

PART VII
Appendix A**Guidelines for Maintenance of Electrical Equipment**

- A.1** In case of electrical appliances, manufacturer's instructions for the usage and maintenance of the equipment should be strictly followed.
- A.2** The detailed/working drawings of all the components of electrical installations should always be available with the maintenance unit. Following records should be available.
- (a) Manufacturer's name.
 - (b) Nameplate of the equipment and its salient features such as capacity, rating etc.
 - (c) Manufacturer's recommendations regarding availability/usage of spare parts.
 - (d) Manufacturer's recommendations for periodical maintenance and post fault maintenance.
 - (e) Details of the maintenance operations performed in the past.
- A.3** Care should be taken while selecting replacement parts. The spare parts should be correct and suitable, preferably as recommended by the manufacturer of the installation. During the placement of order for the supply of spare parts, nameplate particulars and serial number should be quoted.
- A.4** The space where the equipment is kept should be clean and properly ventilated. Equipment should not be disturbed needlessly. Before cleaning, the equipment should be made dead. For internal cleaning a section cleaner should be used.
- A.5** Covers and doors should not be left open unnecessarily during maintenance. Afterwards they should be promptly and correctly closed and locked.
- A.6** Before removing the covers and connections, all covers and cable terminations should be marked to ensure correct replacements. Disturbed connections and temporary connections should be marked to facilitate re-connection. Temporary connections and markings should be removed before the installation is put to use.
- A.7** Those connections which have not been disturbed should also be checked for soundness and overheating.
- A.8** All insulations should be regularly checked. Solid insulations should be checked for cracks and other defects. Fibrous and organic insulations should be checked for sign of blistering, delamination and mechanical damage. For insulating oils the interval between tests should be carried out as per the recommendations of the manufacturer and keeping the adverse environmental conditions in mind.

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- A.9** It should be ensured that the earthing connections are sound and all contact screws are tight.
- A.10** During the examination of interlocks it is necessary to take precautions to prevent danger to plant or persons in the event of malfunction or inadvertent operation. A person responsible for checking and maintaining any interlock system should have thorough knowledge of the extent, nature and function of the interlock.
- A.11** If the equipment is ventilated then it should be ensured that the airflow is smooth and not restricted. If filters are provided, they should be cleaned or replaced as necessary.
- A.12** The standby system for tripping and closing supplies should always be kept in good order. Indicators and alarms should be maintained in time with the manufacturer's instructions.
- A.13** Tools, spares and instruments should be stored near to the installation. These should be regularly checked against an inventory.
- A.14** Before the start of maintenance of the circuit switches it should be ensured that all incoming and outgoing main auxiliary circuits are dead and remain so during the maintenance. Overheating of the circuit switches is the root cause for faults. Overheating may be caused by inadequate ventilation, overloading, loose connection, insufficient contact force and malalignment.
- A.15** Some circuit breakers are not intended to be maintained, such as miniature circuit breakers (MCBs). Such items should not be dismantled for maintenance. These should be renewed periodically.
- A.16** For the maintenance of fuses periodical inspection should be done for correct rating, security, overheating and correct location/orientation. Element of renewable fuses should be renewed when the deterioration is apparent. The availability and correct replacement of fuse links should be ensured.
- A.17** If a fuse link of certain rating has failed and is replaced, then all fuse-links of same rating apparently subjected to the fault should be destroyed and replaced by new fuse links.
- A.18** In order to be reasonably sure that circuit breaker is capable of operation when required, these should be tripped and reclosed at regular intervals. Tripping should be proved manually and where possible electrically via the protective relay contacts. The leakage of oil, sign of corrosion, and any unusual smell which may indicate over-heating should be detected through inspections.

- A.19** Timing devices are mostly designed for specialist maintenance. These should not be dismantled for maintenance or overhaul purposes unless specifically recommended by the manufacturers'. Actual timing periods should be verified with set values and application requirements.
- A.20** In case of cable boxes and terminations, security of mounting and earthing should be examined. Exposed tails should be inspected for good conditions of insulation and freedom from moisture.
- A.21** Battery cells should be inspected for shedding of active material, sedimentation and buckling of plates. Level of electrolyte should be regularly checked and the level should be corrected with distilled water.

PART VIII**Chapter 1****Electrical and Electronic Engineering Services for Buildings****1.1 Introduction****1.1.1 Scope**

The provisions of the Code presented in this Chapter, cover the Electrical and Electronic Engineering Services for Buildings to ensure that the related installation work becomes perfect and safe for the persons residing in and around the building. The term safe means safe for the persons and safe for the properties.

Provisions of the Specifications are to set minimum standards for Electrical and Electronic Engineering Installations in various Occupancy categories of buildings, as described in Part 3 of this Code, including annexes and premises. All the systems and equipment intended for the supply of normal power and standby power to all these places are covered by the provisions of this Code.

The provisions of the Code for various Electrical and Electronic Engineering systems and/or installations for the buildings include, but not limited to:

- (a) Lighting and illumination.
- (b) Fans, cooling and heating.
- (c) Normal and standby power supply.
- (d) Supply system and feeder for lifts/escalator/moving walk, including protection.
- (e) Cable television distribution.
- (f) Electronic access control.
- (g) Burglar alarm/CCTV monitoring/security.
- (h) Electrical cables/conductors and equipment.
- (i) Switches, sockets, other accessories.
- (j) Cables and conductors in a building that connect to the supply of electricity.
- (k) Electrical protection system.
- (l) Earthing system of an electrical installation.
- (m) Lightning protection of a building and its electrical installation.
- (n) Fire alarm.
- (o) Multi-media communications, data communications and telecommunications.