Sydney Trains

Engineering System Integrity
Engineering Instruction
Electrical Distribution Unit

EI D 25-05

Detraining Passengers – Electrical Safety

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

Date in Force: 11 June 2025

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Audience:

- Duty Control Managers
- Network Incident Managers
- Fleet Duty Control Managers
- ICON Duty Managers
- ICON Electricity Network Manager
- Team Managers Electrical
- Electrical System Supervisors and Operators
- Crew - Day of Operations Managers

Main Points:

- The exterior of a train body is ok to touch when all bogies are on the track, and the track is intact.
- If a carriage is not on the track, or the track is broken, an Electrical Authorised Person is required to assess the risk before detraining unless there is imminent hazard to passengers.
- An RPO can be utilised to detrain passengers until a 1500V OHW is solation is enacted.

Primary Affected Document: **PR D 78700 Working around Electrical Equipment**

Document Control

Version	Date	Summary of change
1.0	10/06/2025	First issue

Scope

This Engineering Instruction clarifies when passengers can be detrained safely without exposure to electrical hazards, e.g. after a train is immobilised due to loss of traction supply, or failure of the overhead wire.

Background

Recent incidents have occurred in which trains have been immobilised due to failures of the overhead wire, with passengers remaining on-board for several hours. Loss of traction supply is also possible. Once the situation is assessed as electrically safe, passengers can be detrained without further delay using existing procedures.

Action required

Train immobilised Overhead wiring undamaged:
A train is electrically safe when the train is still on the rails and the rails and overhead wiring are intact, detraining may proceed.

Train immobilised Overhead wiring damaged:
An Authorised Traction Operator or Authorised Officer Mains (Authorised Electrical Person) shall be called to site as a matter of urgency.

A train is electrically safe when the train is still on the rails and the rails are intact, detrainment may proceed, if:

- The train bogies are on the rails;
- There is a clear exit path for the passengers that will not bring them within Safe Approach Distance (SAD) three (3) metres of the OHW;
- The OHW is stable in its current position and unlikely to move or impinge the clear exit path;
- Sufficient personnel are on site to ensure persons do not approach the SAD of the OHW
- The ICON-Electrical has confirmed that the damaged section of Overhead Wiring has been de-energised.

If the **Electrical Authorised Person confirms all the above criteria are met**, it is electrically safe to detrain the passengers via the clear exit paths.

If the **Electrical Authorised Person advises any of the above criteria are not met**,

- A Rescue Power Outage must be enacted; or
- OHW must be isolated and rail-connected prior to detraining the passengers.

In either of the above cases the Electrical Authorised Person in consultation with the Rail Commander may consider further controls including:

- Implement a Rescue Power Outage;
- De-energise any relevant OHW section;
- Isolate the OHW and rail-connect the OHW prior to detraining the passengers;
- Provision of additional Authorised Person/s as a spotter for the OHW;
- Any other controls deemed prudent by the Authorised Person in consultation with the Rail Commander.

NOTE: No overhead wiring works shall be carried out while passengers are being detrained.

If the carriage has derailed or rolled:

- Persons must not touch the exterior of the train until either
  - A Rescue Power Outage (RPO) is in effect; or
  - The OHW concerned is isolated and rail connected and an Electrical Permit to Work issued.
- An Authorised Officer Mains or Authorised Traction Operator is required to attend the site and assess the risk prior to de-training.

Immediate or Emergency Evacuation

Situations that may require emergency evacuation may include:

- Persons with life threatening injuries
- Persons trapped within a sealed train with no air-conditioning and at risk of heat exposure.

If the situation requires the immediate evacuation of the train, the request for immediate evacuation may come from Train Crew or Incident Rail Commander to ROC, or from Emergency Services via their control channels. In this scenario a RPO is required and shall be implemented by ICON - Electrical.

