one tap for every ten latrines or part thereof. The water taps shall be connected to the Municipal water supply or to an overhead storage tank of sufficient capacity, so that water is available from the taps during all hours when the workers are in the factory. Wherever commode type of latrines are provided arrangements shall be made for providing toilet paper and soap solution, in addition to the water tap. The toilet paper and soap solution shall be regularly replenished.

28. NUMBER AND LOCATION OF SPITTOONS.- The number and location of the spittoons to be provided shall be to the satisfaction of the Inspector. Such spittoons shall be placed on a stand or a bracket 90 cm. high.

29. TYPE OF SPITTOONS.- The spittoons shall be of either of the following types, namely:-

(a) a galvanized iron container with a conical funnel-shaped cover. A layer of suitable disinfectant liquid shall always be

maintained in the container; or

(b) a container filled with dry clean sand, and covered with a layer of bleaching powder; or

(c) any other type approved by the Competent Authority.

30. CLEANING OF LATRINES, URINALS, WORKPLACES & SPITTOONS.- Latrines, urinals, washplaces & spittoons shall be maintained in clean & sanitary conditions by employing adequate number of sanitary staff.

31. Qualifications of competent person with reference to various Sections of the Act are given in the schedule below.

SCHEDULE

The Competent Person is a person who is having a degree in the discipline mentioned or equivalent followed by experience as specified, in responsible position in the field and designated by the Competent Authority.

Sl. No.	Rules made under section of the Act requiring competency	Type of work	Discipline	Experience
1	2	3	4	5
1.	Section(6)	Civil construction structural work.	Civil or & structural engineering	Minimum 10 yrs in design, construction testing or repairs of structures, knowledge of various codes pertaining to the non destructive testing methods.
2.	Section21(2)	Operation of dangerous machines	Electrical or mechanical engineering or equivalent	Minimum 7 yrs in design, operation maintenance, testing of relevant machinery, guards, safety devices etc.
3.	Section 28	Lifts & Hoists	- do -	Min. 7 yrs. in design, erection maintenance, inspection and test procedures of Hoists & lifts.

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Rule 31(Sch.)

1	2	3	4	5
4.	Section 29	Lifting Machinery Lifting tackles	Electrical, Mechanical or Metallurgical	Min.7 yrs. in design, erection maintenance, inspection. testing of lifting machinery or lifting tackle
5.	Section 31	Pressure plant	Chemical, Electrical or mechanical or metallurgical Engineering or equivalent	Min. 10 yrs experience in design, erection, maintenance, testing examination, inspection of pressure plants and knowledge of non destructive testing & codes of safety requirement of pressure vessels.
6.	Section 36	Dangerous fumes	Chemical engineering or masters degree in chemistry	Min.7 yrs. experience in collection and analysis of environmental samples and calibration of monitoring equipment.
7.	Section 41-C (b)	Supervision of handling of hazardous substances	Chemical engineering or masters degree in chemistry	Min. 7 yrs. experience on the shop floor in handling & disposal of hazardous chemicals.
8.	Section 87	Ventilation system	Electrical or mechanical engg.	Min.7 yrs. in design, fabrication, installation, testing of ventilation systems and systems used for collection of dusts, fumes etc.

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Rule 32(Sch.)

CHAPTER IV

SAFETY

32. Without prejudice to the provisions of sub-section (1) of section 21 of the Act in regard to fencing , the further precautions specified in Schedules annexed here to shall apply to machines mentioned in each Schedule.

SCHEDULE I

WOODWORKING MACHINERY

1. Definitions.-For the purposes of this schedule -

(a) "woodworking machine" means a circular saw, band saw, planing machine, chain mortising machine or vertical spindle moulding machine operating on wood or cork;

(b) "circular saw" means a circular saw working in a bench (including a rack bench), but does not include a pendulum or similar saw which is moved towards the wood for the purpose of cutting operation;

(c) "band saw" means a band saw, the cutting portion of which runs in a vertical direction but does not include a log saw or band re-sawing machine; and

(d) "planing machine" means a machine for overhead planing or for thicknessing or for both operations.

2. Stopping and starting device.- An efficient stopping and starting device shall be provided on every woodworking machine. The control of this device shall be in such a position as to be readily and conveniently operated by the person in charge of the machine.

3. Space around machines.- The space surrounding every woodworking machine in motion shall be kept free from obstruction.

4. Floors.-The floor surrounding every woodworking machine shall be maintained in good and smooth condition, and shall not be allowed to become slippery, and as far as practicable shall be kept free from chips or other loosely scattered material.

5. Training and supervision.-

(a) No person shall be employed at a woodworking machine unless he has been sufficiently trained to work that class of machine, or unless he works under the adequate supervision of a person who has a thorough knowledge of the working of the machine.

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(b) A person who is being trained to work a woodworking machine shall be fully and carefully instructed as to the dangers of the machine and the precautions to be observed to secure safe working of the machine.

6. Circular saws.-Every circular saw shall be fenced as follows:-

(a) behind and in direct line with the saw there shall be a riving knife, which shall have a smooth surface, shall be strong, rigid and easily adjustable, and shall also conform to the following conditions:-

(i) the edge of the knife nearer the saw shall form an arc of a circle having a radius not exceeding the radius of the largest saw used on the bench;

(ii) the knife shall be maintained as close as practicable to the saw, having regard to the nature of the work being done at the time, and at the level of the bench table. The distance between the front edge of the knife and the teeth of the saw shall not exceed 12 millimeters; and

(iii) for a saw of a diameter of less than 60 cm., the knife shall extend upwards from the bench table to within 25 mm. of the top of the saw, and for a saw of a diameter 60 cm. or over shall extend upwards from the bench table to a height of at least 23 cm.

(b) the top of the saw shall be covered by a strong and easily adjustable guard, with a flange at the side of the saw farthest from the fence. The guard shall be kept so adjusted that the said flange shall extend below the roots of the teeth of the saw. The guard shall extend from the top of the riving knife to a point as low as practicable at the cutting edge of the saw; and

(c) the part of the saw below the bench table shall be protected by two plates of metal or other suitable material, one on each side of the saw; such plates shall not be more than 15 cm. apart, and shall extend from the axis of the saw outwards to a distance of not less than 5 cm. beyond the teeth of the saw. Metal plates, if not beaded, shall be of a thickness of at least 2.5 mm., or if beaded, be of a thickness of at least 1.25 mm.

7. Push Sticks.-A push stick or other suitable appliance shall be provided for use at every circular saw and at every vertical spindle moulding machine to enable the work to be done without unnecessary risk.

8. Band saws.-Every band saw shall be guarded as follows:-

(a) both sides of the bottom pulley shall be completely encased by sheet or expanded metal or other suitable material;

(b) the front of the top pulley shall be covered with sheet or expanded metal or other suitable material; and

(c) all portions of the blade shall be enclosed or otherwise securely guarded, except the portion of the blade between the bench table and the top guide.

9. Planing machines.-

(a) A planing machine (other than a planing machine which is mechanically fed) shall not be used for overhand planing unless it is fitted with a cylindrical cutter block.

(b) Every planing machine used for overhand planing shall be provided with a "bridge" guard capable of covering the full length and breadth of the cutting slot in the bench, and so constructed as to be easily adjusted both in a vertical and horizontal direction.

(c) The feed roller of every planing machine used for thicknessing, except the combined machine for overhand planing and thicknessing, shall be provided with an efficient guard.

10. Adjustment and maintenance of guards.-The guards and other appliances required under this schedule shall be -

(a) maintained in an efficient state;

(b) constantly kept in position while the machinery is in motion; and

(c) so adjusted as to enable the work to be done without unnecessary risk.

11. Exemptions.-Paragraphs 6, 8, 9 and 10 shall not apply to any woodworking machine in respect of which it can be proved that other safeguards are provided, maintained and used which render the machine as safe as it would be if guarded in the manner prescribed in this schedule.

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SCHEDULE II

CENTRIFUGAL MACHINES

1. Definition.-"Centrifugal machines" include centrifugal extractors, separators and driers.

2. Every part of centrifugal machine shall be

(a) of good design and construction and of adequate strength;

(b) properly maintained; and

(c) examined thoroughly by a competent person at regular intervals to check for unbalance & in case unbalance at high speeds is observed steps to restore the balance shall be taken before commissioning the machine.

3. Interlocking guard for drum or basket.-

(a) The cage housing the rotating drum or basket of every centrifugal machine shall be provided with a strong lid. The design and construction of the cage as well as the lid shall be such that no access is possible to the drum or basket when the lid is closed.

(b) Every centrifugal machine shall be provided with an efficient interlocking device that will effectively prevent the lid referred to in sub-paragraph (a) from being opened while the drum or basket is in motion and prevent the drum or basket being set in motion while the lid is in the open position.

4. Braking arrangement.-Every centrifugal machine shall be provided with an effective braking arrangement capable of bringing the drum or basket to rest within as short a period of time as reasonably practicable after the power is cut off.

5. Operating speed.-No centrifugal machine shall be operated at a speed in excess of the manufacturer's rating which shall be legibly stamped at easily visible places both on the inside of the basket and on the outside of the machine casing.

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SCHEDULE III

POWER PRESS

1. Application.- The Schedule shall apply to all types of power presses including press brakes, except when used for working hot metal.

2. Definition.- For the purpose of this Schedule -

(a) "approved" means approved by the Competent Authority;

(b) "fixed fencing" means fencing provided for the tools of a power press being fencing which has no moving parts associated with or dependent upon the mechanism of a power press and includes that part of a closed tool which acts as a guard;

(c) "power press" means a machine used in metal or other industries for moulding, pressing, blanking raising drawing and similar purposes;

(d) "safety device" means the fencing and any other safeguard provided for the tools of a power press.

3. Starting and stopping mechanism.- The starting and stopping mechanism shall be provided with a safety stop so as to prevent

over running of the press or descent of the ram during tool setting, etc.

4. Protection of tool and die.-

(a) Each press shall be provided with a fixed guard with a slip plate on the underside enclosing the front and sides of the tool.

(b) Each die shall be provided with a fixed guard surrounding its front and sides, and extending to the back in the form of a tunnel through which the pressed article falls to the rear of the press.

(c) The design, construction and mutual position of the guards referred to in (a) and (b) such as to preclude the possibility of the worker's hand or fingers approaching the danger zone.

(d) The machine shall be fed through a small aperture at the bottom of the die guard, but a wider aperture may be permitted for second or subsequent operations if feeding is done through a chute.

(e) Notwithstanding anything contained in sub-clauses (a) and (b) an automatic or an inter-locked guard may be used in place of a fixed guard, but where such guards are used they shall be maintained in an efficient working condition and if any guard develops a defect, the power press shall not be operated unless the defect of the guard is removed.

5. Appointment of persons to prepare power presses for use .-

(a) Except as provided in paragraph (4), no person shall set, re-set, adjust or try out the tools on a power press or install or adjust any safety device thereon, being installation or adjustment preparatory to production of die proving, or carry out an inspection and test of any safety device thereon required by paragraph 8 unless he-

(i) has attained the age of eighteen;

(ii) has been trained in accordance with the sub-paragraph (b); and

(iii) has been appointed by the occupier of the factory to carry out those duties in respect of the class or description of power press or the class or description of safety device to which the power press or the safety device (as the case may be) belongs; and the name of every such person shall be entered in a register in Form 1.

Rule 32(Sch.III)

(b) The training shall include suitable and sufficient practical instruction in the matters in relation to each type of power press & safety device in respect of which it is proposed to appoint the person being trained.

6. Examination and testing of power presses and safety devices.-

(a) No power press or safety device shall be taken into use in any factory for the first time in that factory, or in case of a safety device for the first time on any power press, unless it has been thoroughly examined and tested, in the case of a power press, after installation in the factory, or in the case of a safety device, when in position on the power press in connection with which it is to be used.

(b) No power press shall be used unless it has been thoroughly examined and tested by a competent person within the immediately preceding period of 12 months.

(c) No power press shall be used unless every safety device (other than fixed fencing) thereon has within the immediately preceding period of six months when in position on that power press, been thoroughly examined and tested by a competent person.

(d) The competent person carrying out an examination and test under the foregoing provisions shall make a report of the examination and test containing the following particulars and every such report shall be kept readily available for inspection:

(i) name of the occupier of the factory;

(ii) address of the factory;

(iii) identification number or mark sufficient to identify the power press or the safety device;

(iv) date on which the power press or the safety device was first taken into use in the factory;

(v) the date of each periodical thorough examination carried out as per requirements of sub-paragraph (b) above;

(vi) particulars of any defects affecting the safe working of the power press or the safety device found at any such thorough examination and steps taken to remedy such defects;

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7. Defects disclosed during a thorough examination and tests .-

(a) Where any defect is disclosed in any power press or in any safety device by any examination and test under paragraph 6 and in the opinion of the competent person carrying out the examination and test, either-

(i) the said defect is a cause of danger to workers and in consequence the power press or safety device (as the case may be) ought not to be used until the said defect has been remedied; or

(ii) the said defect may become a cause of danger to workers and in consequence the power press or safety device (as the case may be) ought not to be used after the expiration of a specified period unless the said defect has been remedied.

Such defect shall, as soon as possible after the completion of the examination and test, be notified in writing by the competent person to the occupier of the factory and, in the case of a defect falling within clause (ii) of this sub-paragraph such notification shall include the period within which, in the opinion of the competent person, the defect ought to be remedied.

(b) In every case where notification has been given under this paragraph, a copy of the report made under paragraph 6(d) shall be sent by the competent person to the inspector for the area within fourteen days of the completion of the examination and test.

(c) Where any such defect is notified to the occupier in accordance with the foregoing provisions of this paragraph the power press or safety devise (as the case may be) having the said defect shall not be used -

(i) in the case of a defect falling within clause(i) of sub- paragraph (a) until the said defect has been remedied; and

(ii) in the case of defect falling within clause (ii) of sub-paragraph (a), after the expiration of the specified period.

(d) As soon as is practicable after any defect of which notification has been given under sub-paragraph(a) has been remedied, a record shall be made by or on behalf of the occupier stating the measures by which and the date on which the defect was remedied.

8. Inspection and test of safety devices.-

(a) No power press shall be used after the setting, resetting or adjustment of the

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tools thereon unless a person appointed or authorised for the purpose under Paragraph 5 has inspected and tested every safety device thereon while it is in position on the said power press:

Provided that any inspection, test and certificate as aforesaid not be required where any adjustment of the tools has not caused or resulted in any alteration to or disturbance of any safety device on the power press and if, after the adjustment of the tools, the safety devices remain, in the opinion of such a person as aforesaid, in efficient working order.

(b) Every power press and every safety device thereon while it is in position on the said power press shall be inspected and tested by a trained person every day.

9. Defects disclosed during an inspection and test.-

(a) Where it appears to any person as a result of any inspection and test carried out by him under paragraph 8 that any necessary safety device is not in position or is not properly in position on a power press or that any safety device which is in position on a power press is not in his opinion suitable, he shall notify the manager forthwith.

(b) Except as provided in sub-paragraph (c) where any defect is disclosed in a safety device by any inspection and test under paragraph 8, the person carrying out the inspection and test shall notify the manager forthwith.

(c) Where any defect in a safety device is the subject of a notification in writing under paragraph 7 by virtue of which the use of the safety device may be continued during a specified period without the said defect having been remedied, the requirement in sub-paragraph (b) of this paragraph shall not apply to the said defect until the said period has expired.

10. Identification of power presses and safety devices.- For the purpose of identification every power press and every safety device provided for the same shall be distinctively and plainly marked.

11. Training and instructions to operators.- The operators shall be trained and instructed in the safe method of work before starting work on any power press. It shall be ensured by adequate supervision that correct operating procedures are being followed.

12. Exemptions.-

(a) If in respect of any factory, the Competent Authority is satisfied that owing to the circumstances or infrequency 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 employed on any power press or any class or description of power press or in the factory, the Competent Authority 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.

(b) Where such exemption is granted, a legible copy of the certificate, showing the conditions (if any) subject to which it has been granted, shall be kept posted in the factory in a position where it may be conveniently read by the persons employed.

SCHEDULE IV

WELDING AND GAS CUTTING

1. Arc Welding.-

(a) Definition.- Arc welding is a welding process wherein coalescence is produced by heating with an electric arc, with or without application of pressure and with or without the use of filler metal.

(b) Correct and proper electric earthing shall be provided for the welding machine, the casing and the job to be welded. These shall be electrically checked for any leakage of current by an authorised and trained electrician.

(c) The welding machine shall be kept at a dry place and materials shall not be kept around it.

(d) The welding cable shall be in good condition. The metal wire shall not be in an exposed state anywhere. The welding cable connections shall be tight. The cable shall not lie on wet surface nor shall it pass through water. Building structure, fuel tanks, railings etc., shall not be used to support welding cables. As far as possible cable shall not be laid across the passages.

(e) The welder shall not wear any wet dresses, footwear, hand gloves etc. These articles must be dry before working with welding machines. The welder shall wear rubber shoes, hand gloves and use welding screens while doing welding jobs. Welding screen shall be used around the welding area to stop welding flashes from affecting others. The welder must check the welding holder thoroughly before starting the job and shall also see that the insulation of the holder is proper.

(f) The welding cable and holder etc., shall be fastened to the overhead structures with non-conductors to prevent these from dropping down.

(g) Scaffolding made of corrugated sheets shall be used below the areas where welding is to be done to prevent sparks dropping down below.

(h) While welding in confined areas like inside of tanks, pipes etc., proper ventilation shall be provided with the help of a fan.

(i) Welding on a gas or fuel line shall never be done without a special approved procedure written specially for the particular job.

(j) All welding work shall be started only after obtaining a welding permit from authorised agency indicating special precautions including the fire fighting details.

(k) For welding work on overhead equipment such as crane etc. a separate earth cable shall be run up to the work place and shall be connected to work piece.

2. Gas Cutting.-

(a) Definition.- Gas cutting is a process used for cutting mild steel by a flame torch using compressed gases Hydrogen/Acetylene and oxygen to preheat the metal and cutting it by forcing oxygen at higher pressure.

(b) The gas cylinders shall be kept well away from any fire or hot areas. The rubber pipes, joints, gas torches, valve connections shall be thoroughly checked for leakage of gas.

(c) The gas cutter shall use proper safety appliances viz. gas cutters goggles, hand gloves, safety shoes, helmets and safety belts.

(d) The rubber hose shall not come in contact with any hot material and it shall not be taken through hot areas.

(e) The gas torch shall be fastened to a fixed overhead structural or with the body of the gas cutter to stop it from dropping down.

(f) The rubber hose shall not obstruct the movement of others. When necessary to lower the rubber hose with fittings, a fibre rope should be used. A metal sheet shall be used below the job to arrest any sparks/hot slags from falling down.

(g) Before starting any gas cutting, a written permit clearance shall be obtained from authorised person which will indicate all Safety precautions including fire fighting details.

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(h) Gas cutting at or near fuel line/hazardous area etc., shall be done only after obtaining a special approved procedure for that job.

(i) Provisions of Gas Cylinder Rules shall be complied with.

SCHEDULE V

SHEARS, SLITTERS AND GUILLOTINE MACHINES

1. Definition.- For the purpose of this Schedule -

(a) "guillotine" means a machine ordinarily equipped with straight, bevel-edged blade operating vertically against a stationery resisting edge and used for cutting metallic or non- metallic substances;

(b) "shears" or "shearing machine" means a machine ordinarily equipped with straight, bevel-edged blades operating vertically against resisting edges, or with rotary, overlapping cutting wheels, and used for shearing metals or non-metallic substances; and

(c) "slitter" or "slitting machine" means a machine ordinarily equipped with circular disc-type knives, and used for trimming or cutting into metal or non-metallic substances or for slitting them into narrow strips; for the purpose of this Schedule, this term includes bread or other food slicers equipped with rotary knives or cutting discs.

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2. Guillotine and Shears.-

(a) Where practicable, a barrier metal guard of adequate strength shall be provided at the front of the knife, fastened to the machine frame and shall be so fixed as would prevent any part of the operator's body to reach the descending blade from above, below or through the barrier guard or from the sides:

Provided that in case of machines used in the paper printing and allied industries, where a fixed barrier metal guard is not suitable on account of the height and volume of the material being fed, there shall be provided suitable starting devices which require simultaneous action of both the hands of the operator or an automatic device which will remove both the hands of the operator from the danger zone at every descent of the blade.

(b) At the back end of such machines, as inclined guard shall be provided over which the slit pieces would slide and be collected at a safe distance in a manner as would prevent a person at the back from reaching the descending blade.

(c) Power-driven guillotine cutters, except continuous feed trimmers, shall be equipped with -

(i) starting devices which require the simultaneous action of both hands to start the cutting motion and of at least one hand on a control during the complete stroke of the knife; or

(ii) an automatic guard which will remove the hands of the operator from the danger zone at every descent of the blade, used in conjunction with one-hand starting devices which require two distinct movements of the device to start the cutting motion, and so designed as to return positively to the non-starting position after each complete cycle of the knife.

(d) Where two or more workers are employed at the same time on the same power-driven guillotine cutter equipped with two- hand control the device shall be so arranged that each worker shall be required to use both hands simultaneously on the safety trip to start the cutting motion, and at least one hand on a control to complete the cut.

(e) Power-driven guillotine cutters, other than continuous trimmer, shall be provided, in addition to the brake or other stopping mechanism, with an emergency device which will prevent the machine from operating in the event of failure of the brake when the starting mechanism is in the non-starting position.

3. Slitting Machines.-

(a) Circular disc-type knives on machines for cutting metal and leather, paper, rubber, textiles or other non-metallic substances shall, if within reach of operators standing on the floor or working level, be provided with guards enclosing the knife edges at all times as near as practicable to the surface of the material, and which may either-

(i) automatically adjust themselves to the thickness of the material; or

(ii) be fixed or manually adjusted so that the space between the bottom of the guard and the material will not exceed 6 mm (1/4 in.) at any time.

(b) Portions of blades underneath the tables or benches of slitting machines shall be covered by guards.

4. Index Cutters and Vertical Paper Slotters.- Index cutters, and other machines for cutting strips from the ends of books, and for similar operations, shall be provided with fixed guards, so arranged that the fingers of the operators cannot come between the blades and the tables.

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Rule 32(Sch.V-VI)

5. Corner Cutters.- Corner cutters, used in the manufacture of paper boxes, shall be equipped with -

   (a) suitable guard fastened to the machines in front of the knives and provided with slots or perforations to afford visibility of the operations; or

   (b) other guards equally efficient for the protection of the fingers of the workers.

6. Band Knives.- Band wheels on band knives, and all portions of the blades except the working side between the sliding guide and the table on vertical machines, or between the wheel guards on horizontal machines, shall be completely enclosed with hinged guards of sheet metal not less than 1 mm(0.04 in) in thickness or of other material of equal strength.

SCHEDULE VI

AGITATORS AND MIXING MACHINES

1. Definition.- "Agitators and Mixing Machines" means a tank or other container equipped with power-driven mixing arms, blades or paddle wheels fixed to revolvable shafts or other simple mechanical devices for blending stirring liquids with other liquids or with solid substances or combinations of these.

2. When the top of an open agitator tank, beater tank or paddle tank or similar vessel is less than 1 M above the adjacent floor or working level, adequate standard railings shall be installed on all open sides.

3. Agitators and mixing machines shall be provided with an efficient inter-lock arrangement for the top lid, to prevent access to the agitating, stirring or similar devices, whilst in motion and would prevent restart under power with the lids in open position.

4. When other inspection or examination openings are provided at the top or sides of the containers vessels of the agitator and mixing machines, such openings shall be provided with standard grill guards as would prevent access of any part of the operator's body coming in contact with agitator stirring or similar devices whilst in motion.

5. When discharge holes, openings, chutes or similar arrangements are provided at bottom or at the sides of the container vessels of the agitator and mixing machines, they shall, be so designed, shaped guarded, or situated as would prevent access of any part of operator's body coming in contact

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with agitating, stirring or similar devices, whilst in motion inside the vessel.

SCHEDULE VII

CONVEYORS

1. Application.- The schedule shall apply to all types of conveyors.

2. Definition.- Conveyor means a horizontal, inclined or vertical device for moving or transporting bulk materials, packages & objects in a path predetermined by the design of device and having points of loading or discharge fixed or selective.

3. General.- The conveyors shall be so designed installed, operated & maintained as per the national code & standards. Safe procedures shall be laid down to include the following, namely:-

   (a) All moving parts of conveyors such as gears, sprockets, sheaves etc. shall be guarded;

   (b) The starting switch of conveyor shall be located at such a place so that the operator shall have clear view of the entire conveyor length;

   (c) The entire system shall be so interlocked by electrical or mechanical means that it can stop automatically if there is a blockage at any place along the length;

   (d) Conveyors operating in series shall have controls so designed that if one of the conveyor stops others shall automatically stop;

   (e) Electrical machines operating the conveyors equipped with brakes which are mechanically applied or released by movement of operating device, shall be so designed that if the electrical power is interrupted with brakes in OFF position, load can descend only at controlled speed;

   (f) Antirunaway or backstop devices shall be provided on reversible type of conveyors where reversing can cause hazard;

   (g) Overload protecting devices shall be provided on conveyors which shall disconnect the electrical power. All restarting devices shall remain locked till the cause of overload is removed;

   (h) For conveyors feeding the hopper at or near level of floor, the hopper shall be provided with screen or railing and toe-board;

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(i) Conveyors handling flammable material or fine powders shall have only explosion proof electrical fixtures. The dust levels in the area shall be restricted to PLE Limits by suitable means; and

(j) Conveyors running in tunnels & pits shall have sufficient clearance at sides for workers engaged in lubricating or repair works.

4. Conveyors at height.-

(a) Conveyors at elevated locations shall be provided with access platform with toe-board & guard rails.

(b) Conveyors installed within 2 metres of floor or walkway surface shall be provided with crossovers or passages

(c) Overhead conveyors shall be provided with sideboards along the edges & screen guards underneath. Underpasses shall be provided with sheet metal ceiling for protection of the persons crossing.

(d) Conveyors passing through building floors, walls shall have interlocks installed in such a way that all will have to operate at one time to start the system. These switches shall be clearly marked & area near them shall be kept clean and free of obstructions. The openings shall be guarded with hand rails, toe-boards etc.

5. Maintenance.- The operation, maintenance of conveyors shall be done under work permit system keeping in mind the nature of materials handled. The entire mechanism of conveyors, electrical switches, interlocks etc. shall be inspected and maintained regularly especially for brakes, back stops, anti-runaway devices, overload releases and such other safety devices.

6. Fire Fighting.- The entire length of the conveyor shall be covered by installation of fire detection and warning system. Wherever conveyor passes through wall or floor openings, automatic system shall be installed for closing of them to stop the passage of flame through them. Wherever necessary automatic water sprinkler system shall also be provided.

33. Register of workers employed for work on or near machinery in motion.-In every factory a register shall be maintained in Form 1 in which the name and other particulars of every such worker as may be employed for such examination or operation as referred to in the proviso to sub-section (1) of section 21 shall be entered.

34. HOISTS AND LIFTS.-

(1) A register shall be maintained to record particulars of examination of hoists and lifts and shall give particulars as shown in Form 3.

(2) In pursuance of the provisions of sub-section (4) of Section 28, in respect of any class or description of hoist or lift specified in the first column of the following Schedule, the requirements of section 28 specified in the second column of the said Schedule and set opposite to that class or description of hoist or lift shall not apply.

SCHEDULE

Class or description of hoist or lift	Requirements which shall not apply
Hoists or lifts mainly used for raising materials for charging blast furnaces or lime kilns.	Sub-section 1(b) in so far as it requires a gate at the bottom landing; sub-section1(d); sub-section 1(e)
Hoists not connected with mechanical power and which are not used for carrying persons.	Sub-section 1(b) in so far as it requires the hoistway or liftway enclosure to be so constructed as to prevent any person or thing from being trapped between any part of the hoist or lift and any fixed structure or moving part; sub-section 1(e)

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35. LIFTING MACHINES, CHAINS, ROPES AND LIFTING TACKLES.-

(1) No lifting machine and no chain, rope or lifting tackle, except a fibre rope or fibre rope sling, shall be taken into use in any factory for the first time in that factory unless it has been tested and all parts have been thoroughly examined by a competent person and a certificate of such a test and examination specifying the safe working load or loads and signed by the person making the test and the examination, has been obtained and is kept available for inspection.

(2) Every jib-crane so constructed that the safe working load may be varied by the raising or lowering of the jib, shall have attached there to either an automatic indicator of safe working loads or an automatic jib angle indicator and a table indicating the safe working load at corresponding inclinations of the jib or corresponding radii of the load. An audio-visual alarm be preferably provided in addition, to give alarm wherever the limits given in table are exceeded.

(3) A table showing the safe working loads of every kind and

size of chain, rope or lifting tackle in use, and, in the case of a multiple sling, the safe working loads at different angles of the legs, shall be pasted in the store in which the chains, ropes or lifting tackles are kept, and in prominent positions on the premises, and no chain, rope or lifting tackle not shown in the table shall be used:

Provided that this sub-rule shall not apply in respect of such lifting tackle if the safe working load thereof, or in the case of a multiple sling, the safe working load at different angles of the legs, is plainly marked upon it.

(4) The register to be maintained under clause (a)(iii) of sub-section (1) of Section 29 of the Act shall contain the report as given in Form - 4, giving following particulars and shall be kept readily available for inspection:-

(a) Name of occupier of factory.

(b) Address of factory.

(c) Distinguishing number or mark, if any, and description sufficient to identify the lifting machine, chain, rope, or the lifting tackle.

(d) Date when the lifting machine, chain, rope or lifting tackle was first taken into use in the factory.

(e) Date and number of the certificate relating to any test and examination made under sub-rules (1) and (15) together with the name and address of the person who issued the certificate.

(f) Date of each periodical thorough examination made under clause (a) (iii) of sub-section(1) of Section 29 of the Act and sub-section (3) and by whom it was carried out.

(g) Date of annealing or other heat treatment of the chain and other lifting tackle made under sub-rule (7) and by whom it was carried out.

(h) Particulars of any defects affecting the safe working load found at any such thorough examination or after annealing and of the steps taken to remedy such defects.

(5) All rails on which a travelling crane moves and every track on which the carriage of a transporter or runway moves shall be of proper size and adequate strength and have an even running surface; and every such rail or track shall be properly laid, adequately supported and properly maintained.

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Rule 35

(6) To provide access to rail tracks of overhead travelling cranes suitable passage-ways of at least 50 centimeters width with toeboards and double hand rails 90 centimeters high shall be provided alongside, and clear of, the rail tracks of overhead travelling cranes, such that no moving part of the crane can strike persons on the ways, and the passage-way shall be at a lower level than the crane track itself. Safe access ladders shall be provided at suitable intervals to afford access to these passage-ways, and from passage-ways to the rail tracks:

Provided that the Competent Authority may, for reasons to be specified in writing, exempt any factory in respect of any overhead travelling crane from the operation of any provision of this sub-rule subject to such conditions as it may specify.

(7) All chains and lifting tackles except a rope sling shall, unless they have been subjected to such other heat treatment as may be approved by the Competent Authority of Factories, be effectively annealed under the supervision of a competent person at the following intervals:-

(a) all chains, slings, rings, hooks, shackles and swivels used in connection with molten metal or molten slag or when they are made of 12.5 millimeters bar or smaller, once at least in every six months; and

(b) all other chains, rings, hooks, shackles and swivels in general use, once at least in every twelve months:

Provided that chains and lifting tackle not in frequent use shall, subject to the Competent Authority's approval, be annealed only when necessary. Particulars of such annealing shall be entered in a register prescribed under sub-rule (4).

(c) Slinging-

(i) Chains shall not be joined by bolting or wiring links together. They shall not be shortened by tying knots. A chain in which the links are locked, stretched or do not move freely shall not be used. The chain shall be free of kinks and twists. Proper eye splices shall be used to attach the chain hooks.

(ii) Pulley blocks of the proper size shall be used to allow the rope free play in the sheave grooves and to protect the wire rope from sharp bends under load. Idle sling shall not be carried on the crane hook along with a loaded sling. When idle slings are carried they shall be hooked.

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(iii) While using multileged slings, each sling or leg shall be loaded evenly and the slings shall be of sufficient length to avoid a wide angle between the legs.

(iv) Sling hitches on loads shall be made under the supervision of experienced persons.

(8) Nothing in the foregoing sub-rule (7) shall apply to the following classes of chains and lifting tackles, namely:-

(a) chains made of malleable cast iron;

(b) plate link chains;

(c) chains, rings, hooks, shackles and swivels made of steel or of any non-ferrous metal;

(d) pitched chains, working on sprocket or pocketed wheels;

(e) rings, hooks, shackles and swivels permanently attached to pitched chains, pulley blocks or weighing machines;

(f) hooks and swivels having screw threaded parts or ball bearing or other case hardened parts;

(g) socket shackles secured to wire ropes by white-metal capping; and

(h) bordeaux connections:

Provided that such chains and lifting tackles shall be thoroughly examined by a competent person once at least in every twelve months, and particulars entered in the register kept in accordance with sub-rule (4).

(9) Cranes shall be operated only by authorised persons who are well trained and experienced, operators shall ensure that all safety devices are functioning properly before crane is put into operation.

(10) A mobile crane shall be operated so that none of its parts can approach live electric lines closer than 3 m. While lifting loads such a crane shall be located on level ground.

(11) Standard signals shall be used and operators shall recognise signals from only one person during crane operation. Signal men shall direct equipment movement at fills, quarries, pits, intersections or any other place where necessary to prevent possible accidents.

(12) No person shall be permitted to work or walk under a load.

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(13) Thorough inspection and load testing of a crane shall be done by a competent person at least once every 12 months. The load to be used for the purpose of testing shall be as follows:

Safe working load	Test load
Up to 20 tons	25% in excess
20 - 50 tons	5 tons in excess
Over 50 tons	10% in excess

(14) All lifting machines, ropes, chains and lifting tackles, except a fibre rope or fibre sling, which have been lengthened, altered or repaired by welding or otherwise, shall, before being again taken into use, be adequately re-tested and re-examined by a competent person and certificate of such test and examination be obtained, and particulars entered in the register kept in accordance with sub-rule (4).

(15) No person under 18 years of age and no person who is not sufficiently competent and reliable shall be employed as driver of a lifting machine whether driven by mechanical power or otherwise, or to give signals to a driver.

(16) Where the Competent Authority is satisfied that in a factory due to shutdown or for any other reasons it is not practicable to maintain a minimum distance of 6 metres between the person employed or working on or near the wheel track of a travelling crane and the crane, it may on the request of the manager reduce the distance to such extent as it may consider necessary and also prescribe further precautions indicating appointment of suitable number of supervisors to ensure the safety of the persons while they are employed or working on or near the track.

