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STATUTORY INSTRUMENTS

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1970 No. 1355

ELECTRICITY

The Electricity (Overhead Lines) Regulations 1970

Made - - - 10th September 1970

Laid before Parliament 22nd September 1970

Coming into Operation 1st October 1971

The Minister of Technology and the Secretary of State, in pursuance of the powers conferred upon them by section 60 of the Electricity Act 1947(a), section 1(3) of the Electricity Reorganisation (Scotland) Act 1954(b) and section 42 of the Electricity Act 1957(c), and of all other powers them enabling, hereby jointly make the following regulations:—

PART I

*Commencement and citation*

1. These regulations shall come into operation on 1st October 1971 and may be cited as the Electricity (Overhead Lines) Regulations 1970.

*Interpretation*

2.—(1) In these regulations the following expressions have the meanings hereby respectively assigned to them, that is to say:—

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

“high voltage” means a voltage exceeding 650 volts;

“line conductor” means a conductor used or to be used for conveying a supply of electricity;

“low voltage” means a voltage not exceeding 250 volts;

“medium voltage” means a voltage exceeding 250 volts but not exceeding 650 volts;

“metalwork” means any metalwork other than a line conductor or earth lead;

“support” includes stays and struts, but does not include (a) insulators or their fittings or (b) metal brackets or fittings attached to buildings or structures.

(2) Expressions to which meanings are assigned by these regulations shall (unless the contrary intention appears) have the same meanings in any document issued under the provisions of these regulations.

(3) The Interpretation Act 1889(d) shall apply to the interpretation of these regulations as it applies to the interpretation of an Act of Parliament.

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(a) 1947 c. 54.

(b) 1954 c. 60.

(c) 1957 c. 48.

(d) 1889 c. 63.

*Application*

3.—(1) Part II of these regulations shall apply to electric lines and supports placed above ground and erected by an Electricity Board after the date of coming into operation of these regulations.

(2) Part III of these regulations shall apply only to electric lines and supports placed above ground and erected before the date of coming into operation of these regulations, being electric lines and supports under the control of an Electricity Board.

(3) Part IV of these regulations shall apply to all electric lines and supports, whether placed above ground and erected before or after the date of coming into operation of these regulations, being electric lines and supports under the control of an Electricity Board.

PART II

NEW ELECTRIC LINES AND SUPPORTS

*Restriction on placing electric lines above ground*

4.—(1) Except under and in accordance with the terms of a written authority granted by or on behalf of the Minister of Technology or the Secretary of State no Electricity Board shall :—

- (a) place above ground any electric line ;
  - (b) erect any support carrying line conductors ; or
  - (c) place above ground any wire or cable attached to any such support ;
- otherwise than in accordance with the provisions of this Part of these regulations.

(2) Except under and in accordance with the terms of a written authority granted by or on behalf of the Minister of Technology or the Secretary of State, any electric line, support or wire or cable placed or erected in accordance with the provisions of paragraph (1) of this regulation shall be so maintained that it complies with the provisions of this Part of these regulations.

*Materials of line conductors*

5. Every line conductor shall be made of copper, aluminium or steel, or any alloys thereof, or any combination of any of such materials.

*Minimum size of line conductors*

6. Every line conductor shall have a cross-sectional area of not less than 12 square millimetres.

*Minimum height of line conductors*

7.—(1) The height above ground of any line conductor, at any point where it is over any road accessible to vehicular traffic, shall not, at its likely maximum temperature (whether or not in use), be less than the appropriate height specified in column 2 of Schedule 1.

(2) The height above ground of any line conductor, at any point where it is not over any road accessible to vehicular traffic, shall not, at its likely maximum temperature (whether or not in use), be less than the appropriate height specified in column 3 of Schedule 1; provided that this requirement shall not apply to—

- (a) any line conductor surrounded by insulating material suitable for the conditions 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 carrying line conductors with other such equipment or with any other line conductor ; or
- (c) any line conductor connected with earth.