Notes:

- **The rail safety aspects of detrainment of passengers shall be managed by the Incident Rail Commander.**
- **During detrainment it is likely persons will touch the exterior of the train, passengers with no footwear should be guided off the train without touching any metal rails or steel structures of the train.**
- **Persons in the rail corridor should be prevented from touching track or rollingstock and overhead wiring structures or other conductive assets (e.g. metal fences, steel troughing) at the same time, as there is a potential to receive an electric shock.**

Contact

If you have any questions, please contact your Line Manager, SEQR Advisor, or the EDU team via email at RailElectricalSafety@transport.nsw.gov.au.

Engineering System Integrity
Electrical Network Safety Rules

Engineering Procedure
Electrical Distribution Unit

Working Near or On/Within

PR D 78700

Working around Electrical Equipment

Version 1.0
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	1 February 2022	ENSR Project Team	First issue as Sydney Trains document. Extracted from SMS-06-GD-0268 V3.2. Reviewed as part of the ENSR Project.

Table of Contents

1 Introduction

The SafeWork NSW Codes of Practices sets out the requirements for working around electrical equipment.

This document is based upon and shall be read in conjunction with the SafeWork NSW Codes of Practice and covers the extra requirements of Sydney trains as a Network Operator for work around electrical equipment that it maintains or operates which includes:

- The High and Low Voltage Distribution Network – Aerials and Cables
- Low Voltage Installations
- 1500 Volt traction system, and
- Substations.

For work that is:

- Around Electrical Equipment
- Cranes and Plant working as well as packed up for travel
- Excavation, or
- Temporary structures (including scaffolding).

It describes some of the hazards associated with working around Sydney Trains Controlled electrical equipment, and the controls, procedures and requirements that must be implemented:

- to eliminate health and safety risks, so far as is reasonably practicable
- if it is not reasonably practicable to eliminate risks to health and safety, to minimise those risks so far as is reasonably practicable (SFAIRP).

The requirements in this document vary according to:

- the proximity to the electrical equipment (refer to *SP D 79049 Safe Approach Distances (SADs)*)
- the voltage level
- the type of work being done
- whether mobile plant is used to undertake the work (refer to *SP D 79050 Safe Use of Mobile Plant around Electrical Equipment*)
- the competency of the persons involved. (refer to *SP D 79048 Competence of Persons*).

2 Definitions

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

3 Scope

This document applies to all 'persons conducting a business or undertaking' (PCBU) and all workers irrespective of their employer (the PCBU) or discipline, working around electrical equipment owned by Transport Asset Holding Entity of New South Wales (TAHE) or maintained by Sydney Trains.

This document together with other Electrical Network Safety Rules (ENSR) or Safety Management System (SMS) documentation provides electrical work instructions for those persons who are to work around electrical equipment maintained or operated by Sydney Trains. In addition, the Rule *RL D 79800 Electrical Network Safety Rules*, being a subset of the SMS, provides additional electrical work instructions for those Authorised Persons who work near or on/within of electrical equipment maintained or operated by Sydney Trains .

This document does **not** apply to:

- work near another Network Operator's electricity services, which is to be carried out in accordance with *ISSC 37 Guide for working on near or in the vicinity of the apparatus of another Network Operator*, that Operator's safety instructions and/or Sydney Trains ENSR whichever is greater.
- electrical equipment on Rolling Stock (except for roof-mounted exposed electrical equipment under overhead wiring).

For other exclusions, refer to SP D 79049.

4 Universal Safety Responsibilities

To support Person conducting a business or undertaking (PCBU)'s and workers in complying with their duties, all workers share five Universal Safety Responsibilities which define the safety expectations. Sydney Trains established these responsibilities to achieve improved safety outcomes by requiring workers to:

- Participate in interactions, if safe to do so
- Avoid causing harm
- Avoid taking unjustifiable risks
- Follow the Safety Management System
- Be prepared to work safely.

For details refer to *SMS-02-RG-3058 RAA Matrix* or contact your Sydney Trains representative.