36. PRESSURE VESSELS OR PLANTS.-

(1) Interpretation.-In this rule-

(a) "design pressure" means the maximum pressure that a pressure vessel or plant is designed to withstand safely when operating normally;

(b) "maximum permissible working pressure" means the maximum pressure at which a pressure vessel or plant is permitted to be operated or used under this rule and is determined by the technical requirement of the process;

(c) "plant" means a system of piping that is connected to a pressure vessel and is used to contain a gas, vapour or liquid under pressure greater than the atmospheric pressure, and includes the pressure vessel;

(d) "pressure vessel" means a vessel that may be used for containing, storing, distributing, transferring, distilling, processing or otherwise handling any gas, vapour or liquid under pressure greater than the atmospheric pressure and includes any pipeline fitting or other equipment attached thereto or used in connection therewith; and

(e) "competent person" means a person as defined in Sr.No. 5. of schedule to rule 31.

(2) Exceptions.-Nothing in this rule shall apply to -

(a) vessels made of ferrous materials having an internal operating pressure not exceeding 1 kilogram per square centimeter;

(b) steam boilers, steam and feed pipes and their fittings coming under the purview of the Indian Boilers Act, 1923;

(c) metal bottles or cylinders used for storage or transport of compressed gases or liquefied or dissolved gases under pressure covered by the Gas Cylinder Rules, 1981 framed under the Indian Explosives Act, 1884;

(d) vessels in which internal pressure is due solely to the static head of liquid;

(e) vessels with a nominal water capacity not exceeding 500 litres connected in a water-pumping system containing air that is compressed to serve as a cushion;

(f) vessels for nuclear energy application shall be covered by rules framed by Competent Authority;

(g) refrigeration plant having a capacity of 3 tons or less of refrigeration in 24 hours; and

(h) working cylinders of steam engines or prime movers, feed pumps and steam traps; turbine casings; compressor cylinders; steam separators or dryers; steam strainers; steam de-super- heaters; oil separators; air receivers for fire sprinkler installations; air receivers of monotype machines provided the maximum working pressure of the air receiver does not exceed 130 kPa (1.33 kg/sq.cm) and the capacity 85 litres; air receivers of electrical circuit breakers; air receivers of electrical relays; air vessels on pumps, pipe coils, accessories of instruments and appliances such as cylinders and piston assemblies used for operating relays and interlocking type of guards; vessels with liquids subjected to static head only; and hydraulically operating cylinders other than any cylinder communicating with an air loaded accumulator.

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Rule 36

(3) Design and construction.-Every pressure vessel or plant used in a factory -

(a) shall be properly designed on sound engineering practice;

(b) shall be of good construction, sound material, adequate strength and free from any patent defects; and

(c) shall be properly maintained in a safe working condition:

Provided that the pressure vessel or plant in respect of the design and construction of which there is an Indian standard or a standard of the country of manufacture or any other law or regulation in force, shall be designed and constructed in accordance with the said standards, law or regulation, as the case may be, and a certificate thereof shall be obtained from the manufacturer or from the competent person which shall be kept and produced on demand by an Inspector.

(4) Safety devices.-Every pressure vessel shall be fitted with-

(a) a suitable safety valve or other effective pressure relieving device of adequate capacity to ensure that the maximum permissible working pressure of the pressure vessel shall not be exceeded. It shall be set to operate at a pressure not exceeding the maximum permissible working pressure and when more than one protective device is provided, only one of the devices need be set to operate at the maximum permissible working pressure and the additional device shall be set to discharge at a pressure not more than 5 percent in excess of the maximum permissible working pressure;

(b) a suitable pressure gauge with a dial range not less than 1.5 times the maximum permissible working pressure, easily visible and designed to show at all times the correct internal pressure and marked with a prominent red mark at the maximum permissible working pressure of the pressure vessel;

(c) a suitable nipple and globe valve connected for the exclusive purpose of attaching a test pressure gauge for checking the accuracy of the pressure gauge referred to in clause (b) of this sub-rule;

(d) a suitable stop valve or valves by which the pressure vessel may be isolated from other pressure vessels or plant or source of supply of pressure. Such a stop valve or valves shall be located as close to the pressure vessel as possible and shall be easily accessible;

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(e) a suitable drain cock or valve at the lowest part of the pressure vessel for the discharge of the liquid or other substances that may collect in the pressure vessel; and

(f) every pressure gauge, stop valve, nipple and globe valve, shall be mounted at a height not more than 1.5 m from the working level:

Provided that it shall be sufficient for the purpose of this sub-rule if the safety valve or pressure relieving device, the pressure gauge and the stop valve are mounted on a pipeline immediately adjacent to the pressure vessel and where there is a range of two or more similar pressure vessels served by the same pressure lead, only one set of such mountings need be fitted on the pressure lead immediately adjacent to the range of pressure vessels, provided they cannot be isolated.

(5) Pressure reducing devices.-

(a) Every pressure vessel which is designed for a working pressure less than the pressure at the source of supply. or less than the pressure which can be obtained in the pipe connecting the pressure vessel with any other source of supply, shall be fitted with a suitable pressure reducing valve or other suitable automatic device to prevent the maximum permissible working pressure of the pressure vessel being exceeded.

(b) To further protect the pressure vessel in the event of failure of the reducing valve or device, at least one safety valve having a capacity sufficient to release all the steam, vapour or gas without undue pressure rise as determined by the pressure at the source of supply and the size of the pipe connecting the source of supply, shall be fitted on the low pressure side of the reducing valve.

(c) In case of a jacketed vessel in which heat is transmitted by means of steam or other media in the jacket causing pressure rise in the vessel, the heat input in the jacket shall be so controlled by a suitable device as not to allow the safe working pressure of the vessel being exceeded.

6. Pressure vessel or plant being taken into use.-

(a) No new pressure vessel or plant shall be taken into use in a factory after coming into force of this rule unless it has been hydrostatically tested by a competent person at a pressure at least 1.3 times the design pressure, and no pressure vessel or plant which has been previously used or has remained isolated or idle for a period exceeding 6 months or which has undergone alterations or repairs shall be taken into use in a factory unless it has been thoroughly examined by a competent person externally and internally, if practicable, and has been hydrostatically tested by the competent person at a pressure

which shall be 1.5 times the maximum permissible working pressure:

Provided that the pressure vessel or plant which is so designed and constructed that it cannot be safely filled with water or liquid or is used in service when even some traces of water cannot be tolerated, shall be pneumatically tested at a pressure not less than the design pressure or maximum permissible working pressure as the case may be:

Provided further that the pressure vessel or plant which is lined with glass shall be tested hydrostatically or pneumatically as required at a pressure not less than the design pressure or maximum permissible working pressure as the case may be.

Explanation:- Design pressure shall be not less than the maximum permissible working pressure and shall take into account the possible fluctuations of pressure during actual operation.

(b) No pressure vessel or plant shall be used in a factory unless there has been obtained from the maker of pressure vessel or plant or from the competent person a certificate specifying the design pressure or maximum permissible working pressure thereof, and stating the nature of tests to which the pressure vessel or plant and its fittings (if any) have been subjected, and every pressure vessel or plant so used in a factory shall be marked so as to enable it to be identified as to be the pressure vessel or plant to which the certificate relates and certificate shall be kept available for perusal by the Inspector.

(c) No pressure vessel or plant shall be permitted to be operated or used at a pressure higher than its design pressure, or the maximum permissible working pressure as shown in the certificate.

(7) In-service test and examinations.-

(a) Every pressure vessel or plant in service shall be thoroughly examined by a competent person -

(i) externally, once in every period of six months; and

(ii) internally, once in every period of twelve months:

Provided that if by reason of the construction of a pressure vessel or plant, a thorough internal examination is not possible, this examination may be replaced by a hydrostatic test which shall be carried out once in every period of two years:

Provided further that for a pressure vessel or plant in continuous process which cannot be frequently opened, the period

of internal examination may be extended to four years; and

(iii) hydrostatically tested once in every period of four years:

Provided that in respect of a pressure vessel or plant with thin walls, such as sizing cylinder made of copper or any other non-ferrous metal, periodic hydrostatic test may be dispensed with subject to the condition that the requirements laid down in sub-rule (8) are fulfilled:

Provided further that when it is impracticable to carry out thorough external examination of any pressure vessel or plant every six months as required in sub-clause (i)of this clause, or if owing to its construction and use a pressure vessel or plant cannot be hydrostatically tested as required in sub-clauses (ii) and (iii) of this clause, a thorough external examination of the pressure vessel or plant shall be carried out at least once in every period of two years, and at least once in every period of four years a thorough systematic non- destructive test like ultrasonic test or magnetic particle test for metal thickness or other defects of all parts the failure of which might lead to eventual rupture of the pressure vessel or plant shall be carried out.

(b) The pressure for the hydrostatic test to be carried out for the purpose of this sub-rule shall be 1.25 times the design pressure or 1.5 times the maximum permissible working pressure, whichever is less.

(8) (a) In respect of any pressure vessel or plant which cannot hold the hydrostatic load, periodic hydrostatic test may be dispensed with provided the requirements set forth in clause (7)(a)above are complied with.

(b) If any information as to the date of construction, thickness of walls, or maximum permissible working pressure is not available, the age of such pressure vessel or plant shall be determined by the competent person in consultation with the Competent Authority from the other particulars available with the factory.

(c) Every new and second hand pressure vessel or plant to which repairs, likely to affect its strength or safety, have been carried out, shall be tested before use to at least 1.5 times its maximum permissible working pressure.

(9) Report by competent person.-

(a) If during any examination any doubt arises as to the ability of the pressure vessel or plant to work safely until the next prescribed examination, the competent person shall enter in the prescribed register his

observations, findings and conclusions with other relevant remarks with reasons and may authorise the pressure vessel or plant to be used and kept in operation subject to a lowering of maximum permissible working pressure, or to more frequent or special examination or test, or subject to both of these conditions.

(b) A report of every examination or test carried out shall be completed in Form 5 and shall be signed by the person making the examination or test, and shall be kept available for perusal by the Inspector at all hours when the factory or any part thereof is working.

(c) Where the report of any examination under this rule specified any condition for securing the safe working of any pressure vessel or plant, the pressure vessel or plant shall not be used unless the specified condition is fulfilled.

(d) The competent person making report of any examination under this rule, shall within seven days of the completion of the examination, send to the Competent Authority a copy of the report in every case where the maximum permissible working pressure is reduced or the examination shows that the pressure vessel or plant or any part thereof cannot continue to be used with safety unless certain repairs are carried out or unless any other safety measure is taken.

(10) Application of other laws.-

(a) The requirements of this rule shall be in addition to and without any prejudice to and not in derogation of the requirements of any other law in force.

(b) Certificates or reports of any examination, or test of any pressure vessel or plant to which sub-rules (7) to (9) do not apply, conducted or required to be conducted under any other law in force and other relevant record relating to such pressure vessel or plant, shall be properly maintained as required under the said law and shall be produced on demand by the Inspector.

37. WATER-SEALED GASHOLDER.-

(1) The expression "gasholder" means a water-sealed gasholder which has a storage capacity of not less than 140 cu.m.

(2) Every gasholder shall be of adequate material and strength, sound construction and properly maintained.

(3) No gasholder shall be taken into use in any factory for the first time unless,

(a) information giving details of gasholder is recorded in Form 6 ;

(b) certificate of its internal and external examination in Form 6 is obtained either from the manufacturer or from any person competent to conduct such examination; and

(c) such certificate is in possession of the occupier.

(4) Where there is more than one gasholder in a factory, every gasholder shall be marked in a conspicuous position with a distinguishing number or letter.

(5) Every gasholder shall be thoroughly examined externally by a competent person at least once in a period of 12 months.

(6) In the case of gasholder of which any lift has been in use for more than 10 years, the internal state of the sheeting shall, within one year of the coming into operation of these rules and thereafter at least once in every period of four years, be examined by a competent person by means of electronic or other accurate devices:

Provided that if the Competent Authority is satisfied that such electronic or other accurate devices are not available, it may permit the cutting of samples from the crown and the sides of the holder:

Provided further that if the above examination raises a doubt, an internal visual examination shall be made.

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(7) All possible steps shall be taken to prevent or minimise ingress of impurities in the gasholder.

(8) No gasholder shall be repaired or demolished except under the direct supervision of a person who, by his training, experience and knowledge of the necessary precautions against risks of explosion and of persons being overcome by gas, is competent to supervise such work.

(9) (a) All sample discs cut under sub-rule (6) above shall be kept readily available for inspection.

(b) A permanent register in Form 6 duly signed by the occupier or manager shall be maintained.

(c) The results of examinations by the competent person carried out as required under sub-rules (5). and (6). above shall be recorded in Form 6.

(d) A copy of the report shall be kept in the register in Form 6 and both the register and the report shall be readily available for inspection.

(10) The Inspector shall inspect the gasholder at least once in a period of 12 months.

38. EXCESSIVE WEIGHTS.-

(1) No person, unless aided by another person or any mechanical device, shall carry or move by hand or head any material, article, tool or appliance exceeding the maximum limit in weight set out in the following Table:-

TABLE

Persons	Max. weight of material, article, tool or appliance in kg
a) Adult Male	55
b) Adult female	30

Provided that the dimensions of material, tool or appliance shall be such as not to make worker unstable and not to hurt others:

Provided further that pregnant females shall not be engaged for lifting loads.

(2) No female worker shall engage in conjunction with others, in lifting carrying or moving by hand or on head any material article, tool or appliance if the weight thereof exceeds the lowest weight fixed by Table to sub rule (1) above for any of the persons engaged multiplied by the persons engaged.

39. PROTECTION OF EYES.- Effective screens or suitable goggles shall be provided for the protection of persons employed in or in the immediate vicinity of the following processes, namely:-

(1) The processes specified in Schedule I to this rule, being processes which involve risk of injury to eyes from particles or fragments thrown off in the course of the processes.

(2) The processes specified in Schedule II to this rule, being processes which involve risk of injury to eyes by reason of exposure to excessive light or infra-red or ultra-violet radiations.

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Rule-39(Sch.I)

SCHEDULE I

INJURY TO EYE FROM PARTICLES

1. Breaking, cutting, dressing or carving of bricks, stone, concrete, slag or similar materials by means of a hammer, chisel, pick or similar hand tool, or by means of a portable tool driven by mechanical power, and the dry grinding of surfaces of any such materials by means of a wheel or disc driven by mechanical power, where in any of the foregoing cases, particles or fragments are liable to be thrown off towards the face of the operator in the course of the process.

2. Dry grinding of surfaces of metal by applying them by hand to a wheel, disc or band driven by mechanical power, and of surfaces of metal by means of a portable tool driven by mechanical power.

3. Dividing into separate parts of metal, bricks, stone, concrete or similar materials by means of a high speed saw driven by mechanical power or by means of an abrasive cutting-off wheel or disc driven by mechanical power.

4. Turning of metals or articles of metal, where particles or fragments are liable to be thrown off towards the face of the operator in the course of the process.

5. Drilling by means of portable tools, where particles or fragments are liable to be thrown off towards the face of the operator in the course of the process.

6. Welding and cutting of metals by means of an electric, oxy- acetylene or similar process.

7. Hot fettling of steel castings by means of a flux-injected burner or air torch, and de-seaming of metal.

8. Fettling of metal castings involving the removal of metal, including runners, gates and risers, and removal of any other material during the course of such fettling.

9. Chipping of metal, and chipping, knocking out, cutting out or cutting off of cold rivets, bolts, nuts, lugs, pins, collars or similar articles from any structure or plant, or from part of any structure or plant, by means of a hammer, chisel, punch or similar hand tool, or by means of a portable tool driven by mechanical power.

10. Chipping or scurfing of paint, scale, slag, rust or other corrosion from the surface of metal and other hard materials by means of a hand tool or by a portable tool driven by mechanical power.

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Rule 39(Sch.I-II)

11. Breaking of scrap metal by means of a hammer or by means of a tool driven by mechanical power.

12. Routing of metal, where particles or fragments are liable to be thrown off towards the face of the operator in the course of the process.

13. Work with drop hammers and power hammers used in either case for the manufacture of forgings, and work by any person not working with such hammers, whose work is carried on in such circumstances and in such a position that particles or fragments are liable to be thrown off towards his face during work with drop hammers or power hammers.

14. Work at a furnace where there is risk to the eyes from molten metal.

15. Pouring or skimming of molten metal.

16. Work involving risk to the eyes from hot sand being thrown off.

17. Truing or dressing of an abrasive wheel.

18. Handling in open vessels or manipulation of strong acids or dangerous corrosive liquids or materials, and operation, maintenance or dismantling of plant or any part of plant being plant or part of plant which contains or has contained such acids, liquids or materials, unless the plant or part of plant has been so prepared (by isolation, reduction of pressure, or otherwise), treated, or designed and constructed as to prevent risk of injury.

19. Any other process wherein there is a risk of injury to eyes from particles or fragments thrown off during the course of the process.

SCHEDULE II

INJURY TO EYE FROM LIGHT AND RADIATION

1. Welding or cutting of metals by means of an electrical, oxy- acetylene or similar process.

2. All work on furnaces where there is risk of exposure to excessive light or infra-red radiations.

3. Process such as rolling, casting or forging of metals, where there is risk of exposure to excessive light heat or infra-red radiations.

4. Any other process wherein there is a risk of injury to eyes from exposure to excessive light or infra-red or ultra-violet radiations.

40. MINIMUM DIMENSIONS OF MANHOLES.- Every chamber, tank, vat, pipe, flue or other confined space, which persons may have to enter and which may contain dangerous fumes to such an extent as to involve risk of the persons being overcome thereby, shall unless there is other effective means of egress, be provided with a manhole which may be rectangular, oval or circular in shape, and shall have the following dimensions as minimum, namely:-

Rectangular shape- 50 cm X 30 cm

Oval shape - Major & minor axis diameters 50 cm. and 30 cm. respectively.

Circular shape - 50 cm diameter

41. EXEMPTIONS.- The requirements of sub-section (4) of section 37 of the Act shall not apply to the following processes carried on in any factory, namely:-

(1) the operation of repairing a water sealed gasholder by the electric welding process, subject to the following conditions, namely:-

(a) the gasholder shall contain only the following gases, separately or mixed at a pressure greater than atmospheric pressure, namely, town gas, coke-oven gas, producer gas, blast furnace gas, or gases other than air, used in their manufacture:

Provided that this exemption shall not apply to any gasholder containing acetylene or mixture of gases to which acetylene has been added intentionally; and

(b) welding shall only be done by the electric welding process and shall be carried out by experienced operatives under the constant supervision of a competent person;

(2) the operations of cutting or welding steel or wrought iron gas mains and services by the application of heat, subject to the following conditions, namely:-

(a) the main or service shall be situated in the open air, and it shall contain only the following gases, separately or mixed at a pressure greater than atmospheric pressure, namely, town gas, coke-oven gas, producer gas, blast furnace gas, or gases other than air, used in their manufacture;

(b) the main or service shall not contain acetylene or any gas or mixture of gases to which acetylene has been added

intentionally;

(c) the operation shall be carried out by an experienced person or persons and at least 2 persons (including those carrying out the operations) experienced in work on gas mains and over 18 years of age shall be present during the operation;

(d) the site of the operation shall be free from any flammable or explosive gas or vapour;

(e) where acetylene gas is used as a source of heat in connection with an operation, it shall be compressed and contained in a porous substance in a cylinder; and

(f) prior to the application of any flame to the gas main or service, this shall be pierced or drilled and the escaping gas ignited.

42. FIRE PROTECTION,PREVENTION & FIGHTING.-

(1) Processes & equipment, plant, etc. involving serious explosion and serious fire hazards.-

(a) All processes, storages, equipments, plants etc. involving serious explosion and flash fire hazard shall be located in segregated buildings where the equipment shall be so arranged that only a minimum number of employees are exposed to such hazards at any one time.

(b) All industrial processes involving serious fire hazard should be located in building or work places separated from one another by walls of fire-resistant construction.

(c) Equipment and plant involving serious fire or flash fire hazard shall, wherever possible, be so constructed and installed that in case of fire, they can be easily isolated.

(d) Ventilation ducts, pneumatic conveyors and similar equipment involving a serious fire risk should be provided with flame-arresting or automatic fire extinguishing appliances or fire resisting dampers electrically interlocked with heat sensitive / smoke detectors and the air-conditioning plant system.

(e) In all workplaces having serious fire or flash fire hazards, passages between machines, installations or piles of material should be at least 90 cm wide. For storage piles, the clearance between the ceiling and the top of piles shall not be less than 2 m.

(2) Access for fire fighting. -

(a) Buildings and plants shall be so laid out and roads, passageways etc. so maintained as

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to permit unobstructed access for fire fighting. The main exit ways shall have width not less than 4.5m. and vertical clearance not less than 5m.

(b) Doors and/or window openings shall be located in suitable position on all external walls of the building to provide easy access to the entire area within the building for fire fighting.

(3) Protection against lightning.- Protection from lightning shall be provided for-

(a) buildings in which explosive or highly flammable substances are manufactured, used, handled or stored;

(b) storage tanks containing oils, paints, or other flammable liquids;

(c) grain elevators;

(d) buildings, tall chimneys or stacks where flammable gases, fumes, dust or lint are likely to be present; and

(e) sub-station buildings and outdoor transformers / switchyards.

(4) Explosives.-All explosives shall be handled, transported, stored and used in accordance with the provisions in the Indian Explosives Act, 1884 (4 of 1884).

(5) Precautions against ignition.-Wherever there is danger of fire or explosion from accumulation of flammable or explosive substances in air-

(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 a source of ignition;

(b) effective measures shall be adopted for prevention of accumulation of static charges to a dangerous extent;

(c) workers shall wear shoes without 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

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(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.

(6) Spontaneous ignition.- Where materials are likely to induce spontaneous ignition, care shall be taken to avoid formation of air pocket and to ensure adequate ventilation. The materials susceptible to spontaneous ignition shall be stored in dry condition and shall be in heaps of adequate capacity and separated by adequate passage. The materials susceptible to ignition and stored in the open shall be at a distance not less than 10 m. away from process/storage buildings.

(7) Cylinders containing compressed gas.- Cylinders containing compressed gas may only be stored in open if they are protected against excessive variation of temperature, direct rays of sun, or continuous dampness. Such cylinders shall never be stored near highly flammable substances, furnaces or hot processes. The room where such cylinders are stored shall have adequate ventilation.

(8) Storage of flammable liquids.-

(a) The quantity of flammable liquids in any work room shall be the minimum required for the process or processes carried on in such room. Flammable liquids shall be stored in suitable containers with close fitting covers:

Provided that not more than 30 litres of flammable liquids having a flash point of 23 degree C or less shall be kept or stored in any work room without licence as specified in Sec.8 of the Petroleum Act of 1934.

(b) Flammable liquids shall be stored in closed containers as specified in the Petroleum rules and in limited quantities in well ventilated rooms of fire resisting construction which are isolated from the remaining of the building by fire walls and self closing fire doors.

(c) Large quantities of such liquids shall be stored in containers constructed of iron or steel as per relevant I.S. Codes. These containers shall be stored in isolated and adequately ventilated building of fire resisting construction or in storage tanks, preferably underground and at a distance from any building as required in the Petroleum Rules, 1976.

(d) Effective steps shall be taken to prevent leakage of such liquids into basements, sumps or drains and to confine any escaping liquid within safe limits.

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(9) Accumulation of flammable dust, gas, fume or vapour in air or flammable waste material on the floors.-

(a) Effective steps shall be taken for removal or prevention of the accumulation in the air of flammable dust, gas, fume or vapour to an extent which is likely to be dangerous.

(b) No waste material of a flammable nature shall be permitted to accumulate on the floors and shall be removed at least once in a day or shift, and more often, when possible. Such materials shall be placed in suitable metal containers with covers wherever possible.

(10) Fire exits.-

(a) In this rule-

(i) "horizontal exit" means an arrangement which allows alternative egress from a floor area to another floor at or near the same level in an adjoining building or an adjoining part of the same building with adequate separation; and

(ii) "travel distance" means the distance an occupant has to travel to reach an exit.

(b) An exit may be a doorway, corridor, passageway to an external stairway or to a verandah or to an internal stairway segregated from the rest of the building by fire resisting walls which shall provide continuous and protected means of egress to exterior of a building or to an exterior open space. An exit may also include a horizontal exit leading to an adjoining building at the same level.

(c) Lifts, escalators and revolving doors shall not be considered as exits for the purpose of this sub-rule.

(d) In every room of a factory exits sufficient to permit safe escape of the occupants in case of fire or other emergency shall be provided which shall be free of any obstruction.

(e) The exits shall be clearly visible and suitably illuminated with suitable arrangement, whatever artificial lighting is to be adopted for this purpose, to maintain the required illumination in case of failure of the normal source of electric supply.

(f) The exits shall be marked in a language understood by the majority of the workers.

(g) Iron rung ladders or spiral staircases shall not be used as exit staircases.

(h) Fire resisting doors or roller shutters shall be provided at appropriate places along the escape routes to prevent

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spread of fire and smoke, particularly at the entrance of lifts or stairs where funnel or flue effect may be created inducing an upward spread of fire.

(i) All exits shall provide continuous means of egress to the exterior of a building or to an exterior open space leading to a street.

(j) Exits shall be so located that the travel distance on the floor shall not exceed 30m.

(k) In case of those factories where high hazard materials are stored or used, the travel distance to the exit shall not exceed 22.5 m and there shall be at least two ways of escape from every room, however small, except toilet rooms, so located that the points of access there to are out of or suitably shielded from areas of high hazard.

(l) Wherever more than one exit is required for any room space or floor, exits shall be placed as remote from each other as possible and shall be arranged to provide direct access in separate directions from any point in the area served.

(m) The unit of exit width used to measure capacity of any exit shall be 50 cm. A clear width of 25 cm. shall be counted as an additional half unit. Clear width of less than 25 cm. shall not be counted for exit width.

(n) Occupants per unit width shall be 50 for stairs and 75 for doors.

(o) For determining the exits required, the occupant load shall be reckoned on the basis of actual number of occupants within any floor area or 10 sq.m per person, whichever is more.

(p) There shall not be less than two exits serving every floor area above and below the ground floor, and at least one of them shall be an internal enclosed stairway.

(q) For every building or structure used for storage only, and every section thereof considered separately, shall have access to at least one exit so arranged and located as to provide a suitable means of escape for any person employed therein, and in any such room wherein more than 10 persons may be normally present, at least two separate means of exit shall be available, as remote from each other as practicable.

(r) Every storage area shall have access to at least one means of exit which can be readily opened.

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(s) Every exit doorway shall open into an enclosed stairway, a horizontal exit on a corridor or passageway providing continuous and protected means of egress.

(t) No exit doorway shall be less than 100 cm in width. Doorways shall be not less than 200 cm. in height.

(u) Exit doorways shall open outwards, that is, away from the room but shall not obstruct the travel along any exit. No door when opened, shall reduce the required width of stairway or landing to less than 90 cm. Over head or sliding doors shall not be installed for this purpose.

(v) An exit door shall not open immediately upon a flight of stairs. A landing of at least 1.5m X 1.5m in size shall be provided in the stairway at each doorway. The level of landing shall be the same as that of the floor which it serves.

(w) The exit doorways shall be openable from the side which they serve without the use of a key.

(x) Exit corridors and passageways shall be of a width not less than the aggregate required width of exit doorways leading from there in the direction of travel to the exterior.

(y) Where stairways discharge through corridors and passageways, the height of the corridors and passageways shall not be less than 2.4 m.

(z) In the case of enclosed staircases, all windows therein falling within 3m of any other opening in the building shall normally be protected by wired glass in steel framework. In the case of open sided staircases, windows and door openings of the building falling within 3m of the staircase shall normally be protected by wired glass in steel framework and single fireproof door respectively.

(aa) A staircase shall not be arranged round a lift shaft unless the latter is totally enclosed by a material having a fire-resistance rating not lower than that of the type of construction of the former.

(bb) Hollow combustible construction shall not be permitted.

(cc) The minimum width of an internal staircase shall be 100 cm.

(dd) The minimum width of treads without nosing shall be 25 cm. for an internal staircase. The treads shall be constructed and maintained in a manner to prevent slipping.

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(ee) The maximum height of a riser shall be 19 cm. and the number of risers shall be limited to 12 per flight.

(ff) Hand rails shall be provided with a minimum height of 100 cm. and shall be firmly supported.

(gg) The use of spiral stair case shall be limited to low occupant load and to a building of height of 9 m , unless they are connected to platforms such as balconies and terraces to allow escapees to pause. A spiral staircase shall be not less than 300 cm. in diameter and have adequate head room.

(hh) The width of a horizontal exit shall be same as for the exit doorways.

(ii) The horizontal exit shall be equipped with at least one fire door of self closing type.

(jj) The floor area on the opposite or refuge side of a horizontal exit shall be sufficient to accommodate occupants of the floor areas served, allowing not less than 0.3 m^2The refuge area shall be provided with exits adequate to meet the requirements of this sub-rule. At lest one of the exits shall lead directly to the exterior or street.

(kk) Where there is difference in level between connected areas for horizontal exit, ramps not more than 1 in 8 slope shall be provided. For this purpose steps shall not be used.

(ll) Doors in horizontal exits shall be openable at all times.

(mm) Ramps with a slope of not more than 1 in 12 may be substituted for the requirements of staircase. For all slopes exceeding 1 in 12 and wherever the use is such as to involve danger of slipping, the ramp shall be surfaced with non-slipping material.

(nn) In any building not provided with automatic fire alarm a manual fire alarm system shall be provided if the total capacity of the building is over 500 persons, or if more than 25 persons are employed above or below the ground floor, except that no manual fire alarm shall be required in one-storey buildings where the entire area is undivided and all parts thereof are clearly visible to all occupants.

(11) First-aid fire fighting arrangements.-

(a) In every factory there shall be provided and maintained adequate and suitable fire fighting equipment for fighting fires in the early stages, those being referred to as first-aid fire

fighting equipment in this rule.

b) The types of first-aid fire fighting equipment to be provided shall be determined by considering the different types of fire risks which are classified as follows:-

(i) "Class A fire" - Fire due to combustible materials such as wood, textiles, paper, rubbish and the like.

(1) "Light hazard" - Occupancies like offices, assembly halls , canteens, rest- rooms, ambulance rooms and the like;

(2) "Ordinary hazard" - Occupancies like saw mills, carpentry shop, small timber yards, book binding shops, engineering workshop and the like;

(3) "Extra hazard"-Occupancies like large timber yards, godowns storing fibrous materials, flour mills, cotton mills, jute mills, large wood working factories and the like;

(ii) "Class B fire" - Fire in flammable liquids like oil, petroleum products, solvents, grease, paint, etc.

(iii) "Class C fire" - Fire arising out of gaseous substances.

(iv) "Class D fire" - Fire from reactive chemicals, active metals and the like.

(v) “Class E fire" - Fire involving electrical equipment and delicate machinery and the like.

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(c) The number and types of first-aid fire fighting equipment to be provided shall be as given in Schedule I to this rule. For "ordinary hazard or extra hazard occupancies equipments as given in sub-rule (12) shall be provided in addition to that given in Schedule I.

(d) The first-aid fire fighting equipment shall conform to the relevant Indian Standards.

(e) As far as possible the first-aid fire fighting equipment shall all be similar in shape and appearance and shall have the same method of operation.

(f) All first-aid fire fighting equipment shall be placed in a conspicuous position and shall be readily and easily accessible for immediate use. Generally, these equipment shall be placed as near as possible to the exits or staircase landing or normal routes of escape.

(g) All water buckets and bucket pump type extinguishers shall be filled with clean water. All sand buckets shall be filled with clean, dry and fine sand.

(h) All other extinguishers shall be charged appropriately in accordance with the instructions of the manufacturer.

(i) Each first-aid fire fighting equipment shall be allotted a serial number by which it shall be referred to in the records. The following details shall be painted with white paint on the body of each equipment.

(1) Serial number:

(2) Date of last refilling; and

(3) Date of last inspection.

(j) First-aid fire fighting equipment shall be placed on platforms or in cabinets or hanged from brackets in such a way that their bottom is 750 mm above the floor level. Fire buckets shall be placed on hooks attached to a suitable stand or wall in such a way that their bottom is 750 mm above the floor level. Such equipment if placed outside the building, shall be under shades or covers.

(k) All extinguishers shall be thoroughly cleaned and recharged immediately after discharge. Sufficient refill material shall be kept readily available for this purpose at all times.

(l) All first-aid fire fighting equipment shall be subjected to routine maintenance, inspection, and testing to be carried out by properly trained persons. Periodicity of the routine maintenance, inspection and test shall conform to the relevant Indian Standards.

(12) Other fire fighting arrangements.-

(a) In every factory, adequate provision of water supply for fire fighting shall be made and where the amount of water required in litres per minute, as calculated from the formula A + B + C + D divided by 20 is 550 or more, power driven trailer pumps of adequate capacity to meet the requirement of water as calculated above shall be provided and maintained.

In the above formula -

A = the total area in sq.m of all floors including galleries in all buildings of the factory;

B = the total area in sq.m of all floors and galleries including open spaces in which combustible

material are handled or stored;

C = the total area in sq.m of all floors over 15 m above ground level; and

D = the total area in sq.m of all floors of all buildings other than those of fire resisting construction:

Provided that in areas where the fire risk involved does not require use of water, such areas under B,C or D may, for the purpose of calculation, be halved:

Provided further that where the areas under B, C or D are protected by permanent automatic fire fighting installations approved by any fire association or fire insurance company such areas may, for the purpose of calculation, be halved:

Provided also that where the factory is situated at not more than 3 km from an established city or town fire service, the pumping capacity based on the amount of water arrived at by the formula above may be reduced by 25%; but no account shall be taken of this reduction in calculating water supply required under clause(a).

(b) Each trailer pump shall be provided with equipment as per Schedule II to this rule. Such equipment shall conform to the relevant Indian Standards.

(c) Trailer pumps shall be housed in a separate shed or sheds which shall be sited close to a principal source of water supply in the vicinity of the main risks of the factory.

(d) In factories where the area is such as cannot be reached by man-hauling of trailer pumps within reasonable time vehicles with towing attachment shall be provided at the scale of one for every four trailer pumps with a minimum of one such vehicle kept available at all times.

(e) Water supply shall be provided to give flow of water as required under clause (a) for at least 100 minutes. At least 50% of this water supply or 450,000 litres whichever is less, shall be in the form of static tanks of adequate capacities (not less than, 45,000 litres each) distributed round the factory with due regard to the potential fire risks in the factory, where piped supply is provided the size of the main shall not be less than 15 cm. diameter and it shall be capable of supplying a minimum of 4500 litres per minute at a pressure of not less than 700 kPa (7kg/sq.cm.)

(f) All trailer pumps including the equipment provided with them and the vehicles for towing them shall be maintained in good condition and subjected to periodical inspection and testing as

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required.

(13) Personnel in charge of equipment and for fire fighting, fire drills, etc.-

(a) The first-aid and other fire fighting equipment to be provided as required in sub-rules(11) and (12) shall be in charge of a trained responsible person.

(b) Sufficient number of persons shall be trained in the proper handling of fire fighting equipment as referred to in clause (a) and their use against the types of fire for which they are intended to ensure that adequate number of persons are available for fire fighting both by means of first-aid fire fighting equipment and others. Wherever vehicles with towing attachment are to be provided as required in clause (d) of sub- rule (12) sufficient number of persons shall be trained in driving these vehicles to ensure that trained persons are available for driving them whenever the need arises.

