STATUTORY INSTRUMENTS.

2003 No. 22.

THE ELECTRICITY (SAFETY CODE) REGULATIONS, 2003.

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ARRANGEMENT OF REGULATIONS.

PART I—PRELIMINARY.

Regulation.

1. Citation.
2. Application.
3. Interpretation.

PART II—GENERAL PROVISIONS.

4. Information and instruction.
5. Variation.
6. Special procedures.
7. Objections.
8. Accidents and dangerous occurences.
9. Duties.
10. Safety equipment and protective clothing.
11. Electric shock.

PART III—GENERAL SAFETY PRECAUTIONS.

12. Access to and work in operational premises.
13. Vessels containing flammable substance.
14. Work in fire protected areas.
15. Work on poles, towers and high structures.
16. Access to high voltage apparatus and conductors.

Regulation.

17. High voltage switching.
18. Records.
19. Failure of supply.
20. Voltage testing devices.

PART IV—SAFETY PRECAUTIONS FOR WORK ON OR NEAR HIGH VOLTAGE SYSTEMS.

21. General requirements.
22. Isolation of apparatus and conductors.
23. Earthing.
24. Approach to exposed live high voltage conductors or insulators supporting them.
25. Work in substations and switching stations containing exposed live high voltage conductors.
26. Permit-to-work.
27. Sanction-for-test.

28. Procedure for temporary withdrawal of suspension.
29. Limitation-of-access.

PART V—SAFETY PRECAUTIONS AND PROCEDURES APPLICABLE TO LOW VOTAGE SYSTEMS.

30. General.
31. Requirements for work on dead low voltage apparatus and conductors.
32. Precautions for work on dead low voltage cables.
33. Precautions for work on dead low voltage overhead lines.
34. Work on live low voltage apparatus and conductors.
35. Precautions for work on live low voltage cables.
36. Precautions for work on live low voltage overhead lines.
37. Application of high voltage rules to work on low voltage apparatus and conductors.
38. Testing and adjustment of low voltage apparatus.
39. General penalty.

STATUTORY INSTRUMENTS.

2003 No. 22.

The Electricity (Safety Code) Regulations, 2003.

(Under section 120 of the Electricity Act, 1999)

IN EXERCISE of the powers conferred upon the Electricity Regulatory Authority by section 120 of the Electricity Act, 1999 these Regulations are made this 11th day of April, 2003.

PART I—PRELIMINARY.

1. Citation

These Regulations may be cited as the Electricity (Safety Code) Regulations, 2003.

2. Application

(1) These Regulations apply to electrical systems, and to associated plant and apparatus under their ownership or control.

(2) Rules, documents or procedures issued by other authorities may apply in accordance with management instructions, but where no such rules documents or procedures have been issued or if there is any conflict between such rules documents or procedures with these Regulations, these Regulations shall prevail.

3. Interpretation

In these Regulations, unless the context otherwise requires—

"Act" means the Electricity Act, 1999;

"additional earth" means earthing equipment of an approved type, applied after the issue of a safety document;

"apparatus" means any item of electrical machinery or equipment in which conductors are used or supported or of which they form part;

"approved" means sanctioned by the Authority to satisfy in a specified manner, the requirements of these Regulations;

"Authority" means the Electricity Regulatory Authority, established under section 5 of the Act;

"authorised person" means a person appointed by the licensee in writing to carry out specified operational duties, including the issue and cancellation of all types of safety documents;

"caution notice" means a notice in approved form conveying a warning against interference, with such additional approved words as may be required;

“circuit main earth” means earthing equipment of an approved type, applied before the issue of, and at a position recorded in a safety document;

“conductor” means an electric wire, cable or other metallic object, arranged to be electrically connected to a system;

“competent person” means a person appointed by a licensee in writing as having sufficient technical knowledge or experience to enable him or her avoid danger and who may be nominated to receive and clear specified safety documents;

“control operator” means an operator mandated to operate computer controlled equipment;

“currency point” means the value of one currency point specified in the First Schedule;

“danger” means a risk to health, life or bodily injury;

“danger notice” refers to a notice in approved form, reading “Danger” with such additional approved words as may be applicable;

“dead” means disconnected from a live system;

“designated engineer” means an engineer appointed by a licensee to be responsible for the application of these Regulations;

“earth” means the conductive mass of the earth, whose electric potential at any point is conventionally taken as zero;

“earthed” means connected to earth through switch gear, with an adequately rated earthing capacity or by approved earthing leads;

“high voltage” means voltage exceeding 1000v AC;

“high voltage live line work” means work in an approved manner on the conductors or apparatus of a high voltage overhead line, with the conductors live;

“immediate supervision” means supervision by a person, having adequate technical knowledge, experience and competence, who is continuously available at the location where work or testing is in progress and attends the work area as is necessary for the safe performance of the work or testing;

“isolated” means disconnected from an associated plant, apparatus or conductor by an isolating device in the isolating position or by adequate physical separation with sufficient gap;

“isolating device” means a device for rendering plant and apparatus isolated;

“key-safe” means an approved type of device used for the secure retention of keys;

“limitation of access” means a safety document that defines the limits and nature of work that may be carried out when verbal instructions are not considered sufficient for that purpose, and where a permit-to-work or sanction-for-test is not applicable;

“live” means electrically charged;

“low voltage” means voltage not exceeding 1000v AC;

“permit to work” means a safety document specifying the high voltage apparatus made safe to work on and the work that is to be carried out;

