Sydney Trains

Engineering System Integrity

Engineering Instruction
Electrical Distribution Unit

EI D 23-01 V2.0

Electronic Locks - Trial

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

Date in Force: 27 February 2023

Date of Review: 30 June 2023

Approved by:
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Audience:

- Authorised Persons holding electrical keys
- ICON Electrical

Main Points:

- Trial of electronic locks.
- If you need emergency access, lock-boxes are provided containing a fob.

Primary Affected Document: **PR D 78104 Securing Systems for Electrical Equipment**

Scope

This Engineering Instruction concerns the arrangements for Sydney Trains' authorised electrical personnel requiring access to electrical equipment secured by electronic locks.

Background

A trial of electronic locks (iLOQ system) is being conducted at selected locations, which will replace the type C and D locks with Electronic locks at the access points during February to June 2023.

Location Name	Site	Test Asset(s)
Strathfield	Traction Substation (Electrical)	All External Doors and Padlocks
Flemington	Traction Substation (Electrical)	All External Doors and Padlocks
Lidcombe	Signalling Substation (Electrical)	All External Doors and Padlocks
Auburn	Traction Substation Indoor (Electrical)	All External Doors and Padlocks
Clyde Base	Electrical Distribution Cage	Gate Padlock

Instructional videos on the use of the phone app and key fob may be accessed via the link at;
https://support.iloq.com/en/support/solutions/folders/80000682457

For site contact:

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Action required

PR D 78104 prescribes the use of locks with specific keys, defined at Appendix A.1, controlling access to specific locations and types of equipment.

For the purposes of the trial the iLOQ application software, keys, fobs and locks shall be recognised as “Alternative locks” at the following locations/equipment.

1. The iLOQ application software, keys, fobs and locks will be configured to restrict access to authorised persons equivalent to that defined in PR D 78104 Appendix A.1.
2. Access to electrical equipment will be controlled by the Associate Director Electrical Distribution Unit, or their nominee. This includes granting access via the iLOQ system to persons authorised and trained in its use.
3. Mechanical keys and locks will be removed from electrical assets and returned to the Principal Assessor, Electrical Distribution Unit.
4. For Authorised staff not participating in the trial a single point of entry will retain the existing lock.

   Near the entrance of the main building within each location, a lockbox secured with a standard electrical lock contains an electronic fob.

   On completion of use, the fob must be returned to the lockbox and secured.

For the duration of the trial an intranet site has been created that will contain information and briefing packs located at Cyber & Physical Security Critical Asset (CPSA) (nsw.gov.au).

Feedback may be via the web page or the QR Code:

Contact

For further information
Rail Electrical Safety.
E: railelectricalsafety@transport.nsw.gov.au

OFFICIAL

Engineering System Integrity
Electrical Network Safety Rules

Engineering Procedure
Electrical Distribution Unit

Electrical Distribution Network Management

PR D 78104

Securing Systems for Electrical Equipment

Version 2.0
Date in Force: 1 February 2022

Transport Sydney Trains

Approved by:	Associate Director Electrical Distribution Unit Engineering System Integrity	Authorised by:	Engineering Technical Publications Manager System Integrity

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Document control

Version	Date	Author/ Prin. Eng.	Summary of change
1.0	11 November 2015	Chris Leung	First issue as a Sydney Trains document, rebranded from previous RailCorp SMS-06-EN-0555 V1.2.
1.1	23 August 2017	Wayne Halls	Management and Return of keys to EDU.
1.2	05 September 2018	Amy Atkins	Update of WHS regulation reference.
1.3	19 February 2019	Nick Loveday	Updated roles and position names to reflect the current organisation.
1.4	1 February 2022	ENSR Project Team	Reviewed as part of the ENSR Project. Incorporated PR D 78105 V1.3.

Summary of changes from previous version

Summary of change	Section
Document title changed from "Locking Systems for Electrical Equipment"	–
Incorporated PR D 78105 V1.3 DANGER Tags for Electrical Equipment	All
Updated reference documents	5

Table of Contents

1 Purpose and Scope

To specify securing system standards to be used by workers, to ensure:

- the safety of themselves and other persons
- the integrity of Transport Asset Holding Entity of New South Wales (TAHE) electrical equipment.

WARNING

This document is concerned with Transport for NSW (TfNSW) Locks and DANGER Tags ONLY.

Locks and DANGER Tags applied by another entity shall be dealt with as per the safety rules of that entity unless its removal is required due to an emergency condition where there is danger to life, a sustained fault, or a train operation irregularity and upon the direction of ICON Electrical.

2 Definitions

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

3 General

3.1 Precautions When Conducting Work

Workers shall ensure that electrical equipment at a voltage greater than extra-low voltage that has been de-energised to allow work near or on/within exposed electrical equipment is not inadvertently re-energised while the work is being carried out.

The detailed operation and isolation procedures for High Voltage, 1500 Volt DC and Low Voltage equipment are detailed in the local equipment instructions. The appropriate procedures, namely:

- *PR D 78203 High Voltage Operating Procedures*
- *PR D 78305 1500V Operating Procedures*
- *PR D 78401 Isolation and Energisation of Low Voltage Equipment*.

