

25kV OHW Electrical Safety Instructions Trains

Rail Commissioner

PR-EM-EE-112



DOCUMENT AMENDMENT RECORD

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1. Introduction

The Adelaide Metropolitan Passenger Rail Network (AMPRN) operates a 25kV Electrified Train Service over parts of its network. The electrified network consists of Feeder Stations, (FS); Track Sectioning Cabins (TSC); Track Coupling Units (TCU) and the Overhead Wiring System (OHW). This document outlines the safety requirements when on or around the 25kV electrified network.

2. Purpose

The purpose of this document is to set out how the risks to safety associated with the parts of the AMPRN electrified at 25kV are managed. It gives instructions to persons required to access the electrified network on how to do so safely. This document addresses the specific safety requirements in the electrified network and is supplementary and subordinate to the AMPRN Rules and Procedures.

3. Scope

This document applies to all persons who require to access on or near an AMPRN line equipped with the 25kV Electrification System.

The following lines are electrified using the 25kV Overhead Wiring System:

- Adelaide Yard, Platforms 1 to 4 and 104 Road;
- The Seaford Line from Adelaide Yard to Seaford;
- The Belair Line from Adelaide Yard to the Southern end of Goodwood Station;
- The Tonsley Line (to be renamed the Flinders Line),
- Port Stanvac Sidings;
- Seaford Depot.

4. Supporting Information

4.1. Related Documents

DOCUMENT NAME	DOCUMENT NUMBER
Adelaide Metropolitan Passenger Rail Network Rules and Procedures	Knet #6082294
Accessing the Adelaide Metropolitan Passenger Rail Network	PR-RC-NA-267
Adelaide Metropolitan Passenger Network Access – Maintenance & Engineering Works	PR-RC-NA-913
Certificate of OHW Isolation (Form C)	FO-EM-EE-021
PRES (Person Responsible for Electrical Safety) Handbook	GI-EM-EE-1143
Isolation and Preparing The Seaford Depot Graffiti Wash	SWI-EM-EE-653
Isolation of 25kV OHW	WI-EM-EE-930
Isolation of 25kV Traction Switching Stations	WI-EM-EE-928
Isolation of HV Traction Feeder Stations	WI-EM-EE-929
Local Isolation of 25kV OHW on Commissioning Roads 1 & 2 at Seaford Depot	WI-EM-EE-125
Network Rail, Handbook 16	GE/RT8000/HB16
Network Rail, Module AC	GE/RT8000/AC
Substation Access Manual	MN-EM-EE-113
Requirements for Road Rail Vehicles Accessing and Operating on the AMPRN	PTS-MS-10-RS-GUD-00000095
Requirements for Track Machines Accessing and Operating on the AMPRN	RS4-DOC-000885

4.2. References

- Electricity Act/Regulations 23A (3) & Schedule 6
- AS 3000 Electrical Installations
- AS 4836 Safe working on low-voltage electrical installations
- AS/NZS 4292.4:2006 Railway Safety Management Part 4: Signalling and Telecommunications Equipment

- AS/NZS 2550.1-11 Cranes, hoists and winches – Safe Use
- AS/NZS 4576 Guidelines for Scaffolding
- Work Health and Safety Act/Regulations 2012
- Electricity Act 1996
- Electricity (General) Regulations 2012
- Electricity (Principles of Vegetation Clearance) Regulations 2010
- Energy Networks Association – National Electricity Network Safety Code ENA DOC 001-2008 and ENA NENS 01-2006
- National Rail Safety Law Act/Regulations 2012
- Joint Safety Guideline Working Safely Near Overhead Power lines
- Incident Report Process for Electric Shock from the Office of Technical Regulator
- Hazard and Incident Reporting Module

