



Technical Bulletin

TB 0322 – CCT Design and Construction Changes and CLAH-DC and SiC-SA Phase Out

Purpose

This Technical Bulletin is to provide revised lightning protection (LP) design and construction instructions for 11kV and 22kV covered conductor thick (CCT) aerial mains. This replaces TB 0305 - *Revised CCT earthing requirements* issued in 2021.

This Bulletin will change the current LP arrangement stated in Endeavour Energy Standards implementing the following:

1. Lightning protection requirement for CCT must comply with Section L.7.6 of AS1768:2021 - *Lightning Protection*.
2. Current Limiting Arcing Horn/ Discharge Connectors (CLAH-DC) and Silicon Carbide Surge Arresters (SiC-SA) combination shall only be used until the current stocks of these items in the stores are depleted.
3. Earth lead disconnecter type Metal Oxide Varistor Surge Arresters (ELD-SA) can be used in lieu of CLAH-DC and SiC-SA combination to provide LP for CCT mains with an earthing system that will not require risk assessed earthing design.

Background

Currently, EDI 0006 Section 5.3.5.6, specifies the following:

- CLAH/DC units must be installed and earthed at specific intervals for selective pole types, and at transitions between open wire and CCT.

The existing CCT system uses silicon carbide (SiC) style surge arresters which require an airgap to energised mains. A CLAH/DC is required in this system to provide the airgap. CLAH-DC and SiC-SA combination will no longer be produced by the manufacturers due to low demand worldwide, hence Endeavour Energy is unable to source these CLAH/DC units from the market.

Newer metal oxide varistor (MOV) style surge arresters with earth lead disconnecter will now be used. These do not require an airgap and therefore CLAH/DC units will no longer be necessary.

Requirements

Revised LP design using EDL-SA in lieu of CLAH/DC and SiC-SA combination

The current and the new arrangement are summarised in the table below. Changes are highlighted in grey.

Current arrangement	New arrangement
CLAH/DC units must be installed at the following locations and intervals: - At every interface between bare conductors and CCT conductors. - At an interval of 400m for wood pole lines and 250m for steel or concrete (conductive) pole lines.	ELD-SA units must be installed at the following locations and intervals: - At every interface between bare conductors and CCT conductors. - At intervals of up to 400m for wood pole lines and 250m for steel or concrete (conductive) pole lines. Where there is a mixture of pole types, the shorter interval applies. - On both sides of ABS and USL (may be one pole either side for practicality of installation). This ensures CCT remains protected while switches are open.

The above specified locations of the ELD-SA units are ideal but can be adjusted to the next pole at the discretion of the Designer.

ELD-SA that are installed at the existing pole nodes (e.g. substation, LBS, UGOH pole etc.), can be utilised for diverting surge energy in CCT lines thus avoiding duplication of LP devices and allowing ELD-SA installation intervals to be extended.

SA earthing design and installation arrangement

SA installations must be connected as follows:

- New wood (non-conductive) pole: Connect the ELD-SA earth terminal to the pole butt earth. Refer to drawing 522946 in Attachment A.
- Existing wood (non-conductive) pole: Install one (1) 2.4m earth electrode and connect it to the ELD-SA earth terminal. Refer to drawing 522946 in Attachment A.
- Steel or concrete (conductive) pole: Connect the ELD-SA earth terminal to nearest earth ferrule on the pole. The buried conductive pole section will act as an earth rod. Refer to drawing 522946 in Attachment A.

A risk assessed earthing design is not required for ELD-SA earthing installation for CCT. There is no specific earth resistance value to be achieved as the earthing is only required for discharging lightning surge energy to ground. ELD-SA earth down leads installed at each pole must not be bonded to LV neutral and must be separated from both LV ABC bolt hooks and LV ABC conductors by the maximum distance possible across the pole face. This is required to avoid lightning surge flashover to the LV ABC.

Failed CLAH-DC and SiC-SA replacements

For failed CLAH-DC and SiC-SA replacements during maintenance, it is necessary that the complete CLAH-DC and SiC-SA combined unit is replaced with ELD-SA (see stock codes provided below).

Drawings

Following drawings have been updated to utilise ELD-SA in lieu of CLAH-DC and SiC-SA. These new drawings will be made available in ASP website.

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1. 522946 - Earthing Construction - See in Appendix A
2. 332027 - C21 Vertical CCT - See under this TB/MCI0005(future) in ASP Website
3. 332026 - C21 Pin Delta one crossarm - See under this TB/MCI0005(future) in ASP Website
4. 332028 - C22 Pin Delta two crossarms - See under this TB/MCI0005(future) in ASP Website
5. 332001 - Standard Assemblies - See under MCI0005 in ASP Website
6. 332035 - Bare to CCT Transition Pole - See under this TB/MCI0005(future) in ASP Website

Contact

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Implementation date

The new requirements stated must be implemented from the date of issue of this Technical Bulletin.

Actions and Requirements

Earth lead disconnector type Metal Oxide Varistor Surge Arresters (ELD-SA) must be used in lieu of CLAH-DC and SiC-SA combination to provide LP for CCT mains (SAP Material Codes for 11kV and 22kV ELD-SA are 1000005440, and 1000005458 respectively)

Customer Network Solutions

- ASP's are to implement the revised CCT construction instructions within this Technical Bulletin.
- ASP's are to implement the CCT design instructions within this Technical Bulletin.

Internal Designers and Project Managers

- Internal Designers are to implement the CCT design instructions within this Technical Bulletin.
- Project Managers and Responsible Officers are to implement the revised CCT construction instructions within this Technical Bulletin.

Engineering Delivery Manager/ Asset Planning & Performance

- Revise applicable drawings within MCI0005 - *Overhead Construction Standards Manual* to reflect changes approved within the Technical Bulletin.
- CLAH-DC and SiC-SA stock codes to be removed once remaining stocks are used.

Reginal Distribution Managers (Central, West, East and South)

- Use ELD-SA for replacing failed CLAH-DC and SiC-SA. Refer to drawings in ASP website for using ELD-SA in lieu of CLAH-DC and SiC-SA combination.

Impacted Standards

The contents of the technical bulletin will be included in the next revisions of:

- EDI 0006 - *Earthing Construction*
- EDI 100 - *Distribution Earthing Design*
- MCI 0005 - *Overhead Construction Standards Manual*

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Appendix A – Drawing B522946

