Statutory Instrument No. 52 of 1988

ELECTRICITY (SUPPLY) ACT
(Cap. 73:01)

ELECTRICITY (SUPPLY) REGULATIONS, 1988

(*Published on 22nd April, 1988*)

ARRANGEMENT OF REGULATIONS

REGULATION

IN EXERCISE of the powers conferred on the Minister of Mineral Resources and Water Affairs by section 16 (1) of the Electricity (Supply) Act, and after consulation with the Botswana Power Corporation, the following Regulations are hereby made —

PART I *Preliminary*

Citation

1. These Regulations may be cited as the Electricity (Supply) Regulations, 1988.

Interpretation

2. In these Regulations, unless the context otherwise requires —

"apparatus" means electrical apparatus and includes all machines, apparatus and fittings in which conductors are used or of which they form a part;

"authorised person" means a person appointed by an undertaker or by a consumer, or jointly in cases where any electric lines or apparatus are in the joint charge of an undertaker and a consumer, to carry out duties incidental to the generation, transformation, distribution or use of energy, such person being competent for the purpose of these Regulations;

"Board" means the Registration Board created under regulation 43 of these Regulations;

"circuit" means an electrical circuit forming a system or branch of a system;

"circuit protective conductor" means a conductor connecting exposed conductive parts of equipment to the main earthing terminal, but does not include the neutral conductor of the consumer's wiring;

"conductor" means an electrical conductor arranged to be electrically connected to a system;

"connected to earth" means connected with the general mass of earth in such manner as will ensure at all times an immediate and safe discharge of energy;

"consumer" means any person supplied with energy by an undertaker;

"consumers' installation" means the consumer's wiring, together with

any apparatus upon the premises connected or intended to be connected thereto;

"dead" means at or about earth potential and disconnected from any live system;

"distributing main" means the portion of any main used for the purpose of giving origin to service lines for the purpose of general supply;

"electric line" means a conductor, including a neutral conductor, used for the purpose of conveying, transmitting or distributing electricity with any casing surrounding or supporting the same;

"energy" means electrical energy;

"extra low voltage" means normally not exceeding 50V AC or 120V DC between conductors or to earth;

"general supply" means the general supply of energy to ordinary consumers, but not to a consumer under special agreement;

"generating station" means any station for generating energy including any building, and plant used for the purpose and the site thereof, but does not include any station for transforming, converting, or distributing electricity;

"high voltage" means a voltage normally exceeding low voltage

"insulation" means non-conducting material enclosing, surrounding or supporting a conductor and suitable for the purposes of these Regulations;

"line conductor" means an overhead line conductor;

"low voltage" means a voltage normally exceeding extra low voltage but not exceeding 1 000AC or 1 500 V DC between conductors or 600V AC or 900 DC between any conductor and earth;

"main" means any electrical line through which energy may be supplied by an undertaker for the purpose of general supply;

"metalwork" means any metalwork on an overhead line other than a line conductor or earth lead;

"overhead line" means any electric line which is placed above ground and in the open air;

"service line" means any underground or overhead electric line through which energy may be supplied or intended to be supplied by an undertaker to a consumer either from any mains or directly from the premises of such undertaker;

"substation" means any premises or enclosure containing apparatus for transforming energy to or from a voltage with or without any other apparatus for switching, controlling or otherwise regulating the energy, and includes the apparatus therein;

"supply of electricity in bulk" means a supply of electricity to any undertaking or person authorised to supply energy;

"supply terminals" means the ends of the electrical line situated upon any consumer's premises at which the supply of energy is delivered from the service line;

"support" includes stays and struts on an overhead line but does not include —

(*a*) insulators or their fittings, or

(*b*) metal brackets or fittings attached to buildings or structures;

"system" means an electrical system in which all the conductors or

apparatus are electrically connected to a common source of voltage and unless specifically stated otherwise is an alternating current system;

"undertaking" means any undertaking for the generation or for the supply of energy within a defined area, with all the assets and liabilities appertaining thereto, whether or not carried on under the authority of a licence; and undertaker bears a corresponding meaning;