4.3. Acronyms

ACRONYM	FULL NAME
AMPRN	Adelaide Metropolitan Passenger Rail Network
AP	Electrical Authorised Person
DPTI	Department of Planning, Transport and Infrastructure
ECC	Electrical Control Centre
ECO	Electrical Control Officer
EMU	Electrical Multiple Unit
Form C	Certificate of Isolation
HV	High Voltage
UMEE	Unit Manager Electrical Engineering
NOS	Network Operations Supervisor
NP	Electrical Nominated Person
OCC	Operation Control Centre
OHW	Overhead Wiring System
PRES	Person Responsible for Electrical Safety
SA	Switching Attendant
SAD	Safe Approach Distance
SWMS	Safe Working Method Statement
TCU	Track Coupling Unit
TSC	Track Sectioning Cabin

4.4. Definitions

TERM	DEFINITION
Bond	A cable or other electrical conductor which electrically connects together items of equipment.
Buffer Section	A Buffer Section is a length of Permanently Earthed section of OHW that acts as a buffer between existing OHW and OHW being constructed.
Cant Rail	The point on the side of a railcar where the bodyside meets the roof.
Certificate of OHW Isolation	Also known as a "Form C". This is the Certificate issued by a switching Crew to a PRES as confirmation that the OHW equipment is isolated and earthed between the limits stated on the Certificate. The Issue of a Certificate of Isolation does not mean that Trains movements are stopped on the lines concerned.
Contact Wire	The bare solid overhead conductor that the rolling stock pantograph makes contact with.
De-energised	Disconnected from any live electrical equipment, but not earthed and no caution notice has been applied.
Earth	Directly connected to the ground to maintain the effective dissipation of electrical energy.
Electric Multiple Unit (EMU)	EMU is a multiple unit train consisting of self-propelled carriages, using electricity as the motive power.

Electrical Control Centre (ECC)	The ECC accommodates the ECOs and equipment required to manage the Traction Power system
Electrical Control Officer (ECO)	The person responsible for managing the Traction Power System.
Electrified Network	The AMPRN where one or more of the tracks are electrified by 25Kv.
Emergency De-energisation	A de-energisation of part or the whole of the OHW which is usually performed remotely by the ECO. The ECO will give a verbal confirmation that the power has been turned off to the OHW, but it is not able to vouch that it is safe to approach until it has been earthed.
FS	Feeder Station – High Voltage site where power is taken from the energy supplier SAPN and transformed down to railway 25kV traction power that is delivered to the OHW via cables.
HV	High Voltage is defined as a voltage above 600V DC or 1000v AC
Isolation (OHW)	Isolation is the action of causing electrical sections or sub-sections to be disconnected from all sources of electrical supply by opening, locking and fixing a caution notice to lineside switch(es).
Jumper Cable	A length of cable with special clamps to be used as a temporary electrical connection across broken rail or pipe.
Limits of Isolation	These are the locations between which electrical power has been turned off on the OHW by the opening, locking and attaching caution notices to line side switch(es). This term must not be confused with the Term “Working Limits”.
Live (energised)	Live refers to electrical infrastructure where potentially dangerous voltages may exist. Unless proved dead, earthed, and a Certificate of Isolation has been issued, all OHW and traction equipment are to be considered live, and mandatory safe approach distances apply.
Operations Control Centre (OCC)	OCC accommodates Tram/Operations Controllers who control the movement of rolling stock and communicate with drivers.
Overhead Wiring (OHW)	An arrangement of wires, suspended over the railway lines, for supplying electricity to electric trains, together with associated fittings, insulators and other attachments including feeders, switches, jumpers and Return Conductors.
Person Responsible for Electrical Safety (PRES)	A trained and qualified person within a work group that receives and holds the Certificate of OHW Isolation (Form C)
Rail Industry Worker Card	A generic course designed to ensure personnel understand the inherent dangers involved in working in the rail environment. To access the AMPRN the RIW card must have the relevant DPTI Operator role.
Red Bond	A bond that will carry traction current under normal rail operations. These bonds are identified with red paint and are dangerous if damaged or detached.
Return Conductor	The conductor attached to the OHW structures that carry traction return current.
Road Rail Vehicle	A vehicle that can travel on the road using rubber tyres and on the rails using specially lowered steel rail wheels
Soffit	The underside of an architectural structure such as an arch, a balcony or bridge.
Spotter	A competent Person who is suitably qualified by experience, training or both with the sole duty of observing and warning against unsafe approach of a crane, excavator or elevating machinery or extendable, its lifting attachments or load to OHW equipment.
Safe Approach Distance (SAD)	The minimum (safe) distance, which must normally be maintained for personal safety between an exposed, live conductor and the maximum reach of any part of the body or any object or tool (except equipment specifically designed for testing, operating or working on live conductors).
Track Sectioning Cabin (TSC)	A building containing electrical switching gear and other equipment which is arranged to connect together a number of electrical sections of OHW.
TCU	Track Coupling Unit – 25kV circuit breaker with associated control and protection equipment allowing 25kV supply from the main line into a depot.
Track Machine	A Maintenance machine that is permanently mounted on rail wheels, eg a tamper.
Working Limits	The limits stated on a Certificate of Isolation, within an isolation that has been earthed, between which it is safe and permissible to work on or Near to the

