

**Engineering System Integrity
Electrical Network Safety Rules**

**Engineering Procedure
Electrical Distribution Unit**

Working Near or On/Within

**PR D 78502
Substation Access Permit**

Version 2.3

Date in Force: 1 February 2022

Approved by: Associate Director
 Electrical Distribution Unit
 Engineering System Integrity

Authorised by: Engineering Technical
 Publications Manager
 System Integrity

Disclaimer

This document was prepared for use by persons in connection with works near or on/within the rail network electricity system operated by Sydney Trains. Sydney Trains makes no warranties, express or implied, that compliance with the contents of this document shall be sufficient to ensure safe systems or work or operation. It is the document user's sole responsibility to ensure that the copy of the document it is viewing is the current version of the document as in use by Sydney Trains. To the extent permitted by law, Sydney Trains excludes any and all liability for any loss or damage, however caused (including through negligence), which may be directly or indirectly suffered in connection with the use of this document.

Copyright

The information in this document is protected by copyright and no part of this document may be reproduced, altered, stored or transmitted by any person without the prior consent of Sydney Trains.

Document control

| Version | Date | Author/ Prin. Eng. | Summary of change |
|---------|-------------------|--------------------------|---|
| 1.0 | 17 April 2015 | Christopher Leung | First release for Sydney Trains, rebranded from previous RailCorp SMS-06-EN-0583 V1.3 |
| 1.1 | 3 July 2018 | Christopher Leung | 3 yearly review Updated Sample 6: Overhaul 153 1500V 3 Position Switch |
| 1.2 | 19 February 2019 | Nick Loveday | Updated PR D 78502 "Approved by" to Associate Director Electrical Distribution Unit |
| 2.0 | 19 September 2019 | Steven He / Nick Loveday | Version 2.0 for TRIAL USE ONLY includes requirements for Substation Access Permit Holder. General revision on requirements. |
| 2.1 | 1 July 2021 | Rahul Bahl | Issued from Trial Use to Implementation |
| 2.2 | 1 August 2021 | Rahul Bahl | Updated to reflect new permits |
| 2.3 | 1 February 2022 | ENSR Project Team | Reviewed as part of the ENSR Project. |

Summary of changes from previous version

| Summary of change | Section |
|-----------------------------|---------|
| Minor grammatical updates | All |
| Updated reference documents | All |

Table of Contents

| | | |
|-----------|---|-----------|
| 1 | Purpose and Scope | 5 |
| 2 | Definitions | 5 |
| 3 | Responsibility | 5 |
| 4 | System Overview | 6 |
| 4.1 | Safe Access to Electrical Equipment | 6 |
| 4.2 | Details Specified on the Substation Access Permit | 6 |
| 4.3 | Control or Auxiliary Supplies | 8 |
| 4.4 | Additional Work Not to be Carried Out..... | 8 |
| 4.5 | Personnel Registers | 9 |
| 5 | Authorised Person (Substations) | 9 |
| 5.1 | Duties | 9 |
| 5.2 | Constraints | 9 |
| 6 | Substation Access Permit Holders | 10 |
| 6.1 | Eligible Persons | 10 |
| 6.2 | Duties | 10 |
| 6.3 | Constraints | 10 |
| 6.4 | 1500 Volt DC Negative Equipment outside Substations..... | 10 |
| 7 | Issuing a Permit | 11 |
| 7.1 | Preparation..... | 11 |
| 7.2 | Instructing the Permit Holder | 12 |
| 7.3 | Obtaining acknowledgement..... | 13 |
| 7.4 | Receiving a Permit | 13 |
| 7.5 | Issuing the Permit to the Permit Holder | 14 |
| 8 | Holding a Permit | 15 |
| 8.1 | Instruct Workers | 15 |
| 8.2 | Pre-Work Requirements..... | 15 |
| 8.3 | Work in Accordance with a Permit | 16 |
| 8.4 | Person Entering/Leaving the Electrical Safe Work Area | 17 |
| 8.5 | Return the Permit | 17 |
| 9 | Cancelling a Permit | 18 |
| 9.1 | Preliminary Checks | 18 |
| 9.2 | Cancel Permit..... | 18 |
| 10 | Review of Permits | 19 |
| 11 | Other Scenarios | 20 |
| 11.1 | Modifications to the Permit..... | 20 |
| 11.2 | Relieving the Permit Holder (an Unplanned Event) | 20 |
| 11.3 | Transfer Permit (Multiple Continuous Shifts Only)..... | 20 |
| 11.4 | Lost/Damaged Permit | 20 |
| 11.4.1 | Work in Progress | 21 |
| 11.4.2 | Work Completed | 21 |

| | | |
|-----------|--|-----------|
| 11.5 | Early Recall/Suspension | 21 |
| 11.6 | Emergency or Incident | 21 |
| 11.7 | Late Permit Return | 21 |
| 12 | Extraordinary Substation Access Permit | 22 |
| 12.1 | Application..... | 22 |
| 12.2 | Special Requirements | 22 |
| 12.3 | Substation Access Permit Form..... | 22 |
| 13 | Test Substation Access Permit | 23 |
| 13.1 | Application..... | 23 |
| 13.2 | Special Requirements | 23 |
| 13.3 | Substation Access Permit Form..... | 24 |
| 13.4 | Electrical Safe Approach Distances..... | 24 |
| 13.5 | Responsibilities of the Person Issuing the Permit..... | 24 |
| 13.6 | Responsibilities of the Person Carrying Out the Test | 24 |
| 13.7 | Testing a High Voltage Aerial Line or Cable Extending Outside a Substation | 25 |
| 13.8 | Testing 1500 Volt Equipment Extending Outside a Substation | 25 |
| 14 | Reference documents..... | 26 |

1 Purpose and Scope

This procedure describes the issue and cancellation of a Sydney Trains *PR D 78502 FM01 Substation Access Permit with 2 Personnel Registers* and *PR D 78502 FM03 Substation Access Permit with 6 Personnel Registers*.

