Regulation on Occupational Health, Safety and Welfare

Department of Labour
Ministry of Labour and Human Resources

FOREWORD

March 7, 2012

The Ministry of Labour and Human Resources through the Department of Labour is please to bring out a ***Regulation on Occupational Health, Safety and Welfare***. The Ministry over the last few years has been trying to promote occupation health and safety at workplaces for our fellow workers. Despite the best of intentions and efforts, owing to lack of such regulation clearly illustrating the standards to promote and implement the health and safety measures at the workplace, a lot remained to be done.

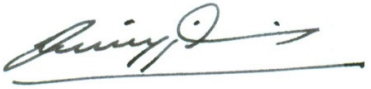
Through this Regulation the Ministry reinforces the priority that it has been according to the promotion of a safe and healthy workplace. Health and safety is a fundamental requirement of a sustainable business and also regarded as an essential part of business management. Accidents and work related diseases are mostly caused either by negligence or due to the absence of simple safety gears and safety drills. The safety of our fellow workers has been an area where we want to adopt a zero tolerance. With this Regulation in place, the Ministry hopes to reduce accidents in the workplaces irrespective of the type and nature of an industry.

By working together to promote safe and healthy workplaces, we will be able to reduce injuries, incidents, lost-time claims, workplace fatalities, and creating a harmonious and productive working life. This will in fact provide a win-win situation to employers and employees in long run.

I would like to congratulate the department for bringing out this Regulation which is simple to understand and easy to implement, in keeping with the international practices.

This Regulation will supersede the *"General Rules and Regulation on Occupational Health and Safety in Construction, Manufacturing, Mining, and Service Industries, 2006"*.

I earnestly appeal to all to promote safe, harmonious and productive workplaces.



(Dorji Wangdi)
Minister

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Introduction

In exercise of the powers conferred under section 234 read with the provisions of Chapter IX of Labour and Employment Act, 2007, the Ministry of Labour and Human Resources hereby promulgates this Regulation on Occupational Health, Safety and Welfare.

CHAPTER 1

Preliminary

1. This Regulation shall be called *"Regulation on Occupational Health, Safety and Welfare"*.

2. This regulation contains legal requirements that must be met by all workplaces within the coverage of Labour and Employment Act, 2007 that come under the inspectorial jurisdiction of the Department of Labour, Ministry of Labour and Human Resources.

3. This regulation shall come into force with effect from May 1st 2012.

Purpose

4. The purpose of this regulation is to establish standards on occupational health, safety and welfare on premises, instruments, vessels, appliances, apparatus, tools, devices, electrical safety and other hazardous conditions. It is to ensure safety, health and welfare for employees as well as other persons at workplaces, from work related risks to their health, safety and well being as provided in Chapter IX of the Labour and Employment Act, 2007.

Scope

5. This regulation applies to all types of employment except in farming.

CHAPTER 2

MANAGEMENT'S POLICY, PROGRAM AND REGISTRATION OF WORKPLACES

Health and safety program

6. An employer of an enterprise to whom this regulation is applicable shall prepare and implement an occupational health and safety program that ensures each workplace of the enterprise is safe and healthy.

7. The employer falling under section 21 of this regulation shall prepare and implement the policy in consultation with the health and safety representative (if any) at each workplace of the enterprise or, if there is no such representative the employees at each of the workplaces, and

8. The employer shall display the program in a prominent place at each permanently sited workplace of the enterprise.

Appointment of health and safety representative

9. The employees at a workplace may appoint one of its members to be their health and safety representative at that workplace in accordance with the provisions of section 166 of the Labour and Employment Act, 2007.

10. The employer shall not discriminate or take disciplinary action of any kind on the OHS representative for having acted in accordance with this regulation.

General requirements

11. Where any person at work in any workplace carries out any process, operation or work, it shall be the duty of the employer to register the workplace with the Chief Labour Administrator.

12. The workplaces under section 11 shall be registered:

a. regardless of size of economic activity, whether small, medium or large scale in one single location;

b. within ninety (90) days after this regulation take effect and for new workplaces within sixty (60) days from the date the business starts operating.

13. Registration shall be made in such form as set out in the Form-I.

14. The registration of workplace shall be free of charge and valid for lifetime. If any one of the following change are made, the workplace will have to be registered like any other new workplace:

a. change in business name;

b. change in location;

c. change in ownership, or

d. re-opening after previous closing.

Information regarding closure of unit/establishment/ manufacturing activity at a workplace

15. The employer shall report in writing to the Chief Labour Administrator and Labour Inspector any intended closure of the workplace or any section or department thereof which falls within the ambit of Labour and Employment Act, 2007, immediately citing of closer in Form-II appended to this regulation.

CHAPTER 3

INSPECTION AND NOTICES

Power of Labour Inspectors

16. Subject to the provisions of the section 27 of the Labour and Employment Act, 2007 a Labour Inspector upon presenting proper credentials to an employer or his/her authorized representative, is authorized to:

a. inquire into any accident or dangerous occurrence whether resulting in bodily injury, disability or not;

b. require the production of any prescribed register or any other document relating to the workplace;

c. take photographs and make such recordings as he considers necessary for the purpose of any examination;

d. exercise such other powers as may be prescribed by an order.

Improvement and prohibition notices

17. In accordance with section 40 and 43 of the Labour and Employment Act, 2007, a Labour Inspector may issue an improvement or prohibition notice to an employer on the spot during the inspection or up to 5 working days after the visit has been completed.

Prompt Compliance

18. Every person to whom an order or directive is issued by Labour Inspector must comply promptly within the time set out in the order or directive.

CHAPTER 4

RIGHTS AND RESPONSIBILITIES

General duties of employers

19. Every employer shall ensure the health and safety of all employees and any other person present at a workplace. The employer shall also comply with the regulations and any other orders applicable.

20. Without limiting section 19 an employer shall:

a. improve working conditions that are hazardous to the health or safety of the employees;

b. ensure that the employees:

i. are made aware of all known or reasonably foreseeable health or safety hazards to which they are likely to be exposed by virtue of their work;

ii. are made aware of their rights and duties under this regulations.

c. establish occupational health and safety policies and programs in accordance with this regulation;

d. provide and maintain in good condition protective equipment, devices and clothing's as required by this regulation or any other law and ensure that these are used by the employees;

e. provide to the employee the information, instruction, and supervision necessary to ensure the health and safety of those workers in carrying out their work and to ensure the health and safety of other persons at the workplace.

Health and Safety Policy

21. The employer that is either :

a. a registered company under the Companies Act of Kingdom of Bhutan (2000), or

b. a small, medium or large scale industry, or

c. a workplace employing twelve or more employees shall prepare a written statement of its policy in respect of health and safety of the employees at work.

22. The Health and Safety policy should contain or deal with:

a. declared intention and commitment of the top management to health, safety and environment and compliance with all the relevant statutory requirements;

b. organizational set up to carry out the declared policy clearly assigning the responsibility at different levels, and

c. arrangements for making the policy effective.

23. In particular the policy should specify the following:

a. arrangement for involving the workers;

b. intention of taking into account the health and safety performance of individual at different levels while considering their career advancement;

c. fixing the responsibility of the contractors, sub-contractors, transporters and other agencies entering the premises;

d. relevant techniques and methods, such as safety audits and risk assessment for periodical assessment of the status on health, safety and environment and taking all the remedial measures;

e. stating its intentions to integrate health and safety, in all decisions including those dealing with purchase of plants, equipment, machinery and material as well as selection and placement of personnel;

f. arrangements for informing, educating and training and retraining its own employees at different levels and the public, wherever required.

24. A copy of the declared "Health and Safety Policy" signed by the owner shall be sent to the Labour Inspector and will also be made available to all employees including contract employees, transporter and suppliers etc. A copy of the policy shall be displayed at a conspicuous place in Dzongkha and English.

25. The employer shall also revise safety policy as and when there is modification or expansion of the plant or new substances or articles are used at the workplace.

General duties of employees

26. Subject to the provisions of section 159 and 160 of the Labour and Employment Act, 2007, every employee shall:

a. carry out his or her work in accordance with established safe work procedures as required by this regulation;

b. use or wear protective equipment, devices and clothing as required by this regulation;

c. not engage in horseplay or similar conduct that may endanger himself/herself or other workers or any other person;

d. ensure that his/her ability to work without risk to his or her own health or safety, or to the health or safety of any other person, is not impaired by alcohol, drugs or other causes;

e. report to the supervisor or employer (i) any contravention of this regulation or any other applicable order of which the worker is aware, and (ii) the absence of or defect in any protective equipment, device or clothing or the existence of any other hazard, that the worker considers is likely to endanger the worker or any other person;

f. cooperate with the joint committee or worker's health and safety representative (if any) for the workplace, and

g. cooperate with the officials of the Department of Labour and any other person carrying out a duty under this regulation.

General duties of supervisors

27. Every supervisor shall:

a. ensure the health and safety of all workers under his/her direct supervision;

b. has adequate knowledge about this regulation applicable to the workplace and competent to supervise and provide at the workplace all the necessary facilities for protecting employee, and

c. comply with this regulation and any other applicable orders.

28. Without limiting section 27, a supervisor shall:

a. ensure that the workers under his or her direct supervision

i. are made aware of all known or reasonably foreseeable health or safety hazards in the area where they work, and

ii. comply with this regulation and any other applicable orders.

b. consult and cooperate with the worker's health and safety representative (if any) for the workplace, and

c. cooperate with the officials of the Department of Labour and any other person carrying out a duty under this regulation.

General duties of suppliers

29. A procuring agency when awarding work contract shall obtain an undertaking from the work awardee/contractor that he/she shall:

a. ensure that any tool, equipment, machine or device, or any biological, chemical or physical agent, supplied is safe when used in accordance with the directions provided;

b. provide directions for the safe use of any tool, equipment, machine or device, or any biological, chemical or physical agent, that is supplied by him/her to be used at a workplace by workers;

c. if the supplier has responsibility under a leasing agreement to maintain any tool, equipment, machine, device or other thing, maintain it in safe condition and in compliance with this regulation.

Rights of workers to withdraw from dangerous work

30. Subject to the provisions of section 162 to 165 of Labour and Employment Act, 2007, the supervisor or employer receiving a report made under the relevant sections of the Act shall immediately investigate the matter, and

a. ensure that the reported unsafe condition is removed without delay, or

b. if in his or her opinion the report is not valid, must so inform the person who made the report.

CHAPTER 5

HEALTH AND SAFETY COMMITTEE

Establishment and composition of Health and Safety Committee

31. In every workplace where in:

a. 50 or more employees are employed, or

b. hazardous process is carried out.

There shall be constituted health and safety committee. The employer shall notify the constitution of health and safety committee to Chief Labour Administrator in Form-III within 90 days from the date this regulation takes effect, and for new workplaces within 60 days from the date the business commences operations.

32. The health and safety committee shall be comprised of equal number of representatives from the employers and employees. The employer's representative shall include:

a. a senior officer who by virtue of his position in the organization can contribute effectively;

b. Safety Officer who shall also act as the secretary of the committee;

c. a representative each from production, maintenance and purchase department.

33. The employees' representatives shall be elected by the members one of whom shall be health and safety representative.

34. The term of the committee shall be 2 years. Each member shall be eligible for reappointment.

35. The committee shall meet as often as necessary but at least once in a quarter.

36. The members of the committee shall be given a reasonable notice of meeting along with a copy of agenda for the meeting.

37. The employer shall provide suitable place for holding the meeting and permit every member of the committee to attend such meeting.

38. The minutes of the meeting shall be recorded in the "minutes book" which shall be produced on demand to the inspector for inspection.

39. The health and safety committee shall have right to be adequately and suitably informed of:

a. potential safety and health hazards to which people may be exposed at work place;

b. data on accident and surveillance including medical examination which would be used by the committee only for the sake of guidance and advice for the improvement of work environment and would be kept confidential.

Functions of a Health and Safety Committee

40. Functions and duties of the health and safety committee shall include:

a. assisting and cooperating with the management in achieving the aims and objectives outlined in the "Health and Safety Policy" of the enterprise;

b. prepare a health and safety program for prevention of accidents and diseases in the workplace;

c. dealing with all matters concerning health, safety and environment and to arrive at practicable solutions to problems encountered;

d. creating safety awareness amongst all workers;

e. understanding educational, training and promotional activities;

f. reviewing the implementation of the recommendation made by it;

g. to study the accident statistics and trends relating to the enterprise, prepare reports on unsafe and unhealthy conditions and practices, and make recommendations for corrective action;

h. to develop and assist in the implementation of a safety and health education and training program, including the conduct of information sessions, for persons employed in the workplace.

Appointment of Safety Officer

41. In every workplace wherein:

a. 50 or more employees are employed, or

b. a hazardous process is carried out.

The employer shall appoint a Safety Officer within 90 days of the regulation taking effect for the existing workplaces and within 60 days of starting of the manufacturing activity in respect of the newly established work places.

Qualifications

42. A Safety Officer should :

a. preferably be a qualified engineer well versed with the occupational safety, health and environmental hazards at workplaces and who has also been associated with the production/maintenance/purchase of equipment at workplace;

b. have adequate knowledge of the language spoken by majority of the employees.

43. Provided that the Chief Labour Administrator may, subject to such conditions as he/she may specify, grant exemption from the requirements of section 42 or may relax the qualification if deemed necessary.

44. Provided further that in the case of a person who has been working as a Safety Officer for a period not less than 5 years on the date of commencement of this regulation, the Chief Labour Administrator may, subject to such conditions as he/she may specify, relax all or any of the above said qualification.

Training and facilities to be provided by employer

45. An employer shall provide the Safety Officer with:

a. training courses of instruction, seminars, conferences and meetings to ensure that the Safety Officer has sound knowledge of his or her functions and duties under this regulation;

b. with such facilities, equipment and information as are necessary to enable him to discharge his duties effectively.

Duties of Safety Officer

46. The duties of a Safety Officer shall be to advise and assist the management in the fulfilment of the obligations, statutory or otherwise concerning prevention of personal injuries and

maintaining a safe working environment. Their duties shall include the following:

a. act as secretary to the health and safety committee;

b. to advise the concerned department or the management in planning and organizing measures necessary for effective control of workplace accident and personal injuries;

c. to advise and carry out plant safety inspection in order to observe the physical condition of work practices and procedure followed by the worker and to render advise on measures to be adopted for removing unsafe action by the workers;

d. investigate every accident and dangerous occurrence which took place within the workplace and any occupational disease contracted in the workplace;

e. to render advice on matter pertaining to reporting and investigations of workplaceaccidents and diseases;

f. to advise on maintenance of such records as are necessary relating to accident, dangerous occurrences and industrial diseases, under the Labour and Employment Act, 2007 and related regulations;

g. organize campaigns, training courses, competitions, contests and other activities which will develop and maintain the interests of the persons employed in the workplace in establishing and maintaining safe and healthy working conditions;

h. advise the employer on the specifications:

   i. for any repair or alteration to be made to the workplace or any extension thereof;

   ii. of any new machinery, plant, equipment or appliance to be installed or used in the workplace.

i. co-operate with any doctor engaged to look after the health of the persons employed in the workplace on all matters affecting the safety and health of those persons;

j. be a focal contact to Department of Labour in relation to Occupational Health and Safety.

CHAPTER 6

NOTIFICATION AND RECORDING OF ACCIDENTS, DANGEROUS OCCURRENCES AND OCCUPATIONAL DISEASES

Duty to notify and report accidents and dangerous occurrences leading to death

47. Where any accident or dangerous occurrence specified in Table I takes place at a workplace which causes death to an employee or which results in such bodily injury to an employee which may result in death, the employer shall immediately notify the Chief Labour Administrator and the nearest Police station of the accident.

48. Any notice given in section 47 shall be confirmed by a detailed written report in Form-VI within 5 days of the occurrence of the accident to the Chief Labour Administrator.

49. In theevent of an injury not resulting in death (non fatal accident) the employer shall notify the Chief Labour Administrator but not later than 2 days and submit a detailed written report in Form-VI.

50. Where any dangerous occurrence specified in Table I, not resulting in death or bodily injury to any employee takes place, the employer shall immediately notify the Chief Labour Administrator of such occurrence. This notice shall be confirmed by a written report in Form-IV to Chief Labour Administrator but not later than 2 days.

Duty to report occupational disease

51. Where any employee at a workplace contracts any occupational disease specified in Table II, the employer shall immediately notify the same to the Chief Labour Administrator in Form-VI.

52. In the case of any qualified medical professional recognized by the Medical and Health Council of Bhutan comes to know of any person contracting any occupational disease who is or believed to have contracted the disease while working at a workplace shall send notice thereof to Chief Labour Administrator giving following details in respect of such employee.

a. the name and full postal address of the patient;

b. the disease from which he believes the patient to be suffering, and

c. the name and address of the workplace in which the patient is, or was last, employed.

Maintenance of Records

53. The employer shall maintain a register of all accident and dangerous occurrences which occur at the workplace in Form-V.

CHAPTER 7

PROVISIONS RELATING TO HEALTH

Cleanliness

54. The employer shall ensure that every workplace wherein he carries out manufacturing activity shall be kept clean and free from effluvia arising from any drain, privy and other nuisance, and in particular:

a. accumulations of dirt and refuse shall be removed daily by sweeping of by any other effective method from the floors and benches of workrooms, and from staircases and passages, and disposed of in a suitable manner;

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

c. effective means of drainage shall be provided and maintained in case of floors which get wet as a result of the manufacturing activity being carried out;

d. all inside walls and partitions, all ceilings or tops of rooms and all walls, side and tops of passages and staircases shall be white washed, colour washed or painted as the case may be. White washing may be done once in 6 months and whereas the paint may be carried out at least once in three years.

Disposal of wastes and effluents

55. In any workplace as a result of manufacturing activities being carried out if any trade wastes or effluents are generated, the employer shall ensure that the trade wastes and effluents are rendered innocuous in accordance with the provisions contained in relevant water and air pollution act or any other scheme in operation enforced by the local authority.

Overcrowding

56. For providing a healthy work environment which should be non injurious to the health of the employees the employer shall ensure at least 14.2m^3 of space per employee at the workplace.

For the purpose of this section no account of space above 4.2m above the level of floors of the room shall be taken into account for the purpose of calculation of space.

Drinking water

57. At every workplace effective arrangements shall be made to provide and maintain suitable points conveniently located for all employees the sufficient supply of safe drinking water.

58. Such points shall be marked "drinking water" in Dzongkha and English. The drinking water location shall be minimum 6m away from any urinal, latrine, open drain or washing facility.

59. Effective arrangements to cool the drinking water during the hot weather shall be made by the employer.

Latrines

60. At every workplace latrine accommodation shall be provided on the following scale:

a. where females are employed there shall be at least one latrine for every 20 females;

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

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

62. There would be displayed outside each latrine block a notice in Dzongkha "For Men ", "For Women" as the case may be. The notice shall also bear the figure of a man or woman as the case may be.

Urinal accommodation

63. Urinal accommodation shall be provided for the use of male employees and shall not be less than 60cm in length one for every 25 males provided that where the number of males employed

exceeds 200, it shall be sufficient if there is one urinal for every 100 males thereafter.

64. Latrine and Urinals shall conform to public health requirements and would be connected to the sewerage system. The walls / ceilings and partitions of latrine and urinal shall be white washed at least once in a period of 6 months, provided this regulation shall not apply in case the latrines and urinals are lined with glazed tiles to provide with smooth, polished impervious surface which is washable with detergents and disinfectants.

