AS/NZS 3835.1:2006

Australian/New Zealand Standard™

Earth potential rise—Protection of telecommunications network users, personnel and plant

Part 1: Code of practice

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee ET-007, Coordinating Committee on Power and Telecommunications (CCPT). It was approved on behalf of the Council of Standards Australia on 10 April 2006 and on behalf of the Council of Standards New Zealand on 13 April 2006.
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The following are represented on Committee ET-007:

Australian Communications and Media Authority
Co-opted Member
Electrical Regulatory Authorities Council
Energy Networks Association
NZCCPTS
Telecommunications Carriers

Additional Interests:

Energex
Queensland Rail
Electranet (South Australia)

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We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia or Standards New Zealand at the address shown on the back cover.

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Australian/New Zealand Standard™

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Technical Committee ET-007-01, Earth Potential Rise, a Joint Committee for the Coordination of Power and Telecommunications Systems.

In Australia, this Standard supersedes the EPR Code, Issue 1, 1984, published jointly by the Australian Telecommunications Commission (now Telstra Corporation), and ESAA (now ENA-Energy Networks Association).

In New Zealand, this Standard supersedes the Application guide for EPR, 1989, published by the New Zealand Committee for the Co-ordination of Power and Telecommunications Systems (NZCCPTS).

The objective of this part of AS/NZS 3835 is to identify and minimize hazards to telecommunications personnel, users and plant caused by earth faults on high voltage a.c. power systems.

Preparation of this Standard was undertaken to update the technical content of the original EPR Code and to remove those contractual and procedural matters better dealt with elsewhere.

This Standard makes reference to publications prepared by the NZCCPTS. Enquiries concerning these publications should be directed to the secretary of NZCCPTS. Contact details for the secretary and details of NZCCPTS publications are available at the web site http://www.nzccpts.co.nz. Some of the publications are available as free downloads from the above web site.

This Standard is Part 1 of a series dealing with Earth Potential Rise (EPR). This Standard when complete will consist of the following parts:

AS/NZS	
3835	Earth potential rise—Protection of telecommunications network users, personnel and plant
3835.1	Part 1: Code of practice (this Standard)
3835.2	Part 2: Application guide
3835.3	Part 3: Isolation arrangements for paired cable telemetering telecontrol services in LV areas and HV sites
HB 219	Earth potential rise—Protection of telecommunications network users, personnel and plant—Worked examples for the application guide

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

Statements expressed in mandatory terms in notes to figures, are deemed to be requirements of this Standard. 'Shall' indicates a requirement is mandatory, while 'should' indicates a recommendation and good practice.

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FOREWORD

In this Standard, no changes have been made to the assumed 'normal' fault clearance times (0.35 s, 0.5 s, 2 s) or to the maximum acceptable rises in earth potential at various sites (430 V, 1 000 V, 1 500 V) that apply in Australia. However the definition of high voltage (HV) is increased from 650 V to 1 000 V to align with AS/NZS 3000, *Electrical installations* (*known as the Australian/New Zealand Wiring Rules*).

The content in this Standard is restricted to the EPR Code of practice. A description of EPR and how it can present hazards to telecommunications network users, personnel and plant, together with guidance on the application of this code is covered in Part 2 of this Standard, AS/NZS 3835.2 *Application guide*.

Earth potential rise—Protection of telecommunications network users, personnel and plant—Worked examples for the application guide supplementing AS/NZS 3835.2 is separately covered in HB 219.

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Australian/New Zealand Standard

Earth potential rise—Protection of telecommunications network users, personnel and plant

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies means of identifying and minimizing hazards to telecommunications personnel, users and plant from Earth Potential Rise (EPR) arising from earth faults on high voltage a.c. power systems.

This Standard further prescribes—

(a) the principles and associated procedures for EPR coordination between the affected power and telecommunications parties;

(b) the EPR hazard voltage limits that apply in Australia and New Zealand; and

(c) measures and practices for mitigating EPR hazard situations.

Earth fault current on HV power lines induces voltages in telecommunications circuits. Where the power and telecommunications routes follow essentially parallel paths in close proximity, the electromagnetic coupling between them results in the generation of longitudinally induced voltages in the telecommunications line, due to currents of various frequencies flowing in the power line and using earth as a return path. This low frequency induction (LFI) voltage shall be applied together with EPR voltage in telecommunications circuit to determine total stress voltage (See Clause 2.1.8).

Requirements for HV isolation equipment are specified in Appendix B.

NOTES:

1 It is assumed that the HV power system is provided with adequate means of earthing in accordance with the relevant Standards and as required by appropriate legislation (if any). It is assumed that the telecommunications equipment complies with the relevant Standards.

2 It is assumed that persons working in locations covered by this Standard are adequately trained and are wearing appropriate clothing and footwear.

3 Guidance on the principles that should be used in agreements on the allocation of costs between power utilities and telecommunications carriers is given in Appendix A.

1.2 EXCLUSIONS

This Standard does not cover the following:

(a) Low frequency induction (LFI). This is covered in HB 101 and HB 102.

(b) D.C. power systems.

(c) Protection against step and touch potentials.

(d) Contractual and procedural matters.