A Substation Access Permit is the primary safety document used in relation to work on any electrical equipment, either high voltage, 1500 Volt and/or low voltage within a Substation, or on 1500 Volt negative connections outside the substation, where the work requires the equipment to be isolated to allow the work to proceed.

Refer to *PR D 78506 Substation – Demarcation Taping* for the setup of the Electrical Safe Working Area using demarcation tape and barriers.

Refer to *PR D 78700 Working around Electrical Equipment* for situations when a Substation Access Permit needs to be issued. For further information on the applicability of a Substation Access Permit, refer to *PR D 78500 Electrical Permits*.

Permit requirements associated with the overhaul of 1500 Volt Isolating Links, Switch Pairs and Three Position Switches are detailed in *PR D 78302 1500 Volt Authority* Section 10.2 Overhaul of Isolating Links, Switch Pairs and Three Position Switches.

NOTE

1. The term 'Substation Access Permit', 'Extraordinary Substation Access Permit' or 'Test Substation Access Permit' is, where appropriate, abridged to 'Permit'.
 2. 'Substation' is used throughout, as defined in the **Electrical Safety Definitions** page available on the RailSafe site.
 3. The term 'Authorised Person (Substations)' is used throughout, this is defined in **PR D 78100**.
 4. Refer to *PR D 78701 Personal Certifications – Electrical* for authorisation details.
-

2 Definitions

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

3 Responsibility

This document sets out specific responsibilities for persons undertaking the following tasks:

- a. Writing and checking Substation Access Permits.
- b. Instructing persons who will hold a Substation Access Permit.
- c. Issuing and cancelling Substation Access Permits.
- d. Holding Substation Access Permits.
- e. Working in accordance with a Substation Access Permit.
- f. Carrying out electrical tests – persons undertaking the tests are responsible for ensuring that the testing is carried out safely.

These persons shall be authorised to perform these tasks in accordance with **PR D 78701**.

4 System Overview

4.1 Safe Access to Electrical Equipment

A Substation Access Permit is issued by an Authorised Person (Substations) to a Permit Holder as confirmation that:

- The specified high voltage, 1500 Volt overhead, and/or low voltage equipment has been isolated, proved dead and earthed where appropriate to provide an Electrical Safe Work Area.
- The isolated (and earthed) condition will remain until the Permit is returned and cancelled.

A Substation Access Permit shall be used to define the Electrical Safe Work Area, which is clear of exposed equipment and where it is safe to work.

Where the Substation Access Permit requires no equipment to be isolated or earthed, Item (4) of the Permit specifying switch operations is to be marked NOT REQUIRED.

4.2 Details Specified on the Substation Access Permit

The Permit specifies the following.

- Location of the work.
- Permit No.
- Planned dates and times for the Permit being in force – Item (1).
- Extent and type of the work for which the Permit is required – Item (2).
- Company or work team to carry out the work with overall responsibility for the work – Item (3).

| | | | |
|---|---|------------|---|
| Location: | | Permit no. | |
| This permit is in force (planned times and dates): | | | |
| 1. From: | <input type="text"/> : <input type="text"/> | Hours | <input type="text"/> / <input type="text"/> /20 |
| To: | <input type="text"/> : <input type="text"/> | Hours | <input type="text"/> / <input type="text"/> /20 |
| 2. Extent and type of work: _____ | | | |
| 3. For work to be carried out by (Company / work team: name): _____ | | | |

Figure 1: PR D 78502 FM01 and PR D 78502 FM03 Items (1) to (3)

- Switching operations required to be carried out to achieve isolation, detailing the switch number, location and action – Item (4).
- Electrical equipment that has been isolated, proved dead and earthed – Item (5).

- k. List of actions by names, signatures, time and date for permit preparation – Item (9):
- Checked by
 - Issued by
 - Received by Permit Holder.

