

Engineering Instruction Electrical Distribution Unit

EI D 18-03 V2.0

Working around Pantograph Condition Monitoring Systems

This Engineering Instruction includes urgent engineering information. Adherence to the information in this Instruction is **MANDATORY**.

Date in Force: 4 March 2020

Date of Review: 4 March 2021

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Audience:

- Network Maintenance Division
- Major Works Division
- TfNSW

Main Points:

- Before working in the vicinity of the PCMS sites, ensure the equipment is isolated as per SWI DSYD2016/40070
- Work in the vicinity of this equipment must not commence until the PCMS is turned off and authorised by ICON Condition Monitoring

Primary Affected Document: SMS-06-EN-0567 1500 Volt Authority
This instruction shall be read in conjunction with SWI DSYD2016/40070

Scope

This instruction sets out the process that shall be followed when working around the Pantograph Condition Monitoring Systems (PCMS).

Background

Pantograph Condition Monitoring Systems are installed on overhead structures and located above the overhead wire to provide frequent, automated inspection of pantographs on electrical passenger trains and send real-time alarms to operational staff at the Rail Management Centre to assist in the prevention of pantograph incidents and minimise rail network delays.

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Each PCMS includes a Class IV laser which may cause temporary or permanent skin and eye damage if **a person is within five metres of the equipment and the laser is triggered by a rail vehicle underneath**. This risk is eliminated by de-energising (isolating) the PCMS for the duration of the work.

Five PCMS sites exist on the Sydney Trains Network:

- **Thornleigh:**
 - Main North Line, between OHWS H 29+950 and OHWS H 30+015
 - Electrical Isolation cabinet located in the Up Cess
- **Warwick Farm:**
 - Main South Line, between OHWS S 30+116 and OHWS S 30+184
 - Electrical Isolation cabinet located in the Up Cess
- **Penshurst:**
 - Illawarra Line, between OHWS SW 15+836 and OHWS S 15+893
 - Electrical Isolation cabinet located in the Up Cess
- **St Marys:**
 - Main West Line, between OHWS SL 47+880 and OHWS SL 47+931
 - Electrical Isolation cabinet located in the Down Cess
- **Artarmon:**
 - North Shore Line, between OHWS MH 9+845 and OHWS MH 9+900
 - Electrical Isolation cabinet located in the Down Cess

Isolation of PCMS Equipment

Where a PCMS is located within the Electrical Safe Work Area of an Authority, the isolation of the PCMS shall be included as part of the Authority and relevant references made on the Electrical Permit. The isolation/restoration procedure of the PCMS is documented in SWI DSYD2016/40070.

Action required

- Authorised Officer (Mains) processing a permit request shall check for the presence of a PCMS within the safe work area or on an adjacent track and make a note on the permit request that the PCMS is required to isolated.
- Persons preparing 1500V Authorities shall check for the presence of a PCMS within the safe work area or on an adjacent track and shall include the instruction to isolate the PCMS system (site) in the Switching 'Instructions' section of the 'Authority for Removal of supply from 1500 Volt sections'. Example:

CIRCUIT BREAKER / SWITCH / LINK	Location	Action
Warwick Farm PCMS	S30+150	Isolate with S/L&DT

- Persons preparing 1500V Authorities shall include a note in the Special Instructions section of the 'Authority For Removal of supply from 1500 Volt sections' as per example below:

"PCMS over the Up/Dn main South between S30+116 to S30+184. Work in accordance with SWI D2016/40070"

- The Permit Writer shall include the following special instruction on each Permit:

The Permit Holder shall ensure the PCMS isolation switch is in the off position, locked and danger tagged as per SWI D2016/40070 **before** proceeding within 5m of this equipment.

