Safe Work Instruction

Electric Shock Protocol

Document no.	Work description
D2013/80869	Minimum level of treatment for any person who has received an electric shock.

Scope

Unless there are obvious signs or symptoms of injury that need medical treatment, this protocol does **not** apply to shocks caused by:

- Static electricity; or
- Contact with livestock, electric fences; or
- Contact with extra low voltage (not exceeding 50V AC or 120 V ripple-free DC) electrical apparatus

NOTE
Should a person receive an electric shock from a voltage source of an unknown voltage level then follow the protocol in this SWI.

Review date	References
11/10/2021	• Jensen, P (1987): "Electric Injury Causing Ventricular Arrhythmias" British Heart Journal Vol 57, No.3, pp 279-283 • Walton AS et al Myocardial Infarction after electrocution Med J Aust 1988; 148 (7): 365-7 • Romero B et al Myocaridal necrosis by electrocution: evaluation of non invasive methods J Nuc Med 1997; 38 (2): 250-1 • Cushing TA "Electrical injuries in emergency medicine" , April 2010 (www.emedicine.medscape.com) • PR D 78103 Electrical Operational Communication and Records • SMS-06-GD-0268 Working around Electrical Equipment • D2013/80870 Rescue From Live Low Voltage • Online Level 5 Investigations • SMS-17-TP-4157 Level 4 Investigation Report • SMS-17-SP-3077 Incident Reporting and Investigations

PPE and precautions	Competencies or qualifications	Licences or permits required
N/A	N/A	Nil

Tools and equipment required

N/A

Purpose	
	This protocol establishes the minimum level of treatment for any person who has received an electric shock. Electrical injury can occur when a person becomes part of an electrical circuit. All persons should be aware that medical attention is required, regardless of initial symptoms as injuries may be more serious than they appear or even have a delayed reaction and some types of injuries may not be obvious to the victim or observer. All persons receiving an electric shock are to attend the nearest hospital by ambulance for assessment, regardless of how minor the contact may appear on reporting. A clear procedure is provided outlining the steps that are to be followed when a person receives an electric shock. It applies to all workers, employees, contractors, visitors, and any person on RailCorp property.

Responsibility

Table 1 Responsibility for ensuring that this instruction is followed

Authority	Action
Business Unit/Site Managers/Line Manager	Authorise persons to carry out this procedure.
Business Units Site Managers/Team Leaders Supervisors of Contractors	Make sure that all workers (including contractors and visitors) working under their control, are aware of the need to follow this procedure.
Contractor Companies	Make sure that all workers (including sub-contractors and visitors) working under their control, are aware of the need to follow this procedure. Contractor companies are responsible for their own workers' costs associated with any incident.
Person / Worker	Comply with the requirements of this Safe Work Instruction and the Safety Management System (SMS).