Electrification Equipment, provided the appropriate Track Protection is in place. The limits are usually identified by structure numbers. This phrase must not be confused with the phrase "Limits of Isolation".

5. Roles and Responsibilities

5.1. Electrical Control Officer (ECO)

The ECO is responsible for the managing the Traction Power System. The ECO is:

- The point of contact to report Emergencies involving the 25kV electrified network.
- Has the ability to control electrical power to FS, TSC and OHW remotely.
- The point of contact to who faults and damage to the electrified network must be reported.
- Evaluates Network Access Applications to determine if an Isolation is required.

5.2. Switching Crew

- The switching crew is a group of trained and authorised people, who carry out lineside switching, under the direction of the ECO for isolations of the OHW.
- The switching crew also test, apply and remove earths on the OHW system.
- The switching crew is comprised of Electrical Authorised Persons (APs) and Switching Attendants (SAs).
- One AP is designated the Nominated Person (NP).
- The NP issues the PRES with a Certificate of Isolation, Form C.

5.2.1. Electrical Authorised Person (AP)

- A person who has been trained in lineside switching and holds current certification at AP Level as detailed in Appendix 1.
- Carries out lineside switching (Switch Operator).
- Tests the OHW
- Applies / removes local earths as required.

5.2.2. Switching Attendant (SA)

- A person who has been trained and authorised as a Switching Attendant.
- Carries out Switching Attendant duties (Checker), under the supervision and authorisation of the AP.
- Tests the OHW, applies/removes local earths as required, under the supervision and authorisation of the AP.

5.2.3. Electrical Nominated Person (NP)

- The AP in the Switching Crew who has been nominated to direct other members of the Switching Crew, or multiple switching crews.
- Briefs the PRES on the working limits of an isolation and issue the PRES with a Certificate of Isolation, Form C.

5.3. Unit Manager Overhead Wiring (UMOHV)

The UMOHV is responsible for full content of this document and periodic reviews.

5.4. Network Access Manager

The Network Access Manager is responsible for submitting all Network Access Requests to the ECO for evaluation of Isolation Requirements

5.5. Person Responsible for Electrical Safety (PRES)

If a work group requires an isolation of the Overhead Wiring Equipment (OHV), then the Electrical Control Officer (ECO) will arrange with a switching crew for the relevant Electrical section(s) to be Isolated in accordance with WI-EM-EE-930. The Nominated Person, from the switching crew will issue a Certificate of OHV Isolation (Form C) for

the Electrical Section(s) that has been isolated. The person in the Work Group that holds this certificate is the PRES. The PRES:

- Receives the Form C.
- Fully understands the working limits on the Form C.
- Briefs the work group on limits on the Form C.
- Monitors the work group to ensure adherence to Form C requirements.
- Ensures all the workgroup, tools, plant and equipment are clear of the OHW and that the workgroup now treat the OHW as live, before relinquishing the Form C.