"voltage" means electromotive force and in particular the voltage between any pair of conductors forming part of a system or between any part of either conductor and the earth; in the case of alternating current, the expression means the virtual voltage or root mean square value under normal conditions subject however to the percentage variation allowed by these Regulations;

"works" includes electric lines, buildings, machinery, engines, works, matters or things or whatever description required to supply energy and to carry into effect the object of an undertaker;

Application

3. These Regulations shall apply to all undertakers and to all works of and all supplies of energy given by such undertakers whether brought into use or commenced before or after the date of publication of these Regulations:

Provided that —

(i) in any works or consumers' installations subject to electricity regulations made under another Act where such regulations conflict with these Regulations these Regulations shall apply; and

(ii) any undertaker may continue to use works and to supply consumers' installations constructed or brought into use before these Regulations came into force which do not fully comply with these Regulations so long as such undertaker is satisfied that such installations will continue to function for a further reasonable period without risk of danger.

PART II *Connection of systems with earth*

Connection of low voltage systems

4. (1) All undertaker's works shall satisfy the conditions for a systems of TN-C-S (Protective Multiple Earthing) as set out in this regulation.

(2) The metal case of the undertaker's transformer and any metal work enclosing high voltage electric lines connected to that transformer shall be effectively earthed.

(3) The supply neutral conductor of the distributing main shall be connected to —

(*a*) an earth electrode situated at or near the transformer; and

(*b*) for overhead lines additional earth electrodes situated along the line route at intervals not exceeding 150 metres and at branching points and at the final pole of each main or service line remote from the transformer; and

(*c*) for underground cables any metal sheathing and any metal amouring of the distributing main; and

(*d*) the neutral conductor of any other distributing main which provides an alternative path to an earth electrode;

and

(*e*) an earth electrode provided by the consumer, at or near the consumer's point of supply with a resistance to earth of 20 ohms or less.

(4) The earthing arrangement referred to in subregulation (2) shall be situated outside the resistance areas of the earth electrodes referred to in subregulation (3) unless any connection between them would result in a resistance to earth of 5 ohms or less.

(5) The connections made in subregulation (3) shall be made at such points as are necessary to ensure that the overall resistance to earth of that supply neutral conductor —

(*a*) does not anywhere exceed 10 ohms;

(*b*) be such that fuses or automatic circuit breakers protecting the high voltage side of the supply transformer will operate in the event of a breakdown between the windings of the transformer.

(6) The copper equivalent cross-sectional area of the neutral conductor throughout all distributing mains and service lines shall, when measured at any point, not be less than the copper equivalent cross-sectional area of the phase conductor.

(7) No fusible cut-pot, circuit breaker or switch shall be included in the neutral conductor and the undertaker shall, in the design, construction, maintenance and operation of the distribution system, take all reasonable precautions to avoid an open circuit in the neutral conductor.

(8) No metal structure, pipe, or metalwork forming part of a telecommunications circuit belonging to Botswana Telecommunications Corporation shall be connected to any earthing terminal except by or with the authority of the Botswana Telecommunications Corporation.

(9) Nothing in this regulations shall —

(*a*) confer upon the undertaker any right to connect the neutral conductor to any earth electrode, metal pipe or other metal structure without the permission of its owner; or

(*b*) affect any right or remedies of the Botswana Telecommunications Corporation in connection with any damage caused to Botswana Telecommunications Corporation lines or confer any exemption from liability or penalty in respect of such damage.

(10) Low voltage generator neutral star points shall be connected to an earth electrode with a resistance to earth not exceeding 10 ohms.

(11) The connection with earth referred to in subsection (10) may be made through low impedance primaries of current transformers installed for the purposes of system protection.

(12) Where generators are supplying a low voltage system giving a general supply the provisions of subregulations (3) or (8) or both shall apply.

Connection of 11 kV, 33 kV and 66 kV systems

5. (1) Every system shall be directly connected with earth at the supply transformer neutral star point or by earthing transformer situated adjacent to it, if the supply windings are connected in delta.