Contact

Electrical Distribution Unit

E: RailElectricalSafety@transport.nsw.gov.au

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1. Purpose and scope

To describe the procedures required for the issuing and cancellation of an Authority for Removal of Supply from 1500 Volt Sections

2. General Requirements

A completed “Authority for Removal of Supply from 1500 Volt Sections” (hereafter called an Authority), form PR D 78301 FM 01, must specify:

- (i) The sections and sub-sections from which supply is to be removed.
- (ii) The date and time of isolation.
- (iii) Any safe working documentation number or notation, which could be either :
 - The Special Train Notice (STN) number in the case of planned work advertised on a STN, or
 - The word “Telegram” in the case of work advertised on short notice on a SAFE Telegram, or
 - The words “Local Arrangement” in the case of Sidings and the like not under the control of a Train Controller or signaller and for which isolation of 1500 volt supply does not need to be advertised.
- (iv) Any necessary special instructions. These must include:
 - Details of RailCorp high and low voltage services, for which Electrical Permits must be received to allow work to be carried out at a specific location.
 - Reference to any other Authority which may be affected by, or is associated with, this Authority.
 - Details of other Network Operators’ Services for which an Operating Agreement must be received to allow work to be carried out at a specific location.
 - Details of locations which must be excluded from a particular Electrical Permit to Work due to live equipment.



Warning

Care must be taken to consider live equipment such as a crossing feeder in the vicinity of the electrically safe work area. See Appendix C for guidance.

- (v) All switching operations required for the 1500 volt isolation.
- (vi) The area for which Electrical Permits to Work and/or Operating Agreements may be issued.
- (vii) The name of the group that is to carry out the work.

3. Issue of Authorities for Planned Work

Authorities must be issued by an officer authorised to do so by the Electrical Network Manager, referred to in this section as the “Issuing Officer”.

- (a) Following the possession approval for planned work, an Authorised Officer (Mains) must understand sufficient details of the work to allow the preparation of the Special Train Notice (STN). This information must be forwarded to the Issuing Officer, who will make arrangements for the following information to be advertised in an STN and/or Telegram:
 - Date, time and the general area where work is being undertaken,

- The tracks which will not be available for electric traction - limits to be nominated,
 - The sections of the overhead wiring from which supply will be removed,
 - The track possession required.
- (b) The person responsible for organising each job must establish whether an Electrical Permit is required in accordance with SMS-06-GD-0268 Working around Electrical Equipment.

For work which requires an Electrical Permit to Work and/or an Operating Agreement, an order for the electrical equipment to be isolated using the form PR D 78501 FM 01 - Request for Electrical Permit to Work must be forwarded to an Authorised Officer (Mains) responsible for approving the Authority.

Where supply is required to be removed from high voltage, and low voltage services for work to be carried out, the requirements of instructions SMS-06-EN-0560 Removal & Restoration of High Voltage Supply and PR D 78401 Isolation and Energisation of Low Voltage Equipment, must be complied with.

- (c) From the information obtained in (b) above, the Authorised Officer (Mains) must forward to the Issuing Officer details required to be included on the Authority under 2 (i), (ii), (iv) and (vi).
- (d) A minimum of seven (7) days prior to the commencement of work, the Issuing Officer will issue the Authority to the work group originating the request, the Electrical System Operator and the Train Controller.
- (e) An Authorised Officer (Mains) must check the field copy of the Authority against:
- the details submitted under (b) and (c) above, and
 - the latest version of the relevant operating diagram

and approve the Authority. This checking must include that:

- (i) The area for which Electrical Permits to Work and/or Operating Agreements may be issued is correct and complete.
- (ii) The sections/subsections from which supply is to be removed fully cover the area in which Electrical Permits to Work and/or Operating Agreements may be issued.

NOTE: *Electrical Permits to Work for working on sectionable overlaps and/or section insulators shall only be issued in accordance with an Authority which isolates both sides of the overlap/section insulator. See Section 3.1 for more detail.*

- (iii) Any special instructions are correct and complete, including details of Operating Agreements required from other Network Operators for work near their services, and other Authorities required before certain Electrical Permits to Work can be issued.