The safety principles of this document are based upon *SMS-06-OP-3026 WHS Risk Management* and shall be applied so far as is reasonably practicable.

The person responsible for the work shall consult an electrically certified person that holds the appropriate function on any electrical technical matters prior to approving work to proceed.

Records shall be retained in accordance with the Safety Management System (refer to *SMS-09-TP-4508 Local Safety Records Register*) of any advice sought, shall be kept by the person responsible.

5 Qualifications of Personnel working near or on/within Electrical Equipment

The minimum safe approach distances specified in SP D 79049 take account of differing levels of electrical competence, and are grouped into 3 levels of electrical awareness for:

- Ordinary Persons
- Accredited Persons
- Authorised Persons.

The safe approach distances are therefore set out accordingly. The role of Safety Observer is also recognised as a significant role in Working around Electrical Equipment and has been addressed within this document and section.

5.1 Ordinary persons

Persons who do not hold personal certifications in accordance with *PR D 78701 Personnel Certifications – Electrical* must work in the vicinity of electrical equipment accordance with the SafeWork NSW Code of Practices. Ordinary Persons are not authorised to work on electrical equipment.

5.2 Accredited Persons

Persons who have been:

- trained in identifying electrical hazards as per the Rail Industry Safety Induction (RISI), and
- attained additional training as set out in the approved SWI for the task, which shall include Electrical Awareness

or

- successfully completed an appropriate training course (e.g. Crane and Plant Electrical Safety Course UETTDREL14A) relating to the work that has been conducted by a registered training organisation in accordance with PR D 78701 or the NSW Code of Practice – as an Accredited Person.

Accredited persons are permitted to perform the functions identified in their letter of authorisation.

5.3 Authorised persons

Persons who have been certified to hold personal certifications in accordance with PR D 78701. Authorised persons are permitted to perform the functions identified in their letter of authorisation as per their functions as set out in PR D 78701 and to the Safe Work Distances as set out in SP D 79049.

5.4 Safety Observer

The Safety Observer is specifically assigned the duty of observing the work around overhead power lines, associated apparatus or other exposed electrical equipment and excavation works near buried cables.

Safety Observers must be able to fully focus their attention on the persons, plant, mobile plant, equipment or load and the safe approach distance (SAD) to live aerial lines, electrical equipment or buried cables.

Safety Observers must **not** carry out any other activity while tasks or work activities which could present a risk of the SAD being encroached, such as plant or load movement, are being undertaken. For example the Safety Observer must not be used to monitor or guide the placement of a component. A separate person must be utilised to perform such a task.

In the absence of the assigned Safety Observer (or the Safety Observer is required to complete activities) the worker or plant, mobile plant or equipment operator must stop work until the observer returns to their position, or is replaced.

5.4.1 Requirements for the Safety Observer

Safety observers must:

a. be attired in personal protective equipment appropriate to the situation

b. not have any known temporary or permanent disabilities that would adversely affect their role and performance

c. only be used to observe those work functions for which they have been certified to carry out

d. in the case of observing mobile plant, be verified as competent on site in accordance with SP D 79050 Section 5 Appointment and Duties of Safety Observer's

e. not be located in the workbasket of an EWP while observing the work being undertaken from that workbasket, unless the work is 'electrical work' and is being performed from a rail mounted EWP.

Safety Observers are to:

- act as a Safety Observer for one work activity at a time only
- be given authority to suspend the work activity at any time
- warn personnel or the crane or plant operator to make sure minimum SADs are being maintained
- warn of any other unsafe conditions
- continually monitor the tasks or work activities that could present a risk of the minimum SAD being encroached by persons directly or by means of tools, equipment, materials or other objects they may be using or carrying during the work
- continually monitor the tasks or work activities that could present an unacceptable risk of damage to electrical equipment and or infrastructure
- be positioned at a suitable location to effectively observe the movement of plant with respect to the overhead power line, overhead wiring, associated apparatus or other exposed electrical equipment representing the risk

- be able to communicate immediately and effectively with plant and equipment operators and other personnel as required
- make sure that workers stay outside the specified minimum SAD, unless they are performing a rescue in accordance with approved procedures or are doing a specific task that is described in the Safe Work Method Statement (SWMS) - such as a dogman holding a non-conductive tag line attached to a load suspended from a crane.