CHAPTER 8

PERSONAL PROTECTIVE EQUIPMENT

General requirements

65. The employer shall furnish employees, at no cost to employees, with protective equipment for the eyes, face, hands and feet, protective shields and barriers whenever necessary by reason of the hazardous nature of the process or environment, chemical or radiological or other mechanical irritants or hazards capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.

66. All personal protective equipment shall be of the approved design and construction appropriate for the exposure and the work to be performed.

67. The employer shall be responsible for the adequacy and proper maintenance of personal protective equipment used in the workplace.

68. The employer shall implement a thorough training program to ensure workers know the correct use and maintenance of their personal protective equipment.

69. No person shall be subjected or exposed to a hazardous environmental condition without protection**.**

70. The employer shall provide appropriate and suitable protective headwear devices, eyes and face protective equipment, respirators, ear protectors, safety belts/harness, foot wears, special protective clothing and hand and arm protective devices, as per the probability of exposures to hazards. Such personal protective equipment shall conform to appropriate American National Standards (ANSI) or Bureau of Indian Standards (BIS) or standards certified by National Institute of Occupational Safety and Health (NIOSH) or any standards developed by Government of Bhutan.

CHAPTER 9

WORKPLACE HAZARDS

Stumbling hazards

71. The parts of floors over which any person is liable to walk shall be sufficiently even to afford safe walking and safe trucking of materials.

72. Such parts of floors shall be free from holes and splinters, improperly fitted gutters or conduits, protruding nails and bolts, projecting valves or pipes, or other projections or obstructions which create stumbling hazards.

Slipping hazards

73. Floors, stair-treads and landings shall not be slippery under any condition, or made of any material which will become slippery through wear.

74. Stairways, ramps, elevator platforms and similar places where slipping may be especially hazardous shall be provided with non-slip walkway surface.

Ladder way openings

75. Ladder way floor openings shall be guarded on all exposed sides, except at the entrance to the opening, by permanent railings and toe-boards. The passage through the railings shall be provided with a barrier or gate so arranged that a person cannot walk directly through the opening.

Stairway openings

76. Stairway floor openings shall be guarded on all exposed sides by permanent railings and toe-boards, except the entrance to the stairway.

77. For infrequently used stairways where traffic across the openings prevents the use of permanent railings, the guards shall consist of flush-hinged covers of adequate strength equipped with railings attached thereto so as to leave only one side exposed when the

covers are open. When the openings are not in use, the covers shall be closed or the exposed sides guarded.

78. Hatchway, chute, pit and trap door openings shall be guarded by:

a. Removable railings with toe-boards on not more than two sides and permanent railings with toe-boards on all other exposed sides, or

b. Flush-hinged covers as prescribed for stairway floor openings.

Window openings

79. Window openings at stair landings, where the opening is more than 30cm in width and the sill is less than 1.9m above the landing, shall be guarded securely by bars, slats, or grills to prevent persons from falling through.

Manholes and other openings

80. Manhole floor openings shall be guarded by manhole covers of adequate strength, which need not be hinged.

81. Other floor openings into which persons can accidentally walk shall be guarded either by permanent railings and toe-boards on all exposed sides or by hinged-floor opening covers of adequate strength.

82. When covers for type in section 80 or 81 above are not in place, the openings shall be constantly attended by someone or protected by portable enclosing railings.

83. Floor openings into which persons cannot accidentally walk on account of fixed machinery, equipment or wall, shall be guarded by covers having no openings more than 2.5cm in width securely held in place.

84. All wall openings less than 1m from the floor, having a height of at least 75cm and a width of at least, 45cm from which there is a drop of more than 2m shall be solidly enclosed or guarded by barriers capable of withstanding a load of at least 100kg applied in any direction at any point of the top rail or corresponding members except vertically upward.

85. All other wall openings, irrespective of their width shall, if their lower edge is either 8cm. or less above floor level on the rear side and 2m or more above ground or floor level on the far side, be guarded by:

a. a toe-board across the bottom of the opening, or

b. an enclosing screen either solid or of grills or slat work with openings not more than 2.5cm in width capable of withstanding a load of at least 50kg applied horizontally at any point.

Construction of railings

86. All railings shall be permanently constructed of wood, pipe, structural metal or other material of sufficient strength.

87. Standard railings shall be at least 1m from the floor level to the upper surface of the top rail.

88. Standard railings shall have posts not more than 2m apart and an intermediate rail halfway between the top rail and the floor.

89. The dimensions of railings and posts anchorage and framing of members shall be such that the completed structure shall be capable of withstanding a load of at least 100kg applied from any direction to any point of the top rail.

90. Railings of the following types of construction shall be deemed to satisfy tests requirements:

a. for wood railings - top rails and posts of at least 5cm x 10cm stock and intermediate rails of at least 5cm x 5cm or by 2cm x 10cm stock, all such railings shall be smooth and free from large or loose knots, protruding nails or bolts, splinters, fins, slivers, or cracks;

b. for pipe railings - top rails and posts of metal pipes of at least 30mm diameter;

c. for structural metal railings - top rails and posts of angle iron of at least 38mm x 38mm x 5mm and intermediate rails of angle iron of at least 32mm x 32mm x 3mm.

91. Railings shall be of sound materials free from defects and all sharp corners rounded and smoothed.

Construction of toe-boards

92. The Toe-board shall be:

a. at least 15cm in height;

b. made of wood, iron, steel or other equivalent material;

c. securely fastened in place, with not more than 6mm clearance above the floor level.

Stairs

93. All stairs to be provided with treads, risers and railings as per provisions contained in the regulation on fire protection.

Fixed ladders

94. All metal parts of fittings of ladders shall be made of steel, wrought iron, malleable cast iron or other materials of equivalent strength.

95. Fixed ladders shall be installed in the following manner:

a. the perpendicular distance from the center line of the rungs to the nearest fixed object on the climbing side of the ladder is at least 90cm for a pitch of 75^{o} and 75cm for a pitch of 90^{o};

b. the distance from the back of the rungs to the nearest fixed object is at least 15cm;

c. except in the case of ladders equipped with cages, baskets, or equivalent guards, a clearance of 20cm from either side of the ladder to a fixed object shall be provided;

d. no fixed ladders shall be installed with a pitch over 90^{o}.

96. Fixed ladders used to ascend heights exceeding 9m:

a. shall be provided with landing platform for each 6m or fraction thereof;

b. the sections of the ladder shall be staggered, and

c. if (a) or (b) is not practical, ladders equipped with cages, baskets, or equivalent guards shall be provided.

Overhead walks, runways and platforms

97. Walks, runways, working platforms or open sided floors 2m or more above the floor or ground level, except platforms used for motor or similar equipment, which do not afford standing space for persons, shall be guarded on all open sides by standard railings and toe-boards.

98. Runways used for filling tank cars or for oiling purposes may have the railing on one side omitted if necessary but the hazards of falling shall be reduced by the use of runways not less than 56cm in width.

99. All runways of platforms constructed over conveyors or machinery shall be guarded on all open sides by standards railings and toe-boards.

First Aid

100. In every workplace there shall be provided and maintained so as to be readily accessible during all working hours a sufficient numbers of first aid boxes or cupboards, provided the distance of the nearest first aid box or a cupboard stall be not more than 200m from any working place.

101. The first aid box will be under the charge of trained first aider who must have undergone such training in first aid treatment.

102. There shall be one first aider for every 50 employees in the workplace or part thereof.

103. Each first aid box or a cupboard shall be distinctly marked "FIRST AID" and shall be equipped with articles specified in Table III appended to this regulation.

Dispensary Room

104. In every workplace where any hazardous process is carried out or 200 or more employees are ordinarily employed there shall be provided and maintained an dispensary room, to the scale laid down under Table III appended to this regulation.

Canteen

105. In every workplace where more than 200 employees are ordinarily employed the employer shall provide and maintain a canteen in accordance with BAFRA rules or regulations.

Rest / Lunch Room

106. In every workplace where in more than 100 employees are ordinarily employed, the employer shall provide an adequate and suitable rest room/lunch room with provision of drinking water, where worker can eat meals brought by them. The rest room/lunch room shall be kept clean and tidy all the time and should be well ventilated. The room shall be adequately furnished with chairs and benches with backrest and shall provide $1m^2$of floor area for each employee. This may however exclude the employees who

habitually go home for the meals for the purpose of calculating numbers of employees to be accommodated.

107. Provided that where canteen is provided in accordance with section 105 the requirement of rest room/lunch room will not be made applicable.

Creche

108. At every workplace where women workers are employees there shall be provided and maintained a suitable room adequately lighted, ventilated and maintained in a clean and sanitary condition for use of children of women employees. This shall be under the charge of a woman trained in the care of infants.

Washing facilities

109. There shall be provided and maintained in every workplace for the use of employees adequate and suitable facilities for washing which shall include soap and nail brushes or other suitable means of cleaning and the facility shall be conveniently accessible and shall be kept in a clean and orderly condition.

Lifting and carrying of excessive weight

110. An employer shall ensure at a workplace that:

a. no employee lifts by hand or carries overhead or over his back or shoulders any material, article, tool or appliances exceeding in weight the maximum limits set out in the following table:

TABLE

Person	Maximum Weight Load
Adult-man	50 kg
Adult-female	25 kg

b. no employee aided by other employees, lift by hand or carry overhead or over their back or shoulders, any material, article, tool or appliance exceeding in weight the sum total of maximum limits set out for each construction worker separately under section 110 (a), unless aided by a mechanical device.

CHAPTER 10

FIRE PROTECTION

General requirements

111. Where any person at work in any workplace carries out any process, operation or work, the employer shall ensure that a fire protection system is provided, maintained and implemented to prevent injury and death by fire in the workplace.

Fire Protection

112. Every workplace shall be provided with adequate means of protection and escape in case of fire without prejudice to the generality of the section 113 to 121.

113. Process, equipment, plant etc. involving serious explosion and serious fire hazards:

a. all processes, storages, equipment, 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 hazards shall where ever 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 he provided with flame arresting or automatic fire extinguishing appliances, or fire resisting dampers, electrically inter-locked with heat sensitive/smoke detractors and the air-conditioning plant system;

e. in all work places having serious fire or flash fire hazards, passages between machines, installations or piles of

material should be at least 90cm wide. For storage piles, the clearance between the ceiling and the top of the pile should not be less than 2m.

114. Access for Fire Fighting:

a. building and plants shall be so laid out and roads, passageways etc. so maintained as to permit unobstructed access for fire fighting;

b. doors and window openings shall be located in suitable positions on all external walls of the building to provide easy access to the entire area within the building for fire fighting.

115. Protection from lightning shall be provided for**:**

a. building in which explosives or highly flammable substances are manufactured, used, handled or stored;

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

c. buildings, tall chimneys or stacks where flammable gases, fumes, dust or lint are likely to be present, and

d. sub-station buildings and outdoor transformers and switch yards.

116. Precaution 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, lightening, or carrying of matches, lighters or smoking materials shall be prohibited;

e. transmission belts with iron fasteners shall not be used, and

f. all other precautions, as are reasonably practicable, shall be taken to prevent initiation of ignition from all other possible sources such as open flames, frictional sparks, overheated surfaces of machinery or plant, chemical or physical, chemical reaction and radiant heat.

117. 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 material susceptible to spontaneous ignition should be stored in dry condition and should be in heaps of such capacity and separated by such passage which will prevent fire. The materials susceptible to ignition and stored in the open shall be at a distance not less than 10m away from process or storage buildings.

118. 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.

119. 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, and flammable liquids shall be stored in suitable containers with close fitting covers;

b. flammable liquids shall be stored in closed containers and in limited quantities in well ventilated rooms of fire resisting construction which are isolated from the remainder of the building by fire walls and self closing fire doors;

c. large quantities of such liquids shall be stored in isolated adequately ventilated building of fire resisting construction or in storage tanks, preferably underground and at a safe distance from any building;

d. effective steps shall be taken to prevent leakage of such liquids into basement sumps drains and to confine any escaping liquid within safe limits.

120. 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 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.

121. Fire exits:

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

b. lifts, escalators and revolving doors shall not be considered as exits for the purpose of this regulation;

c. in every workplace 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;

d. 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 sources of electric supply;

e. the exits shall be marked in a Dzongkha and English;

f. iron rung ladders or spiral staircases shall not be used as exits staircases;

g. fire resisting doors or roller shutters shall be provided at appropriate places along the escape routes to prevent spread of fire and smoke, particularly at the entrance of lifts or stairs where tunnel or flue effect may be created including an upward spread of fire;

h. all exits shall provide continuous means of egress to the exterior of a building or to an exterior open space leading to a street;

i. exits shall be so located that the travel distance to reach at least one of them on the floor shall not exceed 30m;

j. in case of those workplaces where highly hazardous materials are stored or used, the travel distance to the exits shall not exceed 22.5m 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 thereto are out of or suitably shielded from areas of high hazard;

k. there shall not be less than two exits serving every floor area above and below the ground floors, and at least one of them shall be an internal enclosed stairway. The two exits shall be as remote from each other as possible, and both exits shall be accessible through separate ways from any point on the floor;

l. for every building or structure used for storage only and every section thereof considered separately, shall have access to at least one exits 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 exits shall be available, as remote from each other as practicable;

m. every storage area shall have access to at least one means of exits which can be readily opened;

n. every exit doorway shall open into an enclosed stairway horizontal exit or a corridor or passageway providing continuous and protected means of egress;

o. no exit doorway shall be less than 100cm in width. Doorways shall not be less than 200cm in height;

p. exit doorways shall open outwards, that is away front the room hut shall not obstruct the travel along any exit. No door when opened shall reduce the required width of stairway or landing to less than 90cm overhead or sliding door shall not be installed for this purpose;

q. an exit door shall not open immediately upon a flight of stairs. A landing 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 way it serves;

r. hollow combustible construction shall not be permitted;

s. the minimum width of an internal staircase shall be 100cm;

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

u. the maximum height of a riser shall be 19cm and the number of risers shall be limited to 12 per flight;

v. hand rails shall be provided with a minimum height of 100cm and shall be firmly supported;

w. the width of a horizontal exit shall be same as for the exits doorways;

x. the horizontal exit shall be equipped with at least one fire door of self closing type;

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

z. where there is difference in level between connected areas for horizontal exit, ramps not more than 1 in 8 slopes shall he provided. For this purpose steps shall not be used;

aa. doors in horizontal exit shall be open able at all times.

FIRE-FIGHTING FACILITIES

Water supply

122. At every workplace adequate provision of water supply for fire-fighting shall be provided and maintained:

a. where connection from a public water supply system is not available, an adequate private water supply reservoir capable of supplying all fire-fighting systems for at least two hours shall be provided;

b. supply system, including tanks or reservoirs and pumps, shall be located and protected that their operation or use will not be impaired by a fire in the workplace.

Hydrants and hoses

123. Hydrants shall be of the same types and sizes as those used by the local public fire department and located or protected that they will not be exposed to mechanical damage from vehicles.

124. Hose couplings, outside hydrants or standing nipples shall be of the same type and size as those used by the local Public Fire Department and shall be thoroughly drained and dried after each use, and tested at frequent intervals.

Portable extinguishers

125. All places of employment, including those where automatic-sprinkler protection system is installed, shall be provided with portable fire extinguishers for protection against incipient fires.

126. Portable extinguishers shall be maintained in fully charged and operable condition and kept in their designated places at all times when not in use.

127. Approved fire extinguishers shall be used.

128. Extinguishers shall be installed on hangers or brackets conspicuously located in unobstructed areas readily accessible in the event of fire.

129. Extinguishers having group weight not exceeding 18kg shall be installed so that the top is not more than 1.5m above the floor. Those exceeding 18kg, except wheeled types, shall be installed not more than 1m. above the floor.

130. Extinguishers shall be inspected regularly as per manufacturers' recommendations or standards being followed by the Public Fire Department.

131. The employer shall not provide or make available in the workplace portable fire extinguishers using carbon tetrachloride or chlorobromomethane extinguishing agents.

Selection of extinguishers

132. Extinguishers shall be selected for the specific class or classes or hazards to be protected against in accordance with the following:

a. extinguishers for Class "A" hazards, such as wood, cloth, paper, rubber and other similar ordinary materials, shall be selected from foam, loaded stream, multipurpose dry chemical and water types;

b. extinguishers for Class "B" hazards, fires in flammable liquids, gases and greases, shall be selected from carbon dioxide, dry chemical, foam, loaded stream and multipurpose dry chemical;

c. extinguishers for Class "C" hazards, fires which involve energized electrical equipment where the electrical non-conductivity of the extinguishing media if of importance, shall be selected from carbon dioxide, dry chemicals, and multi-purpose dry chemicals; When the electrical energy is disconnected. Class "C" fire may be treated as either Class "A" or Class "B";

d. extinguishers for protection of Class "D" hazards fire in combustible metals, such as magnesium, titanium, zirconium, sodium and potassium, shall be of types approved for use on the specific combustible metal hazard. Only suitable dry powder extinguishers shall be used for metal fires;

e. toxic vaporizing extinguisher is not recommended for any type of fire;

f. extinguishers which need to be inverted to operate are not recommended for use;

g. soda acid fire extinguisher is not recommended for use.

Distribution of fire extinguishers

133. Extinguishers for light hazards Class "A" fires, where the amount of combustible or flammable materials present are of such quantity that fires of small size may be expected in offices,

schoolrooms, assembly halls and other similar places shall be located that a person will not travel more than 30m from any point to reach the nearest extinguisher. One unit of five to six quarts (1 1/4 to 1 1/2 gal.) foam extinguisher for every 250m^2 of floor area or a greater fraction thereof shall be provided.

134. Extinguishers for ordinary hazards Class "A" fires, where the amount of combustible of flammable material present are such that fires of moderate size may be expected in mercantile storage and displays auto showrooms, parking garages, light manufacturing warehouses not classified as extra hazard, school shops and other similar places shall be provided and located that a person will not travel for more than 15m from any point to reach the nearest extinguishing capacity for every 125m^2 of floor area or a greater fraction thereof.

135. Extinguishers for extra hazard Class "B" fires, where the amount of combustible or flammable materials present is such that fires of severe magnitude may be expected in woodworking auto repair, air craft servicing, warehouses with high piled (5m or over) combustible processes, such as flammable liquid handling, painting and other similar areas shall be provided with a 2.7kg dry chemical for every 60m^2meter of floor area or a greater fraction thereof.

136. For deep-layer flammable liquid Class "B" fires in deep or quench tanks, at least one numerical unit of extinguishing potential shall be provided for every 60$m^2$of floor area or a greater fraction thereof. The travel distance to reach the nearest extinguisher shall not be more than 15m. Multiple smaller extinguishers shall not be used in lieu of larger units required.

137. Extinguishers suitable for Class "B" fires are not acceptable in lieu of the required extinguishers for Class "A" fires unless it has also a Class "A" rating. An extinguisher carrying both Class "A" and "B" ratings may be accepted for area requirements under each individual letter classification and at the numerical rating for that class.

138. Extinguishers with Class "C" rating shall be required where energized electrical equipment may be encountered. The size and location shall be on the basis of the anticipated Class "A" or "B" hazards.

139. Extinguishers shall have a durable tag securely attached to show the maintenance and re-charge data and containing the signatures of persons performing the service.

140. Extinguishers shall be properly marked to indicate the suitability of the extinguishers for particular class of fires.

Training and education

141. The fire-fighting equipment to be provided as per this regulation shall be in the charge of a trained responsible person who shall also be responsible for the proper maintenance and upkeep of all fire-fighting equipment.