And requirement for Electrical Commissioning Certificate for Permit Cancellation, and numbers of issued Personnel Registers.

| 9. This permit is: | Name | Signature | Hours | Date |
|-----------------------------|------|-----------|-------|-------|
| Checked (Items 1-7) by: | | | : | / /20 |
| Issued by: | | | : | / /20 |
| Received by permit holders: | | | : | / /20 |

Electrical Commissioning Certificate for permit cancellation is: Required Not required No. of Personnel Registers issued

Figure 5: PR D 78502 FM01 and PR D 78502 FM03 Item (9)

- l. List of actions by names, signature, time and date for Permit return and cancellation – Item (10):
- Returned by Permit Holder
 - Permit Cancelled by Authorised Person (Substations).

| 10. Permit Holder - By signing off this Permit: | | | | |
|--|------|-----------|-------|-------|
| i. I certify that persons signed on the Personnel Register, tools, materials, and machinery are clear of the Electrical Equipment and all persons have been instructed to treat the equipment as live, and | | | | |
| ii. I accept responsibility for persons who have failed to sign off and have undertaken a joint site inspection with the person retrieving the permit to ensure that all persons, tools, materials and machinery are outside the minimum Safe Approach Distance for safe energisation of supply. | | | | |
| | Name | Signature | Hours | Date |
| Returned by Permit Holder: | | | : | / /20 |
| Permit cancelled by Authorised Persons (Substations): | | | : | / /20 |

The cancelled permit (original) is to be forwarded to the nominated electrical representative in the area concerned.

Figure 6: PR D 78502 FM01 and PR D 78502 FM03 Item (10)

4.3 Control or Auxiliary Supplies

The details of relevant control or auxiliary supplies required to be isolated to allow the Permit to be issued shall be included in Item (4) of the Permit: “The following switching operations are to be carried out to achieve isolation”.

If it is necessary to leave low voltage control or auxiliary supplies energised, a warning referring to these supplies shall be included in Item (6) of the Permit headed “Details and Identification of the Electrical Safe Work Area”.

If low voltage control or auxiliary supplies are isolated and it will be necessary to restore such supplies for testing, a note shall be made on the Permit in “The Following Switching Operations...” part of the Permit, indicating that the required supply may be restored when required for testing. This supply may then be restored without cancelling the Permit. The Permit Issuer shall instruct all persons who signed on to the Permit regarding the change of conditions.

4.4 Additional Work Not to be Carried Out

Only those activities specified on the Permit may be carried out in the Electrical Safe Work Area.

4.5 Personnel Registers

One or more Personnel Registers shall be used in association to the Substation Access Permit to be issued. Personnel Registers are included with the Substation Access Permits.

Each Personnel Register forms part of the Permit, and persons signing onto a personnel register are subject to the same conditions as if they had signed onto the Permit form itself.

Additional Personnel Register forms *PR D 78502 FM02 Substation/Low Voltage Personnel Register* can be obtained from the Sydney Trains intranet and printed as needed.

5 Authorised Person (Substations)

5.1 Duties

Only an 'Authorised Person (Substations)' authorised in accordance with PR D 78701 may:

- a. Check the Permit, ensuring:
 - all relevant information including any special instructions and warnings are entered on the Permit
 - all information entered on the Permit in Items (1) to (7), when implemented, would provide an Electrical Safe Work Area, as required for the scope of work.
- b. Instruct the Permit Holder
- c. Issue a Permit
- d. Cancel a Permit.

5.2 Constraints

The person who issues the Permit must be the person who instructs the Permit Holder.

6 Substation Access Permit Holders

6.1 Eligible Persons

Only a person authorised to hold a Substation Access Permit in accordance with PR D 78701 may hold a Substation Access Permit.

6.2 Duties

At all times during the work, the Permit Holder shall be on site, manage the Electrical Safe Work Area, and ensure that persons do not work beyond the limits of the Electrical Safe Work Area. The Permit Holder is responsible for the safety of the work party.

6.3 Constraints

A Substation Access Permit Holder may hold only one Substation Access Permit at a time. A Substation Access Permit may be transferred from one Permit Holder to another in accordance with Section 11.3 of this document.

Not less than two persons (including the Permit Holder) shall be signed on to a Permit. All persons shall understand the Electrical Safe Work Area.

6.4 1500 Volt DC Negative Equipment outside Substations

Persons holding Permits issued for work on 1500 Volt DC negative equipment outside a substation shall be an Accredited Electrical Permit Holder as per *SP D 79055 Electrical Competency Specific Certifications* Section 5.19 Accredited Electrical Permit Holder.

7 Issuing a Permit

The Substation Access Permit may be written by either an Authorised or unauthorised person (e.g. an apprentice, or project engineer) (Items (1) to (7)).

7.1 Preparation

The Authorised Person issuing the Permit shall:

- a. Ensure that Item (9) 'Checked by' section of the Permit has been completed.
- b. Be aware of the details of the work for which the Permit is being issued.
- c. Be satisfied that the isolation and earthing where relevant, and relevant special instructions and warnings, as shown, for which the Permit will be issued allows that work to be carried out safely.
- d. Ensure the following:
 - i. The Permit is made out in duplicate and all the relevant information is entered on the form.
 - ii. The Permit is numbered correctly. The Permit Number is a unique number. The format comprises the issuer's initials (uppercase), date of issue and the respective consecutive number of the permit issued for the day; e.g. LM250107/1, LM250107/2..., etc.
 - iii. The switching operations listed on the Permit are correct to isolate all electrical equipment required to be isolated for the work.
 - iv. The switching operations to isolate the required electrical equipment are carried out with the prior knowledge and agreement of the Electrical System Operator (ESO).
 - v. An Operating Agreement is received from other Network Operators where required.
 - vi. If any additional Permit is also required for a part of the work, the necessary additional Permit is received and understood.
 - vii. The electrical equipment has been proved dead, and high voltage equipment has been earthed.
 - viii. Demarcation tape and temporary warning signs are used to distinguish the limits of the Electrical Safe Work Area in accordance with PR D 78506.
 - ix. In the case of:
 - o High Voltage equipment
 - o Low Voltage equipment
 - o 1500 Volt DC equipment
 - o a pole or pad mounted substation,demarcation tape and temporary warning signs are used to distinguish the limits of the Electrical Safe Work Area within which electrical equipment has been made safe for work.
 - x. If a risk assessment reveals that it is necessary, a restricted access route to the work site shall be defined by appropriate markers and controlled to ensure persons will not be required to or cannot come within the relevant minimum Safe Approach Distance (refer to *SP D 79049 Safe Approach Distances (SADs)*).

