

RL D 79804

Electrical Safety Incidents

1 Principle

An electrical safety incident is an unplanned, undesired event that adversely affects the safety and operation of the Sydney Trains Electrical Distribution Network. Electrical Safety Incidents that occur on the electrical distribution network shall be managed consistently as per ENSR.

2 Incident Management- – Roles and Responsibilities

All Persons Identifying Unsafe Electrical Conditions

- Report unsafe conditions impacting electrical infrastructure to ICON Electrical on 1800 060 015 or 9379 4911.
- Take reasonable steps to mitigate the hazard.
- Record the unsafe condition in SHEM, including actions taken to make safe.
- When raising the unsafe condition in SHEM, commence the brief description with “Electrical Hazard” followed by the hazard description.

ICON Electrical

- Receive and respond to reports of unsafe electrical conditions.
- When an unsafe condition poses an imminent risk of harm, take immediate action in consultation with the Line Manager, Regional Electrical Engineer, Electrical Network Manager, or Principal Electrical Safety Investigator.
- Implement or coordinate risk controls, which may include:
 - isolation of electrical infrastructure
 - provision of site security to prevent unauthorised access
 - inhibiting Auto Reclose where available (high-voltage feeders only)
 - reporting unsafe conditions to the relevant electricity network operator for shared assets
 - installing barriers to protect persons from electrical hazards
 - modifying assets to address safety hazards
 - recommending dismantling or removal of objects creating hazardous conditions
- Remind persons reporting unsafe conditions to ensure the condition is registered in SHEM.

Line Managers

- Assess risks associated with unsafe conditions impacting electrical assets.
- Assure themselves that hazards are mitigated appropriately.
- Consult with the SEQR Safety Professional when assessing hazards.

- Apply SMS-06-OP-3026 Work Health and Safety (WHS) Risk Management where hazards fall within their responsibility.
- Determine timeframes for addressing defects and hazardous conditions in accordance with relevant Corrective Maintenance Timeframe documents.
- Transfer responsibility to another Line Manager where the condition cannot be addressed within their authority or timeframe.

After completing the initial hazard assessment and mitigation, line managers may find they are unable to permanently resolve the hazard. In such cases, the hazardous condition should be transferred to an individual accountable for managing and mitigating the hazard. Examples include:

- **TfNSW Project Works:** Hazards created by Transport for NSW project activities may be best managed by the Project Interface Manager.
- **Sydney Trains Works:** Hazards originating from Sydney Trains activities may be best managed by the Project Manager.
- **Asset conditions:** Hazards arising from asset conditions may be best managed by the Asset Manager.
- **Conditions from facility works** (e.g. Stations or Depots) may be best managed by the Facility Manager.

The transfer of a hazardous condition shall only occur following consultation and agreement between parties, and the transfer of accountability is conducted within SHEM.

Sydney Trains / Electrical Distribution Unit (EDU)

- Manage safety incidents in accordance with the Sydney Trains Safety Management System.
- Report and investigate safety-related incidents in accordance with SMS-17-SP-3077 Incident Notification, Reporting and Investigation.
- Notify the Electrical Regulator (IPART) of Reportable Safety Incidents, Major Reportable Safety Incidents, Reportable Asset Incidents, and Major Reportable Asset Incidents.

3 Investigations

The Business unit accountable for the process that involved the incident are responsible for undertaking the initial workplace (or equivalent) investigation. EDU on request will provide support to the business unit in completing the workplace (or equivalent) investigation.

The Principal Electrical Safety Investigator or another EDU investigator will attend site as required and as soon as practical for the purposes of an initial assessment and oversight of evidence collection.

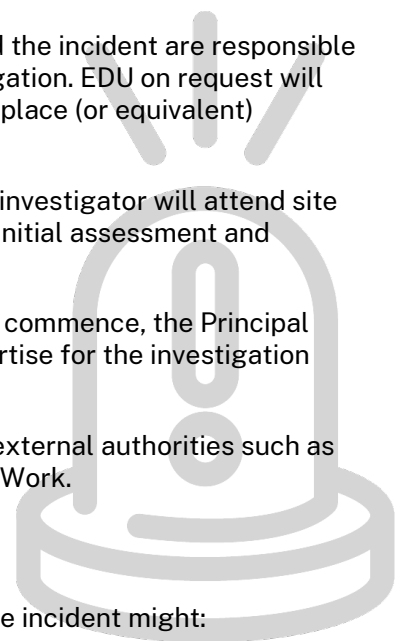
Where significant or systemic (or equivalent) investigations commence, the Principal Electrical Safety Investigator provides subject matter expertise for the investigation team.