(c) Fire fighting drills shall be held as often as necessary & at least once in every period of two months.

(14) Adequate number of automatic sprinklers and fire hydrants shall be provided, in addition, and not in substitution of the requirements in sub-rules (11) and (12).

(15) If the Competent Authority is satisfied in respect of any factory or any part of the factory that owing to the exceptional circumstances such as inadequacy of water supply or infrequency of the manufacturing process or for any other reason, to be recorded in writing, all or any of the requirements of the rules are impracticable or not necessary for the protection of workers, it may by order in writing (which it may at its discretion revoke)exempt such factory or part of the factory from all or any of the provisions of the rules subject to conditions as it may by such order prescribe.

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Rule 42(Sch.I)

SCHEDULE I

First Aid Fire Fighting Equipments

1. The different type of fires and first aid fire fighting equipments suitable for use on them are as under:

Class of Fire		Suitable type of Appliances
A.	Fires in ordinary combustibles (wood, vegetable fibres, paper & the like)	Chemical Extinguishers of Soda-acid, Gas/expelled Water and anti-freeze types and water buckets.
B.	Fires in flammable liquids, paints, grease, solvents and the like	Chemical Extinguishers of foam, Carbon dioxide and dry powder types and sand buckets
C.	Fires in gaseous substances under pressure	Chemical Extinguishers of carbon dioxide and dry powder types
D.	Fires in Reactive Chemicals, active metals and the like	Special type of dry powder extinguishers and sand buckets
E.	Fires in electrical equipments	Chemical extinguishers of carbon dioxide and dry Powder type & sand buckets

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2. One 9 litres water bucket shall be provided for every 100 sq.m. of the floor area or part thereof and one 9 litres water type extinguisher shall be provided to six buckets or part thereof with a minimum of one extinguisher and two buckets per compartment of the building. Buckets may be dispensed with, provided supply of extinguishers is double that indicated above.

3. Acceptable replacements for Water buckets and water type extinguishers in occupancies where Class B fires are anticipated, are as under:

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Acceptable Replacements	Buckets of water		Water type Extinguishers
	For one bucket	For three buckets	For each 9 ltrs.(or 2 gallons) Extinguishers
1	2-a	2-b	3
Dry sand	1 bucket	3 buckets	-
Carbondioxide Extinguishers	3 kg. (or 7 lbs)	9 kg. (or 20 lbs) (In not less than 2 extinguishers)	9 kg.(or 20 lbs)
Dry powder	2 kg. (or 5 lbs)	5 kg. (or 11 lbs) (In one or more extinguishers)	5 kg. (or 11 lbs)
Foam extinguishers	9 litres(or 2 gallons)	9 litres (or 2 gallons)	9 litres (or 2 gallons)

4. The following provisions shall be complied with where Class E fires are anticipated:

(a) For rooms containing electrical transformers, switchgears, motors and/or other electrical apparatus only, not less than two kg. Dry Powder or Carbon Dioxide type extinguishers shall be provided within 15 m. of the apparatus.

(b) Where motors and/or other electrical equipment are installed in rooms other than these containing such equipment only, one 5 kg. Dry Powder or Carbon Dioxide Extinguisher shall be installed within 15 m. of such equipment in addition to the requirements mentioned at (3) and (4) above. For this purpose the same extinguisher may be deemed to afford protection to all apparatus within 15 m. thereof.

(c) Where electrical meters are installed on platforms, one 2 kg. Dry Powder or Carbon Dioxide type extinguisher shall be provided on or below each platform. In case of a long platform with a number of motors, one extinguisher shall be acceptable as adequate for every 3 motors on the common platform. The above requirements will be in addition to the requirements mentioned at item (3) & (4) above.

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Rule 42 (Sch.I-II)

5. The first aid fire fighting equipments shall be so distributed over the entire floor area that a person has to travel not more than 15 m. to reach the nearest equipment.

6. Selection of sites for the installation of first aid fire fighting equipments -

   (a) While selecting sites for first aid fire fighting equipments, due consideration shall be given to the nature of the risk to be covered. The equipments shall be placed in conspicuous positions and shall be readily accessible for immediate use in all parts of the occupancy. It should always be borne in mind while selecting sites that first aid fire fighting equipments are intended only for use on incipient fires and their values may be negligible if the fire is not extinguished or brought under control in the early stages.

   (b) Buckets and extinguishers shall be placed at convenient and easily accessible locations either on hangers or on stands in such a way that their bottom is 750 mm. above the floor level.

7. The operating instructions of the extinguishers shall not be defaced or obliterated. In case the operating instructions are obliterated or have become illegible due to passage of time, fresh transfers of the same shall be obtained from the manufacturers of the equipments and affixed to the extinguishers.

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SCHEDULE II

EQUIPMENT TO BE PROVIDED WITH TRAILER PUMP

For light trailer pump of capacity of 680 ltrs./min.

Type of equipment	Nos.
Armoured suction hose of 9 meters length, with wrenches.	1
Metal suction strainer.	1
Basket strainer.	1
Two-way suction collecting-head.	1
Suction adaptor.	1
Unlined or rubber lined 70 mm delivery hose of 25 meters length complete with quick-release couplings.	10

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Dividing breaching-piece.	1
Branch-piece with 15 mm nozzles.	2
Diffuser nozzle.	1
Standpipe with blank cap.	1
Hydrant key.	1
Collapsible canvas buckets.	4
Fire hook preventor with cutting edge.	1
25 mm manila rope of 30 meters length.	1
Extension ladder of 3 m (where necessary)	1
Heavy axe.	1
Spade.	1
Pick axe.	1
Crowbar.	1
Saw.	1
Hurricane lamp.	1
Electric torch.	1
Pair of rubber gloves.	1

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For large trailer pump of a capacity of 1800 litres/minute

Type of equipment	Nos.
Armoured suction hose of 9 meters length, with wrenches.	1
Metal strainer.	1
Basket strainer.	1
Three-way suction collecting-head.	1
Suction adaptor.	1
Unlined or rubber lined 70 mm delivery hose of	

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25 meters length complete with quick-release couplings.	14
Dividing breaching-piece.	1
Collecting breaching-piece.	1
Branch pipes with one 25 mm, two 20 mm and one diffuser nozzles.	4
Stand pipe with blank caps.	2
Hydrant keys.	2
Collapsible canvas buckets	6
Coiling hook (preventor) with cutting edge.	1
50 mm manila rope of 30 meters length.	1
Extension ladder of 9 meters length (where necessary).	1
Heavy axe.	1
Spade.	1
Pick axe.	1
Crowbar.	1
Saw.	1
Hurricane lamp.	1
Electric torch.	1
Pair of rubber gloves.	1

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Note:- If it appears to the Competent Authority that in any factory the provision of breathing apparatus is necessary it may by order in writing require the occupier to provide suitable breathing apparatus in addition to the equipment for light trailer pump or large trailer pump as the case may be.

43. SAFETY OFFICERS AND STAFF.-

(1) Number of safety officers.- Competent Authority shall notify the number of safety officers & staff required for any particular factory.

(2) Duties of safety officers.- The duties of safety officers shall be to advise and assist the management in the fulfillment of its obligations, statutory or otherwise, concerning prevention of

personal injuries and maintaining a safe working environment. These duties shall include the following, namely:-

(a) to advise the concerned departments in planning and organising measures necessary for the effective control of personal injuries;

(b) to advise on safety aspects in all job studies, and to carry out detailed job safety studies of selected jobs;

(c) to check and evaluate the effectiveness of the action taken or proposed to be taken to prevent personal injuries.

(d) to ensure that all Personal Protective Equipment provided to workers as required under any of the provisions of the Act or the Rules conform to the relevant Indian Standards.

(e) to provide advice on matters related to carrying out plant safety inspections;

(f) to carry out plant safety inspections in order to observe the physical conditions or work and the work practices and procedures followed by workers and to render advice on measures to be adopted for removing the unsafe physical conditions and preventing unsafe actions by workers;

(g) to render advice on matters related to reporting and investigation of industrial accidents and diseases;

(h) to investigate selected accidents;

(i) to investigate the cases of industrial diseases contracted and reportable dangerous occurrences.

(j) to advise on the maintenance of such records as are necessary relating to accidents, dangerous occurrences and industrial diseases;

(k) to promote setting up of safety committee and act as adviser and catalyst to such committees;

(l) to organise in association with the concerned departments, campaigns, competitions, contests and other activities which will develop and maintain the interest of the workers in establishing and maintaining safe conditions of work and procedures; and

(m) to design and conduct either independently or in collaboration with the training department, suitable training and educational programme for the prevention of personal injuries.

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(3) Facilities to be provided to Safety Officers.- The occupier of the factory shall provide each Safety Officer with such facilities, equipment & information as are necessary to enable him to discharge his duties effectively.

(4) Prohibition Of Performance Of Other Duties.- No Safety Officer shall be required or permitted to do any work which is inconsistent with or detrimental to the performance of the duties prescribed in sub-rule (2).

(5) Qualifications.-

(a) A person shall not be eligible for appointment as a Safety Officer unless he

(i) possesses-

(1) a recognised degree or equivalent in any branch of engineering or technology and has had practical experience of working in a factory in a supervisory capacity for a period of not less than 2 years; or

(2) a recognised degree in physics or chemistry and has had practical experience of working in a factory in a supervisory capacity for a period of not less than 5 years; or

(3) a recognised diploma or equivalent in any branch of engineering or technology and has had practical experience of working in a factory in a supervisory capacity for a period of not less than 5 years;

(ii) possesses a degree or diploma in industrial safety recognised by the Central / State Government in this behalf; and

(iii) has adequate knowledge of the language spoken by majority of the workers in the region in which the factory where he is to be appointed is situated.

(b) Notwithstanding the provisions contained in clause (a), any person who -

(i) possesses a recognised degree or diploma in engineering or technology and has had experience of not less than five(5) years in a department of the Central or State Government which deals with the administration of the Factories Act, 1948 or the Dock Workers(Safety, Health and Welfare) Act, 1986 (54 of 1986) or

(ii) possesses a recognised degree or diploma in engineering or technology and has had experience of not less than 5 years, full time, on training, education, consultancy, or research in the field of accident prevention in industry or in any institution;

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shall also be eligible for appointment as a Safety Officer:

Provided that the competent authority may, subject to such conditions as it may specify, grant exemption from the requirements of this sub-rule, if in its opinion, a suitable person possessing the necessary qualifications and experience is not available for appointment:

Provided further that, in the case of a person who has been working as a safety officer for a period of not less than 3 years on the date of commencement of this rule, the Competent Authority may, subject to such conditions as it may specify, relax all or any of the above said qualifications.

(6) Conditions Of Service-

(a) Where the number of Safety Officers to be appointed in a factory exceeds one, one of them shall be designated as the Chief Safety Officer and shall have a status higher than that of the others. The Chief Safety Officer shall be in overall charge of the safety functions as envisaged in sub-rule (2), the other Safety Officers working under his control.

(b) The Chief Safety Officer or the Safety Officer in the case of factories where only one Safety Officer is required to be appointed, shall be given the status of a senior executive and he shall work directly under the control of the Manager of the factory. All other Safety Officers shall be given appropriate status to enable them to discharge their functions effectively.

(c) The scale of pay and the allowances to be granted to the Safety Officers including the Chief Safety Officer, and the other conditions of their service shall be the same as those of the other officers of corresponding status in the factory.

(d) No Safety Officer shall be forcibly transferred or removed from service without prior intimation to the competent authority.

44. SAFETY ORGANISATION FOR THE FACTORY.-

(1) General - Manager of the factory shall not rest satisfied with mere compliance with sections & rules of various Acts & Rules. He shall promote health & safety in his factory by enlisting cooperation of all the employees so that safety culture is created. Towards this he shall appoint Factory level and section level Safety Committees. In addition the corporate offices of the factories shall establish a safety and environmental control section to liase with the Competent Authority and carry out safety audit.

(a) Factory Level Safety Committee:-This is the apex safety body of the factory. The manager of the factory

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shall be the Chairman of this committee with chief safety officer as member secretary. All section heads and two representatives of workers with adequate knowledge of health & safety at their works will be the members of this committee. The committee will meet once in three months & discuss the overall aspects of health & safety and formulate programmes for promotion of safety & health. The committee will also review the reports of Sectional Safety Committees. The other duties will be the same as listed under Duties of Safety Committees.

(b) Sectional Level Safety Committees:-The sectional head shall be the chairman of this committee and one of the Safety Officers or his nominee shall be the member secretary. An equal number of representatives of supervisors and workers from the section with adequate knowledge of health & safety at their work shall be the members of this committee. The committee shall meet once in a month and discuss & analyse the safety performance of the section & set a goal for the next month. The committee shall invite suggestions from employees & discuss these in the meeting & take appropriate action. Suggestions & actions taken thereon shall be put on the safety notice board.

(2) Duties of the Safety Committee.- The main job of the safety committee is to ensure health & safety of all employees and the neighbourhood and towards this the committee shall-

(a) see that all the provisions of relevant Acts & Rules are conformed to.

(b) assess the potential hazards and dangerous occurrences at the work place and examine the effectiveness of the Safety & Control measures.

(c) see that the processes for the manufacture of the main products and for the disposal of gaseous, liquid & solid effluents are safe to ensure conformance to the Environmental Protection Act, 1986.

(d) see that a well documented safety programme exists.

(e) see that a work permit system exists for handling of hazardous materials and working-

(i) at hazardous locations such as at height;

(ii) near electrical installations and high pressure and enthalpy area;

(iii) with flammable and toxic materials; and

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(iv) under high noise environment.

(f) see that the work environment and the neighbourhood is monitored for physical, chemical & biological agents & see that the limits specified by the Acts & Competent Authority are not exceeded any time.

(g) see that all employees are informed of the hazards involved in their work & are provided with adequate protective equipments.

(h) see that a detailed schedule for periodic calibration & preventive maintenance of all the machinery & equipments is being implemented.

(i) see that periodic medical examination of all employees is carried out to the extent required as per the work environment.

(j) discuss accidents & dangerous occurrences at the work place and examine causes of accidents & suggest to the management necessary improvements.

(k) organise safety circles in the unit for developing safety culture.

(l) investigate complaints received from any quarter about the risks or dangers.

(m) promote safety & health by organising accident prevention programs, campaigns, & meets.

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45. PLANNING OF BUILDING CONSTRUCTION & ROADS,SIDEWALKS.-

(1) General.- All constructions shall conform to National Building Code of Indian Standards Institution now Bureau of Indian Standards.*

(2) Means of access for industrial buildings.-

(a) Means of access for industrial buildings & those buildings which attract large crowd shall be adequate.

* Note-The Code covers aspects of administrative regulations, development control rules & general building & fire protection requirements; rules for design of electrical, etc. installations; regulation for ventilation etc. & plumbing services; measures to ensure safety of workers & public during construction etc.

The length of the main access shall be determined by the distance from the farthest building to the public street. The length of the subsidiary accessories shall be measured from the point of its' origin to the next wider road on which it meets.

(b) Pathways: The approach to the buildings from road/street/internal means of access shall be adequate and through paved pathways.

(c) Intersection of Roads: For intersection junction of roads meeting at right angles as well as other than right angles, the rounding off or cut off or splay or similar treatment shall be done, depending upon the width of the roads, traffic, sighting angle etc. to provide clear sight distance.

(d) Speed Breakers & Pedestrian Passage: Speed breakers shall be provided on all roads which lead to main road near the junction. The pedestrian crossings shall be marked.

(e) Sign Boards & Signs: Sign boards displaying information on maximum permissible speeds and appropriate road signs wherever required shall be provided. The maximum permissible speed on internal roads shall be decided by the manager of the factory depending on the traffic, size and number of vehicles, number of persons working in a particular building etc. The sign boards, road signs & pedestrian crossings shall be of fluorescent paint. The speed limit on various roads shall be decided by the factory manager.

(3) Guarding of pits, sumps, trenches, manholes etc.-Pits, sumps, trenches, manholes and any other openings in the wall or floor shall be adequately covered or guarded. these shall be periodically checked and record maintained.

46. CONSTRUCTION & ERECTION.-Manager shall take appropriate measures with the approval of the Inspector to minimise the effects of occupational hazards arising out of animals, reptiles, rodents, poisonous plants and weeds, weather conditions and living conditions.

(1) General.-

(a) Site preparation - While preparing the site for construction, bush and other wood, debris, etc, shall be removed and promptly disposed of so as to minimize the attendant hazards.

Temporary buildings for construction offices and storage shall be so located as to cause the minimum fire hazards and shall be constructed from non-combustible materials as far as practicable.

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(b) Access for Fire Fighting Equipment & Vehicles - Access for fire fighting equipment shall be provided to the construction site at the start of construction and maintained until all construction work is completed:

(i) Free access from the street to fire hydrants/static water tanks, where available, shall be provided and maintained at all times;

(ii) No materials for construction shall be placed within 3m of hydrants/static water tanks; and

(iii) During building operations, free access to permanent, temporary or portable first-aid fire fighting equipment shall be maintained at all times.

(c) Access to the Upper Floors During Construction- In all buildings over two storeys high, at least one stairway shall be provided in usable condition at all times. This stairway shall be extended upward as each floor is completed. As far as possible, there shall be a handrail on the staircase.

(2) Storage, Stacking & Handling of Materials.-Construction of Plant and Building: Construction requires various kinds of materials such as cement; lime; masonary units; aggregate;. fly ash; timber; protective clothing; electrical fittings etc. These shall be stored and handled as per prevalent good practices & relevant national standards in order to ensure quality & quantity of materials used in the construction and safety of personnel handling these materials.

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(3) Safety Requirements for Erection of Structural Steel Work.-

(a) Organization of Work - The agency responsible for erecting the steel work shall analyze the proposed erection scheme for safety. The erection scheme shall cover safety aspects right from the planning stage up to the actual execution of the work and make provision for personnel protective equipments.

(b) Safety of Men:

(i) General - Skilled workers trained in relevant jobs shall only be employed in jobs requiring skills.

(1) All personnel protective equipments like helmets, goggles, safety shoes, gloves, aprons etc. shall be suitable for the job & shall conform to relevant Indian Standards.

(2) When the work is in progress, the area shall be cordoned off by barricades to structural components, or falling into excavated trenches or getting injured by falling objects.

Rule 46

(3) Warning signs shall be displayed where necessary to indicate hazards, for example (a) '440 VOLTS', (b) 'DO NOT SMOKE', (c) 'MEN WORKING AHEAD', etc.

(4) All electrically operated hand tools shall be provided with proper earthing.

(5) Hand lamps shall be of low voltage preferably 24 V to prevent electrical hazards.

(ii) Anchors for guys or ties shall be checked for proper placement. The weight of concrete in which the anchors are embedded shall be checked for uplift and sliding:

(1) Split-end eye anchors shall only be used in good, solid rock.

(2) The first load lifted by a guy derrick shall be kept at a small height for about 10 minutes and the anchors immediately inspected for any signs or indications of failure.

(3) When a number of trusses or deep girders are loaded in one car or on one truck, all but one being lifted shall be tied back unless they have been tied or braced to prevent their falling over and endangering men unloading.

(4) The erection gang shall have adequate supply of bolts, washers, rivets, pins, etc. of correct size. Enough number of bolts shall be used in connecting each piece using a minimum of two bolts in a pattern to ensure that the joint will not fail due to dead load and erection loads.

All splice connections in columns, crane girders, etc., shall be completely bolted or riveted or welded as specified in the drawing before erection.

(5) Safety belts shall always be provided & used for working at heights. The ropes shall be chemically treated to resist dew and rotting. These shall not be tied on sharp edges of steel structures. They shall be tied generally not more than 2 to 3 m. away from the belt.

(6) On a guy derrick or climbing crane job, the tool boxes used by the erection staff shall be moved to the new working floor each time the rig is changed. On a mobile crane job, the boxes shall be moved as soon as the crane starts operating in a new area too far away for the men to reach the boxes conveniently.

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Rule 46

(7) Baskets or containers to hold small materials such as bolts and drift pins shall be provided to men working on floats or scaffolds. Men shall be trained to use such containers, and to keep small tools gathered up and put away in tool boxes when not in use. Material shall not be dumped overboard when a scaffold is to be moved. Rivet heaters shall have safe containers or buckets for hot rivets left over at the end of the day.

(8) During the erection of tall buildings, nylon nets at a height of 3 to 4 m. shall be provided to ensure safety of men if there is a fall from heights.

In case of industrial buildings the height of which is in excess of 4 m a temporary strong net shall be provided below the roof, at a height of 3 m to 4 m above the floor, over which workers are working.

(9) Safety Against Fire - A fire protection procedure shall be set up if there is to be any flame cutting, burning, heating, riveting or any operation that could start a fire. Following precautions shall be observed during welding and cutting operations.

(a) The workers shall be instructed not to throw objects like hot rivets, cigarette stubs, etc, around.

(b) Sufficient number of fire extinguishers, preferably of soda acid type shall be placed at strategic points. Extinguishers shall always be placed in cranes, hoists, compressors and similar places. Where electrical equipments are involved, CO2 or dry powder extinguishers shall be provided.

(10) Riding on a load, tackle or runner shall be prohibited.

(11) The load shall never be allowed to rest on wire ropes. Ropes in operation shall not be touched. Wire ropes/manila ropes conforming to acceptable standards shall be used for guying.

(12) Lifting Appliances - Necessary precautions as laid down in rule 37 shall be followed.

(c) Safety of Structure: General -The structure itself shall be safeguarded during its erection & erection of columns shall be immediately followed by vertical bracing between columns before the roof structure is erected.

Rule 46

(4) Excavation.-

(a) Excavation shall be planned in advance so that hazards due to falling and things falling are avoided. Accident prevention measures shall be adopted and effectively carried out on each job because of inherent dangers.

(b) Underground utilities such as water mains, drainage lines, electrical cables, gas lines etc. shall be located and protected wherever necessary.

(c) Adequate measures shall be taken to prevent dislodgement of loose or unstable earth, rock or other material from falling into the excavation by proper timbering.

(d) Cutting shall be done from top to bottom. Under no circumstances undermining or undercutting shall be done.

(e) No excavation below the level of any foundation of a building or structure (if the excavation is liable to effect the building) shall be commenced unless adequate shoring has been provided to prevent any danger to the building.

(f) In every excavation work along sloping ground, sides and slopes of ground shall be maintained in a safe condition by scaling, benching or barricading. Loose earth and loose rock shall be scaled continuously. To ensure safety of workers engaged on such work, each worker shall be provided with safety belt attached to a safety line. On steep slopes workers shall not be permitted to work one above the other. All such scaling work shall be done under good supervision.

(g) All trenches, 120 cm or more in depth, shall at all times be supplied with at least one ladder for each 30 meters in length or fraction thereof. Ladder shall be extended from bottom of the trench to at least one metre above the surface of the ground.

(h) Every accessible part on an excavation or an opening in the ground into which a person is liable to fall vertically through a height of 2 meters, shall be barricaded to a height of one metre.

(i) Measures shall be taken to prevent spectators and other workmen who are not engaged in excavation work, from approaching excavation areas by placing warning signals etc. near the site of the excavation. Provisions shall also be made to prevent animals from falling into excavation areas.

(5) Shoring.-

(a) Additional precautions by way of shoring and bracing shall be taken to prevent slides, slips or caveins when excavations or trenches are made in locations subject to vibrations from railway or road traffic, the operation of

machinery or any other source of vibration.

(b) Excavations over 1.2 m in depth, unless in solid rock or hard soil shall be shored and braced or sloped to the angle of repose of the material when consolidated. All shoring and bracing shall extend to the bottom of the excavation when necessary.

(c) Materials used for bracing, shoring etc. shall be in good serviceable condition and timbers shall be sound and free from large and loose knots.

(d) No person shall work in an excavation shaft, earth work of tunnel unless all timbering or planks used therein has been inspected by a competent person before the commencement of the work.

(6) Night work.-

(a) Excavated areas shall be adequately lighted up for night work.

(b) During night, a red danger light shall be displayed at a conspicuous place near the excavation site to warn approaching traffic and men.

(7) Disposal of soil.- The excavated material shall be dumped sufficiently away from the edge of the excavated trench to avoid the excavated material slipping and falling into the trench. The excavated materials and any other material or load shall not be dumped or placed within 1.5m of the edges of the trench or half of the depth of the trench whichever is more.

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(8) Scaffolding.-

(a) Suitable scaffolds shall be provided for workmen for all works that cannot be done safely from the ground.

(b) All the members of a scaffold such as planks, braces, vertical supports, horizontal supports shall be of sound material, good construction and of adequate strength. They shall be properly maintained.

(c) No plank shall be kept loose so that levering of the plank is avoided. Nails of proper size shall be used for construction of scaffolds in sufficient numbers and driven fully in.

(d) Scaffolding or staging more than 3.5 metres above the ground floor swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached, bolted, braced and otherwise secured at least one metre high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so

fastened as to prevent it from swaying from the building or structure.

(e) On unprotected scaffolds at high elevations the men must wear life belts suitably anchored to some substantial part of the structure.

(f) Side screens shall be provided on scaffold erected along passageways.

(g) The platform of a suspended scaffold shall not be less than 45 cm. wide and points of suspension not more than 3 m apart and so arranged, that, at the working position, the edge is as close as practicable to the working face when persons have to work in a sitting position. Suspended scaffolds shall be tested as before use to ensure that minimum safety factors are maintained. The test will be made by raising the working surface 30 cm. above the ground and loading it with at least three times the maximum weight that will be imposed upon it.

(h) A safe and convenient means of access shall be provided to the platform or scaffold. Means of access may be a portable ladder, fixed ladder, ramp or a stairway. The use of cross braces or frame work as means of access to the working surface shall not be permitted.

(i) All scaffolds, before use, shall be examined by the engineer in charge.

(j) Every working place and approach thereto, every place where raising or lowering operations with the use of lifting appliance are in progress and all openings dangerous to persons employed shall be adequately and suitably lighted.

(k) During dismantling of scaffolds necessary precautions shall be taken to prevent injury to persons due to fall of loose materials.

(l) Bracings and other members of the scaffolds shall not be removed prematurely while dismantling the entire scaffold which shall be maintained stable and rigid so as to avoid the danger of collapse.

(m) Care shall be taken to see that no uninsulated electric wire exists within 3 metres of the working platform, gangways, runs, etc. of the scaffold.

(n) Good house-keeping shall be maintained at all times upon scaffolds, platforms and ramps. Excessive storage of materials thereon shall be avoided. Care must be taken to avoid accumulation of small objects such as tools, pieces of

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reinforcing steel, waste concrete, which may easily be disturbed or knocked off. Hand rails shall be kept in good repair and securely nailed or otherwise fastened down. Scaffold shall be cleared of tools, materials and rubbish at the end of each working day/shift.

(9) PLATFORMS.- The following minimum width of platforms are recommended for various types of works, namely:-

(a) Where platform is not more than 2 m above the ground or solid floor:

(i) For painters, decorators and similar workmen ... ... 30 cm.

(ii) For other types (Men and tools only) ... ... 50 cm.

(b) Where platform is more than 2 m above the ground or solid floor:

(i) For men, tools and materials ... . 120 cm.

(ii) For men, tools, materials and vehicles such as wheel barrows ... ... 150 cm.

(10) GANGWAYS & RUNS.-

(a) Undue or unequal sagging shall be avoided from all planks forming a gangway or run by suitably supporting them. The slope of all gangways or runs shall be restricted to 1 vertical and 12 horizontal.

(b) Where the slope of the gangway or run renders additional foothold necessary, and in every case where the slope is more than 1 in 12, there shall be provided proper stepping laths which shall-

(i) have a minimum section of 50 x 30 mm and be placed at maximum interval of 45 cm.; and

(ii) be of the full width of the gangway or run except that they may be interrupted over a width of not more than 10 cm to facilitate the movement of barrows.

(11) CONCRETE PLACEMENT.-

(a) All workers handling cement & mortar shall be provided with protective gear.

(b) Concrete buckets for use with cranes shall be constructed without flanges or projections that may collect concrete which might be dislodged and fall on workmen. Buckets shall be provided with proper dumping mechanism.

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(c) A man shall be specially employed as signalman to watch the movement of the bucket and warn the crew and vibrator operators of the approaching bucket so that all workers may clear out of the area affected by the bucket. Signalman shall be so stationed in a safe place that they can see the entire area where concrete is being placed.

(12) Work in open areas and specially at height shall be stopped under adverse weather conditions such as strong winds, snowfall, rainfall and under any other conditions specified by Safety Officer/Inspector.

47. TEMPORARY ELECTRICAL WIRING.-

(1) Frayed and / or bare wires shall not be used for temporary electrical connections during construction. All temporary wiring shall be installed and supervised by a competent electrician. Adequate protection shall be provided for all electrical wiring laid on floor which may have to be crossed over by construction machinery or by the workmen. All flexible wiring connecting the electrical appliances shall have adequate mechanical strength and shall preferably be enclosed in a flexible metal sheath. Overhead wires/cables shall be so laid that they leave adequate head room. Clearance for the above shall be obtained from the competent person.

(2) All electrical circuits, other than those required for illumination of the site at night, shall be switched off at the close of day's work. The main switch board from which connections are taken for lighting, power operated machinery, etc, shall be located in an easily accessible and prominent place. No article of clothing nor stores shall be kept at the back of or over the board or anywhere near it. One 3-kg/4.5-kg CO2 extinguisher or one 5-kg dry powder extinguisher shall be provided near the switch board.

48. BUILDINGS & STRUCTURES.- No building, wall, chimney, bridge, tunnel, road, gallery, stairway, ramp, floor, platform, staging, or other structure, whether of a permanent or temporary character, shall be constructed, situated or maintained in any factory in such a manner as to cause risk of bodily injury.

49. MACHINERY AND PLANT.- No machinery, plant or equipment shall be constructed, situated, operated or maintained in any factory in such a manner as to cause risk of bodily injury or adverse effect on health. The Safety Officer shall have authority to stop the work if he finds that unsafe practices are being followed and/or unsafe conditions exist.

50. METHODS OF WORK.- No process or work shall be carried in any factory in such a manner as to cause risk of bodily injury. Schedule for Hand Tools & Portable Power Tools is given

below.

SCHEDULE

HAND TOOLS & PORTABLE POWER TOOLS

1. Hand tools:-

   (a) Definition: Hand tool means any tool which is used without any external motive power.

   (b) Hand tools shall be of good quality materials, conforming to relevant BIS standards and shall be used only for the job it is designed for. Non sparking tools such as that made of Beryllium Copper alloy shall be used for working in explosive areas.

   (c) Workers shall be trained & instructed for proper use of tools such as files, hammers, hacksaws etc.

   (d) Proper tool bags shall be provided to workers to carry the tools and not leaving them on floors, passages etc.

   (e) Protective equipments such as gloves, goggles etc. shall be provided to and worn by the workers.

   (f) The tools shall be inspected regularly, repaired and maintained.

2. Portable Power Tools.-

   (a) Definition: Portable Power Tool means a tool powered by electric or pneumatic power, operated by a single operator and which is transportable from place to place.

   (b) Portable power tools shall conform to the relevant BIS standards and shall be used for the job it is designed for. Starting switches shall be located at such places where accidental starting cannot take place.

   (c) Electrically operated tools shall be used only with 3 core cable with proper earthing provided. This should be checked before use.

   (d) Electrically operated tools shall not be used where flammable vapours, gases or dusts are present, unless they are specially designed for use in such environment.

   (e) Proper guards shall be provided for tools such as grinders, saws etc. and operators shall be provided with personal protective equipments wherever required.

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(f) In case of pneumatic tools a short chain shall be provided for attaching the air hose and tools housings securely to prevent it from whipping in case of breaking of the coupling.

(g) Periodic inspection and maintenance shall be carried out for electrical insulation, earthing, integrity etc.

51. STACKING AND STORING OF MATERIALS, ETC.- No materials or equipment shall be stacked or stored in such a manner as to cause risk of bodily injury.

52. LADDERS.-

(1) Every ladder shall be of good construction, sound material and of adequate strength for the purpose for which it is used. The rungs shall be parallel, level and uniformly spaced at 30 cm.

(2) Ladders shall be inspected regularly and repaired immediately. No ladder with defective or missing rungs shall be used. Wooden ladders shall not be painted. For preserving the material from deterioration linseed oil or clear varnish shall be used.

(3) No portable single ladder shall be over 9 m in length while the width between side rails in rung ladder shall in no case be less than 28 cm for ladder up to and including 3 m in length. For longer ladders this width shall be increased at least 20 mm for each additional metre of length. Uniform step spacing shall not exceed 30 cm.

(4) All ladders with spreading bases such as step and trestle ladders shall be equipped with rigid spreads or some other means to prevent their premature opening or closing.

(5) Ladders shall be in a safe position before being climbed. The best angle for a ladder is 75 with the horizontal i.e., the distance of the base of the ladder from the wall, pole structure etc., as the case may be shall be 1/4th its length.

(6) A ladder shall be stored upon brackets and in sheltered locations.

(7) A ladder shall not be placed upon a box, barrel, or other movable insecure object and against a round or angular pillar such as pipe or narrow steel section etc.

(8) Two ladders must not be spliced together as far as possible. When it is inevitable they shall be tied together properly to ensure rigidity. Extra parallel members at the point of splicing may be added to each of the main members of the ladder. Two ladders shall not be spliced together to provide access to a greater height than when a single ladder is used.

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(9) Bamboo ladders shall be provided with twisted wire loops enclosing both longitudinal members to prevent them from opening outwards. However, such ladders where longitudinal members are reinforced with metal/wire loops shall not be used when working on electrical circuits.

(10) Metal ladders with insulating rubber shoes shall only be used for working with electrical lines or in places where they may come in contact with such wires.

(11) No worker shall work from a plank placed on the rungs of ladders.

(12) All permanently installed vertical ladders above a height of 3 m shall have manguards provided.

53. OVENS AND DRIERS.-

(1) Application - This rule shall apply to ovens and driers, except those used in laboratories or kitchens of any establishment and those which have a capacity below 325 litres.

(2) Definition:- For the purpose of this rule, "oven or drier" means any enclosed structure, receptacle, compartment or box which is used for baking, drying or otherwise processing of any article or substance at a temperature higher than the ambient temperature of the air in the room or space in which explosive mixture of air and a flammable substance is likely to be evolved within the enclosed structure, receptacle, compartment or box or part thereof on account of the article or substance which is baked, dried or otherwise processed within it.

(3) Separate electrical connection.- Electrical power supplied to every oven or drier shall be by means of a separate circuit provided with an isolation switch.

(4) Design, Construction, examination and testing.-

(a) Every oven or drier shall be properly designed on sound engineering practice and be of good construction, sound materials and adequate strength, free from any patent defects and safe if properly used.

(b) No oven or drier shall be taken into use in a factory for the first time unless a competent person has thoroughly examined all its parts and carried out the tests as are required to establish that the necessary safe systems and controls provided for safety in operation for the processes for which it is to be used and a certificate of such examination and tests signed by that competent person has been obtained and is kept available for inspection.

