

Safety Alert: Number SA-26-005

Title	LV Shocks within Rail Corridor				SAFETY CRITICAL CATEGORY Level 2 – Critical
Applicable Date	From	02 July 2026	To	Until withdrawn	
Approved by	Vishal Singh, Rail Safety & Systems Manager				
Issued by	Ajay Singh, Rail Safety Standards & Investigations Officer				
Location	M1 Network				
Distribution	All personnel with MTS Operator Job Role				

1. Background

During a recent possession weekend, multiple workers experienced electric shocks while undertaking maintenance activities in the rail corridor.

The shocks occurred when workers were in contact with the rail and conductive equipment or surfaces. Post-event testing confirmed residual voltage between the rail, walkway and surrounding infrastructure, despite traction power being isolated.

2. What Happened

- Residual voltage was present across rail, infrastructure and ground surfaces.
- The risk was realised through simultaneous contact between rail and conductive/earthed items (e.g. plant, walkway, concrete).
- Workers experienced electric shocks while handling plant in contact with rail and surrounding surfaces.

3. Key Safety Message

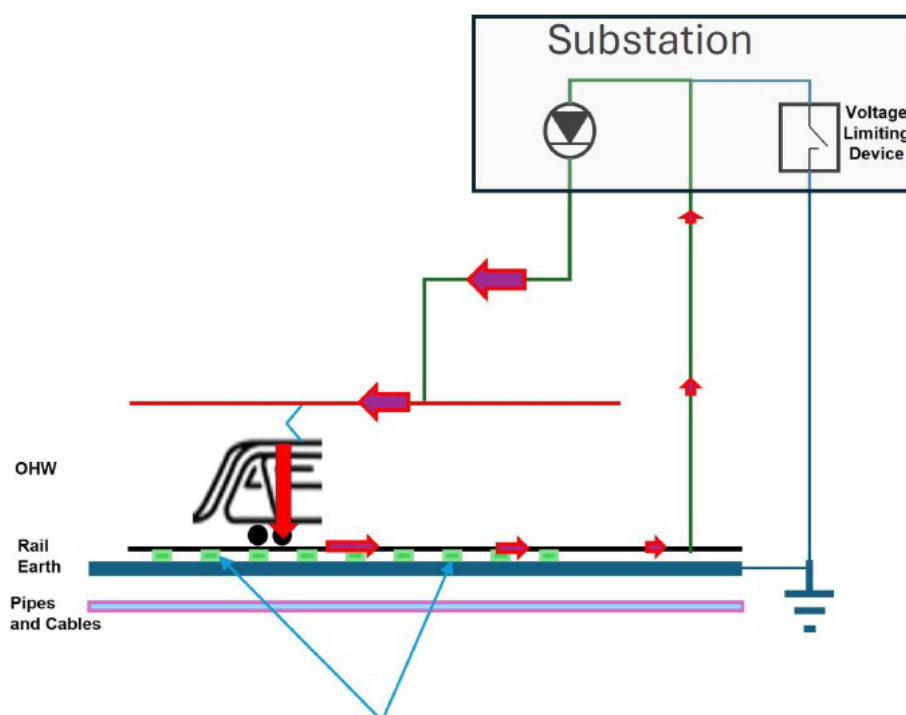
Rail should be treated as energised relative to earth, even when traction power is isolated.

- The MTS network uses rails as part of the traction return current path, creating voltage differences between rail and surrounding infrastructure.
- Residual voltages can exist and create rail-to-earth touch potential, particularly when contact is made between rail and grounded structures.

The MTS network is a Direct Current (DC) Traction Power System (TPS) and uses the track rails as part of the return electrical current path to the substations.

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MTS Safety Alert
MTS-CSF-FM-35414 | version 02



Rail is insulated from Earth

This prevents Traction Return Current flowing through assets parallel to our tracks preventing Electrolysis.
Doing this creates a potential difference (voltage) between Rail and Earth

Moving Forward

Affected personnel must:

1. Apply AEN Controls

- Avoid contact with track rails where practicable
- Avoid simultaneous contact between rail and conductive infrastructure
- Implement additional controls where electrical risk is identified

2. Manage Rail–Earth Touch Potential

- Treat rails as live relative to earth even if there is a power outage in place.
- Do not create conductive paths between rail and:
 - Concrete or walkways
 - Handrails, fences, structures
 - Plant, tools or equipment

3. Control Work Methods and Equipment

- Prevent bridging between rail and earthed infrastructure

- Manage conductive tools and plant
- Equipping workers and personnel with appropriate PPE
- Undertake task risk assessments that explicitly consider dual-contact scenarios

4. Follow Metro Electrical Safety Awareness (MESA) Principles

- Avoid contact with rail where possible
- Avoid concurrent contact with conductive infrastructure
- Recognise that conductive materials can create unintended current paths

5. Stop Work and Verify

- Cease work immediately if electrical sensation/shock is experienced
- Obtain electrical verification before resuming work

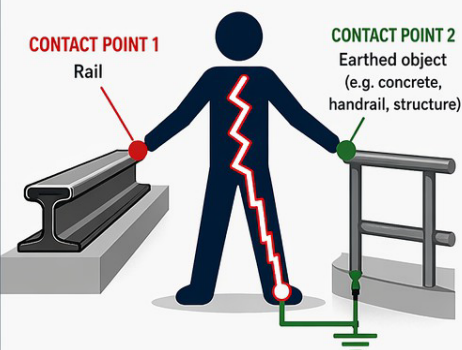


RAILS CAN STILL HAVE VOLTAGE

EVEN WHEN TRACTION POWER IS OFF



Always treat the rail as energised relative to earth.