Significant incidents may also result in an investigation by external authorities such as the Office of Transport Safety Investigations (OTSI) or SafeWork.

4 Emergencies

In the event of an incident requiring urgent action, where the incident might:

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- a. involve death or serious injury, or
- b. health or safety effects, or
- c. significant damage to property or infrastructure, or
- d. environmental impact,
- e. a person may take appropriate action as necessary to prevent or mitigate further danger, if they have considered it is safe to do so. In addition, apparatus may be de-energised by any person to eliminate the danger, provided it is safe to do so and ICON Electrical is to be consulted.
- f. Workers must advise ICON Electrical as soon as practicable of electrical incidents.

ICON Electrical: 9379 4911

NOTE

The Guide for Emergency Service Personnel accessing and operating within the Rail Corridor (available from Sydney Trains intranet) details:

- **major hazards that could be encountered in the Rail Corridor**
- **procedures to be used before and while in the Rail Corridor, e.g. all personnel must be briefed on the dangers involved in entering the Rail Corridor.**

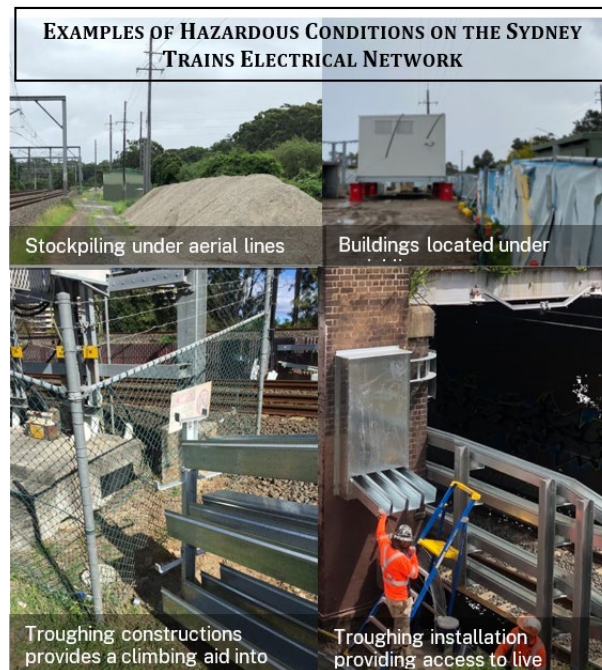
5 Reporting dangerous conditions and practices

When a person observes a dangerous condition or work practice in connection with the electrical equipment, the details shall be immediately reported to their line manager and ICON Electrical. The line manager shall record the details and, in conjunction with ICON Electrical, take appropriate remedial action.

Hazardous conditions that impact the safe operation of Sydney Trains Electrical Networks but are not asset defects must be addressed in accordance with the Sydney Trains Safety Management System. Examples include:

- **Unauthorised construction:** Building structures, scaffolding, fences, swimming pools or stockpiling materials near aerial lines without prior approval.
- **Unsafe asset construction:** Designing, constructing, and installing assets without considering safe access for maintenance, exposing maintainers to hazardous electrical equipment, or structures which pose electrical hazards to the public.
- **Vegetation interference:** Planting vegetation beneath aerial lines that could grow large enough to interfere with their safe operation.
- **Encroachment risks:** Placing or constructing objects or structures that allow individuals to encroach upon hazardous electrical equipment, whether unintentionally (workers) or deliberately (unauthorised access).
- **Restricted access:** Changes obstructing, infringing or restricting access to Electrical Infrastructure, including within National Parks or easements on third-party property.
- **Ground level changes:** Altering the ground level under aerial lines or near electrical poles, both within the rail corridor and in public areas.
- **Spills:** Spills under aerial lines that create network hazards, such as grain spills attracting birds/wildlife with the potential to cause fire ignition.