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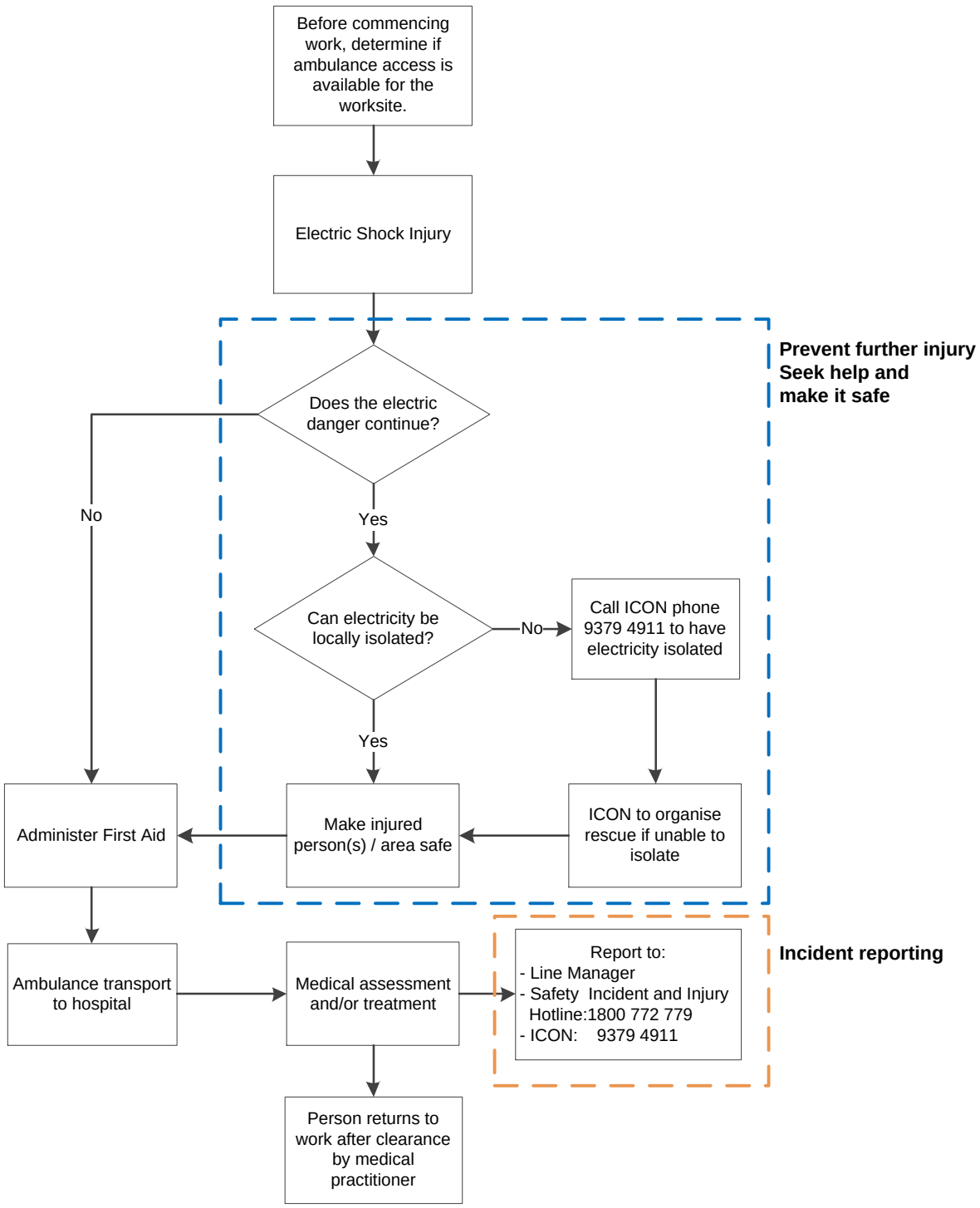
Note: Persons should read and understand the details contained in this Safe Work Instruction. Do not just rely on referring to this flow chart.

Figure 1 Rescue and treatment of electric shock injury



Note:
ICON – Infrastructure Control
SKMS – Safety Knowledge Management System

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Prework Briefing	Before commencing work, determine if ambulance access is available for the worksite.	
Procedure when person receives an electric shock	All persons /workers (whether employees, contractors or visitors) who receive an electric shock during the course of their work or visit are subject to the following procedure, which is schematically illustrated in Figure 1.	
	Prevent further injury	Isolate the electricity to prevent further electric shock(s). If the electricity can not be isolated locally call Infrastructure Control (ICON) on 1800 060 015 or (02) 9379 4911 or internal no. 94911. If a person appears to have received an electric shock, or if the source is known to be high voltage, seek urgent medical attention, immediately call Infrastructure Control (ICON) on 1800 060 015 or (02) 9379 4911 or internal no. 94911. Upon ICON answering the phone you should: • First say “Emergency, Emergency, Emergency”. Then state: 1. The nature of the emergency 2. Identification and location, 3. The type of assistance required. Worker(s) / rescuer(s) are to take all necessary actions, without endangering their own life, to make the injured person(s) safe and to prevent others from also receiving an electric shock. Avoid water or any object that may be in contact with the live conductors. The incident scene is not to be left unattended until it has been made safe. ICON can assist in organising this. ***Warning*** *The rescuer is to be careful not to also become a casualty; a dead or injured rescuer cannot rescue anyone!* *Never assume that the electrical apparatus is dead and safe to touch unless verified by an Electrical Worker*
	Seek help and make it safe	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 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. If the shock has obviously occurred from a portable appliance, and it is safe for you to do so, turn off the power at the power point and remove the plug. If the shock is due to contact with the electrical supply network, contact Infrastructure Control (ICON) to have the electrical supply removed or to organise a rescue using appropriate Authorised Persons (certified in accordance with PR D 78701 Personnel Certifications – Electrical), applying D2013/80870 Rescue from Live Low Voltage. All electric shock incidents associated with the electricity supply network shall be reported to ICON, irrespective of whether removal and/or isolation of electrical supply is needed. Stay well clear of any electrical apparatus for which the victim may be in contact.