HOW SHOCKS HAPPEN	AVOID THESE SITUATIONS	SAFE WORKING PRINCIPLES
A shock occurs when your body creates a path between the rail and something earthed.  CURRENT FLOWS THROUGH THE BODY = ELECTRICAL SHOCK	Simultaneous contact between rail and any earthed object.  Rail + Concrete / Walkway  Rail + Handrail / Structure  Rail + Plant / Equipment  Rail + Tools / Equipment	Break the circuit – eliminate or control one of the contacts.  Avoid contact with the rail where possible.  Avoid simultaneous contact between the rail and any earthed surface or object.  Plan your work, use the right controls and stop work if electrical risk exists.  Review and revise work practices and SWMS for tasks where there may be potential for simultaneous contact between the rail and any earthed points (e.g. concrete, structures, handrails, tools, plant).



STOP. THINK. ASSESS.
If unsure – stop work and verify.



REVIEW YOUR WORK
Review and revise SWMS and work practices for tasks where there may be potential for simultaneous contact between rail and earthed points.



FOLLOW REQUIREMENTS
Comply with AEN and MESA (MTS Electrical Safety Awareness) training.

Organisational Requirements

All organisations (MTS and Contractors) must:

- Review and address tasks where there is potential for simultaneous contact between rail and earthed surfaces, including:
 - Concrete or track slab
 - Walkways and access paths
 - Handrails, fences and structural elements
 - Plant, tools and metal equipment
- Ensure controls are clearly defined to eliminate or minimise bridging between rail and earth

Engineering / Operational Actions

- Review isolation and switching arrangements to ensure residual rail voltage risks are controlled during possessions
- Verify and monitor rail voltage conditions under possession configurations
- Reinforce Safety Alert & AEN requirements across workgroups

Key Learnings

- Isolation of traction power does not eliminate electrical risk on rails
- Residual voltage can be present and capable of causing electric shock
- Risk is driven by simultaneous contact (bridging) between rail and earth
- Effective control relies on managing contact pathways, not just isolation

Title:	Track Rail Voltage Safety
AEN No.:	AEN-2021-08-04-HV-1S
Revision:	04

Effective Date:	29/06/2026	Expiry Date:	Until withdrawn
Distribution:	Engineering Maintenance Delivery Staff, Workers accessing the rail corridor.		

Purpose

This AEN advises workers who access the track or the track where rail volts are present. There are obligations to implement safe methods of work.

Information

The MTS network is a Direct Current (DC) Traction Power System (TPS) and uses the track rails as part of the return electrical current path to the substations. The MTS track rails are electrically isolated from all surrounding corridor infrastructure. This means a varying electrical voltage exists between the MTS track rails and all surrounding corridor infrastructure, including adjacent train network track rails. This electrical voltage is controlled to be compliant with EN50122-1 engineering standard. This notation of track rail voltage compliant to EN50122-1 is commonplace around the world on railways with a DC TPS.

Workers are required to implement safe working practices to manage track rail volts, including mitigating:

- The voltage between MTS track rail volts and adjacent train network track rails (such as in a parallel running corridor at Chatswood).
- The voltage between MTS track rail volts and surrounding corridor electrically conductive infrastructure (such as electrically conductive cable trays, posts, frames, walkways, platform edge doors, structural members, points machines, fences, fixed equipment, equipment cubicles and panels, pipes).
- The voltage between MTS track rail volts and any other voltage source.

Typical safe working practices may include:

- Avoiding contact with the MTS track rails where viable.
- Avoiding electrically conductive concurrent contact between MTS track rails and surrounding corridor electrically conductive corridor infrastructure.
- When assessed by electrical and safety competent persons, temporary bonding between the MTS track rails and other infrastructure.

Addendum

N/A

Attachment

N/A

Reference

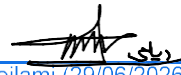
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Actions

1. All workers must complete MTS Electrical Safety Awareness training prior to working or accessing near the track rails.
2. All workers must implement safe working practices to manage track rail volts.

Revision History

1. Reviewed 16/06/2026. Valid, minor wording grammar fixes, re-issued as revision 04.

Prepared by: Andrew Barber Electrical Network Manager	Sign/Date: 
Endorsed by: Amir Deilami Head of Infrastructure Engineering	Sign/Date:  Amir Deilami (29/06/2026 11:09:45 GMT+10)