“personal supervision” means supervision by a person having adequate technical knowledge, experience or competence such that he or she is always in the presence of the person being supervised while the work or testing is being carried out;

“plant” means a mechanical plant including all machinery and equipment not elsewhere defined as apparatus;

“safety distance” means the distance from the nearest high voltage exposed conductor not earthed, or from an insulator, supporting a high voltage conductor which must be maintained to avoid danger;

“safety document” means a limitation of access, permit-to-work or sanction-for-test;

“safety lock” means a device such as a padlock used exclusively for approved purposes, like locking off the points at which the circuit can be energised, and different from all other standard locks used in systems;

“sanction-for-test” means a safety document specifying the high voltage apparatus made safe for testing, and the conditions under which the testing is to be carried out;

“senior competent person” means a competent person appointed in writing by a licensee, to carry out specific operational duties that may include authority to issue and cancel limitations-of-access or to receive sanctions-for-test;

“switching” means the operation of circuit breakers, isolators, disconnectors, fuses or other methods of making or breaking an electrical circuit or the application and removal of circuit main earths;

“system” means an electrical system in which conductors and apparatus are electrically connected to a common source of supply;

"system control engineer" means—

(a) for the centrally controlled system, the Control Engineer at the National Control Centre; and

(b) for a locally controlled system, the engineer specifically mandated to exercise the function and control of such a system;

"working and access clearance" means the distance to be maintained from the nearest live exposed high voltage conductor, to ensure observance of the safety distance in work on systems;

"working party" means persons under the immediate supervision of a competent or senior competent person (who shall himself or herself be a member of the working party) or a competent or senior competent person when working alone.

PART II—GENERAL PROVISIONS.

4. Information and instruction

(1) Each licensee shall sufficiently inform and instruct its employees about the system, plant or apparatus affected by a particular operation or work, and the rules, procedures or documents which apply to such licensee's operations.

(2) A licensee shall in addition to sub-regulation (1), furnish information to .other persons not being its employees who are likely to be exposed to danger by the operations or work of such licensee, to such an extent as may in the licensee's opinion be reasonably practicable.

5. Variation

The Authority may in exceptional or special circumstances vary these Regulations and issue additional guidelines to such an extent as may, in the opinion of the Authority be necessary to achieve the objectives of these Regulations.

6. Special procedures

A licensee shall ensure that work on or testing of apparatus, conductors or plant to which these Regulations are, for special reasons not applicable, shall be carried out according to a special procedure, which shall adhere to the safety requirements prescribed under these Regulations.

7. Objections

(1) A person who receives instructions regarding the operation of or work upon a licensee's systems and associated plant and apparatus shall, if he or she has an objection on safety grounds against the carrying out of such instructions, lodge such objection with the person issuing the instructions.

(2) Where an objection has been raised under sub-regulation (1), the licensee or other concerned entity shall cause investigations to be conducted into the merits of the objection and if necessary refer the matter to a higher authority for a decision before proceeding with such operation or work.

8. Accidents and dangerous occurences

(1) Every electrical accident and dangerous occurrence involving a licensee's high voltage system shall be reported immediately to the Control Engineer.

(2) Each accident and dangerous accurence involving a low voltage system or associated plant or apparatus shall be reported immediately to the appropriate designated officer.

9. Duties

(1) A person engaged in the operations or work upon electrical systems and associated plant and apparatus shall comply with these Regulations and other related documents and legal procedures relevant to his or her duties.

(2) A person shall not neglect his or her duties on ground that he or she is ignorant of the relevant legal requirements and procedures.

(3) A person who has any doubts as to any of these duties shall report the matter to a higher authority for advice before proceeding with the work.

10. Safety equipment and protective clothing

(1) Every licensee shall obtain and issue to its employees safety equipment and protective clothing approved by the Authority.

(2) Each employee working under circumstances requiring safety precautions shall wear appropriate protective clothing and foot wear or such other protective clothing as may be necessary, having regard to the work such employee may be involved in.

11. Electric shock

Every licensee shall train each person involved with the operation of or work upon the licensee's system and associated plant and apparatus, in the treatment of electric shock.

PART III—GENERAL SAFETY PRECAUTIONS.

12. Access to and work in operational premises

(1) A person shall not without authority, enter or have access to any operational premises like a control room, substation, switching station or underground chamber belonging to or under the control of a licensee.

(2) A barrier, door or gate restricting access to an underground chamber or other confined space, substation or tunnel shall be kept locked and the control of the keys shall be in accordance with approved procedure.

(3) A person shall not enter or work in any indoor substation or confined space such as an underground chamber, tunnel, vessel, tank, pit, culvert or pipeline without the consent of a senior competent person.

(4) Where it becomes necessary for a person to enter and work in any of the places specified under sub-regulation (3), adequate precautions shall be taken against danger arising from toxic and flammable or abnormal temperature.

(5) Safety precautions under sub-regulations (4) include but are not limited to—

(a) use of approved natural or forced ventilation or air conditioning;

(b) wearing approved breathing apparatus;

(c) testing the atmosphere using approved specialised equipment;

(d) prohibition of smoking and use of exposed flame; and

(e) posting a person outside such place to keep in constant touch with the person engaged in the work with appropriate rescue equipment, ready and capable of assisting in an emergency.

(6) A person using the apparatus under paragraph *(b)* of sub-regulation (5) shall be specially trained in its use.