- xi. Special barriers have been erected where necessary to provide a safeguard for persons working.
- xii. Should the Electrical Safe Work Area contain equipment that supports live electrical equipment, or has live electrical equipment passing above or in the vicinity, then appropriate special instructions and warnings shall be documented on the Permit Item (7).
- xiii. Confirm with the work party as to whether an Electrical Commissioning Certification is required for Return and Cancellation of the Permit or not.

NOTE

In the case when more space is required for sections of the Substation Access Permit form, the Permit form shall be marked as 'Page 1' on the top right corner of the form and a new form with the same permit number and marked as 'Page 2' on the top right corner of the form shall be used to record the required content.

7.2 Instructing the Permit Holder

The Authorised Person (Substations) who is issuing a Permit shall present evidence of their accreditation and instruct all persons who will hold the Permit at the worksite at the time of issuing the Permit.

The Authorised Person (Substations) issuing the Permit shall:

- a. Ensure the Permit Holders are accredited and the extent of the work is within Permit Holder(s)' accreditation.
- b. Brief the Permit Holders with the following:
 - The location, date and time restrictions of the Permit.
 - Which electrical equipment is covered by the Permit and is safe to work near or on/within.
 - Which electrical equipment shall be treated as live.
 - Details and identification of the Electrical Safe Work Area.
 - Any special instructions and warnings on the Permit.
 - That the Permit only applies to the electrical equipment specified on the Permit and all other electrical equipment shall be treated as live unless a separate Permit is received.
 - That no work is to be carried out near or on/within the isolated electrical equipment other than the work specified on the Permit.
 - That the Permit shall be retained by the Permit Holder at all times while the work for which the Permit is required is being carried out.
 - That the Permit Holder shall control the work process and provide direct supervision so that persons carrying out the work for which the Permit is required do not work beyond the limits of the Electrical Safe Work Area.
 - The responsibilities set out on both sides of the Permit.
 - The obligation of the Permit Holder for the electrical safety of staff working under their control.
- c. Direct the Permit Holder to instruct all persons carrying out the work for which the Permit is being issued the following warnings:
 - Not to allow any part of their body, clothes, tools, materials or machinery they may be using or carrying to come within the Safe Approach Distances of any

exposed equipment other than the isolated equipment in the Electrical Safe Work Area.

- Not to pass over or under work area access markers, safety fences, demarcation tape or special barriers.
- To comply with the instructed process (refer to Section 8.4) for exiting and re-entering the Electrical Safe Work Area.

7.3 Obtaining acknowledgement

The Authorised Person (Substations) instructing the Permit Holder shall obtain acknowledgment from the Permit Holder that the work will be carried out safely within the Electrical Safe Work Area shown on the Permit.

The Authorised Person (Substations) shall provide the Permit Holder with any advice or assistance required in order for the Permit Holder to make an informed assessment prior to giving the required acknowledgment.

The Authorised Person (Substations) shall read Items (1) through (7) of the Permit to the Permit Holder and, as each item is completed, require the prospective Permit Holder to give verbal confirmation that:

- a. They have understood that item of the Permit.
- b. The information in each item of the Permit matches the work that they are undertaking.

7.4 Receiving a Permit

The Permit Holder shall:

- a. Satisfy themselves that the Permit provides access for the work as requested and is appropriate to the work to be carried out.
- b. Understand the limits of the Permit, the precautions and control measures that have been taken and any relevant warnings.
- c. Confirm control measures, as required, are applied, such as the installation of any working earths, barriers or signage or the appointment of a safety observer.
- d. Endorse the Permit as having been received.

7.5 Issuing the Permit to the Permit Holder

The Authorised Person issuing the Permit shall:

- a. Ensure that the Permit Holder prints their name and signs the Permit at the space Provided at Item (8) in acknowledgment of acceptance of the associated responsibilities.
- b. Acknowledge having instructed the Permit Holder and makes the Permit 'In Force' by printing their name and signing at the space provided, and entering the time and date 'In Force' at Items (8) and (9).
- c. Send a copy of the issued permit and photo(s) of Electrical Safe Work Area to ElectricalPermits@transport.nsw.gov.au with email subject "SAP-[Location]-[Permit Number]" (i.e. email subject for Substation Access Permit LM250107/1 at Lewisham Substation is "SAP-Lewisham SS-LM250107/1").
- d. Then issue the Permit.

The person issuing the Permit is not required to remain at the substation.