*Minimum height of wires and cables other than line conductors*

8. The height above ground of any wire or cable which is attached to a support carrying any line conductor shall not, at its likely maximum temperature (whether or not in use), be less than 5.8 metres at any point where it is over any road accessible to vehicular traffic.

*Stress limitations in line conductors and other wires and cables*

9.—(1) In the case of a line conductor to which Part I of Schedule 2 applies the tension in that line conductor, or in any wire or cable attached to any support, bracket or fitting carrying such line conductor, shall be such that at a temperature of minus 5.6 deg. Celsius the forces specified in paragraph 1(a) of Schedule 2 can be accepted without the tension exceeding forty per centum of the breaking load of that line conductor, wire or cable.

(2) In the case of any other line conductor, the tension in that line conductor, or in any wire or cable attached to any support, bracket or fitting carrying such line conductor, shall be such that at a temperature of minus 5.6 deg. Celsius the forces specified in paragraph 3(a) of Schedule 2 can be accepted without the tension exceeding fifty per centum of the breaking load of that line conductor, wire or cable.

*Supports*

10.—(1) Every support carrying a line conductor shall be made of wood, steel, reinforced concrete or pre-stressed reinforced concrete or any combination of any of such materials, and, in any case in which wood or steel is used in the construction of a support, such wood or steel shall be so far as is reasonably practicable protected against decay or corrosion, as the case may be.

(2) Subject to paragraph (3) hereof every support and the foundations thereof shall be so constructed and sited, taking into account the reaction of the ground in which they are to be embedded to the loads which they are designed to carry, as to withstand simultaneously the forces specified in paragraph 3(b) of Schedule 2 without the stress in the support or any of its constituent members exceeding 40 per centum of whichever of the following is appropriate :—

- (a) the elastic limit in the case of all steel members other than crossarms, bracings and stays fixed to wooden, reinforced concrete or pre-stressed reinforced concrete supports ;
- (b) the ultimate tensile stress in the case of steel cross-arms, bracings and stays fixed to wooden, reinforced concrete or pre-stressed reinforced concrete supports ;
- (c) the ultimate extreme fibre stress in the case of wooden supports and wooden cross-arms ;
- (d) the ultimate compressive or shear stress of the material concerned ;

- (e) the crippling load of any strut ;
  - (f) the maximum stress which can be accepted throughout a reinforced or pre-stressed reinforced concrete support without failure or inability to support further load.
- (3) For the purposes of paragraph (2) hereof the forces specified in paragraph 1(b) of Schedule 2 shall apply in place of those specified in paragraph 3(b) of that Schedule in the case of any support carrying a line conductor to which Part I of that Schedule applies.
- (4) 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, be not less than one quarter of its required strength in a horizontal direction at right angles to such direction.
- (5) The minimum diameter of a wooden support at a point 1.5 metres above the butt shall be 150 millimetres.

### PART III

#### EXISTING ELECTRIC LINES AND SUPPORTS

##### *Height above ground*

11. Except under and in accordance with the terms of a written authority granted by or on behalf of the Minister of Technology or the Secretary of State no Electricity Board shall use any line conductor, or earth or other wire or cable, if the height above ground of the line conductor, earth or other wire or cable falls below the minimum height required by whatever regulations may have been in force at the time of erection of such line conductor, earth or other wire or cable.

##### *Maintenance*

12. Every electric line, support, wire and cable shall be properly and efficiently maintained.

### PART IV

#### ALL ELECTRIC LINES AND SUPPORTS

##### *Position, insulation and protection of line conductors*

13. Except under and in accordance with the terms of a written authority granted by or on behalf of the Minister of Technology or the Secretary of State—

- (a) every line conductor or part thereof (other than a line conductor connected with earth) which is not ordinarily accessible from the ground or from a building or structure shall either—
  - (i) be supported at appropriate intervals by insulators suitable for the conditions under which it is to be used ;
  - or
  - (ii) be effectively insulated by surrounding it with, or encasing it in, material suitable for the conditions under which it is to be used ;
- (b) every line conductor or part thereof (other than a line conductor connected with earth) which is ordinarily accessible from the ground or from a building or structure shall be effectively insulated by surround-

ing it with, or encasing it in, material suitable for the conditions under which it is to be used, and every such line conductor or part thereof and any insulating material surrounding or encasing it shall be protected so far as is reasonable in the circumstances against mechanical damage or interference ;

- (c) any bare medium or low voltage line conductor not connected with earth shall be situated, throughout its length, vertically above a bare earth wire or a bare line conductor which is connected with earth.