(2) The resistance to earth of the neutral point earth electrode shall not exceed 1 ohm.

(3) The connection to earth shall be made at the supply transformer only and the insulation of the system shall be maintained at all other parts.

(4) High voltage generator winding neutral star points shall be connected either —

(*a*) directly with earth; or

(*b*) where the level of earth fault current would be such as to cause damage to generator windings earthed through a current limiting resistor or reactor.

(5) A connection of a system with earth under subregulation (1) or (4) may be made through low impedance primaries of current transformers installed for purposes of system protection.

Connection of 132 kV, and 220 kV systems

6. (1) 132 kV, 220 kV and 330 kV systems shall be multiple earth systems, and the neutral star point of all 132 kV, 220 kV and 330 kV transformer windings on these systems shall be connected directly with earth.

(2) The direct connection of the systems referred in subregulation (1) with earth may be made through low impedance primaries of current transformers installed for the purpose of system protection.

(3) The resistance to earth of the neutral point earth electrode shall not exceed 1 ohm.

(4) The connections to earth shall be made at transforming sub-stations only and the insulation of the system shall be maintained at all other parts.

PART III *Electric lines, systems and apparatus*

Test of resistance of insulation on low voltage

7. Electric lines for use at low voltage shall not be connected to a system for the purposes of the supply of energy unless the insulation of such electric lines has withstood the application of a testing voltage of not less than 500 volts between conductors and between conductors and earth for a period of not less than one minute.

Completion and control of high voltage lines

8. (1) Electric lines for use at high voltage shall be placed in position, properly jointed and duly completed and examined before they are brought into use for the purpose of the supply of energy.

(2) Every electric line shall during its use be in the sole charge of the undertaker but the undertaker may make arrangements with the consumer for control by an authorized person of the electric lines on the premises of the consumer.

Tests required for insulation for high voltage lines

9. Electric lines and apparatus for use at high voltage shall not be connected to a system for the purposes of the supply of energy unless the insulation of the said electric lines and apparatus have withstood either the tests prescribed in the appropriate specification of the Standards of the International Electrotechnical Commission or any revisions thereof current at the time of the test, or, where such tests cannot be applied due to suitable testing equipment not being available, such other tests as may be authorized by the Minister.

Precautions against excess leakage on high voltage lines

10. The following privisons shall apply to electric lines for use at high voltage —

(*a*) any metal sheathing shall be electrically continuous and connected with earth and the conductivity shall be maintained and reasonable precautions taken where necessary to avoid corrosion;

(*b*) in the event of a failure of insulation occurring between one conductor and the metal sheathing at any point along an electric

line as aforesaid, the impedance of the relevant circuit shall be such that with the full voltage maintained at the source of supply, the current resulting from such failure shall be not less than twice the value of the current for which a suitable fusible cut-out or other suitable device has been set to operate a suitable discriminative fault current relay:

Provided that the operation of the overload preventative device relay shall cause the automatic operation of a circuit breaker of adequate repturing capacity;

(*c*) the relevant circuit referred to means the complete circuit from the source of supply to the point of failure of the insulation, including any connection with earth.

PART IV *Overhead lines*

Restriction on overhead lines

11. No person or undertaker shall place above ground any overhead electric line except in accordance with the provisions of this Part.

Materials and minimum size of line conductors

12. Every line conductor shall be made of copper, aluminium or steel or any alloy or combination of such materials and shall have a cross-sectional area of not less than 12 mm^2.

Minimum height of conductors above ground

13. (1) The height above ground of any line conductor at any point whether it is either over or not over any road accessible to vehicular traffic shall not, at a temperature of 50^{0}C be less than, —

(*a*) in the case where it is over a road accessible to vehicular traffic, the appropriate height specified in column 1 of the First Schedule hereto; and

(*b*) in the case where it is not over a road accessible to vehicular traffic, the appropriate height specified in the second column of the First Schedule.