NOTE: *When any other Authorities are cross referenced in the Special Instructions, the details on those Authorities must also be examined. This is to ensure that any switching operations will not compromise the electrically safe work area on another Authority.*

- (iv) The switching operations required to isolate and rail connect the sections/subsections concerned are correct and complete.
- (v) The dates and times are correct.
- (vi) The details contained on the Authority are in agreement with the Special Train Notice and/or Telegram if issued.

After approval, the Authorised Officer (Mains) must forward the Authority to the Authorised Person (Mains) in charge of the Authority together with details of the work to be carried out on each Permit.

- (f) The Electrical System Operator must:

- Check Items (i), (ii) and (iii) of (e) above, as far as can be determined from the operating diagrams or other electrical safety documents available at the Electrical Operating Centre,
- Check Items (iv), (v) and (vi) of (e) above, and
- Sign and date the Electrical System Operator's copy.

NOTE: *When any other Authorities are cross-referenced in the Special Instructions, the details on those Authorities must also be examined to ensure that any switching operations will not compromise the electrically safe work area on another Authority.*

- (g) If it becomes necessary to make minor alterations to an Authority after it has been issued, the person making the alteration must ensure that all relevant copies have been amended. The amendment must be in accordance with any Special Train Notice and/or Telegram advertising the work. If the minor alterations do not affect any details relevant to the Train Controller i.e. any details on the form above the TRAIN CONTROLLER box, an amended copy need not be sent to the Train Controller.

The Authority must then be re-checked by both an Authorised Officer (Mains) and an Electrical System Operator. Each amendment must be initialled and dated by the person checking them.

Once an Authority is in force, no alterations may be made to it in respect to switching required for the isolation except as provided in 3(h) below.

- (h) If it is necessary to overhaul Isolating Links, Switch Pairs or Three Position Switches at substations which is a point of isolation for the Authority, the procedure described in Section 5 shall be followed.
- (i) If it is necessary to alter an Authority which will cause the electrically safe work area to be altered, any Permit Holder who has been instructed in that electrically safe work area must be re-instructed for the new area.

3.1. Authorities for Sectionable Overlaps or Section Insulators

When abutting Authorities are issued covering electrically adjacent sections, no work is permitted in the sectionable overlap or on the section insulator as it is excluded from the area in which Electrical Permits to Work may be issued on both Authorities.

Overlapping Authorities may be issued when planned work is required to be performed in sectionable overlaps or on section insulators. In this case, the Authorities must be cross-referenced and a double set of Danger Tags are required at the relevant isolating locations.

Where abutting Authorities have already been planned and the need for work in sectionable overlaps or on section insulators becomes apparent **after** the work has been advertised, the issuing of a third Authority is permitted. This third Authority must cover the sections either side of the overlaps and/or section insulators in addition to the abutting Authorities for each side. In this case, all three Authorities must be cross-referenced and the Special Instructions on the third Authority must also specify that:

- (i) This Authority must not be implemented until the two Authorities covering the sections adjacent to the overlaps and/or section insulators are in force, and
- (ii) This Authority must be cancelled before either of the other Authorities can be cancelled.

The Electrical Permits to Work allowing the work in the sectionable overlaps or on the section insulators must be issued from this third Authority.

4. Issue of Authorities Under Emergency Conditions

- (i) An Authorised Officer (Mains) on site must communicate verbally with the appropriate Electrical System Operator regarding the sections/subsections of the 1500 volt overhead wiring system that need to be isolated and rail connected, including other

Network Operator's services that need to be isolated and earthed, for the work to be carried out safely. Reference shall be made to controlled copies of Operating Diagrams and an appropriate field inspection shall be carried out.

Once agreement has been reached about the sections/subsections to be isolated and the timing of the isolation, the Authorised Officer (Mains) on site must communicate to the Electrical System Operator the details required to be included on the Authority as set out in Section 2 (i), (iv), (vi) and (vii).

- (ii) The Electrical System Operator must issue the Authority verbally to the Authorised Officer (Mains) on site, who must record the details on an Authority form and approve the Authority. Alternatively, the Authority may be issued by fax/email or may be hand delivered. Work must not proceed until any discrepancy has been resolved. This Authority is deemed an Emergency Authority. The Authority form must be used with the word "EMERGENCY" written in front of the title.