(7) Before a person enters an area under this regulation, he or she shall be issued with a limitation-of-access, and the arrangements for access and work and the precautions to be taken shall be in accordance with approved procedures.

13. Vessels containing flammable substance

(1) A person shall not smoke or expose a flame near an open vessel containing or which has a contained oil or any other flammable substance unless such a person has taken the safety precautions specified in regulation 14.

(2) A person shall not engage in work involving application of heat on a vessel under sub-regulation (1) unless such person has taken all practical precautions to prevent a fire or explosion. The prevention of fire or explosion shall be by removal of the flammable substance and any fumes or by rendering them non explosive and non flammable.

(3) A person shall not enter a vessel that has recently been emptied of oil or other flammable or toxic substance unless a senior competent person is satisfied that all dangerous vapours have been expelled, and a limitation-of-access has been issued.

14. Work in fire protected areas

(1) Unless alternative approved safety procedures apply because of special circumstances, before access or work is carried out in an enclosure protected by automatic fire extinguishing equipment—

(a) the automatic control shall be rendered in-operative and the equipment left on manual control, and a caution notice attached;

(b) the precautions taken to render the automatic control in-operative and the conditions under which it may be restored shall be noted on a

safety document or written instruction issued for such access or work or other activity; and

(c) the automatic control shall be restored immediately after the persons engaged in the work have withdrawn from the enclosure.

(2) Only approved portable fire extinguishers shall be made available and shall be the only extinguishers to be used near live apparatus and conductors.

(3) In the handling of fire extinguishers, the safety distances specified in regulation 24 shall be maintained.

(4) After the discharge of a portable fire extinguisher in an enclosed space, personnel shall leave the space until the precautions specified in regulation 13(3) have been taken.

(5) After an explosion, fire or discharge of a fire extinguisher in an enclosed space, the space shall be adequately ventilated before any personnel enter it.

15. Work on poles, towers and high structures

(1) A person shall not climb any pole unless such a pole has been tested in an approved manner.

(2) A person shall not climb a pole which is impaired by decay or damage or whose stability is in doubt until such pole has been supported by approved means.

(3) Where a pole is supported as provided under sub-regulation (2), such pole shall be climbed by one person at a time or access to its top may be by other approved means independent of the pole.

(4) A person gaining access to work on a tower, pole or other high structure shall use safety belts, harnesses or other safety equipment of an approved type.

(5) A person working on a tower, pole or other high structure shall be in visual range of another person who shall be fully conversant with approved rescue procedures.

(6) Every gate or device to prevent climbing of towers and gantries supporting high voltage conductors shall always be kept secured in an approved manner, and access shall be controlled by a senior competent person or a competent person in receipt of an appropriate safety document.

16. Access to high voltage apparatus and conductors

(1) Guards to an access ladder, barrier, door or gate on or in an outdoor compound preventing access to a live high voltage conductor shall be kept secured in an approved manner, and access to them shall be according to approved procedure.

(2) Any barrier, door or gate preventing access to a totally enclosed chamber, cubicle or cell containing live high voltage conductors shall be kept locked and the keys shall be accessible only to a senior competent person.

(3) Any spout shutter not required for immediate work or operation shall, if the spout is not otherwise made inaccessible, be locked and the key accessible only to a senior competent person.

17. High voltage switching

(1) High voltage switching shall not be carried out by any person other than an authorised person, a senior competent person or by remote control directed by a control engineer.

(2) Notwithstanding sub-regulation (1), a competent person may for the purpose of training and acting under the personal supervision of an authorised person or senior competent person, carry out high voltage switching.

(3) Except in cases of emergency, high voltage switching shall not be carried out without the authority of the appropriate control engineer.

(4) When a control engineer gives authority for high voltage switching to be carried out, he or she shall communicate directly with the person intending to carry out the switching, and where for special reasons direct communication is not possible, an approved procedure shall be followed.

(5) Before any high voltage switching is carried out on any system that may affect another system, the control engineer authorising the switching shall communicate with the control engineer of the other system and the switching shall be agreed between them and recorded in the respective control books of all control engineers concerned.

(6) Where high voltage switching is to be carried out for issuing a safety document and there are two or more control functions involved, in the absence of a standing agreement for such matter, the control engineers concerned shall agree on the person to be in control of the part of the system in the isolated state and to be responsible for giving consent to the issuing of a safety document, and such agreement between the control engineers shall be recorded in the respective control log books by each control engineer.

(7) Where there are special requirements to be complied with before, during or after high voltage switching operations, approved procedures shall apply and special provisions shall be made to ensure that the control engineers, the operators and others affected are aware of their responsibilities.

(8) High voltage switching with the control engineer’s authority shall be carried out without undue delay and all such switching or switching in emergency, shall be reported to the control engineer as soon as possible. For emergency switching, the circumstances demanding such switching shall be reported at the same time.

(9) If a switchgear shows any sign of distress, the operator shall report its condition to the control engineer who shall in turn report to a higher authority in order to have it examined before taking a decision about further operation.

(10) An operator shall, while operating a switching gear mounted on a pole or other structure from ground level where necessary, wear rubber gloves or use other approved equipment.

(11) A person shall not undertake switching or work on high voltage equipment by signal or prearranged understanding after an agreed interval of time.

18. Records

(1) Every message by telephone or otherwise relating to the operation of a high voltage system shall be recorded down and shall be repeated to the sender to ensure that it has been accurately received.

