

REPUBLIC OF RWANDA



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GUIDELINES N°01/GL/EL-EWS/RURA/2015

ON

RIGHT-OF-WAY FOR POWER LINES

ADOPTED BY

THE REGULATORY BOARD

OF

RWANDA UTILITIES REGULATORY AUTHORITY (RURA)

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0. INTRODUCTION

The law No 21/2011 of 23/06/2011 governing electricity in Rwanda, especially in Article 48, stipulates that *"The right of way is necessary to the operators in production, transmission, distribution and supply of electricity and shall be exercised in accordance with the standards set by the Regulatory Authority"*.

Within its mandate of regulating the Electricity Sector, RURA has the responsibility of ensuring that Licensees provide safe, reliable and economical electrical service to all customers. Keeping electricity reliable requires unobstructed access for maintaining power lines, facilities and rights of way.

These Right-of-Way guidelines have been developed to provide the required minimum safety corridor around power lines with consideration to safety clearances. The guidelines also provide the procedures for obtaining Right-of-Way and responsibilities of different parties involved in Right-of-Way for power lines. They also intend to limit the uses within the Right of Way to activities that are safe and compatible with the operation of the Power Lines.

These guidelines shall be used in planning of every power project for an orderly and sustainable development of power lines in the country.

The Regulatory Board of the Rwanda Utilities Regulatory Authority, upon due consideration and deliberations in its meeting of 30th November 2015, hereby issues the following guidelines on Right-of-Way for Power Lines in Rwanda;

I. GENERAL PROVISIONS

I.1 PURPOSE OF THESE GUIDELINES

The purpose of these guidelines is to provide a safety corridor to allow the Licensee to keep the power lines clear of tall trees, building and other structures that could interfere with line operation and to provide access for maintenance of power lines to ensure safety of public, properties and environment around power lines.

I.2 SCOPE

The Right-of-Way Guidelines cover the required minimum safety corridor around power lines with consideration to safety clearances and electromagnetic field exposure limits, which would enable the power utility to build, maintain, replace or protect its facilities. The guidelines also provide procedures for obtaining Right-of-Way and responsibilities of different parties involved in Right-of-Way for power lines.

I.3 DEFINITIONS OF TERMS

For the purpose of these guidelines, the terms hereunder shall have the following meaning:

1. **Border Zone:** area from the Wire Zone to the edge of the Right-of-Way;
2. **Distribution line:** a power line that carries electricity at Medium or Low Voltages (≤ 30 kV) from substations to various categories of consumers;
3. **Easement:** an agreement between the Licensee and the Landowner which grants a permanent right to the Licensee to cross or use land to build, maintain, operate and protect the power lines, while permitting the landowner to retain the general ownership and control of the land;
4. **Licensee:** an electric power company that is licensed by the Regulatory Authority to own and operate equipments and facilities for transmission and distribution of electric energy which it sells to consumers;
5. **Power line:** a set of conductors and associated structure used to transmit and distribute electrical energy;
6. **Right-of-Way:** strip of land set aside for a safety corridor distance between the power line and nearby structures and vegetation and which is used by the Licensee to construct, maintain or repair a power line;
7. **Regulatory Authority:** refers to the Rwanda Utilities Regulatory Authority as established by the Law No 09/2013 of 01/03/2013.
8. **Transmission line:** a power line that carries electricity at High Voltages (≥ 110 kV) from generating plants to substations or between substations and;
9. **Wire Zone:** area directly under the power conductors.

II. RIGHT-OF-WAY PRINCIPLES AND ASSOCIATED DIMENSIONS

II.1 FACTORS AFFECTING DIMENSIONS OF RIGHT-OF-WAY

The dimensions of the Right-of-Way are dependent on factors associated with the type of power line installed which include but not limited to:

1. **Voltage:** the voltage level of the distribution power line influences the potential for electric discharge. The higher the voltage the greater the potential and hence the need for a greater clearance space;
2. **Type:** insulating power line conductors reduces the risk of electric discharge. Using aerial bundled cable or other insulated conductors reduces the necessary dimensions of the clearance space;
3. **Span length (distance between poles):** as the span length increases, the added weight of the power line conductors causes an increase in power line sag. Conductors can sway with the wind, therefore all dimensions of the clearance space shall be greater as the span length increases;
4. **Conductor size:** the size of a power line conductor affects its weight and therefore the amount that the conductor will sag. Conductors can sway with the wind therefore dimensions of the clearance space needs to increase as the size of the conductor increases;
5. **Distance along the power line conductors from the pole:** along the distribution power line conductors, the greatest sag occurs midway between the supporting poles (on level ground);
6. **Temperature of the power line conductors:** increases in the temperature of power line conductors, caused by weather and the amount of electricity being carried, increases the sag of the conductors. These factors are in a state of continual change, so an allowance is made in the dimensions of the clearance space for the temperature of transmission/distribution power line conductors.