#### *Earthing connections*

**14.**—(1) Except under and in accordance with the terms of a written authority granted by or on behalf of the Minister of Technology or the Secretary of State—

- (a) any metalwork attached to, or forming part of, any support carrying a line conductor, other than a wooden pole, and every metal transformer case, shall be connected with earth ;
- (b) any metal bracket which carries a line conductor not connected with earth and which is attached to, in contact with or adjacent to any metalwork on or forming part of any building or structure shall be connected with earth unless such line conductor is both surrounded by insulation and supported by an insulator, each form of insulation being suitable for the conditions under which it will be required to operate in the event of failure of the other ;
- (c) any metalwork attached to, or forming part of, any wooden pole support carrying a line conductor shall be connected with earth unless the design and construction of the support and its fittings are such as to prevent, so far as is reasonably practicable, danger within 3 metres of the ground due to leakage across, or failure of, an insulator supporting the line conductor or of the insulation surrounding such conductor ;
- (d) every stay wire which forms part of or is attached to any support carrying a line conductor and which is not connected to an earth lead shall be fitted with an insulator no part of which shall be less than 3 metres above ground.

(2) Every earth connection shall be installed in such a manner and in such a position and so maintained as to prevent, so far as is reasonably practicable, any accident arising from the presence of a voltage gradient.

#### *Precautions against excessive voltage*

**15.** Every medium or low voltage circuit shall so far as is reasonably practicable be protected against danger arising from accidental contact with or leakage from any high voltage circuit.

#### *Warning notices*

**16.** There shall be kept affixed to any support carrying a high voltage line conductor a notice inscribed with the word “DANGER” in white letters of at least 30 millimetres in height on a red background, or in red letters of the same dimensions on a white background.

#### *Precautions against access*

**17.** Every support carrying a high voltage line conductor shall, if the circumstances reasonably require, be fitted with suitable devices so as to prevent,

so far as may reasonably be foreseen, any person from having access to any position which is dangerously near any such line conductor.

PART V  
GENERAL

*Penalties*

**18.** Any Electricity Board failing to comply with any of the provisions of these regulations shall be liable on summary conviction to a fine not exceeding £100.

*Application*

**19.** These regulations shall not apply to any electric line or support above ground within premises under the control of any Electricity Board which are normally inaccessible to the public.

*Revocation*

**20.** The Overhead Line Regulations dated 10th January 1947 and made by the Electricity Commissioners under the Electricity (Supply) Acts 1882 to 1936 are hereby revoked.

Dated 4th September 1970.

*John Davies,*  
Minister of Technology.

Dated 10th September 1970.

*Gordon Campbell,*  
One of Her Majesty's  
Principal Secretaries of State.

SCHEDULE 1  
HEIGHT OF LINE CONDUCTORS

Regulation 7

Column 1	Column 2	Column 3
Not exceeding 33,000 volts	5·8 metres	5·2 metres
Exceeding 33,000 volts not exceeding 66,000 volts	6 metres	6 metres
Exceeding 66,000 volts not exceeding 132,000 volts	6·7 metres	6·7 metres
Exceeding 132,000 volts not exceeding 275,000 volts	7 metres	7 metres
Exceeding 275,000 volts	7·3 metres	7·3 metres

## SCHEDULE 2

## PART I

*Applicable to line conductors, wires, cables and their supports where the line conductors do not exceed 35 square millimetres of copper equivalent cross-sectional area and where the voltage of the system exceeds 650 volts but does not exceed 33,000 volts.*

*Forces applicable*

1. (a) In the case of every line conductor, wire or cable the forces shall be the tension forces in the conductor, wire or cable subject to the equivalent wind pressure specified in paragraph 2 of this Schedule ;

(b) in the case of every support the forces on the support shall be the forces due to the conductor, wire or cable being subject to the equivalent wind pressure specified in paragraph 2 of this Schedule.

