

Installation of Aerial Line

Regulation 41. General conditions of aerial line.

The following general conditions shall apply to an aerial line:

(1) A line conductor shall be of hard-drawn copper, cadmium copper, aluminium or steel-cored aluminium, or such other material as may be approved in writing by the Commission.

(2) A line conductor, unless it is effectively insulated, shall be rendered inaccessible to the natural reach of a person in a building or any other place.

(3) The height of the line conductor shall be increased or its position altered in order to provide sufficient clearance for safety in accordance with its use.

(4) Effective means shall be provided to ensure that a line conductor is dead after it has fallen due to breakage or otherwise.

(5) Any metal work on supports other than a conductor, within 3, 048 millimetres of the ground wherever situated, shall be effectively earthed at each support or connected to a continuous overhead earth conductor which shall be effectively earthed at not less than four points in every 1.61 kilometres.

(6) Any stay wire under subregulation (5) shall be effectively earthed except where it is connected with any unearthed steel-work on wooden pole supports in which case it shall be insulated by means of an insulator placed in each stay wire at a height of not less than 3, 048 millimetres from the ground.

(7) A multiple-earth neutral shall not be installed except with the written approval of the Commission and subject to such conditions as the Commission may impose.

(8) A line conductor, other than a multiple-earth neutral, shall be attached to a suitable insulator carried on the support of wood, iron, steel or reinforced concrete.

(9) Every precaution shall be taken to prevent the corrosion of any metalwork and the deterioration of wooden poles and supports at or below the surface of the ground.

(10) A service line shall be connected to a line conductor at a point of support only and shall be fixed to an insulator on a consumer's premises.

(11) Adequate provision shall be made for any line conductor forming part of a system at different voltages, erected on the same pole or support, to—

(a) guard against danger to any person who works on the system; and

(b) guard against the lower voltage caused by leakage from, or when it comes into contact with, the higher voltage system.

(12) An aerial line, including its supports and structural parts, and any electrical appliance or device belonging to or connected therewith, shall be regularly inspected and effectively maintained.

(13) Any owner, management, licensee or supply authority, as the case may be, shall remove any aerial line upon ceasing to use it for transmission of electricity.

(14) The factor of safety of a line conductor shall be—

(a) based on the breaking load and shall be calculated on the assumption that the line conductor is at a temperature of 21 degrees Celsius; and

(b) the line conductor shall be simultaneously subjected to wind of 96.56 kilometres per hour at right angles to the line and this is wind to be taken as exerting a pressure equivalent to 0.05 gram per square millimetre calculated on the whole of the projected area of the lines.

(15) The height from the ground of any line conductor or auxiliary earth wire in still air shall not, except with the written permission of the Commission, be less than the height appropriate to the system voltage and situation indicated below:

<i>System Voltage between conductors</i>	<i>Ground Clearance in Metres</i>		
	<i>Over roads</i>	<i>Other than over roads</i>	<i>In positions inaccessible to vehicular traffic</i>
Not exceeding 600 volts	5.49	5.18	4.57
Exceeding 600 volts but not exceeding 11,000 volts	5.79	5.49	4.88
Exceeding 11,000 volts but not exceeding 66,000 volts	6.10	6.10	5.18
Exceeding 66,000 volts but not exceeding 132,000 volts	6.70	6.70	5.79
Exceeding 132,000 volts but not exceeding 275,000 volts	7.00	7.00	7.00
Exceeding 275,000 volts	7.30	7.30	7.30

(16) Any insulated line conductor, operating at a voltage not exceeding low voltage, shall be terminated on the building at a height of not less than 2.74 metres from ground level where the normal use of the building does not result in danger or accidental contact with the line conductor by a person normally resident in, or employed in, or visiting the building.

(17) A line conductor shall not cross, over or under, any radio aerial, except with the written permission of the Commission.

(18) Where an aerial line crosses, over or under or is in close proximity to any other aerial line, adequate clearance must be maintained, and where one of the aerial lines operates at high extra high voltage, and the other aerial line at low voltage, suitable protection shall be provided to protect the low voltage line from danger due to excess voltage in the event of any contact between the two lines due to breakage of any line conductor of any of the aerial lines.

(19) At the point of crossing of any aerial lines under subregulation (18), protection shall be provided by an earthed cradle guard between the two aerial lines, and where the higher voltage line crosses over the low voltage line, and where the higher voltage line crosses over the low voltage line, the cradle guard shall not be erected on the lower voltage line supports and shall not be connected to any of the lower voltage line conductors or auxiliary earth conductors except with the written permission of the Commission.

(20) A cradle guard under an aerial line shall be such that from the outermost wires on each side of the guard a line drawn upwards towards the centre of the guard at an angle of 45 degrees to the horizontal shall totally enclose the line conductors.

(21) A cradle guard shall be suitably backstayed where necessary, and in the event of breakage of any or all of the line conductors, the cradle guard shall support any fallen line conductor without serious deformation and without allowing the line conductor or the cradle guard wire to come into contact with the aerial line to be protected or any road underneath the guard.