II.2 RIGHT-OF-WAY DIMENSIONS

1. The Schedule 1 in the annex specifies minimum horizontal Right-of-Way width requirement for overhead lines. The actual Right-of-Way required will depend of the topography, structure type, span length, and other factors that might be determined by the Licensee;
2. Right-of-Way dimensions for existing power lines or when special circumstances require may differ from values given in the Schedule 1;

3. Right-of-Way dimensions near fuel and gas tanks shall be at minimum equal to the values given in Schedule 2;
4. When the power line parallels other existing infrastructure Right-of-Way such as roads, railroads, a lesser width may be required as part of the Right-of-Way of the existing infrastructure can often be combined with the Right-of-Way needed for the power line;
5. The safety clearance distances to power lines shall comply with the following standards:
 - i. RS 474-1: 2011 for Power Installations exceeding 1kV a.c. – Part 1: Common rules;
 - ii. RS EAS 811-2: 2014 on Code of practice for safety of electrical installations;
 - iii. Any other relevant standards issued by the National Standards Bureau.
6. For safety purposes, underground lines shall be placed at the minimum depth specified in Schedule 3.
7. The safety clearance between underground lines and communication facilities in joint use manholes and vaults shall be at minimum equal to the specified distances given in Schedule 4;
8. If an underground cable is placed beneath an urban road then the Right-of-Way would be the road itself. If the underground cable is not following a roadway, the Right-of-Way shall be based on the amount of space needed for construction and maintenance activities to safely take place.

III. PROCEDURES FOR LAND ACQUISITIONS

III.1 RIGHT-OF-WAY ACQUISITION

1. The Licensee shall obtain a Right-of-Way for a power line through an Easement from the property owner or through purchasing the title ownership of the required land. In the latter case, a landowner shall sell the strip or be expropriated of the land to the Licensee outright.
2. The Regulatory Authority views the easement as a private agreement between two parties and would therefore not be directly involved, unless asked by one of the parties to provide an independent and unbiased response to practices that contravene these guidelines by any of the parties.

III.2 EASEMENT

1. The Licensee shall acquire easements by negotiating with land owners on whose land the power line will be placed. As agreed upon in negotiations, the Licensee may pay a compensation fee to the landowner in one lump sum.

2. The easement shall specify rights and restrictions of both the Licensee's and the landowner's use of the land. The Licensee shall be allowed to build and maintain the power line while the landowner shall retain general ownership and control of the land.
3. An easement shall be binding with the land, which means it shall stay with the property even if ownership of the property changes until the contract is dissolved.
4. All easement rights shall be registered in accordance the Law in force governing land registration.
5. The Local Authorities in charge of land management and the landowner shall ensure that this easement is disclosed for all subsequent transaction including proposals for development and sales/exchange or transfer of ownership of the land.
6. Where a new line need to be installed in place of an older line that is in poor condition, if the existing Right-of-Way is not appropriate for the new line, a new Right-of-Way can be obtained through a new easement.
7. If the Licensee removes a power line, it might offer the landowners the opportunity to cancel their easement agreements.

III.3 EXPROPRIATION

1. Expropriation of the Right-of-Way shall be conducted in accordance with the Law into force governing expropriation for public interest in Rwanda. The landowner shall subsequently hand over all the rights and responsibilities for the expropriated strip of land.
2. Procedures for land acquisitions and land transfer shall comply with the domestic laws and regulations governing the matters.

IV. THE USE OF RIGHT OF WAY

IV.1 LANDOWNER RIGHTS

1. The Licensee shall not use any land beyond the boundaries of the easement for any purpose, without the consent of the landowner.
2. The landowner shall be afforded a reasonable time to be agreed with the Licensee prior to commencement of construction or maintenance to harvest any trees or vegetation located within the easement boundaries, and if the landowner fails to do so, the landowner shall nevertheless retain title to all trees cut by the Licensee.

IV. 2 LIMITATION OF LIABILITY

The landowner shall not be responsible for any injury to persons or property caused by the design, construction or upkeep of power lines unless his responsibility has been fully proven by the Competent Court of the Law.

IV.3 RESTRICTION ON RIGHT OF WAY

The Right-of-Way shall generally be clear of unauthorized structures that could interfere with a power line operation.

IV.4 GENERAL REQUIREMENTS

It is forbidden for any person to do or assist in any of the following acts:

- a. to construct any building or structure or carry out cultivation, farming or any other activity within the Right-of-Way prior to the consent of the Licensee;
- b. ~~to drill, mine or excavate or carry on any similar operation within the Right-of-Way;~~
- c. to place any combustible material inside the Right-of-Way;
- d. to cause any fire to burn within Sixty (60) meters of the transmission line Right-of-Way;
- e. to climb on to, attach to or hang any object on or from any tower/pole or transmission/distribution line;
- f. to cause anything to come into contact with the power line;
- g. to place, drive, tow, pull or carry any crane, jig, or any object, under, over or near the transmission line except with the prior consent of the Licensee obtained in writing and subject to any condition that the Utility may impose in relation to such consent;
- h. to carry out any form of blasting within hundred (100) meters of any power line; and
- i. Permanent buildings, including foundations and overhangs, pools, septic tanks, dumps, junkyards, wells, fueling or fuel storage facilities, garbage, recycling receptacles and other non-compatible uses shall not be permitted on the Right-of-Way.

