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Discipline
Engineering Standard - NSW

Category
Electrical

Title
Transmission Line Base Safety and Operating Standards

Reference Number
POS 01 - (RIC Standard: EP 10 01 00 03 SP)

Document Control

Status	Date	Prepared	Reviewed	Endorsed	Approved
Issue 1 Revision 1	Mar 05	Standards and Systems	Signalling Standards Engineer	GM Infrastructure Strategy & Performance	Safety Committee
		Refer to Reference Number	T Moore	M Owens	Refer to minutes of meeting 24/01/05

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Document Approval

The technical content of this document has been approved by the relevant ARTC engineering authority and has also been endorsed by the ARTC Safety Committee.

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About This Standard

This Standard indicates those common conditions which should be reason for interrupting service of aerial transmission line feeders in order to perform urgent corrective actions to ensure the safety and reliability of the equipment. If the repairs are not performed, there is a risk of consequential human injury or damage to equipment.

This publication supersedes RIC. publication “Transmission Line Base Safety and Operating Standards” EP 10 00 00 03 SP dated June 1997.

Document History

Primary Source – RIC Standard EP 10 01 00 03 SP Version 1.0

List of Amendments –

ISSUE	DATE	CLAUSE	DESCRIPTION
1.1	11/03/2005	Disclaimer	Minor editorial change

Contents

1 References

[1] Standards Australia & Electricity Supply Association of NSW publication HB C(b)1, “Guidelines for Design and Maintenance of Overhead Distribution and Transmission Lines”.

[2] Electricity Association of NSW publication ISSC3, “Guidelines for Tree Planting and Maintaining Safety Clearances Near Power Lines”.

2 Basic Condition of Equipment

Asset / Parameter	**Base Safety and Operating Limit**
Damaged Conductors	Signs of damage (eg. stranding) with less than half the conductor cross-sectional area remaining.
Damaged Connections	Signs of excessive burning that could cause failure of the conductors.
Damaged Pole	Cracked or weakened pole, repair within 1 day when: • Internal decay is found to be larger than 75% of the original ground line diameter provided there is negligible reduction in the original outside diameter of the pole at groundline or • The outside diameter of the pole at groundline has been reduced to less than 80% of the original groundline diameter and the pole has any internal defect. If risk of imminent failure, immediately support the pole before proper repairs are effected. (This includes damage due to collision, termites, dry rot, pipes, etc.)
Damaged Conductor Support	Failure of any pole top equipment that could result in a conductor falling to ground, eg. broken cross arm, damaged insulator string, etc.
Foreign Objects on Transmission Line	Foreign objects such as conductive materials (eg. wire) hanging from the transmission line such as to cause a safety or operation hazard. • To be removed immediately.

Asset / Parameter	Base Safety and Operating Limit
Leakage / Interference	Reported interference to radio and television reception • Replace suspect insulators within 7 days.
Bushfires	Bushfires in immediate vicinity of transmission line feeders pose a potential safety hazard. • Isolate the transmission line in conjunction with relevant Authorities. • Patrol the transmission line before re-energising the feeder.
Floods	Flooded transmission line easement or right of way. • Isolate the transmission line in conjunction with relevant Authorities. • Patrol the transmission line before re-energising the feeder.

3 Clearances

Asset / Parameter	Base Safety and Operating Limit
Clearance Infringements	Clearances to structures, other circuits and ground line less than those identified in Standards Australia & Electricity Supply Association joint publication HB C(b)1 • The transmission line is to be taken out of service for immediate repair (at the discretion of the System Control Engineer and Maintainer). Vegetation clearances identified as an Emergency Risk Category as shown in the table in Appendix A. • The transmission line is to be taken out of service for immediate repair (at the discretion of the System Control Engineer and Maintainer). Trees or structures reported in a dangerous condition and likely to fall on the transmission line. • Isolate the transmission line until the danger has been removed.

4 Appendix A – Vegetation Clearance - Maintenance Triggers and Risk Categories

Voltage	Risk category	Clearance at pole to nearest conductor in rest position	Clearance along middle 2/3 of span to nearest conductor in rest position
Up to 1,000V	**High –** All areas – correct within 7 days	0 – 0.5m	0 – 0.5m
	Medium – Correct within 4 weeks	0.5 – 1.0m	0.5 – 1.0m
	Low – Correct within 3 months	1.0 – 1.5m	1.0 – 1.5m OR sag at 50^0C plus 1.0m (which ever is greatest).
Greater than 1,000V up to 22kV	**Emergency –** In public areas or bush fire risk – Correct immediately November to March inclusive	0 – 0.5m	0 – 0.5m
	High – All areas – correct within 7 days	0 – 1.0m	0 – 1.0m
	Medium – Correct within 4 weeks	1.0 – 1.5m	1.0 – 1.5m
	Low – Correct within 3 months	1.5 – 2.0m	1.5 – 2.0m OR sag at 50^0C plus 1.0m (which ever is greatest).
Greater than 22kV up to 66kV	**Emergency –** In public areas or bush fire risk – Correct immediately November to March inclusive	0 – 0.5m	0 – 0.5m
	High – All areas – correct within 7 days	0 – 1.5m	0 – 1.5m
	Medium – Correct within 4 weeks	1.5 – 2.25m	1.5 – 2.25m
	Low – Correct within 3 months	2.25 – 2.75m	2.25 – 2.75m OR sag at 50^0C plus 1.0m (which ever is greatest).
Greater than 66kV up to 132kV	**Emergency –** In public areas or bush fire risk – Correct immediately November to March inclusive	0 – 1.0m	0 – 1.0m
	High – All areas – correct within 7 days	0 – 2.0m	0 – 2.0m
	Medium – Correct within 4 weeks	2.0 – 3.0m	2.0 – 3.0m
	Low – Correct within 3 months	3.0 – 3.5m	3.0 – 3.5m OR sag at 50^0C plus 1.0m (which ever is greatest).
11 kV Aerial Bundled Cable Screened and insulated Low Voltage service Lines	**High –** 16mm diameter branches resting, rubbing on cable – Correct within 48 hours	0	0
	Medium – 16mm diameter branches in clearing space – Correct within weeks	0 – 0.5m	0 – 1.0m
	Low – Branches than 16mm in clearing space – Correct within 3 months	0.5 – 0.7m	1.0 – 1.5m OR sag at 50^0C plus 1.0m (which ever is greatest).

NOTE: *During hot weather highly flammable gases are given off from most native trees and these gases can be easily ignited by contact between the conductor and trees. This consequence must be taken into account when assessing the category of clearance infringement.*

These clearances allow for fire hazard areas and for normal whip by trees in high winds. Additional allowances should be made for very slender trees.

No limbs should be permitted to overhang the clearance space or any conductor in any fire hazard area.