The Electrical System Operator must also advise the appropriate Train Controller of the Authority details and obtain the necessary traffic clearances. A facsimile or emailed copy of the Authority will be satisfactory.

- (iii) The field and Electrical System Operators' copies of the Emergency Authority must be checked and approved in the same way as for an Authority for planned work. Minor alterations to an Emergency Authority after it has been issued must be dealt with in the same way as for an Authority for planned work.
- (iv) In the absence of an Authorised Officer (Mains), an Authorised Traction Operator, with a knowledge of the electrical sectioning in the area, may carry out the procedures in section 4 (i) and (ii) when approved by the Electrical Network Manager or the Electrical Engineer having authority over the area concerned.

NOTE: *This approval will only be granted on a case by case basis, and is only current for the particular Emergency Authority.*

5. Overhaul of Isolating Links, Switch Pairs and Three Position Switches

The following sections apply to the overhaul of Isolating Links, Switch Pairs and Three Position Switches within Substations and Sectioning Huts, but does not apply to field Links or Switches.

NOTE: *There are a few locations where Substation Isolating Links, Switch Pairs or Three Position Switches are positioned remotely from the Substation, but are still within the designated boundary of the Substation (shown on the Operating Diagram) and therefore classified as Substation equipment.*

5.1. Electrical Permit Requirements

Prior to the start of work, the Authorised Person (Substations) must obtain an Electrical Permit to Work.

A separate Substation Access Permit must be issued for each 1500V link, Switch Pair or Three Position Switch being overhauled if there are other live links present in the 1500V link area.

In the case of a complete outage where every 1500V link in the link area is covered by the Electrical Permit to Work and there are no other sources of supply, a single Substation Access Permit may be issued to overhaul the links. However, this concession is only applicable with 1500V links and does not apply to the Switch Pairs and Three Position Switches.

5.2. Overhaul of Isolating Links

If it is necessary to overhaul the isolating link which is a point of isolation for the Authority, an Authorised Person (Substations) is permitted to extend the 1500 volt isolation to the feeder DCCB, provided the Substation Access Permit is endorsed with the words "Isolating link No(s)._____ is (are) to be checked open and Danger Tagged in accordance with current Authority No._____ prior to the cancellation of this Permit".

The Electrical System Operator must authorise the removal of the Danger Tag(s), which was (were) attached to the link(s). The Authorised Person (Substations) holding the Substation Access Permit must replace this (these) Danger Tag(s) before cancelling the Permit and advise the Electrical System Operator that the Danger Tag(s) for the link(s) has been replaced.

5.3. Overhaul of Switch Pairs and Three Position Switches

If it is necessary to overhaul the isolating and/or rail connecting switch which is a point of isolation for the Authority, an Authorised Person (Substations) is permitted to extend the 1500 volt isolation to the feeder DCCB, provided that a separate Substation Access Permit is issued for each switch being overhauled and the Substation Access Permit is endorsed with the words:

- (i) "Isolating switch No._____ is to be checked OPEN and Danger Tagged in accordance with current Authority No._____ prior to the cancellation of this Permit", and
- (ii) "The rail connecting switch shall be checked CLOSED, LOCKED CLOSED (if appropriate) with a special lock and Danger Tagged in accordance with current Authority No._____ prior to the cancellation of this Permit".

Portable rail connections must be applied in accordance with PR D 78305 1500V Operating Procedures, either directly to the overhead wiring, or between the negative rail inside the link area and the feeder side of the isolating switch.

The Electrical System Operator must authorise the removal of the Danger Tag, which was attached to the switch. The Authorised Person (Substations) holding the Substation Access Permit must replace this Danger Tag before cancelling the Permit and advise the Electrical System Operator that the Danger Tag for the switch has been replaced.

Portable rail connections must not be removed, and rail connecting switches closed for the Authority must not be opened, in connection with work carried out in accordance with the above provisions, unless alternative rail connections are put in place.

