

## 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

Sydney Trains safety incidents are managed in accordance with the Sydney Trains' safety management system.

For information relating to reporting safety-related incidents and investigating the associated incidents, refer to *SMS-17-SP-3077 Incident Notification, Reporting and Investigation*.

Sydney Trains Electrical Distribution Unit (EDU) notifies the Electrical Regulator (IPART) of Reportable Safety Incidents, Major Reportable Safety Incidents, Reportable Asset Incidents and Major Reportable Asset Incidents.

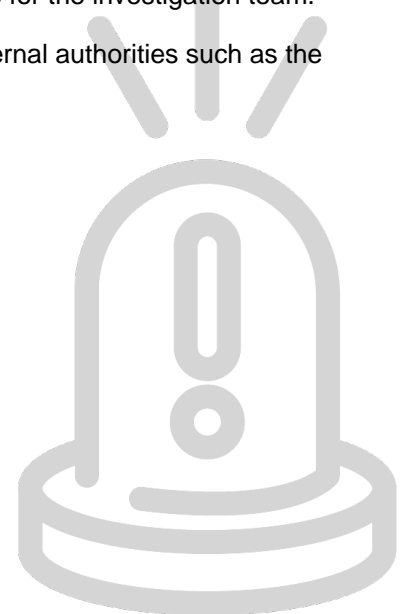
### 3 Investigations

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:

- a. involve death or serious injury, or
- b. health or safety effects, or
- c. significant damage to property or infrastructure, or
- d. environmental impact,

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.

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:*

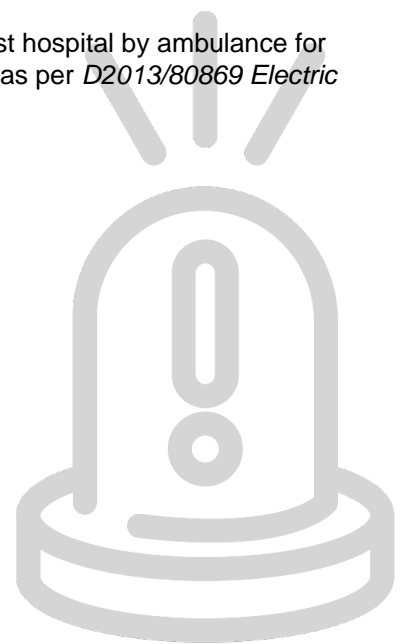
- major hazards that could be encountered in the Rail Corridor
- procedures to be used before and while in the Rail Corridor, e.g. all personnel must be briefed on the dangers involved in entering the Rail Corridor.

## 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.

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

### **WARNING**

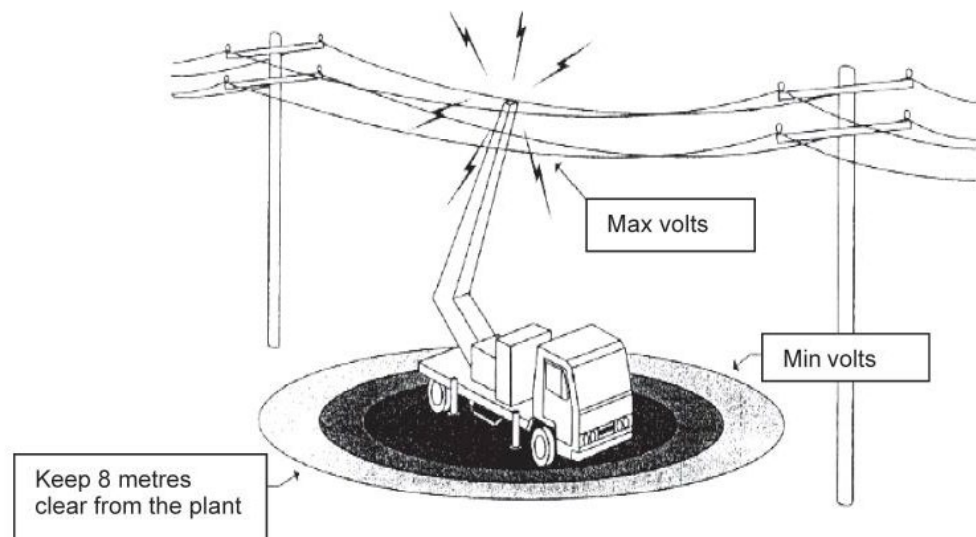
**When a crane or item of plant inadvertently contacts overhead power lines, circuit protective devices may operate to automatically turn the power off. However some protection devices are designed to automatically reclose thereby re-energising the powerlines after a short period of time, typically 1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

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 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

## 9 Document properties

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<b>Date in Force</b>	9 February 2022

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