Engineering System Integrity
Electrical Network Safety Rules

Engineering Specification
Electrical Distribution Unit

Electrical Distribution Network Management

SP D 79054

Inspection and Testing of Fixed Electrical Equipment

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Transport Sydney Trains

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Document control

Version	Date	Author/ Prin. Eng.	Summary of change
1.0	1 February 2022	ENSR Project Team	First issue as Sydney Trains document. Rebranded from PR D 78106 V1.2. Reviewed as part of the ENSR Project.
1.1	9 February 2026	Nick Loveday	Periodic review, republished with no changes.

Document history (previously PR D 78106)

Version	Date	Author/ Prin. Eng.	Summary of change
1.0	28 April 2015	Chris Leung	First issue as a Sydney Trains document, rebranded from previous RailCorp SMS-06-EN-0557 V1.2
1.1	8 May 2018	Chris Leung	Three year review, no technical change
1.2	19 February 2019	Nick Loveday	Updated PR D 78106 "Approved by" to Associate Director Electrical Distribution Unit

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1 Purpose and scope

To provide the procedures for the in-situ inspection and testing of High Voltage (HV), 1500 Volt D.C., and Low Voltage (LV) electrical equipment such as switchgear, cables, transformers, overhead lines and 1500 Volt D.C. overhead wiring.

This procedure does not apply to:

- the testing of portable LV equipment
- testing carried out in a testing laboratory or similar facility.

2 Definitions

Refer to the **Electrical Safety Definitions** page available on the **RailSafe** site.

3 1500 Volt or High Voltage electrical equipment

3.1 General

All aspects of testing work, including connection and disconnection of the equipment under test, the test equipment and the actual testing operations, shall be carried out in accordance with *PR D 78700 Working around Electrical Equipment*, except as set out in Sections 3.2, 3.3 and 3.4 below.

3.2 Tests where equipment under test is energised from the 1500 Volt D.C. or HV system

If an Electrical Permit to Work or a Substation Access Permit is required for the connection of the test equipment, the Permit shall be cancelled before the equipment under test is energised from the 1500 Volt D.C. or HV system for the test. Alternatively, in the case of testing being carried out from within a substation, an Extraordinary Substation Access Permit may be used.

The use of a Test Electrical Permit to Work or a Test Substation Access Permit is not applicable for tests carried out when the equipment under test is energised directly from the 1500 Volt D.C. or HV system. For example, when performing tests on equipment in the withdrawn state such as drop out tests on Direct Current Circuit Breakers (DCCBs).

3.3 Other tests where equipment under test is energised from the test equipment

When testing requires test equipment to be connected to HV equipment under test and earths are to be removed while the equipment under test is still isolated, the work shall be carried out under a Test Electrical Permit to Work or a Test Substation Access Permit.

When testing requires test equipment to be connected to 1500 Volt D.C. equipment under test and rail connections are to be removed while the equipment under test is still isolated, the work shall be carried out under a Test Electrical Permit to Work (and a Test Substation Access Permit if appropriate). Refer to *PR D 78500 Electrical Permits*.

If testing 1500 Volt D.C. equipment within substations requires the use of test equipment that applies a voltage in excess of 50 Volts A.C. or 120 Volts D.C. to the equipment, the following requirements shall be complied with:

- An Authorised Person (Substations) competent of undertaking the required test shall either carry out the tests or shall check the details of the tests to be carried out and the isolation arrangements with the person carrying out the tests, and shall be present to ensure that the agreed arrangements are followed.
- The person carrying out the tests shall have sufficient knowledge of the test procedures and is responsible for ensuring that the testing is carried out safely.
- An Eligible Person (refer to *PR D 78502 Substation Access Permit* or *PR D 78501 Electrical Permit to Work*) shall hold the required Electrical Permit(s) for the 1500 Volt D.C. equipment being tested.
- All persons involved in the testing shall be signed onto the Electrical Permit(s).
- All persons in the vicinity shall be warned to keep clear by the responsible Site Manager (refer to **Note** below) prior to the test voltage being applied.

NOTE

The minimum Safe Approach Distances (SAD) from the equipment to be tested must not be infringed. The SAD depends on the test voltage that will be applied during the test. SADs are documented in *SP D 79049 Safe Approach Distances* (SADs) Table 1 Minimum SADs to exposed electrical equipment for persons and tools they hold.

3.4 Tests within substations requiring repeated isolation

When testing, inspection or adjustment of 1500 Volt D.C. or High Voltage equipment within substations requires repeated isolation and restoration of supply, the work may be carried out under a single Extraordinary Substation Access Permit instead of a number of Substation Access Permits. Refer to PR D 78502 Section 12 Extraordinary Substation Access Permit for details.

4 Low Voltage equipment

When carrying out testing using test equipment that applies a voltage in excess of 50 Volts A.C. or 120 Volts D.C. to the Low Voltage equipment under test, the following precautions shall be observed:

- There shall be no Low Voltage Access Permits in force for the equipment unless they are held by the person carrying out the tests.
- The equipment shall be isolated and proved dead prior to connecting the test equipment.
- All persons in the vicinity shall be warned to keep clear by the responsible Site Manager (see Note above) prior to the test voltage being applied.

5 Reference documents

PR D 78500 Electrical Permits

PR D 78501 Electrical Permit to Work

PR D 78502 Substation Access Permit

PR D 78700 Working around Electrical Equipment

SP D 79049 Safe Approach Distances (SADs)