142. Sufficient number of person shall be trained in the proper handling of fire-fighting equipment and their appropriate use against the type of fire for which they are required to be used.

143. Fire-fighting drills shall be held at regular intervals as determined by Chief Labour Administrator from time to time.

CHAPTER 11

ELECTRICAL SAFETY

General requirements

144. All electric supply lines, switches, conductors and apparatus shall be of sufficient rating for power, insulation and estimated fault current and shall be constructed, installed, protected worked and maintained in such a manner as to ensure safety of all employees.

145. All circuits and apparatus shall be arranged in such a way that they shall not get accidentally charged to any voltage beyond their limits.

146. Overhead lines of different voltage installed on the same support, shall be segregated, arranged and protected in such a way that they shall not come in contact with each other.

Insulation and protection of conductors

147. The material and apparatus used shall conform to the relevant specification prescribed in the standards approved by the Government of Bhutan and if there is no standard then the concerned department shall frame their specification for apparatuses, materials and type of works.

148. Adequate precautions shall be taken to ensure that no live parts are so exposed as to cause danger.

Switches, Conductors and Electric Motors

149. All switches shall be provided with a handle or other suitable means of operating system insulated from the live portion and arranged in such a way that the person operating it is unlikely to make accidental contact with live parts and terminal.

150. When the switch is in "off" position, the electric supply to the equipment, circuits, apparatus is completely cut off and cannot be left in partial contact with the live parts and terminal, and

151. It should be installed in such a manner to prevent electrical hazard from arcing, scattering of fusible metal outside the switch box during blowing of fuse.

Protection of circuits by fuses and circuit breakers

152. Every circuit shall be protected against excess current and energy by means of a suitable fuse or circuit breaker of adequate breaking capacity suitably located and of such construction as to prevent an electrical hazard from overheating, arcing, or the scattering of hot metal or other substance when it comes into operation.

153. Every fuse and circuit breaker shall be capable of breaking the maximum prospective excess current or energy at the point of installation and every switch intended to be used for breaking under load shall be capable of breaking the load at the point of installation without causing an electrical hazard.

154. Every fuse shall be either constructed and installed in such manner or protected by a suitable switch so as to permit the ready renewal of the fuse element without electrical hazard.

Construction of joints and connections

155. Every electrical joint and connection shall be of proper construction and design as regards conductivity, insulation, mechanical strength and protection.

156. There should not be more than 2 joints in any conductor of any span of the overhead line.

Switch for controlling energy

157. The energy shall not be supplied, transformed, converted or used or continued to be supplied, transformed, converted or used unless provisions as set out below are observed:

a. the following controls of requisite capacity to carry and break the current are placed after the point of commencement of supply so as to be readily accessible and capable of being easily operated to completely isolate the supply to the installation such equipment being in addition to any equipment installed for controlling individual circuits or apparatus:

   i. a linked switch with fuse(s) or a circuit breaker by low and medium voltage up to 20kws;

   ii. a circuit breaker by low and medium voltage installation or apparatus above 20kws;

   iii. a linked switch with fuse(s) or a circuit breaker by HV consumers having aggregate installed transformer/apparatus capacity up to 100KVA;

iv. a circuit breaker by HV consumers having an aggregate installed transformer/apparatus capacity above 100KVA.

b. except in the case of composite control gear designed as a unit distinct circuit is protected against excess energy by means of suitable cut-out or a circuit breaker;

c. the supply of energy to each motor or a group of motors or other apparatus meant for operating one particular machine is controlled by a suitable linked switch or a circuit breaker or an emergency tripping device with manual reset of requisite capacity placed in such a position as to be adjacent to the motor or a group of motors or other apparatus readily accessible to and easily operated by the person in charge.

Identification of earthed and earthed neutral conductors and position of switches and cut-outs therein

158. Where the conductors include an earthed conductor of a two wire system or an earthed neutral conductor of a multi-wire system or a conductor which is to be connected thereto, the following conditions shall be complied with:

a. An indication of a permanent nature shall be provided by the owner of the earthed or earthed neutral conductor, or the conductor which is to be connected thereto, to enable such conductor to be distinguished from any live conductor. Such indication shall be provided:

i. where the earthed or earthed neutral conductor is the property of the supplier, at or near the point of commencement of supply;

ii. where a conductor forming part of a consumer's system is to be connected to the supplier's earthed or earthed neutral conductor, at the point where such connection is to be made;

iii. in all other cases, at a point corresponding to the point of commencement of supply or at such other points in the workplace as may be approved by the supplier.

b. No cut-out, link or switch other than a linked switch arranged to operate simultaneously on the earthed or earthed neutral conductor and live conductors shall be inserted or remain inserted in any earthed or earthed neutral conductor of a two wire-system or in any earthed or earthed neutral conductor of a multi-wire system.

Starting and stopping of electric motors

159. Every electric motor or machine driven by electric motor shall be controlled by a switch fuse unit or circuit breaker or a starter of adequate breaking capacity for starting and stopping, and shall be so placed as to be readily accessible to and easily operated by the person in charge.

160. Every electric motor shall be equipped with such efficient means so that when stoppage occurs may be due to fluctuation in supply voltage or failure of electric supply or overloading, the motor will

not restart automatically in any circumstances, wherein restarting is likely to cause electrical hazard or any other danger.

Cables for portable or transportable apparatus

161. Flexible cables shall not be used for portable or transportable motors, generators, transformer rectifiers, electric drill, electric sprayers, welding sets or any other portable or transportable apparatus unless they are heavily insulated and adequately protected from mechanical injury.

162. Where the protection is by means of metallic covering, the covering shall be in metallic connection with the frame of any such apparatus and earth.

163. The cables shall be three core type and four core type for portable and transportable apparatus working on single phase and three phase supply respectively and the wire meant to be used for ground connections shall be identifiable.

Provisions applicable to medium, high or extra-high voltage installations

164. The following provisions shall be observed where energy at medium, high or extra-high voltage is supplied, converted, transformed or used:

a. All conductors (other than those of overhead lines) shall be completely enclosed in mechanically strong metal casting or metallic covering which is electrically and mechanically continuous and adequately protected against mechanical damage unless the said conductors are

accessible only to an authorized person or are installed and protected in such a manner so as to prevent danger;

Provided that non-metallic conduits conforming to the relevant strength and specifications may be used for medium voltage installation;

b. All metal works, enclosing, supporting or associated with the installation, other than that designed to serve as a conductor shall be connected with an efficient earthing system.

Precautions to be taken against metal becoming live

165. Where necessary to prevent electrical hazard adequate precautions shall be taken either by earthing or other suitable means to prevent any metalwork, other than the current-carrying conductors, enclosing or supporting any such conductors, from becoming live.

Connection with earth

166. The following provisions shall apply to the connection with earth of systems at low voltage in cases where the voltage normally exceeds 125 volts and of systems at medium voltage:

a. neutral conductor of a three phase four wire system and the middle conductor of a 2 phase. 3-wire system shall be earthed by not less than two separate and distinct connections with a minimum of two different earth electrodes of such large numbers as may be necessary to bring the earth resistance to a satisfactory value both at the

generating station and at the sub-station. The earth electrodes so provided, may be inter-connected to reduce earth resistance. It may also be earthed at one or more points along the distribution system or service line in addition to any connection with earth which may be at the workplace;

b. in the case of a system comprising electric supply lines having concentric cables, the external conductor of such cables shall be earthed by two separate and distinct connections with earth;

c. no person shall make connection with earth by the aid of, nor shall he keep it in contact with, any water main.

167. The frame of every generator, stationary motor, portable motor, and the metallic parts (not intended as conductors) of all transformers and any other apparatus used for regulating or controlling energy and all medium voltage energy consuming apparatus shall be earthed by the owner by two separate and distinct connections with earth.

168. All metal castings or metallic coverings containing or protecting any electric supply-line or apparatus shall be connected with earth and shall be so joined and connected across all junction boxes and other openings as to make good mechanical and electrical connection throughout their whole length:

Provided that where the supply is at low voltage, it shall not apply to isolated wall tubes or to brackets, switches, ceiling fans or other fittings unless provided with earth terminal.

169. Where the supply is at low voltage and where the installations are either new or renovated, all plug sockets shall be of the three-pin type, and the third pin shall be permanently and efficiently earthed.

170. All earthing systems belonging to the supplier and of workplace are tested for resistance on dry day during the dry season not less than once every year.

Precautions to be taken when persons are working on electrical apparatus

171. Before any conductor or apparatus is handled adequate precautions shall be taken, by earthing or other suitable means, to discharge electrically such conductor or apparatus, and any adjacent conductor or apparatus if there is danger there from, and to prevent any conductor or apparatus from being accidentally or inadvertently electrically charged when persons are working thereon.

172. Every person who is working on an electric supply line or apparatus or both shall be provided with tools and devices such as gloves, rubber shoes, and safety belts, ladders, earthing devices, helmets, line testers, hand lines and the like for protecting him from mechanical and electrical injury. Such tools and devices shall always be maintained in sound and efficient working conditions.

173. No person shall work on any live electric supply line or apparatus and no person shall assist such person on such work, unless he is

authorized in that behalf, and takes the adequate safety precautions to prevent any hazard.

174. Every telecommunication line on supports carrying a high or extra-high voltage line shall, for the purpose of working thereon, be deemed to be a high voltage line.

Provision and use of protective equipment, stands, screens, boots and gloves

175. Portable insulating stands, screens, mats and covers and insulating boots, gloves or other protective equipment shall be provided and maintained in good condition for use where necessary as a protection against electrical hazard.

176. Fire buckets filled with clean dry sand and ready for immediate use for extinguishing fires, in addition to fire extinguishers suitable for dealing with electric fires, shall be conspicuously marked and kept in all generating stations. Enclosed sub-stations and switch stations in convenient situation. The fire extinguishers shall be tested for satisfactory operation at least once a year and record of such tests shall be maintained.

177. Every person working on apparatus shall make proper use of any equipment provided under section 175.

Provision of access to and working space for apparatus

178. All apparatus which, in normal use, requires operation or attention by any person shall be installed so that adequate access and working space are afforded for its operation and attention, without electrical hazard.

Illumination at workplace

179. Adequate illumination shall be provided in all parts of the premises where apparatus, in normal use, is installed for proper visibility and healthy work environment.

Precautions for special conditions

180. All apparatus and conductors:

a. exposed to weather, water, corrosive atmospheres or other adverse conditions;

b. exposed to flammable surroundings or explosive atmosphere, or

c. used in any process or for any special purpose other than for lighting or power;

shall be so constructed, installed and protected as may in the circumstances of such exposure or use be necessary to prevent electrical hazard or other danger.

Caution notices

181. The owner of every medium, high and extra-high voltage installation shall affix permanently in a conspicuous position a danger notice in Dzongkha and English with a sign of skull and bones:

a. every motor, generator, transformer and other electrical plant and equipment together with apparatus used for controlling or regulating the same;

b. all supports of high and extra-high voltage overhead lines which can be easily climb-upon without the aid of ladder or special appliances;

c. luminous tube sign requiring high voltage supply, X-ray and similar high-frequency installations.

182. Provided that where it is not possible to affix such notices on any generator, motor transformer of other apparatus. They shall be affixed as near as possible thereto; or the word 'danger' and the voltage of the apparatus concerned shall be permanently marked on it.

183. Provided further that where the generator, motor, transformer of other apparatus is within an enclosure one notice affixed to tile said enclosure shall be sufficient for the purposes of this regulation.

Qualifications and supervision of persons carrying out work

184. Subject to section 185 no person except an authorized person shall carry out or assist in carrying out of any work on any apparatus where technical or practical knowledge or experience is required in order to avoid electrical hazard.

185. Notwithstanding section 184 a competent person under the immediate supervision of an authorized person may carry out or assist in such work if:

a. in the case where the electrical hazard to be avoided is under the control of an electrical contractor, he is appointed by the electrical contractor, and

b. in the case where the electrical hazard to be avoided is under the control of the owner, he is appointed by the owner.

Display of notices on the treatment for electrical shock

186. The employer shall display a notice in Dzongkha and English as to the steps to be followed in the treatment of a person who receives an electric shock, such notice to be displayed in all parts of the premises where electricity is generated, transformed, or used and at such other places in those premises as directed by a Labour Inspector.

http://www.legislation.gov.hk/blis_ind.nsf/e1bf50c09a33d3dc482564840019d2f4/1dc28676e672a5fec82564800042aa4e?Navigate&To=Prevhttp://www.legislation.gov.hk/blis_ind.nsf/e1bf50c09a33d3dc482564840019d2f4/1dc28676e672a5fec82564800042aa4e?Navigate&To=Nexthttp://www.legislation.gov.hk/blis_ind.nsf/WebSwitchLang?OpenAgenthttp://203.85.188.32/blisdata/blis.nsf/WebBacktoView?OpenAgenthttp://203.85.188.32/CltIndex.htmhttp://www.legislation.gov.hk/blis_ind.nsf/e1bf50c09a33d3dc482564840019d2f4/1dc28676e672a5fec82564800042aa4e?Navigate&To=Prev**Sub-stations**

187. Every sub-station shall be of proper construction and design and all apparatus therein shall be so located, protected or screened as to be inaccessible to all unauthorized persons and secure against interference from outside the sub-station and shall be maintained in a dry condition and provided with such efficient means of ventilation.

188. Cable trenches inside the sub-stations and switch stations containing cables shall be filled with sand, pebbles or similar non-inflammable materials or completely cover with non-inflammable slabs.

189. Every sub-station shall be under the charge and control of an authorized person and any part thereof where electrical hazard is liable to arise shall be restricted as regards entry, so as to be accessible only to an authorized person or to a competent person acting under the immediate supervision of an authorized person.

Safe access to underground sub-stations

190. Every underground sub-station not otherwise easily or readily accessible shall be provided with adequate means of access by a door or trap door with a staircase or ladder securely fixed and so placed so that no person can make accidental contact with any live part of any switchboard or any bare conductor therein.

Earthing (Overhead lines)

191. All metal supports and all reinforced and prestressed cement concrete supports of overhead lines and metallic fittings attached thereto shall be permanently and efficiently earthed. For this purpose a continuous earth wire shall be provided and securely fastened to each pole and connected with earth ordinarily at three points in every kilometre the spacing between the points being as nearly equidistance as possible. Alternatively, each support and the metallic fitting attached thereto shall be efficiently earthed.

192. Metallic bearer wire used for supporting insulated wire of low and medium voltage overhead service lines shall be efficiently earthed or insulated.

193. Each stay-wire shall be similarly earthed unless insulator has been placed in it at a height not less than 3m from the ground.

194. Overhead electrical conductors shall at all times have minimum clearance above ground level in accordance with safety code issued by Bhutan Electricity Authority.

Protection of transformer and generating set

195. Over current protection to disconnect the supply automatically if the rated current of the equipment, cable or supply line is exceeded for a time which the equipment, cable or supply line is not designed to withstand.

196. Earth-fault/earth leakage protection to disconnect the supply automatically if the earth-fault current exceeds the limit of current for keeping the contact potential within the reasonable values.

197. Gas pressure type and winding and oil temperature protection to give alarm and tripping shall be provided on all transformers of rating 1000KVA and above.

198. All generators with rating of 100KVA and above shall be protected against earth fault/leakage. All generators of rating 100KVA and above shall be protected against faults within the

generator winding using restricted earth-fault protection or differential protection or by both.

Earth Leakage protective device

199. The supply of energy to every electrical installation other than low voltage installation below 5KWS, shall be controlled by an earth leakage protective device so as to disconnect the supply instantly on occurrence of earth fault or leakage of current.

Precautions against leakage of current

200. The owner of a workplace shall not connect any installation or apparatus installed in his workplace to electric supply unless he is reasonably satisfied that the connection with the supply may not cause a leakage of current from the installation or apparatus of a magnitude detrimental to safety. Compliance with the regulation shall be checked by measuring the insulation resistance as provided below:

a. all the electrical installation or equipment of low voltage and medium voltage have the "IR" values of 1 mega ohm when tested at a pressure of 500 volts applied between each live part of installation and earth (metallic body) for a period of one minute;

b. at a pressure of 2.5KVDC applied between each live terminal/conductor and earth (metallic body) for a period of one minute, the insulation resistance of high voltage equipment shall be at least 5 mega ohms.

Note: The installation should be in off position during the test being conducted.

CHAPTER 12

MACHINE GUARDING

Machine guarding requirements

201. The employer shall provide and maintain proper machine guarding at all workplaces where any person at work is in direct contact with any machine part, function or process which may cause harm, injury or death.

Built-in safety

202. When an employer orders machinery, machine parts or other working equipment, that employer shall specify in the order that such machinery, parts or equipment shall be provided with all the protective devices required by this regulation for any dangerous part thereof. In cases where it is impossible to anticipate the type of protective device required for special operations, such devices shall be obtained or provided as soon as possible.

203. Manufacturers, vendors and leaser of machinery, machine parts or other working equipment shall ensure that every article delivered, sold or let by them is provided with all the required protective devices.

204. Employers installing new machinery, machine parts or other working equipment, and persons or firms in charge of the installation of such machinery or parts of machinery and other

working equipment shall see to it that these are properly guarded in conformity with existing occupational health and safety standards.

Guarding requirements

205. All moving parts of prime movers, transmission equipment and all dangerous parts of driven machinery specified in Table IV appended to this regulation shall be effectively guarded, unless so constructed or located to prevent any person or object from coming or being brought into contact with them.

206. One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips and sparks.

207. Every guard or device used shall be:

a. of substantial construction;

b. maintained in an efficient condition, and

c. kept in its proper position while the machinery or plant is in motion.

208. Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard shall be such that it does not offer an accident hazard in itself.

Removal of guards from machinery

209. Machine guards or other effective means used to render machinery safe may be removed to such extent as is necessary while the part of the machinery is in motion when:

a. any examination of the machinery or part of the machinery is necessary, or

b. any lubrication or adjustment shown by such examination to be immediately necessary, being an examination, a lubrication or an adjustment which is necessary to be carried out while the part of machinery is in motion.

210. Section 209 shall only apply where a person who is carrying out any lubrication or any mounting or shifting of belts in respect of any part of transmission machinery:

a. has attained the age of 18 years;

b. has been trained to carry out, and is acquainted with the dangers of moving machinery connected with the relevant examination, lubrication or other operation, and

c. is wearing tight clothing which has no loose ends;

d. another person, instructed as to the steps to be taken in case of an emergency, is immediately available within sight or hearing of the person carrying out the relevant examination, lubrication or other operation, and

e. any ladder or work platform in use for the carrying out of the relevant examination, lubrication or other operation is securely fixed or lashed, or is firmly held by a person stationed at the foot of the ladder.

Machine guard at point of operation

211. General requirement for machine guard at point of operation shall be in accordance to the following:

a. the point of operation of machinery shall be effectively guarded;

b. mechanical feeding and ejection devices shall be provided;

c. individual starting and stopping devices shall be provided on every working machine having a cutting, drawing, grinding, pressing, punching, shearing or squeezing action to make it possible for the operator to start or stop the machine without leaving his working position.

TRANSMISSION MACHINERY GUARDING

Prime movers

212. Flywheel and other prime movers shall be periodically inspected by qualified personnel for cracks, incorrect adjustments and other defects to prevent explosion.

213. Any exposed part of flywheel 2,100mm or less above the floor or platform shall be guarded.

214. In areas where standard railings are used, the railings shall not be less than 380mm nor more than 500mm from the rim of the wheel. A standard toe-board shall also be provided.

215. When it is necessary to move flywheels for starting, guards may be removed temporarily but shall be returned immediately after

such an operation is completed. A slot opening for jack bar will be permitted.

