

**Engineering System Integrity
Electrical Network Safety Rules**

**Engineering Procedure
Electrical Distribution Unit**

Electrical Distribution Network Management

PR D 78201

**Removal and Restoration of High
Voltage Supply**

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Approved by: Associate Director
Electrical Distribution Unit
Engineering System Integrity

Authorised by: Engineering Technical
Publications Manager
System Integrity

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Document control

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1.0	1 February 2022	ENSR Project Team	First issue as Sydney Trains document. Rebranded from SMS-06-EN-0560 V1.4. Reviewed as part of the ENSR Project.
2.0	28 January 2026	N. Loveday	Includes "Switching Plans" from EI D 22-04.

Document history

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2.0	28 January 2026	N. Loveday	Inserted sections 5.1 and 5.2 Reformatted bullets as alpha lists throughout

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1 Purpose and scope

To describe the specifications for the co-ordination and management of the removal and restoration of supply for working near or on/within Transport Asset Holding Entity of New South Wales (TAHE)'s High Voltage equipment.

2 Definitions

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

3 General

All work near or on/within exposed High Voltage equipment must be carried out in accordance with the guide *PR D 78700 Working around Electrical Equipment*.

No High Voltage equipment is to be taken out of service without the prior approval of ICON Electrical, except where a life-threatening situation exists. Refer to *RL D 78904 Electrical Safety Incidents* Section 2 Emergencies involving danger to human life.

WARNING

High Voltage equipment must not be returned to service until all necessary tests and phase checks have been satisfactorily carried out, and then only with the agreement with ICON Electrical.

4 Removal and restoration of supply outside substations

4.1 Working High Voltage Instruction

A Working High Voltage Instruction (WHVI) must be issued for all work outside a substation that requires isolation and earthing of a High Voltage aerial line or cable except:

- a. Lines under construction may not need a WHVI.
- b. For work on abandoned HV cables, an Electrical Permit to Work may be used without the issue of a WHVI, refer to *SP D 79052 Cables – Work near or on/within* Section 6 Work on cables.

Where a low voltage aerial line has to be isolated and proved dead for the work, it must be included on the WHVI and the Electrical Permit to Work. A separate Low Voltage Access Permit will not be required.

4.2 Removal of supply – outside substations

- a. A WHVI must be issued in accordance with the process detailed in instruction *PR D 78202 Working High Voltage Instruction*.
- b. Prior to work commencing, the Authorised Person (Mains) in charge of the WHVI must contact ICON Electrical and advise their name, the number of the WHVI held and the staff arrangements for field switching.
- c. ICON Electrical must give clearance to proceed with the work only to the Authorised Person (Mains) in charge of the WHVI.

- d. ICON Electrical must:
 - i. Arrange for the switching operations listed on the WHVI to be carried out.
 - ii. Arrange for proving dead and for the safety earthing operations listed on the WHVI to be carried out.
 - iii. Where another Network Operator's services need to be isolated:
 - o request the other Network Operator to remove supply from its services
 - o obtain confirmation from the Authorised Person (Mains) in Charge of the WHVI that the required Operating Agreement has been received.
 - iv. On completion of the switching and safety earthing operations, inform the Authorised Person (Mains) in charge of the WHVI that:
 - o supply has been removed
 - o safety earths have been applied where applicable in accordance with the WHVI
 - o clearance is given to proceed with the proving dead, earthing and issuing of Electrical Permits and/or Operating Agreements.

4.3 Removal of bridges

Where equipment is isolated by the removal of bridges, jumpers or permanent connections, this removal requires both sides to be isolated, proved dead and earthed. A separate WHVI and Electrical Permit to Work is required for each of the following stages:

- a. The work of removing the bridges, jumpers or permanent connections.
- b. The work for which the bridges, jumpers or permanent connections are being removed.
- c. The restoration of bridges, jumpers or permanent connections.

4.4 Restoration of supply – outside substations

4.4.1 Energising at line voltage to carry out phase checks

The Authorised Person (Mains) in charge of the WHVI must:

- a. Ensure that all necessary tests which need to be done before the equipment is energised have been completed satisfactorily.
- b. Arrange for all Electrical Permits to Work and/or Operating Agreements issued on the WHVI to be cancelled and for all working earths to be removed.
- c. Advise ICON Electrical:
 - all Electrical Permits To Work and/or Operating Agreements issued on the WHVI have been cancelled and that no further Electrical Permits To Work and/or Operating Agreements will be issued without clearance from ICON Electrical
 - all working earths have been removed
 - the aerial lines or cables may be energised for phase checking.