(2) A control engineer shall ensure that a record is made of the time and particulars of all high voltage switching including that carried out by the control engineer by remote control.

19. Failure of supply

(1) A failure of supply to or from any part of a high voltage system from whatever cause, shall be immediately reported to the control engineer.

(2) During a failure of supply, all apparatus and conductors are regarded as live unless they are isolated and proved dead by approved means.

20. Voltage testing devices

(1) Voltage testing devices shall be of an approved type and shall be used in accordance with approved procedures.

(2) Voltage testing devices shall be tested in an approved manner immediately before and after use, and where this is not practically possible, in accordance with other approved procedures.

PART IV—SAFETY PECAUTIONS FOR WORK ON OR NEAR HIGH VOLTAGE SYSTEMS.

21. General requirements

(1) Subject to the exceptions specified in this regulation and those expressly allowed by individual rules, a person shall not undertake any repair, maintainance, cleaning, alteration or such work, on or within the safety distance of an exposed conductor, part of a high voltage system distance of an exposed conductor or part of a high voltage system unless such parts of the system are—

(a) dead;

(b) isolated and all practicable steps taken up to lock off from all points of supply, including voltage and auxiliary transformers, common earthing equipment and other sources from which the apparatus and conductors may become live with caution notices fixed at all points of isolation;

(c) earthed by approved means at all points of disconnection of high voltage supply from the system or between such points and the point of work;

(d) screened where necessary to prevent danger, and danger notices are attached to apparatus containing live conductors and attached near other live conductors;

(e) identified at the point of work by approved means;

(f) released for work by the issue of an appropriate safety document that shall not be issued unless such person is fully conversant with the precise parts of the systems, apparatus and conductors to be worked upon, the nature and extent of the work to be done and the safety precautions to be taken.

(2) It is the duty of the person issuing the appropriate safety documents to ensure compliance with the provisions of sub-regulation (1).

(3) Notwithstand the provisions of sub-regulation (1)—

(a) work such as cleaning and painting of earthed metal enclosures, connections or disconnections of circuits to or from live high voltage systems, live line testing and live insulator washing may be carried out but only according to approved procedures;

(b) as a safeguard for personnel carrying out cleaning and painting works on substations, the system diagram in the appropriate local office shall be marked to show the work locations;

(c) high voltage live line work on high voltage overhead lines may be carried out but only according to approved procedures;

(d) where the design of apparatus does not allow strict compliance with all the requirements in that sub-regulation and if an operational procedure for carrying out the work does not exist, the work shall be carried out in accordance with special instructions issued by an authorised person, to ensure that safety is achieved, and shall be carried out under the personal supervision of the authorised person, with the control engineer kept informed of the circumstances.

22. Isolation of apparatus and conductors

(1) Isolation or reconnection of high voltage apparatus or conductors shall not be initiated except with the sanction of the control engineer.

(2) Safety locks shall be used to lock all switch gear at points where the circuit on which work is to be carried out is likely to be energised and the keys for such locks shall be kept in a key safe, if provided, or in some other safe place in the possession of an authorised person.

(3) Safety locks shall be fitted to the switch gear at all points of isolation immediately following the sectionalisation of defective apparatus.

(4) Details of the isolation referred to in sub-regulation (1) and the deposit of safety lock keys associated with the isolation shall be recorded by the Control Centre.

(5) Where the circuit on which work is to be carried out is controlled only by fuses or links, the fuses or links (and carriers) shall be removed and kept in a safe place preferably in the possession of the person responsible for issuing the safety documents, or where such removals are not practicable approved procedures to ensure safety shall be followed.

(6) When the mechanical isolation of a voltage transformer involves physical difficulty in withdrawal to achieve total high voltage isolation, the withdrawal of the voltage transformer secondary fuses or links may be accepted as isolation, and fuses or links so withdrawn shall be kept in a safe place in the possession of the person responsible for issuing the safety document, and caution notices shall be fixed at all points of isolation.

23. Earthing

(1) Where high voltage apparatus or conductors are to be discharged and earthed in accordance with regulation 21(1), it shall be done—

(a) when reasonably practicable, by using a circuit breaker or earthing switch provided for the purpose of making the earthing connection, and where a circuit breaker is used the trip feature shall be rendered inoperative before closing unless this is not practicable when it shall be done afterwards. After closing, the circuit breaker or earthing switch shall be locked in the earthed position, so that it remains inoperative while it is the circuit main earth;

(b) where a circuit beaker is used to make the earth connection, the operation of closing to earth shall be carried out locally and SCADA shall not be used for this purpose;

(c) where paragraph *(a)* is not reasonably practicable or not applicable, the high voltage apparatus and conductors shall be checked by means of an approved testing device to verify that they are not live, and may then be discharged and earthed by an earthing lead applied by means of an approved earthing appliance;

(d) where work is carried out on an overhead system to which a consumer remains connected, a circuit main earth shall be provided and maintained between that consumer and the point of work;

(e) due to the possibility of low voltage and high voltage inversions like from customers generation, care shall be taken when using earthing lead following a test with the indicator, to verify that the circuit is not live, and one conductor shall be earthed and subsequent tests carried

out to verify that the retaining conductors are not live before applying an earth to them.

(2) Earthing leads and associated clamps shall be of an approved type and of adequate capacity for the duty at the point of application, and shall be adequately maintained and always examined immediately before use.