6 Safe Work Method Statements (SWMS) and Safe Work Instructions (SWI)

SWMS and SWI shall be developed as per *SMS-05-OP-3002 Create and Approve New SMS Documents* for working on and around electrical equipment as detailed in the scope of the guide to Working around Electrical Equipment.

NOTE

Work on or around electrical equipment must be conducted in accordance with approved SWMS or SWI.

New or modified SWMS or SWI shall be developed in accordance with SMS-05-0P-3002. For work that has the potential of encroaching within the SAD of Accredited Persons as part of the approval and review process these documents shall be:

- Reviewed by an Electrically Certified Person that holds the appropriate function.
- Authorised by the delegation as required by this document.

Where an Existing SWMS from the Safety Intranet is to be used, the person responsible for the work is to conduct and document the assessment in accordance with SMS-06-OP-3026.

This assessment includes:

- confirming that the SWMS is current and fit-for-purpose
- using the Pre-work briefing process (refer to *SMS-06-OP-3114 Pre-work Briefings*) to identify and document site specific hazards, risks and the Safety Observer requirements set out in Section 4.4.1
- having workers sign the form *SMS-06-FM-4163 Pre-Work Briefing* to acknowledge the SWMS briefing or instruction
- attaching the completed Pre-work briefing form to the SWMS
- if a SWMS covering the work to be done is not available on the Sydney Trains Safety Intranet, the Line Manager is to conduct the assessment by:
  - developing a SWMS in accordance with SMS-06-OP-3026
  - preparing a Pre-work briefing that covers site specific risks and the requirements set out in Section 7 Mandatory Risk Management
- site specific risks are those risks that may only become apparent during an on site assessment and include, but are not limited to, the following conditions:
  - weather conditions - effects of wind and temperature on the equipment and/or conductors, the amount of sag and sway that can be expected and the effects of wind gusts on a load being handled
  - ground conditions - effects of moisture, contour, etc. that may affect the movement of plant or cranes

- lighting conditions - low light levels or glare that may impede clear viewing of the conductors
- sighting distances and conditions - including visibility of the conductors and the ability to accurately determine distances and clearances.

WARNING

When proposed work is situated in tunnels, additional risk assessment and planning activities may be required due to the installation of exposed electrical equipment mounted on tunnel walls, such as is the case in the CBD underground system.

7 Mandatory Risk Management

Prior to undertaking any work around live exposed electrical equipment, the work must be planned, including a documented risk assessment which identifies the safety controls to be implemented, and the implementation of the proposed safety controls must be verified prior to the work commencing. The risks shall be managed in accordance with the hierarchy of controls as contained within the SafeWork NSW Code of Practices and SMS-06-OP-3026.

The following documents hold the minimum Risk Management Controls which the person responsible for the work is required to implement and follow:

- *SMS-06-OP-3043 Preparing and using Safe Work Practice*
- *SMS-06-FM-4107 WHS Risk Assessment Form*
- *SMS-06-SR-3006 Control Verification Protocol*

If you are unable to source documentation please contact your Sydney Trains designated interface manager or Line Manager.

7.1 Managing the risks

As described in SMS-06- OP-3043 person responsible for the work shall:

- identify the hazards
- assess the risks
- determine the possible control measures
- implement the control measures
- review and monitor the control measures
- in all cases, the person responsible for the work must:
  - arrange for the electrical equipment to be isolated, or
  - implement adequate additional protection or controls.
- persons intending to work around electrical equipment are appropriately qualified where required by PR D 78701, also refer to SP D 79048
- determine if Electrical Permits are required, seeking advice from the electrical discipline if necessary. Refer to *PR D 78500 Electrical Permits* for details about conditions that require Electrical Permits.

