Safe Work Instruction

Rescue from Live Low Voltage Equipment (Including Rescue Kit Care)

Document no.	D2013/80870
Work description	Rescuing victims from situations involving live Low Voltage (LV) equipment at ground level.
Scope	This SWI is mandatory for working on or near live LV electrical equipment for the supply or distribution of electricity or for work on live LV electrical installations; subject to conditions specified below in the "Overview" section. This SWI is NOT for rescue of victims from situations involving High Voltage. This SWI excludes special procedures that apply to the rescue of victims from height. This SWI includes the requirements for the inspection, use and care of rescue kits.
Review date	01/02/2025
References	• AS/NZS IEC 60903:2020 Live Working – Electrical Insulating Gloves • D2013/80869 Electric Shock Protocol • ISSC 14 Guide to electrical workers' safety equipment (January 1993 & October 2010) • ISSC 24 Guide to Electricity Workers' Escape & Rescue Procedures 1997, Electricity Association of NSW. (Document has been withdrawn but this reference is left as it was referred to in producing version 1.1 of the SWI) • PR D 78700 Working around Electrical Equipment • PR D 78701 Personnel Certifications - Electrical • Work Health and Safety Regulation 2017
PPE and precautions	As described in the document.
Competencies or qualification	Authorised electrical workers as described in *PR D 78701 Personnel Certifications – Electrical*.
Licences or permits required	n/a
Tools and equipment required	As described below.
Overview	This SWI is mandatory for working on live LV electrical equipment for the supply or distribution of electricity. This SWI is mandatory for working near live LV electrical equipment for the supply or distribution of electricity, unless the risk assessment shows that there is no serious risk associated with the proposed work. This SWI is mandatory for work on live LV electrical installations, unless the work consists only of testing and the risk assessment shows that there is no serious risk of contact with exposed electrical equipment associated with the proposed work. In such cases of testing, a Safety Observer would not be required and thus not available to enact rescue. Factors to be considered during a risk assessment include but are not be limited to: • the area where the electrical work is to be carried out is clear of obstructions so as to allow for easy access and exit • the point at which the electrical equipment can be disconnected or isolated from its electricity supply is: - clearly marked or labelled, and - clear of obstructions so as to allow for easy access and exit by the worker who is to carry out the electrical work or any other competent person, and - capable of being operated quickly

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	• only persons authorised can enter the immediate area in which electrical work on energised electrical equipment is being carried out • complexity of the electrical work • proximity to live exposed conductors or equipment • work environment • number of persons working as a team, and • tools and equipment (including personal protective equipment) used.
Principles and priorities	Rescue procedures cannot be defined in detail for all cases. However, everyone who works on or near LV electrical equipment, and those assisting in such work, are to be familiar with the basic principles outlined in this SWI. In situations involving electric shock, give priority to the prompt release and rescue of a victim as time is essential for the victim's survival.
Employee competence	Authorised Electrical workers are to undergo training, instruction and assessment in the rescue procedures at intervals not exceeding 12 months. Line Managers are to make sure that records of this training are kept. Where it is determined during work planning activities that a person who has been assessed as competent to undertake this rescue is required, the field supervisors are to make sure they are present during live low voltage works.
Rescuer's safety	At all times rescuers are to fully assess the situation they are facing and not jeopardise their own safety by any action they may take, despite the consequences this might have for any victim. All personnel undertaking the rescue are to wear the appropriate personal protective equipment (PPE); that is, at a minimum the insulating gloves contained within the rescue kit. It is anticipated that the rescuer would be an electrically trained person and as such, already be wearing the PPE as required by *PR D 78700 Working around Electrical Equipment* Section 8 Personal Protective Equipment. **NOTE** Take care that the rescuer does not become a casualty!
Release from live electrical equipment	Contact with live electrical equipment can result in the worker becoming the victim of electric shock. The recommended steps to be taken for the release and rescue are detailed in the **Rescue steps** section and summarised in the flowchart (Figure 2).
Rescue Kit	The rescue kit is to contain the following items (as shown in Figure 1): a. torch b. emergency isolation tag c. low voltage retrieval aid (insulated crook) d. trauma dressing e. rescue kit bag f. fire blanket g. insulated gloves h. list of contents (not shown in the photo)

Missing contents shall be replaced as required.

Figure 1: Rescue Kit Items

NOTE

Rescue equipment shall not be used for any purpose other than its intended use, and their components shall not be altered in any way that may affect their operation as originally recommended or supplied.

Inspection and Testing of Rescue kit

Before Use Inspection

Before commencing the proposed electrical work, check the rescue kit to make sure all items are in good condition:

- torch functioning properly
- trauma dressing is sealed and within use by date
- insulating gloves shall be visually inspected for cuts, tears, perishing and distortion, pinholes, punctures, cracks, chemical bloom, embedded foreign matter and hard spots. If either glove is thought to be unsafe, the pair should not be used and returned for testing
- insulating gloves shall be tested for any air leakage as illustrated below

Step 1. Hold Glove Downward and Grasp Cuff.