(3) Subject to sub-regulation (1), the general procedure to be followed when using earthing leads shall be as follows—

(a) the circuit shall be verified that it is not live and where practicable, checked by means of an approved voltage testing device or other approved means;

(b) the circuit shall be verified that it is not live and, where practicable, checked by means of an approved earthing pole or other approved appliance and care shall be taken to ensure that good contact is made and that earthing leads are clearly visible;

(c) earthing leads shall be connected to earth before being connected to the phase conductors. They shall only be connected to the phases by means of an approved earthing pole or other approved appliance. Care shall be taken to ensure that good contact is made and that earthing leads are clearly visible;

(d) all phases shall be earthed, even if work is to be carried out only on one phase;

(e) earthing leads shall not be applied in any cell or compartment in which there is any exposed metal live at high voltage that may be a source of danger, and shall be applied so that they remain clearly visible as far as it is reasonably practicable;

(f) when earthing leads are being removed, each shall be disconnected from its phase conductor by means of an approved eathing appliance before it is removed from its earth connection;

(g) for earthing on spout contacts of metal-enclosed switch gear, only approved appliances shall be used and a person shall not insert a hand or tool into contact with spouts for this purpose.

(4) A person shall not operate a high voltage earthing switch or circuit main earth connected or disconnected, except with the consent of the Control Engineer or under the terms of a sanction-for-test or by an authorised person or by a senior competent person acting under the personal supervision of an authorised person.

(5) Each operation of circuit main earths shall be reported to the Control Engineer as soon as possible after completion and when operating to an HV switching schedule, the application or removal of circuit main earths shall be reported to the control engineer at the appropriate control break.

(6) The location of each circuit main earth shall be recorded on the safety document.

(7) Additional earths applied after the issue of a permit-to-work or sanction-for-test may be attached or removed by a senior competent person.

24. Approach to exposed live high voltage conductors or insulators supporting them

(1) The safety distances designated in the Second Schedule shall be maintained at the respective system voltages between any part of a person or object and the nearest exposed live high voltage conductor.

(2) A distance of 300mm shall be maintained at all system voltages, from the portion of insulators supporting live high voltage conductors which is outside the appropriate safety distance from the conductors.

(3) Subject to the provisions of sub-regulation (4), a person shall not allow any part of his or her body or any other object not provided for within the approved procedures to approach exposed high voltage conductors or insulators supporting such conductors within the safety distances specified in sub-regulation (2), unless the conductors have been made safe for work and a safety document issued as required by sub-regulation (1) of regulation 21. Unless it is unavoidable, such person's hands shall be kept below shoulder height when in the vicinity of exposed live high voltage conductors.

(4) When a person is applying an approved voltage testing device to high voltage conductors contained within the open spouts of metal enclosed switch gear, it is allowable for those parts of the body of such person required to do the task to approach within the safety distances specified in sub-regulation (2), subject to approved procedures.

(5) Where exposed high voltage conductors are not isolated, the only objects that shall be caused to approach them or insulators supporting them, within the safety distances specified in sub-regulation (2) shall be insulated devices approved for high voltage live line work or approved voltage testing devices.

(6) Where exposed conductors are isolated but not proved dead, the only objects that shall be caused to approach them or insulators supporting them within the safety distances specified in sub-regulation (2) shall be insulated devices approved for high voltage live line work or approved voltage testing devices.

(7) Where exposed 132KV conductors in a high voltage substation compound have been isolated, a circuit main earth may be applied to the apparatus following a visual examination to confirm that adequate isolation has been achieved.

(8) Taking account of the nature and location of the work and the hazards and the presence of persons, an authorised person or the person in charge of the work, shall establish working and access clearances such as to ensure that the safety

distances specified in sub-regulation (2) are maintained both in respect of those persons present and the objects being handled.

(9) Recommended working and access clearances for the guidance of authorised persons are specified in the Third, Fourth and Fifth Schedules.

(10) Where work is to be carried out within a one metre distance of the safety distance specified in sub-regulation (2), the supervisor shall ascertain if any of the following additional precautions have been taken before work commences-

(a) danger notices or red pennants are attached to the pole or structure at a distance not less than is specified in that sub-regulation; or

(b) a limitation-of-access has been issued defining the work to be carried out in the vicinity of live conductors and detailing any specified potential hazards to be avoided.

(11) Danger notices or red pennants shall be attached by a senior competent person or engineer or by a competent person acting under personal supervision of an authorised person or senior competent person.

25. Work in substations and switching stations containing exposed live high voltage conductors

(1) The following provisions apply to a zone of work—

(a) when work is to be carried out in a substation, or switching station in which there are exposed live high voltage conductors, the zone of work shall be properly identified by an authorised person, and shall be defined as far as possible by the use of approved barriers roping, yellow demarcation ribbons or by other approved means and shall be so arranged that the specified working and access clearances, from the nearest exposed live conductor or supporting insulator to ground level or platform or access way which may be repaired to be used, are established;

(b) the zone of work to be defined at ground level shall be only that in which the work is to be carried out;

(c) if the work cannot be carried out without leaving the ground level or a platform or access way, the working and access clearances shall be obtained from the nearest exposed live high voltage conductor to the points from which work is actually carried out, and in such cases access shall only be by means of an approved ladder or other approved means;

(d) a person shall not climb any structure to gain access. In the case of terminal poles in substations, access shall be in accordance with approved procedures;

(e) if the work is such that the specified working and access clearances are not sufficient to avoid danger, other suitable arrangements shall be made; and

(f) the approved barriers or roping shall be clearly visible, so far as it is reasonably practicable, and shall not be supported by any structure carrying electrical apparatus or conductor and shall not carry any notice; and at ground level the section so defined shall be clearly distinguished by green flags by day or, if not otherwise satisfactorily illuminated, by green lights at night, fixed on separate supports and suitably spaced within the safe boundary. Danger notices shall be attached to adjoining apparatus containing live conductors or adjacent conductor supports at the limits of the zone of work.