Subsequent sections in this document describe the risks that arise in typical work scenarios and control measures that must be applied.

7.2 Risk assessment and planning

Persons planning work around electrical equipment must ensure that the work is assessed and planned to enable the most effective and highest practicable level of risk control to be applied.

The assessment must consider:

- the possible consequences
- the voltage present on the equipment. If the voltage is not known for certain, contact the Maintenance Engineer Electrical
- the location of the electrical equipment and/or conductors that may be affected by the work
- the task
- whether a person can intentionally or inadvertently come within the relevant SADs by means of tools, equipment, materials or other objects they may be using or carrying during the work (refer to SP D 79049)
- the possible controls, and their effectiveness.

WARNING

- **It is unacceptable to reject a known, effective control without showing its cost is grossly disproportionate to the safety benefit obtained.**
- **It is unacceptable to remove a higher-level of control and replace with a lesser one.**
- **It is unacceptable to introduce a known hazard without an effective control.**

Further guidance is available in Sydney Trains' SP D 79039.

WARNING

If there is any uncertainty about the identification of any electrical equipment, get advice from an appropriate electrically Authorised Person before nominating the equipment, from which removal of supply is requested.

NOTE

Do not attempt to use a measuring tape, unapproved stave or other physical measuring device to directly measure the height of, or distance to conductors. If the distance cannot be determined by sighting or measured with a non-contact measuring device, Request for an Authorised Person to make the measurement.

7.3 Hierarchy of Controls

The controls to mitigate any risk shall be implemented in a hierarchal manner, refer to *SMS-07-GD-3084 Hazard Identification and Safety Risk Assessment*:

Elimination	Removal of electrical hazards.
Substitution	Isolation and working with a Permit to Work (Electrical).
Engineering Controls	Use of a controlled process/plant that cannot encroach on the safe approach distance or an approved physical barrier to prevent anything contacting the Electrical Equipment.
Administrative Controls	Safety Observers, signage, warning barriers, SWI's to maintain safe work distances.
PPE	Gloves, arc rated clothing, helmet, boots, etc.

NOTE

Line Managers and Persons in charge of the work process must make sure that workers do not start work until they have received the required instruction and pre-work briefing. (Refer to SMS-06-OP-3114)

7.4 Onsite Risk Assessment

The assessment is to include at a minimum the:

- nature of the work
- number of people involved in the work and their individual needs
- qualifications, competency, skill and experience of people doing the work
- set up and pack up process
- type and design envelope of machinery, equipment and tools to be used
- potential for inadvertent movement of equipment, persons and electrical equipment in the area
- prevailing or unexpected wind strength, direction and weather conditions
- foreseeable abnormal conditions that may exist at the worksite
- need to provide a Safety Observer for the work and
- duration and number of occurrences/repetitions of the work.

NOTE

It is not sufficient to consider only the range or intended range of movement required to do the work.

The assessment MUST take account of the full extent of movement that the plant, equipment, tools or people can reach.

NOTE

It is also necessary to minimise safety risks to the public that may lead to contact with electricity, such as creating touch-potentials, the presence of aerial lines over structures, unauthorised access to electrical equipment, or creating climbing aids.

7.4.1 Risk and Mobile Plant

Work around electrical equipment using mobile plant must be performed at greater SADs than those described in SP D 79049, and additional planning and risk assessment is required. When a Safety Observer is used as a control with mobile plant used around electrical equipment, one Safety Observer must be appointed per item of mobile plant. If identified by the risk assessment processes of SP D 79050, more than one safety observer may be appointed to observe the same item of mobile plant, equipment or load.

For details of Safety Observer(s) requirements and duties refer to Section 5.4 Safety Observer and Section 7.4 Onsite Risk Assessment.