(2) The provisions of paragraph (*b*) of subregulation (1) shall not apply to —

(*a*) any line conductor surrounded by insulating material suitable for the condition under which it is to be used;

(*b*) any line conductor which is not so surrounded by insulating material and which is at least 4,3 metres above ground and connects transforming, switching or other equipment mounted on supports (equipped with anti climbing devices) carrying line conductors with other such equipment or with any other line conductor; or

(*c*) any line conductor connected with earth.

Minimum clearance of conductor from buildings

14. (1) No person shall erect any building or structure on any land over which an overhead line has been lawfully constructed, in such a position or in such a manner as to be likely to interfere with the supply of electricity through such line or in such a position that an existing line could constitute a danger to life and property without the permission of the undertaker having control of such line. If any person so erects a building or structure the undertaker may apply to the Minister for an order authorising the removal or adjustment for the building or structure.

(2) All low voltage conductors not covered by insulation, nor connected with earth shall under all conditions have a minimum vertical clearance of 2,5 metres above the building or structure over which they pass and a minimum horizontal distance of 2,0 metres from the nearest point of the building or structure.

(3) All high voltage conductors operating at voltages up to and including 33 kV shall, under all conditions, have a minimum vertical clearance of 3,5 metres above the building or structure over which they pass and a minimum horizontal distance of 2,0 metres from the nearest point of the building structure.

Position, protection and insulation of line conductors

15. (1) Every line conductor or part thereof shall —

(*a*) if not ordinarily accessible from the ground or a building or structure either be —

(i) supported at appropriate intervals by suitable insulators, or

(ii) effectively covered by insulation;

(*b*) if ordinarily accessible from the ground or a building be effectively covered by insulation and protected against mechanical damage and interference.

(2) All low voltage conductors not covered by insulation shall be situated throughout the line route vertically above a bare earth wire or bare line conductor which is connected with earth.

(3) All 33 kV and 11 kV conductors when operating in combined construction with low voltage conductors shall be separated from the low voltage conductors throughout the line route by a vertical distance, that is to say, if the rate of voltage —

(*a*) does not exceed 11 000 volts, the minimum clearance shall be 1,25 metres; and

(*b*) exceeds 11 000 volts but does not exceed 33 000 volts, the minimum clearance shall be 1,5 metres

(4) Except with the prior approval of the Minister no person shall operate any combined line construction other than those specified in this regulation.

Materials of supports

16. (1) Every support carrying a line conductor shall be made of wood, steel, reinforced concrete or fibre glass reinforced plastic or any combination of any such materials and be protected against decay or corrosion insofar as is reasonably practicable.

(2) The minimum top diameter of a wooden pole support shall be 135 mm.

Danger notices and precautions against access

17. Every support carrying a high voltage line conductor shall —

(*a*) have affixed to it at a height of 3 metres above ground a suitable notice to indicate danger; and

(*b*) with the exception of smooth bodied round supports, be fitted with a suitable anti climbing device to prevent as far as is reasonably possible access to any person to any position dangerously near such line conductor.

Earthing connections

18. (1) Any metal work attached to, or forming part of, any support carrying a line conductor, other than a wooden or fibre glass reinforced plastic pole, and every metal transformer case, shall be connected with earth.

(2) Any metal work attached to or forming part of wooden pole carrying a line conductor shall be connected with earth unless the

design and construction is such as to prevent, as far as reasonably possible within 3 metres of the ground, danger from leakage across or failure of, an insulator supporting or insulation of a line conductor.

(3) Every stay wire which is attached to any unearthed portion of a support carrying a line conductor shall be fitted with an insulator not less than 3 metres above ground.

(4) Every earth connection shall be installed in such a manner and in such a position as to prevent an accident arising from the presence of a voltage gradient.

Inspection and maintenance

19. Every electric line shall be regularly inspected and properly and efficiently maintained.

Wind pressure and factors of safety

20. (1) The projected area of all line conductors, wires, cables, insulators, supports and constituent parts of supports used to calculate the force attributable to wind pressure equivalent to 760 Pa acting horizontally at right angles to the line and simultaneously on all aforementioned components shall be taken as —

(*a*) in the case of lattice type structures a minimum of 1,56 times the projected area of the members of one face of the structure;
(*b*) in the case of round or elliptical poles, conductors and wires 0,60 of the projected area; and
(*c*) in the case of insulators, 0,83 of the projected area.