216. Every jack bar should be equipped with a hand stop so located that it will safely clear the flywheel guards when fully inserted but will prevent the worker's hand being pinched between the slot and bar.

217. Any portion of the flywheel protruding through a place where workers work or pass shall be completely enclosed or surrounded by guard rails.

Governors

218. Centrifugal governors shall be guarded or enclosed in the same way as flywheels.

219. Fly ball governors located 2,135mm or less above the floor, platform or other working level having rotating, projecting or sectional parts or hazardous recesses shall be enclosed or covered with guard secured to rigid supports and accessible to oiling and inspection.

Collars and couplings

220. Revolving collars and couplings shall be cylindrical and no screws or bolts project beyond largest periphery. Couplings shall be enclosed by stationary guards.

Keys and set screws

221. Projecting keys, set screws and other projections in revolving parts of a machine not guarded by the frame of the machine or by

location shall be removed, made flush or guarded by non-rotating metal caps.

Tail rods

222. Tail rods extending in areas where persons work or pass shall be guarded.

223. If guardrails are used, the range shall be 50.8cm when the tail is fully extended.

Shafting

224. Shafts shall be completely enclosed 2.13m from the floor.

225. Shafts under benches or floors shall be covered.

226. Exposed face ends of shafts over half the diameter of the shaft shall be guarded with non-rotating caps.

Belt and pulley drive

227. Any part of a horizontal belt and pulley drive, involving the use of flat crowned or flanged pulleys, which is 2,100mm or less above the floor or working level shall be guarded.

228. The distance between two pulleys, except in cases of tight and loose pulleys should be greater than the width of the belt.

229. Overhead belts over 2,100mm from the floor shall be guarded in its entire length if:

a. located over passageways or workplaces and running at speed of 20 km/hr. or over;

b. center to center distance between pulleys is 3.05m or more;

c. belt is 200mm or more in width. The bottom and sides shall also be guarded.

230. When both runs of belts are 2,100mm or less from the floor, the belts shall be completely enclosed.

231. Where a group of flat belt drive is guarded by standard railing guard, such drives shall be considered guarded where the distance from the vertical plane of the rail to the nearest point of any belt or pulley is not less than 380mm nor more than 500mm and where the distance between any two adjacent belts or pulleys does not exceed 900mm.

232. Belt-type variable speed drives located 2,100mm or less from the floor or working level shall have all moving parts guarded.

233. Belts and shafting in workplaces where flammable liquids or vapours of explosives dusts are present shall be grounded or the accumulation of static electricity shall be controlled.

234. Pulleys with a speed of 400rpm shall be periodically inspected for defects.

Conveyors

235. Screw conveyors 2,100mm or less above floor or other working level shall be completely covered with substantial lids except that

screw conveyors the top of which is 600mm or less above the floor or other working level, or below the floor level may be guarded by standard railing guards having toe-boards of mid-rail height or shall be guarded by substantial covers or gratings.

236. All belt conveyors head pulleys, tail pulleys, single tension pulleys and dip take-up pulleys shall be so guarded that the entire sides of the pulleys are covered and the guard shall extend in the direction of the run of the belt such a distance that a person cannot reach behind it and become caught in the nip point between the belt and the pulley.

237. Portable inclined conveyors shall have head and tail pulleys or sprockets and other power transmission equipment guarded accordingly.

238. Where necessary to pass over exposed chain, belt, bucket, screw or roller conveyors, such crossovers shall be bridged or catwalk properly equipped with standard railings and toe-boards and shall have a safe means of access either fixed ladder, ramp or stairway.

239. Conveyors passing over areas that are occupied or used by employees shall be so guarded as to prevent the materials handled from falling on and causing injury to employees.

240. Where workmen pass under the return strands of chain conveyors a shallow through or other effective means or sufficient strength to carry the weight of the broken chain shall be provided.

Gears and sprockets

241. All power operated gears and sprockets wherever located shall be completely covered.

242. The chains, sprockets and chain drives located within 2,100mm of the floor or other working level shall be guarded in the same manner as the belts are.

Starting and stopping devices

243. Clutches, cut-off couplings or clutch pulleys and other mechanical power control devices having projecting parts where any parts of such devices is located 2,100mm or less above the floor or working level shall be completely enclosed and such enclosure shall not interfere with the operation of the mechanical control.

244. Each process machine driven by an individual prime mover shall be equipped with emergency stopping devices which can be safely actuated from the operator's working position unless the machine is equipped with automatic clutch which will stop or disengage all machine operation.

245. Where an operator attends one or more process machine not having individual drive each machine shall be equipped with a stopping device which can be safely actuated from the operator's working position at the machine, such a stopping device may stop an entire group of machine by stopping the prime mover, power transmission or it may be a machine clutch, cut-off coupling or tight and loose pulley with belt shifter which can stop all the machine operations at any time on any machine. Pole or hand shifting of belts is not considered adequate means for disconnecting the power.

Exception: Where due to the process, machine must be operated in groups, the machine power control may stop the entire group of machines, such group drives shall be provided with conveniently located readily accessible, and properly marked or otherwise identified emergency stop device.

246. Where practicable each process machine simultaneously attended or operated by more than one employee shall be equipped with a machine power control for each employee exposed to point of operation hazards. Said controls shall be interlocked in a manner to prevent operation of machine unless all controls are operated simultaneously.

247. Machine power controls shall be maintained in safe operating conditions and shall be so designed, installed and or located that they are not likely to operate from accidental contact with objects or parts of the body.

248. Motor switches, friction clutches, belt shifters, engine stops and similar machine parts shall be arranged that control can be affected at the point of operation.

WOOD WORKING MACHINERY

Swing and cut-off saw

249. Hood guards shall be provided on swing saws extending below the platforms with the side cover next to the end of the platform preferably hinged for easy access to the saw.

250. The rear of the saw shall be completely housed when the saw is in back position where it is possible to pass behind a swing and cut-

off saw. The housing shall include the swing frame as well as the saw.

251. Swing saws shall be provided with limit chains or other positive means to prevent travel beyond the front edge of the saw table.

252. Swing saw shall be provided with latches or other positive means to prevent the saw from rebounding when swinging back and shall not depend on fibre rope or cord for its functioning.

253. Swing saws shall be provided with counterweights or other effective devices which will automatically return the saw when its front edge is released by the operator at any point of its travel.

254. Counterweights on swing saws shall be prevented from dropping by means of:

a. bolts through the extreme ends of the bar, and

b. safety chains secured to the ceiling or other overhead support.

255. If counterweight is used all bolts supporting the bar and weight shall be provided with nuts and cotter pins.

Table saws

256. Every circular and fed table saw shall be guarded by hood enclosing completely the portion of the saw above the table. The hood and mounting shall be so arranged that the hood will automatically adjust itself to the thickness of the stock being cut without considerable resistance to the material being sawed.

257. Where the saw moves forward horizontally the hood or guard shall extend at least 50mm in front of the saw teeth when the saw is in back position. The width of the hood shall be limited so as to provide not more than 12.70mm clearance on each side of saw blade. A fixed or manually adjusted hood or guard may be allowed, provided the space between the bottom of the guard and the material being cut does not exceed 12.70mm.

258. Except when grooving and when a roller wheel is provided at its back, the saw shall be provided with a spreader mounted directly at the back of the saw at a distance of not more than 0.95cm and shall be supported so that all times it will be in alignment with the saw when the table is lifted or tilted. The spreader shall be slightly thinner than the saw kerb and slightly thicker than the saw blade.

259. The saw shall be provided with anti-kick-back device to prevent the stock from being thrown back towards the operator. Anti-kick-back devices shall be designed to be effective for all thickness of material.

260. The exposed part of the saw blade under the table shall be enclosed or guarded against contact.

261. For narrow or thin cuts, push sticks or push blocks shall be used and the operator shall always stay away from the direct line of the stock being sawed.

262. The saw guard shall be equipped with a handle or lug by which it may be temporarily retracted without exposing the operator's fingers to the blade.

263. Saw guards shall not be locked in an open position and shall be maintained in good working conditions at all times.

Planners

264. Cutting knives shall be completely enclosed, templates, jigs or fixture which will enable the part to be processed without exposing the operator's hand to the danger zone shall he used.

265. The feeding mechanisms of planners shall be guarded or enclosed leaving only the space required for feeding of the stock. The guard shall be fastened to the frame carrying the rolls so as to remain in adjustment for any thickness of the stock.

266. Power feed planners shall be provided with anti-kick-back devices.

Jointers

267. A suitable guard which will automatically adjust itself to cover the portion of the cutting head exposed during the planning operations shall be used. The guard shall be capable of protecting the entire length of the cutting space in the table.

268. All jointers shall be equipped with cylindrical cutting heads.

269. The exposed portions of the cutting head at the rear of the fence shall be covered.

270. For short cuts, push sticks or blocks shall be used.

Sanders

271. Belt sanders shall have both pulleys and the unused run of the sanding belt enclosed. Rim guards will be acceptable for pulleys with smooth disc wheels provided that on-running nip points are guarded. Guards may be hinged to permit sanding on the pulley.

272. Disc sanders shall have the periphery and back of revolving disc guarded, and the space between revolving disc and edge of table shall not be greater than 6.35mm.

273. The exposed parts of the drum of the drum sanders except for the portion where the material comes in contact with the abrasive surfaces shall be guarded.

274. The revolving head of the elbow sander shall be fully guarded except where abrasive comes in contact with the material.

Band saws

275. The upper and lower band wheel shall be guarded and the periphery of the enclosure shall be of solid metal. The cover at the back and front of the saw shall be of solid or mesh metal.

276. Feed rolls of band resaw and band ripsaw shall be protected with a semi-cylindrical guard to prevent the hands of the employee from coming in contact with the in-running rolls at any point. The guard shall be constructed of heavy material, preferably metal and the edge of the guard shall come to within 12.7mm of the plane formed by the inside face of the feed roll in contact with the stock being cut.

277. Large band saws shall be provided with a breaking device to bring the saw to a stop when the power is cut off.

Guarding mechanical power presses, foot and hand power presses

278. Guards for mechanical power, foot and hand power presses other than what is provided in this regulation may be acceptable provided they afford equal protection to the employees.

279. Automatic, semi-automatic or mechanical feed presses:

Fixed guards or enclosures - a fixed guard or enclosure shall be so arranged and equipped to guard the front and both sides to prevent the operator's fingers from reaching the danger zone. However, said fixed guards may not be required where access to the danger zone by the operator is not possible or necessary.

280. Hand and foot power presses:

a. Fixed guard or enclosure - a fixed guard or enclosure across the front and shall be so arranged that the finger cannot be inserted under, over, through or around the guard. The guard may be an integral part of the die or attached to the press frame;

b. Interlocking gate guard - a guard or gate operated by a tripping device which will not permit the press to operate until after the hands of the operator shall have been removed from the danger zone;

c. Limited ram travel - the stroke of the ram or plunger shall be such that the clearance between the ram and the plunger and die or the stripper shall not be more 10mm;

d. Swept guard - a mechanically operated guard which throws the hands of the operator out of the way as the ram

descends. Such a guard should be padded to prevent injury should it strike the operator's wrist;

e. Pull-out protective device - a mechanically operated device attached to the operator's hands, wrist or arms which withdraws the operator's hands from the danger zone as the ram descends;

f. Two handed trip device - an arrangement whereby hands are used instead of feet to trip the press: the simultaneous and continuous action of both hands being required.

Controls

281. Mechanical, electrical or air controls shall be permitted on large presses requiring one or more operators provided that such controls require the simultaneous action of both hands of each operator to trip the press. Such controls shall be located in such a way that the hands or any part of the body of the operator will not reach the danger zone during the descending stroke.

Pedal or treadle guards

282. Pedals or treadles of foot actuated presses shall be provided with substantial guards to prevent accidental tripping. For treadles other than long bars extending across the machine the openings in such guards shall not be more than twice the width of the foot.

Special hand tools

283. Where necessary, special hand tools such as pushers, pickers, pliers, tweezers, forks, magnets, or suction discs shall also be provided for feeding or removing materials without placing the hands in the danger zone.

RUBBER MILLS

Installation of machines

284. Mills for breaking down, cracking, grating, mixing, refining and warming rubber or rubber compounds shall be so installed that the top of the front roll is not less than 1.25m above the floor working level. Provided that in existing installations where the top of the front roll is below this height a strong rigid distance bar guards shall be fitted across the front of the machine in such position that the operator cannot reach the nip of the rolls.

Safety Devices

285. Rubber mills shall be equipped with:

a. hoppers so constructed or guarded that it is impossible for the operators to come into contact in any manner with the nip of the rolls;

b. horizontal safety-trip rods or tight wire cables across both front and rear, which will when pushed or pulled, operate instantly to disconnect the power and apply the brakes, or to reverse the rolls.

286. Safety-trip rods or tight wire cables on all rubber mills shall extend across the entire length of the face of the rolls and shall be

located not more than more than 1.75m above the floor or working level.

287. Safety-trip rods and tight wire cables on all rubber mills shall be examined and tested daily in the presence of the Manager or other responsible person and if any defect is disclosed by such examination and test, the mill shall not be used until such defect has been remedied.

CENTRIFUGAL MACHINES

288. 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.

Interlocking guard for drum or basket

289. 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 should be such that no access is possible to the drum or basket when the lid is closed.

290. Every centrifugal machine shall be provided with an efficient interlocking device that will effectively prevent the lid referred to in section 289 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 position.

Breaking arrangement

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

Operating speed

292. 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 casting.

Hoists and lifts

293. Every hoist and lift shall be:

a. of good mechanical construction, sound material, adequate strength and free from defects;

b. properly maintained, and shall be thoroughly examined by a competent person at least once in every period of six months, and a register shall be maintained to record particulars of examination of hoists or lifts and shall give particulars as shown in Form-VIII appended to this regulation.

294. Every hoist way and lift way shall be sufficiently protected by an enclosure fitted with gates, and the hoist and lift and every such enclosure shall be so constructed as to prevent any person or thing

from being trapped between any part of the hoist or lift and any fixed structure or moving part:

a. the maximum safe working load shall be plainly marked on every hoist or lift;

b. the cage of every hoist or lift used for carrying persons shall be fitted with a gate on each side from which access is afforded to a landing;

c. every gate shall be fitted with interlocking or other efficient device to secure that the gate cannot be opened except when the cage is at the landing and the cage cannot be moved unless the gate is closed.

Lifting machines, chains, ropes and lifting tackles

295. In any workplace, all parts including the working gear whether fixed or movable of every lifting machine (other than a hoist and lift), chain, rope and lifting tackle used for the purpose of raising or lowering persons, goods or materials shall be:

a. of good construction, sound material and adequate strength and free from defects;

b. properly maintained, and

c. shall be thoroughly examined by a competent person at least once in every period of twelve months, and register shall be kept containing the prescribed particulars of every such examination. The register shall be kept readily available for inspection.

296. Particulars of register to be maintained under section 295 (c) of this regulation shall be:

a. name of owner of the workplace;

b. address of the workplace;

c. distinguishing number of mark, if any, and description sufficient to identify the lifting machine, chain, rope, or lifting tackle;

d. date when the lifting machine, chain, rope or lifting tackle was first taken into use in the workplace;

e. date and number of the certificate relating to any test and examination made together with the name and address of the person who issued the certificate;

f. date of each periodical through examination made under section 298 (c) of this regulation and by whom it was carried out;

g. date of annealing or other heat treatment of the chain and other lifting tackle made under section 299 and by it was carried out;

h. particulars of any defects affecting the safe working load found at any such through examination or after annealing and the steps taken to remedy such defects.

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

298. While any person is employed or working on or near the wheel track of a travelling crane in any place where he is liable to be

struck by the crane, effective measures shall be taken to ensure that the crane does not approached within 6m of that place.

299. All chains and lifting tackle, except a rope sling shall unless they have been subjected to such other heat treatment be effectively annealed under the supervision of a competent person at the following intervals:

a. all chains, sling rings hooks, shackles and swivels used in connection with molten metal or molten slag or when they are made of half inch bar or smaller, once at least in a very six months;

b. all the chains, rings, hook shackles and swivels in general use once at least in every 12 months.

Provided that chains and lifting tackle not in frequent use shall, be annealed only when necessary. Particulars of such annealing shall be entered in a register prescribed under section 296.

300. Nothing in section 299 shall apply to the following clauses of chains and lifting tackles:

a. chains made of malleable cast iron;

b. plate link chains;

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

d. pitched chains working on sprocket;

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.

Such chains and lifting tackle 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 section 296.

301. No lifting machine and no chain, rope or lifting tackle shall, except for the purpose of test be loaded beyond the safe working load which shall be plainly marked thereon.

Revolving machinery

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

303. The speeds indicated in notices under section 302 shall not be exceeded.

Floors, stairs and means of access

304. In every workplace:

a. all floors, steps, stairs, passages and gangways shall be of sound construction and properly maintained (and shall be kept free from obstructions and substances

likely to cause persons to slip and where it is necessary to ensure safety, steps, stairs, passages and gangways shall be provided with substantial handrails;

b. there shall, so far as is reasonably practicable, be provided, and maintained safe means of access to every place at which any person is at any time required to work;

c. when any person has to work at a height from where he is likely to fall, provision shall be made, so far as is reasonably practicable, by fencing or otherwise, to ensure the safety of the person so working.

Protection of eyes

305. In respect of any such manufacturing process carried on in any workplace which involves:

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

b. risk to the eyes by reason of exposure to excessive light, the employer shall take effective measures to provide screens or goggles for the protection of employees in or in the immediate vicinity of the process in accordance with the regulation on personal protective equipment.

Power to require specifications of defective parts or tests of stability

306. If it appears to the Inspector that any building or part of a building or any part of the ways, machinery or plant in a workplace is in such a condition that it may be dangerous to human life or safety,

he may serve on (the owner or manager or both) of the workplace an order in writing requiring him before a specified date:

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

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

Tag-out procedures

307. It shall be the duty of the employer to establish and implement tag-out procedures relating to the inspection, cleaning, repair or maintenance of any plant, machinery, equipment or electrical installation in the workplace that, if inadvertently activated or energized, is liable to cause bodily injury to any person.

308. It shall be the duty of the employer to ensure that every person carrying out any inspection, cleaning, repair or maintenance of any plant, machinery, equipment or electrical installation in the workplace is fully instructed on the tag-out procedures for that work before commencing that work.

309. In this section, "tag-out procedures" means a set of procedures:

a. to ensure that all energy sources to the relevant plant, machinery, equipment or electrical installation are isolated, disconnected or discharged, and

b. to prevent any part of plant, machinery, equipment or electrical installation from being inadvertently activated or energized.

Protection relating to tanks, structures, sumps or pits containing dangerous substances

310. Where any tank, structure, sump or pit in a workplace contains any scalding, burning, corrosive or toxic liquid and the edge of the tank, structure, sump or pit is less than 1m above the highest ground or platform from which a person might fall into it, it shall be the duty of the employer to ensure that:

a. the tank, structure, sump or pit is securely covered or is securely guarded to a height of at least 1m above that ground or platform, or

b. where by reason of the nature of the work, neither secure covering nor secure guarding to that height is practicable, all reasonably practicable steps are taken by covering, guarding or other means to prevent any person from falling into the tank, structure, sump or pit.

311. Where any tank, structure, sump or pit in a factory contains any scalding, burning, corrosive or toxic liquid but is not securely covered, it shall be the duty of the employer to ensure that no ladder, stair or gangway is placed above, across or inside it unless the ladder, stair or gangway is:

a. at least 500mm wide, and

b. securely guarded to a height of at least 1m and securely fixed.