Further details on the entry and supervision of persons within a substation shall be detailed in the Pre-work Briefing, refer to *SMS-06-OP-3114 Pre-work Briefings* for further information.

8 Holding a Permit

The Permit Holder shall remain at the work area to the extent necessary to exercise their responsibility until such time as either:

- a. The Permit is cancelled (Section 9.2), or
- b. The Permit is transferred (Section 11.3), or
- c. The Permit is recalled (Sections 11.5 and 11.6).

8.1 Instruct Workers

The Permit Holder shall instruct all workers at the worksite before they enter the Electrical Safe Work Area and:

- a. Ensure the limits of the Electrical Safe Work Area, the precautions, control measures and any warnings or instructions, as applicable, that are entered on the Substation Access Permit are communicated to, and are observed by all persons signing on the Personnel Register(s) associated with the Substation Access Permit;
- b. Ensure no member of the work party commences work until they have signed on the Personnel Register(s) associated with the Substation Access Permit;
- c. Ensure persons signed on the Personnel Register(s) associated with the Substation Access Permit are constantly supervised; and
- d. Ensure the Substation Access Permit is available for the duration of issue.

Where a barrier is established, the Permit Holder shall ensure:

- a. Approved procedures are used for the control of personnel within, or when leaving or returning to the barrier area.
- b. Where it is necessary to temporarily alter the barrier that it is carried out in accordance with PR D 78506 Section 5.10 Modifying the Electrical Safe Work Area / Demarcation Tape Barrier After the Issue of the Associated Substation Access Permit.
- c. Tape barriers to clearly define the safe work area and/or clearly identify other adjacent equipment, which must be treated as live. The tape must enable clear access to allow safe completion of the work.

8.2 Pre-Work Requirements

Before starting work, the Permit Holder shall make sure that:

- a. The requirements of the Permit (both sides) are understood.
- b. The Permit fully describes the work to be carried out.
- c. The obligations of the Permit Holder for the electrical safety of staff working under their control are understood.
- d. The work process is adequately controlled so that persons carrying out the work for which the Permit was issued do not work beyond the limits of the Electrical Safe Work Area (the Permit Holder may use appropriate markers to assist in the control of the work process).

- e. All persons (including the Permit Holder) carrying out the work for which the Permit was issued are instructed, warned and understand:
 - i. Which equipment is covered by the Permit and is safe to work near or on/within.
 - ii. That all other exposed electrical equipment shall be treated as live for the purposes of this Permit.
 - iii. That no work is to be carried out near or on/within the isolated equipment in the Electrical Safe Work Area, other than that specified on the Permit.
 - iv. Not to allow any part of their body, clothes, tools, material or machinery they may be using or carrying, to come within the minimum Safe Approach Distances of exposed electrical equipment, other than the isolated equipment in the Electrical Safe Work Area.
 - v. That work process controls have been put in place and that they shall not pass over or under any work area access markers, safety fences, demarcation tape or special barriers placed in connection with the Permit.
 - vi. To comply with the instructed process for exiting and re-entering the Electrical Safe Work Area.
 - vii. To print their names and sign on to the Personnel Register prior to commencing the work for which the Permit is required.
- f. Only allow those employees carrying out work that directly relates to the purpose of the SAP to sign on to the Permit as members of the workgroup.

The Permit Holder shall sign on and off on the Permit and/or the Personnel Registers. Other work party members shall sign on and off accordingly.

For special arrangements regarding work using cranes, vehicles and mobile plant, refer to PR D 78700 Section 5.2 Accredited Persons and Section 7.2 Risk assessment and planning, and *SP D 79050 Safe Use of Mobile Plant around Electrical Equipment*.

8.3 Work in Accordance with a Permit

While work is being carried out, the Permit Holder shall make sure that (as per Part (B) of the Substation Access Permit Form):

- a. The arrangements set out in 'Permit Holder requirements' and 'Pre-work requirements' of the pre-work brief are in place.
- b. The Permit is retained at all times. The permit holder is responsible for safeguarding the SAP.
- c. Persons signed on to the Personnel Register of the Substation Access Permit shall sign off prior to leaving the worksite at the end of their shift.
- d. Anyone who has signed off the Personnel Register understands that permission for them to carry out work for which the Permit was issued has been withdrawn.
- e. The Permit is returned no later than the time shown on the Permit.
- f. If it is probable that the work will extend beyond the expiry time shown on the Permit, the Permit Holder shall inform the Authorised Person who issued or is retrieving the Permit as soon as it is known that the Permit may be returned late. If they are uncontactable, the Permit Holder shall contact Transport for NSW (TfNSW) Contractors Representative.

NOTE

The TfNSW Contract Representative is a TfNSW project representative who is an Authorised Persons (Substations).

8.4 Person Entering/Leaving the Electrical Safe Work Area

Persons signed onto the Personnel Register(s) of the Substation Access Permit for which a demarcation taped barrier has been erected may enter into the Electrical Safe Work Area as per the instruction process. These Persons shall only enter the Electrical Safe Work Area and only via the defined entrance as instructed by the Permit Holder.