IV.5 DEROGATIONS

1. As long as minimum clearances from poles and conductors are maintained and with a prior written consent of the Licensee, the Right-of-Way can be used for certain activities such as yards, gardens, pastures and farming, recreational fields, streets, roads, driveways, parking lots, lakes, fences, drainage ditches, grading or any other activity that may not interfere with the line operation.

2. Temporary buildings or structures that are small and easily movable may be acceptable in the Right-of-Way with prior approval of the Licensee, provided that:
 - a. they are located away from the Licensee's works and access roads and not directly beneath overhead conductors;
 - b. they are not habitable;
 - c. they are not used for the purpose of storing flammable, explosive or toxic materials that could create a fire hazard;
 - d. they do not have electrical or water service;
 - e. they are of non-metallic construction, or are grounded to the utilities' satisfaction.
 - f. they do not adversely affect safety of customers, utility personnel and the general public.

IV.6 LICENSEE'S OBLIGATIONS

In constructing and maintaining power lines on the property covered by the easement, the Licensee shall:

1. Maintain the Right-of-Way as it requires, both within the Wire Zone and the Border Zone;
2. Remove vegetation that could pose danger to a power line or pole inside the Right-of-Way and outside the Right-of-Way if it could come too close to power lines or poles;
3. If excavation is necessary, ensure that the top soil is stripped, piled and replaced upon completion of the operation;
4. Restore to its original condition any strip of land which has been disturbed by the construction or maintenance;
5. Clear all debris and remove all stones and rocks resulting from construction activity upon completion of construction;
6. Pay for any damage caused by such construction or maintenance or satisfactorily repair any damage caused by such construction or maintenance to its original condition;
7. Control vegetation and weeds around its power lines and facilities, and decide the appropriate method to adopt to ensure that the clearance space remains free of vegetation that could pose danger to a power line taking account of the potential risk to the public, conservation and other values;
8. Ensure that the pruning or clearing is done responsibly; and determine the regrowth space, hazard space and the pruning and clearing cycle;

9. Notify the land owner before carrying out any pruning and clearing. In emergency situations, the Licensee may remove vegetation which poses an immediate risk without notification, but the Licensee should notify the owner or occupiers as soon as practicable after the removal of the vegetation;
10. Ensure that pruning or clearing activities near power lines are undertaken safely. This may require the Licensee to de-energize the power lines or install necessary grounding to landowner's fence or equipment to enable the clearance of vegetation safely; and
11. Ensure that any of his employees undertaking operations in the vicinity of his power lines, and any contractors he engages to carry out such works are appropriately trained and competent for that task, especially on safe working practices near power lines.

V. FINAL PROVISIONS

V.1 REPEALING PROVISION

All prior legal provisions inconsistent with these guidelines are hereby repealed.

V.4 COMMENCEMENT

These guidelines shall come into force on the date of its signature by the chairperson of the Regulatory Board.

Done at Kigali, on 30th November 2015

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Eng. Coletha RUHAMYA
CHAIRPERSON OF THE REGULATORY BOARD

SCHEDULES

SCHEDULE I: HORIZONTAL RIGHT-OF-WAYS

VOLTAGE LEVELS	0.4 kV	15kV≤V≤30 kV	110 kV	220 kV	400 kV
Right of Way width (m)	3	12	25	30	50

Note: The power lines shall be centered in the Right-of-Ways given in the table above.

SCHEDULE II: RIGHT-OF-WAY OF POWER LINES TO FUEL TANKS

VOLTAGE LEVELS		0.4 kV	15 kV	30 kV	110 kV	220 kV	400 kV
Horizontal Clearance from power line conductors to petrol tanks and vents (m)		15	15	15	15	15	20
Horizontal clearance from line conductors to liquid gas tanks (m).	1) 459 to 2273 liter capacity	3	6	6	15	15	25
	(2) 2274 to 9092 liter capacity	7.6	7.6	7.6	15	15	25
	(3) More than 9093 liter.	15	15	15	15	15	20

**SCHEDULE III: UNDERGROUND SUPPLY CABLE OR CONDUCTOR BURIAL,
DEPTH**

VOLTAGE LEVELS	0.4 kV	15 kV	30 kV	110 kV	220 kV	400 kV
Minimum Depth of burial (m)	0.6	0.8	0.8	1.2	1.2	1.2

Note:

- Depths of burial specified herein are applicable to both direct buried cables and cables in ducts or likewise.
- Cables crossing the road shall be buried through conduit ducts (steel or concrete) and shall have a minimum depth of 0.8m.

**SCHEDULE IV: CLEARANCE BETWEEN SUPPLY AND COMMUNICATIONS
FACILITIES IN JOINT-USE MANHOLES AND VAULTS**

VOLTAGE LEVELS	0.4 kV	15 kV	30 kV	110 kV	220 kV	400 kV
Surface to surface clearance (m)	0.15	0.15	0.23	0.3	0.6	0.6

Note:

- These clearances do not apply to earthing conductors.
- These clearances may be reduced by mutual agreement between the parties concerned when suitable barriers or guards are installed.

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**Eng. Colethu RUHAMYA
CHAIRPERSON OF THE REGULATORY BOARD**