(2) Every support and foundation thereof, taking into account the reaction of the ground in which they are embedded to the load which they are designed to carry, so as to withstand simultaneously the forces specified in subparagraph (1), shall be so constructed and sited as to have the following minimum factor of safety —

(*a*) 2.0 at 10°C on the breaking load of line conductors, wires and cables;
(*b*) 2,5 on the elastic limit of all steel members other than crossarms, bracings and stays fixed to wooden, reinforced concrete or pre-stressed reinforced concrete supports;
(*c*) 2,5 on the ultimate tensile stress in the case of steel crossarms, bracings and stays fixed to wooden, reinforced concrete or pre-stressed reinforced concrete supports;
(*d*) 2,5 on the ultimate extreme fibre stress in the case of wooden supports and wooden crossarms;
(*e*) 2,5 on the ultimate compressive or shear stress of the material concerned;
(*f*) 2,5 on the crippling load of any strut;
(*g*) 2,5 on the maximum stress which can be accepted throughout a reinforced or pre-stressed reinforced concrete support without failure of inability to support further load.

(3) The strength of every support carrying a line conductor shall, in the direction of such line conductor or the mean direction as the case may be, not be less than one quarter of its required strength in a horizontal direction at right angles to such direction.

PART V

Transformation and Control of Energy at High Voltage

General conditions as to transormation, control etc.

21. Where energy at high voltage is transformed, converted, regulated or otherwise controlled in substations or switch stations the following provisions shall have effect —

(*a*) substations and switch stations shall preferably be erected above ground, but where necessarily constructed underground there shall be due provision for ventilation and draingage;

(*b*) outdoor substations and outdoor switch stations shall (unless the apparatus is completely enclosed in a metal casing connected with earth, the said apparatus also being connected with the system by armoured electric lines) be efficiently protected by fencing not less than 2,5 metres in height or by other means so as to prevent access to the electric lines and apparatus therein by any authorised person;

(*c*) fire-resisting casing on the premises of a consumer, preferably of metal connected with earth, shall completely enclose all electric lines (other than overhead lines) and apparatus on the premises designed to be electrically charged at high voltage and shall be secured so as to prevent access by any authorised person; and

(*d*) the works shall be labelled with an appropriate danger notice, with the name of the undertaker and with the address or telephone number at which an officer will be in attendance.

Further construc-tional details in certain cases

22. The following provosions as to constructional details shall have effect where energy at high voltage is transformed, covered, regulated or otherwise controlled —

(*a*) all doors or covers shall be so secured that they cannot be opened, except by means of a key or special appliance, and apparatus so arranged that it shall not be poossible for the person opening the door or cover to come into accidental contact with metal electrically charged at high voltage. Unless the whole of the enclosed conductors and apparatus may be made dead at the same time for the purpose of cleaning or for other work thereon, they shall be so arranged that they may be made dead in sections so separated by divisions or screens from all adjacent live metal that work on any section made dead may be carried on by an authorised person without danger;

(*b*) every fusible cut-out shall either be capable of being made dead by a switch or shall be so constructed and placed that it can be handled without danger by an authorised person for the purpose of renewal; and

(*c*) on supports of overhead lines or adjacent thereto all conductors and transforming or switching apparatus, unless completely enclosed and connected to the system by armoured electric lines or effictively screened, shall be so arranged that no live metal with which contact can be made shall be a less distance than 4,3 metres from the ground or any place accessible to an unauthorised person.

23. Where energy is transformed suitable provision shall be made either by connecting with earth a point of the system at the lower voltage or otherwise to guard against danger of such system becoming accidental charged above its normal voltage by leakage from or contact with the system at the higher voltage.