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Procedure when person receives an electric shock (continued)	**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.
	Ambulance transport to hospital	The injured person(s) **shall not** be left alone or allowed to drive to the hospital as heart problems can occur up to several hours following an electric shock. The injured person(s) shall be transported to the nearest hospital 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 & 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.
	Initial treatment	Injured person(s) are to attend a hospital for an evaluation, including an ECG regardless of how superficial the injury may look. An abnormal ECG (depending on the abnormality) may require admission for monitoring until heart rhythm has returned to normal. On arrival at the hospital for an evaluation, the accompanying person is to call the Incident Hotline.
	After assessment	Medical clearance is to be obtained prior to transporting the worker home or back to work. If the person is discharged after examination, the worker's Line Manager is to arrange: • appropriate transport back to the workplace or to the injured worker's residence, and • a person to accompany the worker.
	Continuing treatment	In the event of ongoing medical problems, including palpitations and/or pain, the injured person(s) should seek prompt medical attention.
	Incident reporting	All incidents, regardless of their severity, are to be reported to the worker's Line Manager and to the Safety Incident and Injury Hotline 1800 772 779 and SER On Call Officer 0400 354 677, either by the person or by their Line Manager if they are unable to make the call. All incidents involving electricity are to be reported to ICON. Phone 9379 4911.

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Effects of an electric shock	The body's response to electric shock is variable. Several factors such as voltage, tissue resistance, tissue susceptibility, type and quantity of current, current pathway, site and duration of electric contact determine the severity and extent of the injury. Electrical injuries can affect several organs and can cause a variety of burns and traumatic injuries.	
	Cardiovascular	• Effects may include cardiac arrest: ventricular fibrillation (VF) or asystole (absence of any electrical activity in the heart), and other disturbances of heart rhythm. • Sudden death due to VF is more common with low voltage AC. Asystole is more often associated with high voltage AC or DC. • Low voltage contact directly with the chest may result in VF. • Delayed disturbance of heart rhythm may occur. However, this is rare if the initial electrocardiogram (ECG) is normal. • Long-term cardiac complications from electrical injury are rare.
	Respiratory	Respiratory arrest may occur if chest wall muscles are paralysed as a result of current pathway being over the chest.
	Burns	Burns may initially appear minor despite significant deep tissue injury. Burns are most often severe at the source (usually hands or head) and ground contact point (usually feet). The severity and extent of tissue damage are influenced by the strength and duration of contact with the source. Burns from high voltage may appear minor at the surface whilst causing significant damage to underlying deeper tissue. Skin with high resistance will transmit energy to deeper tissues with lower resistance. Severe tissue burns can result in kidney failure. Low voltage burns look like ordinary thermal burns.
	Neurological effects	Most neurological effects result from secondary blunt trauma (eg being thrown from the source). Seizure or spinal cord injury may result from hand to hand flow. Prolonged contact time from grasping the source can result in paralysis of respiratory muscles.
	Musculoskeletal	Fractures may occur from blunt trauma.

Additional controls
NIL

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