The following personnel can undertake the Role of a PRES:

- A Person who has successfully completed the PRES course run by Learning and Development and holds a valid PRES Card.
- An Electrical Authorised Person.

More details can be found in section 9 of this document and the PRES Handbook, GI-EM-EE-1143.

Where local isolation instructions exist, these will determine if a PRES is required.

5.6. Persons Accessing the AMPRN 25kV Network.

Persons who access the AMPRN Network are responsible for ensuring that neither they nor their equipment comes within 3m of the OHW unless the OHW has been Isolated and Earthed and they have signed onto a Certificate of Isolation, Form C, or followed local isolation instructions for depots.

6. Persons Required to go on or Near the AMPRN 25kV Electrified Network

6.1. Competence

It is not permitted to go on or near a Railway Line equipped with 25kV OHW unless you hold a current Rail Industry Worker (RIW) Card with the relevant DPTI Operator Role, or have completed the online Rail Commissioner's Rail Safety Induction.

In special circumstances a person without the above accreditation may be allowed on the electrified network in accordance with the Network Access Manual.

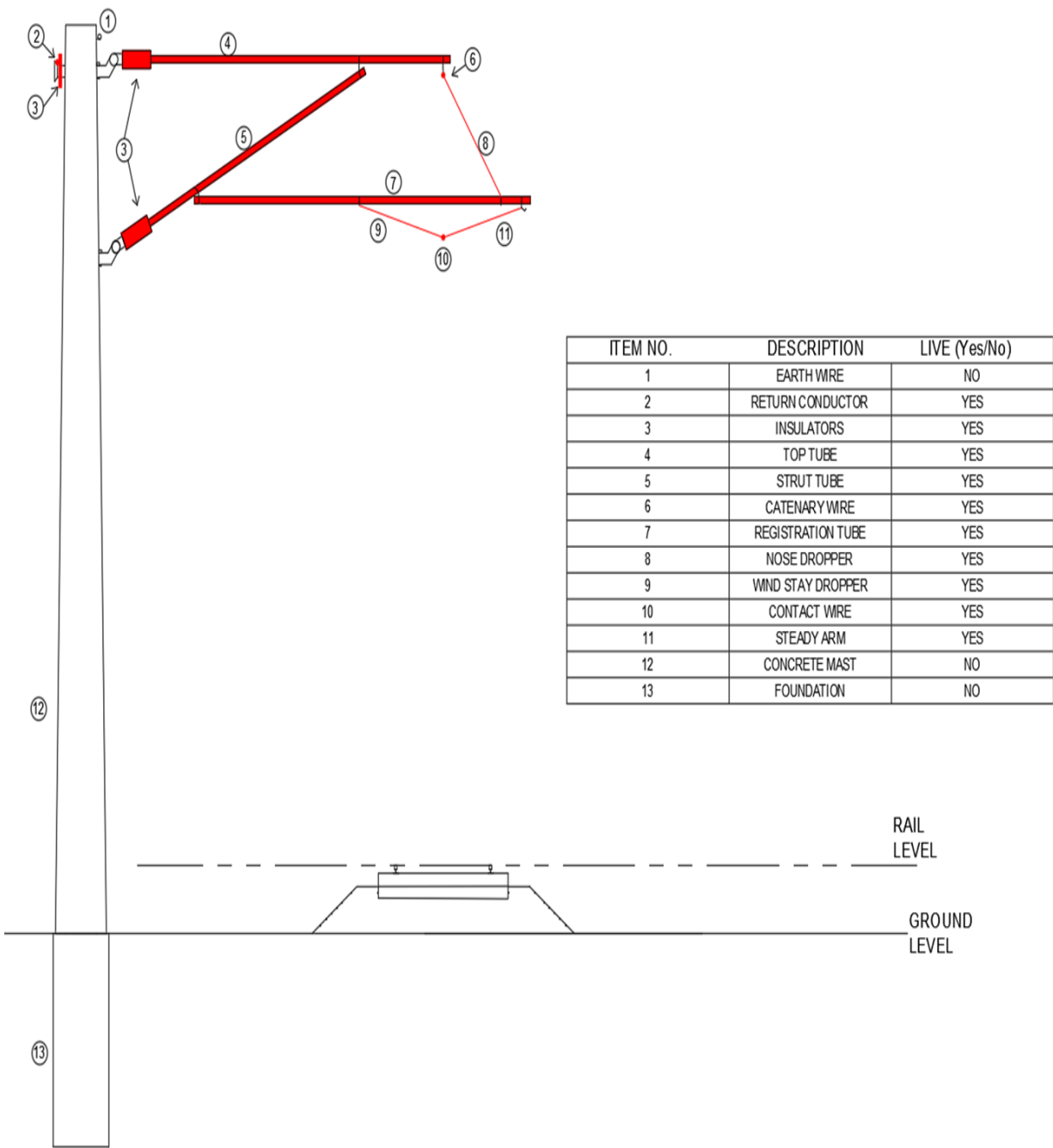
6.2. Dangers of the System

Overhead Wiring, Overhead Wiring Support Equipment, Return Conductors, Feeder Stations, Track Sectioning Cabins and Track Coupling Units and on trains pantographs and roof mounted equipment, are extremely dangerous and are likely to be fatal if you touch them or go near to them. The following diagram shows the live equipment on a typical cantilever structure.

All items shall be treated as being live at all times unless the overhead line equipment has been isolated and earthed and you have signed onto a Certificate of Isolation, (Form C), after receiving a brief from the PRES who holds that Form C or local depot isolation procedures have been followed.

If any doubt exists you must treat the equipment as live and seek advice from an ECO, a Switching Crew or the Unit Manager Overhead Wiring.

Typical Cantilever Structure with Live Parts shown in Red.



6.3. Reporting Objects and defects to the ECO

You must immediately make sure the following are reported to the ECO on 7201 5031:

- Objects that have been thrown onto, are hanging from, or are otherwise touching the OHW. **Do not touch or attempt to remove any such objects yourself.**
- Damage to the OHW.
- OHW that is smoking, excessively sparking or fusing.
- Broken or displaced along-track conductors.
- Broken or displaced wires connected to the OHW.
- Damaged or loose Automatic Power Control (APC) magnets.
- A broken or parted rail.
- A broken or defective bond, in which case you must tell the ECO the colour of the bond.

You must not touch or approach any objects that have been thrown onto, are hanging from, or are otherwise touching the OHW.

You must not touch the rails if they are broken or parted neither must you touch a broken or defective bond if it is marked red, nor any equipment connected to that bond.

If the damage or defect will affect the safe operation of trains, you must first report this to the train controller.

7. Personal Safety

7.1. Safe Approach Distance (SAD)

You must not place yourself or any equipment above, or closer than 3m in any other direction of OHW except in the following circumstances:

- The OHW has been isolated and earthed and a PRES holds a Certificate of Isolation (Form C) for the section of OHW you need to work above or approach within 3m in any other direction and the PRES has briefed you the working limits of the Form C and you have signed onto the Form C to confirm that you have understood the briefing given by the PRES.
- In limited circumstances work will be permitted between 3m and 1m of the live OHW, but no closer than 1m under any circumstances. In these cases a written Safe Working Method Statement (SWMS) or Job Safety Analysis (JSA) must be provided that has a separate section detailing what measures will be in place, such as a physical barrier, to ensure the 1m exclusion zone will not be breached and the safety of all personnel. The SWMS must be signed off by the Unit Manager Overhead Wiring Engineering.
- On some over bridges the minimum contact wire height can come as low as 4.6m to allow for sufficient electrical clearance to the bridge soffit. It is permitted to walk under these bridges, though special care must be taken to ensure no tools or equipment is carried above shoulder height.
- A depot or part of the depot has been isolated in accordance with Local Instructions.