(c) All parts of any oven or drier which has undergone any alteration or repair which has the effect of modifying any of the design characteristics, shall not be used unless a thorough examination and tests as have been mentioned in clause (b) has been carried out by a competent person and a certificate of such examination and tests signed by that competent person has been obtained and is kept available for inspection.

(5) Safety Ventilation.-

(a) Every oven or drier shall be provided with a positive and effective safety ventilation system using one or more motor-driven centrifugal fans so as to dilute any mixture of air and any flammable substance that may be formed within the oven or drier and maintain the concentration of the flammable substance in the air at a safe level of dilution.

(b) The safe level of dilution referred to in clause (a) shall be so as to achieve a concentration of the concerned flammable substance in air of not more than 25 percent of its lower explosive limit:

Provided that a level of concentration in air up to 50 percent of the lower explosive limit of the concerned flammable substance may be permitted to exist subject to installation and maintenance of an automatic device which -

(i) shows continuously the concentration of the flammable substances in air present in the oven or drier at any instant;

(ii) sounds an alarm when the concentration of the flammable substance in air in any part of the oven or drier reaches a level of 50 percent of its lower explosive limit; and

(iii) shuts down the heating system of the oven or drier automatically when the concentration in air of the flammable substance in any part of the oven or drier reaches a level of 60 percent of its lower explosive limit, is provided to the oven or drier and maintained in efficient working condition.

(c) No oven or drier shall be operated without its safety ventilation system working in an efficient manner.

(d) No oven or drier shall be operated with a level of dilution less than what is referred to in clause (b).

(e) Exhaust ducts of safety ventilation systems should be so designed and placed that their ducts discharge the mixture of air and flammable substance away from workrooms and not near windows

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or doors or other openings from where the mixture could re-enter the workrooms.

(f) The fresh air admitted into the oven or drier by means of the safety ventilation system shall be circulated adequately by means of circulating fan or fans through all parts of the oven or drier so as to ensure that there are no locations where the flammable substance can accumulate in the air or become pocketed to any dangerous degree.

(g) Throttling dampers in any safety ventilation system shall be so designed, by cutting away a portion of damper or otherwise, that the system shall handle at least the minimum ventilation rate required for safety when they are set in their maximum throttling position.

(6) Explosion panels.-

(a) Every oven or drier having an internal total space of not less than half cubic meter shall be provided with suitably designed explosion panels so as to allow release of the pressure of any possible explosion within the oven or drier through explosion vents. The area of openings to be provided by means of such vents together with the area of openings of any access doors which are provided with suitable arrangements for their release in case of any explosion, shall be not less than 2200 sq.cm. for every one cu.m. of volume of the oven or drier. The design of the explosion panels and doors as mentioned above shall be such as to secure their complete release under an internal pressure of 25 kPa (0.25 kg./sq.cm.).

(b) The explosion releasing panels, shall, as far as practicable, be situated at the roof of the oven or drier or at those portions of the walls where persons do not remain in connection with operation of the oven or drier.

(7) Interlocking arrangements.-In each oven or drier efficient inter-locking arrangements shall be provided and maintained to ensure that-

(a) all ventilating fans and circulating fans whose failure would adversely effect the ventilation rate or flow pattern, are in operation before any mechanical conveyor that may be provided for feeding the articles or substances to be processed in the oven or drier is put into operation;

(b) failure of any of the ventilating or circulating fans will automatically stop any conveyor as referred to in clause (i) as may be provided, as well as stop the fuel supply by closing the shut off valve and shut off the ignition in case of gas or oil fired ovens, and in the case of electrically heated ovens switch off the electrical supply to the heaters;

(c) the above said mechanical conveyor is set in operation before the above said shut off valve can be energized; and

(d) the failure of the above said conveyor will automatically close the above said shut off valve in the case of ovens and driers heated by gas, oil or steam and deactivate the ignition system, or cut off the electrical heaters in the case of electrically heated ovens or furnaces.

(8) Automatic preventilation.- Every oven or drier heated by oil, gas , steam or electricity shall be provided with an efficient arrangement for automatic preventilation consisting of at least 3 volume changes with fresh air by operation of the safety ventilation fans and the circulating fans (if used)so as to effect purging of the oven or drier of any mixture of air and a flammable substance before the heating system can be activated and before the conveyor can be placed in position.

(9) Temperature control.- Every oven or drier shall be provided with an automatic arrangement to ensure that the temperature within does not exceed a safe upper preset limit to be decided in respect of the particular processing being carried on.

(10) Multistage processes.- Wherever materials are to be processed in ovens or driers in successive operations, suitable arrangement shall be provided to ensure that the operating temperatures necessary for safe operation at each stage are maintained with the design limits.

(11) Combustible substances not to drip on electrical heaters or burner flames.- Effective arrangements shall be provided in every oven or drier to prevent dripping of combustible substances on electric heaters or burner flame used for heating.

(12) Periodical examination testing and maintenance.-

(a) All parts of every oven and drier shall be properly maintained and thoroughly examined and the various controls as mentioned in this rule and the working of the oven or drier tested at frequent intervals to ensure its safe operation by a competent person.

(b) A register shall be maintained in which the details of the various tests carried out from time to time under clause (a) shall be entered and every entry made shall be signed by the person doing the tests.

(13) Training of Operators.- No person shall be assigned any task connected with operation of any oven or drier unless he has completed 18 years of age and he is properly trained.

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54. REACTION VESSELS AND KETTLES.-

(1) This rule applies to reaction vessels and kettles, here in after referred to as reaction vessels, which normally work at a pressure not above the atmospheric pressure but in which there is likelihood of pressure being created above the atmospheric pressure due to reaction getting out of control or any other circumstances.

(2) In the event of the vessel being heated by electrical means, a suitable thermostatic control device shall be provided to prevent the temperature exceeding the safe limit.

(3) Where steam is used for heating purposes in a reaction vessel, it shall be supplied through a suitable pressure reducing valve or any other suitable automatic device to prevent the maximum permissible steam pressure being exceeded, unless the pressure of the steam in the supply line itself cannot exceed the said maximum permissible pressure.

(4) A suitable safety valve or rupture disc of adequate size and capacity shall be provided to effectively prevent the pressure being built up in the reaction vessel beyond the safe limit. Effective arrangements shall be made to ensure that the released gases, fumes, vapours, liquids or dusts, as the case may be, are led away and disposed of through suitable pipes without causing any hazard. Where flammable gases or vapours are likely to be vented out from the vessel, the discharge end shall be provided with a flame arrester.

(5) Every reaction vessel shall be provided with a pressure gauge having the appropriate range.

(6) In addition to the devices as mentioned in the foregoing provisions, means shall be provided for automatically stopping the feed into the vessel as soon as process conditions deviate from the normal limits to an extent which can be considered as dangerous.

(7) Wherever necessary, an effective system for cooling, flooding or blanketing shall be provided, for the purpose of controlling the reaction and process conditions within the safe limits of temperature and pressure.

(8) An automatic audio-visual warning device shall be provided for clear warning whenever process conditions exceed the preset limits. This device, wherever possible, shall be integrated with automatic process correction systems.

(9) A notice pointing out the possible circumstances in which pressures above atmospheric pressure may be built up in the reaction vessel, the dangers involved and the precautions to be taken by the operators shall be displayed at a conspicuous place

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near the vessel.

55. EXAMINATION OF EYE SIGHT OF CERTAIN WORKERS.-

(1) No person shall be employed to operate a crane, locomotive or fork-lift truck, or to give signals to a crane or locomotive operator unless his eyesight and colour vision have been examined and declared fit by a qualified ophthalmologist to work whether with or without the use of corrective glasses.

(2) The eye sight and colour vision of the person employed as referred to in clause 1 shall be examined at least once in every period of 12 months up to the age of 45 years and once in every 6 months beyond that age.

(3) Any fee payable for an examination of a person under this sub-rule shall be paid by the occupier and shall not be recoverable from that person.

(4) The record of examination or re-examination carried out as required under sub-rule 1. shall be maintained in Form-1.

56. RAILWAYS IN FACTORIES.-

(1) This rule shall apply to railways in the precincts of a factory which are not subject to the Railways Act, 1988.(59 of 1988)

(2) Gateways.- A gateway through which a railway track passes shall not be used for the general passage of workers into or out of a factory.

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(3) Barriers and Turngates.-

(a) Where building or walls contain doors or gates which open to a railway track, a barrier about 1 m high shall be fixed parallel to and about 60 cm. away from the building or wall outside the opening and extending several metres beyond it at either end, so that any person passing out may become aware of the approaching train when his pace is checked at the barrier:

Provided that if the traffic on the nearest track is all in one direction the barrier shall be in the form of an "L" with the end of the short leg abutting on to the wall and the other end opening towards the approaching train.

(b) If the distance between wall and track cannot be made to accommodate such a barrier, the barrier or a turngate shall be placed at the inside of the opening.

(c) Where a footway passes close to a building or other obstruction as it approaches a railway track, a barrier or a turngate shall be fixed in such a manner that a person approaching the track is compelled to move away from the building

or obstruction and thus obtain timely sight of an approaching locomotive or wagon.

(4) Crowds.-

(a) Workers' pay-windows, first-aid stations and other points where a crowd may collect shall not be placed near a railway track.

(b) At any time of the day when workers are starting or ending work, all railway traffic shall cease for not less than five minutes.

(5) Locomotives.-

(a) No locomotive shall be used in shunting operations unless it is in good working order.

(b) Every locomotive and tender shall be provided with efficient brakes, all of which shall be maintained in good working order. Brake shoes shall be examined at suitably fixed intervals and those that are worn out replaced at once.

(c) Water-gauge glasses of every locomotive, whatever its boiler pressure, shall be protected with substantial glass or metal screens.

(d) Suitable stops and hand-holds shall be provided at the corners of the locomotive for the use of shunters.

(e) Every locomotive crane shall be provided with lifting and jacking pads at the four corners of the locomotive for assisting in re-railing operation

(f) It shall be clearly indicated on every locomotive crane in English and in language understood by the majority of the workers in the factory, for what weight of load and at what radius the crane is safe.

(6) Wagons.-

(a) Every wagon (and passenger coach, if any) shall be provided either with self-acting brakes capable of being applied continuously or with efficient hand brakes which shall be maintained in good working order. The hand brakes shall be capable of being applied by a person on the ground and fitted with a device for retaining them in the applied position.

(b) No wagon shall be kept standing within 3 metres of any authorised crossing.

(c) No wagon shall be moved with the help of crowbars or pinch bars.

(7) Riding on locomotive, wagon or other rolling stock.- No person shall be permitted to be upon (whether inside or outside)any locomotive, wagon or after rolling stock except

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where secure foothold and handhold are provided.

(8) Attention to brakes and doors.-

(a) No locomotive, wagon or other rolling stock shall be kept standing unless its brakes are firmly applied and, where it is on a gradient, without sufficient number of properly constructed scotches placed firmly in position.

(b) No train shall be set in motion until the shunting jamadar has satisfied himself that all wagon doors are securely fastened.

(9) Projecting loads and cranes.-

(a) If the load on a wagon projects beyond its length, a guard or dummy-truck shall be used beneath the projection.

(b) No loco-crane shall travel without load unless the jib is completely lowered and positioned in line with the track.

(c) When it is necessary for a loco-crane to travel with a load, the jib shall not be swung until the loco-crane has come to rest.

(10) Loose-shunting.- Loose-shunting shall be permitted only when it cannot be avoided. It shall never be performed on a wagon not accompanied by a man capable of applying and pinning down the brakes. A wagon not provided with brakes in good working order and capable of being easily pinned down shall not be loose-shunted unless there is attached to it at least another wagon with such brakes. Loose-shunting shall not be performed with, or against a wagon containing passengers, live-stock or explosives.

(11) Fly-shunting.- Fly-shunting shall not be permitted on any factory railway.

(12) The shunting jamadar.-

(a) Every locomotive or wagon in motion in a factory shall be in charge of a properly trained jamadar.

(b) Before authorising a locomotive or wagon to be moved, the shunting jamadar shall satisfy himself that no person is under or in-between or in front of the locomotive or wagon.

(13) Hand signals.- The hand signals used by the shunting jamadar by day and night shall be those prescribed by the shunting rules of railways, working under the Railways Act , 1988 (59 of 1988).

(14) Night work and fog.-

(a) In factories where persons work at night, no movement of locomotive, wagon or other rolling stock

otherwise than by hand shall be permitted between sunset and sunrise unless the tracks and their vicinity are lighted on a scale of not less than 10 lux as measured at the horizontal plane at the ground level.

(b) In no circumstances shall any locomotive or train be moved between sunset and sunrise or at any time when there is fog, unless it carries a white head light and a red rear light.

(15) Speed control.-

(a) A locomotive or train shall not move at a speed greater than seven kilometres per hour.

(b) A train, locomotive, wagon or other rolling stock shall not be moved by mechanical or electrical power unless it is preceded at a distance of not less than 10 metres during the whole of its journey by a shunting jamadar. He shall be provided with signaling flags or lamp and whistle necessary for calling the attention of the driver.

(16) Tracks.-

(a) The distance,

(i) between tracks;

(ii) between tracks and buildings, blind walls or other structures; and

(iii) between tracks and materials deposited on the ground shall be respectively not less than :-

(1) from centre to centre of parallel tracks, the overall width of the widest wagon of that gauge plus twice the width of the door of such a wagon when opened directly outward plus metre.

(2) from a building or structure other than a loading platform to the centre of the nearest track, half the overall width of the widest wagon of the gauge, plus the width of its door when opened outward, plus 1.5 m.

(3) from material stacked or deposited alongside the track, on the ground or on a loading platform, to the centre of the nearest track, half the overall width of its door when opened directly outward, plus 1 m.

(b) Sleepers of a track shall be in level with the ground and at the crossings of the track with a road or walkway, the surface of the road or walkway shall be in level with the top of the rails.

(c) All track ends shall be equipped with buffer stops of adequate strength.

(d) Barriers of substantial construction shall be securely and permanently fixed across any doorway or gateway in a building

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or in a wall which conceals an approaching train from view, between the building and the tracks as prescribed in clause (a) of sub-rule (3).

(e) Where tracks are carried on a gantry or other elevation, a safe footway or footways with hand rails and toe-boards shall be provided at all positions where persons work or pass on foot; and where there is an opening in the stage of an elevated track for the dropping of material to a lower level, the position shall be adequately fenced or the opening itself provided with a grill through which a person cannot fall.

(f) All point levers shall have their movements parallel to, not across, the direction of the track.

(g) All loading platforms which are more than 60 cm. above the level of the ground on which the track is laid and more than 15 m. in length, shall be provided with stops at intervals not greater than 15 m. apart to enable the platform to be easily mounted from the track.

(h) Turn tables on plant railways shall be provided with locking devices which will prevent the tables from turning while locomotives or wagons are being run on or off the tables.

(i) Workers shall be prohibited from passing under, between or above railway wagons.

(17) Crossings.-

(a) At all crossings of a track with a road or walkway, danger or crossing signs and wherever reasonably practicable, blinking lights or alarm lights shall be provided. At all important crossings, manned gates or barriers or watchmen shall be provided. Swinging gates and barriers shall be secured against inadvertent opening or closing.

(b) All crossing, warning signs, gate and barriers shall be illuminated during hours of darkness.

(18) Duties of drivers and shunters.- It shall be the duty of every driver of a locomotive, or a shunter including a shunting jamadar, to report without delay to their superior any defect in permanent way, locomotive or rolling stock.

(19) The Competent Authority may by an order in writing exempt a factory or part of it from all or any of the provisions of this rule to such extent and on such conditions as it deems necessary.

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57. QUALITY OF PERSONAL PROTECTIVE EQUIPMENT.- All Personal Protective Equipment provided to workers as required under any of the provisions of the Act or the Rules shall conform to the relevant Indian Standards.

58. PROTECTIVE EQUIPMENT.- The Inspector may, having regard to the nature of the hazards involved in work and process being carried out, order the occupier or the manager in writing to supply to the workers exposed to particular hazard any personal protective equipment as may be found necessary.

59. THERMIC FLUID HEATERS.-

(1) All heaters shall be of such construction that coils are removable for periodic cleaning, visual inspection and hydraulic test.

(2) Suitable arrangements shall be made for cooling the furnace effectively in case of power failure.

(3) Before restarting the furnace, it shall be effectively purged.

(4) Velocity of flow of the thermic fluid shall not be allowed to fall below the minimum recommended by the manufacturers while the heater is in operation.

(5) The thermic fluid shall be circulated in a closed circuit formation with an expansion cum deaerator tank. This tank shall be located outside the shed where the heater is installed.

(6) Every heater shall be provided with a Photo-resistor actuated audio-visual alarm to indicate flame failure and automatic burner cut off.

(7) The stack temperature monitor-cum-controller with audio- visual alarm shall be provided so as to warn the operator in case the outlet temperature exceeds the specified minimum.

(8) Where inspection doors are provided on the furnace they shall be interlocked with the burner itself so that they cannot be opened until burner is shut off and furnace is cooled sufficiently.

(9) All heaters shall also be provided with the following safety devices:-

(a) level control in the expansion tank;

(b) temperature control of thermic fluid;

(c) differential pressure switch on the outlet line of the

heater tubes; and

(d) temperature control device for the fuel oil supply to the burner.

(10) All devices mentioned in sub-rule (9)shall have interlocking arrangement with burner so that in case of any predetermined limits being crossed the supply of fuel and air to burner shall automatically be cut-off.

(11) All safety interlocks when operated shall be indicated on the control panel of the heater by a suitable audio visual alarm.

(12) Every heater unit shall be provided as a standard accessory an arrangement for sniffing with low pressure steam or nitrogen for putting out the fire.

(13) Electric panel for the heater shall be located near the heater but not so close as to be exposed to spilling or leaking oil.

(14) The heater shall be located in a place segregated from other manufacturing activities.

(15) Explosion vent shall be so installed that release takes place at safe location.

(16) The heater oil shall be subjected to pressure test by competent person once at least in every 12 months. The test pressure shall not be less than twice the operating pressure.

(17) If repairs are carried out to the coil, it shall be tested before taking it into use.

(18) The thermic fluid shall conform to the specifications prescribed by the manufacturer and shall be tested by competent person for suitability at least once in every three months period. Such tests shall include test for acidity, suspended matter, ash contents, viscosity and flash point.

(19) Cleaning of the internal surface of the heater or soot and check up of refractory surface on the inside shall be carried out every month or as often as required depending upon working conditions. The coils shall be removed and surface of the coils cleaned thoroughly once at least in a period of six months. The burner, nozzles, oil filters and pumps shall be cleaned once a week during the period of use.

(20) A separate register containing the following information shall be maintained,-

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(a) weekly checks carried out confirming the effectiveness of the interlock;

(b) weekly checks confirming that all accessories are in good state of repairs; and

(c) information regarding fuel oil temperature, pressure, thermic fluid inlet/outlet pressure and temperature, fuel gas temperature, recorded at 4 hourly interval.

(21) The heater when in operation shall always be kept in charge of a trained operator.

60. RECORD KEEPING & ANNUAL REVIEW.-Each factory shall maintain a record of field equipment failures and Failure Mode, Effect & Criticality Analysis in prescribed Forms 7 & 8 respectively. This data and analysis shall be used for preparation of preventive maintenance schedules and prevention of potential hazards. In addition, the factory shall conduct an annual review of unusual occurrences and accidents occurred and submit the report to the Competent Authority.

61. COLOUR CODING OF SERVICE LINES.-

(1) Pipelines for water, air, oil and gases shall be colour coded as per Indian Standard: 2379-1963 & Indian Standard: 5-1978.

(2) Electrical conduit panels shall be colour coded as per Indian Standard: 375-1951 & Indian Standard: 5-1978.

62. HAZARDOUS CHEMICALS.- The occupier of every factory involving hazardous process shall fill the Form 9 entitled `Material Safety Data Sheet' and inform all employees of the factory, and the Competent Authority about the hazards involved. The Competent Authority may, on the basis of Material Safety Data Sheet mentioned above direct the Manager in writing to supply the workers exposed to particular hazard any necessary personal protective equipment conforming to relevant Indian Standards and prescribe the information and manner in which this information is to be passed on to the general public residing in the vicinity of the factory.

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Rule 63

CHAPTER V

WELFARE

63. WASHING FACILITIES.-

(1) There shall be provided and maintained, in every factory for the use of employed persons adequate and suitable facilities for washing which shall include soap and nail brushes or other suitable means of cleaning and the facilities shall be conveniently accessible and shall be kept in a clean and orderly condition.

(2) Without prejudice to the generality of the foregoing provisions, the washing facilities shall include-

(a) a trough with taps or jets at intervals of not less than 60 cm.; or

(b) wash basins with taps attached there to;or

(c) taps on stand-pipes; or

(d) showers controlled by taps; or

(e) circular troughs of fountain type:

Provided that the Inspector may having regard to the needs and habits of the workers, fix the proportion in which the aforementioned types of facilities shall be installed.

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(3) (a) Every trough and basin shall have a smooth, impervious surface and shall be fitted with a waste-pipe and plug.

(b) The floor or ground under and in the immediate vicinity of every trough, tap, jet, wash-basin, stand-pipe, and shower shall be so laid or finished as to provide a smooth impervious surface and shall be adequately drained.

(4) For persons whose work involves contact with any injurious or noxious substance there shall be at least one tap for every fifteen persons, and for persons whose work does not involve such contact the number of taps shall be as prescribed in the Schedule given below.

SCHEDULE

Number of workers	Number of taps
(1)	(2)
Up to 20	1
21 to 35	2
36 to 50	3
51 to 150	4
151 to 200	5

Exceeding 200 but not exceeding 500	5 plus one tap for every 50 or fraction of 50
Exceeding 500	11 plus one tap for every 100 or fraction there of 100

(5) If female workers are employed, separate washing facilities shall be provided and so enclosed or screened that the interiors are not visible from any place where persons of other sex work or pass. The entrance to such facilities shall bear conspicuous notice "For Women Only" in the language understood by the majority of the workers and shall also be indicated pictorially.

(6) The water supply to the washing facilities shall be capable of yielding at least 27 litres a day for each person employed in the factory and shall be from a source approved in writing by the Medical Officer if the source of supply is not the same as for drinking water:

Provided that where the Competent Authority is satisfied that such an yield is not practicable he may by certificate in writing permit the supply of a smaller quantity not being less than 5 litres per day for every person employed in the factory.

64. FACILITIES FOR KEEPING CLOTHING.- All classes of factories mentioned in the Schedule to this rule shall provide facilities for keeping clothing not worn during working hours. Such facilities shall include the provision of arrangements approved by the Competent Authority. The Competent Authority shall have powers to add other factories under the Schedule given below:-

SCHEDULE

Chemical works.

Engineering workshops.

Glass works.

Automobile workshops.

Power Plants.

65. FIRST-AID AND FIRST-AID APPLIANCES.- The first-aid boxes or cupboards shall be distinctively marked with a red cross on white background and shall contain the following equipments, namely :-

(1) The manager of the factory shall lay down procedures for First-Aid and medical services so that injured or ill person receives prompt attention or aid. The person here means, a worker of the factory, contractor's labour or even a visitor.

(2) For factories in which the number of persons employed does not exceed ten, or in the case of factories in which mechanical

power is not used & the number of persons does not exceed fifty each first-aid box or cupboard shall contain the following equipments, namely:-

(a) Six small size sterilised dressings.

(b) Three medium size sterilised dressings.

(c) Three large size sterilised dressings.

(d) Three large size sterilised burn dressings.

(e) One (60 ml) bottle of centrimide solution (1%) or a suitable antiseptic solution.

(f) One (60 ml) bottle of mercury chrome solution (2%) in water.

(g) One (30 ml) bottle containing sal-volatile having the dose and mode of administration indicated on the label.

(h) One pair of scissors.

(i) One roll of adhesive plaster (2 cm X 1 m).

(j) Six pieces of sterilised eye pads in separate sealed packets.

(k) A bottle containing 100 tablets (each of 325 mg) of aspirin or any other analgesic.

(l) Polythene wash bottle (1/2 litre, i.e. 500 cc) for washing eyes.

(m) A snake-bite lancet.

(n) One (30 ml) bottle containing potassium permanganate crystals.

(o) One tourniquet.

(p) A supply of suitable splints, and

(q) One copy of First-Aid leaflet issued by the Competent Authority.

(3) For factories in which mechanical power is used and in which the number of persons employed exceeds ten but does not exceed fifty, each first-aid box or cupboard shall contain the following equipments, namely:-

(a) Double of the quantity as indicated in respect of items (a) to (g) of sub-rule (2) above.

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(b) Six (15 gms) packets of sterilized cotton wool.

(c) One pair of scissors.

(d) Two rolls of adhesive plaster (2 cm X 1 m).

(e) Eight pieces of sterilized eye pads in separate sealed packets.

(f) One tourniquet.

(g) A supply of suitable splints.

(h) One dozen safety pins.

(i) A bottle containing 100 tablets (each of 325 mg) of aspirin or any other analgesic.

(j) One polythene wash bottle (1/2 litre i.e., 500 cc) for washing eyes.

(k) A snake-bite lancet.

(l) One(30 ml) bottle containing potassium permanganate crystals.

(m) One copy of the first-aid leaflet issued by the Competent Authority.

(4) For factories employing more than fifty persons, each First-Aid box or cupboard shall contain the following equipments, namely:-

(a) Double of the quantity as indicated in respect of items (a) to (e) of sub-rule (2) above.

(b) One (200 ml) bottle of centrimide solution(1%) or a suitable antiseptic solution.

(c) One (200 ml) bottle of mercury chrome (2%) solution in water

(d) One (120 ml) bottle of sal-volatile having the dose and mode of administration indicated on the label.

(e) One pair of scissors.

(f) One roll of adhesive plaster (6 cm X 1 m).

(g) Two rolls of adhesive plaster (2 cm X 1 m).

(h) Twelve pieces of sterilized eye pads in separate sealed packets.

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(i) A bottle containing 100 tablets (each of 325 mg) of aspirin or any other analgesic.

(j) One polythene wash bottle (500 cc) for washing eyes.

(k) Twelve roller bandages 10 cm wide.

(l) Twelve roller bandages 5 cm wide.

(m) Six triangular bandages.

(n) One tourniquet.

(o) A supply of suitable splints.

(p) Two packets of safety pins.

(q) Kidney tray.

(r) A snake-bite lancet.

(s) One(30 ml) bottle containing potassium permanganate crystals.

(t) One copy of first-aid leaflet issued by the Competent Authority:

Provided that items (j) to (q) inclusive, need not be included in the standard first-aid box or cupboard where there is a properly equipped ambulance room, or if at least one box containing such items placed and maintained in accordance with the requirements of section 45 is separately provided:

Provided further that the medical officer of the factory may alter the type and quantity of the contents at his discretion. The list of contents shall, however, be pasted inside the first aid box.

(5) In lieu of the dressings required under items (a) and (b), these may be substituted by adhesive wound dressings approved by the Competent Authority and other equipment or medicines that may be considered essential and recommended by the Competent Authority from time to time.

66. NOTICE REGARDING FIRST-AID.- A notice containing the names of the persons working within the precincts of the factory who are trained in first-aid treatment and who are in charge of the first-aid boxes or cupboards shall be posted in every factory at a conspicuous place and near each such box or cupboard. The notice shall also indicate workroom where the said person shall be available. The name of the nearest hospital and its telephone number shall also be mentioned prominently in the said notice.

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67. AMBULANCE ROOM.-

(1) Every ambulance room shall be under the charge of at least one whole-time qualified medical practitioner (hereinafter referred to as medical officer) who shall be assisted by at least one qualified nurse or dresser-cum-compounder and one nursing attendant in each shift. The medical officer shall be readily available on call during working hours of the factory:

Provided that where a factory works in more than one shift, the Competent Authority, if it is satisfied that on account of the size of the factory, nature of hazards or frequency of accidents, it is necessary to employ a whole time medical officer for each shift separately, may, order so in writing.

(2) There shall be displayed in the ambulance room a notice giving the name, address and telephone number of the medical practitioner in charge. The name of the nearest hospital and its telephone number shall also be mentioned prominently in the said notice.

(3) No medical officer shall be required or permitted to do any work which is inconsistent with or detrimental to his responsibilities under this rule.

(4) The ambulance room shall be separate from the rest of the factory and shall be used only for the purpose of first-aid treatment and rest. It shall have a floor area of at least 24 sq.m. and smooth, hard and impervious walls and floors, and shall be adequately ventilated and lighted by both natural and artificial means. There shall be attached to it at least one latrine & urinal of sanitary type. An adequate supply of wholesome drinking water shall be laid on and the room shall contain at least the following, namely:-

(a) A glazed sink with hot and cold water always available.

(b) A table with a smooth top at least 180 cm X 105 cm.

(c) Means for sterilizing instruments.

(d) A couch.

(e) Two stretchers.

(f) Two buckets or containers with close fitting lids.

(g) Two rubber hot water bags.

(h) A kettle and spirit stove or other suitable means of boiling water.

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(i) Twelve plain wooden splints 900 mm X 100 mm X 6 mm.

(j) Twelve plain wooden splints 350 mm X 75 mm X 6 mm.

(k) Six plain wooden splints 250 mm X 50 mm X 12 mm.

(l) Six woolen blankets.

(m) Three pairs of artery forceps.

(n) One bottle of spiritus ammoniac aromaticus (120 ml)

(o) Smelling salts (60 gm).

(p) Two medium size sponges.

(q) Six hand towels.

(r) Four "Kidney" trays.

(s) Four cakes of toilet, preferably antiseptic soap.

(t) Two glass tumblers and two wine glasses.

(u) Two clinical thermometers.

(v) Two tea spoons.

(w) Two graduated (120 ml) measuring glasses.

(x) Two minim measuring glasses.

(y) One wash bottle (1000 cc) for washing eyes.

(z) One bottle (one litre) carbolic lotion 1 in 20.

(aa) Three chairs.

(bb) One screen.

(cc) One electric hand torch.

(dd) Four first-aid boxes or cupboards stocked to standards prescribed under(c)of rule 59.

(ee) An adequate supply of anti-tetanus toxiod.

(ff) Injections - morphia, pethidrine, atropine, adrenaline, coramine, novocain (6 each).

(gg) Coramine liquid (60 ml).

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(hh) Tablets -25 each of antihistaminic, antispasmodic.

(ii) Syringes with needles - 2 cc, 5 cc, 10 cc and 50 cc.

(jj) Three surgical scissors.

(kk) Two needle holders, big and small.

(ll) Suturing needles and materials.

(mm) Three dissecting forceps.

(nn) Three dressing forceps.

(oo) Three scalpels.

(pp) One stethoscope.

(qq) Rubber bandage - pressure bandage.

(rr) Oxygen cylinder with necessary attachments.

(5) The occupier of every factory to which these rules apply shall for the purpose of removing serious cases of accidents or sickness, provide in the premises and maintain in good condition a suitable conveyance unless he has made arrangements for obtaining such a conveyance from a hospital.

(6) The Competent Authority may, by an order in writing exempt any factory from the requirements of this rule, subject to such conditions as it may specify in that order, if a hospital, ambulance room or dispensary is maintained at or within 200 m. of the precincts of the factory and such arrangements are made as to ensure the immediate treatment of all injuries sustained by workers within the factory and for providing rest to the workers so injured.

Explanation:- For the purpose of this rule, "qualified medical practitioner" means a person holding a qualification granted by an authority specified in the schedule to the Indian Medical Degrees Act, 1916 (7 of 1916), or in the schedules to the Indian Medical Council Act, 1956 (102 of 1956).

68. CANTEENS.-

(1) The occupier of every factory where in more than two hundred and fifty workers are ordinarily employed shall provide in or near factory an adequate canteen according to standard prescribed in these rules.

(2) The canteen building shall be situated not less than 15 meters from any boiler house, coal stacks, ash dumps and any other source of dust, smoke or obnoxious fumes:

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Provided that the Competent Authority may in any particular factory relax the provisions of this sub-rule to such an extent as may be reasonable in the circumstances and may require measures to be adopted to secure the essential purpose of this sub-rule.

(3) The canteen building shall be constructed in accordance with the plans and shall accommodate at least a dining hall, kitchen, store room, pantry and washing places separately for workers and for utensils.

(4) In a canteen the floor and inside walls up to a height of 1.2 metres from the floor shall be made of smooth and impervious material; the remaining portion of the inside walls shall be made smooth by cement plaster or in any other manner.

(5) The doors and windows of a canteen building shall be of flyproof construction and shall allow adequate ventilation.

(6) The canteen shall be sufficiently lighted at all times when any persons have access to it.

(7) (a) In every canteen -

(i) all inside walls of rooms and all ceilings and passages and staircases shall be limewashed or colourwashed at least once in each year or painted once in three years dating from the period when last limewashed, colourwashed or painted, as the case may be;

(ii) all wood work shall be varnished or painted once in three years dating from the period when last varnished or painted; and

(iii) all internal structural iron or steel work shall be varnished or painted once in three years dating from the period when last varnished or painted:

Provided that inside walls of the kitchen shall be limewashed once every four months.

(b) Records of dates on which lime washing, colourwashing, varnishing or painting is carried out shall be maintained in the prescribed register (Form 2).

(8) The precincts of the canteen shall be maintained in a clean and sanitary condition. Waste water shall be carried away in suitable covered drains and shall not be allowed to accumulate so as to cause a nuisance. Suitable arrangements shall be made for the collection and disposal of garbage.

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69. DINING HALL.-

(1) The dining hall shall accommodate at a time at least 30 per cent of the workers working at a time and shall be provided with adequate numbers of tables and chairs or benches:

Provided that, in any particular factory or in any particular class of factories, the Competent Authority may by a notification in this behalf alter the percentage of workers to be accommodated.

(2) The floor area of the dining hall, excluding the area occupied by the service counter and any furniture except tables and chairs, shall be not less than 1 sq.m per diner to be accommodated as prescribed in sub-rule (1).

(3) A portion of the dining hall and service counter shall be partitioned off and reserved for women workers in proportion to their number. Washing places for women shall be separate and screened to secure privacy.

70. EQUIPMENT.-

(1) There shall be provided and maintained sufficient utensils, crockery, cutlery, furniture and any other equipment necessary for the efficient running of the canteen. Suitable clean clothes for the employees serving in the canteen shall also be provided and maintained.

(2) The furniture, utensils and other equipment shall be maintained in a clean and hygienic condition. A service counter, if provided, shall have a top of smooth and impervious material. Suitable facilities including an adequate supply of hot water shall be provided for the cleaning of utensils and equipment.

71. ANNUAL MEDICAL EXAMINATION.-

(1) Annual medical examination for fitness of each member of the canteen staff who handles foodstuffs shall be carried out by the factory medical officer or the Certifying Surgeon, which should include the following, namely:-

(a) routine blood examination;

(b) routine and bacteriological testing, of faeces and urine for germs of dysentery and typhoid fever; and

(c) any other examination including chest X-ray that may be considered necessary by the factory medical officer or the Certifying Surgeon.