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Conditions classified as asset defects, rather than hazards impacting the electrical network, include:

- Existing vegetation encroaching the safe approach distance to electrical infrastructure.
- Foreign objects in contact with or near electrical infrastructure.
- Instances of trespass or vandalism.
- Faults or failures in electrical infrastructure.

These conditions are recorded in the Sydney Trains Asset Management System (EAM) as defects.

6 Electric Shock

All persons receiving an electric shock are to attend the nearest hospital by ambulance for assessment, regardless of how minor the contact may appear as per D2013/80869 *Electric Shock Protocol*.

7 Emergency Procedure following contact with live overhead power lines or apparatus

(Reproduced from the SafeWork NSW Code of Practice for Work Near Overhead Power Lines)

Should contact be made with a live overhead power line or a flash-over occurs between a live overhead power line and a crane or an item of mobile plant, the following actions shall be taken:

- An attempt should be made to break the machinery's contact with the live overhead power line by moving the jib or driving the machine clear.
- If it is not possible to break the contact with the live overhead power line, the operator of the crane or mobile plant should remain inside the cabin of the crane or on the plant item. The network operator should be called immediately to isolate power to the live overhead power line. The operator must remain in place

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until the power has been isolated, and the 'all clear' given by the network operator.

WARNING

When a crane or item of plant inadvertently contacts overhead power lines, circuit protective devices may operate to automatically turn the power off. However some protection devices are designed to automatically reclose thereby re-energising the powerlines after a short period of time, typically 1 – 4 seconds

- Warn all other personnel and members of the public to keep 8 metres clear from the crane or item of plant. Do not touch or allow persons to touch any part of the crane or plant item and do not allow persons to approach or re-enter the vehicle until an Authorised Person has determined the site safe.
- If it is essential to leave the cabin or the operator's position due to fire or other life threatening reason, then jump clear of the equipment. Do not touch the equipment and the ground at the same time. When moving away from the equipment, the operator should hop or shuffle away from the plant item (with both feet together) until at least 8 metres from the nearest part of the crane or plant. Under no circumstances run or walk from the crane or item of plant as voltage gradients passing through the ground may cause electricity to pass through the body resulting in an electric shock:
- Untrained, unequipped persons should not attempt to rescue a person receiving an electric shock. All too often secondary deaths occur because others get electrocuted trying to help earlier victims. If the crane or plant operator is immobilised, ensure the power supply has been isolated and the site has been made safe before giving assistance.

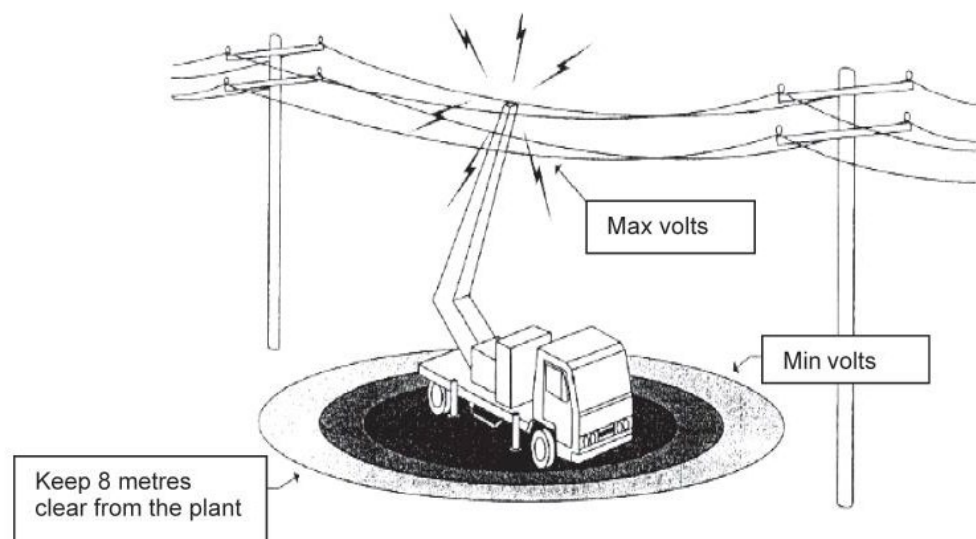


Figure 1 - Affected area surrounding mobile plant when in contact with a live overhead power line

Post – incident inspection by a competent person

When a crane or item of mobile plant has been in contact with a live overhead power line, it should be checked by a competent person for any damage to the components of the crane or mobile plant. Any actions recommended by the competent person are to be completed before the crane or mobile plant is returned to service.