8. Communicating with the ECO

You can contact the ECO on 08 7201 5031 for general communications and on 08 7201 5040 in the case of an emergency.

When contacting the ECO, you must state:

- If you are making an emergency call.
- Your name and job title.
- The railway line you are on.
- The location, for example the nearest bridge, station or signal number.
- The number on the nearest OHW structure.

- The telephone number on which you can be contacted.

9. Isolation of the OHW

Note: An Isolation of the OHW does not mean that trains have stopped running, nor does it allow access on or near the line. The processes described in the AMPRN Rules and Procedures must be followed for accessing the Rail Corridor.

9.1. Emergency Isolations

If an Emergency Isolation is required then you must contact the ECO and request the Emergency Isolation. The ECO will make arrangements for the Emergency Isolation in accordance with document WI-EM-EE-930, Isolation of 25kV OHW.

9.2. Planned Isolation

Planned Isolations are to be in accordance with document WI-EM-EE-930 Isolation of 25kV OHW.

9.2.1. Applying for an Isolation of the OHW.

Except in an Emergency all Isolations must be planned in advance. A Network Access Request (FO-RC-NA-915) must be completed in accordance with PR-RC-NA-913, or PR-PC-NA-267. When the access application is for an electrified Line the Network Access Manager will pass the application onto the ECO for determination if an Isolation is required. It is important that the Applicant includes a copy of their SWMS and any other documentation in order that the ECO can evaluate the request.

If the ECO determines an Isolation is required the applicant must nominate a qualified PRES.

9.2.2. Issuing a Certificate of OHW Isolation- Form C

When the Nominated Person has made sure that the OHW has been isolated and earthed he will hand the PRES a Certificate of OHW Isolation – Form C. The Nominated Person must make sure the PRES understands:

- The working limits on the Form C.
- Where live equipment is adjacent to, or crosses over earthed equipment, which equipment is live and which equipment is earthed.
- The date, time and location that the Form C is to be returned by the PRES to the Nominated Person.
- The issue of a Form C does not mean that train movements have been stopped.
- The PRES must sign Part 1 of the Form C to show that they understand the conditions.
- The PRES must make sure that everyone in the Work Group understands the conditions shown on the Form C. All members of the Work Group must sign onto Part 4 of the Form C to confirm that they understand these conditions, before work is allowed to start.

9.2.3. During The Work

The PRES must remain with the work group and must keep the Form C until:

- Work is completed and the PRES and all members of the work group the PRES is responsible for are clear of the OHW and have signed off on the Form C, or
- The PRES is relieved by another PRES, in which case the Form C must be handed over to the new PRES and both people must sign Part 2.

The new PRES must tell the Nominated Person (either directly or through the ECO) that they have taken over the duties from the previous PRES.

The PRES must immediately tell the Nominated Person (either directly or through the ECO) if the Form C is lost. The Nominated Person will arrange to issue another Form C endorsed "Duplicate". The PRES must ensure that all members of the Work Group sign onto the Duplicate Form C.

9.2.4. Changes of Personnel within the Work Group

The PRES must make sure that each person coming onto the site of work after the Form C has been issued, fully understands the conditions shown below before being allowed to start work:

- The working limits on the Form C.
- Where live equipment is adjacent to, or crosses over earthed equipment, which equipment is live and which is earthed.

Each person must sign onto Part 4 the Form C to confirm they understand the conditions.

9.2.5. When the work is suspended or completed.

When the work is suspended or completed, the PRES must make sure all personnel and materials are removed from, and are no closer than 3 metres from, the OHW.

The PRES must then:

- Instruct each person in the work group to treat the OHW as live and dangerous to life.
- Require each member of the work group to sign Part 4 of the Form C to confirm that they understand the OHW is now to be considered live and dangerous.
- Complete Part 3 of the Form C.
- Return the Form C to the Nominated Person who will countersign Part 3.

