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Electrical installations — Extra-low voltage power supplies and service earthing within telecommunications networks



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Electrical installations — Extra-low voltage power supplies and service earthing within telecommunications networks

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Preface

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee EL-001, Wiring Rules, to supersede AS/NZS 3015:2004, *Electrical installations — Extra low-voltage d.c. power supplies and service earthing within public telecommunications networks*.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this document as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this document is to establish safety requirements, consistent with maintaining continuity of essential supply, for the installation of extra-low voltage (ELV) power supplies in restricted access locations (RAL) of telecommunications networks.

The major changes in this edition are as follows:

- (a) AS/NZS 3015:2004 applied only to public telecommunications networks. This edition now applies to all telecommunications carriers.
- (b) Other organizations and entities may opt to use this document.
- (c) The demarcation points between Standards relating to telecommunications infrastructure have been defined.
- (d) Requirements for outdoor cabinets and enclosures, and pole-mounted infrastructure have been included.
- (e) Electrical energy source classifications have been defined.
- (f) Requirements for the co-location of ELV and low voltage (LV) power have been included.
- (g) Guidance on emergency powering of outdoor cabinets has been included.
- (h) The batteries and battery hazards section includes new battery energy storage technologies and the addition of lithium-ion (Li-ion) batteries.
- (i) Requirements for special earthing for buildings and shelters, outdoor cabinets, pole-mounted equipment and rooftops have been included.
- (j) Updates to figures for overall site earthing, radio site earthing, outdoor cabinets, pole-mounted equipment and dedicated site earthing.
- (k) Requirements on indoor earthing have been included.
- (l) Maximum values of earth resistance have been revised.
- (m) [Appendix C](#) has been updated.
- (n) [Appendices D, E and F](#) have been added.
- (o) Hybrid fibre-coaxial (HFC) is deemed to be ES1 or ES2, and included in the scope of this document.

The terms “normative” and “informative” are used in Standards to define the application of the provisions to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

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Introduction

Most telecommunications network equipment is powered from extra-low voltage (ELV) supplies that are 12, 24 or 48 V d.c. but may also include a.c. telecommunications network equipment that is powered from ES1 or ES2 power supplies. This voltage is the nominal voltage between positive and negative regardless of which pole, if either, is earthed. Consequently, these supplies and their power distribution systems fall into the category of ELV as defined in this document.

The power supplies form an integral part of the telecommunications facility and their proper function is vital to the continuation of such a facility, especially to essential services such as railways, the police, fire brigade and ambulance services. The practices that are included in this document have been developed over many years of safe operation in telecommunications networks. This document applies to telecommunication carriers or other organizations and entities that opt to use this document. Use of this document is recommended for all other entities that install or operate telecommunications equipment.

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Electrical installations — Extra-low voltage power supplies and service earthing within telecommunications networks

Section 1 Scope and general

1.1 Scope

This document sets out requirements for telecommunications ELV power systems and earthing in the provision of telecommunications networks where —

- (a) the telecommunications carrier or entity owns the ELV power supply;
- (b) the ELV power supply is located in a restricted access location; and
- (c) the ELV power supply is located in premises and on land that are owned, leased or otherwise occupied in whole or in part by the telecommunications carrier or entity.

This document defines the demarcation points between Standards when used in telecommunications infrastructure.

This document also specifies the minimum requirements for personal safety, equipment safety and safety from fire while maintaining the viability of the telecommunications network.

This document is applicable to the following:

- (i) Critical power systems including —
 - (A) telecommunication facilities;
 - (B) wireless/radio sites;
 - (C) small cells;
 - (D) outdoor cabinets and enclosures;
 - (E) hybrid fibre-coaxial (HFC) power systems;
 - (F) pole-mounted infrastructure; and
 - (G) security and building management systems associated with information telecommunications infrastructure [Information Communication Technology (ICT)].
- (ii) Single or dual plane power systems.
- (iii) Rechargeable battery systems.
- (iv) Partial state of charge battery systems.
- (v) Telecommunications off-grid power systems e.g. solar, wind or fuel cell.

This document does not apply to power systems of the following types —

- (A) portable equipment;
- (B) electric vehicles;
- (C) uninterruptible power systems (UPS) that are in accordance with AS 62040.1.1 and AS 62040.1.2 (with the exception of HFC UPS systems);
- (D) non-telecommunications industrial premises; or