Transforming apparatus: precautions against danger

PART VI

Electric lines and apparatus (general) other than consumers' installation

24. Every electric line shall be protected against excess energy by a suitable fusible cut-out or automatic circuit-breaker of adequate rupturing capacity which shall not be inserted in any conductor permanently connected with earth.

Protection against excess energy

25. (1) Where any electric line (including a service line up to the supply terminals) at the time it is placed in position crosses or is in proximity to any pipe, line or other metal, precautions shall be taken to prevent such pipe, line or other metal from becoming electrically charged.

Precautions against metal work becoming electrically charged

(2) Any metal work, enclosing, supporting or otherwise associated with electric lines and apparatus unless designed to serve as a conductor shall where necessary to prevent danger be connected with earth.

26. Substation buildings shall be adequately ventilated and maintained to ensure a dry environment for the equipment housed therein.

Construction of substation buildings

27. Where a substation or switch station situated in any building contains oil-immersed transformers or switches involving the use of more than 5 000 litres of oil in any one oil tank, receptacle or chamber, provision shall be made for the draining away or removal or any oil which may leak or escape and adequate provision shall be made for the extinguising of any fire which may occur. Spare oil shall not be stored in any such substation or switch station.

Precautions against risk of fire

28. All conduits, pipes, casings, street boxes and similar structures used by an undertaker as enclosures for electric lines or apparatus shall be constructed of durable material, and where placed under carriageways shall be of ample strength to withstand heavy traffic.

Enclosures for electric lines and apparatus

29. The layout of the electric lines of an undertaker for the supply of energy throughout his area of supply shall under normal working conditions be sectionalised and so arranged and provided where necessary with fusible cut-outs or automatic circuit-breakers so located as to restrict within reasonable limits the extent of the portion of the undertaking affected by any failure of supply.

Electric lines to be sectionalised

30. During and in connection with the installation, extension, replacement, repair and maintenance of any of his works, an undertaker shall take all reasonable precautions to avoid any accidental interruptions of supply, and also to avoid danger to the public or to any employee or authorised person when enaged on any operation as aforesaid not coming within the scope of the Factories (Electriciy) Regulations.

Precautions against failure of supply

Cap. 44:01 (Sub.Leg.)

PART VII

Supply to premises of consumers and consumers' installations

Identification of conductors of service lines

31. The separate conductors of service lines shall be permanently marked by colouration, lables or otherwise as close as practicable to the supply terminals so as to indicate in a distinctive manner the polarity of the conductors or the neutral and line phase conductors, as the case may be.

Provision of meters and accuracy thereof

32. (1) For the purpose of measuring the electrical energy supplied to the consumer an undertaker shall provide suitable metering equipment (hereinafter referred to as the "meter") as close as practicable to the supply terminals and in such a position as to provide ready access by the employees of the undertaker and be protected in such a manner as the undertaker may require.

(2) For general supply an undertaker shall maintain meters in such a manner that the limits of error shall not exceed plus or minus 2 $^1/_2$ per cent at the reference conditions given for class 2 meters in IEC standard 521, section.

(3) Where a consumer contests the accuracy of a meter he may on payment of a prescribed fee require the undertaker to carry out such tests as may be necessary to check the accuracy of the meter and to advise him of the result. If the limits of error are within those in subregulation (2) the fee shall be forfeit but if outside those limits the fee shall be refunded and the charges raised for electrical energy supplied during the meter reading period immediately prior to the complaint shall be revised accordingly.

Protection of consumers' installations against excess energy

33. For the protection against excess energy a suitable fusible cut-out or automatic circuit-breaker of adequate rupturing capacity completely enclosed in a suitable, locked or sealed receptable or solid fire-resisting construction shall be inserted by an undertaker in every service line as close as practicable to the supply terminals and in a position which, in the opinion of the undertaker, is suitable for the purpose:

Provded that —

(i) no such fusible cut-out or automatic circut-breaker shall be inserted in any conductor which is permanently connected with earth; and

(ii) where a supply of energy is given at high voltage provision shall be made whereby the fusible cut-out or automatic circut-breaker can be isolated from the service line and whereby the consumer is enabled to cut off all voltage from the supply terminals without risk of danger.