(2) Where necessary to prevent danger, the means of access to and from the zone of work shall be defined in an approved manner.

(3) The working and access clearance required at the zone of work under sub-regulation (1) shall be as specified in sub-regulation (8) of regulation 24.

(4) The following provisions apply to the use of portable ladders and long objects where there are exposed live conductors—

(a) the type of portable ladders shall be approved and shall be of no greater length than is required for the work involved;

(b) portable ladders and other long objects shall not be used without the permission of an authorised person, who shall define the conditions of use to the senior competent person in charge of the work, the movement and erection of such ladders and objects shall then be carried out only under the personal supervision of the senior competent person in charge of the work, and when moved at ground level shall be carried only in a horizontal position and as near the ground as reasonably practicable;

(c) portable ladders provided for giving access to fixed ladders which terminate above ground level, and to provide access in other approved cases, shall be padlocked in position or otherwise secured by a senior competent person while work is being carried out; and

(d) all portable ladders within substations, or switching stations shall be securely locked to a suitable anchorage when not in use.

(5) The following provisions apply to the use of cranes, scaffolds and other equipment—

(a) when cranes, scaffolds or other equipment and materials transported by vehicles or otherwise are taken into or out of a substation, the route to be followed shall be agreed by an authorised person, and the cranes

scaffolds or other equipment shall be connected to the substation earthing system as soon as reasonably practicable;

(b) the limits of operation of such equipment shall be defined by an authorised person to a senior competent person who shall be in charge of the work and thereafter the equipment shall be erected or moved only within such limits under the personal supervision of the senior competent person.

(6) Danger notices, barriers and screens shall be fixed or moved only by, or under the personal supervision of an authorised person.

(7) In the event of a lightning storm, work on exposed conductors in outdoor substations or outdoor switching stations, or on apparatus directly connected to exposed conductors shall cease immediately where necessary, to prevent danger, and the control engineer shall be informed.

26. **Permit-to-work**

(1) A permit-to-work shall be issued by an authorised person before any work is carried out on any apparatus or conductor.

(2) A permit-to-work shall only be issued with the knowledge of the Control Engineer, who shall maintain a record of the issue and cancellation of each permit-to-work.

(3) When working to a high voltage switching schedule, the issue and cancellation of a permit-to-work shall be recorded by the control engineer as soon after its issue as is practicable.

(4) Where more than one working party is involved in work on apparatus or conductors associated with the same circuit a main earths, the authorised person in charge of the high voltage switching schedule shall record the issue of all safety documents on his or her copy of the high voltage switching schedule or danger envelope.

(5) If after agreement with the control engineer, it is found necessary to move any point of isolation located between the zone of work and a live high voltage system, every outstanding permit-to-work shall be cancelled and new ones issued for any subsequent work on the apparatus.

(6) A permit-to-work shall be explained and issued to the person in direct charge of the work, who after reading its contents and confirming that he or she understands it and is conversant with the nature and extent of the work to be done, shall sign its receipt and its duplicate.

(7) The recipient of a permit-to-work shall be a competent person who shall retain the permit-to-work in his or her possession or all times while work is being carried out.

(8) Where more than one working parties is involved, a permit-to-work shall be issued to the competent persons in direct charge of each working party and they may, where necessary be cross-referenced with each other.

(9) A permit-to-work shall be cleared and cancelled—

(a) when work on the apparatus or conductor for which it was issued has been completed;

(b) where it is necessary to issue a sanction-for-test in which case all permits-to-work that are associated with the apparatus and conductors to be tested shall be cancelled;

(c) where it is necessary to change the person in charge of the work detailed on the permit-to-work; or

(d) at the discretion of an authorised person, when it is necessary to interrupt or suspend the work detailed on the permit-to-work.

(10) The recipient shall sign the clearance and return the permit-to-work to an authorised person who shall cancel it and inform the control engineer, and in all cases the recipient shall indicate in the clearance section whether the work is complete or not and all gear and tools have been removed or not.

(11) Where more than one permit-to-work has been issued for work on high voltage apparatus or conductors associated with the same circuit main earths, the Control Engineer shall ensure that all such permits-to-work have been cancelled before the circuit main earths are removed.

(12) Where there is a requirement for a permit-to-work to be temporarily withdrawn or suspended, such withdrawal or suspension shall be in accordance with an approved procedure.

27. Sanction-for-test

(1) A sanction-for-test shall be issued by the authorised person initiating the testing under these Regulations, before any testing is carried out on any apparatus or conductor.

(2) Apparatus shall be connected to earth in accordance with regulation 21(1)*(c)* prior to the issue of a sanction-for-test.

(3) A sanction-for-test shall only be issued with the knowledge of the Control Engineer, who shall maintain a record of the issue of each sanction-for-test or its cancellation.