If the PRES has lost the Form C, he must tell the Nominated Person. The PRES must carry out a visual inspection with the Nominated Person to make sure all persons and material are clear of the OHW.

9.2.6. A PRES performing other duties not associated with the PRES Role:

A PRES may perform other duties that are not associated with their role as a PRES provided:

- The other duties do not take the PRES away from the Work Group.
- The other duties are not so onerous that the PRES cannot satisfactorily carry out their PRES duties.
- Their PRES duties are not so onerous that the PRES cannot satisfactorily carry out his other duties.

9.3. Local Isolations of Depots.

For the Rolling Stock Maintainer Local Isolation Instructions apply to Commissioning Roads 1 & 2 at Seaford Depot. The method of applying these Isolations is described in WI-EM-EE-125, Local Isolation of 25kV OHW on Commissioning Roads 1 & 2 at Seaford Depot.

9.4. Isolation of Graffiti Wash in Seaford Depot.

SWI-EM-EE-653, Isolation and Preparing the Seaford Depot Graffiti Wash, describes the method for Isolation of the OHW through the Graffiti Wash. Note this process is only for the use of the Graffiti Wash Facility. Any other tasks in this area that requires an Isolation is to be covered by the process described in 9.2. The use of the automatic train wash does not require an isolation.

9.5. Access and Isolation of Feeder stations, Track Sectioning Cabins and Track Coupling Unit

Document MN-EM-EE-113, Substation Access Manual, describes the process and requirements for accessing FS, TSC and TCU. Documents WI-EM-EE-928 and WI-EM-EE-929 describes the process for Isolating FS, TSC and TCU.

10. Rail Vehicles, Track Machines and Road Rail Vehicles

10.1. Stabling of Rail Vehicles, Track Machines and Road Rail Vehicles

Rail Vehicles, Track Machines and Road Rail Vehicles must not be stabled under or adjacent to live Overhead Wiring equipment if the vehicle has open platforms that if accessed could put a person within 3m of the OHW, or if the vehicle is fitted with unguarded ladders that allow access to the roof of the vehicle.

10.2. Working on Rail vehicles

You must never go above the cant rail or climb above the floor level of the driving cab, or the open upper deck of a vehicle unless one of the following applies

- The vehicle is on a line where there is no OHW above or adjacent to the vehicle; or
- The OHW has been isolated and earthed and a Pres holds a certificate of Isolation (Form C) for the section of OHW you need to work above, or approach within 3m in any other direction, and the PRES has briefed you the working limits of the Form C and you have signed onto the Form C to confirm that you have understood the briefing given by the PRES; or
- The OHW has been isolated under local depot instructions.

10.3. Track Machines and Road Rail Vehicles Operating on the 25kV Network.

The Overhead Line must be Isolated and Earthed for the area in which the track machine or Road Rail vehicle is to On Track, Travel or Work and must be accompanied by a PRES who holds a Certificate of Isolation for the OHW unless:

- The Road Rail Vehicle complies with Section 19 of document PTS-MS-10-RS-GUD-00000095, "Requirements for Road Rail Vehicles accessing and Operating on the AMPRN" and is displaying a valid label.
- The Track Machine complies with Section 13 of document RS4-DOC-000885, "Requirements for Track Machines Accessing and Operating on the AMPRN".
- **And** SWMS or similar for the Road Rail vehicle or Track Machine details how that Machine will safely Travel and Work under live 25kV OHW Equipment.
- **And** the machine is listed on the approved register, held by the Technical Assurance Engineer, of Road Rail Vehicles and Track Machines that are permitted to travel or operate under live 25kV OHW Equipment.
- The Network Access Application must state that the intension is for the machine to travel or work under live 25kV and quote the ID number of the machine so it can be cross referenced to the register.