7.4.2 Risks associated with Track Vehicles or Rolling Stock

In the case of track vehicles and rolling stock, if the activity is such that no part or section of these vehicles, other than pantographs, can move towards the overhead wiring then the need for a Safety Observer may be waived.

Sydney Trains SWMS from the Safety Intranet is to be used, the person responsible for the work is to conduct and document the assessment in accordance with SMS-06-OP-3026.

8 Personal Protective Equipment

Persons carrying out electrical work near or on/within exposed electrical equipment must wear clothing, footwear and other personal protective equipment as per *D2013/80874 PPE for Electrical Work*.

Protective clothing worn by persons must be appropriate for the purpose, fit correctly, cover the full body (including the arms and legs) and be in good condition sufficient for the arc potential energy as stated in relevant equipment local instruction.

The wearing or carrying of personal metal effects constitute a danger when working on or near live electrical equipment. Such items must be removed prior to any electrical work being performed on or near live electrical equipment.

Personal metal effects include but are not limited to chains, watch bands, bracelets, body piercing jewellery, exposed metal zips, rings, keys, etc.

Unless the risk assessment identifies otherwise, an safety helmet must be worn at all times within the boundary of all substations and section huts.

9 Safe Approach Distance

Persons, any objects or things must not encroach the minimum Safe Approach Distance (SAD) at any time, unless signed on to a relevant Electrical Permit or Section 13 where special conditions have been put in place.

A fundamental aspect of all work near or on/within exposed electrical equipment is the concept of the ‘Safe Approach Distance’ (SAD). This distance varies according to the type of work, the nominal voltage of the equipment, the use of materials, tools, plant or structures, and the authorisations of the workers. Refer to SP D 79049.

10 Work above exposed electrical equipment

When working above exposed electrical equipment there is a risk of persons or material encroaching the SAD due to falling materials, or plant or equipment being manoeuvred or lowered.

NOTE

Sydney Trains does NOT allow work or permit temporary structure work or the use of temporary structures above live exposed HV aerial lines or equipment.

When work is above live exposed Low Voltage or 1500V DC overhead wiring or electrical equipment:

- the work is to be carried out under an appropriate Electrical Permit, or
- the work is to be carried out in accordance with an approved SWMS and the specific work is to be approved by an Authorised Officer (Mains or Substations), or
- a continuous rigid barrier is to be erected and the work is to be carried out in accordance with a SWMS.

NOTE

All of the conditions specified in *SP D 79051 Temporary Structures around Electrical Equipment*, must be met for the erection and use of the continuous rigid barrier.

If a continuous rigid barrier is used, the SWMS are to be approved by an Authorised Officer (Mains or Substations) who understands sufficient detail of the work process for which the continuous rigid barrier is required and to assess the documented work process for its adequacy to prevent infringement of the relevant SADs.

Particular requirements apply to work above exposed electrical equipment using mobile plant. Refer to SP D 79050.

Particular requirements also apply to temporary structures, scaffolding work and the use of temporary structures and scaffolds above exposed electrical equipment. Refer to SP D 79051.

11 Work near electrical equipment

An Electrical Permit may not be required for work near electrical equipment if the risk assessment shows that persons performing the work will **not** be required to, or **cannot**, either directly or through tools, plant, equipment, material or other conducting objects, come inadvertently within the relevant minimum SAD defined in SP D 79049 Section 3 Safe Approach Distances (SADs).

The person planning the work must make sure that risk control measures are developed and communicated in accordance with Section 7.2 Risk assessment and planning. These controls must be directed toward ensuring that persons, material or plant cannot infringe the relevant minimum SADs.