(4) When working on a high voltage switching schedule, the issue or cancellation of a sanction-for-test shall be recorded by the control engineer as soon after its issue or cancellation as is practicable.

(5) A sanction-for-test shall be explained and issued to a person in direct charge of the testing, who after reading its contents and confirming that he or she understands it and is conversant with the nature and extent of the testing to be done, shall sign its receipt and its duplicate.

(6) The recipient of a sanction-for-test shall be a senior compentent person who shall retain the sanction-or-test in his or her possession at all times whilst tests are being done.

(7) When testing on apparatus for which a sanction-for-test has been issued is suspended or completed, the recipient shall sign the clearance and return the sanction-for-test to an authorised person who shall cancel it and inform the Control Engineer.

28. P**rocedure for temporary withdrawal of suspension**

Where there is a requirement for a sanction-for-test to be temporarily withdrawn or suspended, such withdrawal or suspension shall be in accordance with an approved procedure.

29. Limitation-of-access

(1) A limitation-of-access shall be issued by an authorised person or a senior competent person specially authorised to do so, when it is considered necessary to have written instructions to avoid danger and when a permit-to-work or a sanction-for-test is not applicable.

(2) Where a limitation of access is required for work above ground level in a 132kV compound, it shall only be issued by an authorised person with the knowledge of the Control Engineer.

(3) A person issuing a limitation-of-access shall determine from the nature of the work, occasions when the Control Engineer shall record its issue and cancellation.

(4) A limitation-of-access shall when there is danger, be issued for the following types of activity—

(a) work in proximity to, but outside the working and access clearance from exposed live high voltage conductors, when work is to proceed in the vicinity of an overhead line and the line is made dead in accordance with regulation 21;

(b) access to and work in underground chambers and similar confined spaces;

(c) work on plant operated by or containing compressed air or other gases; or

(d) such other access or work as may be specified by a designated engineer.

(5) A limitation-of-access shall be explained and issued to the person in direct charge of the work, who after reading its contents and confirming that he or

she understands it and is conversant with the nature and extent of the work to be done, shall sign its receipt and duplicate.

(6) The recipient of a limitation-of-access shall be a competent person who shall retain it in his or her possession at all times whilst work is being carried out.

(7) Where more than one working parties is involved, a limitation-of-access shall be issued to the competent persons severally having personal supervision of each working party.

(8) A limitation-of-access shall be cancelled by the recipient signing the clearance and returning the limitation-of-access for cancellation to an, authorised person or senior competent person specially authorised to do so.

PART V—SAFETY PRECAUTIONS AND PROCEDURE APPLICABLE TO LOW VOLTAGES SYSTEMS.

30. General

(1) Where work or testing is carried out on or near low voltage apparatus and conductors—

(a) precautions shall be taken to prevent danger from body injury due to electric arc or electric shock;

(b) the conductors shall be covered with insulation and screening, and the adequacy of these materials to prevent danger shall be assessed before work or testing is carried out; and

(c) the precautions appropriate to work on or near exposed danger precautions appropriate to work on or near exposed conductors shall be applied.

(2) Danger may arise in the following circumstances—

(a) where a person confuses apparatus and conductors which have been made dead with those which remain live;

(b) dead apparatus and conductors are accidentally or inadvertently made live;

(c) if a person accidentally or inadvertently makes contact with adjacent live conductors; or

(d) if inadequate precautions are taken during live work or testing.

(3) The term “earthed” when applied to the low voltage system comprises the bonding of the phase conductors (including any switch or earth wire) to the neutral conductors by means of an approved device or leads.

(4) Control and operation of low voltage systems shall be in accordance with an approved procedure, and only persons appointed in accordance with an approved procedure shall carry out activities such as switching and the live testing of low voltage systems.

(5) Work or testing of low voltage apparatus and conductors shall be carried out by a competent person, and where working arrangements so require, approved procedures for the control of work, including the issue of a safety document shall apply.

(6) Where work or testing involves the initial connection or the re-arrangement of conductors to a consumer, the electricity supply shall not be provided to the consumer until checks have been made at an appropriate point on the system to ensure correct polarity at the supply terminals and where necessary, in the case of a three-phase supply, the phase rotation shall additionally be checked.

(7) A person shall not erect or dismantle a low voltage overhead line under a live high voltage overhead line without the authority of an authorised person, who shall ensure that when necessary because of insufficient clearance, the high voltage line is made dead and a permit-to-work issued.

(8) When a low voltage overhead line conductor is to be raised or lowered or otherwise held on temporary support or connections, approved procedures shall be followed to ensure that no danger is caused at locations such as road or rail crossing where other persons may be present.

31. Requirements for work on dead low voltage apparatus and conductors

(1) When work is to be carried out on dead low voltage apparatus—

(a) the conductors shall be isolated from all sources of supply from the system;

(b) where the isolating devices are lockable, safety locks shall be applied;

(c) if components such as fuses and links are removable, they shall be removed;

(d) caution notices shall be securely fixed at all points of isolation; and

(e) keys and removed components shall be kept in a secure place in the possession of the person in charge of the work.

(2) Conductors shall be earthed using an earthing device or earthing leads approved for use on the conductors concerned.

(3) Except when work on a low voltage system is being carried out as part of approved high voltage live line work, the following requirements apply—

(a) if the work requires a point of isolation to be established on a high voltage system, an appropriate safety document shall be issued;

(b) if the work requires a high voltage system to be made dead, isolated and earthed, a permit-to-work shall be issued; and

(c) if the work is being done in conjunction with work on a high voltage system which has been made dead, isolated and earthed, this work

shall be included on the permit-to-work issued for the high voltage work.