312. Where any such tank, structure, sump or pit in a workplace referred to in section 311 adjoins another tank, structure, sump or pit, and

a. the space between them, clear of any surrounding brick or other work, is less than 500mm in width, or

b. each tank, structure, sump or pit is not securely guarded to a height of at least 1m.

it shall be the duty of the employer to ensure that secure barriers are so placed as to prevent passage between them.

313. For the purposes of this section 310 to 312, a ladder, stair or gangway shall not be considered to be securely guarded unless it is provided either with sheet guarding or with an upper and a lower rail and toe-boards.

314. A warning notice in Dzongkha and English indicating the nature of danger is marked on or attached to the tank, structure, sump or pit which is understood by persons at work in that workplace.

Dangerous fumes and lack of oxygen in confined spaces

315. It shall be the duty of every employer to ensure that no employee is required or allowed to enter any chamber, tank, vat, pit, pipe, flue or other confined space in any workplace in which any gas, fume, vapour or dust is likely to be present to such an extent as to involve risk to persons being overcome thereby, unless it is provided with a manhole of minimum size of 40cm long and 30cm wide in case of rectangular or oval shape, in case of circular shape not be less than 40cm in diameter or other effective means of egress.

316. No person shall be required or allowed to enter any confined space as is referred to in section 315 until all practicable measure have been taken to remove any gas, fume, vapour or dust, which may be present so as to bring its level within the permissible limit and to prevent any ingress of any such gas, fume, vapour or dust and unless:

a. a certificate in writing has been issued by a competent person to the effect that the confined space where the employees are required to carry out some activity is free from dangerous gas vapour or dust;

b. and such employee is wearing a suitable breathing apparatus and a belt securely attached to a rope free end of which is held by a person outside the confined space;

c. such employee is not carrying any electrical appliance which is operated on voltage exceeding 24 volts;

d. if any inflammable gas, fume or dust is likely to be present in such confined space the lamp of light other than that of a flame proof construction shall be permitted to be used therein.

Explosive or inflammable dust, gas, etc

317. In a workplace where any dust, gas, fume or vapour of such character and to such extent as to be likely to explode to ignition are produced, all practicable measures shall be taken to prevent any such explosion by:

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

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

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

318. Where the plant or machinery used in a process to in section 317 is not so construed as to withstand the probable pressure which such an explosion as aforesaid would produce, all practicable measures shall be taken to restrict the spread and effects of the explosion by the provision in the plant or machinery of chokes, baffles, vents or other effective appliances.

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

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

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

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

Provided that the provisions of section 319 shall not apply in the case of plant or machinery installed in the open air.

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

CHAPTER 13

PROVISIONS RELATING TO PRESSURE PLANTS INCLUDING STEAM BOILERS

STEAM BOILERS

For the purpose of this chapter

Boiler means a pressure vessel in which steam is generated for use external to itself by application of heat which is wholly or partly under pressure when steam is shut off but dose not include a pressure vessel:

a. with capacity less than 25 liters (such capacity being measured from feed check valve to main stream stop valve);

b. with less than 1kg/cm^{2}design gauge pressure and working gauge pressure, or

c. in which the water is heated below one hundred degree centigrade.

Accident means an explosion of a boiler or boiler component, which is calculated to weaken the strength or an uncontrolled release of water and steam there from, liable to cause death or injury to any person or damage to any property.

Boiler component means steam piping, feedpiping, economiser superheater, any mounting or other fitting and any other external or internal part of boiler which is subject to pressure exceeding one kilogram per centimetre square gauge.

Feedpipe means any pipe or connected fitting wholly or partly under pressure through which feed-water passes directly to a boiler and which does not form an integral part there of.

Steam pipe means any pipe through which steam passes from a boiler to a prime-mover or other user or both, if

a. the pressure at which steam passes through such pipe exceeds 3.5kg/cm^2 above atmospheric pressure, or

b. such pipe exceeds 254mm in internal diameter and pressure of steam exceeds 1kg/cm^2 above atmospheric pressure.

Super heater means any equipment which is partly or wholly exposed to flue gases for the purpose of raising the temperature of steam beyond the saturation temperature at that pressure and includes a re-heater.

Economiser means any part of a feed pipe that is wholly or partly exposed to the action of flue gases for the purpose of recovery of waste heat.

Owner includes any person possessing or using a boiler as an agent of the owner thereof and any person using a boiler which he has hired or obtained on loan from the owner thereof.

Structural alteration ,addition or renewal means:

a. any change in the design of the boiler or boiler component;

b. replacement of any part of boiler or boiler component by a part which does not confirm to the same specifications, or

c. any addition to any part of boiler or boiler component.

Boiler attendant/boiler operation engineers

321. All boilers shall be operated by the qualified boiler attendents/boiler operation engineers posessing essential qualification and experience.

Duty of owner at examination of boiler

322. Every owner shall provide all reasonable facilities to competent person for examination of the boiler. The boiler shall be properly prepared for the examination as per advice rendered by the competent person.

323. In case owner is not able to provide all reasonable facilities to competent person for examination of the boiler, the competent person can refuse to examine the boiler and report the case to Chief Labour Administrator who in turn, if satisfied may also forbid the use of the boiler.

Alteration/ renewal/repairs to a boiler or boiler component

324. All alterations, additions and renewals to the boilers/ boiler components shall be made under the supervision of a competent person. However the owner of the boiler/ boiler component shall also be required to inform Chief Labour Administrator about such alterations, additions and renewals.

Duties of competent persons

325. Duties of competent person are:

a. verify whether the stamping or nameplate is legible and represents the item described on the inspection documentation;

b. perform external and internal inspections and witness the pressure tests if required;

c. report the inspection results, including any nonconforming conditions, in the manner prescribed to the owner of the boilers;

d. verify that the boiler owner has informed in writing to the Chief Labour Administrator and the activity is permitted under the scope of the structural alteration, addition or renewal to be made under his supervision;

e. verify that all materials to be used for structural alteration, addition or renewal comply with the prescribed standards/codes.

Revoking the certificate of boiler

326. The Chief Labour Administrator may revoke any certificate or provisional order on the report of a competent person or otherwise:

a. the certificate has been fraudulently obtained or has been granted erroneously or without sufficient examination, or

b. the boiler has been damaged or not in good condition, or

c. the boiler is being worked by the persons not qualified to operate.

Boiler mountings

327. Every boiler shall be provided with the following safety devices:

a. two safety valves. The diameter of the seat of safety valve shall be minimum 19mm;

b. two means of indicating water level of a boiler;

c. a steam pressure gauge. The dial of which should be calibrated to twice the working pressure as nearly as possible;

d. a steam stop valve, directly fitted on the boiler;

e. a feed check valve;

f. two feed pumps or other devices to fill water in the boiler under pressure with a capacity more than the maximum continuous rating of the boiler;

g. a blow down cock to drain out the sediment from the boiler;

h. a fusible plug when boiler has internal furnace;

i. an attachment for competent person's test gauge;

j. a manhole and sufficient number of mud holes or sight hole as are necessary for effective cleaning of the boiler.

In case of automatic or semi-automatic oil-fired or gas-fired boilers fusible plugs shall be replaced with the automatic tripping device to disconnect fuel supply and to start the feed pump simultaneously in the event of low water in the boiler.

In case boilers fitted with integral super heaters an additional safety valve shall be provided at super heater outlet header.

Procedure of inspection of installed boilers

328. All boilers shall be properly cooled and thoroughly cleaned for inspection externally and internally, and shall be thoroughly examined for defects which inter alia include scale, oil etc, corrosion, grooving, stays, manholes and other opening, fire surface-bulging, blistering, leaks, lap joints, fire crack, defects of the tubes and ligaments between tube holes, pipe connection and fittings, water column, safety valve and steam gauge (to be tested by competent person and compare with a standard test gauge).

Hydraulic test

329. The competent person shall conduct the hydraulic test of the boiler in accordance with the international practice and the procedure given in the manuals supplied by the manufacturers. He shall carefully examine the boiler from inside and outside and satisfy himself that the boiler has satisfactorily withstood the hydraulic test.

Steam test

330. The competent person shall also conduct the steam test in accordance with international standard practices and procedures laid down in the manufacturer's manual.

Steam receiver

331. All provisions of steam boilers shall be applicable to steam receivers as well.

332. The competent person after examining the steam boiler and steam receiver shall issue and sign a report about the result of the examination conducted by him referred to above and provide a copy of the same to the owner as well as Chief Labour Administrator. If the results of the examination referred to above are in order the certificate of the boiler issued by the competent person shall be valid for a period of one year from the date of issue.

Pressure plant

333. Every plant or machinery other than the working cylinders of prime movers, and operated at a pressure greater than atmospheric pressure, shall be :

a. of good construction, sound material, adequate strength, and free from any patent defect;

b. properly maintained in a safe condition;

c. fitted with :

   i. a suitable valve or other effective device to ensure that the maximum permissible working pressure of the vessel shall not be exceeded;

   ii. a suitable pressure gauge easily visible and designed to show, at all times, the correct interval pressure in kg/cm^2, and marked with a prominent red mark at the safe working pressure of the vessels;

   iii. a suitable stop valve or valves by which the vessel may be isolated from other vessels or source of supply of pressure;

   iv. a suitable drain cock or valve at the lowest part of the vessel for the discharge of connected liquid.

d. thoroughly examined by a competent person:

   i. externally, once in every period of 6 months, to ensure general condition of the vessel and the working of its fittings;

   ii. internally, once in every period of 12 months to ensure condition walls, seams, and ties, both inside

and outside the vessel, soundness of the parts of the vessel, and the effects of correction. If by reason of construction of the vessel, a thorough internal examination is not possible, this examination may be replaced by a hydraulic test which shall be carried out once in every 2 years. Provided that the vessels in continuous processes which cannot be frequently opened, the period of internal examination may be extended to 4 years, and

iii. hydraulically tested at interval or not more than 4 years provided that in respect of pressure vessels with thin walls such as sizing cylinders made of copper or any other non ferrous metal periodic hydraulic test may be dispensed with on the condition that the requirements laid down in section 334 is fulfilled.

Provided that it shall be sufficient for the purpose of subsection (c) if the safety valve, pressure gauge and stop valve are mounted on a pipe line immediately adjacent to the vessel and where there is a range of two or more similar vessels in a plant served by the same pressure lead, only one set of such mountings need be fitted provided they cannot be isolated.

334. In respect of pressure vessels of thin wall such as sizing cylinders made of copper or any other non-ferrous metal the safe working pressure shall be reduced at the rate of 5 per cent of the original working pressure for every year of its use after the first five years

and no such cylinder shall be continued to be used for more than twenty years after it was first taken into use.

335. No vessel which has undergone alterations or repairs shall be taken into use unless it is thoroughly examined by a competent person.

336. A report of the result of every examination made shall be completed in the prescribed Form-VII and signed by the person making the examination, and shall be kept available for inspection by an Inspector at any time while the vessel is in service.

337. Nothing in this regulation shall apply to:

a. any vessels which comes within the scope of section 333 to 336 referred to above;

b. metal bottles of cylinders used for the storage or transport of compressed gases or liquefied or dissolved gases under pressure.

Pipes and equipment conveying certain substances

338. It shall be the duty of the employer to ensure that every pipe, pump, compressor and other equipment in the workplace used to convey steam, air refrigerant or any hazardous substance, and each part and fitting of, and attachment to, every pipe, pump, compressor and other equipment is:

a. of good construction, sound material and adequate strength;

b. free from patent defects, and

c. properly maintained.

Gas plants

339. Every gas plant shall be of sound construction and properly maintained.

340. Every gas plant shall be inspected by a competent person before use and thereafter within such period as the Chief Labour Administrator may specify.

341. Every water-sealed gasholder which has a storage capacity of not less than $25m^3$shall be examined externally by a competent person at least once every 2 years.

342. A record of the examination referred to in section 341 containing such particulars as the Chief Labour Administrator may determine shall be entered in or attached to a register

343. No gasholder shall be repaired or demolished except under the direct supervision of a person who:

a. by his training and experience, and

b. with his knowledge of the necessary precaution against risks of explosion and of persons being overcome by gas, is competent to supervise the work.

344. No gas filling shall be allowed except under the direct supervision of a person who:

a. by his training and experience, and

b. is competent to supervise the work, with his knowledge of the necessary precautions against any risk.

345. No gas cylinder shall be filled unless:

a. The cylinder has been examined or tested by competent person:

i. where the cylinder is for corrosive gases, at least once in 2 years, or

ii. where the cylinder is for other gases, at least once every 5 years, and

b. the result of such examination or test is entered in a register and kept for inspection by an inspector.

346. It shall be the duty of the owner of a gas plant used in a workplace to comply with section 339 to 345.

347. It shall be the duty of a competent person to exercise all due diligence in conducting any test or examination under this section.

CHAPTER 14

PROVISIONS RELATING TO TOXIC SUBSTANCES AND HAZARDOUS PROCESSES

General requirements

348. All workplaces where any employee at work is exposed to environmental conditions that may have adverse effects on health, it shall be the duty of the employer to take effective measures to protect that person from such problems.

349. The safety and health measures for the environmental conditions under section 348, as specified in section 356 to 391 are to be implemented by the employer with the cooperation of employees.

Infectious agents and biohazardous material

350. Where any person at work in any workplace carries out any process, operation or work involving exposure to any infectious agents or biohazardous material which may constitute a risk to his health, it shall be the duty of the employer of that person to take effective measures to protect that person from their harmful effects.

351. In the section 350, "infectious agents or biohazardous material" includes:

a. any substance which contains toxins;

b. any biological waste;

c. any culture medium;

d. any contaminated blood, urine or faeces;

e. any infected tissue or organ, and

f. any infected animal.

General ventilation

352. It shall be the duty of the employer to ensure that every workroom of the workplace is provided with adequate ventilation.

353. Where gases, vapours or other impurities are generated in the course of any process or work carried out in a workplace which may be injurious to health, it shall be the duty of the employer to provide effective and suitable ventilation:

a. for securing and maintaining the circulation of fresh air in the workplace, and

b. to render harmless, so far as is reasonably practicable, all such gases, vapours or other impurities.

354. This regulation shall not apply to any workplace where it is impracticable to make provision for adequate ventilation and where suitable air-supplied breathing apparatus is provided to persons at work in the workplace.

Vibration

355. In any workplace where persons are at work in any process or operation which involves exposure to vibration which may constitute a risk to their health, it shall be the duty of the employer to provide, so far as is reasonably practicable, effective means to reduce the vibration.

Excessive heat or cold and harmful radiations

356. It shall be the duty of the employer to take all reasonably practicable measures to ensure that persons at work in the

workplace are protected from excessive heat or cold and harmful radiations.

Noise

357. The employer must take all practical measures to reduce or control noise from any machinery, equipment or process such that no person employed or working in the workplace is exposed to excessive noise.

358. The measures to be taken under section 357 must include one or more of the following where appropriate:

a. replacing noisy machinery, equipment or processes with less noisy machinery, equipment or processes;

b. locating noise sources away from hard walls or corners;

c. isolating noise sources such that a minimum number of persons employed or working in the workplace are exposed to the noise;

d. constructing suitable acoustic enclosures to contain noise emitted by machinery, equipment or processes;

e. erecting an effective noise barrier larger in size than the noise source to provide acoustic shielding;

f. operating pneumatic machinery, equipment or tools at optimum air pressure to minimize noise emission and installing suitable pneumatic silencers at pneumatic line outlets;

g. installing mufflers at intake and exhaust openings that emit noise;

h. mounting vibrating machinery on vibration isolators or separate foundations;

i. isolating persons employed or working in the workplace in an acoustically shielded room or enclosure, where reduction of noise at the noise source is not practicable;

j. lining hard surfaces with acoustically absorbent materials to reduce noise reverberation;

k. isolating or reducing the size and vibration of vibrating surfaces or applying damping materials to vibrating surfaces;

l. reducing the height from which objects are allowed to fall or applying a resilient material at the point of impact or at the point of interaction of moving objects, or

m. maintaining machinery and equipment at regular intervals to reduce noise emission.

359. Where it is not practicable to reduce the noise, the employer must limit the duration of time persons employed or working in the workplace are exposed to the noise so that such persons are not exposed to excessive noise.

Permissible exposure limites for noise

360. It shall be the duty of the employer to take all reasonably practicable measures to ensure that a person exposed to noise

level of more than 90dBA shall not be allowed to work without wearing ear plugs/ear muffs.

361. Permissible noise exposure:

a. the values specified in Table V apply to total time of exposure per working day regardless of whether this is one continuous exposure or a number of short-term exposures but does not apply to impact or impulsive type of noise;

b. if the variation in noise level involves maximum intervals of one second or less, it shall be considered as continuous. If the interval is over one second, it becomes impulse or impact noise;

c. when the daily noise exposure is composed of two or more period noise exposure of different levels, their combined effect should be considered rather than the effect of each. If the sum of the fraction ;

$$\{C1 /T1\}+ \quad \{C2/T2\} + \{C3/T3\}$$

exceeds unity, then the mixed exposure should be considered to exceed the permissible limit value C indicates the total time exposure at a specified noise level, and T indicates the total time of exposure permitted at the level. However, the permissible levels found in the table shall not be exceeded for the corresponding number of hours per day allowed. Noise exposures of less than 90dBA do not enter into the above calculations.

d. Exposures to impulsive or impact noise shall not exceed 140dBA.

362. In all cases where the prevailing sound levels exceed the permissible levels specified in Table V appended to this regulation, there shall be administered an effective hearing conservation program 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.

363. Every employee working in areas where the noise level is more than 90dBA shall be subjected to an auditory examination by a qualified medical professional at least once in every 6 months. The records of such periodical medical examination shall be kept in a register and produce on demand to an Inspector.

364. The employer must provide suitable hearing protectors to all persons employed or working in the workplace who are exposed or are likely to be exposed to excessive noise and take steps to ensure that such protective devices are used at all necessary times.

Illumination

365. All workplaces where persons work or pass or may have to work or pass in emergencies, shall be provided during time of use with adequate natural lighting or artificial lighting or both, suitable for the operation and the special type of work performed.

366. Natural lighting:

a. skylights and windows should be located and spaced so that daylight conditions are fairly uniform over the working area;

b. where necessary, skylights and windows should be provided with means to avoid glare;

c. a regular system of cleaning skylights and windows should be established to ensure that they are kept clean at all times.

367. Artificial lighting:

a. artificial lighting shall be provided when daylight fails or for area where the daylight illumination is insufficient;

b. the general lighting should be of uniform level, widely distributed to avoid harsh shadows or strong contrast and free from direct or reflected glare;

c. where intense local lighting is necessary, a combination of general and supplementary lighting at the point of work shall be provided;

d. supplementary lighting shall be specially designed for the particular visual task and arranged or provided with shading or diffusing devices to prevent glare.

368. Prevention of glare:

At every workplace effective provision shall, so far as is practicable, be made for prevention of:

a. glare, either directly from a source of light or by reflection from a smooth or polished surface;

b. the formation of the shadows to such an extent as to cause eye-strain or risk of accident to any employee.

369. Intensity:

Adequate artificial lighting for different operations of work environment shall be in accordance with the standard laid down in Table VI.

Toxic dust, fumes or other contaminants

370. Where any process or work carried on in any workplace is likely to produce or give off any toxic dust, fumes or other contaminants, it shall be the duty of the employer to provide all reasonably practicable measures to:

a. prevent their accumulation in the workplace, and

b. protect persons at work in the workplace against inhalation of dust, fumes or other contaminants.

