

Network Asset Technical Document

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**TELECOMMUNICATION EQUIPMENT  
LOCATED IN THE VICINITY OF  
PROPOSED DISTRIBUTION HV  
EARTHS**

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Original Issue: August 2006

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This Revision: Rev 1 – October 2007

Date For Next Review: October 2012

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ABN 18540492861

# Document Control

## Endorsement/Approvals

	Name	Title	Signature
Endorsed by	R. Rogerson	Distribution Standards & Policy Manager	
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## Record of revisions

This document contains multiple formatting sections. When it is updated please ensure all section headers and footers have also been updated with correct version numbers and dates.

Revision no.	Date	DMS Version	Revised by	Description
1	October 2007	2688666 V8	S. Magan	Includes notification to Telecommunication Companies about existing earths near telecommunication pits

## Documents referenced in this document

DMS#	Title of document
2654846	Identification of Underground Services
2548097	Notification of proposed installation of HV earthing
1404215	Notifying Telstra of a new HV earth installation – Field instruction 3.20
2533002	22kv feeder settings policy
3110607	Canning Vale 22kv Distribution System
2483728	Guide for the use of Fault Tamer Fuses in South Country
3041796	EPR Calculations
4117881	Telstra Form – Notification of co-existing earths

## Other documents that reference this document

DMS#	Title of document
3573985	Underground Distribution Schemes Manual – PDF version

## Stakeholders

In the process of document update, the following positions must be consulted:

Position/title
Distribution Design Manager

## Notification list

When this document is updated, the following positions must be notified of any authorised change:

Position/title
Distribution Design Manager

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## 1 OBJECTIVE:

To ensure that high voltage (HV) distribution earthing system installations do not result in dangerous levels of earth potential rise (EPR) on nearby telecommunications assets.

## 2 CONTEXT:

Fault currents flowing through HV distribution earths may result in an EPR level that is dangerous to telecommunication equipment and employees. In practice, this can only occur when the HV distribution earthing system is installed within 15 metres of telecommunication pits housing earthed cable joints, or other telecommunication equipment.

## 3 POLICY STATEMENT:

High voltage distribution earths should not be installed if this could result in a level of EPR, which is dangerous to telecommunication equipment and personnel.

Maximum acceptable EPR levels are as defined in CJC 5–1997, Section 2.3, and confirmed in CJC 4–2000, Section 6.3.2.

As a duty of care, the respective telecommunications company should be notified where it is found that telecommunications equipment exists within 15m of the high voltage distribution earth.

## 4 POLICY DETAILS:

### 4.1 New high voltage distribution earths

In order to ensure that the EPR level is not dangerous, designers should use the following process when installing new high voltage distribution earths:

1. Check for telecommunication equipment by inspecting an area around the proposed earthing location (for signs of telecommunication pits or other telecommunication equipment) and by using the Dial-Before-You-Dig service, as defined in the policy *Identification of underground services*.
2. If telecommunication equipment is located within 15 metres of the proposed earthing location then:
  - a) Perform initial calculations of EPR levels,
  - b) Send the result of these calculations (a copy of the spreadsheet) together with a notification letter to the telecommunications company.
  - c) Do not finalise the design of earthing installations until the telecommunications company has confirmed in writing EPR is acceptable.

In the case of Telstra, the contact details are as follows:

- ❖ Fax number for sending notification letters: (08) 9491 6265
- ❖ Telephone enquires regarding the installation of HV earthing:(08) 9491 7544

If the reply states that the proposed earthing installation is unacceptable, it will be necessary to find an alternative location for the earthing, or pay the telecommunication company to relocate or alter its existing equipment.

According to CJC 5–1997, Section 2.3, overhead power lines and underground cables protected by circuit breakers or reclosers are classified as Category C. This is because they are considered to have low reliability and/or are protected by protection devices with a fault clearance time of up to 2 seconds, see Table 1 for recloser and feeder clearance times. The maximum EPR level for this type of equipment should not exceed 430 Volts.

The underground sections of the network can be classified as Category B, if they are protected by a high voltage fuse. This is because underground cables experience few faults (and can be classified as high reliability) and the clearance time for a fuse is typically faster than 0.5 sec, See Table 1 for fuse clearance times. This type of arrangement exists for ground-mounted transformers. The maximum EPR level for Category B installations is equalled to 1000 Volts.

The designer must confirm in the design documentation or design drawing that:

- a) Notification is not required, or
- b) Notification is required, has been issued, and there are no objections from the telecommunications company for the proposed earthing installation.

The information above is required in order to comply with Field Instruction 3.20, *Notifying Telstra of new HV earth installations*. Notifications can be logged via the email gateway [F1102490@team.telstra.com](mailto:F1102490@team.telstra.com). If notification is not provided, field staff will not proceed with the work and will have to obtain the information from designers. Consequently, the earthing installation will be delayed.

**Table 1. Typical protection operation times for phase to earth faults**

Protection device type				
Substation CB		Recloser		HV fuse
Description	Time (sec)	Description	Time (sec)	Time (sec)
No downstream recloser	0.5 – 1.0	3-phase	0.5 – 1.0	< 0.5
With downstream reclosers	0.7 – 2.0	1-phase	0.1 – 1.0	

Note: Values in Table 1 are based on the following documents:

- *22 kV Feeder Settings Policy*
- *Canning Vale 22 kV Distribution System*
- *Guide for the use of Fault Tamer Fuses in South Country.*

#### 4.2 Existing high voltage distribution earths

The respective telecommunications company should be notified, where Western Power finds telecommunications equipment co-existing within 15m of the high voltage distribution earth. The purpose is to bring to the attention of the telecommunications company a potential hazard that may exist so that it can be rectified by the telecommunications company.

Western Power will pay for relocation of either asset if it can be proved that the telecommunications equipment was installed prior to Western Power's high voltage distribution earth. The onus is on the telecommunication company to prove Western Power installed its earth after the telecommunications equipment was installed.

Notification form "Telstra Form – Notification of co-existing earths" shall not be used if the following works are being undertaken such as:

- a) Installing new HV equipment or earths
- b) Altering relative position of the existing Western Power earth in relation to the telecommunication assets.

Under these circumstances Section 5.1 applies.

## 5 REFERENCES AND SUPPORTING DOCUMENTATION:

### 5.1 Western Power Internal References

- *Identification of underground services*
- *Notification of Proposed installation of HV earthing*
- *Notifying Telstra of new HV earth installations – Field Instruction 3.20*

### 5.2 External References

- CJC 4 - 2000, Coordination of power and telecommunication – *Manual for the establishment of safe work practice and the minimisation of operational interference between power systems and paired cable telecommunications systems*, published by Australian Standards.
- CJC 5 – 1997, Coordination of power and telecommunication – Low Frequency Induction (LFI) – Application Guide to the LFI Code, published by Australian Standards.
- 22 kV Feeder Settings Policy.
- Canning Vale 22 kV Distribution System.
- Guide for the use of Fault Tamer Fuses in South Country.