CIRCUIT-BREAKERS AND SWITCHES.

32–21. (1) Every switch, switch-fuse, circuit-breaker, and isolating-switch shall be:—

(*a*) So constructed, placed, or protected as to prevent electrical hazard; and

(*b*) So constructed and adjusted as accurately to make and maintain good contact; and

(*c*) Provided with an efficient handle or other means of operating insulated from the system, and so arranged that the hand of the operator cannot inadvertently touch live metal; and

(*d*) So constructed or arranged that it cannot, with proper care, be left in partial contact or accidentally fall or move into contact when left out of contact.

(2) Upon every isolating-switch that is so mounted that the force of gravity, or magnetic forces due to short-circuits, tend to open it, there shall be provided a suitable safety-catch to counteract the effect of such forces.

(3) Every high pressure and extra-high pressure circuit-breaker shall be provided with suitable means by which it can be safely isolated from all live conductors.

32–22. Every switch intended to be used for breaking under-load, and every circuit-breaker, shall be so constructed that an arc cannot accidentally be maintained under normal operating conditions.

32–23. Every circuit-breaker shall be capable of breaking the undermentioned currents without undue arcing and without injury to the operator: In the case of direct current it shall be capable of breaking twice the normal full-load current of the circuit on which it is installed, and in the case of alternating current it shall be capable of rupturing the maximum short-circuit current to which it may be subjected.

32–24. Every enclosed switch and circuit-breaker shall have an external device to indicate clearly whether the switch or circuit-breaker is open or closed.

32–25. All metal handles of high pressure or extra-high pressure switches and circuit-breakers, and (where necessary to prevent electrical hazard) all metal not normally alive, shall be earthed.

32–26. Where practicable, switches shall be so connected that the blades will be dead when the switch is in the "off" position.

CUT-OUTS.

32–31. Every cut-out shall be either of such construction or so protected by a switch that the fuse-link may be readily renewed without electrical hazard.

PART 33.—POWER-HOUSES, SUBSTATIONS, AND TRANSFORMERS.

POWER-HOUSES AND SUBSTATIONS.

33–01. All power-houses and substations shall be so designed and all apparatus therein shall be so secured that they will withstand a horizontal acceleration of one-sixth of the acceleration due to gravity.

33–02. The apparatus of all power-houses and substations shall be so arranged as to be inaccessible to all unauthorized persons.

33–03. Reasonable working-space and means of access shall be provided in respect of all electrical apparatus which has to be operated or attended to by any person in any power-house or substation.

33–04. Every high pressure or extra-high pressure conductor situated within reach of any working-platform or in any switchboard passage-way in any power-house or substation shall be so placed or protected as adequately to prevent electrical hazard.

33–05. Where necessary to prevent electrical hazard, adequate precautions shall be taken, either by earthing or by other suitable means, to ensure that no metal, other than the conductor, shall become electrically charged in any power-house or substation.

33–06. Adequate precautions shall be taken to prevent any conductor or apparatus in any power-house or substation from becoming accidentally or inadvertently electrically charged when any person is working thereon.

33–07. Where necessary in any power-house or substation to prevent electrical hazard, insulating-stands and screens shall be provided and kept permanently available, and shall be maintained in a sound condition.

33–08. (1) Every ladder stored in the vicinity of a pole-substation shall be securely padlocked or otherwise made inaccessible to unauthorized persons.

(2) Every ladder fixed to a pole-substation shall either be of the shut-up type, and kept securely closed and padlocked when not in use, or of such a type that it cannot be used by any unauthorized person.

33–09. (1) Where platform type of construction is used for a pole-substation and space sufficient for any person to stand on the platform is provided, a substantial handrail shall be built around the platform.

(2) If the handrail is of metal it shall not be connected with earth.

(3) Earthed metal—*e.g.*, pipes containing cables—shall not be attached to metal handrails, and when attached to handrails other than metal shall be so placed or protected that any person on the platform cannot accidentally be in contact with live metal and such earthed metal at the same time.

(4) Handrails shall be fitted at a height not less than 3 ft. or more than 4 ft. above the platform.

(5) Metal screens fitted to handrails shall not be connected with earth.

33–10. Fire-buckets filled with clean dry sand and ready for immediate use in extinguishing fires, or suitable fire-extinguishers filled with a non-conducting fluid, shall be kept in all power-houses and substations, other than pole-substations, in a convenient situation adjacent to the electrical apparatus and shall be conspicuously marked.

33–11. (1) The licensee if a vendor of electrical energy shall install suitable meters for recording the electrical energy generated, or purchased in bulk (as the case may be), by the licensee, and for recording the half-hourly maximum demand:

Provided that it shall be sufficient compliance with this clause if such meters as are hereby prescribed are installed by the authority or person from whom the electrical energy is purchased by the licensee.

(2) The units generated and/or purchased shall be recorded in a book or similar register on the last day of each calendar month, and the maximum demand shall be recorded on a chart, or on the last day of every quarter in a book or similar register, and the maximum demand instrument shall be reset on such day. Such chart, book, or register (as the case may be) shall be available for inspection at all reasonable times by any person authorized in that behalf by the Minister, and shall be retained by the licensee for such inspection for a period of two years after the date of the last entry therein.

TRANSFORMERS.

33–21. (1) Every transformer exposed to the weather shall be fitted with a weatherproof case, and when fixed to a pole shall be either thoroughly protected against interference or attached to the pole at such a height as to make it inaccessible except by means of a ladder or other special appliance.

(2) No pole-step shall be placed at a less height than 9 ft. above the ground-level.

33–22. Every transformer placed within a building or enclosure shall be inaccessible to unauthorized persons, and all high pressure or extra-high pressure conductors in such buildings or enclosures shall be screened and protected so that no person can make accidental contact therewith.

33–23. Every transformer (or bank of transformers), other than a step-up transformer directly connected to a generator, shall be protected on the primary side by cut-outs, overload circuit-breakers, or other approved protection located within 4 chains thereof.

33–24. The cases of all transformers shall be earthed by a copper conductor in accordance with Regulations 31–31, 31–32, 31–33, 31–37, and 31–38 hereof.

33–25. All transformers erected on poles shall be securely bolted thereto.

CONDENSERS.

33–31. Means shall be provided for the immediate automatic discharge of every static condenser on disconnection of the supply.

PART 34.—PROTECTIVE APPARATUS AND SAFEGUARDS.

LIGHTNING-ARRESTERS.

34–01. Where an electric line is erected in a locality in which lightning is to be apprehended efficient protection shall be provided.

FEEDER AND DISTRIBUTION PROTECTION.

34–11. (1) Except as provided in Regulations 34–12 and 34–14 hereof, each outgoing feeder or distributor from any power-house or substation shall be protected by cut-outs, or an automatic circuit-breaker equipped with overload inverse time-limit, or other approved tripping-device.

(2) Such cut-out or circuit-breaker shall be located in each conductor, except a conductor which is in contact with earth, and in the case of three-phase circuits one overload inverse time-limit trip-coil may be replaced by an earth-leakage trip-coil.

34–12. In transformer substations not exceeding 100 kilovolt-ampere capacity only the high pressure or primary side of the transformers need be protected by cut-outs or circuit-breakers, and special precautions shall be taken in the adjustment of these to the capacity of the transformers.