6. Responsibility of the Person in Charge of the Authority

6.1. Preparation

The Authorised Person (Mains) in charge of the Authority must ensure that each Authorised Person (Mains) who will be issuing an Electrical Permit to Work has a copy of the approved Authority.

6.2. Responsibilities Relating to Removal of Supply

When given clearance by the Electrical System Operator to proceed with proving dead, rail connecting and issuing Electrical Permits to Work or Operating Agreements, the Authorised Person (Mains) in charge of the Authority must:

- (a) Print their name and sign on the back of the Authority as the Authorised Person (Mains) in charge of the Authority and enter the date and time, and
- (b) Ensure that an Operating Agreement is received from other Network Operators and the working earths have been applied where required. Check that the equipment listed on the Operating Agreement corresponds with that listed on the Authority, and list the details of the Operating Agreement on the back of the Authority. The Operating Agreement must be kept with the Authority until the Operating Agreement is cancelled, and

- (c) Arrange for proving dead to be carried out in accordance with the procedure detailed in PR D 78305 1500V Operating Procedures, and
- (d) Arrange for portable rail connections to be applied in accordance with the procedure detailed in PR D 78305 1500V Operating Procedures. A record is to be made by the Person in charge of the Authority for each portable rail connection including the location, track, rail, electrical section, time applied and time removed using form PR D 78501 FM 02 Portable Rail Connection / Earthing Schedule. This record is to be attached to the field copy of the Authority at all times whilst the Authority is in force and returned to the appropriate Electrical Engineer's Office upon cancellation of the Authority.

Where overlapping Authorities exist, the portable rail connections applied in the overlapping "areas in which permits may be issued" must be recorded on each of the portable rail connection / earthing schedule forms for each of the overlapping Authorities.

6.3. Responsibilities Related to Issuing of Permits

Upon completion of all the necessary isolation and rail connecting procedures, the person in charge of the Authority must:

- (a) Arrange for an Electrical Permit to Work or Operating Agreement to be issued in accordance with the procedure detailed in PR D 78500 Electrical Permits for each separate work party to carry out work on or near the specified 1500 volt equipment.
- (b) On the back of the Authority form, list the details of all Electrical Permits to Work or Operating Agreements issued on the Authority. Also print the name of the person to whom the Electrical Permit to Work/Operating Agreement was issued and print the name of the Authorised Person who issued this Electrical Permit to Work/Operating Agreement.

Each Electrical Permit to Work and/or Operating Agreement issued on the Authority must be numbered as a sub-number of the Authority. For example, the first Permit or Operating Agreement issued under Authority number 1234 must be numbered 1234 / 1, the second 1234 / 2, and so on.

- (c) Contact the Electrical System Operator immediately after the issue of one or more Electrical Permits to Work and / or Operating Agreements and advise the identifying numbers of the Permits and / or Operating Agreements issued. This requirement also applies to Operating Agreements if received.

Where the Authorised Person (Mains) in charge of the Authority is also the Person in charge of a work party the Electrical Permit to Work must be issued to themselves.

The Authorised Person (Mains) in charge of the Authority is not required to remain in the vicinity of the work unless holding an Electrical Permit to Work.

If the Authorised Person (Mains) in charge of the Authority becomes aware that work will not be completed in time for supply to be restored by the time stated on the Authority, the Electrical System Operator is to be immediately informed. The Authority will remain in force until all Electrical Permits to Work and / or Operating Agreements issued have been cancelled.

6.4. Transfer of Responsibility

- (a) The Authorised Person (Mains) must advise the Electrical System Operator:
 - (i) before ceasing to be in charge of the Authority, and
 - (ii) of where the Authority and any other Network Operators' Operating Agreements if received will be left for the next shift.

When ceasing duty, the Authorised Person (Mains) in Charge of the Authority relinquishes responsibility for holding the Authority and the Operating Agreements if received.