(2) Any person who in the opinion of the factory medical officer or the certifying surgeon is unsuitable for employment on account of possible risk to the health of others, shall not be employed as canteen staff.

Rule 72

72. SHELTERS, REST ROOMS AND LUNCH ROOMS.-

(1) The shelters, or rest rooms and lunch rooms shall conform to the following standards, namely:-

(a) the building shall be soundly constructed and all the walls and roof shall be of suitable heat resisting materials and shall be water-proof. The floor and walls to a height of 90 cm. shall be so laid or finished as to provide a smooth, hard impervious surface;

(b) the height of every room in the building shall be not less than 3.70 m from floor level to the lowest part of the roof and there shall be at least 1.10 sq.m of floor area for every person employed:

Provided that (i) workers who habitually go home for their meals during the rest periods may be excluded in calculating the number of workers to be accommodated, and (ii) in the case of factories in existence at the date of commencement of the Act, where it is impracticable owing to lack of space to provide 1.10 sq.m. of floor area for each person, such reduced floor area per person shall be provided as may be approved in writing by the Competent Authority;

(c) effective and suitable provision shall be made in every room for securing and maintaining adequate ventilation by the circulation of fresh air and there shall also be provided and maintained sufficient and suitable natural or artificial lighting;

(d) every room shall be adequately furnished with chairs or benches with back-rest; and

(e) sweepers shall be employed whose primary duty it is to keep the rooms, building and precincts thereof in a clean and tidy condition.

(f) suitable provision shall be made in every room for supply of drinking water and facilities for washing.

(2) The lunch rooms shall -

(a) comply with the requirements laid down in clauses (a) to (f) of sub-rule (1), and

(b) be provided with adequate number of tables with impervious tops for the use of workers for taking food:

Provided that the Competent Authority may exempt any factory from the provisions of this rule subject to the provisions being complied by some other means.

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73. CRECHES.-

(1) The creche shall be conveniently accessible to the mothers of the children accommodated therein and so far as is reasonably practicable it shall not be situated in close proximity to any part of the factory where obnoxious fumes, dust or odours are given off or in which excessively noisy processes are carried on.

(2) The building in which the creche is situated shall be soundly constructed and all the walls and roof shall be of suitable heat resisting materials and shall be water-proof. The floor and internal walls of the creche shall be so laid or finished as to provide a smooth impervious surface.

(3) The height of the rooms in the building shall be not less than 3.70 m from the floor to the lowest part of the roof and there shall be not less than 2.00 sq.m of floor area for each child to be accommodated.

(4) Effective and suitable provision shall be made in every part of the creche for securing and maintaining adequate ventilation by the circulation of fresh air.

(5) The creche shall be adequately furnished and equipped and in particular there shall be one suitable cot or cradle with the necessary bedding for each child (provided that for children over two years of age it will be sufficient if suitable bedding is made available), at least one chair or equivalent seating accommodation for the use of each mother while she is feeding or attending to her child, and a sufficient supply of suitable toys for the older children.

(6) A suitably fenced and shady open air playground shall be provided for the older children:

Provided that the Competent Authority may by order in writing exempt any factory from compliance with this sub-rule if he is satisfied that there is not sufficient space available for the provision of such a play-ground.

74. WASHROOM.-

(1) There shall be in or adjoining the creche a suitable washroom for the washing of the children and their clothing. The washroom shall conform to the following standards, namely:-

(a) the floor and internal walls of the room to a height of 90 cm. shall be so laid or furnished as to provide a smooth impervious surface. The room shall be adequately lighted and ventilated and the floor shall be effectively drained and maintained in a clean and tidy condition;

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(b) there shall be at least one basin or similar vessel for every four children accommodated in a creche at any one time together with a supply of water provided, if practicable, through taps from a source approved by the Health Officer. Such source shall be capable of yielding for each child a supply of at least 23 litres of water a day; and

(c) an adequate supply of clean clothes, soap and clean towels shall be made available for each child while it is in the creche.

(2) Adjoining the washroom referred to in sub-rule (1), a latrine shall be provided for the sole use of the children in the creche. The design of latrine and the scale of accommodation to be provided shall either be approved by the Public Health authorities or, where there is no such Public Health authority, by the Competent Authority.

75. SUPPLY OF MILK AND REFRESHMENT.-At least a quarter litre of clean pure milk shall be available for each child on every day if accommodated in the creche and the mother of such a child shall be allowed in the course of her daily work, four intervals of at least 15 minutes to feed the child. For children above two years of age there shall be provided in addition an adequate supply of wholesome refreshment.

76. CRECHE STAFF.- For each creche there shall be appointed a woman in-charge and an adequate number of female attendants to help the woman in-charge. No woman in-charge shall be appointed under this rule unless she possesses the qualifications prescribed for a midwife or produces a certificate that she has undergone training for a period of not less than 18 months in a hospital, maternity home or nursing home approved in this behalf by the Competent Authority or produces a certificate that she has received training for a pre-primary teacher in an institution approved by the State Government. The creche staff shall be provided with suitable clean clothes for use while on duty in the creche.

77. EXEMPTION FROM THE PROVISION OF CRECHE.-

(1) In factories where the number of married women or widows employed does not exceed 15 or where the factory works for less than 180 days in a calendar year, or where number of children kept in the creche was less than 5 in the preceding year, the Competent Authority may exempt such factories from the provisions of section 48 and the rules 73 to 76 made thereunder, if he is satisfied that alternate arrangements as stipulated under sub-rule (2) are provided by the factory.

(2) (a) The alternate arrangements required in sub-rule (1) shall include a creche building which has a minimum accommodation

at the rate of 1.90 sq. m. per child and constructed in accordance with the plans approved by the Competent Authority.

(b) The creche building shall have -

(i) a suitable washroom for washing of the children and their clothing;

(ii) adequate supply of soap and clean clothes and towels; and

(iii) adequate number of female attendants who are provided with suitable clean clothes for use while on duty to look after the children in the creche.

(3) The exemption granted under sub-rule (1) may at any time be withdrawn by the Competent Authority if it finds after such enquiry as he may deem fit, that the factory has committed a breach of this rule.

78. WELFARE OFFICER.-

(1) Number of Welfare Officers.-

(a) The occupier of every factory employing between five hundred(500) and two thousand (2000) workers shall appoint at least one Welfare Officer, and where the number of workers exceeds 2000, there shall be an additional Welfare Officer for every additional 2000 workers or fraction thereof over 500. In a factory where both men and women workers are employed, the number of women Welfare Officers to be appointed shall be in proportion to the women workers employed provided that where the number of women employed is more than 100 and the total number of workers does not exceed 2500 an additional woman Welfare Officer shall be appointed.

(b) Where there are more than one Welfare Officer appointed, one of them shall be called the Chief Welfare Officer and the others Assistant Welfare Officers.

(2) Qualifications.- A person shall not be eligible for appointment as a Welfare Officer, unless he -

(a) possesses a degree of a University recognised by the Government in this behalf;

(b) has obtained a degree or diploma in social science with specialization in industrial relations from any institution recognised by the Government in this behalf; and

(c) has adequate knowledge of the language spoken by the majority of the workers in the factory to which he is to be attached:

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Provided that the Competent Authority, may by notification grant exemption from the provisions of clause (b) in suitable cases till such time as qualified persons are available:

Provided further that, in the case of a person who is acting as a Welfare Officer at the commencement of these rules, the Competent Authority may, subject to such conditions as it may specify, relax all or any of the aforesaid qualifications.

(3) Appointment of Welfare Officers.-

(a) The appointment of welfare officers shall be done as per the extant government procedures.

(b) The appointment when made shall be notified by the occupier to the Competent Authority or such authority as the Competent Authority may specify for the purpose, giving full details of the qualifications, etc. of the officer appointed and the conditions of his service.

(4) Conditions of service of Welfare Officers.-

(a) A Welfare Officer shall be given appropriate status corresponding to the status of the other executive heads of the factory and he shall be started on a suitable scale of pay equivalent to that of group B officer, the minimum of which shall not be less than Rs.2000/- per month.

(b) The conditions of service of a Welfare Officer shall be the same as of other members of the staff of corresponding status in the factory.

(5) Duties of Welfare Officer.- The duties of a Welfare Officer shall be -

(a) to establish contacts and hold consultations with a view to maintaining harmonious relations between the factory management and workers;

(b) to bring to the notice of the factory management the grievances of workers, individual as well as collective, with a view of securing their expeditious redress and to act as a liaison officer between the management and labour;

(c) to study and understand the point of view of labour in order to help the factory management to shape and formulate labour policies and to interpret these policies to the workers in a language they can understand;

(d) to watch industrial relations with a view of using his influence in the event of a dispute between the factory management and workers and to help to bring about a settlement by

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persuasive effort;

(e) to advise on fulfillment by the management and the concerned departments of the factory of obligations, statutory or otherwise, concerning regulation of working hours, maternity benefit, medical care, compensation for injuries and sickness and other welfare and social benefit measures;

(f) to advise and assist the management in the fulfillment of its obligations, statutory or otherwise, concerning prevention of personal injuries and maintaining a safe work environment, in such factories where a Safety Officer is not required to be appointed under the enabling provisions under section 40 B;

(g) to promote relations between the concerned departments of the factory and workers which will bring about productive efficiency as well as amelioration in the working conditions and to help workers to adjust and adapt themselves to these working environments;

(h) to encourage the formation of Works and Joint Production Committees, Co-operative Societies and Welfare Committee, and to supervise their work;

(i) to encourage provision of amenities such as canteens, shelters for rest, creches, adequate latrine facilities, drinking water, sickness and benevolent scheme payments, pension and superannuation funds, gratuity payments, granting of loans and legal advice to workers;

(j) to help the factory management in regulating the grant of leave with wages and explain to the workers the provisions relating to leave with wages and other leave privileges and to guide the workers in the matter of submission of application for grant of leave for regulating authorised absence;

(k) to advise on provision of welfare facilities, such as housing facilities, foodstuffs, social and recreational facilities, sanitation, advice on individual personnel problems and education of children;

(l) to advise the factory management on questions relating to training of new starters, apprentices, workers on transfer and promotion, instructors and supervisors, supervision and control of notice board and information bulletins to further education of workers and to encourage their attendance at technical institutes; and

(m) to suggest measures which will serve to raise the standard of living of workers and in general promote their well- being.

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(6) Welfare Officers not to deal with disciplinary cases or appear on behalf of the management against workers.- No Welfare Officer shall deal with any disciplinary cases against workers or appear before a conciliation officer in a court or tribunal on behalf of the factory management against a worker or workers.

(7) Powers of exemption.- The Competent Authority may, by notification exempt any factory or class or description of factories from the operation of all or any of the provisions of this chapter, subject to compliance with such alternative arrangements as may be approved by such Competent Authority.

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CHAPTER VI

WORKING HOURS OF ADULTS

79. COMPENSATORY HOLIDAYS.-

(1) Except in the case of workers engaged in any work which for technical reasons must be carried on continuously throughout the day, the compensatory holidays to be allowed under sub-section (1) of section 53 of the Act shall be so placed that not more than two holidays are given in one week.

(2) The Manager of the factory shall display, on or before the end of the month in which holidays are lost, a notice in respect of workers allowed compensatory holidays during the following month and of the dates thereof, at the place at which the notice of periods of work prescribed under section 61 is displayed. Any subsequent change in the notice in respect of any compensatory holiday shall be made not less than three days in advance of the date of that holiday.

(3) Any compensatory holiday or holidays to which a worker is entitled shall be given to him before he is discharged or dismissed and shall not be reckoned as part of any period of notice required to be given before discharge or dismissal.

(4) (a) The Manager shall maintain attendance register:

Provided that, if the Competent Authority is of the opinion that any muster roll or register maintained as part of the routine of the factory or return made by the manager, gives in respect of any or all of the workers in the factory the particulars required for the enforcement of section 52 it may, by order in writing, direct that such muster roll or register or return shall, to the corresponding extent, be maintained in place of and be treated as the register or return required under this rule for that factory.

(b) The register maintained under clause (a) shall be preserved for a period of three years after the last entry in it and shall be produced before the Competent Authority on demand.

80. MUSTER ROLL FOR EXEMPTED WORKERS.-The manager of every factory in which workers are exempted under section 64 or 65 from the provisions of section 51 or 54 shall keep a muster roll. In this muster roll shall be correctly entered the overtime hrs. of work and payments therefor of all exempted workers. The muster roll shall always be available for inspection.

81. NOTICE OF PERIODS OF WORK FOR ADULTS.- The notice shall be displayed on the notice board.

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82. REGISTER OF ADULT WORKERS.- The register of adult workers shall be maintained as per the extant rules of the Central Government.

83. PERSONS DEFINED TO HOLD POSITIONS OF SUPERVISION OR MANAGEMENT.- The following persons shall be deemed to hold positions of supervision or management, namely:-

(1) All persons specified in the schedule to this rule, and

(2) Any other person who, in the opinion of the Competent Authority, holds a position of supervision or management.

SCHEDULE

1. General Managers, Managers or equivalent
2. Assistant Managers or equivalent & above
3. Engineers & Officers of Group A & B
4. Foremen/Supervisors

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84. LIST TO BE MAINTAINED OF PERSONS HOLDING CONFIDENTIAL POSITION OR POSITION OF SUPERVISION OF MANAGEMENT.- A list showing the names and designations of all persons to whom the provisions of sub-section (1) of section 64 have been applied shall be maintained in every factory.

85. EXEMPTION OF CERTAIN ADULT WORKERS.- Adult workers engaged in factories specified in column 2 of the schedule to this rule on the work specified in column 3 of the said schedule shall be exempted from the provisions of the sections specified in column 4 subject to the conditions, if any, specified in column 5 of the said schedule.

Rule 85 (Sch.)

SCHEDULE

Section of the Act empowering grant of exemption	Class of factory	Nature of exempted work	Extent of exemption	Remarks
1	2	3	4	5
64 (2)(a) and 64(3)	All factories	Urgent repairs.	Sections 51,52, 54,55, 56 and61.	(i) No worker shall be employed on such repairs for > 15 hours on any one day, 39 hrs during any three consecutive days, or 66 hrs. during each period of seven consecutive days commencing from his first employment on such repairs. (ii) Within 24 hours of commencement of the work notice shall be sent to the Competent Authority describing the nature of the urgent repairs and the period probably required for their completion. (iii) Exemption from the provisions of section 54 shall apply only in the case of adult male workers.

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Rule 85(Sch.)

1	2	3	4	5
64(2)(b) and 64(3)	All factories	(a) Work in the machine shop, the smithy or the foundry or in connection with the mill gearing, the electric driving or lighting apparatus, the mechanical or electrical lifts or the steam or water pipes or pumps of a factory.	Sections 51, 54, 55, 56 and 61.	The limits of work inclusive of overtime shall not exceed those mentioned in sub-section (4) of section 64.
		(b) Work of examining or repairing any machinery or other part of the plant which is necessary for carrying on work in the factory.	do	do
		(c) Work in boiler houses and engine rooms such as lighting fires in order to raise steam or generate gas preparatory to the commencement of regular work in the factory.	do	do
64(2)(c) and 64(3)	All factories	(a)Work performed by drivers on lighting, ventilating and humidifying apparatus.	Sections 51,54, 55 and 61.	do
		(b) Work performed by fire pumpmen.	do	do

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Rule 85(Sch.)

1	2	3	4	5
64(2)(d) and 64(3)	(1) Oil tank installations.	Work performed by workers connected with pumping operations.	Sections 51, 52, 54, 55, 56 and 61.	In the absence of a worker who has failed to report for duty, a shift worker shall be allowed to work the whole or part of a subsequent shift provided that- (i) the next shift of the shift worker shall not commence before a period of 16 hours has elapsed; (ii) within 24 hours of the commencement of the subsequent shift, notice shall be sent to the Competent Authority describing the circumstances under which the worker is required to work in the subsequent shift; (iii) the exemption will be restricted to only male adult workers; and

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Rule 85(Sch.)

1	2	3	4	5
				(iv)the limits of work inclusive of over time shall not exceed those mentioned in sub-section(4) of section 64.
	(2)Electrical transforming factories	Work of operation and maintenance of the transforming plant, switch yards such as substations etc.	do	do
	(3)Chemical factories.	All continuous processes such as production of heavy water.	do	do
	(4)All factories	Work on automatic equipment engaged in galvanizing, anodising and enamelling.	Sections 51, 52,54, 55,56 and 58.	(1)The limits of work inclusive of overtime shall not exceed those mentioned in sub-section (4) of section 64 (2)The exemption shall be granted only in respect of adult male workers.
		Loading and unloading of railway wagons, lorries or trucks	Sections 51, 52, 54, 55 & 56	do

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Rule 85(Sch.)

1	2	3	4	5
	Any factory or class or description of factories as may be notified by the Central/ State Govt. in the Official Gazette.	Work of national importance as may be notified by the Government in the Official Gazette.	Sections 51, 52,54, 55,56 & 58.	(1)The limit of work inclusive of overtime shall not exceed those mentioned in sub-section (4) of section 64. (2)The exemption shall be limited to adult male workers.

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Explanations:-

1. The following shall be considered to be urgent repairs:-

   (a) repairs to any part of the machinery, plant or structure of a factory which are of such a nature that delay in their execution would involve danger to human life or safety or the stoppage of manufacturing process;

   (b) breakdown repairs to the motive power, transmission or other essential plant of other factories, collieries, railways, dockyards, harbours, tram-ways, motor transport, gas, electrical generating and transmission, pumping or similar essential or public utility services carried out in general engineering works and foundries and which are necessary to enable such concerns to maintain their main manufacturing processes, production or services during normal working hours;

   (c) repairs in connection with a change of motive power, for example, from steam to electricity or vice versa, when such work cannot possibly be done without stoppage of the normal manufacturing process.

2. Periodical cleaning is not included in the terms "examining" or "repairing".

Rule 86

CHAPTER VII

EMPLOYMENT OF YOUNG PERSONS

86. EMPLOYMENT OF YOUNG PERSONS IN THE CENTRAL GOVERNMENT DEPTS./CENTRAL GOVERNMENT OWNED FACTORIES/CENTRAL GOVERNMENT ENTERPRISES & THEIR CONTRACTORS.- No contractor shall employ or cause to be employed any person who is less than 18 years of age.

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Rule 87

CHAPTER VIII

ANNUAL LEAVE WITH WAGES

87. Maintenance of Register of by Factories exempted under Section 84 of the Act.- Factories exempted by the Competent Authority after ascertaining that the leave rules applicable to workers in a factory provide benefits which are not less favourable than those provided for in the Chapter VIII of the Factories Act,1948 (63 of 1948) shall:-

(1) Maintain a register showing the leave due, leave taken and wages granted in respect of each employee.

(2) Display a notice giving full details of the system of leave with wages established in the factory for the information of workers and make a copy of the same available to the Inspector.

(3) Make no alteration in the scheme approved by the Competent Authority at the time of granting of exemption without its previous sanction.

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Rule 88

CHAPTER IX

SPECIAL PROVISIONS

88. DANGEROUS MANUFACTURING PROCESSES OR OPERATIONS.-

(1) The following manufacturing processes or operations when carried on in any factory are declared to be dangerous manufacturing processes or operations, namely:-

I. 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.

II. Chemicals & Chemical works.

III. Manipulation of stone or any other materials containing free silica

IV. Grinding or glazing of metals

V. Handling or manipulation of corrosive substances.

VI. Foundry.

VII. Electrical work.

VIII. Beryllium operations

IX. Zirconium operations.

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

XI. Operations involving high noise level.

XII. Highly flammable liquids & flammable compressed gases.

XIII. Radioactive substances.

XIV. Laser & Optical Radiations.

XV. Motor Vehicle Garages.

XVI. Cryogenic Liquids.

XVII. Alkali Metals.

(2) 'First Employment' means employment for the first time in a hazardous process or operation so notified under section 87,or

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re-employment therein after cessation of employment in such process or operation for a period exceeding three calendar months.

(3) The provisions specified in the schedules to this rule shall apply to any class or description of factories wherein dangerous manufacturing processes or operations specified in each schedule are carried on.

(4) The occupier of the factory will pay the required fees for the medical examinations of workers to be carried out by the Certifying Surgeon as required by the schedule annexed to this rule.

(5) Notwithstanding the provisions specified in schedules to this rule, the Inspector may by issue of orders in writing to the manager or occupier or both, direct them to carry out such measures, and within such time as may be specified in such order with a view to removing conditions dangerous to the health of workers or to suspend any process where such process constitutes, in the opinion of the inspector imminent danger of poisoning or toxicity.

(6) Any register or record of medical examinations and tests connected therewith required to be carried out under any of the schedules to this rule in respect of any worker shall be kept readily available to the Competent Authority and shall be preserved till the expiry of one year after the worker ceases to be in employment of the factory.

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SCHEDULE I

ELECTROPLATING

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.- For the purposes of this Schedule -

(a) "electrolytic process" means the electrolytic plating or oxidation of metal articles by the use of 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.

Rule 88 (Sch.I)

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.- No women, shall be employed or permitted to work at a bath.

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

5. Protective devices.-

   (a) 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 -

      (i) waterproof aprons and bibs; and

      (ii) for persons actually working at a bath, loose-fitting rubber gloves and rubber boots or other waterproof footwear & chemical goggles.

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

6. Water facilities.-

   (a) There shall be provided & maintained in good repair for the use of all persons employed in electrolytic process & processes incidental to it -

      (i) a wash place under cover, with either

         (1) a trough with a smooth impervious surface filled with a waste pipe, & of sufficient length to allow at least 60 cm for every 5 persons employed at any one time, & having a constant supply of water from taps or jets above the trough at intervals of not more than 60cm.; or

         (2) at least one wash basin for every 5 such persons employed at any one time, fitted with a waste pipe & having a constant supply of water laid on.

      (ii) a sufficient supply of clean towels renewed daily,

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and soap or other suitable cleaning material.

(b) In addition to the facility in sub-paragraph(a) an approved type of emergency shower with eye fountain shall be provided and maintained in good working order, where ever 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

1. Chemicals handled in this plant are corrosive and poisonous.

2. Smoking, chewing tobacco, eating food or drinking, in this area is prohibited. No food stuff or drink shall be brought in this area.

3. Some of these chemicals may be absorbed through the skin and may cause poisoning.

4. A good wash shall be taken before meals.

5. Protective devices supplied shall be used while working in this area.

6. Spillage of the chemicals on any part of the body or on the floor shall be immediately washed away with water.

7. All workers shall undergo the prescribed medical tests regularly to protect their own health.

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

(a) The occupier of every factory in which electrolytic processes are carried on shall -

(i) employ a qualified medical practitioner for medical surveillance of the workers employed therein whose appointment shall be subject to the approval of the Competent Authority ;

(ii) provide to the said medical practitioner all the necessary facilities for the purpose referred to in clause (i); and

(iii) maintain a sufficient supply of suitable barrier cream, ointment & 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.

(b) 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.

(c) The record of the examinations referred to in sub- paragraph (b) shall be maintained in a separate register in Form 1A which shall be kept readily available for inspection by the inspector.

9. Medical examination by the Certifying Surgeon.-

(a) 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-

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

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

(iii) in case of cadmium plating, test for cadmium in urine & alpha - 2 microglobulin in urine.

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

(c) 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 & nickel plating processes for whom this examination shall be carried out once in every 6 months. Such re-examination shall, wherever the Certifying Surgeon considers appropriate, include tests as specified under sub- paragraph (a) excluding the X-ray of the chest which shall not be required normally to be carried out earlier than once in three years.

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(d) The Certifying Surgeon after examining a worker, shall issue a Certificate of Fitness in Form 1. 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 (a) and (b), including the nature and the results of the tests, shall also be entered by the Certifying Surgeon in a health register in Form 1A.

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

(f) 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 shall 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.

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

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SCHEDULE II

CHEMICALS AND CHEMICAL WORKS

PART I

1. Application.- This schedule shall apply to all manufactures and processes incidental thereto carried on in chemical works.

2. Definitions.- For the purposes of this schedule -

(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 environment of any place in which work is carried on;

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(c) "bleaching powder" means the bleaching powder commonly called chloride of 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 permissible level of exposure abbreviated as PLE, as specified in the Second Schedule of section 41 F, exceeds the concentration specified therein would make the substances 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 BIS specifications or in the absence of it, personal protective equipment approved by the Competent Authority;

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(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' of this Schedule

1. Housekeeping.-

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

(b) Floors, platforms, stairways, passages & gangways shall be kept free of any obstructions.

(c) 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 of chemicals or solvents shall be permitted to be used by workers for any purposes other than the 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.-

(a) 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 of testing of material or substances used in the process or using any contaminated container for drinking or eating, to which the workers' attention shall be drawn for ensuring their safety & health.

(b) In addition to the above customary 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 shall 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

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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.-

(a) 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 workers, which may occur during manufacture.

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

(c) 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.

(d) The requirements under the sub-para (a) to (c) 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 on or where dangerous chemical reactions are taking place or where hazardous chemical reactions are taking place or where hazardous chemicals are stored.

7. Examination of instruments and safety devices.-

(a) 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.

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Records of such tests and examinations shall be maintained in a register.

(b) 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 BIS specifications governing their construction and use for that area.

9. Handling and storage of chemicals.-

(a) 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 labeling 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 BIS 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.

(b) 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 Second Schedule of Section 41F.

(c) Without prejudice to the generality of the requirements in sub-para (b) 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 , capacity of flooring and the compatibility requirements of substances with other chemicals stored nearby.

(d) (i) 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.

(ii) Whenever the quantities laid down in the above clause (a) are to be exceeded, the permission of the Competent Authority shall be obtained.

(iii) Notwithstanding anything contained in clause(i)& (ii) above, the Competent Authority may direct any factory

carrying out processes covered in Appendix 'A' to further limit the storage of hazardous substances to quantities less than two months on considerations of safety.

(e) Standby arrangements equal to the biggest container shall always be available to transfer the toxic substances quickly into the standby storage facility if any defect develops in any of the container resulting in the release of toxic substances.

(f) Any storage facility constructed using nonmetallic material such as Fibreglass 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, pipelines 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.-

(a) 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.

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

(c) As regards any doubt regarding the appropriateness of any personal protective equipment, the decision of the Competent Authority shall be final.

12. Alarm Systems.-

(a) Suitable and effective alarm systems giving audio-visual 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 at least once in a month to ensure its performance efficiency at all times.

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(b) The Competent Authority 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 or escape of substances into the work atmosphere.-

(a) Effective arrangements such as, enclosure, or by pass, or 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 such are likely to give rise to fire or explosion or toxic hazards during normal working and in the event of accident or emergency.

(b) 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.

(c) The substances that would have escaped into the work atmosphere before taking immediate steps as required in sub-para (b), 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 provision, 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 or blanketing or other effective arrangements shall come into operation.

15. Testing, examination and repair of plant & equipment.-

(a) All parts of plant, 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 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:-

(i) 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 matter . 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 pyrophoric nature or contains spontaneously combustible chemicals;

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(ii) as soon as the test is completed, the vessel 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

(iii) 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 Competent Authority.

(b) 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.

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

(d) 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, butt welding of joints shall be preferred. Wherever necessary, the responsible person shall regulate the aforesaid work through a 'Permit to work system'.

16. Staging.-

(a) 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 processes 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 Standards & Specifications.

(b) 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.

(c) All the staging constructed for the purpose of this para shall give appropriate access which are safe and shall be fitted with proper hand rails to a height of one metre and toe 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 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

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atmosphere.

18. Entry into or work in confined spaces.-

(a) 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-

(i) 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;

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

(iii) before testing the confined space for entry into or 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;

(iv) 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;

(v) 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.

(b) 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, the location of the work and such other details that would have a bearing on the safety and health of the 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.-

(a) All the work connected with the maintenance of plants and equipment including cleaning of empty

containers which have 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.

(b) 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-alia 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 a knowledgeable 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, purging, 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';

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(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 or 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.-

(a) 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.

(b) 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.

(c) The occupier shall send the list of emergencies and the details of procedures and plans formulated to meet the emergencies, to the Competent Authority.

(d) The occupier shall arrange to install distinctive and recognizable warning arrangements to caution all persons inside the plant as well as the neighbouring 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.

(e) Alternate power supply arrangements shall be made and interlocked with the 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 of Part II, Part III, Part IV and Part V of this Schedule.

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

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

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

(i) The occupier shall arrange to have ten percent 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.

(j) 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.-

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

(b) 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.

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PART III

Fire and Explosion Risks & Counter Measures

1. Sources of ignition including lighting installation.-

(a) 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.

(b) 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.

(c) 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.

(d) 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.

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

(f) Smoking in process areas 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 specified areas.

2. Static electricity.-

(a) 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.

(b) 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. Lightning protection.- Lightning protection arrangement 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 and 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.-

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

(b) Waste material in contact with flammable substances shall be disposed off suitably under the supervision of knowledgeable and responsible person.

(c) Adequate and suitable fire-fighting appliances shall be installed in the vicinity of such vessels.

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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 pipe line 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 any deterioration or defects, or accumulation of flammable or explosive substances, and record kept of any defects found and repairs made.

8. Fire fighting systems.-

(a) Every factory employing 500 or more persons and carrying out processes listed in Appendix 'A' shall provide -

(i) 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 be available at any time. The squad shall consist of watch & ward personnel, fire pumpman and departmental supervisors and operators trained in the operation of fire & emergency services;

(ii) squad leaders shall preferably be trained in a recognised government institution and their usefulness enhanced by providing residence on the premises; and

(iii) squad personnel shall be provided with clothing and equipment including helmets, boots and belts.

(b) 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 of emergency.

(c) 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.

(d) 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 areas.

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PART IV

Risks of Toxic Substances

1. Leakage.-

   (a) All plants shall be so designed and constructed as to prevent the escape of toxic substance. Where necessary, separate buildings, rooms, or protective process and the buildings shall be so designed as to localise any escape of toxic substances.

   (b) 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 specifically provided for this purpose where in deleterious material shall be neutralised, treated or otherwise rendered safe before it is discharged into public drains or sewers.

3. Covering of vessels.-

   (a) 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.

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

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

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

   (i) saturators used in the manufacture of sulphate of ammonia; and

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

4. Continuous exhaust arrangement.-

   (a) 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.

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(b) 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.-

(a) 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.

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

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

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PART V

Special Precautions

1. Special precautions for Nitro or Amino Processes.-

(a) Unless the crystallised 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.

(b) 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.

(c) Filling of containers with nitro or amino compounds shall be done only by using a suitable scoop to avoid physical contact and the drying of 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.

(d) 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.

(e) 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'.-

(a) 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.

(b) 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.

(c) 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 form 1A.

(d) There shall be always available at designated places of work suitable ointment such as glycerine, vaseline, 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.-

(a) Process 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 wiremesh covering to protect persons working nearby in the event of breakage of glass vessel.

(b) Any spillage or emission 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.-

(a) 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.

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(b) The personnel 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.

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

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

5. Special precautions in the use of plant and equipment made from reinforced plastics.-

(a) All plant and equipments shall conform to appropriate Indian or any other National Standards.

(b) Care shall be taken during storage, transport handling and installation of plant and equipments to avoid accidental damage.

(c) All plant and equipments shall be installed in such a way as to ensure that loads are distributed as intended in design or as per the recommendations of the manufacturers.

(d) All pipe work shall be supported so that total loads local to the branches on the vessel or tank do not exceed their design values.

(e) After erection all plant and equipments shall be subjected to a pressure test followed by a thorough examination by a competent person. The test and examination shall be as per relevant Standard. A certificate of test and examination by competent person shall be obtained and kept available at site.

(f) All plant and equipments shall be subjected to periodical test and examination and record maintained as per Paragraph 15 in Part II of this Schedule.

(g) Plant and equipments during their use shall not be subjected to over filling or over loading beyond rated capacity.

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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, namely:-

(a) Fully equipped first aid box;

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

TABLE

No. of persons employed at any time	No. of drenching showers
Up to 50 persons	2
between51 to 100	3
101 to 200	3+1 for every 50 persons thereafter
201 to 400	5+1 for every 100 " "
401 and above	7+1 for every 200 " "

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(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 -

(a) For factories employing up to 50 workers-

(i) the services of a qualified medical practitioner here-in - after known as Factory Medical Officer, shall be available 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;

(ii) a minimum of five persons trained in first aid procedures, amongst whom at least one shall always be available during the working period; and

(iii) a fully equipped first aid box.

(b) For factories employing 51 to 200 workers -

(i) the occupational health centre shall have a room having a minimum floor area of 15 sq.m , with floors and walls made of smooth, hard and impervious surface and shall be adequately illuminated, ventilated and equipped;

(ii) services of medical doctor shall be available in normal working hours as well as during emergency at centre;

(iii) there shall be one qualified and trained dresser-cum- compounder on duty throughout the working period; and

(iv) a fully equipped first aid box.

(c) For factories employing above 200 workers-

(i) there shall be one full-time Factory Medical Officer for factories employing up to 500 workers and one more medical officer for every 1000 workers or part thereof;

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

(iii) there shall be one trained nurse, one dresser-cum- compounder and one sweeper-cum-ward boy throughout the working period; and

(iv) the Occupational Health Centre in this case shall be suitably equipped to manage medical emergencies.

3. Ambulance van.-

(a) 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.

(b) 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.

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4. Medical examination.-

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

(i) once before employment, to ascertain physical suitability of the person to do the particular job;

(ii) once in a period of 6 months, to ascertain the health status of the worker; and

(iii) the details of pre-employment and periodical medical examinations carried out as aforesaid shall be recorded in the prescribed form 1.

(b) Any finding 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 incapaciated 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 worker 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.

(c) 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.

(d) The worker suspended from the process owing to the circumstances covered in sub-para (b) 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.

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PART VII

Additional Welfare Amenities

1. Washing facilities.-

   (a) 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 115 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.

   (b) 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.-

   (a) The occupier of all the factories carrying out process 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 well ventilated and provided with tables and sitting facilities along with the provision of cold and hygienic drinking water facilities.

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

3. Cloakroom facilities.-

   (a) The occupier of every factory carrying out any process covered in Appendix 'A' shall provide for all the workers employed in the process cloak room 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.

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

4. Special bathing facilities.-

   (a) The occupier of any factory carrying out the process 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.

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Rule 88(Sch.II)

(b) The occupier shall insist all the workers employed in the 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 shall also effectively prevent such of those workers taking bath in any place other than the bathing facilities.

(c) Notwithstanding anything contained in sub-para (a) above, the Competent Authority 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

Duties of Workers

1. Duties of workers.-

(a) Every worker employed in the processes covered in Appendix 'A' and appendix 'B' shall not make 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.

(b) Before commencing any work, all workers employed in processes covered in Appendix 'A' shall check their workplace 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.

(c) 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 use all the personal protective equipments issued to them in a careful manner.

(d) 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 shall be used.

(e) 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 the Schedule, in such a manner as to cause risk to themselves as well as or to others employed.

(f) The workers shall not refuse undergoing medical examination as required under these rules.

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PART IX

No women shall be employed in the processes covered under Appendix 'A'

PART X

EXEMPTIONS

1. Power of Exemption.- The Government or subject to the control of the Government, the Competent Authority 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 and/or 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 the 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; and

(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 chlorine gas is produced in chlor-alkali plants.