The Permit Holder shall establish a process by which all members of the work party shall exit and re-enter the Electrical Safe Work Area. The process shall include all of the following:

- Work party member shall notify the Permit Holder when exiting and re-entering the Electrical Safe Work Area.
- Identification of isolated and live equipment prior to leaving the Electrical Safe Work Area.
- A review of working conditions prior to the work party member returning to the Electrical Safe Work Area.

Should a person who is not signed onto the Substation Access Permit need to enter the Electrical Safe Work Area, the Permit Holder shall instruct the person in accordance with Section 7.1 and give approval before entry. The Permit Holder shall risk assess and implement the necessary controls on this person to allow entry.

8.5 Return the Permit

The Permit Holder shall return the Permit to the Authorised Person cancelling the Permit. The Permit Holder cannot leave until the Permit has been handed over to the Authorised Person (Substations). The Permit Holder shall check and ensure that all members of the work party have signed off before leaving the work site and that they are in possession of the Electrical Commissioning Certificate (where identified as being required on the issued permit).

9 Cancelling a Permit

9.1 Preliminary Checks

A Substation Access Permit may only be cancelled by an Authorised Person (Substations).

Prior to cancelling the Permit, the Authorised Person cancelling the Permit shall:

- a. Check that the Permit Holder has certified (Item (10) of the Permit) that the Permit may be cancelled.
- b. Check that all persons signed on to the Personnel Registers have signed off.

If the electrical equipment is to be energised or re-energised post cancellation of the Permit, check that the electrical equipment for which the Permit was issued has been inspected, tested and is safe for supply to be restored. This may include receipt of the Electrical Commissioning Certificate and test results from the persons performing the work.

If it appears that any work party member may not have signed off, confirm that the Permit Holder:

- a. Has made reasonable attempts to ensure that any person failing to sign off has left the work site and it is impracticable to get them back for signing off.
- b. Accepts responsibility for that person, and an appropriate notation shall be made on the Personnel Register.
- c. Is required to undertake a joint site inspection with the person cancelling the Permit to ensure that all persons, tools, materials and machinery are outside the minimum Safe Approach Distance for safe energisation of supply.

9.2 Cancel Permit

Once the preliminary checks have been satisfactorily completed, the person cancelling the Substation Access Permit shall then:

- a. Cancel the original copy of the Substation Access Permit by signing in the space provided and entering the time and date – Item (10) of the Permit.
- b. Ensure all related Permits and Operating Agreements have been signed off, if received.
- c. Remove any work area or defined route access markers, safety fences, demarcation tape, temporary warning signs, and/or special barriers.
- d. Remove the earths and Danger Tags when applicable.

NOTE

Removal of earths shall be in co-ordination with the ESO. Earths shall not be removed, without first checking that they are not also protecting work being carried out on another Substation Access Permit or a WHVI

- e. Arrange/carry out the switching operations to restore the electrical equipment concerned to service, in co-ordination with the ESO and in accordance with the appropriate instruction:
 - *PR D 78201 Removal and Restoration of High Voltage Supply*
 - *PR D 78301 Removal and Restoration of 1500 Volt Supply*

- *PR D 78401 Isolation and Energisation of Low Voltage Equipment.*
- f. Forward the cancelled Permit to the nominated Electrical Engineer or electrical representative in the area concerned.

10 Review of Permits

Nominated TfNSW Electrical Engineers, or electrical representatives in the area concerned, are responsible for reviewing Permits returned to them after completion of the work covered by the Permits.

11 Other Scenarios

11.1 Modifications to the Permit

Unless stated otherwise in this document, no deletions or alterations may be made to the work or operating details on the Permit once it has been issued.

Should it be necessary to vary the work specified after the Permit has been issued, the Permit shall be cancelled and a new Permit issued for the revised work.

11.2 Relieving the Permit Holder (an Unplanned Event)

Where a Permit Holder is unable to fulfil their duties (e.g. illness), all persons signed on the Permit shall cease the work and sign off the Personnel Register for which the Permit was issued until the new Permit Holder is appropriately instructed, receives a Permit and takes charge of the work party. This is to be arranged with an Authorised Person (Substations) or the TfNSW Contractors Representative.

The new Permit Holder can sign off the Personnel Register on behalf of the previous Permit Holder confirming all personnel are signed off the Personnel Register.

11.3 Transfer Permit (Multiple Continuous Shifts Only)

A single Substation Access Permit may be issued to accommodate multiple shifts if all the conditions below are confirmed prior to the commencement of each shift:

- a. Work is continuous and uninterrupted.
- b. The electrical isolation, earthing and the Electrical Safe Work Area remain unchanged.
- c. The configuration of the work area markers, defined route access markers, safety fences, demarcation taping and or temporary warning signs defining the Electrical Safe Work Area remain unchanged.
- d. The scope of work, including the extent and type of work, remains unchanged.
- e. The members comprising the work party have been instructed.
- f. No additional electrical hazards have been introduced to the work area.
- g. The new Permit Holder to receive the Permit is instructed by an Authorised Person (Substations).

If any of the above conditions cannot be met, the Permit shall be cancelled and a new Substation Access Permit shall be issued.

For **each shift**, members of the work party shall sign on to the Personnel Register prior to commencing work and shall sign off the Personnel Register at the completion of their shift.