The person in charge of the work party remains responsible for the electrical safety of the staff working under their control. The person in charge of the work party is to make sure that:

- administrative controls as per Section 7 of this document are established and implemented
- the work process is adequately controlled so that persons, equipment, plant tools or material do **not** come within the prescribed minimum SADs of exposed electrical equipment
- persons carrying out the work are warned to **not** allow any part of their body, clothes, tools or material they use or carry to come within the minimum SADs of exposed electrical equipment
- persons carrying out the work understand the work process controls put in place and that they are **not** to pass over or under any work area or access markers, safety fences, demarcation tape or other special barriers placed in connection with the work.

12 Work near or on/within cables

To locate underground cables and buried services refer to *PR D 78102 Electrical Hazards and Warnings*. All other information is in *SP D 79052 Cables – Work near or on/within.*

13 Where an Electrical Permit may not be necessary

An Electrical Permit may not be necessary if the work is:

- Carried out under live conditions by persons trained and authorised to work on live equipment in accordance with the relevant instructions, refer to *PR D 78403 Work on Live Low Voltage Equipment and SMS*.
- On Low Voltage equipment and electrical discipline personnel carry out the work in accordance with *PR D 78402 Work on Low Voltage Distribution System* or *D2013/80873 Work on Low Voltage Installations*, and the relevant instruction states that an Electrical Permit is not required for the particular situation.
- Work utilising temporary structures that are in accordance with SP D 79051.
- Work on Rail Mounted Vehicles that is carried out totally within a dedicated work site at a Maintenance Centre where electrical isolation is effected by utilisation of an Annett style Key Token System or Supplementary Lock System (refer to *D2013/80655 Isolate OHW Using Annett Key or Supplementary Lock Systems*).

NOTE

Sydney Trains does NOT permit work on live HV equipment.

14 Jacking rolling stock

Jacking of a vehicle on or adjacent to an electrified track is to be carried out in accordance with the following instructions. Any person not signed onto an Electrical Permit to Work for the section/subsection concerned is to treat the overhead wiring as live.

A vehicle may be jacked under or adjacent to live 1500 Volt overhead wiring provided that each of the following three conditions is satisfied:

- ICON Electrical is advised:
  - before work commences, and
  - at the completion of the work.
- All electrically connected Pantographs are lowered.
- No part of the vehicle is, or may come, closer than 1m to the OHW except if one bogie of the vehicle remains on the rails, the vertical distance below the contact may be reduced to 300mm, provided that the rails are not separated from the traction current return path to a substation. This distance may be further reduced to 150mm if an Authorised Traction Line Worker or Authorised Officer (Mains) supervises the electrical safety aspects.

15 Reference documents

D2013/80655 Isolate OHW Using Annett Key or Supplementary Lock Systems

D2013/80873 Work on Low Voltage Installations

D2013/80874 PPE for Electrical Work

ISSC 37 Guide for working on near or in the vicinity of the apparatus of another Network Operator

PR D 78102 Electrical Hazards and Warnings

PR D 78402 Work on Low Voltage Distribution System

PR D 78403 Work on Live Low Voltage Equipment

PR D 78500 Electrical Permits

PR D 78701 Personnel Certifications – Electrical

RL D 79800 Electrical Network Safety Rules

SMS-02-RG-3058 RAA Matrix

SMS-06-FM-4107 WHS Risk Assessment Form

SMS-06-FM-4163 Pre-Work Briefing

SMS-05-OP-3002 Create and Approve New SMS Documents

SMS-06-OP-3026 WHS Risk Management

SMS-06-OP-3043 Preparing and using Safe Work Practice

SMS-06-OP-3114 Pre-work Briefings

SMS-06-SR-3006 Control Verification Protocol

SMS-07-GD-3084 Hazard Identification and Safety Risk Assessment

SMS-09-TP-4508 Local Safety Records Register

SP D 79048 Competence of Persons

SP D 79049 Safe Approach Distances (SADs)

SP D 79050 Safe Use of Mobile Plant around Electrical Equipment

SP D 79051 Temporary Structures around Electrical Equipment

SP D 79052 Cables – Work near or on/within