(4) Suitable precaution shall be taken by approved screening or other approved means to avoid danger from inadvertent contact with adjacent live conductors including where necessary, the fixing of danger notices to apparatus containing live conductors adjacent to other live conductors and at the limits of the zone in which the work may be carried out.

(5) Where conductors are likely to become live due to the operation of a consumer's generator, the following precautions shall be taken to prevent danger—

(a) the conductors shall be isolated from the consumer's system; or

(b) the conductors shall be earthed on an earth provided between the point of work and the consumer's system.

(6) Before work is connected the apparatus and conductors shall be identified and proved dead at the point of work by means of an approved voltage testing device, and whilst work is in progress, any live working method that can reasonably be applied to minimise the risk of danger from the conductors being accidentally or inadvertently made live shall be used.

32. Precautions for work on dead low voltage cables

(1) A cable to be worked on shall be identified in accordance with the following—

(a) unless the point of work can be visually traced from a point where the conductors are accessible and have been proved dead at that point, it will be necessary to open the cable as if it is live and test each conductor with an approved voltage testing device; and

(b) if the cable has been damaged or is faulty, it shall not be presumed dead, and consequently, the test shall be made at a safe distance from the suspected point of damaged fault and the cable shall be visually traced from the point of test to the suspect point of damage or fault. Appropriate precautions shall be taken to avoid danger from electric arcing until the point of damage or fault is located.

(2) Where work is to be carried out on an auxiliary cable which may be subject to induced voltage from a high voltage circuit, additional precautions to prevent danger from these voltages shall be taken in accordance with approved procedures.

33. Precautions for work on dead low voltage overhead lines

(1) Bare open-wire low voltage conductors shall be earthed using approved earthing leads, and where insulated but unscreened conductors are present, the requirements for live working shall be observed until the conductors have been proved dead.

(2) Any unearthed steelwork such as an offset racket or the upper portion of a stay above the insulator shall be treated as live until it is or the conductors have been proved dead.

34. Work on live low voltage apparatus and conductors

(1) A person shall not carry out low voltage live work except in accordance with an approved procedure, which shall ensure adequate protection from danger from electric shock and inadvertent short-circuiting of the conductors.

(2) Where low voltage live work is to be carried out, the competent person in charge of the working party shall make an assessment of the site conductors, and the work shall only commence where site conditions enable work to be done safely.

(3) If the site conditions become unsafe, low voltage live working shall be suspended and the following requirements shall be assessed—

(a) the apparatus to be worked upon shall be visually inspected to ascertain if it is in a satisfactory condition;

(b) there shall be adequate working space and safe means of escape;

(c) the working space and the apparatus to be worked on shall be adequately illuminated; and

(d) if the work is outdoors, the weather conditions shall not be unduly adverse.

(4) Every person who carries out live working shall be a competent person and shall have received appropriate training in the particular low voltage live working procedure, and adequately instructed by the competent person in charge of the working party.

(5) Tools and equipment approved for that purpose shall be the only tools used for work on, or the testing of low voltage apparatus and conductors.

(6) A person shall not carry out work which involves, or is equivalent to a manipulation of bare live conductors unless accompanied by another person who shall be available to render or obtain assistance in an emergency.

35. Precautions for work on live low voltage cables

(1) A cable to be worked on shall be identified by approved means, and all metal work adjacent to the point of work shall be adequately shrouded with approved insulating material to prevent inadvertent contact. The metallic sheaths of cables shall be bonded to each other with an approved insulated conductor before jointing and cutting to ensure continuity of the electrical circuit through the sheath.

(2) Unless alternative approved procedures allow, during all work including the change of cut-outs, only one conductor shall be bared at a time and insulating gloves and an insulating mat shall be used.

36. Precautions for work on live low voltage overhead lines

(1) Where work is carried out on live overhead lines, any unearthed steelwork such as an offset bracket shall be proved dead using an approved voltage testing device.

(2) When work is carried out on insulated but un-screened low voltage conductors, a person working on such conductors shall wear insulated gloves and use insulated tools to prevent danger that may arise if the insulation has deteriorated or is damaged.

37. Application of high voltage rules to work on low voltage apparatus and conductors

Safety rules applicable to work on high voltage systems, apparatus and conductors may with the necessary modifications be applied to work on low voltage systems, apparatus and conductors in accordance with approved procedures.

38. Testing and adjustment of low voltage apparatus

(1) Testing and adjustment including functional testing may be made with low voltage apparatus live if a person making such testing and adjustment uses approved insulated tools and instruments.

(2) If the testing or adjustment requires covers to be removed so that terminals or connections that are live or can be made live are exposed or temporarily disconnected, precautions shall be taken to prevent unauthorised access to or interference with the apparatus. Such precautions shall include where necessary, personal supervision or erection of suitable barriers or screening and the display of danger notices.

(3) If the conductors are to be made dead in order to avoid danger, appropriate requirements under regulations 31 and 32 shall be applied.

(4) In this Part, “low voltage” applies to a licensee’s 415/240V distributing mains and services.

39. General penalty

A person who contravenes the provisions of these Regulations commits an offence and is liable on conviction to a fine not exceeding ten currency points or to imprisonment for a term not exceeding one year, or both.

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SCHEDULES.