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

(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 substituted derivatives, such as chloroform, ethylene glycol, formaldehyde, benzyl chloride, phenol, methyl ethyl ketone peroxide , cobalt carbonyl, tungsten carbide etc. are manufactured or recovered.

Appendix B

Concerning Special Bathing Accommodation in pursuance of Para 4 of Part VII.

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 chloralkali 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 :

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General :-

- A wheeled stretcher with folding and adjusting devices; Head of the stretcher must be capable of being tilted upward;
- Fixed suction unit with equipments;
- Fixed oxygen supply with equipments;
- Pillow with case;
- Sheets;
- Blankets;
- Towels;
- Emesis bag;
- Bed pan;
- Urinal;
- Glass.

Safety equipment:-

- Flares with life of 30 minutes
- Flood lights;
- Flash lights;
- Fire extinguisher dry powder type;
- Insulated gauntlets.

Emergency care equipments:-

Resuscitation:-

- Portable suction unit;
- Portable oxygen unit;
- Bag-valve-mask, hand operated artificial ventilation unit;
- Airways;
- Mouth gags;

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- Tracheotomy adaptors;
- Short spine board;
- I.V. Fluids with administration unit;
- B.P. monitor;
- Cugg;
- Stethoscope.

Immobilization:-

- Long & short padded boards;
- Wire ladder splints;
- Triangular bandage;
- Long & short spine boards.

Dressings:-

- Gauze pads - 10 cm x 19 cm ;
- Universal dressing -25 cm X 90 cm ;
- Roll of aluminium foils;
- Soft roller bandages 15 cm X 5 m ;
- Adhesive tape in 7.5 cm roll;
- Safety pins;
- Bandage sheets;
- Burn sheet.

Poisoning:-

- Syrup of Ipecac; |
- Activated charcoal; Prepacketed in doses
- Snake bite kit;
- Drinking water.

Emergency Medicines:-

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

SCHEDULE III

MANIPULATION OF STONE OR ANY OTHER MATERIAL

CONTAINING FREE SILICA

1. Application.- This schedule 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.- For the purpose of this Schedule -

   (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) damping 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 Second Schedule of section 41 F

   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.-

   (a) All floors or places where fine dust is likely to settle on and where on any person has to work or pass shall be of impervious material and maintained in such condition 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.

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(b) The surface of every floor of every work room or place where any work is carried on or where any person has to pass during the course of his work, shall be cleansed of dust once at least 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. Medical facilities and records of examinations and tests.-

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

(i) employ a qualified medical officer for medical surveillance of the worker employed therein whose employment shall be subject to the approval of the Competent Authority; and

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

(b) The record of medical examination and appropriate tests carried out by the said medical officer shall be maintained in a separate register in form 1A and shall be kept readily available for inspection by the Inspector.

6. Medical examination by Certifying Surgeon.-

(a) 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.

(b) 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 (a) except chest X-ray which will be once in 3 years.

(c) The Certifying Surgeon after examining a worker, shall issue a Certificate of Fitness in Form 1 . 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 (a) and (b), including the nature and the results of the tests, shall also be entered by the Certifying Surgeon in a health register in Form 1A.

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

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(e) 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 shall 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.

(f) No person who has been found unfit to work as said in sub-paragraph (e) 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.

7. Exemptions.- If in respect of any factory, the Competent Authority 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 Competent Authority 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.

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SCHEDULE IV

GRINDING OR GLAZING OF METALS AND PROCESSES INCIDENTAL THERETO

1. Exception.-

(a) Nothing in this schedule 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.

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

2. Definitions.- For the purposes of this schedule -

(a) grindstone" means a grindstone composed of natural or manufactured sandstone but does not include a metal wheel or cylinder into which blocks of natural or manufactured sandstone are fitted;

(b) "abrasive wheel" means a wheel manufactured of bonded

emery or similar abrasive;

(c) "grinding" means the abrasion, by aid of mechanical power, of metal, by means of a grindstone or abrasive wheel;

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

(e) "racing" means the turning up, cutting or dressing of a revolving grindstone before it is brought into use for the first time;

(f) "hacking" means the chipping of the surface of a grindstone by a hack or similar tool; and

(g) "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 so 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, 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 Competent Authority may accept any other appliance that is, in his opinion, as effective 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 interceptions of dust are provided in accordance with the requirements of paragraph 3.

7. Examination of dust equipment.-

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

(b) A register containing particulars of such examination and tests shall be kept in Form 10.

8. Medical facilities and record of examinations and tests.-

(a) The occupier of every factory in which grinding or glazing of metals are carried out, shall -

(i) employ a qualified medical practitioner for medical surveillance of the workers employed therein whose appointment shall be subject to the approval of the Competent Authority ; and

(ii) provide to the said medical practitioner all the necessary facilities for the purpose referred to in the sub-paragraph (i) above.

(b) The record of medical examinations and appropriate tests carried out by the said medical practitioner shall be maintained in a separate register in Form 1A and which shall be kept readily available for inspection by the Competent Authority.

9. Medical examination by Certifying Surgeon.-

(a) Every worker employed in grinding or glazing of 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.

(b) Every worker employed in the said processes shall be re-examined by a Certifying Surgeon at least once in every 12

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calendar months. Such re-examination shall, wherever the Certifying Surgeon considers appropriate, include tests as specified in sub-paragraph(a).

(c) The Certifying Surgeon after examining a worker, shall issue a Certificate of Fitness in Form 1. 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 (a) and (b),including the nature and the results of the tests, shall also be entered by the Certifying Surgeon in a health register in Form 1A.

(d) The Certificate of Fitness and the health register shall be kept readily available for inspection by the Competent Authority.

(e) 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 shall also include the period for which he considers that the said 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.

(f) No person who has been found unfit to work as said in sub-paragraph (e) 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 Competent Authority 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.

SCHEDULE V

HANDLING OR MANIPULATION OF CORROSIVE SUBSTANCES

1. Definitions.- For the purposes of this schedule -

(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 acid, phosphoric acid, liquid chlorine, liquid bromine, ammonia, sodium hydroxide and potassium hydroxide and a mixture thereof, and any other substance which the Competent Authority will notify 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.-

(a) 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 kept 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.

(b) The protective equipment and preparations provided shall be used by the persons employed in any corrosive operation.

4. Water facilities.- Where any corrosive operation is carried on, there shall be provided as close to the place of such operation as possible, an eyewash fountain or a source of clean water at a height of 210 cm. from a pipe of 1.25 cm. 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. Wherever necessary, in order to ensure continuous water supply a storage tank having a minimum length, breadth and height of 210 cm., 120 cm. and 60 cms respectively or such dimensions as are approved by the Competent Authority 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.

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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.-

(a) 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 sound construction and of sufficient strength.

(b) 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.

(c) Containers for corrosive substances shall be plainly labeled.

7. Devices for handling corrosives.-

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

(b) Corrosive substance shall not be handled by bare hands but by means of a suitable scoop or other device.

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.-

(a) 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).

(b) 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 worker's safety.

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(c) 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.-

(a) 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.

(b) 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.

(c) 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. Defects so found out shall be removed forthwith. A register shall be maintained of every such examination made and shall be produced before the Competent Authority 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 how 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 on an application made by the manager, the Competent Authority is satisfied that owing to the exceptional circumstances, or the infrequency of the process or for any other reason to be recorded by it in writing, all or any of the provisions of this schedule are not necessary for the protection of the persons employed therein, it may by a certificate in writing, which it may at any time revoke, exempt the factory from such of the provisions and subject to such conditions as it may specify therein.

SCHEDULE VI

FOUNDRY

1. Application.- Provisions of this schedule shall apply to all parts of factories where any of the following operations or processes are carried on:

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(a) the production of iron castings or, as the case may be, steel casings by casting in moulds made of sand, loam, moulding composition or other mixture of materials, or by shell 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 shell mouldings, die-casting (including pressure die casting), 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 -

(i) any process with respect to the smelting and manufacture of lead and the Electric Accumulators;

(ii) any process for the purposes of a printing works; or

(iii) any smelting process in which metal is obtained by a reducing operation or any process incidental to such operation; or

(iv) the production of steel in the form of ingots; or

(v) any process in the course of the manufacture of solder or any process incidental to such manufacture; or

(vi) 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. Definition.-For the purpose of this schedule-

(a) "approved respirator" means a respirator of a type approved by the Competent Authority;

(b) "cupola or furnace" includes a receiver associated therewith;

(c) "dressing of 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 electrical heaters in the case of electrically heated ovens or furnaces.

(d) "foundry" means those parts of a factory in which the production of iron or steel or nonferrous castings(not being the

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production of steel in 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 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 and in the course of, such production, namely, the preparation and mixing of materials used in foundry process, the preparation of moulds and cores, knockout operations and dressing or fettling operations;

(e) "knock-out operations" means all methods of removing castings from moulds and the following operations, castings from moulds and the following operations, when done in connection therewith, namely, stripping, coring-out and the removal of runners and risers;

(f) "pouring aisle" means as aisle leading from a main gangway or directly from a cupola or furnace to where metal is poured into moulds.

3. Prohibition of use of certain materials as parting materials .-

(a) 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 percent by weight of the dry material :

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 -

(i) Zirconium silicate (Zircon).

(ii) Calcined china clay.

(iii) Calcined aluminous fireclay.

(iv) Sillimanite.

(v) Calcined or fused alumina.

(vi) Olivine.

(vii) Natural sand.

(b) 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 workrooms the following requirements shall be observed -

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(a) moulding boxes, loam plates, laddles, 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.-

(a) 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.

(b) 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.

(c) 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.-

(a) All accessible parts of the walls of every indoor workplace 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 m 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).

(b) Effective cleaning by a suitable method shall be carried out at least once every working day of 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.-

(a) 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 -

(i) which is adequate for the safe performance of the work and

(ii) which, so far as reasonably practicable, is kept free from obstruction.

(b) 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, where 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.-

(a) 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 gangways shall be provided and properly maintained which -

(i) 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;

(ii) shall be kept, so far as reasonably practicable, free from obstruction;

(iii) if not used for carrying molten metal, shall be at least 920 mm wide; and

(iv) if used for carrying molten metal shall be -

(1) where truck ladles are used exclusively, at least 600 mm wider than the overall width of the ladle;

(2) where hand shanks are carried by not more than two men, at least 920 mm in width;

(3) where hand shanks are carried by more than two men, at least 1.2 m in width; and

(4) where used for simultaneous travel in both directions by men carrying hand shanks, at least 1.8 m in width.

(b) 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

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shall be provided and properly maintained which -

(i) 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;

(ii) shall be kept so far as reasonably practicable free from obstruction;

(iii) if molten metal is carried in hand ladles or bull ladles by not more than two men per ladle, shall be at least 460 mm wide, but where any moulds alongside the aisle are more than 510 mm above the floor of the aisle, the aisle shall be not less than 600 mm wide;

(iv) if molten metal is carried in hand ladles or bull ladles by more than two men per ladle, shall be at least 760 mm wide; and

(v) if molten metal is carried in crane, trolley or truck ladles, the same shall be of a width adequate for the safe performance of the work.

(c) Requirements of sub-paragraph (a) & (b) 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.

(d) In this Paragraph "workroom to which this Paragraph applies" means a part of 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.- No person shall carry out any work within a distance of 4 m 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 m from a vertical line 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 shall be carried out within that distance or 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.

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10. Dust and fumes.-

(a) Open coal, coke or wood fires shall not be used for heating or drying ladles inside a workroom unless adequate measures are taken to prevent, so far as practicable, fumes or other impurities from entering into or remaining in the atmosphere of the workroom.

(b) 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.

(c) Mould stoves, core stoves 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.

(d) All knock-out operations shall be carried out -

(i) 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

(ii) 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.

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(e) All dressing or fettling operations shall be carried out -

(i) in a separate room or in a separate part of the foundry suitably partitioned off; or

(ii) 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 equally effective means of suppressing dust, operating as near as possible to the point of origin of the dust.

11. Maintenance and examination of exhaust plant.-

(a) All ventilating plants used for the purpose of extracting, suppressing or controlling dust or fumes shall be properly maintained.

(b) All ventilating plants used for the purpose of extracting, suppressing or controlling dust or fumes shall be examined and inspected once every week by a responsible person.

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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 Form 10 which shall be available for inspection by an inspector. Any defect found on any 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.

12. Protective Equipment.-

(a) The occupier shall provide and maintain suitable protective equipment specified for the protection of workers-

(i) 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;

(ii) 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.

(b) No respirator provided for the purposes of clause (a)(ii)has been worn by a person shall be worn by another person if it has not since been thoroughly cleaned and disinfected.

(c) Persons who for any of their time -

(i) 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 that its contact with the body would cause a burn; or

(ii) are engaged in, or in assisting with, the pouring of molten metal; or

(iii) carry by hand or move by manual power any ladle or mould containing molten metal; or

(iv) are engaged in knocking-out operations involving material at such a temperature that its contact with the body would cause a burn; shall be provided with suitable footwear and gaiters which when worn by them prevent, so far as reasonably practicable, risk or burns to his feet and ankles.

(d) Where appropriate, suitable screens shall be provided for protection against flying materials (including splashes of

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molten metal and sparks and chips thrown off in the course of any process).

(e) The occupier shall provide and maintain suitable accommodation for the storage and make adequate arrangements for cleaning and maintaining of the protective equipment supplied in pursuance of this paragraph.

(f) Every person shall make full and proper use of the equipment provided for his protection in pursuance of subparagraphs (a) and (d) and shall without delay report to the occupier, manager or other appropriate person any defect in, or loss of, the same.

13. Washing and bathing facilities.-

(a) There shall be provided and maintained in clean state and good repair for the use of all workers employed in the foundry -

(i) a wash place under cover with either -

(1) a trough with impervious surface fitted with a waste pipe without plug, and of sufficient length to allow at least 60 cm 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 cm.; or

(2) 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 m apart; and

(ii) not less than one half of the total number of washing places provided under sub-para (i) above, shall be in the form of bath rooms.

(iii) a sufficient supply of clean towels made of suitable material changed daily, with sufficient supply of nail brushes and soap.

(b) The facilities provided for the purposes of sub- paragraph (a) shall be placed in charge of a responsible person or persons and maintained in a clean and orderly condition.

14. Disposal of dross and skimmings.- Dross and skimmings removed from molten metal or taken from a furnace shall be placed forthwith in suitable receptacles.

15. 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.

16. Material and equipment left out of doors.- All material and equipment left out of doors (including material sand equipment so left only temporarily or occasionally) shall be so arranged and placed as to avoid unnecessary risk. There shall be safe means of access to all such material and equipment and, so far as reasonably practicable, such access shall be by roadways or pathways shall have a firm and even surface and shall, so far as reasonably practicable be kept free from obstruction.

17. Medical facilities and records of examinations and tests.-

(a) The occupier of every factory to which the Schedule applies, shall-

(i) employ a qualified medical practitioner for medical surveillance of the workers employed therein whose employment shall be subject to the approval of the Competent Authority ; and

(ii) provide to the said medical practitioner all the necessary facilities for the purpose referred to in sub- paragraph (i) above.

(b) The record of medical examinations and appropriate tests carried out by the said medical practitioner shall be maintained in a separate register -Form 1A- which shall be kept readily available for inspection by the Competent Authority.

18. Medical examination by Certifying Surgeon.-

(a) 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.

(b) 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 (a) except chest X-ray which will be once in 3 years.

(c) The Certifying Surgeon after examining a worker, shall issue a Certificate of Fitness in Form 1 . 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 (a) and (b), including the nature and the results of the tests, shall also be entered by the Certifying Surgeon in a health register in Form 1A.

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(d) The Certificate of Fitness and the health register shall be kept readily available for inspection by an inspector.

(e) 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 the said certificate and documents shall also include the period for which he considers that the said person is unfit for work in the said processes.

(f) No person who has been found unfit to work as said in sub-paragraph(e) 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.

19. Exemption.- If in respect of any factory, the Competent Authority 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 Competent Authority 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.

SCHEDULE VII

ELECTRICAL WORK & ELECTRICAL INSTALLATIONS

1. Scope. This schedule covers safety procedures and practices in electrical work, fire safety of electrical installations and transformer protection.

2. Permit-to work system.-

(a) All work on major electrical installations shall be carried out under permit-to-work system, unless standing instructions are issued by the competent authority to follow other procedures. In extenuating circumstance, such as for the purpose of saving life or time in the event of an emergency, it may become necessary to start the work without being able to obtain the necessary permit-to-work; in such cases, the action taken shall be reported to the person-in-charge as soon as possible. The permit-to-work certificate from the person-in-charge of operation to the person-in-charge of the men selected to carry out any particular work ensures that portion of the installation where the work is to be carried out is rendered dead and safe for working. All work shall be carried out under the personal supervision of a competent person. If more than one department is working on the same apparatus, a

permit-to-work shall be issued to the person-in-charge of each department.

(b) No work shall be commenced on live mains unless it is specifically intended to be so done by specially trained staff. In such cases all possible precautions shall be taken to ensure the safety of the staff engaged for such work, and also of others who may be directly or indirectly connected with the work. Such work shall only be carried out with proper equipment provided for the purpose and, after taking necessary precautions, by specially trained and experienced persons who are aware of the danger that exists when working on or near live mains or apparatus.

(c) On completion of the work for which the permit-to-work is issued, the person-in-charge of the maintenance staff should return the permit duly discharged to the issuing authority.

(d) In all cases, the issue and return of permits shall be recorded in a special register provided for that purpose.

(e) The permits shall be issued not only to the staff of the supply under takings, but also to the staff of other departments, contractors, engineers, etc, who might be required to work adjacent to live electrical mains or apparatus.

(f) Permit books shall be treated as important records. All sheets in the permit books and the books themselves shall be serially numbered. No page shall be detached or used for any other except bonafide work. If any sheet is detached, a dated and initialed statement shall then and there be recorded in the book by the person responsible for it.

(g) Permit books shall be kept only by the person-in-charge of operations who shall maintain a record of the receipts and issues made by him.

3. Safety instructions.-

(a) Safety Instructions for Working on Mains and Apparatus up to and including 650V-

(i) Work on Dead, Low and Medium Voltage Mains and Apparatus - Unless a person is authorised to work on live mains and apparatus all mains and apparatus to be worked upon shall be isolated from all sources of supply before starting the work, proved dead, earthed and short-circuited. For earthing and short-circuiting, measures shall be taken against the inadvertent energizing of the mains and apparatus.

(ii) Work on Live Mains and Apparatus - Only competent, experienced and authorized persons shall work on live mains

and apparatus, and such persons shall take all safety measures as may be required.

Warning boards shall be attached on or adjacent to the live apparatus and at the limits of the zone in which work may be carried out.

Immediately before starting work, rubber gauntlets, if used, shall be thoroughly examined to see whether they are in sound condition. Under no circumstances shall a person work with unsound gauntlets, mats, stools, platforms or other accessories and safety devices.

No live part shall be within unsafe distance of a person working on live low and medium voltage mains so that he does not come in contact with it unless he is properly protected.

(iii) Testing of Mains and Apparatus - No persons shall apply test voltage to any mains unless he has received a permit-to work and has warned all persons working on the mains of the proposed application of test voltage. If any part which will thus become alive is exposed, the person in- charge of the test shall take due precautions to ensure that the exposed live portion does not constitute danger to any person. It shall also be ensured before the application of test voltage, that no other permit-to-work has been issued for working on this mains.

(iv) Connecting Dead Mains to Live Mains - When dead mains are connected to live mains, all connections to the live parts shall be made last, and in all cases the phase sequence shall be checked to ensure that only like phases are connected together. Before inserting fuses or links in a feeder or distribution pillar controlling the cable on which a fault has been cleared, each phase shall first be connected through a test switch fuse.

(b) Safety Instructions for Working on Mains and Apparatus at Voltages Above 650V-

(i) General - All mains and apparatus shall be regarded as live and a source of danger and treated accordingly, unless it is positively known to be dead and earthed.

(ii) No person shall work on, test or earth mains or apparatus unless covered by a permit-to-work and after proving the mains dead, except for the purpose of connecting the testing apparatus, etc. which is specially designed for connecting to the live parts.

(iii) The operations of proving dead, earthing and short- circuiting of any mains shall be carried out only by an authorized person under the instructions of the person-in- charge of maintenance;

(iv) While working on mains, the following precautions shall be taken:

(1) No person, after receiving a permit-to-work, shall work on, or in any way interfere with, any mains or conduits or trough containing a live mains except under the personal instructions, and supervision, on the site of work, of competent person;

(2) When any live mains is to be earthed, the procedure prescribed in 3(e) shall be scrupulously followed; and

(3) The earths and short-circuits, specified on the permit-to-work shall not be removed or interfered with except by authority from the person-in-charge of the work.

(c) Minimum Working Distance - No person shall work within the minimum working distance from the exposed live mains and apparatus. The minimum working distance depends upon the actual voltages. It does not apply to operations carried out on mains and apparatus which are so constructed as to permit safe operation within these distances. Exposed live equipment in the vicinity shall be cordoned off. The cordoning off shall be done in such a way that it does not hinder the movement of the maintenance personnel. If necessary, a safety supervisor shall be posted.

(d) Isolation of Mains - Isolation of mains shall be effected by the following methods:

(i) The electrical circuits shall be broken only by authorized persons by disconnecting switches, isolating links, unbolting connections or switches which are racked out. Where possible, the isolation shall be visibly checked; and

(ii) Where the means of isolation are provided with a device to prevent their reclosure by unauthorised persons, such a device shall be used.

(e) Devices for Proving Mains and Apparatus Dead:

(i) High voltage neon lamp contact indicator rods fitted with an indicating neon tube or other means which glows when the contact end of the rod comes in contact with exposed

live parts and is clearly marked for the maximum voltage on which it may be safely used and shall not, under any circumstances, be used on higher voltages;

(ii) Contact indicator and phasing rods are provided for phasing and proving exposed mains and apparatus dead. Each set, consisting of two rods, is normally marked for the maximum voltage on which it may be used and shall not, under any circumstances, be used on higher voltages;

(iii) Use of Contact Indicator and Phasing Rods - While using the high voltage contact indicator and phasing rods for proving the mains or apparatus dead, following precautions shall be taken-

(1) Ensure that the rod is clean and dry;

(2) Check the rod by applying it to known live parts of the correct voltage, the indicating tube shall glow;

(3) Apply the rod to each phase required to be proved dead, the indicating tube shall not glow. Be very careful to be in a position to see the glow, if any, appearing in the indicating tube; and

(4) Again check the rod by applying it to live parts as in (2) above, again the indicating tube shall glow;

(iv) Testing and marking of devices - It shall be ensured that all devices for proving high voltage mains and apparatus dead are marked clearly with the maximum voltage for which they are intended and shall be tested periodically;

(v) Identification of cables to be worked upon - A cable shall be identified as that having been proved dead prior to cutting or carrying out any operation which may involve work on or movement of the cable. A non-contact indicating rod, induction testing set or spiking device may be used for proving the cable dead;

(vi) Earthing and short-circuiting mains -

(1) High voltage mains shall not be worked upon unless they are discharged to earth after making them dead and are earthed and short-circuited with earthing and short- circuiting equipment adequate to carry possible short- circuit currents and specially meant for the purpose. All earthing switches wherever installed shall be locked up;

(2) If a cable is required to be cut, a steel wedge

shall be carefully driven through it at the point where it is to be cut or preferably by means of a spiking gun of approved design;

(3) After testing the cable with dc voltage, the cable shall be discharged through a 2 mega ohms resistance and not directly, owing to dielectric absorption which is particularly prominent in the dc voltage testing of high voltage cables. The cable shall be discharged for a sufficiently long period to prevent rebuilding up of voltage;

(4) The earthing device when used shall be first connected to an effective earth. The other end of the device shall then be connected to the conductors to be earthed; and

(5) Except for the purpose of testing, phasing, etc. the earthing and short-circuiting devices shall remain connected for the duration of the work;

(vii) Removing the earth connections - On completion of work, removal of the earthing and short-circuiting devices shall be carried out in the reverse order to that adopted for placing them(see 3(b)(vi) that is, the end of the earthing device attached to the conductors of the earthed mains or apparatus shall be removed first and the other end connected to earths shall be removed last. The conductor shall not be touched after the earthing device has been removed from it;

(viii) Safety precautions for earthing - The precautions mentioned below shall be adopted to the extent applicable and possible-

(1) Examine earthing devices periodically and always prior to their use;

(2) Use only earthing switches or any other special apparatus where provided for earthing;

(3) Verify that the circuit is dead by means of discharging rod or potential indicator. The indicator itself shall first be tested on a live circuit before and after the verification;

(4) Earthing shall be done in such a manner that the persons doing the job are protected by earth connections on both sides of their working zone; and

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(5) All the three phases shall be effectively earthed and short-circuited though work may be proceeding on one phase only;

(ix) Working on mains where visible isolation cannot be carried out- Where the electrical circuit cannot be broken visibly as set out in [3.(d)] the circuit may be broken by two circuit opening devices, one on each side of the work zone, where duplicate feed is available and by one circuit opening device where duplicate feed is not available provided the following conditions are fulfilled:

(1) The position of the contacts of the circuit opening device(s) - 'open' or 'closed' - is clearly indicated by the position of the operating handle or by signal lights or by other means.

(2) The circuit opening device(s) can be locked mechanically in the open position.

(3) The mains and apparatus to be worked on are adequately earthed and short-circuited between the circuit opening device and the position of the work.

(4) In cases where duplicate feed is available, both the circuit opening devices are in series between the mains and any source of supply.

(5) In cases where duplicate feed is not available, the circuit opening device is between the mains to be worked on and any source of supply.

The circuit opening devices mentioned above shall be locked in the open position before the work on the mains and apparatus is commenced. The locking devices shall be removed only by a competent person and not until the work has been completed. Any short-circuiting and earthing shall be removed and the permit-to-work form duly returned and canceled.

(x) Work on mains with two or more sections - When the mains to be worked upon are to be divided into two or more sections, the provisions of 3(d) and 3(e)(vi) and 3(e)(ix) shall be observed with regard to each section.

4. Safety practices.- In all electrical works, safety practices as prescribed in relevant Indian national standards shall be observed.

5. Safety posters.-The owner of every medium, high and extra high voltage installation is required to fix permanently, in a

conspicuous position a danger notice in Hindi or English and the local language on every motor, generator, transformer, all supports of high and extra high voltage etc. The danger notice plate shall contain symbols and shall conform to national standards.

6. Accidents and treatment for electric shock.- First-aid provisions & First-aid trained persons shall be available in the factory to take care of emergencies due to accidents. Reference may be made to relevant national standards in this respect.

7. Fire safety of electrical installations.-

(a) General- Electrical installations in any plant consist of pumps, motors, diesel generator sets with oil tanks, circuit breakers, transformers interconnected with thousands of metres of power & instrumentation cables running on matrix of cable trays separated from each other by distance and carrying large number of cables. It is a good practice to avoid cable joints in the plant area. The cables have invariably to penetrate walls & floorings. A defence in depth approach against fires shall be employed by adequate balance in -

(i) preventing fires from starting;

(ii) detecting & extinguishing quickly such fires as do get started & limiting their damage; and

(iii) designing the plant to minimise the effect of fires on essential functions.

(b) Cables & Cable Trays - Only those cables which are qualified for normal operation, for operation during design basis events & passing specified flame tests as per relevant standards shall only be used. Cable trays shall be separated by appropriate physical distance from each other & floor and ceilings taking into account fire spread characteristics of the cables , cable ventilation requirements & also electromagnetic interference requirements.

(c) Cable Penetration Sealants, Fire Retardant Spray, Fire barriers- These shall be used whenever the cables penetrate walls, ceiling or floorings within a plant. The penetrations shall be closed and sealed with fire retardant sealing material from both sides. In addition the cables shall be coated with fire retardant material to a distance of at least 30 cm on both sides of the penetration. Fire barriers shall be provided at distances of every 25 m.

(d) Housekeeping-Proper housekeeping procedures shall be drawn to see that flammable liquids, combustible materials &

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dust are not allowed to accumulate in cable trays & cable spread room.

(e) Fire detection & annunciation system - Combination of ionization & optical type of flame detectors in adequate numbers shall be used taking into account ventilation pattern in the area. Line detectors shall be used in special areas like cable vaults and cable spread rooms. A separate fire annunciation panel with both audio & visual annunciation shall be provided for each zone. In addition one central panel for all the fire zones shall be provided in the control room.

(f) CCTV Monitoring System - A close circuit TV Monitoring system be preferably used for continuous monitoring of unmanned areas from the control room.

(g) Personnel & Equipment Protection - Electrical Fires in general give out toxic or corrosive fumes which attack both man & equipment. Proper personnel protective gear such as self contained breathing apparatus, fire retardant clothing, eye protection gear shall be made available in adequate numbers.

Electrical & electronic equipments shall be properly cleaned after the fire so as to remove the effects of corrosive fumes & fire extinguishing materials.

(h) Periodic Inspection & Testing - A detailed program to inspect & test the electrical installations shall be established as per the relevant standards & rules.

8. Transformer protection.-

(a) Design - The design, construction & manufacture shall comply with all currently applicable statutes, regulations and safety codes in the locality where the transformer will be installed. The reliability of a transformer shall be given first consideration, the principal factors being-

(i) sound mechanical construction

(ii) adequate oil ducts and electrical clearances.

(iii) Current and flux densities such as to avoid local heating.

(iv) Liberal radiating surfaces.

(v) Good oil.

Relevant national standards and Indian Electricity Rules,1956 shall be referred to.

Rule 88(Sch.VII)

(b) Acceptance - A transformer shall be subjected to following tests at the manufacturing end before its acceptance.

(i) routine tests - All transformers are subjected to following tests:

(1) voltage ratio & polarity.

(2) winding resistance.

(3) impedance voltage, short-circuit impedance and load loss.

(4) dielectric tests

(5) no load losses & current.

(6) on-load changes, where appropriate.

(ii) Type tests -These are meant for complying with specified requirements and not covered under routine tests:

(1) temperature rise test.

(2) lightning impulse tests.

(iii) Special tests - These are other than routine or type tests as agreed between manufacturer & purchaser:

(1) dielectric tests,

(2) zero sequence impedance on 3 phase transformer,

(3) short-circuit test,

(4) acoustic sound level test,

(5) Harmonics on the no-load current,

(6) Power taken by fan and oil pump motors.

(c) Installation & Commissioning - The transformer shall be so installed that there is no risk of anyone receiving an electric shock. Although with all metal parts of the metal tank bound together and properly earthed, the tank may be considered quite safe, yet consideration shall be given to the arrangement of the connections.

If two or more transformers are installed side by side, they shall be separated by fire-separation walls. Fire separation

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Rule 88(Sch.VII)

walls are adequate from fire-safety point of view, if oil capacity of individual transformers do not exceed 2000 litres and total capacity of all transformers installed side by side exceeds 2000 litres.

For indoor transformers, oil soak pits shall be provided under the transformer or outside the transformer room.

The tests to be carried out at site before commissioning the transformer will depend upon the voltage and KVA rating of the transformer, facilities available at site and conditions of contracts. Following are the typical tests to be carried out:

(i) general inspection,

(ii) secondary injection,

(iii) primary injection,

(iv) ratio tests,

(v) tripping tests,

(vi) earth resistance,

(vii) Buchholtz relay.

(viii) alarm circuits.

(ix) fans & pumps.

(x) tap changing tests to check mechanism, indication, buzzer lamp etc.

(xi) phasing tests.

(xii) insulation tests.

(xiii) site test for oil

(xiv) voltage compensation tests.

(xv) neutral earthing switches are closed before alive.

(xvi) check for transformers on equal taps before switching on.

(xvii) set down relays before closing in - advise control.

(xviii) if necessary, arrange temporary protection for soaking & switching on.

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(xix) set up relays after soaking & before going on load.

(xx) load tests.

(xxi) tap changing test on load over full range of taps.

(xxii) advise control of any main equipment commissioned.

(xxiii) low voltage excitation current.

(xxiv) single-phase, magnetic balance test.

(d) Maintenance - Detailed inspection & maintenance schedule shall be drawn & implemented depending on the size of transformer, importance of service continuity, the location of the system and operating conditions such as ambient temp., unusually dirty atmosphere, heavy fogs and water supply (in case of water-cooled units). The supply authority shall be consulted if heavy loads on single phase or unbalanced loads are to be connected.

(i) maintenance schedules for all types of transformers of rating less than 1000 KVA and for ratings of 1000 KVA and above shall be as per relevant BIS standards. The hourly and daily inspections are applicable to attended sub- stations only. However, for unattended sub-stations, these items shall be inspected as frequently as practicable.

(ii) Faults observed during the periodic maintenance schedules shall be rectified as per relevant BIS standard.

(e) Standard Safety requirements - Following points shall be observed as standard safety requirements with respect to fire and electrical hazards of a transformer.

(i) Transformers shall be located preferably outside the buildings and when so located shall be surrounded by an enclosure of metal fencing at least 2.5 M high or isolated by elevation. Where building walls form a part of such enclosures, any opening there in shall be screened or barred. In addition, oil filled transformers shall be suitably isolated from such building walls by approved fire resistant materials or adequate distances.

(ii) Oil filled transformers located inside buildings shall be placed in ventilated fireproof vaults provided with raised door sills, locked fire resistant doors, air vents that close automatically in the event of the fire and an appropriate automatic fire extinguishing arrangement as per relevant standards.

Rule 88 (Sch.VIII)

SCHEDULE VIII

BERYLLIUM OPERATIONS

1. Work on beryl ore, beryllium and its compounds involves risk of air contamination. Hence they shall be carried out in a specially designed totally enclosed facility, consisting of dust extraction & suppression system, with bare minimum use of manual operation. Use of Beryllium rooms shall be restricted solely to beryllium work. A central monitoring room shall be set up to monitor the vital parameters of the process. All stocks of beryllium and its compounds shall be kept in a fire proof store. A fire & fumes detection & alarm system shall be provided.

2. The worker exposure to beryllium and its compounds in the workplace shall be controlled by requiring compliance with the rules set forth in the following paragraphs.

3. Environmental (workplace) air concentration.-

   (a) No worker shall be exposed at his place of employment to a concentration of beryllium more than two micrograms of total airborne particulate beryllium per cubic meter of air (2 μg Be/m3) (determined by the breathing-zone and general air methods) , determined as a time- weighted average (TWA) exposure for an 8-hour work day as stipulated in the second schedule of the Act.

   (b) Sampling and Analysis - Procedures for sampling, calibration of equipment, and analysis of beryllium samples shall be as per relevant standards.

   (c) Medical -

      (i) Medical surveillance of the worker shall be continued up to 20 years from the cessation of the work or his death whichever is earlier.

      (ii) A comprehensive pre-placement history and physical examination for all workers shall be provided to include as a minimum a 38cm X 43cm chest X-ray, baseline pulmonary function [forced vital capacity (FVC) and forced expiratory volume at one second (FEV1.0)], and a baseline weight.

      (iii) Each worker exposed to beryllium shall receive an annual examination that includes:

         (1) Spirometry, including FVC and FEV1.0.