Step 2. Twirl Glove Towards Your Body to Trap Air Inside. Squeeze Glove To Look For Damage.

Step 3. Hold Glove To Face and Feel. Listen For Escaping Air or Immerse In Water and Watch For Bubbles.

- check the insulated crook and bag for any sign of damage or deterioration
- using your hands located at each end of the insulated crook, apply an “opposing twist” to apply a torsional tension through the length of the insulated crook a means of verifying structural integrity.

Routine Inspection and Tests

On an annual basis the integrity of the Rescue Kit shall be verified to ensure components of the kit are still fit for the purpose intended.

In addition, to the ‘Before Use Inspection’ requirements detailed above the:

- storage of the Rescue Kit and in particular the LV insulating gloves is to be verified as in compliance with Appendix A.2 of *AS/NZS IEC 60903:2020*, and
- insulating crook, which is rated for 5kV shall be subjected to an insulation resistance test. Upon application of an insulation resistance test of 1kV DC for 1 minute, the measured resistance value is not to be less than 50M Ohm.

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Planning for rescue from live LV	The rescue kit is to be readily available prior to work being performed on or near live low voltage equipment. The rescue kit is to be: • inspected as per the 'Before Use Inspection' requirements detailed above, and • arranged so that items, particularly the insulated gloves and crook, are readily available. Install the emergency isolation tag at the isolation switch before starting the work as described in the "Scope" of this SWI.
General precautions for rescue	1 Quickly observe the general circumstances, noting: • The voltage that is involved and if it is LV. This rescue technique does NOT apply if the voltage is High Voltage • If there are special difficulties involved, and • If special precautions are necessary. 2 Act promptly: Time is important and delay may be fatal; but speed of action shall be accompanied by due care. 3 Take precautions against receiving a shock yourself: Remember that until the victim is released or the electricity has been isolated, the victim is electrified at the voltage of the live electrical equipment. 4 Where practicable, isolate the electricity to prevent further electric shock(s). If the electrical equipment contacted by the victim is controlled by a switch, which is readily accessible, the switch should be immediately opened to facilitate the rescue. LOOK for the "emergency isolation tag". This is subject to the rescuer being competent to do so. The equipment involved shall still be treated as alive unless isolated and proved dead.
Key considerations	The key considerations for situations involving low voltage are that: • the minimum safe approach distance for live LV conductors or equipment is 500mm for authorised electrical persons • the use of LV insulating gloves is mandatory as it provides electric shock protection to the hand of the rescuer. This is enhanced by the use of the insulated LV retrieval aid (the insulated crook) which provides additional insulation and allows extra clearances to be maintained.
Rescue steps	Follow these general steps in rescue from live LV equipment: 1 Seek help – if practicable, and if this can be done without delay e.g. verbal request to bystanders, contact Infrastructure Control (ICON Electrical) on 1800 060 015 or (02) 9379 4911 or internal no. 94911. 2 Assess the situation. 3 Isolate the electricity. **LOOK** for the "emergency isolation tag". **NOTE** If the isolation switch is far away from the incident site, or the rescuer is unable to 'isolate' safely skip this step and continue with preceding steps being aware that the exposed equipment and victim are still electrically LIVE. 4 Put on the insulating gloves. 5 Grab the insulated crook. 6 Check for danger such as live parts, live cables and the potential to cause a short circuit. 7 Approaching from behind the victim, place the insulated crook under the victim's shoulder. 8 Turn the insulated crook into the victim's body. When pulling the victim clear, the insulated crook can slide off if it is not turned into their body and just placed under their arm.

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9 **Pull the victim clear of the 'live' exposed electrical equipment.**

As the victim falls, stand clear as they may push you towards the 'live' exposed electrical equipment.

If possible support the victim's head as they are positioned to a safe position.

10 **Seek urgent medical attention.**

Immediately call ICON Electrical on 1800 060 015 or (02) 9379 4911 or internal no. 94911.

Upon ICON Electrical answering the phone you should:

- first say "Emergency, Emergency, Emergency".

Then state:

- identification and location
- the nature of the emergency, and
- the type of assistance required.

In some situations such as when access to the rail corridor will not be required by emergency services and/or removal of the electrical supply will not require ICON Electrical to coordinate such activities, it may be preferable to contact the emergency services first, in such cases, call 000 (or 112 from a mobile phone) for an ambulance and, if necessary, rescue services.

11 **Make safe the incident scene.**

The incident scene is not to be left unattended until it has been made safe. ICON Electrical can assist in organising this.

12 **First Aid.**

Persons trained in first aid should follow first aid steps DRSABCD (Danger, Response, Send for Help, Airway, Breathing, Circulation and Defibrillation). Others should follow the instructions given by the ambulance call line operator.

Consideration may also need to be given to significant trauma such as cervical spine injury.

Treat burns.

13 **Ambulance transport to hospital.**

The injured person(s) shall be transported to the nearest hospital.