4 DANGER Tags and Special Locks

Danger "Do Not Operate" tags (DANGER Tags) serve as a warning that the electrical equipment to which they are attached shall not be operated

Each device used as an isolation point must be rendered inoperable (including any remote control) and a DANGER Tag secured to the device. Where a locking facility is available, it must be used to lock the isolation device in the required state, lock out any remote control, and secure the DANGER Tag per the equipment local instructions.

An isolation device that is the common point for multiple isolations must have a separate DANGER Tag applied for each isolation. Each DANGER Tag must reference the permit, WHVI or authority that it relates to.

4.1 Application of Danger Tags and Special Locks

Isolating devices are secured with a Danger Tag and where facilities exist a Special Lock by the:

- Authorised Person performing the work
- Authorised Person holding the Authority, WHVI
- person issuing Substation Access Permit or Low Voltage Access Permit for the work to be undertaken
- in support of the process for the application of a DANGER Tag.

4.2 Attachment of Danger Tags and Special Locks

a. Special Locks and DANGER Tags shall be:
   - affixed only after the device is in the required state
   - placed so that it cannot be removed other than deliberately
   - positioned so that it is obvious to any person who may attempt to operate the device
   - affixed to switch tabs, mesh screens or cubicle handles with a Special Lock
   - affixed to indoor control panels with either a Special Lock, approved magnetic holder (adhesive tape if that is impracticable) or by other means,

   as per the Equipment Local Instructions.

WARNING

Minimum Safe Approach Distances from exposed electrical equipment shall be maintained when placing DANGER Tags.

b. If it is impracticable or unsafe to attach a Special Lock and/or DANGER Tag directly to a device, the Special Lock and/or DANGER Tag shall be attached as close as practicable to the device to ensure that an operator will see it.

c. In a secured substation only, if a Special Lock is unavailable to attach the DANGER Tag, a cable tie or adhesive tape can be used as a short-term interim measure until the operator returns with a Special Lock.

d. Where it is necessary to attach additional DANGER Tags to an item of equipment that is already DANGER Tagged, subsequent DANGER Tags shall not obscure those tags already in place. For example: If two tags are attached with a single Special Lock, they should be placed at either side of the equipment attachment point on the padlock shackle.

4.3 Precautions When Leaving Work

High Voltage and 1500 Volt DC equipment shall be secured at all times either directly or by being located in a secured area to prevent inadvertent operation of the equipment.

Where practicable, Low Voltage equipment shall be secured at all times either directly or by being located in a secured area to prevent inadvertent operation of the equipment.

4.4 Additional requirements for Low Voltage equipment

When the work is being done on Low Voltage equipment by Authorised Persons who are taking responsibility for their own safety and a LV Access Permit is not required, then a separate DANGER Tag shall be placed by each person.

When the work is being done on Low Voltage equipment by a work party supervised by an Authorised Person who is taking responsibility for the safety of the work party and a LV Access Permit is not required, then a separate DANGER Tag shall be placed by each supervising Authorised Person.

Figure 1 shows examples of 'Lock Out' kits that can be used where practicable for different LV applications.

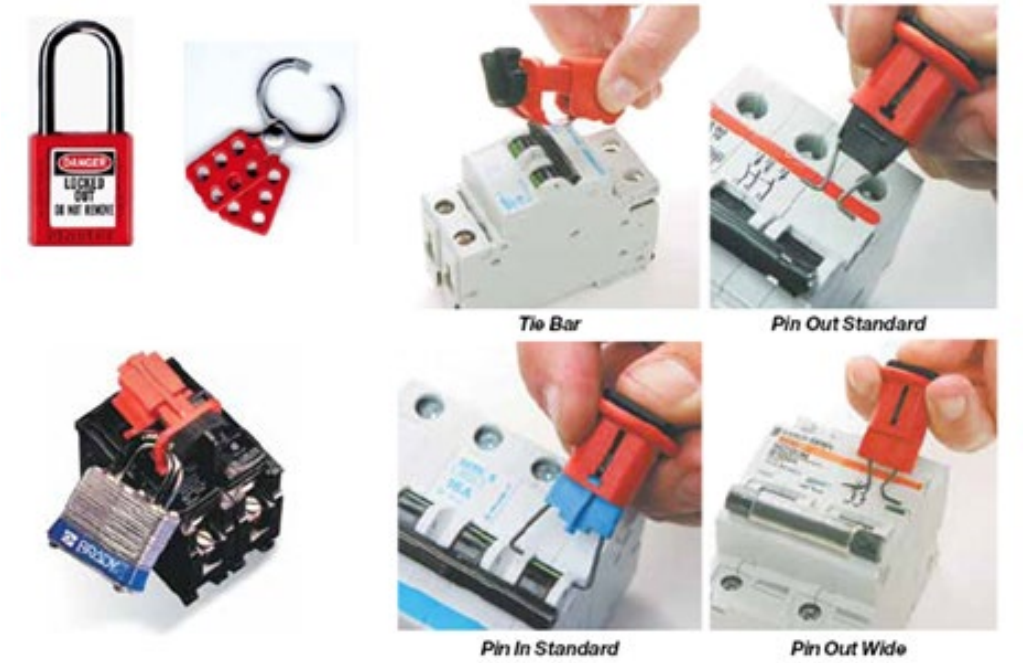

Figure 1: Examples of 'Lock Out' Kits

4.5 Removal of Danger Tags and Special Locks

WARNING

DANGER Tags shall not be interfered with or removed without the proper authority.