- (b) The relieving Authorised Person (Mains) taking over the Authority and the Operating Agreements if received must:
 - (i) Advise the Electrical System Operator, and
 - (ii) Take responsibility for the Authority by printing their name and signing the Authority in the space provided and entering the date and time, and also take responsibility for the Operating Agreements if received.

7. Backup Record of Permits and/or Operating Agreements

The Electrical System Operator must record on the reverse side of the Electrical System Operator's copy of the Authority, the identifying number of the Electrical Permits to Work and / or Operating Agreements issued on the Authority, and Operating Agreements if received, as advised by the Authorised Person (Mains) in charge of the Authority.

8. Procedure in Case of the Authority Being Lost

In the event that the original copy of the Authority is lost, the Authorised Person (Mains) in charge of the Authority must contact the Electrical System Operator immediately and arrange for a replacement Authority.

The replacement may be transmitted verbally and transcribed onto the appropriate form, or may be transmitted by fax/email. Both sides of the form must be replaced. The replacement Authority must be endorsed "REPLACEMENT - Original Lost". The date, time and initials of the Authorised Person (Mains) in charge of the Authority must be included with this endorsement.

When completing the reverse side of the replacement form, the identifying numbers of all Electrical Permits to Work and Operating Agreements issued on the lost Authority, and Operating Agreements if received, as recorded on the Electrical System Operator's copy, must be used to ensure that all Permits and Operating Agreements that were issued, and Operating Agreements if received, are included on the replacement Authority.

The book copies of Electrical Permits to Work and Operating Agreements, or other methods, should then be used to establish to whom the individual Permits and Operating Agreements were issued. At the required time, cancellation of the Authority must then proceed in accordance with the procedures prescribed in Section 9.

9. Cancellation of Authorities

Before supply is restored, the Authorised Person (Mains) in Charge of the Authority must:

- (a) Ensure that any necessary inspections, tests, measurements or trials have been completed satisfactorily.
- (b) Arrange for all Electrical Permits to Work or Operating Agreements issued on the Authority to be cancelled and for all portable rail connections to be removed. A record is to be made for each portable rail connection removed on the form PR D 78501 FM 02 Portable Rail Connection / Earthing Schedule.
Where overlapping Authorities exist, the portable rail connections applied in the overlapping areas must not be removed without the approval of the Authority Holders for each of the overlapping Authorities concerned.
- (c) Enter the time each Permit or Operating Agreement is cancelled in the space provided on the Authority, and print the name of the Authorised Person who cancelled the permit/operating agreement.
- (d) Cancel the Authority by printing their name, sign and enter the date and time of cancellation on the back of the Authority, and

- (e) Forward a copy of the back of the Cancelled field Authority listing the cancelled permits to the ICON electrical

If the Authorised Person (Mains) cannot forward the back of the Cancelled Field Authority listing the cancelled Permits to ICON

- The APM in charge of the Authority shall contact the ESO and advise of the,
 - Authority number
 - the individual permit and operating agreements
 - - number
 - - cancelled by
 - - time and date
 - The ESO shall record all of the details onto the rear of ICON copy of the 1500V Authority form with a note as too advised by whom and repeat the information back to the APM for confirmation.
- (f) Advise the Electrical Operating Centre that:
- all Electrical Permits To Work issued on the Authority have been cancelled,
 - all portable Rail Connections have been removed,
 - all other issued Network Operators' Operating Agreements have been signed off, and
 - supply may be restored to the aerial lines or cables specified on the Authority.
- (g) Forward the cancelled Authority and completed form PR D 78501 FM 02 Portable Rail Connection / Earthing Schedule to the appropriate Electrical Engineer's Office.
- (h) The Electrical Operating Centre must:
- (i) Verify the name of the person giving clearance, against the recorded person in charge of the WHVI
 - (ii) Verify the advice received by the Authorised Person (Mains) that all permits have been cancelled
 - (iii) Accept clearance to restore supply only from the Authorised Person (Mains) in charge of the WHVI.
- (i) Arrange for supply to be restored per SMS-06-EN-0566.