371. The measures to be taken under section 370 shall, where appropriate, include one or more of the following:

a. carrying out the process or work in isolated areas where persons not connected with the process or work are prohibited from being present;

b. carrying out the process or work in closed vessels or systems to prevent persons at work in the workplace from

coming into contact with the dust, fumes or other contaminants;

c. providing adequate ventilation to dilute the dust, fumes or other contaminants;

d. providing local exhaust ventilation to remove the dust, fumes or other contaminants at their sources of emission, and

e. carrying out the process or work wet.

372. The local exhaust ventilation system referred to in section 371 (d) shall be so designed, constructed, operated and maintained that the dust, fumes or other contaminants are safely and effectively removed at the source of generation and are not dispersed or scattered in the surrounding air.

373. Accumulation of toxic dust or waste on the floors, walls, work benches or other surfaces in any workplace shall be removed by washing, vacuum cleaning or other suitable means in a manner that will not make the dust or waste airborne.

374. No stationary internal combustion engine shall be used unless provision is made for conducting the exhaust gases from the engine into the open air.

375. The atmosphere of any place of work in which toxic substances are manufactured, handled, used or given off shall be tested at sufficient intervals to ensure that toxic dust, fumes, gases, mists or vapours are not present in quantities liable to injure the health of persons at work.

376. Notwithstanding section 375, the Chief Labour Administrator may, by order in writing, require the employer:

a. to monitor, test or assess the environment of any workplace for potential health hazards, and

b. to take air samples in the breathing zone of the persons who are exposed to dust, fumes or other contaminants by using appropriate personal sampling equipment.

377. A record of the result of every test carried out under section 375 and 376 shall be kept available for inspection by an Inspector for at least 5 years from the date of the test or such other period as the Chief Labour Administrator may specify in writing.

378. Section 370, 371, 375 and 376 shall not apply to any workplace where:

a. it is impracticable to comply with such requirements, and

b. where suitable air-supplied breathing apparatus is used by every person at the workplace.

379. The air-supplied breathing apparatus used under section 378 shall be supplied with air:

a. of a temperature and humidity comfortable for breathing, and

b. which has been suitably treated to remove particles of any material, oil mist, vapour, odour, carbon monoxide and carbon dioxide.

Permissible exposure levels of toxic substances

380. It shall be the duty of the employer to take all reasonably practicable measures to ensure that no person at work is exposed to the toxic substances in excess of the permissible exposure levels specified in Table VIII.

381. Where the PEL (Short Term) of a toxic substance is not specified in the Table VIII, the PEL (Short Term) of the substance shall be deemed to be exceeded if the time weighted average concentration of the substance measured over a 15-minute period during any working day exceeds 5 times the PEL (Long Term) of that substance as specified in that Table.

382. Where there is exposure to more than one toxic substance at the same time and the substances have similar harmful effects, the permissible exposure level shall be deemed to have been exceeded if the sum of the ratios between the time weighted average concentration and the permissible exposure level of each substance exceeds one.

Working environment measurement

383. Requirements:

a. working environment measurement shall include temperature, humidity, pressure, illumination, ventilation, and concentration of substances and noise;

b. the employer shall carry out the working environment measurement in indoor or other workplaces where hazardous work is performed. The working

environment measurement shall be performed periodically as may be necessary;

c. a copy of the working environment measurement record shall be kept in the workplace for inspection by any inspector;

d. the working environment measurement shall be performed by the safety or other personnel who have taken adequate training and experience in working environment measurement;

e. in the event of inability to perform the working environment measurement, the employer shall commission the other institutions or organizations accredited or recognized by the Department of Labour, to perform the measurement.

Hazardous substances

384. It shall be the duty of the employer to control all hazardous substances and their dangers in a workplace. Adequate warning notices in languages understood by all persons at work in a workplace specifying the nature of the danger of the hazardous substances shall be placed where the hazardous substances are used or present:

a. at all entrances to any workroom, and

b. at appropriate locations.

385. Persons at work in a workplace who are liable to be exposed to hazardous substances shall be warned of the hazards involved and the precautionary measures to be taken.

386. All hazardous substances in a workplace shall be kept, stored, used, handled or disposed of in such a manner as not to pose a risk to the health and safety of any person at work in the workplace.

Warning labels

387. It shall be the duty of the employer in which there is any container of hazardous substances to ensure that, so far as reasonably practicable, every such container is affixed with one or more labels that:

a. are easily understood by all persons at work in the workplace;

b. warn of the hazards involved with the hazardous substance in the container, and

c. specify the precautionary measures to be taken when dealing with the hazardous substance in the container.

Chemical safety data sheet

388. Where any hazardous substance is used, handled or stored in a workplace, it shall be the duty of the employer to:

a. obtain a chemical safety data sheet of the substance;

b. assess the information in the chemical safety data sheet and take precautionary measures to ensure the safe use of the substance, and

c. make available the chemical safety data sheet to all persons at work in the workplace who are liable to be exposed to the substance.

389. Where any hazardous substance is sold to any person for use in a workplace, the seller or any agent of the seller who caused or procured the sale shall provide the buyer with a chemical safety data sheet for the substance, giving accurate and adequate information on the substance in the format prescribed in Table IX appended to this regulation.

390. The employer shall provide chemical safety training to all employees who are using or being exposed to the chemicals in that workplace.

Medical examination of employees

391. It shall be the duty of the employer to get the employees engaged in a 'hazardous process' to be medically examined by a qualified medical professional in the following manner:

a. once before employment, to ascertain physical fitness of the employees to do the particular job;

b. once in a period of 6 months to ascertain the health status of all the employees in respect of occupational health hazards and in case wherein the opinion of the qualified

medical professional is necessary to do so at a shorter interval in respect of any worker;

c. the record of the medical examination of all the employees shall be maintained in a register in accordance with guidelines prepared by Ministry of Health. The register shall be produced for inspection on demand of the Inspector;

d. every employee engaged in process referred to above shall have an access to his medical record to know the status of his health.

CHAPTER 15

Special provisions on hazardous processes

Following operations are identified as Hazardous Processes:

a. Operation in Foundries including alloy steel castings;

b. Manipulation of stone or any other material containing free silica.

Following schedules shall apply to above processes for the purpose of monitoring in occupational safety and health status at all work places involving the above process.

SCHEDULE I

OPERATIONS IN FOUNDRIES AND ALLOY STEEL CASTING

Application

392. Provision of this schedule shall apply to all workplaces where any of the following operations or processes are carried on:

a. the production of iron castings and non ferrous castings or, as the case may be, steel castings by casting in moulds made of sand, loam, moulding composition or other mixture of materials, or by shell moulding, or by centrifugal casting and any process incidental to such production;

b. the melting and casting of non-ferrous metal for the production of ingots, billets, slabs or other similar products, and the stripping thereof.

Definition

For the purpose of this schedule:

"approved respirator" means a respirator of a type prescribed under chapter 8 of this regulation.

"cupola of furnace" includes a receiver associated therewith.

"dressing or fettling operations" includes stripping and other removal of adherent sand, cores, runners, risers, flash and other surplus metal from a casting and the production of reasonably clean and smooth surface.

"foundry" means the workplace where the production of iron or steel or non-ferrous castings (not being the production of pig iron or the production of steel in the form of ingots) is carried on by casting in moulds made of sand, loam, moulding composition or other mixture of materials, or by shell moulding or by centrifugal casting in metal mould lined with sand, or die casting including pressure die castings.

"knock-out operations" means all methods of removing castings from moulds and the following operations, when done in connection therewith, namely, stripping, corning-out and the removal of runners and risers.

"pouring aisle" means an aisle leading from a main gangway or directly from a cupola or furnace to where metal is poured into moulds.

Arrangement and storage

393. For the purposes of promoting safety and cleanliness in work-rooms the following requirement shall be observed:

a. moulding boxes, loam plates, ladles, patterns, pattern plates, frames, boards, box weights, and other heavy articles shall be so arranged and placed as to enable work to be carried on without unnecessary risk;

b. suitable and conveniently accessible racks, bins or other receptacles shall be provided and used for the storage of other gear and tools;

c. where there is bulk storage of sand, fuel, metal scrap or other materials or residues, suitable bins bunkers or other

receptacles shall be provided for the purpose of such storage.

Construction of floors

394. 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.

395. 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.

396. 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.

Cleanliness of indoor workplaces

397. 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 once in a year.

398. 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.

Manual operations involving molten metal

399. There shall be provided and properly maintained for all persons employed on manual operations involving molten metal with

which they are liable to be splashed, a working space for that operation:

a. which is adequate for the safe performance of the work, and

b. which, so far as reasonably practicable, is kept free from obstruction.

400. Any operation involving the carrying by hand of a container holding molten metal shall be performed on a floor, where any person walks while engaged in the operation shall be on the same level.

Gangways and pouring aisles

401. At every workplace to which this paragraph applies, sufficient and clearly defined main gangway pouring aisles shall be provided and properly maintained which:

a. shall have an even surface of hard material and shall, in particular, not be of sand or have on them more sand than is necessary to avoid risk of flying metal from accidental spillage;

b. shall be kept, so far as reasonable practicable, free from obstruction;

c. if molten metal is carried in crane, trolley or truck ladles, shall be of a width, adequate for the same performance of the work.

Work near cupolas, furnaces and scrap charging

402. No person shall carry out any work within a distance of 4m of any spout of a cupola or furnace or within a distance of 2.4m from any ladle which is in position at the end of such a spout.

403. It should be ensured before charging the scrap that is free from dampness and hazardous substances.

404. The workers engaged in sorting out and handling the scrap should be provided with metal reinforced (stapled) hand gloves, safety shoes and safety goggles.

405. Sorting out of the scrap should be done by experienced workers who should be made aware of the dangers which are likely due to entry of hazardous impurities and items into the furnace. This work should be done under strict supervision and it should be ensured that the scrap before being set to charging platform is free from moisture and other hazardous impurities and items.

406. Induction furnaces should be provided with mechanical charging system. Charging may be done by a crane and bucket.

407. The charging platform of each induction furnace should be provided with two stairways one for routine working and the other as an emergency stairway. The stairways should be provided with railings which should be properly fitted and always kept in perfectly maintained condition.

408. Repair jobs should be attended to only after melting is over and the furnace has cooled down.

Dust and fumes

409. Open coal, coke or wood fires shall not be used for heating or drying ladles inside a work-room 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 work-room.

410. 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.

411. 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 work-room during any period when a person is employed therein.

412. All knockout operations shall be carried out

a. in a separate part of the foundry suitably partitioned off, being a room or part in which, so far as reasonably practicable, effective and suitable local exhaust ventilation and adequate general ventilation are provided, or

b. in an area of the foundry in which, so far as reasonably practicable, effective and suitable local exhaust ventilation is provided or where compliance with this requirement is not reasonably practicable, adequate general ventilation is provided.

413. All dressing or fettling operations shall be carried out:

a. in a separate room or in a separate part of the foundry suitably partitioned of, or

b. in an area of the foundry set apart for the purpose, and shall, so far as reasonably practicable, be carried out with effective and suitable local exhaust ventilation or other equally effective means of suppressing dust, operating as near as possible to the point of origin of the dust.

Maintenance and examination of exhaust plant

414. All ventilator plants used for the purpose of extracting, suppressing or controlling dust or fumes shall be properly maintained.

415. All ventilating plant used for the purpose of extracting, suppressing or controlling dust or fumes 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 a register which shall be available for inspection by an inspector.

Protective equipment

416. The employer shall provide appropriate personal protective equipment to its employees in accordance with provisions contained in Chapter 8 of this regulation.

417. Where appropriate, suitable screens shall be provided for protection against flying materials (including splashes of molten metal and sparks and chips thrown off in the course of any process).

418. The employer 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.

Washing facilities, cloak room and mess room

419. There shall be provided and maintained in clean state and good repair for the use of all workers employed in the foundry:

a. washing facilities in accordance with the provisions contain in this regulation shall be provided and maintained;

b. a cloak room with lockers for each employee where he can keep his street as well as work clothing, and

c. a mess room furnished with tables and benches with means for warming food, provided where a canteen exists for the workers to take their meals, the requirement of mess room shall be dispensed with.

Disposal of dross and skimming

420. Dross and skimming removed from molten metal or taken from a furnace shall be placed for with in suitable receptacles.

Disposal of waste

421. Appropriate measures shall be taken for the disposal of all waste products (including waste burnt and) as soon as reasonably practicable after the castings have been knocked-out.

Medical facilities and records of examination tests

422. It shall be the duty of the employer to get the employees engaged in a 'hazardous process' to be medically examined by a qualified Medical professional in the following manner:

a. once before employment, to ascertain physical fitness of the employees to do the particular job;

b. once in a period of 6 months to ascertain the health status of all the employees in respect of occupational health hazards and in case wherein the opinion of the qualified Medical professional is necessary to do so at a shorter interval in respect of any worker;

c. the record of the medical examination of all the employees shall be maintained in a register in accordance with guidelines prepared by Ministry of Health. The register shall be produced for inspection on demand of the Inspector;

d. every employee engaged in process referred to above shall have an access to his medical record to know the status of his health.

423. Where the qualified Medical professional is of the opinion that the employee suffering from any disease requires further investigations and tests, the cost for such tests/investigations would be borne by the employer.

SCHEDULE II

Manipulation of stone or any other material containing free silica

Application

424. This schedule shall apply to all workplaces or parts of work places in which manipulation of stone or any other material containing free silica is carried on.

Definitions

For the purpose of this Schedule:

"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.

"**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.

Precautions in manipulation

425. No manipulation shall be carried out at a workplace 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 at any workplace where any person is employed, at a level equal to or below the maximum permissible level for silica dust as laid down in Table IV appended to this regulation.

Maintenance of floors

426. All floors or places where fine dust is likely to settle on and whereon 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.

427. The surface of every floor at every workplace or place where any work is carried on where any person has to pass during the course of his work, shall be cleaned 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.

Medical facilities and records of examinations and tests

428. The employer of every workplace to which the schedule applies, shall arrange to get every employee employed in the above process to be medically examined by a qualified medical professional in the following manner:

a. once before employment, to ascertain physical fitness of the employees to do the particular job;

b. once in a period of 6 months to ascertain the health status of all the employees in respect of occupational health hazards and in case wherein the opinion of the qualified Medical professional is necessary to do so at a shorter interval in respect of any worker;

c. medical examination shall include pulmonary function tests, chest X-ray and other routine tests which the Qualified Medical Officer deems fit. However chest X-ray shall be conducted once in 3 years;

d. the record of the medical examination of all the employees shall be maintained in a register in accordance with guidelines prepared by Ministry of Health. The register shall be produced for inspection on demand of the Inspector;

e. every employee engaged in process referred to above shall have an access to his medical record to know the status of his health.

CHAPTER 16

OFFENCES

429. Any employer who contravenes section 6 to 30, 201 to 347 and 392 to 428 of this regulation shall be guilty of an offence and shall be:

a. liable to pay a fine at the rate of National Minimum Wage Rate to a maximum of 1 year of the National Minimum Wage Rate in the first instance;

b. a misdemeanour, in addition, the court may impose appropriate compensatory damages, in the second instance;

c. a felony of fourth degree, in addition, the court may impose appropriate compensatory damages, in the third instance;

d. an employee or a person other than an employer who contravenes this regulation shall be guilty of an offence and shall be liable to pay a fine at the rate of National Minimum Wage Rate to a maximum of 1 year of the National Minimum Wage Rate.

430. Any employer who contravenes section 113 to 143 and 348 to 391 of this regulation shall be guilty of an offence and shall be:

a. liable to pay a fine at the rate of National Minimum Wage Rate to a maximum of 1 year of the National Minimum Wage Rate in the first instance;

b. a misdemeanour, in addition, the court may impose appropriate compensatory damages, in the second instance;

c. a felony of fourth degree, in addition, the court may impose appropriate compensatory damages, in the third instance.

431. Any employer who contravenes section 31 to 112 of this regulation shall be guilty of an offence and shall be liable to pay a fine at the rate of National Minimum Wage Rate to a maximum of 1 year of the National Minimum Wage Rate.

432. Any employer or electrical contractor who contravenes regulations 144 to 200 of this regulation shall be guilty of an offence and shall be:

a. liable to pay a fine at the rate of Daily Minimum National Wage Rate to a maximum of 1 year of the Daily Minimum National Wage Rate in the first instance;

b. a misdemeanour, in addition, the court may impose appropriate compensatory damages, in the second instance;

c. a felony of fourth degree, in addition, the court may impose appropriate compensatory damages, in the third instance.

433. A person who:

a. wilfully misuses or interferes with any apparatus or protective equipment in a manner liable to cause electrical hazard to himself or other persons, or

b. wilfully and without reasonable cause does any other thing liable to cause electrical hazard to himself or other persons, or

c. contravenes any of the provisions of the regulation which cast responsibility on him section, commits an offence and is liable to a fine at the rate of Daily Minimum National Wage Rage to a maximum of 1 year of Daily Minimum National Wage Rate.

CHAPTER 17

DEFINITIONS

434. For the purposes of this regulation unless the context indicate otherwise, the words, phrases and acronym are defined as follows:

"accident" means any unintended or unforeseen event or mishap arising from work activity that results in death or injury to an employee.

"apparatus" includes all electrical apparatus and any apparatus, machines or fittings in which conductors are used.

"authorized person" means a person who is either the employer; or an electrical contractor for the time being under contract with the

employer; or a person appointed in writing by an employer or an electrical contractor, as the case may be, for all or any of the purposes of this regulation.

“authorized representative” means a person duly authorized by the employer to deal with any matter relating to the health and safety of the persons employed in the workplace in such manner as that person thinks fit.

“automatic guard” means a guard which automatically prevents an operator of any machinery or plant from coming into contact with a dangerous part when that part is in motion.

“bare” means not covered by insulating material.

“carbon dioxide” means a colorless, odorless, electrically nonconductive inert gas that is a medium for extinguishing fires by reducing the concentration of oxygen or fuel vapor in the air to the point where combustion is impossible.

"centrifugal machine" include centrifugal extractors and driers.

“chairperson” means the chairperson of a health and safety committee.

"circuit" means an arrangement of conductors forming an electrical system or branch of an electrical system for the purpose of carrying electricity.

“circuit breaker" means a device, capable of making and breaking the circuit under all conditions, and unless otherwise specified, so designed as to break the current automatically under abnormal conditions.

“competent person” in relation to any provisions of this regulations means any person or an institution recognized as such by the Chief

Labour Administrator for the purpose of carrying out any test, examination and inspection. Such person or Institution (employing qualified persons) who by virtue of his qualification, training and experience and facilities available at his disposal is capable to carry out the tests and examinations.

"concentric cable" means a composite cable comprising an inner conductor which is insulated and one or more outer conductors which are insulated from one another and are disposed over the insulation of, and more or less around, the inner conductor.

"conductor" means any wire, cable, bar or tube used for conducting electricity.

"covered" in relation to insulating material, means sufficiently covered with insulating material so as to prevent electrical hazard.

'confined space' means any place, including any vessel, tank, container, vat, silo, hopper, pit, bund, trench, pipe, sewer, flue, well, chamber, compartment, cellar or other similar space which, by virtue of its enclosed nature creates conditions which give rise to a likelihood of accident, harm or injury of such a nature as to require emergency action due to:

a. the presence or reasonably foreseeable presence of
   (i) flammable or explosive atmospheres,
   (ii) harmful gas, fume or vapour,
   (iii) free flowing solid or an increasing level of liquid,
   (iv) excess of oxygen
   (v) excessively high temperature,

b. the lack or reasonably foreseeable lack of oxygen

"dangerous occurrence" means an unintended or unforeseen event or mishap arising from work activity of such nature as may be prescribed occurs, whether causing any bodily injury or disability or not.