The injured person(s) is not to be left alone or allowed to drive to the hospital as heart problems can occur up to several hours following an electric shock.

In the **first** preference, the injured person(s) shall be transported by ambulance. Should ambulance transport not be possible a Team Leader, next senior work party member, or Line Manager shall arrange:

- for alternative transport e.g. taxi or vehicle and driver, and
- to have another person, where possible a qualified first aider and preferably one knowing the details of the incident, to:
  - accompany the injured person(s) in the alternative transport to the nearest hospital, and
  - wait until all tests are completed.

14 **Complete subsequent steps regarding:**

- Initial treatment
- After assessment
- Continuing treatment
- Incident reporting, and
- Statutory notification

as detailed in *D2013/80869 Electric Shock Protocol*.

Additional controls	Nil

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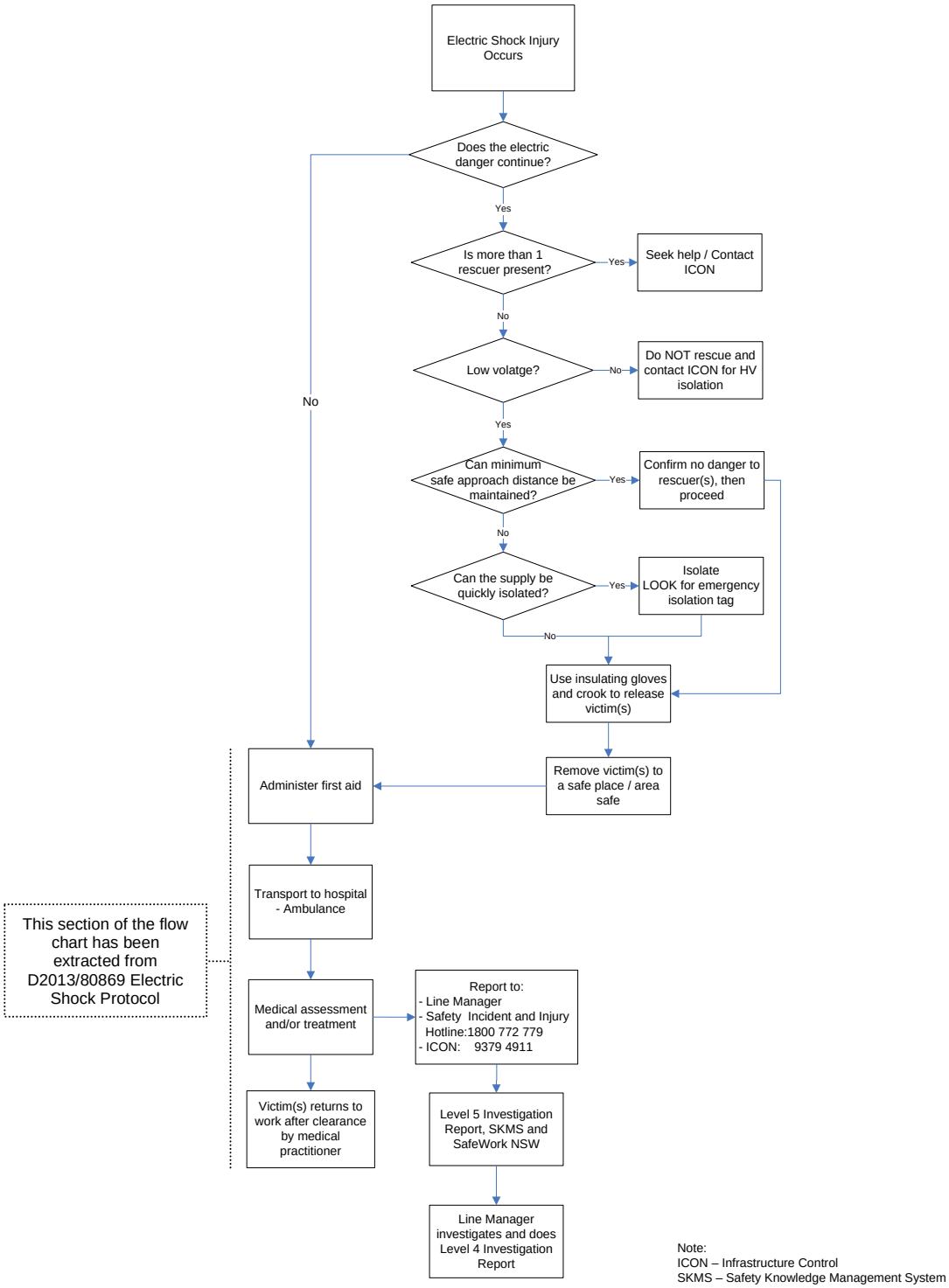

Figure 2: Release and rescue procedure in the event of a live LV electrical accident

NOTE

Persons should read and understand the details contained in this Safe Work Instruction. Do not just rely on referring to this flow chart.