10. References

SMS-06-EN-0560	Removal & Restoration of High Voltage Supply
SMS-06-EN-0570	1500V Operating Procedures
PR D 78401	Isolation and Energisation of Low Voltage Equipment
PR D 78500	Electrical Permits
PR D 78302 FM 01	Authority for Removal of Supply from 1500 Volt Sections
SMS-06-GD-0268	Working around Electrical Equipment
PR D 78501 FM 01	Request for Electrical Permit to Work
PR D 78501 FM 02	Portable Rail Connection / Earthing Schedule

11. Appendices

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Appendix A Sample Front of "Authority for Removal of Supply from 1500 Volt Sections" Form



Authority for Removal of Supply from 1500 Volt Sections

AUTHORITY No. 05/2010

SECTIONS AND SUB-SECTIONS FROM WHICH SUPPLY IS TO BE REMOVED:

W2/1A, W2/1B, W2/1C, W2/2, W4/1A, W4/1B, W4/1C, W4/1D, W4/2,
W3/1A, W3/1B, W3/1C, W3/1D, W3/1E, W3/1F, W3/2
W1/1A, W1/1B, W1/1C, W1/1D, W1/1E, W1/1F, W1/2

DATE AND TIME: 0220 HRS SATURDAY 19 CONTINUOUS TO 0200 HRS MONDAY 21 FEBRUARY 2010

S.T.N. No. XXXXX

SPECIAL INSTRUCTIONS:

All exposed electrical equipment must be considered alive and appropriate clearances maintained to this equipment unless a Permit has been received for that electrical equipment.

TRAIN CONTROLLER: Please ensure that no Electric train shall pass a signal which will permit a train pantograph to make contact with the sections / subsections from which supply has been removed on this Authority.
All information below is for use by the Electrical Discipline only.

THE ELECTRICAL SYSTEM OPERATOR SHALL ARRANGE FOR THE FOLLOWING SWITCHING OPERATIONS:

CIRCUIT BREAKER / SWITCH / LINK:	LOCATION:	ACTION:
W2.W4.W3.W1	BLACKTOWN SUBSTATION	OPEN
W1/1.W3/1.W4/1.W2/1.W2/2.W4/2.W3/2.W1/2	DOONSIDE SECTIONING HUT	OPEN
W1/2.W3/2.W4/2.W2/2	MT. DRUITT SECTIONING HUT	OPEN

Sample

AREA IN WHICH PERMITS MAY BE ISSUED:

OVER THE UP AND DOWN MAIN & UP AND DOWN SUBURBAN BETWEEN SL34+239 AND SL42+604

BY:

ESO USE ONLY:

Telephoned Facsimiled		ISSUED BY:	P.CRAWFORD For System Control Engineer
Date:		Date:	17/1/2010
Held by Authorised Person (Mans)	1 3 2 4	APPROVED BY:	G. J. GILLESPIE Authorised Officer (Mans)
Clearance From	Title	Date:	16/2/2010
ESO Instructed	Title	CHECKED BY:	P. GRIFFIN Electrical System Operator
Clearance For Restoration By	Title	Date:	16/2/2010
Operating Completed	Title		
Operations Control Adv	Title		

Custodian: Chief Engineer Electrical
Approved by: GM Chief Engineers
Number: SMS-06-FM-0602

Issue date: 6/12/2010
Review date: 6/12/2013

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Version: 1.2
1 of 2

Appendix B Sample Back of "Authority" Form



Authority for Removal of Supply from 1500 Volt Sections

Authorised Person (Mains) in charge of this Authority
 PRINT: M LOGAN Signed: M Logan Date: 19 / 2 /2010 Time: 0200
 Note: The form "SMS-06-FM-0600 – Portable Rail Connection / Earthing Schedule" is to be attached to the field copy of the Authority at all times whilst the Authority is in force.