WARNING

No person shall operate an isolator or knowingly use equipment to which an isolation-securing device or DANGER Tag is attached.

Special Lock and Danger Tags shall be removed only on the direction of the:

a. Authorised Person who is cancelling the Authority, WHVI, Substation Access Permit or Low Voltage Access Permit.

b. Authorised Person holding a:

- WHVI and/or Authority for a Test Electrical Permit to Work
- Test Substation Access Permit.

c. Electrical System Operator (ESO) on instruction of the Authorised Person who has cancelled the Authority, WHVI, Substation Access Permit or Low Voltage Access Permit.

In support of the process for removal of a DANGER Tag as per PR D 78401 Section 5.1 Additional LV specific requirements.

5 Reference documents

PR D 78203 High Voltage Operating Procedures

PR D 78305 1500V Operating Procedures

PR D 78401 Isolation and Energisation of Low Voltage Equipment

Appendix A Electrical Locks

A.1 Standard Locks

Access to, and operation of, electrical equipment is restricted by the following types of locks:

Lock	Used for
C1	Non-traction substations and substation (traction and non-traction) yards
C1A	Sectioning huts, link areas, 1500 Volt field switches, HV field switches, Low Voltage Distribution Supply Main Switch Boards and collapsible ladders to live equipment (i.e. locks which prevent access to live HV equipment)
C1B	Low Voltage Installation Supply Main Switchboards (i.e. locks preventing access to locations containing enclosed equipment) which may be operated by station staff
D1	Traction substations and sectioning huts with external links
Falcon 22 or R	Signalling Equipment Power Rooms
No. 2	Low Voltage switchboard (may also be locked with the local electricity distributor's lock)
M	Low Voltage switchboards at various locations in the Northern Region

C keys unlock any of the C series locks.

C1 keys unlock C1, C1A, and C1B locks.

C1A keys unlock C1A and C1B locks.

NOTE

The Associate Director Electrical Distribution Unit (EDU) is the nominated custodian for C, D, S and SS type keys.

Keys shall be recorded on a signed register, maintained by EDU, and issued/used only by personnel authorised for the relevant duties. Unauthorised copies of a key for any of the locks listed below shall not be made.

Any person or organisation that does not have the required authorisations shall cease operation and access of equipment/areas that are controlled by C, S and SS type locks and return the keys to the EDU section.

A.2 Special Locks

A.2.1 Identification of foreseeable hazards

Where it is necessary to secure an isolating device for the protection of personnel or equipment, the Standard Lock shall be replaced with a Special Lock. A Special Lock may be any lock not listed below and not otherwise in general use.

Where practicable, the following types of padlock may be used as special locks:

- S – Mains "Special" lock
- SS – Mains "Small Special" lock

Where a Special Lock is used, it should also secure any associated DANGER Tags, refer to Appendix B DANGER Tags for Electrical Equipment.

Where locking facilities are available Special Locks must be used in addition to DANGER Tags to provide added security.

Appendix B DANGER Tags for Electrical Equipment

Information to be included on a DANGER Tag

Figure 2: Example front and back of a 'blank' DANGER Tag (Stock Code: 001874965)

The DANGER Tag (a typical one is shown in Figure 2) when completed shall specify:

- according to the type of work and work location:
  - for work outside a substation: the WHVI, Authority, or Low Voltage Access Permit number when issued, or
  - for work on negative connections outside the substation at which the DANGER Tag is being placed: the Substation Access Permit number, or
  - for work inside the substation at which the DANGER Tag is being placed: the Substation Access Permit number, or
  - for work inside a substation other than at the substation at which the DANGER Tag is being placed: the name of the substation at which the work is being carried out and the Substation Access Permit number, or
  - for work when a WHVI, Authority, or Low Voltage Access Permit is not issued: enter N/A
- who holds the WHVI, Authority or Permit, or N/A
- equipment identifier (description and number)
- work location, including where practicable:
  - the Electrical Safe Work Area, or
  - for WHVIs, enter "as per WHVI", or
  - for a 1500V Authority, enter "as per Authority"
- name of the person who attached the DANGER Tag
- date attached, and
- time attached (include where practicable).

As the DANGER Tag contains important electrical safety information, it is essential to ensure that details shown shall not fade for the entire duration of DANGER Tagging, especially in an outdoor environment.

This can be achieved by:

- using a fine point permanent marker pen for entering details on the DANGER Tag
- adopting other appropriate measures (e.g. laminating) to ensure that the details remain legible, if the DANGER Tag is to be in place for an extended period.