11. Cranes, Excavators and Elevating Machinery

In accordance with the principles of AS2550 Cranes, Excavators and Elevating Machinery working on the Electrified AMPRN require an Isolation of the OHW equipment and to be accompanied by a PRES who holds a certificate of Isolation unless:

- No part of the crane, excavator or elevating machinery, lifting attachments or load will come above or within 3m in any other direction of the OHW.
- A spotter must be employed if the distance from the OHW is less than 6.4m
- A SWMS/JSA must be completed and included as part of the Network Access Application.

- The SWMS/JSA must take into account any likely movements such as wind effects, mechanical or hydraulic failure, swinging of crane loads, operator error and control measures that have been implemented.

12. Other Plant Tools and Equipment

12.1. Using Long Items

Personnel must take extreme care when using or carrying long items and must make sure they do not come within 3m of live OHW.

Long items must be carried horizontally below shoulder height and, if necessary, get other people to assist.

When using ladders near OHW only ladders that are made of wood, or other non-conducting material may be used.

Ladders that are reinforced with metal attachments running along the sides must not be used.

12.2. Insulated Tools

Only Insulated tools that have been certified and tested for use on 25kV systems are allowed to be used within 3m of the live OHW. The following must apply:

- The tool has an in date test certificate.
- The operator has been trained in the use of the tool and has evidence that his training is up to date.
- The SWMS must have a section detailing how the insulated tool is to be safely used within 3m of the live OHW. This SWMS must be signed off by the UMEE.

13. Water Use in an Electrified Area

Nozzles or similar fittings shall not be used where it could be possible to direct water above or within 3m in other directions of live equipment.

All hoses and fittings shall be inspected prior to use to ensure that they are in good condition. A faulty hose including fittings shall not be used in electrified areas.

When hosing special care shall be taken to ensure that the water stream does not come within 3m or above live OHW, booster transformers, emergency supply transformers or electrical equipment mounted on trains.

14. New OHW Equipment on Non Electrified Lines

If new OHW Equipment is being installed, or an electrified area is being extended, the instructions in this document will not apply until the equipment has been declared live. You will be notified of this by the publication of an Energisation Notice.

The project responsible for the construction or extension of the new OHW equipment is responsible for setting up their own Electrical safety System prior to the OHW being declared live.

The new Equipment must be declared live at the moment it is connected up to any existing OHW equipment, unless a permanently earthed section, also known as a buffer section, has been installed between the existing equipment and the new equipment and the design of the buffer section has been approved by the Unit Manager Electrical Engineering and Sectioning Diagrams have been updated to show the buffer section.

Appendix 1

Authorised Persons - Accreditation Category Descriptions

Category	Switchgear	Description
1	66 kV GIS Substation Switchgear	This category permits switching of the 66 kV GIS Switchgear in the train substations
2	25 kV Substation Switchgear (including SVC 7.5kV equipment)	This category permits switching of the switchgear in the 25 kV train substations, including the SVC 7.5 kV equipment
3	25 kV OHW Track Isolators	This category permits switching of all 25kV OHW Track isolators.
3b	Seaford Meadows Depot Commissioning Shed 25kV Isolators	This category is restricted to switching the 25 kV isolators leading in to the Seaford Meadows Depot Commissioning Facility. This includes isolator 704/5 and 704/6.
3c	Seaford Meadows Depot Graffiti Wash 25 kV isolator	This category is restricted to switching the 25 kV isolator at Seaford Meadows Depot Graffiti Wash. This includes isolator 704/7 only.
4	11 kV Tram Substation Switchgear	This category permits switching in 11 kV plant and equipment and tram substation switchgear.
5	600 V DC Tram Substation Switchgear	This category permits switching of 600VDC tram plant and equipment and tram substation switchgear
6	600VDC Tram OHW Isolators	This category permits switching of all 600VDC lineside tram OHW isolators
6a	600v DC Tram OHW Isolators – Glengowrie Depot	This category permits switching of 600VDC tram OHW isolators in Glengowrie Depot
7	SCADA Switching/Monitoring and supervision in ECC	This category permits the monitoring, switching and supervision of the train and tram traction systems using SCADA in the ECC