Relieving Authorised Person (Mains) in charge of this Authority
 PRINT: P HOGAN Signed: P Hogan Date: 19 / 2 /2010 Time: 0700
 PRINT: M LOGAN Signed: M Logan Date: 19 / 2 /2010 Time: 1500
 PRINT: P HOGAN Signed: P Hogan Date: 19 / 2 /2010 Time: 2300
 PRINT: G JOHNSON Signed: G Johnson Date: 20 / 2 /2010 Time: 0700
 PRINT: M LOGAN Signed: M Logan Date: 20 / 2 /2010 Time: 1500
 PRINT: Signed: Date: / / Time: :
 PRINT: Signed: Date: / / Time: :

OTHER NETWORK OPERATOR'S OPERATING AGREEMENTS RECEIVED FOR THIS AUTHORITY:
 Operating Agreement No. must be advised to the Electrical System Operator if received

Network Operator:	Operating Agreement No:	Service:	Cancelled by:	Time:

THE FOLLOWING ELECTRICAL PERMITS TO WORK AND/OR OPERATING AGREEMENTS HAVE BEEN ISSUED ON THIS AUTHORITY:
 The Permit and/or Operating Agreement No. must be advised to the Electrical System Operator after the Permit and/or Operating Agreement issues have been issued.

Permit / Operating Agreement No:	Issued to:	Issued by:	Cancelled by:	Time:
05/2010/1	E. MEAD	R. REAGAN	R. REAGAN	0130
05/2010/2	B. ABLE	P HOGAN	G. JOHNSON	1400

Sample

WHEN ADVISED THE ELECTRICAL PERMITS TO WORK AND/OR OPERATING AGREEMENTS ISSUED ON THIS AUTHORITY HAVE BEEN CANCELLED AND ALL RAIL CONNECTIONS, INCLUDING THOSE LISTED ON THE FORM "SMS-06-FM-0600 – PORTABLE RAIL CONNECTION / EARTHING SCHEDULE" HAVE BEEN REMOVED. THIS AUTHORITY MAY BE CANCELLED.

AUTHORITY CANCELLED BY: Print: M LOGAN Signed: M Logan Date: 27 / 2 /2010 Time: 0145
 Authorised Person (Mains)

THE ELECTRICAL SYSTEM OPERATOR, WHEN ADVISED THAT THIS 1500V AUTHORITY HAS BEEN CANCELLED, SHALL ARRANGE FOR SUPPLY TO BE RESTORED.

THE CANCELLED AUTHORITY AND SMS-06-FM-0600 FORM ARE TO BE FORWARDED TO THE APPROPRIATE ELECTRICAL ENGINEER'S OFFICE.

Appendix C Vertical Extent of Electrically Safe Work Area

Crossings that comply with RailCorp standards do not normally need to be included (in the Special Instructions) on the Authority.

For Accredited Persons (reference SMS-06-GD-0268 Working around Electrical Equipment), the vertical extent of the electrically safe work area is the greater of 7.4m above rail and 2.3m above OHW structures.

The table below shows the derivation of these dimensions, for guidance purposes only.

Voltage of Conductors Crossing OHW	Minimum Conductor Height	Clearance (Accredited Persons)	Vertical Extent of Electrically Safe Work Area
Crossing Overhead Wiring Only			
11kV	8.8m	1.2m	7.6m
33kV	8.8m	1.2m	7.6m
66kV	8.8m	1.4m	7.4m
132kV	10.7m	1.8m	8.9m
Crossing Overhead Wiring Structure			
11kV	Structure + 3.7m	1.2m	Structure + 2.5m
33kV	Structure + 3.7m	1.2m	Structure + 2.5m
66kV	Structure + 3.7m	1.4m	Structure + 2.3m
132kV	Structure + 4.6m	1.8m	Structure + 2.8m

Where plant which will operate above the height of the catenary is to be used, the presence of crossings will require specific consideration as follows:

- (i) All exposed crossing high voltage aerial conductors must be regarded as LIVE. Appropriate clearances from such conductors must be maintained (in accordance with SMS-06-GD-0268 Working around Electrical Equipment), unless a Permit has been issued for that crossing circuit.
- (ii) The location(s) of these crossings must be shown under 'Special Instructions' on the relevant Authority.