"dangerous part" means any part of machinery or plant specified in the Table IV and any combination of such parts.

"dBA" refers to sound level in decibels as measured on a sound level meter operating on the A-weighting network with slow meter response.

"dead" means at or about zero voltage and disconnected from any live electrical system.

"decibel"means one-tenth of "Bel".

"dry chemical" means an extinguishing agent composed of very small particles of chemicals such as, but not limited to, sodium bicarbonate, potassium bicarbonate, urea based potassium bicarbonate, potassium chloride, or mono-ammonium phosphate supplemented by special treatment to provide resistance to packing and moisture absorption (caking) as well as to provide proper flow capabilities. Dry chemical does not include dry powders.

"dry powder" means a compound used to extinguish or control Class D fires.

"earthed" means connected to the general mass of the earth in such manner as will ensure at all times an immediate discharge of electrical energy without causing electrical hazard.

"electrical contractor" means any person or firm engaged in carrying out electrical work by way of trade or business, either on his own account or pursuant to a contract or arrangement entered into with another person, including the State or any public body.

"electrical equipment"

a. means any machine, appliance, apparatus or lighting fitting which consumes or utilizes electricity in its operation or use, and

b. includes any cable, wire and other devices necessary to enable it to be connected to a source of electricity supply.

"electrical hazard" means danger to health, life or property from electric fire or electric shock.

"farming"means subsistence farming operated by family or self-employed person without any employees.

"first aid" means-

a. in cases where a person needs help from a registered medical practitioner or nurse, treatment for the purpose of preserving life and minimizing the consequences of bodily injury until such help is obtained, or

b. treatment of minor bodily injury which does not require treatment by a registered medical practitioner or nurse.

"fixed guard" means a guard which by its design and construction prevents access to a dangerous part of machinery or plant and which has no moving parts associated with or dependent upon the machinery or plant to which the guard is fitted.

"flash point" means the minimum temperature in degrees at which material will give off flammable vapour.

"flywheel": includes flywheels, balance wheels and pulleys which are mounted on and revolves with the crankshaft of an engine or other

shafting of a prime mover, which by its inertia assists in securing uniform motion of machinery by resisting sudden changes of speed.

"foam" means a stable aggregation of small bubbles which flow freely over a burning liquid surface and form a coherent blanket which seals combustible vapors and thereby extinguishes the fire.

"fume" includes gas or vapor.

"guarded" means shielded, fenced, enclosed or otherwise protected according to their orders, by means of suitable enclosures, covers, or casing through 'U' guards, shield guards, standard railings, or by the nature of the location where permitted in these orders, so as to remove the liability of accidental contact or approach dangerous to persons.

"hazardous process" means any process or activity in relation to an industry specified in Table VII where, unless special care is taken, raw materials used therein or the intermediate or finished products, bye-products, wastes or effluents thereof would:

i. cause material impairment to the health the employee engaged inor connected therewith, or

ii. result in the pollution of the general environment.

"health and safety committee" means a health and safety committee established at a workplace.

"health and safety representative" means a person who is appointed by the employees to be their representative to deal with any matter relating to health and safety at that workplace pursuant to section 166 of the Labour and Employment Act, 2007.

"high noise level" means any noise level measured on the A weighted scale is 90dBA or above.

"high voltage" means 66kv and above.

"horizontal exits" 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 on adjoining part of the same building with adequate separation.

"immediately" means within 12 hours after any accident or dangerous occurrence occurs at a workplace.

"installation" means any composite electrical unit used for the purpose of generating, transforming, transmitting, converting, distributing or utilizing energy.

"insulated" and "insulating" in relation to any apparatus, device, protective equipment or fitting means made of or covered with a non-conducting material of such design and construction so that it is normally impossible when the apparatus, device, protective equipment or fitting is in use for any person to make accidental or unintentional contact with any live metal or metal liable to become live.

"interlocking guard" means a guard which is connected with machinery or plant so that the machinery or plant cannot be operated unless the guard is in a closed position, and the guard cannot be opened unless the machinery or plant is not in motion or its removal from a closed position causes the machinery or plant to cease operating forthwith.

"live" means charged with electricity so that a voltage exists between a conductor and another conductor or a conductor and earth.

"low voltage" means not exceeding 400volts between phase to phase for a three phase supply or 230volts between phase to neutral in case of single phase supply.

"mechanical power transmission equipment" means all mechanical means of transmitting power from prime movers to a machine up to but not including the point of operation.

"medium voltage" means any voltage of 6.6kv or 11kv or 33kv.

"members" means the members of a health and safety committee.

"noise" means any unwanted sound.

"occupational disease" means any illness or sickness or ailment contracted as a result of an exposure to risk factors arising from work activity.

"PEL (Long Term)" means the permissible exposure level over an 8-hour working day and a 40-hour work week.

"PEL (Short Term)" means the permissible exposure level over a 15-minute period during any working day.

"permissible exposure level" means the average maximum time weighted average concentration of a toxic substance to which any person may be exposed; specified in the Table VIII.

"plant" means any machinery, vessel, pipe or other apparatus or combination thereof which is connected or used for the purpose of making a product.

"point of operation" means that part of a working machine at which cutting, shaping, forming or any other necessary operation is accomplished, and/or that point or location where stock or materials is fed to the machine. A machine may have more than one point of operation.

"prime mover" means an engine or motor operated by steam, gas, air, electricity, liquid or gaseous fuel, liquid in motion or other forms of energy and whose main function is to drive or operate, either directly or indirectly other mechanical equipment.

"protective equipment" includes any insulating stands, screens, portable or otherwise, mats and covers and insulating boots, gloves or other protective equipment mentioned under regulation on "Occupational Health, Safety and Welfare."

"Qualified medical professional" means the person registered with the Medical and Health Council of Bhutan.

"Safety Officer" means a person who is appointed by the employer as a Safety Officer; possessing qualification as laid down in this regulation.

"safe working pressure" means the pressure specified in the report of examination referred to in section 333 and 334 of this regulation.

"secretary" means the secretary of a health and safety committee.

"**slow burning construction"** means construction consisting of substantial masonry walls and heavy timber interior.

"standard machinery guard" means guard constructed as prescribed in this regulation.

"steam boiler" means any closed vessel wherein steam or other vapor is or intended to be generated above atmospheric pressure by the application of fire, by the product of combustion, by electrical means, or by other heat source.

"sub-station" means any building, structure or enclosure, either above or below ground, containing transforming or converting apparatus in which electrical energy is transformed or converted to or from voltage exceeding low voltage otherwise than for the purpose of working instruments, relays or similar auxiliary apparatus, where such building, structure or enclosure has sufficient space to permit a person to enter.

"Supervisor" means the person under whose control the manufacturing activity is carried out at the work place. He is also the person who works under the overall control and direction of employer or his authorized representative.

"supplier" means a licensee, a non-licensee or any other supplier of energy [including the Government].

"switchboard" means a panel or structure on which is located any switching equipment or other apparatus used in or in connection with the control of current or voltage in an electrical system.

"system" means an electrical system in which all the conductors and apparatus used in or in connection with the electrical system are connected to a common source of electrical energy, and

"tank" includes any pipe and valve thereof and all its fittings and attachments.

"time weighted average concentration" means the concentration determined by adding together the products of each concentration and the corresponding time over which that concentration was measured, and dividing the sum by the total time over which the measurements were taken.

"toxic substance" means any substance which may cause irritation, bodily injury or any harmful effect to a person through ingestion,

inhalation or contact with anybody surface, and includes any substance.

"transmission machinery" means every shaft, wheel, drum, pulley, systems of tight and loose pulleys couplings, clutch, driving belts, V-belts sheaves and belts, chains and sprockets, gearing, torque connectors, hydraulic couplings, magnetic couplings, speed reducers, speed increasers or other power transmission devices by which the motion of any engine is transmitted to or received by any other machinery or appliance.

"travel distance" means the distance an occupant has to travel to reach fire exit.

"trip guard" means a guard which is connected with machinery or plant so that upon its activation the machinery or plant stops before a person can come into contact with a dangerous part thereof.

"two-hand control device" means a device which is so designed that the operator's hands must continuously engage the controls of the machinery or plant if it is to complete its cycle of operation and that if one or both of the operator's hands cease to engage the controls thereof the machinery or plant stops.

"voltage" means the difference of electrical potential between conductors or between a conductor and the earth as measured by a suitable volt meter and is said to be.

"wood-frame construction" means a construction in which wooden frame-work forms the structural support for enclosure walls, floors, and doors.

"workplace" means any place, whether a building or structure, open space, home, office or factory, where an employee works.

"working environment measurement" means sampling and analysis carried out in respect of the atmospheric working environment and other fundamental elements of working environment for the purpose of determining actual conditions therein.

Table I

Dangerous occurrences

The following classes of dangerous occurrence, whether or not they are attended by personal injury disablement:

a. Bursting of a plant used for containing or supplying steam under pressure greater than atmospheric pressure.

b. Collapse or failure of a crane, derrick, which 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, or fire in rooms of cotton pressing factories when a cotton opener is in use.

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 any liquid or solid resulting from the compression of gas.

e. Collapse or subsidence of any floor, gallery, roof, bridge, tunnel, chimney, wall, building or any other structure.

Table II

List of Reportable Occupational Disease

1. Lead poisoning including poisoning by any preparation or compound of lead
2. Lead tetra-ethyl poisoning
3. Phosphorus poisoning
4. Mercury poisoning
5. Manganese poisoning
6. Arsenic poisoning
7. Poisoning by nitrous fumes
8. Carbon bi-sulphide poisoning
9. Benzene poisoning
10. Chrome ulceration
11. Anthrax
12. Silicosis
13. Poisoning by halogens or halogen derivatives of the hydrocarbons of the aliphatic series
14. Pathological manifestation due to:
    a. radium or other radioactive substances
    b. X-rays
15. Primary epitheliomatus cancer of the skin
16. Toxic anemia
17. Toxic jaundice due to poisonous substances

18. Oil acne or dermatitis due to mineral oils and compounds containing mineral oil base
19. Byssionosis
20. Asbestosis
21. Occupational or contract dermatitis caused by direct contract with chemicals and paints. These are of two types, that is, primary irritants and allergic sensitizers.
22. Noise induced hearing loss (exposure to high noise levels)
23. Beryllium poisoning
24. Carbon monoxide, poisoning
25. Coal miners pneumoconiosis
26. Phosgene poisoning
27. Occupational cancer
28. Isocyanides poisoning
29. Toxic nephritis
30. Pesticide poisoning
31. Compressed air illness (caissons disease)
32. Musculoskeletal disorders
33. Mesothelioma

Table III

Contents of first aid box or cup-boards and dispensary

(A) First Aid Appliance – The first aid boxes or cup-boards shall be distinctively marked with white cross on a green background and shall contain the following equipment:

Sl. no	**Items**	**Number of Employee**	
		1- 50	**51 < above**
1	Small sterilized dressings	12	24
2	Medium size sterilized dressings	6	12
3	Large size sterilized dressing	6	12
4	Large size sterilized burn dressings	6	12
5	(1/2oz.) Sterilized cotton wool	6 packets	12 packets
6	(2oz.) Bottle containing a two per cent alcoholic solution of iodine	1	2
7	(2oz.) Bottle containing Betadine (antiseptic solution) having the dose and mode of administration indicated on the label	1	2
8	Roll of adhesive plaster	1	2

9	A snake bite lancet	1	1
10	Torch light	1	1
11	pair of scissors	1	1
12	Tablets Aspirin (5gms)	2 dozen	4 dozen
13	Burn Ointment	2 tubes	4 tubes
14	Dettol	2 phial (about2 ozs)	4 phial
15	Bandages 4 inches wide		12 rolls
16	Bandages 2 inches wide		12 rolls
17	Triangular bandages	2	6
18	Packets of safety pins	1	2
19	A supply of suitable splint		Yes
20	Tourniquet		1

(B) Dispensary Room

1. The dispensary room shall be in charge of qualified medical professional assisted by at least one qualified nurse and such subordinate staff Inspector may direct.

2. The dispensary shall be separated 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 25m^2 with smooth, hard and impervious walls and floor and shall be adequately ventilated and lighted by both natural and artificial means. An adequate supply of safe drinking water shall be laid on and the room shall contain at least:

i. A glazed sink with hot and cold water always available

ii. A table with a smooth top at least 180cm x 105cm

iii. Means for sterilizing instruments

iv. A couch

v. Two stretchers

vi. Two buckets or containers with close fitting lids

vii. Two rubber hot water bags

viii. A kettle and spirit stove or other suitable means of boiling water

ix. Twelve plain wooden splints 36" x 4" x ¼"

x. Twelve plain wooden splints 14" x 3" x ¼"

xi. Six plain wooden splints 10" x 2" x ½"

xii. Six woolen blankets

xiii. One pair artery forceps

xiv. One bottle of spiritus anemia aremations (120ml)

xv. Two medium size sponges

xvi. Six hand towels

xvii. Four "kidney" trays

xviii. Four cakes carbolic soap

xix. Two glass tumblers and two wine glasses

xx. Two clinical thermometers

xxi. The Graduated measuring glass (120ml) with two teaspoons.

xxii. One eye bath

xxiii. One bottle (2 lbs) carbolic lotion 1 in 20

xxiv. One screen

xxv. Three chairs

xxvi. One electric hand torch

xxvii. Four first aid boxes or cupboards stocked to the standards prescribed under item (ii) above

xxviii. An adequate supply of anti titanus'toxoid'

xxix. Injection – morphia, pethidine, atrophine, adrenaline, coramine, novocaine (6 each)

xxx. Cramine liquid (60ml)

xxxi. Tablets – antihistaminic antispasmodic 25 each)

xxxii. Syringes with needles – 2cc, 5cc, 10cc and 50 cc

xxxiii. Two needle holders, big and small

xxxiv. Suturing needles and materials

xxxv. Three dissecting forceps

xxxvi. Three scalpels

xxxvii. One stethoscope

xxxviii. Oxygen cylinder with necessary attachments

xxxix. Any other equipment or appliance recommended by the qualified professional.

3. The employer at every workplace to which this regulation apply shall for the purpose of removing serious cases of accident 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.

4. A record of all cases of accident and sickness treated at the room shall be kept and produced to the Inspector when required.

Table IV

Dangerous Parts of Machinery or Plant

1. Revolving shafts, couplings, spindles, mandrels, bars and flywheels.
2. In-running nips between pairs of rotating parts.
3. In-running nips of the belt and pulley type.
4. Projections on revolving parts.
5. Discontinuous rotating parts.
6. Revolving beaters, spiked cylinders and revolving drums.
7. Revolving mixer arms in casings fitted with openings.
8. Revolving worms and spirals in casings fitted with openings.
9. Revolving high-speed cages in casings fitted with openings.
10. Revolving cutting tools.
11. Reciprocating cutting tools.
12. Reciprocating press tools and dies.
13. Reciprocating needles.
14. Closing nips between platen motions.
15. Projecting belt fasteners and fast running belts.
16. Nips between connecting rods or links, and rotating wheel cranks or discs.
17. Traps arising from the traversing carriages of self-acting machines.

Table V

Permissible Noise Exposure

Duration per day, hours	Sound Levels, dBA, slow response
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25	115

* ceiling value: No exposure in excess of 140dBA is allowed

Table VI

Illumination Levels

(Lux)	Place	Kind of Work
3000 2000 1500	Control room Factory	**Extremely fine visual works** Extra fine assembling instrument, watch manufacturing, grading etc.
1000 750	Office, Drawing room Factory	**Fine visual works** Long assembling, Fine bench and machine work, Fine inspection, Drafting, Typing/ other prolonged close office desk work
500 300	Office, Meeting room Factory	**Normal visual works** Production line ; Assembling, Inspection, Office desk work, Medium bench and machine work
200 150	Workshop Electricity/machine room	**Rough visual works** Medium assembling, Rough bench and machine work, Rough inspection of testing of products
100 75	Works in warehouse General construction plant Exit/ Entrance passage Locker room, Toilet	**Very rough visual works** Rough assembling, Packaging Tunnel drilling
50 30	Warehouses, Passageways Emergency stairs, Corridor Underground work area	Loading, Unloading, Carrying in warehouse Excavation, Concrete placement
20	Roadways Outside thoroughfares	

Note: *Illumination of the workplace is measured using the unit called as LUX andthe instrument used to measure illumination is known as LUX Meter.*

Table VII

List of industries involving hazardous processes

1. Ferrous metallurgical industries
   - Integrated iron and steel
   - Ferro-alloys
2. Non—ferrous metallurgical industries
   - Primary metallurgical industries, namely, zinc, lead, copper, manganese and aluminum.
3. Foundries (ferrous and non-ferrous)
   - Castings and forgings including cleaning or smoothening/roughening by sand and shot blasting.
4. Coal (including coke) industries
   - Coal, Lignite, Coke, etc.
   - Fuel gases (including coal gas, producer gas, water gas)
5. Power generating industries
6. Cement industries
   - Portland cement (including slag cement, puzzolona cement and their products)
7. Chemical industries
8. Grinding or glazing of metals
9. Manufacture, handling and processing of asbestos and its products
10. Extraction of oils and fats from vegetable and animal sources
11. Manufacture, handling and use of benzene and substances containing benzene
12. Dyes and Dyestuff including their intermediates
13. Highly flammable liquids and gases.