ICON Electrical must:

- a. Accept clearance to energise only from the Authorised Person (Mains) in charge of the WHVI.
- b. Arrange for the safety earths to be removed.
- c. Arrange for the relevant DANGER Tags to be removed in accordance with instruction *PR D 78104 Securing Systems for Electrical Equipment* and for the necessary switching operations to energise the equipment to be carried out. The WHVI does not need to be cancelled.
- d. If the phasing is found to be correct:
 - o advise the Authorised Person (Mains) in charge of the WHVI and request that the remaining steps described below in Section 4.3.2 be carried out in order to cancel the WHVI and restore supply.
- e. If the phasing is found to be incorrect:
 - o advise the Authorised Person (Mains) in charge of the WHVI
 - o remove supply in accordance with Section 4.2 to allow alterations to be made.

4.4.2 Return to Service – outside substations

After successful completion of the activities detailed in Section 4.3.1:

- a. The Authorised Person (Mains) in charge of the WHVI must:
 - i. Cancel the WHVI in accordance with instruction PR D 78202.
 - ii. Sign off all other Network Operators' Operating Agreements if received.
- b. ICON Electrical must:
 - i. Accept clearance to restore supply only from the Authorised Person (Mains) in charge of the WHVI.
 - ii. Arrange for the safety earths to be removed.
 - iii. Arrange for the relevant DANGER Tags to be removed in accordance with instruction PR D 78104 and for the necessary switching operations to restore supply to be carried out.
 - iv. Advise other Network Operators that their Operating Agreements have been signed off and that their supply may be restored as far as TAHE is concerned.
 - v. On restoration of TAHE's supply, advise the Authorised Person (Mains) in charge of the WHVI that supply has been restored so far as that WHVI is concerned.

WARNING

The equipment must not be returned to service until all necessary tests and phase checks have been carried out.

5 Removal and restoration of supply within substations

5.1 Substation Access Permit and Switching Plan

When supply is to be removed for work near or on/within High Voltage equipment within substations, the following must be completed before any work commences:

- a. The equipment must be isolated, proved dead, short circuited and earthed.
- b. The Electrically Safe Work Area must be defined and demarcation tape and temporary warning signs applied where required.
- c. Where required, access to the work site shall be defined by appropriate access markers.
- d. A Substation Access Permit shall be issued, recording the points of isolation and the equipment to be isolated.
- e. Where a single action is sufficient to isolate the equipment, the Substation Access Permit is sufficient.
- f. Where multiple actions are required to isolate the equipment, a switching plan shall be prepared (*PR D 78201 FM01 Substation Electrical Switching Plan*) detailing the sequence of actions to implement the isolation, and the sequence to restore supply. The switching plan shall be attached to the Substation Access Permit.
- g. Where 1500 Volt and/or Low Voltage equipment in the Substation will be isolated and proved dead for the work, it must be included on the Substation Access Permit and Switching Plan.
- h. The neutrals of transformers when disconnected from the earthing system must be considered as High Voltage equipment.

Switching outside a substation (associated with a WHVI) or Authority is excluded from this process.

5.2 Switching Plan

Prior to operation of electrical equipment, an Authorised Operator Substations (AO) shall:

- a. Write or obtain a switching plan for the operation of the substation electrical equipment.
- b. Where a new switching plan is required, the AO shall create one. The switching plan shall be written using the Operating and/or Sectioning Diagrams to develop the plan and the local instructions where available.
- c. Confirm the suitability of the switching plan for the purpose.

Prior to giving clearance to operate, the Electrical System Operator (ESO) will ask the AO to confirm they have a documented switching plan, to carry out the operation.

The ESO and AO shall come to an agreement on what is required and the sequence of operation for both personal safety and network security. The agreed sequence may not be the same as the AO's switching plan.

Note: The ESO holds no accountability over the details of the switching plan.

In the event of a switching incident, a copy of the completed switching plan shall be emailed to ICON Electrical and electricalincidents@transport.nsw.gov.au immediately.

5.3 Removal of supply – within substations

The Authorised Person (Substations) issuing the Substation Access Permit must arrange for the removal of supply with ICON Electrical.

ICON Electrical must request other Network Operators for the removal of supply from their services where required.

5.4 Restoration of supply – within substations

DANGER Tags and earths must not be removed and supply to High Voltage equipment within substations must not be restored until all associated Substation Access Permits have been cancelled.

The Authorised Person (Substations) cancelling the Substation Access Permit must arrange for the restoration of supply with ICON Electrical.

ICON Electrical must advise other Network Operators that their supply may be restored.

WARNING

The equipment must not be returned to service until all necessary tests and phase checks have been carried out.

6 Reference documents

PR D 78104 Securing Systems for Electrical Equipment

PR D 78202 Working High Voltage Instruction

PR D 78700 Working around Electrical Equipment

RL D 78904 Electrical Safety Incidents

SP D 79052 Cables – Work near or on/within