         (2) A medical history questionnaire that includes presence and degree of respiratory symptoms, that is breathlessness, cough, sputum production, and wheezing.

         (3) A 38 cm X 43 cm chest X-ray

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Rule 88(Sch.VIII)

(d) Competent Authority; Inspector; & medical inspector shall have access to medical records.

(e) Medical records shall be maintained for at least 20 years.

4. Labeling.-

(a) The following precautionary label shall be applied to all shipping and storage containers or packages containing beryllium and beryllium compounds where exposures to dusts, fumes, powders, or liquids are likely to occur.

BERYLLIUM

(Name of Compound)

Dust, Fume, Powder, or Liquid

DANGER

Harmful If Inhaled and May Cause Immediate or

Delayed Injury

Use Only With Adequate Local Exhaust Ventilation and Approved Respiratory and Personal Protective Devices

May Cause Rash or External Ulcers

Wash Thoroughly After Handling

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(b) The following warning sign shall be affixed in a readily visible location on processing and other equipment, on storage bins and tanks, and at or near entrances and areas where exposure to dusts or fumes of beryllium and its compounds are likely to occur.

DANGER

Beryllium Dust (or Fume) Areas

UNAUTHORIZED PERSONS

KEEP OUT

Breathing Dust (Or Fumes) May Cause Immediate or Delayed Injury

5. Personal Protective Equipment and Clothing.-

(a) Respiratory Devices.-

(i) Respiratory protective devices shall be used any time the actual or projected level of beryllium will exceed an 8-hour

time-weighted average concentration of 2 ug/m3. These devices shall not be used as a substitute for proper engineering controls, but are appropriate for necessary periods where excessive atmospheric concentrations result from emergencies or from maintenance or repair.

(ii) Standard procedures shall be established for respirator use to include the following:

(1) Procedures established for respirator usage shall insure that no worker is exposed to beryllium in excess of the standard because of improper respirator selection or face piece fit.

(2) Facepiece fit shall be checked by the wearer each time he puts on the respirator.

(iii) The respirator used shall be of the appropriate class as determined on the basis of the actual or projected atmospheric concentration of airborne beryllium at the worksite where the respirator is to be used as follows:

(1) Reusable half mask air purifying respirators equipped with high efficiency filters shall be used in atmospheres containing not more than 25 µg Be/m3 for any period of time.

(2) Reusable full-facepiece air purifying respirators equipped with high efficiency filters shall be used in atmospheres containing not more than 100 µg Be/m3 for any period of time.

(3) Powdered air purifying respirators equipped with high efficiency filters, operating with positive pressure during the inhalation phase of breathing shall be used in atmospheres containing not more than 1000 µg Be/m3. When equipped with a "fume filter," respirators shall be used in atmospheres containing not more than 40 µg Be/m3.

(4) Continuous flow air-line respirators or self-contained breathing units operating in the pressure-demand mode and providing positive pressure during the inhalation phase of breathing, shall be used in atmospheres that exceed 1000 µg Be/m3.

(iv) An effective respirator program to include selection, use, maintenance and care, special problems, and effective respirator program evaluation shall be established. Compliance with the requirements of the latest BIS standards for respiratory protection shall be implemented.

(b) Protective Clothing

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Rule 88(Sch.VIII)

(i) Beryllium Exposed Workers

(1) The employer shall provide each employee except those with minimal exposure with protective clothing, headgear, and shoes when the employee must work with and/or be exposed to beryllium, beryllium compounds, or beryllium containing products.

(2) Such clothing may be coveralls or similar full body protective clothing.

(3) Protective shoecovers or work shoes shall be worn during the working hours in areas where there is exposure to beryllium.

(4) Resin-impregnated paper or similar protective clothing can be substituted for fabric-type clothing.

(5) Protective clothing shall be changed at least each day at the end of each shift.

(6) The employer shall provide for maintenance and laundering of soiled protective clothing, which shall be stored, transported, and disposed of in sealed, non-reusable containers and labeled with easy-to-read letters as outlined in paragraph 4.

(7) Dust removal, by blowing or shaking of clothing, shall be prohibited; protective clothing shall be cleaned by power suction (vacuum) prior to removal; removal of contaminated clothing shall be allowed only in the change rooms.

(8) The employer shall provide laundering controls and inform the employee and any party inhouse or otherwise which launders contaminated clothing, of the potentially harmful effects of exposure to beryllium dust and of safe practices required in the laundering of beryllium-soiled work clothing.

(ii) Workers with Minimum Beryllium Exposure

(1) The employer shall provide laboratory coats or equivalent protective clothing to each such employee who works with or is exposed to beryllium, beryllium compounds, or beryllium containing products.

(2) Clean protective clothing shall be supplied to each worker at least weekly.

6. Appraisal of Employees of Hazards from Beryllium.-

(a) Each employee exposed to beryllium shall be apprised of all hazards, adverse symptoms of overexposure, appropriate emergency procedures, and proper conditions and precautions for safe use or exposure, to include as a minimum, all information as set forth

in Form 9 which is applicable to that specific product or material containing beryllium to which he is exposed.

(b) The information shall be maintained on file and readily accessible to the worker at all places of employment where beryllium is involved in unit processes and operations.

(c) Information as specified in Form 9 titled 'Material Safety Data Sheet' shall be recorded.

7. Work Practices.-

(a) Emergency Procedures-

(i) Procedures, including fire fighting procedures, shall be established and implemented to meet foreseeable emergency events, including those involving massive release of beryllium contaminants.

(1) Where there is the possibility of massive beryllium contamination from accidents involving elevated temperature operations or large scale spills, a general alarm, drench-type showers, and cleansing facilities shall be installed in such a manner as to provide prompt, immediate access by any employee; respirators shall be available for wearing during evacuation procedures if long distances need to be traversed; and full-facepiece or supplied-air respirators shall be available for employee use where equipment or operations cannot be abandoned. If large scale spills occur, careful monitoring of beryllium air levels shall be instituted as soon as practicable. Determinations shall be made as to when it is safe to re-enter a contaminated area with respiratory protection and to resume operations without respiratory protection. Thoroughly supervised cleanup operations shall be instituted as soon as air levels recede to the point where operations may be conducted.

(2) Full-face piece or supplied-air respirators shall be kept ready for emergency use. They shall be inspected after each use and at least monthly to assure satisfactory working condition. Where used, air and oxygen cylinders shall be fully charged according to the manufacturer's instructions.

(3) Sand, soda ash, or commercial metal fire extinguishment powder shall be available for use as an extinguishing agent for beryllium; water and carbon dioxide shall not be used.

(ii) Exhaust Systems - Procedures shall be established to reduce exposure to airborne beryllium through implementation of adequate ventilation methods. Local exhaust and collection shall be designed and maintained to prevent the accumulation of beryllium dust and fumes. A report on examination & test of dust extraction & suppression system shall be maintained in Form 10 and be kept available for inspection.

(iii) General Housekeeping-

(1) No dry sweeping shall be performed.

(2) Emphasis shall be placed upon cleanup of spills, periodic repair of equipment and leaks, and proper storage of materials to prevent breakage.

(iv) Disposal - Beryllium waste and scrap shall be collected and disposed of in sealed bags or other sealed containers. Scrap shall be recycled or shall be disposed of by burial.

(v) Non-Worker Access to Beryllium Areas - Entry to any area where there is the possibility of exposure to beryllium shall be permitted only on the basis of need and all persons so entering shall be provided with the same protective clothing as required for employees regularly assigned to that area.

(vi) Educational Program - An educational program shall be instituted for all workers to include proper instruction in maintenance procedures, cleanup methods, and use of respiratory protective devices and protective clothing.

8. Sanitation Practices.-

(a) Food Facilities - Food preparation and eating shall be prohibited in beryllium work areas.

(b) Locker and Toilet Facilities -

(i) Separate locker facilities shall be provided for work clothes and street clothes.

(ii) Showers for exposed workers shall be required following a work shift and prior to putting on street clothes.

(iii) Locker-shower facilities shall be so arranged that the showers can serve to demarcate between potentially "clean" and "contaminated" areas.

(iv) Suitable provisions shall be made for the control of contaminated dust in workshop storage and clothing hanger locations.

(v) Handwashing and toilet facilities shall be arranged so that following use, workers need not re-enter a potentially contaminated area.

9. Monitoring and Recordkeeping Requirements.-

(a) Employers shall maintain record of environmental exposures to beryllium based upon the following sampling and recording schedule:

(i) Quarterly requirements-

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Rule 88(Sch.VIII-IX)

(1) Breathing-zone samples shall be collected from employees at least quarterly for specific work operations. It is recognised that sampling frequency is dependent upon the process and emissions; the quarterly sampling frequency is primarily for production operations.

(2) Samples shall be collected and evaluated as both time- weighted and peak concentration values.

(ii) Thirty-Day Requirements - The sampling regime shall be every 30 days for work areas under the following conditions:

(1) The environmental time-weighted average or peak concentrations are in excess of the standards.

(2) Sampling, monitoring, and recordkeeping requirements of a 30-day schedule shall be required only until two consecutive 30-day sampling periods have resulted in environmental levels which meet the standard.

(b) Records shall be maintained for all sampling schedules to include the type of personal protective devices, if any, in use.

(c) Workers shall be informed of the periodic results of samplings.

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SCHEDULE IX

ZIRCONIUM OPERATIONS

1. Work on zirconium and its compounds involves risk of fire, as such, it shall be carried out in a specially designed facility. Use of such facilities shall be restricted only for zirconium work. A suitable notice shall be displayed at the entrance prohibiting the entry of unauthorised personnel.

2. Surface of plant/laboratories and store shall be designed to prevent accumulation of zirconium powder.

3. Source of ignition shall be excluded from the zirconium handling areas. The design for these areas shall include lightning protection and means to prevent accumulation of static electric charge.

4. Electrical equipment installed in these areas shall be of approved explosion proof type.

5. Wherever zirconium powder may be formed, a local exhaust system shall be provided. The duct shall be as short as

possible. It shall be free from sharp bends and dead space and shall have proper means of access for inspection and cleaning.

6. A high standard of cleanliness shall be maintained throughout the zirconium handling areas. Wet mopping shall be adopted for cleaning. Mops used for cleaning shall be stored always under water.

7. The design of plant/laboratories shall make adequate provision for the safe storage of zirconium powder, sludges, sponges or scrap.

8. Containers for product or waste shall be metallic and labeled. They shall not be exposed to extremes of temperature.

9. Zirconium wastes containing sludges, sponge or scrap shall be stored separately from any other waste material. They shall be stored under water (minimum 15 cm.). Safe procedures shall be formulated for the collection, transportation, storage and disposal taking into account the pyrophoricity of the material.

10. Disposal of powder waste shall be done by incineration under controlled conditions by trained personnel at a suitable place designated for the purpose.

11. Waste liquid containing zirconium in suspension shall be treated by a process which removes the suspended zirconium, before discharging.

12. Fire-fighting appliances shall be provided in all the areas. Operations involving zirconium shall never remain unattended.

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SCHEDULE X

FINISHING BY ABRASIVES PROPELLED BY COMPRESSED AIR/STEAM

Cleaning or Smoothening, Roughening, etc., of Articles, by a Jet of Sand, Metal Shot, or Grit, or other Abrasive Propelled by a Blast of Compressed Air or Steam:

1. Definition.- For the purposes of this Schedule

   (a) "blasting" means cleaning, smoothening, 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 enclosure 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 or 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 further that no woman shall be employed or permitted to work at any operation of sand blasting.

3. Precautions in connection with blasting operations.-

(a) Blasting shall not be done except in a blasting enclosure and no work other than blasting and any work immediately incidental thereto and clearing 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.

(b) 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.

(c) 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 clause 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 Competent Authority is of opinion that it is not reasonably practicable to provide such separating apparatus.

(d) 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

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be disposed of by such method and in such manner that it shall not escape into the air of any room; and every other filtering or settling 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.

(e) The ventilating plant provided for the purpose of sub-paragraph (d) 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 examination.-

(a) Every blasting enclosure shall be specially inspected by a competent person at least once in every week in which it is used for 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.

(b) Particulars of the result of every such inspection, examination or test shall forthwith be entered in a register which shall be kept in Form 10 and shall be available for inspection by any workman employed in or in connection with blasting in the factory. Any defect found on any such inspection, examination or test 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.

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

(a) 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 by a certificate of the Competent Authority; and every such person shall wear the helmet provided for this use whilst he is in the chamber and shall not remove it until he is outside the chamber.

(b) 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.

(c) 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.

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(d) Suitable gauntlets and overalls shall be provided for the 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 -

(a) Where any person is engaged upon cleaning of any blasting apparatus or blasting enclosure or of any apparatus or ventilating plant connected therewith or the surroundings thereof or upon 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.

(b) In connection with any cleaning operation referred to in paragraph 5, and with the removal of dust from filtering or settling devices all practicable measures shall be taken 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 by paragraph 5 shall be proved outside and conveniently near to every blasting enclosure and such accommodation shall be kept clean. Helmets and overalls when not in actual use shall be kept in this accommodation.

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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 weekday 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.-

(a) The occupier of every factory to which the Schedule applies, shall

(i) employ a qualified medical practitioner for medical surveillance of the workers employed therein, and whose

employment shall be subject to the approval of the Competent Authority; and

(ii) provide to the said medical practitioner all the necessary facilities for the purpose referred to in clause (i) above.

(b) 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 Competent Authority which shall be kept readily available for inspection by the Inspector.

11. Medical examination by Certifying Surgeon.-

(a) 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.

(b) 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.

(c) The Certifying Surgeon after examining a worker, shall issue a Certificate of Fitness in Form 1 .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 under sub-paragraphs (a) and (b), including the nature and the results of the tests, shall also be entered by the Certifying Surgeon in a health register in Form 1A.

(d) The Certificate of Fitness and the health register shall be kept readily available for inspection by the Competent Authority.

(e) 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 shall 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

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affected shall be suitably rehabilitated.

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

12. Power to exempt or relax.-

(a) If the Competent Authority is satisfied that in any factory or any class of factories, 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, it may, with the previous sanction of the Central 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.

(b) Where an exemption has been granted under sub-paragraph (a), 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.

SCHEDULE XI

OPERATIONS INVOLVING HIGH NOISE LEVELS

1. Application.- This schedule shall apply to all operations in any manufacturing process having high noise level.

2. Definitions.-

(a) "Noise" means any unwanted sound.

(b) "High noise level" means any noise level measured on the A-weighted scale is 90 dB or above.

(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. The noise level (or the sound pressure level)

corresponds to a reference pressure of 20 micro-newtons per square meter or 0.0002 dynes per sq.cm. which is the threshold of hearing in average healthy listeners.

(d) "Frequency" is the rate of pressure variations expressed in cycles per second or hertz.

(e) "dBA" refers to sound level in decibels as measured on a sound level meter operating on the A weighting network with slow meter response.

(f) "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 measured by an instrument reflects the actual response of the human ear to the sound measured.

3. Protection against noise.-

(a) 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 & 2.

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Table 1

Permissible Exposure in Cases of Continuous Noise

Total time of exposure (continuous or a number of short term exposures) per day, in hours.	sound pressure level in dBA
1	2
8	90
6	92
4	95
3	97
2	100
3/2	102
1	105
3/4	107
1/2	110
1/4	115

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Note : 1. No exposure in excess of 115 dBA is to be permitted.

2. For any period of exposure falling 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

Peak sound pressure level in dB	Permitted number of impulses or impacts per day
1	2
140	100
135	315

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Peak sound pressure level in dB	Permitted number of impulses or impacts per day
1	2
130	1,000
125	3,160
120	10,000

Note : 1. No exposure in excess of 140 dB peak sound pressure level is permitted.

2. For any peak sound pressure level falling in between any figure and the next higher or lower figure as indicated in column 1,thepermitted number of impulses is to be determined by extrapolation on a proportionate basis.

(b) For the purposes of this schedule, if the variations in the noise level involve maxima 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.

(c) 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 > 1

Where the C1, C2 etc. indicate the total time of actual exposure at a specified noise level and T1, T2, etc. denote the time of exposure permissible at that level. Noise exposure of less than 90 dBA may be ignored in the above calculation.

(d) Where it is not possible to reduce the noise exposure to the levels specified in sub-rule (a) by reasonably practicable engineering control or administrative measures, the noise exposure shall be reduced to the greatest extent feasible by such control 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-rule(a).

(e) Where the ear protectors provided in accordance with sub-paragraph (b) 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 under Table 1 or Table 2 as the case may be, the noise exposure period shall be suitably reduced to correspond to the permissible noise exposures specified in sub-paragraph (a).

(f) (i) In all cases where the prevailing sound levels exceed the permissible levels specified in sub-paragraph(a) 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.

(ii) Every worker employed in areas where the noise exceeds the maximum permissible exposure levels specified in sub- rule (a) shall be subjected to an auditory examination by a Certifying Surgeon within 14 days of his first employment and thereafter, shall be re-examined at least once every 12 months. 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 Hz.

SCHEDULE XII

HIGHLY FLAMMABLE LIQUIDS AND FLAMMABLE COMPRESSED GASES

1. Application.- These rules will be applicable to all factories where highly flammable liquids or flammable compressed gases are manufactured, stored, handled or used.

2. Definition.- For the purpose of this Schedule -

(a) "highly flammable liquid" means any liquid including its solution, emulsion or suspension which when tested in a manner specified by sections 14 and 15 of the Petroleum Act, 1934, (30 of 1934) gives off flammable vapours at a temperature less than 32 degrees Celsius;

(b) "flammable compressed gas" means flammable compressed gas as defined in rule 2 of the Static and Mobile Pressure Vessels (Unfired) Rules 1981 framed under the Explosives Act, 1884.

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3. Storage.-

(a) Every flammable liquid or flammable compressed gas used in every 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.

(b) 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.

(c) 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.-

(a) Wherever it is reasonably practicable, 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.

(b) Safety measures in factories where equipment or pipelines containing flammable materials are operated.- Where work of opening any equipment or pipeline containing flammable liquids or gases is to be carried out in any factory, the following provisions shall be complied with, namely:-

(i) The system of work permits shall be introduced and unless the equipment or the pipeline is certified to be free of flammable gas or liquid, no person shall be allowed to enter or open the same.

(ii) The work of opening such equipment or pipeline shall not be commenced unless the following operations are carried out and checked by the Supervisor in-charge of the Process Department of the Factory:-

(1) Blanking Operations -The equipment or pipeline to be opened for repairs or maintenance shall be effectively blanked so as to ensure that no flammable gas or liquid can enter the same under any circumstances during the operation of repairs or maintenance. The Supervisor of the Process Department shall check personally these operations and shall certify accordingly.

(2) Flushing operations -The Supervisor of the Process

Department shall carry out the steaming or flushing out with water of the equipment or pipeline and shall certify to that effect.

(iii) (1) Opening of the equipment -The Supervisor of the Engineering Department of the factory in charge of the work of opening of such equipment or pipeline, or getting clearance from the Supervisor in-charge of the Process Department, shall satisfy himself that the above operations are complete and shall sign the work permits issued by the Supervisor of the Process Department.

(2) It shall be the joint responsibility of the Supervisor of the Process Department and the Supervisor of the Engineering Department to check and ensure that the hot lines, if any, in the vicinity of such works are properly screened, in accordance with the safety instructions of the factory management. The work permit shall have a specific entry for this operation which shall be signed by both the Supervisors.

(iv) No part of the running equipment or pipeline shall be opened unless a gas test is conducted by a responsible person to ensure that the equipment or pipeline is safe for opening.

(v) No workers whose clothes have been contaminated with flammable material shall be allowed to work where any such running equipment or pipeline is being opened.

(vi) The Safety Officer or any officer authorised by him, shall have system of random checking on the work permits issued and he shall report any serious deficiencies to the Manager.

(vii) All drains of such equipments or pipeline shall be laid into the drains to prevent any splashing of the draining flammable liquids or gases.

(viii) Before commencing the opening operation, it shall be ensured that a specific person trained in fire-fighting operations, is kept available and his presence shall be ensured throughout the operation of the opening of the equipment.

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, drain off or dilute such spills or leakage as to prevent formation of flammable mixture with air.

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6. Prevention of Ignition.-

(a) 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:

(i) 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 a source of ignition;

(ii) effective measures shall be adopted for prevention of accumulation of static charges to a dangerous extent;

(iii) no person shall wear or be allowed to wear any footwear having iron or steel nails or any other exposed ferrous materials which is likely to cause sparks by friction;

(iv) smoking, lighting or carrying of matches, lighters or smoking materials shall be prohibited;

(v) transmission belts with iron fasteners shall not be used; and

(vi) 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 includes the fixed and portable shall appoint a second assessor itself. It shall then fix a date for the hearing of the appeal and shall give due notice of such date to the appellant and to the Competent Authority whose order is appealed against, and shall call upon the two assessors to appear upon such date to assist in the hearing of the appeal.

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9. Exemptions.- If in respect of any factory, the Competent Authority is satisfied that owing to the exceptional circumstances, 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 Competent Authority 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.

SCHEDULE XIII

RADIOACTIVE SUBSTANCES

1. Handling of radioactive substances.- Rules for handling of Radioactive substances are covered under-

   a. Radiation Protection Rules, 1971; and

   b. Atomic Energy (Working of the mines, minerals and handling of prescribed substances) Rules, 1984.

2. These and any other notifications issued from time to time by the Chairman, Atomic Energy Regulatory Board shall be followed.

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SCHEDULE XIV

LASER AND OPTICAL RADIATIONS

1. Application.- The schedule is applicable to Laser radiations and optical radiations from wave lengths between 100 nm and 1 mm i.e. ultraviolet radiation (UVR), visible light, and infrared radiation (IR) pose potential hazards. Sources of optical radiations are catagorised as 1) Sunlight 2) Lamps 3) Lasers and 4) Other incandescent sources.

2. Optical radiations.- The industry, in addition to lasers, makes use of continuous optical radiation sources such as compact arc lamps, quartz-iodide-tungsten lamps, gas and vapour discharge tubes, electric welding units, pulsed optical sources such as flash lamps, exploding wires, and super-radiant light. Goggles and face shields of appropriate characteristics shall be used for protection while working with non laser optical sources.

3. Laser radiations.- Lasers are divided into four classes depending on the power and their effects and the same are given below.

   (a) Class 1 Lasers- These are the lowest powered lasers such as Gallium Arsenide. They are not considered hazardous.

(b) Class 2 Lasers- These are low power lasers and pose low risk and safety requirements are as follows.

(i) A caution label shall be attached to the equipment.

(ii) Workers shall not be allowed to stare into the laser beam for a long time.

(iii) The exposure to eye and duration shall not be allowed to exceed permissible levels specified.

(c) Class 3 Lasers- These are medium power lasers and pose moderate risk and safety requirements are as follows.

(i) The equipments shall have danger label with precautions to be taken marked and written on it.

(ii) The laser beam path shall be enclosed and terminations shall be provided at the end of useful paths of direct and any secondary beams.

(iii) Shutters, polarisers and optical filters shall be placed at the exit port.

(iv) Laser path shall be located in such a way that it shall be always above the eye level of workers. The laser mountings shall be firmly attached to avoid deviations.

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(v) All unnecessary reflecting surfaces shall be removed from the operating area.

(vi) Work permit system shall be evolved and followed for the laser operations.

(vii) The warning signs both audio and visual shall be placed at the entrances of the area.

(viii) Safety equipment shall be provided and used by the workers.

(d) Class 4 Lasers- These are highest powered lasers and hence pose greatest potential for injury or combustion of flammable materials. The safety requirements are as follows.

(i) These shall be operated in localised enclosures and wherever complete enclosure is not possible, indoor operations shall be done in a light tight room with interlocked entrances.

(ii) The laser firing with remote operations and with video monitoring or other safe viewing techniques shall be

preferred.

(iii) Back stops shall wherever feasible be made of diffusively reflecting fire-resistant materials. Safety enclosures shall be used around microwelding and microdrilling work pieces to contain the reflection hazard.

(iv) Outdoor high power laser devices such as satellite laser transmission systems and laser radars etc. shall have positive stops on azimuth and elevation traverse to ensure that the beam shall not deviate.

(v) All safety precautions associated with high electrical voltage and use of cryogenic liquids shall be followed.

(vi) Appropriate safety precautions shall be taken to eliminate the chemical hazards such as release of chemical vapours, vapourisation of target materials etc. Materials used shall be fire resistant.

(vii) The work permit system shall be evolved and used for the operation.

(viii) Safety equipments such as goggles with proper filters, ear muffs etc. shall be provided and used by the workers.

Exposure limits for direct occular exposure from a laser beam will be notified by the Competent Authority.

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SCHEDULE XV

MOTOR VEHICLE GARAGES

1. Application.- This schedule shall apply to all factories where repairs and maintenance of all power driven vehicles such as cars, buses, trucks, tractors, fork lifts etc. is carried on.

2. Location.- The garage shall be located with sufficient space depending on the number of vehicles being handled, with marked aisles for movement of vehicles. There shall be separate and segregated areas for operations such as washing, tyre repairs, welding, battery charging etc.

3. Ventilation, Illumination, Temperature etc. These shall be provided as specified in Rule 11.

4. Tyre repair area.-

(a) Trained workers shall only be employed for this work.

(b) Mechanical lifting and moving aids shall be provided to workers for lifting of heavy tyres, engine blocks etc.

(c) Free tyres shall be inflated in steel cages or similar devices which shall restrain flying objects if the blowout occurs.

(d) Rubber cement and flammable solvents used for patching operations shall be properly stored and this work shall be done in ventilated area.

5. Washing area.-

(a) The floor shall be rough trowelled to produce non slip surface.

(b) Electrical fixtures used in the area shall be rain or water proof type.

(c) Workers shall wear suitable protective gears such as safety shoes, apron etc.

6. Battery Charging area.-

(a) The area shall be separated and provided with exhaust ventilation and hydrogen monitors. The electrical fittings shall conform to requirements under relevant standards for explosive atmosphere.

(b) Workers shall work in the area with protective equipment such as face shields, gloves, rubber shoes etc.

(c) Open flames and smoking shall be banned.

(d) Lifting devices and hand trucks shall be used for movement of heavy batteries.

(e) First Aid box with acid neutralizing solution and water shall be located near the charging room.

(f) Acid carboys shall be handled carefully and siphon shall be used for taking out acid from the carboy for preparation of electrolyte.

7. Paint Shop.-

(a) The paint shop shall be located away from welding or battery charging area and proper local exhaust ventilation shall be provided.

(b) Personal protective equipments such as respirator, goggles etc. of the approved quality shall be provided to the painters.

(c) Smoking shall be banned.

8. General Safety precautions.-

(a) Solvents with higher flash points shall be used for cleaning operation and gasoline shall not be used for this operation.

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(b) Welding or soldering operation on fuel tanks shall be done only after the tank is empty and is purged out of vapours. A suitable fire extinguisher shall be placed near the workplace.

(c) Barricades shall be erected around the vehicle wherever workers are working underneath. They shall wear safety goggles when working underneath.

(d) Engines shall not be run in enclosed area unless sufficient exhaust ventilation is available.

(e) Traffic lanes inside the garage shall be distinctly marked and traffic rules within the garage shall be framed and rigidly enforced.

(f) Housekeeping in the garage shall be given top priority. Cotton rags, wastes etc. shall be stored temporarily in metal drums for disposal later.

(g) Appropriate fire fighting equipments shall be located and maintained in the garage.

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SCHEDULE XVI

CRYOGENIC LIQUIDS

1. Application.- These rules are applicable to gases which are in liquid state due to low temperature and having a normal boiling point below -150 degree C.

2. Storage.-

(a) These liquids shall be stored only in specially designed suitable containers and which shall be stored at such place where rain or water cannot reach.

(b) The containers shall have two pressure relief devices viz. pressure relief valve and frangible rupture disc.

(c) Safety devices shall not be tampered with and if they are found triggered, the container shall be checked for loss of vacuum or insulation or leak.

(d) The containers shall not be dropped or tipped on their sides.

(e) Welding, cutting operations and smoking shall be banned in storage area.

(f) The containers shall be marked for its contents.

3. Handling.-

(a) Cryogenic liquids shall not be handled in open containers.

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(b) The supplier's operating procedures shall be strictly followed. If a plug of ice is formed on the container, the container shall be removed to a remote and safe location and only an authorised worker shall carry out the unplugging work.

(c) Workers handling the liquid shall use suitable eye and hand protective appliances. Loose fitting gloves shall be used to facilitate easy removal.

(d) Cryogenic liquids shall be transferred wherever possible by using cryogenic pumps.

(e) Containers shall be firmly secured and stored in an upright position.

(f) Warm, solid or liquid shall not be dropped into cryogenic liquid.

(g) While transferring the liquids, the operation shall be done slowly to avoid thermal shock to piping and container.

3. General safety precautions.-

(a) Work permit system shall be used for the use of cryogenic liquids. The liquid shall be handled by trained persons by using safety appliances.

(b) Operation of transfer of liquid from one container to another shall be done very carefully and slowly.

4. Special precautions.-

(a) Handling of liquid oxygen.-

(i) All combustible materials such as oils, grease etc. shall be kept away from the area where liquid oxygen is being handled.

(ii) Smoking or open flame shall not be permitted in the area.

(iii) Liquid oxygen or oxygen rich air shall not be allowed to come in contact with organic salts, oils, grease, asphalt, kerosene, cloth, tar etc. as these react violently with it.

(iv) In case of spillage of liquid oxygen on asphalt or any other surface contaminated with oil, no one shall be allowed to walk over it for a minimum period of 30 minutes.

(v) Any clothing which is splashed with oxygen shall be changed immediately.

(vi) Valves in liquid oxygen system shall be operated slowly as abrupt starting or stopping of the flow may ignite the

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contaminant.

(b) Handling of inert gas system.- The main hazard in such a system is the rupture of container vacuum or pipeline which may lead to increased evaporation and can cause asphyxiation to workers in the area. Hence arrangements shall be made where such systems are installed to vent the gases to areas open to the sky.

5. First Aid.- A properly trained person shall always be made available wherever cryogenic liquids are handled, stored or used. First aid box with specified medicines shall be provided and which shall be regularly checked for availability of medicines.

SCHEDULE XVII

USE OF ALKALI METALS

1. Application.- This schedule shall be applicable towards storage, handling and disposal of alkali metals such as Potassium and Sodium.

2. Storage.-

(a) Storage area for large quantities shall be separated from main building and located at a safe distance to avoid risk of explosion. An explosion venting shall be provided to the building.

(b) The building construction shall be such that rain water shall not leak in the area and raised platforms for storing of containers shall be constructed to prevent ground water reaching the containers under any circumstances.

(c) Water in any form shall not come in the storage area. Water and steam pipes shall not pass through the area.

(d) Smoking shall be prohibited and a warning prohibiting use of water shall be prominently displayed. Appropriate fire extinguishers shall be provided and no other type of extinguisher shall be kept anywhere near the building.

(e) All electrical fittings and wiring in the area shall be of explosion proof type and shall conform to relevant BIS standards.

(f) Notice indicating dangers involved and safety measures to be taken shall be displayed on the containers. Containers storing the metals shall be checked periodically for corrosion or damage and shall be replaced immediately if found defective.

(g) The empty containers shall be separately stored in the same area till they are disposed off.

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3. Handling.-

(a) Dispensing area shall be separated form bulk storage area. However the safety provisions shall be same as those of bulk storage area.

(b) The equipment and systems used for handling the metals shall be properly designed for safe operation. Steam shall not be used for directly heating and liquefying the metals.

(c) Transfer of molten alkali metals shall be done under an inert gas or vacuum and at lowest possible temperature and pressure.

(d) A fast acting drainage system shall be incorporated in a liquid metal handling system to allow the liquid to drain in secondary containment system.

(e) All piping shall be seamless and welded construction shall be employed throughout, except at valves and connections to equipment. Machinery and piping shall be effectively grounded wherever possibility of accumulation of static charge exists.

(f) Non sparking tools shall, only be used for opening of bulk storage drums etc.

(g) Suitable personal protective equipment like goggles or face shields, aprons, gloves etc. shall be provided and worn by the workers.

(h) Safe handling procedures shall be laid down and work permit system shall be evolved and followed for all operations on alkali metals.

4. Waste disposal.- Sodium wastes shall be disposed off by burning it in a well ventilated area and workers present shall wear suitable protective equipments such as respirators, gloves etc. for protection from fumes.

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89. NOTIFICATION OF ACCIDENTS.-

(1) Where any accident specified in sub-para (a) of para 1 of the Schedule to this rule or any occurrences specified in para 2 of the said schedule takes place in a factory, the Manager of the factory, in which the accident occurred, shall within four hours of the happening of such accident or occurrence, send notice there of in Form 11 by telephone, telex, telegram or special messenger to the inspector and the Competent Authority and when the accident is fatal or it is of such a nature that it is likely to prove fatal, notice as aforesaid shall also be sent to-

(a) the District Magistrate or sub Divisional Magistrate;

(b) the Officer In Charge of the nearest Police Station;

(c) the Electrical Inspector (In case of electrical accident); and

(d) the relatives of the injured or deceased person.

(2) The notice so given shall be confirmed by the Manager of the factory to the above mentioned authorities within 12 hours of the accident/occurrence by sending a written report in Form 12 and in case of electrical accidents in Form 13 to the Electrical Inspector.

(3) When any accident of a minor nature specified in sub-para (b) of the said para 1 of the schedule takes place in a factory, the Manager of the factory shall within 24 hours after the expiry of the period specified in the said sub-para (b) , send notice thereof in the Form 11 to the medical officer; & the Competent Authority.

(4) If, in case of an accident, the injured person subsequently dies due to such accident, information of his death whenever known shall be sent by the Manager of the factory by telephone, telex, telegram or special messenger within 24 hours of the occurrence to-

(a) the District Magistrate or Sub-Divisional Magistrate;

(b) the Officer In Charge of the nearest Police Station;

(c) the Competent Authority; and

(d) the Electrical Inspector (In case of Electrical accidents).

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EXPLANATION: Accident of serious nature means an accident which results in either or all of the following, namely:-

(1) Immediate loss of any part of the body or any limb or part there of;

(2) Crushed or Serious injury to any part of the body due to which loss of the same is obvious or any injury which is likely to prove fatal;

(3) Unconsciousness;

(4) Severe burns or scalds due to chemicals, steam or any other cause; and

(5) Any injury to man/animal due to electrical energy.

(5) The Manager of the factory shall lay down the procedures for investigation of all accidents and occupational illnesses reported as per Forms 12 and 14.

SCHEDULE

1. (a) Accidents which cause death to any person or are of a serious nature.

   (b) Accidents which cause such bodily injury as prevents or will probably prevent the person injured from working for a period of 48 hours or more immediately following the accident.

2. The following classes of occurrences, whether or not they are attended by personal injury or disablement:-

   (a) Bursting of a vessel used for containing steam under pressure greater than atmospheric pressure, other than plant which comes within the scope of the Indian Boilers Act.

   (b) Collapse or failure of a crane, derrick, winch, hoist or other appliances used in raising or lowering persons or goods or any part thereof, or the overturning of a crane.