11.4 Lost/Damaged Permit

If the Permit is lost or damaged, the Permit Holder shall immediately report the loss to the Authorised Person (Substations) who issued or is retrieving the Permit or the TfNSW Contract Representative. The Permit Holder shall also advise other shift Permit Holders that no work can be carried out unless a replacement Permit has been issued and they are briefed for the replacement Permit by an Authorised Person (Substations) or TfNSW Contract Representative.

11.4.1 Work in Progress

If work is still in progress, an Authorised Person (Substations) shall issue a duplicate Permit with the same number. This duplicate Permit shall be endorsed "Replacement for Lost / Damaged Permit". The Authorised Person (Substations) issuing the replacement Permit shall instruct the Permit Holder to ensure that all persons still engaged in the work sign on to the duplicate Permit. The Authorised Person (Substations) shall also ensure that the loss/damaged and replacement action is recorded at Item (7) of the duplicate Permit.

11.4.2 Work Completed

If work has been completed, and a replacement Permit has not been issued, the Authorised Person (Substations) who would have cancelled the Permit shall obtain written notification from the Permit Holder that:

- a. All persons, tools, materials or machinery are clear of all electrical equipment for which the Permit was issued, and
- b. All persons who signed on the Personnel Register associated with the Substation Access Permit have been instructed to treat the equipment as live.

If the book copy of the Substation Access Permit is available, this written notification may be provided by making a notation on the book copy that "the original Permit has been lost/damaged" and ensuring all persons signed on to the original Permit, sign off on the book copy.

11.5 Early Recall/Suspension

When an Early Recall/Suspension is requested by the Network Operator, the Permit Holder shall:

- a. Provide the Network Operator with the operational readiness details of the electrical infrastructure being recalled.
- b. Follow instructions from the Network Operator.

When further action is required by the Network Operator, the Permit Holder shall perform as per the Network Operator's request to

- a. Complete work as planned
- b. Reverse work to make ready for the recalled equipment with Electrical Commissioning Certificate,

prior to returning the Permit to an Authorised Person (Substations).

11.6 Emergency or Incident

Under emergency or when an incident occurs, the Permit Holder shall communicate with the Network Operator and follow procedures in Section 11.5.

11.7 Late Permit Return

The Permit shall be returned no later than the time shown on the Permit. If it is probable that the work might extend beyond the expiry time shown on the permit, the permit holder shall inform the Authorised Person (Substations) who issued or is retrieving the Permit or the TfNSW Contract Representative as soon as it is known that the permit may be returned late.

12 Extraordinary Substation Access Permit

12.1 Application

When electrical equipment within a substation is to be isolated (and earthed) and re-energised a number of times for testing, inspection or adjustment purposes, a single Extraordinary Substation Access Permit may be issued in place of a number of Substation Access Permits.

Only an Authorised Officer (Substations) may hold an Extraordinary Substation Access Permit.

During the currency of an Extraordinary Substation Access Permit, an Authorised Officer (Substations) shall be in charge of the work party and shall be accompanied by another Authorised Officer (Substations) or an Authorised Operator, and both shall check each switching operation.

12.2 Special Requirements

All conditions and responsibilities for the Substation Access Permit, as detailed in this document, apply to the Extraordinary Substation Access Permit except for:

- a. Only an Authorised Officer (Substations) may write, check, instruct and issue an Extraordinary Substation Access Permit.
- b. The Substation Access Permit form shall be utilised as per Section 12.3 below.
- c. No other Electrical Permit (refer to the **Electrical Safety Definitions** page available on the **RailSafe** site for the definition of an Electrical Permit) are to be in force for the electrical equipment being tested, inspected or adjusted during the currency of the Extraordinary Substation Access Permit.
- d. Only an Authorised Officer (Substations) may be a Permit Holder of an Extraordinary Substation Access Permit.

12.3 Substation Access Permit Form

The Substation Access Permit form shall be used with the word 'Extraordinary' written in front of the title.

The Extraordinary Substation Access Permit shall be made out as normal with the exception that:

- a. no entries are required for Items (4) and (5)
- b. Items (6) and (7) will require completion, especially with regards to relevant special instructions and warnings.

All other conditions for the Substation Access Permit apply to the Extraordinary Substation Access Permit.

13 Test Substation Access Permit

13.1 Application

When it is necessary to remove earths from high voltage equipment to enable test equipment to be used, a Test Substation Access Permit shall be issued.

Since it is not necessary to rail connect 1500 Volt equipment within a substation, testing of 1500 Volt DC equipment will normally be carried out using a Substation Access Permit in accordance with procedure *SP D 79054 Inspection and Testing of Fixed Electrical Equipment*

However, for testing high voltage and/or 1500 Volt equipment extending outside a substation, a Test Substation Access Permit shall be issued in accordance with Sections 13.7 or 13.8.

The following work may be carried out on the Test Substation Access Permit:

- a. connection and disconnection of the test equipment
- b. adjustment of the equipment under test
- c. adjustment of the test equipment.

This work shall be carried out with the electrical equipment earthed (or rail connected as appropriate) unless it is carried out in a manner that does not require persons to come within the Safe Approach Distance of the electrical equipment.

Only an Authorised Operator may hold a Test Substation Access Permit.