*Equivalent wind pressure*

2. (a) The equivalent wind pressure on any line conductor, wire or cable shall be 760 newtons per square metre, the equivalent wind pressure on any support, insulator or equipment attached thereto being disregarded ;

(b) the force attributable to the equivalent wind pressure shall be the force resulting from the equivalent wind pressure acting horizontally at right angles to the line conductor on an area equal to the projected area of the line conductor, wire or cable as the case may be.

## PART II

*Applicable to line conductors, wires, cables and their supports other than those to which Part I applies.*

*Forces applicable*

3. (a) In the case of every line conductor, wire or cable the forces shall be the tension forces in the conductor, wire or cable due to the conductor, wire or cable having the augmented mass and the augmented diameter specified in paragraph 4 of this Schedule and being subject to the equivalent wind pressure specified in such paragraph ;

(b) in the case of every support the forces shall be :—

- (i) the forces on the support due to the line conductors, wires and cables having the said augmented mass and the said augmented diameter and being subject to the equivalent wind pressure specified in paragraph 4(c)(i) of this Schedule for such line conductors, wires and cables ; and
- (ii) the forces on the support, insulators and any equipment attached thereto due to the equivalent wind pressure specified in paragraph 4(c)(ii) of this Schedule for such support, insulators and attached equipment.

*Calculation of forces*

4. For the purposes of paragraph 3 of this Schedule :—

(a) (i) The augmented mass in grammes per metre length of every line conductor, wire or cable shall be the mass in grammes per metre length increased by the quantity derived from the formula :—

$$0.717\alpha(\alpha + 2\delta)$$

where  $\delta$  is the diameter in millimetres and  $\alpha$  is the amount in millimetres specified in sub-paragraphs (ii) or (iii) hereof as appropriate ;

(ii) where the highest voltage on the support does not exceed 650 volts  $\alpha$  shall be 9.5 ;

(iii) where the highest voltage on the support exceeds 650 volts  $\alpha$  shall be 19.

(b) (i) The augmented diameter of every line conductor, wire or cable shall be the diameter increased by the amount in millimetres specified in sub-paragraphs (ii) or (iii) hereof as appropriate ;

(ii) where the highest voltage on the support does not exceed 650 volts the amount in millimetres referred to in sub-paragraph (i) hereof shall be 9.5 ;

(iii) where the highest voltage on the support exceeds 650 volts the amount in millimetres referred to in sub-paragraph (i) hereof shall be 19.

(c) (i) The equivalent wind pressure on any line conductor, wire or cable shall be 380 newtons per square metre ;

(ii) the equivalent wind pressure on any support, insulator or equipment attached thereto shall be 380 newtons per square metre except in the case of any leaside member of a compound support when the equivalent wind pressure thereon shall be 190 newtons per square metre ;

(iii) the force attributable to the equivalent wind pressure shall be the force resulting from the equivalent wind pressure acting horizontally at right angles to the line conductor on an area equal to the projected area of the line conductor, wire, cable, support, insulator or equipment attached thereto as the case may be ;

(iv) the projected area of any line conductor, wire or cable shall be the projected area based on the augmented diameter specified in sub-paragraph (b) hereof.

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#### EXPLANATORY NOTE

*(This Note is not part of the Regulations.)*

These Regulations replace the Overhead Line Regulations 1947 made by the Electricity Commissioners. They impose a more flexible system of control on the design and erection of new overhead lines and set out the conditions under which the use of unearthed metalwork on wood pole supports is permitted.

The Regulations also impose stricter requirements in respect of all overhead lines as to the manner in which they should be maintained in the interests of safety.

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