(22) A cradle guard wire shall be of hard-drawn copper or galvanised stranded steel wire.

(23) The cradle guard shall be connected at both ends to effective earth plates or pipes and to the continuous earth wire, if provided, and the electrical resistance of the cradle guard to earth shall be maintained at a sufficiently low value to ensure the immediate operation of the protective devices controlling the circuit in the event of failure of insulation occurring between a line conductor and the cradle guard.

(24) Any cradle guard wire, including cross lacing, must be maintained in good order and sound condition and the resistance of each arrangement of cradle guard wires to earth must be maintained at a sufficiently low value so that, in the event of any contact occurring between a line conductor and a cradle guard wire, the line conductor shall be made dead.

(25) An aerial line may cross over a railway line provided that, in all cases, the prior written consent of the relevant authority has been obtained, and any such crossing shall be installed and protected in the manner prescribed in subregulation (20), (21), (22), (23) and (24) and conforms with any instruction issued from time to time by the Commission or the relevant authority, as the case may be.

(26) No joint in a line conductor shall be made in any span of an aerial line which crosses over another aerial line or a telecommunication line, road, railway line or navigable waterway.

(27) *[Deleted by P.U.(A) 431/2003: Reg. 20]*

Regulation 42. Aerial line operating at low voltage.

The following conditions shall apply to an aerial line operating at low voltage:

- (a) an aerial line shall be protected from leakage in the following manner:
 - (i) in a case where metal poles are used, an earthed wire running from pole to pole and connected to the pole shall be used; or
 - (ii) in a case where wooden or concrete poles are used, a bonding wire connected to the supporting metalwork of all insulators and terminating at the lowest point shall be used; and
 - (iii) in all cases, the neutral shall be the lowest conductor of an aerial line;
- (b) a line conductor may cross, over or under, any overhead telecommunication line, provided that the line is installed and protected in accordance with the provisions of subregulations 41(21), (22), (23), (24) and (25) and conforms with any instruction issued from time to time by the Commission or Malaysian Communication and Multimedia Commission;
- (c) the clearance between a line conductor and a building or structure, other than a substation, shall be maintained at not less than 2,134 millimetres horizontally or not less than 2, 743 millimetres vertically unless the written permission of the Commission has been obtained to provide for a different clearance;
- (d) no person shall, without the lawful authority of the owner, management, licensee or supply authority of the installation, as the case may be, undertake any work or engage in any activity within 2, 134 millimetres horizontally or 2, 743 millimetres vertically of any conductor.

Regulation 43. Aerial line operating at high or extra high voltage.

The following provisions shall apply to an aerial line operating at high or extra high voltage:

- (a) any metalwork other than conductors, but including stays, shall be permanently and effectively earthed and for this purpose a continuous earth wire shall be provided and connected with earth at not less than four points in every 1.61 kilometres, the spacing between the points being as nearly equal as possible, or the metalwork shall be connected to an effective earthing device at each individual support;
- (b) where an aerial line crosses over a road, a suitable cradle guard shall be erected in accordance with the requirements of subregulations 41(21), (22), (23), (24) and (25) and the Commission may in special circumstances exempt the owner, management, licensee or supply authority of the installation, as the case may be, from having to comply with this subregulation;

(c) no aerial line shall be erected along a road without the prior approval in writing of the Commission who may require special precautions and method of construction to be adopted;

(d) any line conductor operating at a voltage not exceeding 66, 000 volts may cross over an overhead telecommunication line provided that the crossing is installed and protected in the manner required by subregulations 41(21), (22), (23), (24) and (25) and conforms to any instruction issued from time to time by the Commission or Malaysian Communications and Multimedia Commission;

(e) an aerial line support or structure shall be clearly and permanently marked with a number;

(f) an aerial line support or structure shall be numbered consecutively;

(g) adequate provision shall be made to prevent unauthorized climbing on any lattice steel tower or other types of aerial line support or structure;

(h) a danger notice of the standard pattern prescribed in subregulations 38(3) and (4) shall be fixed at each support or structure where an aerial line is erected along or across a road, canal, navigable river or railway or crosses over any other overhead conductor;

(i) the clearance between a line conductor and a building or structure, other than a substation, shall be maintained at not less than 4.57 metres unless the written permission of the Commission has been obtained to provide for a different clearance;

(j) no person shall, without the lawful authority of the owner, management, licensee or supply authority of the installation, as the case may be, undertake any work or engage in any activity within 4.57 metres of a conductor;

(k) an aerial line conveying electricity at high or extra high voltage shall not be laid or placed parallel to or nearly parallel to any telecommunication line which is within 183 metres by direct measurement of the proposed route of the supply line:

Provided that the distance of 183 metres may be increased or reduced by the Commission after considering the voltage to be used and all circumstances generally affecting each particular case;

(l) no person, other than a licensee or supply authority, shall lay or place an aerial line conveying electricity at high or extra high voltage within 9.15 metres of any open wire telecommunication line except with the written permission of the Commission; and

(m) the provisions of paragraph (1) shall not apply to any telecommunication line or apparatus installed in a building.