   (c) Explosion, fire, bursting out, leakage or escape of any molten metal, or hot liquor or gas causing bodily injury to any person or damage to any room or place in which persons are employed.

   (d) Explosion of a receiver or container used for the storage at a pressure greater than atmospheric pressure of any gas or gases(including air) or a liquid or solid resulting from the compression of gas.

   (e) Collapse or subsidence of any floor, gallery, roof, bridge, tunnel, chimney, wall or building, forming part of a factory or within the compound or curtilage of factory.

3. Leakage or release of effluents to the outside environment above those specified by the Department of Environment and Air and Water Pollution Control Boards.

90. NOTICE OF POISONING OR DISEASE. - A notice in Form 14 shall be sent with in four hours to the Competent Authority by the manager of the factory in which there occurs a case of poisoning or disease due to items mentioned in the Third Schedule of section 45 of the Factories Act, 1948(63 of 1948).

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Rule 91

CHAPTER X

SUPPLEMENTAL

91. PROCEDURE IN APPEALS.-

(1) An appeal presented under section 107 of the Act shall lie with the Competent Authority, or in cases where the order appealed against is an order passed by that officer, to the Central Government or to such authority as the Central Government may appoint in this behalf and shall be in the form of a memorandum setting forth concisely the grounds of objection to the order and shall be accompanied by a copy of the order appealed against.

(2) On receipt of the memorandum of appeal, the appellate authority shall, if it thinks fit or if the appellant has requested that the appeal should be heard with the aid of assessors, call upon the body declared under sub-rule (3) to be representative of the industry concerned, to appoint an assessor within a period of 14 days . If an assessor is nominated by such body, the appellate authority shall appoint a second assessor itself. It shall then fix a date for the hearing of the appeal and shall give due notice of such date to the appellant and to the Competent Authority whose order is appealed against, and shall call upon the two assessors to appear upon such date to assist in the hearing of the appeal.

(3) The appellant shall state in the memorandum presented under sub-rule (1) whether he is a member of one or more of the following bodies, namely:-

(i) The Engineering Association of India;

(ii) Any Association of Employers in the industry concerned.

The body empowered to appoint the assessor shall –

(a) if the appellant is a member of one of such bodies, be that body;

(b) if he is a member of two such bodies, be the body which the appellant desires should appoint such assessor; and

(c) if the appellant is not a member of any of the aforesaid bodies or if he does not state in the memorandum which of such bodies he desires should appoint the assessor, be the body which the appellant authority considers as the best fitted to represent the industry concerned.

(4) As assessor appointed in accordance with the provisions of sub-rules (2) and (3) shall receive, for the hearing of the appeal, a fee to be fixed by the appellate authority as per the extant rules in this regard. He shall also receive the actual travelling expenses. The fees and travelling expenses shall be paid to the assessor by the Government but where

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assessors have been appointed at the request of the appellant and the appeal has been decided wholly or partly against him the appellate authority may direct that the fees and travelling expenses of the assessors shall be paid in whole or in part by the appellant.

92. DISPLAY OF NOTICES.-The abstract of the Act and of the rules shall be displayed in every factory.

93. SERVICES OF NOTICES.- The dispatch by post under registered cover of any notice or order shall be deemed sufficient service on the occupier, owner or manager of a factory of such notice or order.

94. RETURNS.- The Manager of every factory shall furnish to the Competent Authority or other officer appointed by the Government in this behalf, the Half-yearly/ Annual return in Form 15, in duplicate, on or before the 31st July/January of every year, as the case may be.

95. INFORMATION REQUIRED BY THE INSPECTOR.- The occupier, owner or manager of a factory shall furnish any information that the inspector may require for the purpose of satisfying himself whether any provision of the Act has been complied with or whether any order of an inspector has been duly carried out. Any demand by the inspector for such information, if made, during the course of any inspection, shall be complied forthwith if the information is available in the factory, or if made in writing, shall be complied with, within seven days of receipt thereof.

96. PERMISSIBLE LEVELS OF CERTAIN CHEMICAL SUBSTANCES IN WORK ENVIRONMENT.- Without prejudice to the requirements in any other provisions in the Act or the Rules, the requirements specified in the Schedule to this rule shall apply to all factories.

SCHEDULE

1. Definitions.- For the purpose of this schedule-

(a) "mg/m3" means milligrams of substance per cubic meter of air;

(b) "mppcm" means million particles of a substance per cubic meter of air;

(c) "ppm" means parts of vapour or gas per million parts of air by volume at 25 degree C and 760 mm of mercury pressure;

(d) "Time weighted average concentration" means the average concentration of a substance in the air at any work location in a factory computed from evaluation of adequate number of air samples taken at that location, spread over the entire shift on any day, after giving weightage to the duration for which each

such sample is collected and the concentration prevailing at the time of taking the sample.

$$\text{Time weighted average Concentration} = \frac{C1xT1 + C2xT2 + ...Cn \times Tn}{T1 + T2 + ...Tn}$$

Where Cn represents the concentration of the substance for duration Tn(in hours) for any n.

(e) "work location" means a location in a factory at which a worker works or may be required to work at any time during any shift on any day.

2. Limits of concentrations of substances at work locations.-

(a) The time weighted average concentration of any substance listed in Table 1 or 2 of the Second Schedule of the Act, at any work location in a factory during any shift on any day shall not exceed the limit of the permissible time weighted average concentration specified in respect of that substance:

Provided that in the case of a substance mentioned in the Second Schedule of the Act in respect of which a limit in terms of short term maximum concentration is indicated, the concentration of such a substance may exceed the permissible limit of the time weighted average concentration for the substance for short periods not exceeding 15 minutes at a time, subject to the condition that -

(i) such periods during which the concentration exceeds the prescribed time weighted average concentration are restricted to not more than 4 per shift;

(ii) the time interval between any two such periods of higher exposure shall not be less than 60 minutes; and

(iii) at no time the concentration of the substance in the air shall exceed the limit of short term maximum concentration.

(b) In the case of any substance given in the Second Schedule of the Factories Act, the concentration of the substance at any work location in a factory at any time during any day shall not exceed the limit of exposure for that substance specified in the said Second Schedule.

(c) In the cases where the word "skin" has been indicated against certain substance mentioned in the Second Schedule of the Act appropriate measures shall be taken to prevent absorption through cutaneous routes particularly skin, mucous membranes, and eyes as the limits specified in the above said

Second Schedule are for conditions where the exposure is only through respiratory tract.

(d) (i) In case, the air at any work location contains a mixture of such substances mentioned in the Second Schedule of the Factories Act which have similar toxic properties, the time weighted concentration of each of these substances during the shift should be such, that when these time weighted concentration divided by the respective permissible time weighted average concentration specified in the above mentioned Schedule, and the fractions obtained are added together, the total shall not exceed unity.

i.e. C1/L1 + C2/L2 + ...+Cn/Ln shall not exceed unity.

Where C1, C2, ...Cn are the time weighted concentration of toxic substances 1, 2, ...and n respectively, and L1, L2,.....Ln are the permissible time weighted average concentration of the toxic substances 1, 2, ... and n respectively.

(ii) In case the air at any work location contains a mixture of substances, mentioned in the Second Schedule of the Act and these do not have similar toxic properties, then the time weighted average concentration of each of these substances shall not exceed the permissible time weighted average concentration specified in the above mentioned Schedule , for that particular substance.

(iii) The requirement in sub-para (i) and (ii) above shall be in addition to the requirements in paragraphs 2(a) and 2(b).

3. Sampling and evaluation procedures.-

(a) Not withstanding provisions in any other paragraphs, the sampling and evaluation procedures to be adopted for checking compliance with the provisions in the schedule shall be as per standard procedures in vogue from time to time.

(b) Notwithstanding the provisions in paragraph 3.(a) above the following conditions regarding the sampling and evaluation procedures relevant to checking compliance with the provisions in this schedule are specified.

(i) For determination of the number of particles per cubic meter as per the item (a)(i) of the Second Schedule of the Act, silica are to be collected by standard or midget impinger and the counts made by light-field technique.

(ii) The percentage of quartz as per the formulae given in

the Second Schedule of the Act is to be determined from air borne samples.

(iii) For determination of number of fibres the membrane filter method at 430 X magnification (4 mm. objective) with phase contrast shall be used.

(iv) Both for determination of concentration and percentage of quartz the fraction passing through a size-selector with the following characteristics shall only be considered.

Aerodynamic diameter (unit density sphere)	Percentage allowed by size-selector
2.0	90
2.5	75
3.5	50
5.0	25
10.0	0

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4. Power to require assessment of concentration of substances -

(a) The Competent Authority may, by an order in writing, direct the occupier or manager of a factory to get before any specified date, the assessment of the time weighted average concentration at any work location of any of the substances mentioned in the Second Schedule of the Act carried out.

(b) The results of such assessment as well as the method followed for air sampling and analysis for such assessment shall be sent to the Competent Authority within 3 days from the date of completion of such assessment and also a record of the same kept readily available for inspection by the inspector.

5. Exemption.- If in respect of any factory or a part of a factory, the Competent Authority is satisfied that, by virtue of the pattern of working time of the workers at different work locations or on account of other circumstances, no worker is exposed, in the air at the work locations, to a substance or substances specified in the Second Schedule of the Act to such an extent as is likely to be injurious to his health, he (the Competent Authority) may by an order in writing, exempt the factory or a part of the factory from the requirements in paragraph 2, subject to such conditions, if any, as he may specify therein.

97. MUSTER ROLL.- The manager of every factory shall maintain a muster roll of all the workers employed in the factory showing (a) the name of each worker, (b) the nature of his work and (c) the daily attendance of the worker.

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98. REGISTER OF ACCIDENTS AND DANGEROUS OCCURRENCES. - The manager of every factory shall maintain a register of all accidents and dangerous occurrences which occur in the factory. All these shall be investigated thoroughly and causes established. Any deficiency found in respect of systems & practices shall be corrected & report thereof shall be made available to the inspector & Competent Authority.

99. MAINTENANCE OF INSPECTION BOOK.- The manager of every factory shall maintain a register of inspection reports and shall produce it when so required by the Competent Authority or Certifying Surgeon.

100. INFORMATION REGARDING CLOSURE OF FACTORIES.-

(1) The occupier or the Manager of every factory shall report to the Competent Authority any intended closure of the factory or any shift, section or department thereof immediately after it is decided to do so, and before the closure takes place, intimating-

(i) the date of intended closure;

(ii) the reason for closure;

(iii) the number of workers likely to be affected;

(iv) the probable period of the closure; and

(v) the number of workers on the muster.

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(2) An intimation shall also be sent to the Competent Authority as soon as the factory or the shift or the section or department of the factory, as the case may be, starts working again.

101. COMMUNICATION FACILITIES.- The Manager shall establish effective communication facilities so that in the normal as well as in emergency conditions the Shift-in-charge is able to contact without delay the factory manager, control room, security, fire station, dispensary, workers and the outside agencies such as police, fire brigade, hospital, district magistrate, civil defence post.

102. SPECIAL POWERS OF THE COMPETENT AUTHORITY.- The Competent Authority shall have powers to notify specific safety procedures, guides, manuals to enhance safety & health in any factory.

APPENDIX

LIST OF FORMS

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FORMS

The factory shall fill the relevant forms F 1 to F 15 as the case may be. The list of forms is given below:

Form No.	Title	To be filled by
1.	Certificate of fitness to work on specified job	Medical Officer
1A.	Health register of worker employed on specified job.	Medical Officer
2.	Record of lime washing, painting, anti-termite treatment, floor marking etc.	Manager
3.	Report of examination of hoists & lifts	Competent Person
4.	Report of examination of lifting machines, ropes & lifting tackles	Competent Person
5.	Report of examination or test of pressure vessel or plant.	Competent Person
6.	Examination of water sealed gas holder.	Competent Person
7.	Item field performance report.	Manager
8.	Failure mode, effect & criticality analysis.	Manager
9.	Material safety data sheet.	Manager
10.	Report of examination and test of dust extraction or suppression system.	Competent person
11.	Preliminary report of accident or dangerous occurrences.	Manager
12.	Notice of accidents or dangerous occurrence.	Manager
13.	Form for reporting electrical accidents.	Manager
14.	Notice of poisoning or disease.	Manager
15.	Half yearly/Annual Return.	Manager

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Form - 1

CERTIFICATE OF FITNESS TO WORK ON SPECIFIED JOB

(See rules 7(3), 32 Sch. III, 33, 55, 88)

1. Name of the Factory:

2. Name of the Person

   (In Block letters) and Employee No.

   Sex: M/F Date of birth:

3. Educational Qualifications:

4. Previous Experience :

   Field of Experience :

5. Details of Medical Examination : Date

   .1. Height.....cm. .2. Weight.....kg.

   .3. Hearing (Auditory Examination): Normal/Not normal*

   .4. Eyesight : Normal/Normal with spects/Not normal*

   : Colour blindness : Yes/No

   .5. General Laboratory Investigations (Blood, urine, excreta, sputum etc.): Normal/Not normal*

   .6. Pulmonary function & Chest Examination : Normal/Not normal*

   (including X ray examination)

   .7. Nervous system: Normal/Not normal*

   .8. Overall health assessment:

---

* Specify the condition & remedial measures.

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6. I certify that I have personally examined Dr./Shri/Smt./Kum.. ..... and seen his/her other medical reports and my recommendations are recorded below.

7.	Work with/in/at		Recommendations
.1.	Chemicals and hazardous materials including prescribed materials		Fit/Unfit
.2.	Machines		
	.2.1	Cranes	Fit/Unfit
	.2.2	Locomotives	Fit/Unfit
	.2.3	Fork lifts	Fit/Unfit
.3.	Blasting by compressed air/steam for cleaning of articles.		Fit/Unfit
.4.	Radioactive Area		Fit/Unfit
.5.	Any other work specified by the Competent Authority.....		Fit/Unfit

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Signature of Certifying Surgeon

Name …….....

Date: Reg.No. .....

Note: Strike out whichever is not applicable.

Medical Examination Record

S.No.	Date of Last Examination	Date of Next Examination	Remarks

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Form - 1A

HEALTH REGISTER OF WORKERS EMPLOYED ON SPECIFIED JOBS

(See rules 7(4), 88)

Name of the Factory:

S.No.	Name	Age Yrs.	Nature of job	Date of			If suspended from work period of suspension	Date of resumption of duty	Signature with date of certifying surgeon
				Medical Exam.	Employment in present work	Learning or transfer to other work			

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N.B. Against column Nature of job please write the applicable number as given below:

(1) Working with Chemicals & Hazardous materials.

(2) Working with-2.1 rotating machines; 2.2 lifting machines; 2.3 material handling equipment.

(3) Working with -3.1 electrical work-low & medium voltage; 3.2 electrical work-high voltage.

(4) At height.

(5) At blasting by compressed air/steam for cleaning of articles.

(6) Radioactive area.

Form - 2

Record of Limewashing, Painting, Antitermite treatment, floor marking etc.

(See rules 8,25 & 68(7)(b))

Name of the Factory:

S.No.	Location no. of the part* in factory	Parts covered (e.g. walls, ceiling, woodwork etc.)								Remarks
		Lime Washing		Painting		Antitermite treatment		Floor Marking		
		Name of part	Date	Name of part	Date	Name of part	Date	Name of part	Date	

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Signature

Date: **(Manager)**

* Part means wall, ceiling, woodwork etc.

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Form - 3

REPORT OF EXAMINATION OF HOISTS & LIFTS

(See Rule 34)

1. Name of the Factory :

2.1 Type of hoist or lift and identification No. or description :

2.2 Date of construction/reconstruction :

3. Are all parts of the hoist or lift, of good mechanical construction, sound material and adequate strength (so far as ascertainable) :

4. Are the following parts of the hoist or lift properly maintained and in good working order? If not, state what defects have been found.

.1. Enclosure of hoistway or liftway :

.2. Landing gates and cage gate(s) :

.3. Interlocks and the landing gates and cage gate(s) :

.4. Other gate fastenings :

.5. Cage and platform and fittings, guides, buffers, interior of the hoistway or liftway. :

.6. Overrunning devices :

.7. Suspension ropes or chain and their attachments. :

.8. Safety gear i.e. arrangement for preventing fall of platform or cage brakes. :

.9. Brakes :

.10. Worm or spur gearing :

.11. Other electrical equipment :

.12. Other parts :

5. What parts(if any) were inaccessible :

6. Repairs, renewals :

7. Maximum safe work load :

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8. Is any of the lift made as per requirements of fire lift & if so its location & identification No. :

9. Other particulars :

I/we certify that on (date) ..... I/we thoroughly examined this hoist or lift and that the above is a correct report of the result.

Signature:

Date: **Name :**

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Form - 4

REPORT OF EXAMINATION OF LIFTING MACHINES

Ropes & Lifting Tackles

(See rule 35(4))

1.	Name of the Factory	:
2.	Distinguishing number or mark (if any) and description sufficient to identify the lifting machine, chains, rope or lifting tackle.	:
3.	Date when lifting machine chain, rope or lifting tackle was first used in the factory.	:
4.	Date and number of certificate of last examination made under section 29(1)a (iii) and by whom it was carried out.	:
5.	Date and number of certificate relating to any test & examination made, under rules 35.1 & 35.15 together with the name & address of the certifying person.	:
6.	Date & certificate of annealing or other heat treatment of the chain and lifting tackle carried out as per rule 35.7 and by whom it was carried out.	:
7.	Particulars of any defect found at any such examination or after annealing and affecting the safe working load and steps taken to remedy such defect.	:

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I/We certify that on .....……..... I/We thoroughly examined the above mentioned lifting machine/chain rope/lifting tackle and that the above is a correct report of the result.

Signature:

Date: **Name:**

Form - 5

REPORT OF EXAMINATION OR TEST OF PRESSURE VESSEL OR PLANT

(See rule 36(9)(b))

1. Name of the Factory :

2. Details of pressure vessel or plant and location (i.e. Distinctive no. max. & safe working pressure etc. :

3. Name, address of the manufacturer and reference no. of test certificate by manufacturer and/or competent person & date. :

4. Nature of process in which the pressure vessel/plant is used. :

5. Particulars of pressure vessel or plant. :

   .1 Date of construction. :

   .2 Method of construction (e.g. supported) :

   .3 Thickness of walls.(mm.) : :

   .4 Date on which the pressure vessel/plant first taken into use :

   .5 Maximum permissible working pressure specified by the manufacturer :

   .6 Design pressure(if known) : :

6. Date of last hydrostatic test (if any) and pressure applied. :

   .1 If Hydrostatic test could not be carried out due to constraints of construction Date of ultrasonic/magnetic particle / or any other suitable test as approved by the Competent Authority :

7. Is the pressure vessel/plant in open or otherwise exposed to weather or damp or corrosive environment. :

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8. What parts were inaccessible :

9. What examinations and tests were made (specify pressure if hydrostatic test is made) :

10. Condition of pressure vessel/ External plant (state any defects materially affecting the max. permissible working/ safe Internal working pressure) :

    .1 If any defect is observed affecting safe working pressure, is the new safe working pressure marked with date. :

11. Are the required fittings and appliances provided in accordance with rules :

    .1 Are all fittings and appliances properly maintained in good condition. :

12. Have the pressure settings of safety valves been checked? :

13 Repairs. :

    .1 Required :

    .2 Period within which repairs should be carried out. :

    .3 Any other condition which the person making the examination thinks it necessary for securing safe working. :

14. Maximum permissible working pressure calculated from dimensions and from other data ascertained by present examination, due allowance being made for conditions of working if unusual or exceptionally severe. :

    .1 Minimum thickness of pressure vessel, plant measured during the examination. :

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15. Where repairs affecting the maximum working pressure are required state the working pressure. :

.1 Before expiration of period specified in 13.2. :

.2 After the expiration of such period if the required repairs have not been complete. :

.3 After the completion of the required repairs. :

16. Other observations. :

I certify that on (Date).....the pressure vessel/plant described above was thoroughly cleaned and (so far as construction permits) made accessible for thorough examination and for such tests as were necessary for thorough examination and that on the said date, I thoroughly examined this pressure vessel/plant, including its fittings and that above is a true report of my examination.

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Signature:

Date: **Name:**

Form - 6

Report of Examination of Water Sealed Gas Holder

(See rule 37)

1. Name of the Factory :
2. Description, type& distinguishing numbers or letters of the gas holder :
3. Location in the plant and date of installation :
4. Name & address of manufacturer :
5. Design data :
   - .1. Maximum Capacity in Cu.m. :
   - .2. Pressure shown by the holder when full :
   - .3. Number of lifts and their distinguishing numbers & letters :
6. Constructional details of the gas holder including the main dimensions, such as diameter, height of each lift and tank, the thickness of side plates and the crown, description of the type of material used to form the side plates & the crown :
7. Allowable min. thickness of the side plates & crown of gas holder :
8. Number etc. of the drawing showing constructional details of gas holder, prepared by its manufacturer :
9. Date of examination :
   - .1. Internal :
   - .2. External :
10. Parts of gas holders examined by the electronic or other accurate devices or by cutting sample discs there of :

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11.	Particulars as to the conditions of	:
	.1. Crown	:
	.2. Side sheeting including grips & cups	:
	.3. Guiding mechanism (roller carriages, roller, pins, guide, ropes, etc.)	:
	.4. Tank	:
	.5. Other Structure, if any columns (framing & bracing)	:
12.	Particulars as to the position of lifts at the time of exam.	:
13.	Particulars as to whether tank and lifts were found sufficiently level for safe working.	:
14.	Are all fittings and appliances properly maintained in good condition, repairs if any reqd. & period within which they shall be carried out	:
15.	Any other condition which shall be complied with and are necessary according to the opinion of competent person	:

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I certify that the gas holder described above was thoroughly examined and such of the tests as were necessary, were carried out and that above is a true report of the examination carried out by me.

Signature:

Date: **Name:**

Form - 7

ITEM FIELD PERFORMANCE REPORT

(See rule 60)

1.	Name of the Factory		:
2.	Item		:
	.1	Identification	:
	.2	Manufacturer	:
	.3	Number of items of the type	:
	.4	Date of manufacture	:
	.5	Date of modification/reconditioning	:
	.6	Date first placed in use	:
	.7	Cumulative operating time since above	:
	.8	Date & place where used after 2.5	:
	.9	Date/ cumulative operating time since above	:
	.10	Cumulative time-Non use (Storage/Maintenance)	:
4.	Operating environment		:
	.1	Temperature Range	:
	.2	Relative humidity range	:
	.3	Nature of atmosphere A.C./Clean/Dusty/Corrosive/....	:
	.4	Vibration level	:
5.	Mode of operation Continuous/Intermittent/Standby/.....		:

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6.	Item failure information		:
	.1	Symptoms of failure	:
	.2	Failure detected during Operation / Periodic check / Preventive maintenance	:
	.3	Functions affected by failure	:
	.4	Failure cause	:
		Inherent/Misuse/ Maintenance induced/	:
		External to item/ Secondary/Unknown	:
7.	Item failure analysis and correction		:
	.1	List of failed parts	:
	.2	List of replaced parts	:
	.3	Adjustments made	:
8.	Total active downtime		:
9.	Total downtime		:
10.	Any other information		:

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Signature:

Date:

Name :

Designation:

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Form - 8

FAILURE MODE, EFFECT & CRITICALITY ANALYSIS

[F M E C A]

(See rule 60)

Name of the Factory:

System : .....

Sub System: ..... Page _____of _____

Code No. : .....

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No.	Part No.	Part		Failure Mode		Detection Method	Effect on System Plant	Remarks
		Name	Function	No.	Description			
1	2	3		4		5	6	7

Prepared By ..... Checked By ..... Approved By .....

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Form -9

Material Safety Data Sheet

(See rules 62, 88 Sch.VIII)

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

IDENTITY (As Used on Label and List) and Maximum Quantity handled at any time.

Section I - Hazardous Ingredients/Identity Information : Unless otherwise specified, PLE & TLV values are averaged over 8 hrs. period and STEL values are averaged over 15 mts. period.

Hazardous	Components (Specific Chemical Identity, Common Name(s)	PLE Factories Act	TLV OSHA	Other Limits Recommended	% (Optional)

Section II – Physical/Chemical characteristics			
Boiling Point (degree C)		Specific Gravity (H2O=1) liquid	
Vapor Pressure (mm Hg) at 20 degree C		Melting point (degree C)	
Vapour density (air=1)		Evaporation rate (Butyl Acetate=1)	

Solubility in water gms/100 gms of water at 20 degrees C :
Appearance and Odour :

Section III – Fire and explosion hazard Data			
Flash point (Method used)	Flammable limits % by volume	LEL	UEL
Extinguishing Media :			
Special Fire Fighting Procedures :			
Unusual Fire and Explosion hazards:			

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Section IV - Reactivity Data				
Stability	Unstable		Conditions to avoid:	
	Stable			
Incompatibility (material to avoid) :				
Hazardous decomposition or Byproducts:				
Hazardous Polymerisation	May occur		Condition to avoid :	
	Will Not occur			
Section V – Health Hazard Data				
Route(s) of Entry:	Inhalation?		Skin?	Ingestion?
Health Hazards (Acute and Chronic) :				
Carcinogenity:	MTP?		IARC Monographs?	OSHA Regulated?
Signs and Symptoms of Exposure:				
Medical Conditions :				
Generally aggravated by Exposure:				
Emergency and First Aid Procedures:				
Section VI – Precautions for Safe Handling and Use				
Steps to be taken in case material is spilled or released :				

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Waste Disposal Method		
Precautions to be taken while Handling and Storing:		
Other precautions:		
Section VII – Control Measures		
Respiratory Protection (Specify Type) :		
Ventilation	Local Exhaust	Special
	Mechanical (General)	Other
Protective Gloves	Eye Protection :	
Other Protective Clothing or Equipment :		
Work/hygienic Practices :		
Section VIII		
Manufacturers name	Emergency Telephone Number	
	Telephone number for information	
Postal Address :	Date prepared	
	Signature of Preparer (optional)	

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Section IX – Notes

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Form - 10

REPORT OF EXAMINATION AND TEST OF DUST EXTRACTION OR SUPPRESSION SYSTEM

[See rule 88 Schedules IV, VI,VIII & X]

1.	Name of the Factory	:		
2.	Description of system	:		
3.	Hood/Enclosure	:		
	.1 Sr. No. of Hood/Enclosure	:		
	.2 Contaminant captured	:		
	.3 Capture Velocities (at point to be specified)	:	Design Value	Actual Value
	.4 Volume Exhausted at Hood/Enclosure	:	..... m3/hr	
4.	Pressure Drop at	:		
	.1 Joints	:		
	.2 Any other points (to be specified)	:		
5.	Transport velocity in duct (At points along ducts to be specified)	:		
6.	Air cleaning device	:		
	.1 Type used	:		
	.2 Velocity at inlet	:		
	.3 Static pressure at inlet	:		
	.4 Velocity at outlet	:		
	.5 Static pressure at outlet	:		
7.	Fan	:		
	.1 Type used	:		

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	.2	Volume handled	:
	.3	Static Pressure	:
	.4	Pressure drop at outlet of fan	:
8.	Fan Motor		:
	.1	Type	:
	.2	Speed in r.p.m. & power in kW	:
9.	Particulars of defects if any, disclosed during the test in any of the above components		:

I certify that on (Date)..... the above dust extraction system was thoroughly cleaned and (so far as its construction permits) made accessible for thorough examination;. I further certify that on the said date, I thoroughly examined the above dust extraction system including the components and fittings and that the above is a true report of my examination.

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Signature:

Date: **Name :**

N.B. All measurement units shall be in metric system.

Form - 11

PRELIMINARY REPORT OF ACCIDENT OR DANGEROUS OCCURRENCES

(See rules 89(1), 89(3))

1. Name of the Factory :
2. Name of injured person & address :
   Official :
   Residential :
3. a) Sex : M/F b) Age:
   c) Designation : d) Pay:
4. Date and hours of accident/dangerous occurrence :
5. Cause & Nature of accident/dangerous occurrence :

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Date: **Manager** **Signature:**

Place: **Name :**

1. District/Sub Divisional Magistrate
2. Officer in charge of nearest police station

} In case of fatal accident or if it is of such a nature that it is likely to be

3. Inspector concerned.
4. Competent Authority.
5. Relatives of the injured/deceased.
6. Electrical Inspector.[In case of Electrical Accidents.]

Form -12

NOTICE OF ACCIDENTS OR DANGEROUS OCCURRENCE

(See rules 89(2), 89(5))

1.	Name of the Factory	:		
2.	Branch or section & exact place where the accident or dangerous occurrence happened	:		
3.	Name of injured person	:		
	Address Official	:		
	Residential	:		
4.	a) Sex : M/F		b)	Age :
	c) Designation :		d)	Pay :
5.	Date and hour of accident or dangerous occurrence	:		
6.	Hours at which he started work on the day of accident	:		
7.	a) Cause & nature of accident or dangerous occurrence	:		
	b) If caused by machinery	:		
	i) Name of the machine and part causing the accident, &	:		
	ii) Whether it was moved by mechanical power at that time	:	Yes/No	
	c) Exactly what injured person was doing at that time	:		
8.	Names & addresses of the witnesses to the accident	:	1)	
		:	2)	
9.	Nature & extent of Injury	:		
10.	Period of disability	:		

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11.	If accident is not fatal, state whether injured person is likely to be disabled for 48 hours or more	:	Yes/No
12.	Name of Medical Officer in attendance on injured person	:	

I certify that to the best of my knowledge and belief that the above particulars are correct in every respect.

Date: **Manager** **Signature :**

Place: **Name :**

Competent Authority.

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Form - 13

FORM FOR REPORTING ELECTRICAL ACCIDENTS

(See rule 44-A of the Indian Electricity Rules,1956;

&

the Atomic Energy (Factories)Rules, 1994; rule 89(2))

1.	Date and time of accident	:
2.	Place of accident and district	:
3.	System & Voltage of supply	:
4.	Name of the licensee or person/persons or supplier or user of energy in whose premises or jurisdiction the accident occurred	:
5.	a) (i) Name of the person	:
	(ii) Animal(please specify the name and address of the owner)	:
	b) Address of such/each person	:
6.	Occupation and designation of such person/persons (and in particular whether employed in electrical works or elsewhere)	:
7.	Brief description of the job undertaken, if any	:
8.	Authority under which such person / persons was / were allowed to work on the job. State also whether he/they was/were authorised person/persons	:
9.	Describe fully nature and extent of injuries, e.g. fatal, disablement of any portion of body or other injury, etc.	:
10.	Detailed causes leading to the accident	:
11.	Action taken regarding first aid, medical attendance, etc. immediately after the occurrence of the accident.	:
12.	Whether appropriate Govt. Dist. and police station informed (if so, give the address).	:

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(2)

13.	Steps taken to preserve the evidence in connection with the accident to the extent possible.	:
14.	Name and designation/s of the person/s assisting the person/s killed or injured.	:
15.	What safety equipment were given to and used by the person/s who met with this accident(e.g. rubber gloves, rubber mats, safety belts and ladders, etc.).	:
16.	Whether isolating switches and other sectionalising devices were employed to deaden the sections for working on the same, if so, whether these were earthed.	:
17.	Whether the work on live lines was undertaken by an authorized person/s. If so, the name and designation of such person/s may be given.	:
18.	Whether artificial resuscitation treatment was given to the person who met with electric accident. If yes, for how long was it continued, before abandonment.	:
19.	Steps proposed to be taken to avoid recurrence	:
20.	Names and designations of persons present at the time of accident.	:
21.	Any other remarks	:

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Date: **Manager** **Signature :**

Time: **Name:**

1. Electrical Inspector of the region.

2. Competent Authority.

Form - 14

Notice of Poisoning or Disease

(See rules 89(5), 90)

1.	Name of the Factory		:
2.	Name and address of the undertaking in which the patient presumes that he was exposed to the risk to which the poisoning or disease is attributed.		:
3.	Harmful agent or process		:
4.	Patient.	Name	:
		Address	:
5.	1. Sex : M/F	2. Age :	
	3. Designation:	4. Pay :	
6.	Precise occupation of the patient		:
	.1 at the place or last place of employment		:
	.2 at the undertaking in which the patient presumes that he was exposed to the risk.		:
7.	Nature of poisoning or disease.		:
8.	Approximate dates of beginning & cessation of exposure of the patient to the harmful agent or process mentioned in 3 above.		:
9.	General particulars		:

Manager, **Signature:**

Date: **Name:**

Competent Authority.

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Form-15

Half yearly/Annual Return

(See rule 94)

1.	Name of the Factory	:	
2.	Average number of workers employed daily	:	Male
		:	Female
3.	Normal hours per week	:	
4.	Number of days worked in a year	:	
5.	Does the factory come under section 87. (Dangerous Operations)	:	Yes/No
6.	Average daily number of workers employed in dangerous operations	:	
7.	Number of Accidents reported involving	:	
.1.	Fatalities	:	
.2.	Serious occurrences (without injury to persons)	:	
.3.	Minor loss of time (Accident causing disability of more than 48 hours)	:	
.4.	Permanent partial disability	:	
.5.	Permanent total disability	:	
8.	Causative factors of accidents	:	
.1	Machinery	:	
.2	Handling of materials	:	
.3	Chemicals	:	
.4	Hand tools	:	
.5	Fall of persons	:	
.6	Fall of objects	:	
.7	Striking against/struck	:	
.8	Explosion or Fire	:	
.9	Misc. Agencies	:	

Manager Signature:

Date: Name:

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Note. A detailed report on accidents be prepared on the lines suggested in IS-3786 entitled "Industrial accidents, classification and computation of injuries and accidents."

Rules and the sections of the Act

The following table gives the Rule Number(s) and the corresponding section(s) of the Factories Act, 1948 under which the Rule(s) is framed.

Rule Number(s)	Section(s) of the Act
3, 4	6(1)
5	8(1)
6	9
7	10(4)
8, 9	11(1) & (2)
10	12(2)
11	13 & 17
12 to 17	18(4)
18 to 27	19(3)
28 to 30	20(2)
31	6,21,28,29,31,36,41,87
32	21(2)
33	22(1)
34	28
35	29(2)
36 & 37	31(2) & (3)
38	34(2)
39	35
40	36(6)
41	37(5)
42	38(1) & 41
43 & 44	40 B
45 to 54	41
55 & 56	41 & 112

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Rule Number(s)		Section(s) of the Act
57 to 61	.....	41
62	.....	41 & 112
63	.....	42(2)
64	.....	43
65	.....	45(1)
66	.....	45(3) & 112
67	.....	45(4) & 112
68 to 71	.....	46 & 112
72	.....	47 & 112
73 to 76	.....	48(3) & 112
77	.....	48 & 50
78	.....	49(2) & 50
79	.....	53(2)
80	.....	59(5)
81	.....	61(8)
82	.....	62(2)
83 to 85	.....	64(2)
86	.....	72(3)
87	.....	84
88	.....	87
89	.....	88 & 88A
90	.....	89(1)
91	.....	107(1)
92	.....	108(1)
93	.....	109
94	.....	110
95 to 102	.....	112

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