Undertaker's lines, etc. on consumer's premises

34. An undertaker shall be responsible for all electric lines and apparatus placed by him on the premises of a consumer, and either belonging to the undertaker or under his control (whether forming the whole or part of the consumer's installation or not), being installed and maintained in a safe condition and suitable for their respective purposes and being so fixed and protected as to prevent so far as is reasonably practicable leakage to any adjacent metal.

Standards for consumers' installations

35. An undertaker shall not permanently connect a consumer's installation with his electric lines or commence or continue a supply of energy unless he is reasonably satisfied that the installation complies with the provisions of the Second Schedule.

Declared type of current, frequency and voltage at supply terminals

36. (1) Before commencing to give a supply of energy to any consumer an undertaker shall declare to that consumer the type of current, the number of phases, the voltage and the frequency. The voltage declared shall be constantly maintained subject as regards the frequency to a permissible variation not exceeding 2 $^1/_2$ per cent above or below the declared frequency, and as regards the voltage to a permissible variation not exceeding 10 per cent above or 10 per cent below the declared voltage, and shall not be altered or departed from nor shall the aforesaid permissible variation be exceeded except with the prior written consent of the Minister and subject to such terms and conditions as the Minister may impose.

(2) Unless authorised by the Minister, the type of current shall be 3-phase alternating current with a periodicity of 50 hertz. If the supply is given at low voltage the system shall be 3-phase, 4-wire with earthed neutral and a declared voltage of 400 volts between phases and 230 volts between any phase and neutral.

Undertaker to provide constant supply

37. From the time when an undertaker commences to supply energy through any distributing main he shall maintain a supply of energy sufficient for the use of all consumers for the time being entitled to be supplied from that distributing main; and that supply shall be constantly maintained without change of the neutral conductor:

Provided that —

(i) for any purpose connected with the proper working of the undertaking the supply of energy may be discontinued for any such period as is necessary subject (except in case of emergency) to not less than 24 hours' notice being given to consumers likely to be affected;

(ii) if a consumer fails to make payment for supply of energy or of other services provided by the undertaker to him within the period specified in the account rendered to him the supply of energy to him may be discontinued and not resumed until such payments are made together with such further charges as the undertaker may require;

(iii) any discontinuance of supplies for periods of 4 hours affecting more than 100 consumers or a loss of system load of 1 MW more shall, with the reasons for such, be notified to the Minister in writing within 7 days; and

(iv) nothing contained in this regulation shall prevent any undertaker from offering a general supply with restricted hours of availability, subject to the prior approval of the Minister.

Procedure for determining disputes

38. Any difference which may arise between a consumer and an undertaker shall be determined by a suitably qualified inspector nominated by the Minister on the application of the consumer or his authorised agent or of the undertaker, as the case may be. The inspector shall prescribe the fee to be paid and shall determine by which of the parties the costs of and incidental to the proceedings before him (including the prescribed fee) or any portion of such costs shall be paid.

PART VIII *Miscellaneous*

Availability of regulations

39 (1) Every undertaker shall keep copies of the Act, these Regulations and other regulations relating to standards for consumers' installations referred to in the Second Schedule thereto at his principal office within the area of supply.

(2) He shall also supply a copy of the said regulations relating to standards for consumers' installations to any person demanding the same at a price per copy not exceeding the price paid by him.

Inspections, examinations and tests by the Minister

40. Officers duly appointed and authorised by the Minister shall be entitled at all reasonable times to inspect and to make examinations and tests of the works of an undertaker and to examine and take records of the readings of any instruments, and every undertaker shall afford all due facilities for any such inspection, examination and test:

Provided that an undertaker shall not be responsible for any interruption in the supply of energy which may be occassioned by any such inspection, examination or test.

Prohibition of dangerous apparatus

41. The Minister may prohibit the importation, sale or use of any type of apparatus he deems is unsafe for general use, and shall not be responsible for any claims arising from such a prohibition.