Table VIII

Permissible levels of certain toxic substances in work environment

Substance	*PermissibleExposure Limits (PEL)*			
	PEL (Long Term)		*PEL (Short Term)**	
	ppm	mg/m^3	ppm	mg/m^3
1. Acetaldehyde	100	180	150	270
2. Acetic Acid	10	25	15	37
3. Acetone	750	1780	1000	2375
4. Acrolein	0.1	0.25	0.3	0.8
5. Acrylonitrile-skin (S.C.)	2	4.5	--	--
6. Aldrin-skin	--	0.25	--	0.75
7. Allyl Chloride	1	3	2	6
8. Ammonia	25	18	35	27
9. Aniline-skin	2	10	5	20
10. Anisidine (Pisoners) skin	0.1	0.5	--	--
11. Arsenic and compounds (as As)	--	0.2	--	--
12. Benzene (H.C.)	10	20	25	75
13. Beryllium and compounds (S.C.)	--	0.002	--	--
14. Boron Trifluoride	0.1	0.3	--	--
15. Bromine	0.1	0.7	0.3	2
16. Butane	800	1900	--	--
17. 2-Butanon (Methylethyle Ketone-MEK)	200	590	300	885
18. n-Butyl acetate	150	710	200	950
19. n-Butyl alcohol-skin – C	50	150	--	--
20. sec/tert. Butyl acetate	200	950	250	1190

21. Butyl Mercptan	0.5	1.5	--	--
22. Cadmium-dust and salts (as Cd)	--	0.05	--	0.2
23. Calcium oxide	--	2	--	--
24. Carbaryl (Sevin)	--	5	--	10
25. Carbofuran (Furadan)	--	0.1	--	--
26. Carbon disulphide-skin	10	30	--	--
27. Carbon monoxide	50	40	400	440
28. Carbon tetrachloride-skin (S.C)	5	30	20	125
29. Carbonyl Chloride (Phosgene)	0.1	0.4	--	--
30. Chlorobenzene (monochloro benzene)	75	350	--	--
31. Chlordane –skin	--	0.5	--	2
32. Chlorine	1	3	3	9
33. Chloroform (S.C.)	10	50	50	225
34. bis-Chloromethyl ether (H.C.)	0.001	0.005	--	--
35. Chromic acid and chromates (as Cr)	--	0.05	--	--
36. Chromous Salts (as Cr)	--	0.05	--	--
37. Copper fume	--	0.2	--	--
38. Cotton dust, raw	--	0.2	--	0.6
39. Cresol, all isomers – skin	5	22	--	--
40. Cyanides (as CN)- skin	--	5	--	--
41. Cyanogen	10	20	--	--
42. DDT (Dichloro-diphenylTrichloro-ethene)	--	1	--	3
43. Demeton-skin	0.01	0.1	0.03	0.3
44. Diazinon-skin	--	0.1	--	0.3
45. DibutylPhythalate	--	5	--	10
46. Dichlorvos (DDVP) – skin	0.1	1	0.3	3
47. Dieldrin-skin	--	0.25	--	0.75
48. Dinitrobenzene (all	0.15	1	0.5	3

isomers) – skin				
49. Dinitrotoluene – skin	--	1.5	--	5
50. Diophenyl	0.2	1.5	0.6	4
51. Endrin-skin	--	0.1	--	0.3
52. Ethyl acetate	400	1400	--	--
53. Ethyl alcohol	1000	1900	--	--
54. Ethylamin	10	18	--	--
55. Fluorides (as F)	--	2.5	--	--
56. Formaldehyde (S.C.)	1.0	1.5	2	3
57. Fluorine	1	2	2	4
58. Formic Acid	5	9	--	--
59. Gasoline	300	900	500	1500
60. Hydrogen Chloride – C	5	7	--	--
61. Hydrogen Cyanide-skin-C	10	10	--	--
62. Hydrogen Fluoride (as F)-C	3	2.5	6	5
63. Hydrogen Peroxide	1	1.5	2	3
64. Hydrogen Sulphide	10	14	15	21
65. Iodine-C	0.1	1	--	--
66. Iron Oxide Fume (Fe_2O_3) (as Fe)	--	5	--	10
67. Isoamyl acetate	100	525	125	655
68. Isoamyl alcohol	100	300	125	450
69. Isobutyl alcohol	50	150	75	225
70. Lead, inorganic, fumes and dusts (as Pb)	--	0.15	--	0.45
71. Lindane-skin	--	0.5	--	1.5
72. Malathion-skin	--	10	--	--
73. Manganese (as Mn) dust and compounds-C	--	05	--	--
74. Fume	--	1	--	0.3
75. Mercury (as Hg)-skin Alkyl compounds	--	0.01	--	0.03
76. All forms except alkyl vapour	--	0.05	--	--
77. Aryl and inorganic	--	0.1	--	--

compounds				
78. Methyl alcohol (methanol) skin	200	260	250	310
79. Methyl cellosove-skin (2 methoxy ethanol)	5	16	--	--
80. Methyl isobutyl Ketone-skin	50	205	75	300
81. Methyl Isocyanate	0.02	0.05	--	--
82. Naphthalene	10	50	15	75
83. Nickel carbonyl (as Ni)	0.05	0.35	--	--
84. Nitric acid	2	5	4	10
85. Nitric oxide	25	30	35	45
86. Nitrobenzene –skin	1	5	2	10
87. Nitrogen dioxide	3	6	5	10
88. Oil mist, minerals	--	5	--	10
89. Ozone	0.1	0.2	0.3	0.6
90. Parathion-skin	--	0.1	--	0.3
91. Phenol-skin	5	19	10	38
92. Phorate (Thimet)-skin	--	0.05	--	0.2
93. Phosgone (Carbonyl Chloride)	0.1	0.4	--	--
94. Phosphine	0.3	0.4	1	1
95. Phosphorus (yellow)	--	0.1	--	0.3
96. Phosphorus pentachloride	0.1	1	--	--
97. Phosphorus trichloride	0.2	1.5	0.5	3
98. Picric acid-skin	--	0.1	--	0.3
99. Pyridine	5	15	10	30
100. Silane (silicon tetrahydride)	5	7	--	--
101. Sodium hydroxide-C	--	2	--	--
102. Styrene, monomer (phanylethylene)	50	215	100	425
103. Sulphur dioxide	2	5	5	10
104. Sulphur hexafluoride	1000	6000	1250	7500
105. Sulphuric acid	--	1	--	--

106. Toluene (Tuluol)	100	375	150	560
107. O-Toluidine-skin-(S.C.)	2	9	--	--
108. Tributyl phosphate	0.2	2.5	0.4	5
109. Trichloroethylene	50	270	200	1080
110. Uranium, natural (as U)	--	0.2	--	0.5
111. Vinyl chloride (H.C.)	5	10	--	--
112. Welding fumes	--	5	--	--
113. Xylene (o-, m-, P-isomers)	100	435	150	655
114. Zinc Oxide				
(i) Fume	-	5.0	-	10
(ii) Dust (Total Dust	-	10	-	-
115. Zirconium compounds (as Zr)	--	5	--	10

* Lint-free dust as measured by the vertical elutriator cotton-dust sampler.

ppm: parts of vapour or gas per million parts of contaminated air by volume at 25^0C and 760 mm of HG.

mg/m^3: milligram of substance per cubic meter of air

*: Not more than 4 times a day with at least 60 min interval between successive exposures.

** : $mg/m^3 = \frac{\text{Molecular weight}}{24.45} \text{ x ppm}$

C: denotes Ceiling Limit

Skin: denotes potential contribution to the overall exposure by the cutaneous route including mucous membranes and eye.

S.C: denotes Suspected Human Carcinogen

H.C: denotes Confirmed Human Carcinogen.

Substance	*PEL (Long Term)*
1. Silica SiO_2	
(a) Crystalline	
(i) Quartz	
(1) In terms of dust count	$\frac{10600}{\%\text{Quartz} + 10}$ mppcm.
(2) In terms of respirable dust	$\frac{10}{\%\text{respirable quartz} + 2}$ mg/m^3
(3) In terms of total dust	$\frac{30}{\%\text{Quartz} + 3}$ mg/m^3
(ii)Cristobalite	Half the limits given against quartz.
(iii) Tridymite	Half the limits given against quartz
(iv) Silica fused	Same limits as for quartz.
(v) Tripoli	Same limits as in formula in item 2 given against quartz.
(b) Amorphous Silicates :	10mg/m^3 total dust
(Asbestos (H.C.):	
(i) Amosite	0.5 fibre/cc***
(ii) Chrysotile	1.0 fibre/cc***
(iii) Crysodolite	0.2 fibre/cc***

*** (i) For fibres greater than 5m in length and less than 5m in breadth with length to breadth ratio equal to or greater than 3:1.

(ii) As determined by the membrane filter method at 400-450 x magnification (4mm objective) phase contrast illumination.)

Portland Cement : 10mg/m^3, total dust containing less than 1% quartz

Coal Dust. : 2mg/m^3, respirable dust fraction containing less than 5% quartz. mppcm= Million particles per cubic meter of air, based on impingersamples counted by light-field techniques. * As determined by the membrane filter method at 400-450 x magnification (4 mm objective) phase contrast illumination.	
2. Coal dust (1) Forairborne dust having less than 5% silicon dioxide by weight (2) For airborne dust having over 5% silicon dioxide	2mg/m^3 Same limit as prescribed by formulas in item (2) against quartz.
3. Dust* : *Dust means whether mineral, inorganic, or organic dust not listed specifically by substance name in this table.	5mg/m^3

Note: This table on Permissible levels of certain chemical substances in work environment is subjected to change as an when deem necessary.

Table IX
Format of a Safety Data Sheet

1. CHEMICAL IDENTITY			
Chemical Name		Chemical Classification	
Synonyms		Trade Name	
Formula		C.A.S. No.	U.N.No.
Regulated identification	Shipping Name Codes / Label	Hazchem m N	
	Hazardous Waste I.D. No.		
1.		3.	
2.		4.	
2. PHYSICAL AND CHEMICAL DATA			
Boiling Range/Point	°C	Physical State	Appearance
Melting/Freezing Point	°C	Vapour Pressure at 35^0 C mm Hg Odour	
Vapour Density (Air=1)	Solubility in water at 30^0C		Others
Specific Gravity Water=1	pH		
3. FIRE AND EXPLOSIVE HAZARD DATA			
Flammability	Yes/No LEL	% Flash Point°C	Autoignitiontemp. °C
TDG Flammability UEL	% Flash Point	°C	Hazardous

Explosion Sensitivity to Impact			Explosion to Static Electricity	Combust-ion Products
Hazardous Polymerisation				
Combustible Liquid	Explosive Material			Corrosi-ve Material
Flammable Material	Oxidiser			Others
Pyrophoric Material			Organic Peroxide	
4. REACTIVITY DATA				
Chemical Stability				
Incompatibility with other material				
Reactivity				
Hazardous Reaction Products				
5. HEALTH HAZARD DATA				
Routes of Entry				
Effects of Expsoure / Symptoms				
Emergency Treatment				
TLV (ACGIH)	ppm ppm	mg/m^3 Mg/m^3	STEL	
Permissible ppm	ppm mg/m^3	mg/m^3	OdourTreshold	
Exposure Limit LD_{50}			LD	
NEPA	Hazard Stability Signal	Health Special	Flammability	
6. PREVENTIVE MEASURES				
Personal Protective				

equipment	
Handling and Storage Preceautions	

7. EMERGENCY AND FIRST AID MEASURES	
Fire	FIRE EXTINGUISHING Media
Fire	Special Procedures
	Unusual Hazards
Exposures	First aid Measures Antidotes/Dosages
Spills	Steps to be taken Waste Disposal Methods
8. ADDITIONAL INFORMATION / REFERENCES	

9. MANUFACTURER/SUPPLIES DATA	
Name of firms	Contact Person in Emergency
Mailing Address	Local Bodies Involved
Telephone / Telex No.	Standards Packing
Telegraphic Address	Tremcard Details/Ref.
	Others
10. DISCLAIMER	

Information contained in this Safety Data Sheet is believed to be reliable but no representation, guarantee or warranties of any kind are made as to its accuracy, suitability for a particular application or results to be obtained from them. It is up to the manufacturer/seller to ensure that the information contained in the Safety Data Sheet is relevant to the product manufactured/handled or sold by him as the case may be. The Government makes no warranties expressed or implied in respect of the adequacy of this document for any particular purpose.

Acronyms and Glossary of terms:

CAS	:	Chemical Abstracts Service Registration Number
UN Number	:	United Nations Number
HAZCHEM Code	:	Emergency Action Code (EAC) allocated by the Joint Committee of Fire Brigade Operations, UK
TDG Flammability	:	Transport of Dangerous Goods : Flammability Classification by United Nations
NFPCA	:	National Fire Prevention and Control Administration, USA

LD_{50} and LC_{50} represent the dose in mg/kg of body weight and the concentration in mg/1 for 4 hours having lethal effect on 50% of the animals (rats) treated.

PEL	:	Permissible Exposure Limit as laid down in the statutes

TLV	:	Threshold Limit Value as laid down by the American Conference of Government Industrial Hygienists (ACGIH), USA
STEL	:	Short Term Exposure Limit as laid down in the statutes or by the ACGIH

Form-I

Registration of Workplace

Application for: Registration ☐ **Re- registration** ☐

Application No: ……. Date: ……..

1. Details of Enterprise/Workplace:
   a. Name of enterprise/workplace:……
   b. Trade license No.: ……
   c. CBD license No.(construction only):……
   d. Nature of business: ……
   e. Date of commencement of business: …….
   f. Location: Dzongkhag……..……Dungkhag……

Gewog……exact location……

2. Contact person

Name :		Designation:	
Telephone/mobile No.:		Fax No.:	
Email:		PO box No.:	

	(Temporary)		(Regular)		Below 15 years	below 18 years
	Male	Female	Male	Female		
Bhutanese						
Foreign						

workers						
Total						

3. Number of employees

4. Technical information

Machinery and equipment or other devices. *example: boiler; pressure vessel; internal combustion engine diesel, gasoline…..etc.*	Material handling equipment and devices: *example: hand trucks, power trucks, conveyors, etc*	Chemicals or substances used
1. 2. 3.	1. 2. 3.	1. 2. 3.

(***Note:*** *Additional sheet may be used if required*)

5. If branch unit, name of parent workplace:
   Location……
6. Current Capital/Total Assets: ……..

FOR RE-REGISTRATION, ACCOMPLISH ALSO:

7. Past Application Number: ……..Date of Application: ……
8. If Changing Name of Workplace, State Former Name……
9. If Changing Location, Give Past Address: ……

I hereby certify that the above information is true and correct.

Owner/Manager

Date:

Official use only

Received and Approved

Director/Director General, DOL

Date:

Form-II

Information regarding closure of unit / establishment / workplace

1.	Name of the unit/Estt./Workplace	:
2.	Address of the Workplace	:
3.	Registration No.	:
4.	Date of closure	:
5.	Probable period of closure	:
6.	Reason of closure	:
7.	Nature of closure	:
8.	Date of re-opening	:
9.	No. of workers on roll of workplace	:
10.	No. of working days in which the the unit remained closed during the month	:
11.	No. of persons likely to be affected/unaffected by the closure.	:
12.	Rate of compensation, if any, paid to remaining employees due to the closure.	:

Dated: Name and signature of employer

Form-III

Establishment of health and safety committee

1. Enterprise _____
   Address _____
   Tel: _____ Fax: _____ e-mail _____
2. Nature of Business _____
3. Number of Employees _____
4. Composition of Health and Safety Committee
   Chairperson: _____
   Members: _____
   _____
   _____
   _____
   _____
   _____
   Secretary: _____

   Establishment Date: _____

I hereby certify that the above particulars are true and correct to the best of my knowledge.

_____

Signature of Employer

_____

Date

Form-IV

Notice of dangerous occurrence which does not result in death or bodily injury

Note : To be completed in legible handwriting or preferably typewritten.

1. Name and address of the Enterprise/Workplace:_____

2. Name of the Employer: _____

3. Name of the Manager: _____

4. Nature of Industry/Enterprise: _____

5. Branch or Department and exact place where

   the dangerous occurrence took place: _____

6. Date and Hour of occurrence: _____

7. Nature of dangerous occurrence: _____

   (State exactly what happened. Use additional sheets)

I certify that, to the best of knowledge and belief the above particulars are correct in every respect.

Signature of the Employer/Manager
Date of dispatch of Report

_____

(This space to be completed by Labour Inspector)

Date of receipt: _____

Date of Investigation: _____

Result of Investigation: _____

_____

Form-V

Register of accidents and dangerous occurrences

Name of injured person (if any)	Date of accident or dangerous occurrence	Date of report (in Form no. IV and VI) to Inspector	Nature of accident or dangerous occurrence	Date of return of injured person to work	No. of days injured person was absent from work

Form-VI

Workplace injury and disease reporting and recording form

Reference number: _____

1. Name of the Enterprise/workplace: _____
2. Nature of Business: _____
3. Contact person: _____
4. Address/ Location: _____

   Tel: _____ Fax: _____

   E-mail _____
5. Types of accident/incidence

   [ ] death [ ] dangerous occurrence [ ] injury [ ] disease

6. Location of Accident: _____
7. Time and Date of accident occurred:_____
8. Kind of Accident:_____
9. How the accident occurred: _____
10. Cause of the accident: _____

11. General classification

Human Loss							**Material Loss**		
Classification		Death	Suspension of Work			Total	Classification	Name, Scale	Nu.
			4<	1-3	0		Building		
Number of suffers in work place	M						Other Structure		
							Machinery		
	F						Raw Material		
							Product		
Other Sufferers							Others		
							Total		

12. Personal details of concerned employees

Name					Nationality	
Sex (M of F)		Age		Position	Service duration	
Occupational Category			Type of Contract			
Condition of Injury / Disease		Bodily Locati-on		Day(s) of absence from work		

13. Preventative measures:_____

_____

14. Detail of person completing this form

Name		**[Note]** 1. *Kind of Accident: Please fill such as, Fall, Falling object, Collapse, Construction machinery, Automobiles, Handling and transportation, Electricity and others. 2. For serial number 9, 10, and 13 use additional sheet **3.** For serial number 12, if more than one employee is involve use additional form.
Position		
Signature		
Date		

Form-VII

Report of examination of pressure vessel

1. Name of Owner of workplace:……..

2. Situation and address of workplace:…….

3. Particulars of vessel:—

    a. Name, description and distinctive number of pressure vessel:

    b. Name and address of manufacturer:

    c. Nature of process in which it is used:

    d. Date of installation:

    e. Thickness of walls:

    f. Date on which the vessel was first taken into use:

    g. Safe working pressure recommended by the manufacturer:

    h. The history should be briefly given, and the examiner should state whether he has seen the last previous report:

4. Date of last hydraulic test (if any) and pressure applied:

5. Is the vessel in open, or otherwise exposed to weather or to damp:

6. What examination and tests were made? (specify pressure if hydraulic test was carried out.)

7. Condition of vessel (State any defects materially affecting the safe working pressure or the safe working of the vessel).

External .....

Internal .....

8. Are the required fittings and appliances provided in accordance with the rules of pressure vessels?

   .....

9. Are all fittings and appliances properly maintained and in good condition?

   .....

10. Repairs (if any) required, and period within which they should be executed and any other condition which the person making the examination thinks it necessary to specify for acquiring safe working

    .....

11. Safe working pressure, calculated from dimensions and from the thickness and other data ascertained by the present examination, due allowance being made for conditions of working if unusual or exceptionally severe (State minimum thickness of walls measure during the examination)

    .....

12. Where repairs affecting the safe working pressure are required, state the working pressure

    a. Before the expiration of the period specified in (13)

    b. After the expiration of such period if the required repairs have not been completed

    c. After the completion of the required repairs

13. Other observations

I certify that on…….. the pressure vessel described above was thoroughly cleaned and (so far as its 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 including its fittings, and that the above is a true report of my examination.

Signature……..

Qualification ……

Address…….

Date:…….

If employed by a Company or Association give name and address

Form-VIII

Report of examination of hoist or lift/installed at a workplace

Address:

1. (a) Type of hoist or lift and Identification number or description.

   (b) Date of construction or re-construction (if ascertainable).

2. Design and construction

   Are all parts of the hoist or lift of good mechanical construction sound material and adequate strength (so as ascertainable).

3. Maintenance

   Are the following parts of the hoist or lift properly maintained and in good working order, if not, state what defects have been found:

   a. Enclosure of hoist way or lift way

   b. Landing gates and cage gate(s)

   c. Interlocks on the landing gates and cage gate(s)

   d. Other gates fastenings

   e. Cage and platform and fittings guides, buffers, interior of the hoist way or lift way

   f. Over-running devices

   g. Suspension ropes or chain and their attachments

   h. Safety gear, i.e. arrangements for preventing fall of platform or cage brakes

   i. Brakes

   j. Worm or super gearing

   k. Other electrical equipment

   l. Other parts

4. What parts (if any were) inaccessible.

5. Repairs, renewals or alternations (if any) required and the period with which they should be executed.

6. Maximum safe working load subject to repairs, renewals or alterations (if any) specified in (5).

7. Others

I/we verify that on ..... I/We thoroughly examined this hoist of life and that above is correct report of the result.

Signature.....

Counter signature.....

If employed by a company or
association give names and address

Qualification .....
Address.....
Date .....

Date.....

Note : Details of any repairs, renewal or alterations required should be given in 5 above.