13.2 Special Requirements

All conditions and responsibilities for the Substation Access Permit, as detailed in this procedure, apply to the Test Substation Access Permit except as indicated:

- The Substation Access Permit form shall be utilised as per Section 13.3 below.
- No other Electrical Permits (refer to the **Electrical Safety Definitions** page available on the **RailSafe** site for the definition of an Electrical Permit) are to be in force for the electrical equipment being tested, inspected or adjusted during the currency of the Test Substation Access Permit except for as described in Sections 13.7 and 13.8.

The high voltage equipment to be tested shall be isolated and earthed prior to the issue of the Test Substation Access Permit.

The earths shall only be removed for the duration of the test.

The 1500 Volt equipment to be tested in accordance with Section 13.8 shall be isolated and rail connected prior to the issue of the Test Substation Access Permit.

The rail connections shall only be removed for the duration of the test.

WARNING

Equipment capacitance can result in a dangerous voltage remaining on the equipment after the test equipment has been turned off.

High voltage equipment shall be discharged to earth and 1500 Volt equipment short circuited to prior to persons coming within the electrical Safe Approach Distances at the conclusion of the test.

The equipment shall remain isolated while the Test Substation Access Permit is in force.

All conditions of the Substation Access Permit other than the removal of earths apply to the Test Substation Access Permit.

13.3 Substation Access Permit Form

The Substation Access Permit form shall be used with the word TEST written in front of the title.

13.4 Electrical Safe Approach Distances

During the period for which earths (or rail connections) are removed from the electrical equipment, all persons shall maintain the required Safe Approach Distance from the electrical equipment (including the test equipment). The required distance is the greater of that prescribed in SP D 79049 for:

- a. the nominal equipment operating voltage
- b. the test voltage.

NOTE

SP D 79052 allows for reduced Electrical Safe Approach Distances in some circumstances.

13.5 Responsibilities of the Person Issuing the Permit

An Authorised Person (Substations) shall:

- a. Check the isolation, earthing, relevant special instructions and warnings, demarcation tape and temporary warning sign arrangements with the person carrying out the tests prior to issuing the Test Substation Access Permit.
- b. Either carry out the tests or check the details of the tests to be carried out.
- c. Ensure that no other Electrical Permits (refer to the **Electrical Safety Definitions** page available on the **RailSafe** site for the definition of an Electrical Permit) are to be in force for the electrical equipment being tested during the currency of the Test Substation Access Permit, except as provided for in Sections 13.7 or 13.8.
- d. Be present during the tests to ensure that the agreed arrangements are followed.
- e. Authorise the removal of earths when required.

Operating procedures are to be carried out in co-ordination with the ESO.

13.6 Responsibilities of the Person Carrying Out the Test

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.

13.7 Testing a High Voltage Aerial Line or Cable Extending Outside a Substation

A Test Substation Access Permit shall be issued where the testing is carried out on a high voltage aerial line or cable extending outside the Substation and the test is conducted from within a substation.

If a WHVI is current for the high voltage aerial line or cable under test, a Test Electrical Permit to Work shall be issued in accordance with *PR D 78501 Electrical Permit to Work* to the person issuing the Test Substation Access Permit.

The Test Electrical Permit to Work shall be received prior to the issue of the Test Substation Access Permit and shall not be returned until the Test Substation Access Permit has been cancelled. The number of the Test Electrical Permit to Work shall be recorded on the Test Substation Access Permit under the heading “The Following Switching Operations Are To Be Carried Out” along with any other switching necessary to complete the isolation required for the testing.

13.8 Testing 1500 Volt Equipment Extending Outside a Substation

A Test Substation Access Permit shall be issued where the testing is carried out on 1500 volt equipment that cannot be isolated from the 1500 Volt overhead wiring and the test is conducted from within a substation.

In this case, a Test Electrical Permit to Work shall be issued in accordance with PR D 78501 to the person issuing the Test Substation Access Permit.

The Test Electrical Permit to Work shall be received prior to the issue of the Test Substation Access Permit and shall not be returned until the Test Substation Access Permit has been cancelled. The number of the Test Electrical Permit to Work shall be recorded on the Test Substation Access Permit under the Item (4) “The Following Switching Operations Are To Be Carried Out” along with any other switching necessary to complete the isolation required for the testing.

14 Reference documents

PR D 78201 Removal and Restoration of High Voltage Supply

PR D 78301 Removal and Restoration of 1500 Volt Supply

PR D 78302 1500 Volt Authority

PR D 78401 Isolation and Energisation of Low Voltage Equipment

PR D 78500 Electrical Permits

PR D 78501 Electrical Permit to Work

PR D 78502 FM01 Substation Access Permit with 2 Personnel Registers

PR D 78502 FM02 Substation/Low Voltage Personnel Register

PR D 78502 FM03 Substation Access Permit with 6 Personnel Registers

PR D 78506 Substation – Demarcation Taping

PR D 78700 Working around Electrical Equipment

PR D 78701 Personal Certifications – Electrical

SMS-06-OP-3114 Pre-work Briefings

SP D 79049 Safe Approach Distances (SADs)

SP D 79050 Safe Use of Mobile Plant around Electrical Equipment

SP D 79054 Inspection and Testing of Fixed Electrical Equipment

SP D 79055 Electrical Competency Specific Certifications