Register of contractors and artisans

42. For the purpose of ensuring compliance with these Regulations insofar as consumers' installations are concerned the Minister may require that all new installations and additions and alterations to existing installations shall only be carried out by him in a register created for that purpose.

Registration Board

43.(1) The Minister may set up a Registration Board for the preparation and maintainance of the register referred to in regulation 42, which Board shall consist of a Chairman, who shall be a qualified electrical engineer, and not less than 2 and not more than 8 members.

(2) The Registration Board shall prescribe in what manner applications for registration shall be made and what fees shall be paid and, after considering such applications, decide whether or not the applicant shall be registered and advise him accordingly.

(3) Any person aggrieved by a decision of the Board may, within 6 months of that decision, appeal, in writing, to the Minister.

Annual Report

44. (1) The Board shall, not later than three months after the termination of every financial year, submit, to the Minister, a written annual report on its undertakings and operations for the year.

(2) The Minister shall, within 30 days of receiving the report referred to in sub-regulations (1), lay that report, together with the audited accounts of the Board, before the National Assembly.

Penalties

45. Any person contravening any provision of these Regulations shall be guilty of an offence and liable to a fine not exceeding P200 and to imprisonment for a term not exceeding 6 months and in the case of continuing offence to an additional fine of P100 for each day on which the offence continues.

Revocation of Cap.73:01 (Sub. Leg.)

46. The Electricity (Supply) Regulations are hereby revoked.

FIRST SCHEDULE

	Column 1 Over any readway	*Column 2* Not accessible to Vehicular Traffic
Not exceeding 1000 V	5.5 m	4.9 m
Exceeding 1000 V but not exceeding 33000 V	5.8 m	5.2 m
Exceeding 33000 V but not exceeding 66000 V	6.0 m	6.0 m
Exceeding 6000 V but not exceeding 122000 V	6.7 m	6.7 m
Exceeding 132000 V but not exceeding 275000 V	7.0 m	7.0 m
Exceeding 275000 V	7.3 m	7.3 m

SECOND SCHEDULE

Standards for Consumers' Installations

1. Consumers' installations shall comply wherever possible with the undermentioned provisions current at the date of these Regulations or subsequent alterations or additional made thereto —
   (*a*) these Regulations;
   (*b*) standards of the International Electrotechnical Commission;
   (*c*) the Institution of Electrical Engineers Regulations for Electrical Installations;
   (*d*) such regulations as may be made by the Botswana Telecommunications Corporation;
   (*e*) The Factories (Electricity) Regulations, in premises where the Factories Act applies;
   (*f*) such electricity regulations as may be made under the Mines, Quarries, Works and Machinery Act, in premises where that Act applies. Cap. 44:02
2. In addition, consumers' installations, except those in premises where the Factories Act or the Mines, Quarries, Works and Machinery Act, apply shall have fitted circuit breakers of an approved type to provide protection as follows —
   (*a*) earth leakage protection, by residual current device, with a rated operating current of not more than 30 mA on each final socket outlet circuit;
   (*b*) overload protection on each final circuit.
3. In consumers's building installations supplied at low voltage the neutral conductor shall not be connected with earth nor with any protective conductor.
4. In consumers' installations supplied at high voltage —
   (*a*) all conductors and apparatus intended for use at high voltage owned by the supply undertaking and situated on the premises of the consumer shall normally be inaccessible to the consumer, and all operations in connection with the said conductors and apparatus shall be carried out by the undertaker unless otherwise agreed between the undertaker and the consumer;

(*b*) the consumer shall give to the undertaker a guarantee in writing that every portion of the consumer's installation which is for use at high voltage will be maintained in an efficient state to the satisfaction of the undertaker; that in cases where the said portion of the consumer's installation is not enclosed in a building or other enclosure to which access can only be obtained by means of a key or special appliance, an authorised person will be available to cut off the supply in the event of emergency; and that instructions as to treatment of persons suffering from shock will be affixed on or in the premises of the consumer.

MADE this 11th day of April, 1988.

A.M. MOGWE,
Minister of Mineral Resources
and Water Affairs.

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