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Tyres on cranes and mobile plant that have been in contact with overhead power lines where electrical flash-over and current flow occurs through the rubber tyres should be considered as a potential hazard.

These rubber tyres may catch fire, with the obvious potential for them to explode. Additionally, a lesser known danger may occur, which results when combustion takes place within the tyre, with no apparent external signs. When excessive heat is developed in or applied to a tyre as in the case from contact with overhead power lines, it can initiate a process known as pyrolysis, which is the decomposition of a substance by heat. This can generate a build up of flammable gases and pressure within the tyre, which may ultimately rupture or explode.

Vast amounts of energy can be released by a tyre explosion, often leading to significant equipment damage, serious injuries or fatalities. Pyrolysis related explosions are very unpredictable and have been known to occur immediately or up to 24 hours after initiation. An explosion can occur where no fire is visible and the danger area can be up to 300 metres from the tyre.

Any rubber tyred crane or plant item involved in an incident where contact is made with overhead power lines which results in discharges or flash-over of electrical current through the tyres should be considered as a potential hazard. The risk should be managed by:

- parking the crane in an isolation zone, with a minimum 300 metre radius
- removing all personnel from the area, and not allowing access to isolation zone for 24 hours
- alerting fire fighting services.

8 Relevant Procedures

- SMS-06-OP-3028 Reporting and Managing Work Health and Safety (WHS) hazards
- [SHEM Unsafe Acts/Unsafe Conditions](#)
- [SHEM: Report Unsafe Acts or Conditions](#)
- [SHEM: Process an Unsafe Act or Unsafe Conditions](#)
- [NMD-ME-GUI-480 - Corrective Maintenance Timeframes for Substations and Sectioning Huts](#)
- [NMD-ME-PRO-401 - Corrective Maintenance Timeframes on Aerial Line Assets](#)
- [NMD-ME-PRO-476 - Corrective Maintenance Timeframes on Overhead Wiring Assets](#)

9 Reference documents

- D2013/80869 Electric Shock Protocol
- Guide for Emergency Service Personnel accessing and operating within the Rail Corridor
- RL D 79800 Electrical Network Safety Rules
- SafeWork NSW Code of Practice for Work Near Overhead Power Lines
- SMS-17-SP-3077 Incident Notification, Reporting and Investigation

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10 Document properties

Disclaimer

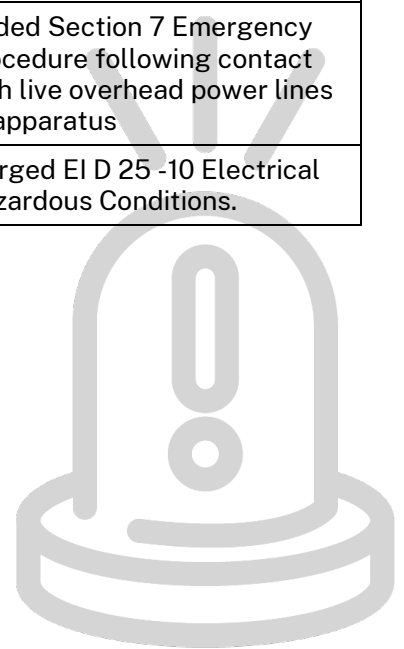
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Version	Date	Author/ Prin. Eng.	Summary of change
1.0	1 February 2022	ENSR Project Team	First issue as Sydney Trains document. Extracted from PR D 78000 Electrical Network Safety Rules and PR D 78101 General Requirements for Electrical Work. Reviewed as part of the ENSR Project.
1.1	9 February 2022	Wayne Halls	Added Section 7 Emergency Procedure following contact with live overhead power lines or apparatus
1.2	30 January 2026	Deepak Sinha	Merged EI D 25 -10 Electrical Hazardous Conditions.



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