

Electric Shock Protocol

Document no.	Work description Minimum level of treatment for any person who has received an electric shock.		
SMS-06-SW-0269	<p>Scope</p> <p>Unless there are obvious signs or symptoms of injury that needs medical treatment, this protocol does not apply to shocks caused by :</p> <ul style="list-style-type: none"> • static electricity, or • contact with exposed extra-low voltage (not exceeding 50V AC or 120V ripple-free DC) electrical apparatus, or • contact with livestock electric fences. 		
Review date	<p>References</p> <ul style="list-style-type: none"> • (Reference 1) Jensen, P (1987): "Electric Injury Causing Ventricular Arrhythmias" British Heart Journal Vol 57, No.3, pp 279-283 • (Reference 2) Walton AS et al Myocardial Infarction after electrocution Med J Aust 1988; 148 (7): 365-7 • (Reference 3) Romero B et al Myocardial necrosis by electrocution: evaluation of non invasive methods J Nuc Med 1997; 38 (2): 250-1 • SMS-06-FM-0270 ECG Request • SMS-06-SW-0271 Rescue from Live Low Voltage • SMS-06-GD-0268 Working Around Electrical Equipment • SMS-17-SR-0099 Incident Reporting and Notification • SMS-17-SR-0153 Incident Investigation • SMS-17-FM-0219 Level 5 Incident Investigation • SMS-17-FM-0157 Level 4 Incident Investigation 		
Responsible supervisor <i>Insert name in BLOCK letters</i>	PPE and precautions	Competencies or qualifications	Licences or permits required
Tools and equipment required			
IF CONTROL MEASURES ARE NOT SUITABLE AND MAJOR CHANGES ARE NEEDED, CONDUCT A RISK ASSESSMENT AND DEVELOP NEW CONTROLS ACCORDING TO SMS-06-PR-0104 WORKPLACE RISK MANAGEMENT .			

Purpose	This protocol establishes a minimum level of treatment for any person who has received an electric shock. An electric shock is the effect produced on a person's body by an electric current passing through it. All persons are to be aware that delayed serious effects can still occur for some time after an electric shock and it is essential that medical attention be received, regardless of the initial symptoms. All persons receiving an electric shock are to attend a medical centre or hospital for an electrocardiogram (ECG), regardless of how minor the contact may appear upon reporting. A clear procedure is provided outlining the steps that are to be followed when a person receives an electric shock. It applies to employees, contractors, visitors, and any person on RailCorp property.
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Responsibility	Table 1 Responsibility for ensuring that this instruction is followed	
	Authority	Action
Business Unit/Site Manager		Authorise persons to carry out this procedure
Business Units		Make sure that all employees (including contractors and visitors) working under their control, are aware of the need to follow this procedure
Site Manager/Team Leader		
Supervisors of Contractors		
Contractor Companies		Make sure that all employees (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 employees' costs associated with any incident.

Effects of an electric shock	<p>The body's response to electric shock is variable. Several factors such as voltage, tissue resistance, tissue susceptibility, type of current, current pathway, site and duration of electric contact determine the severity and distribution of the injury.</p> <p>The heart in particular is liable to damage by electrical injury and there are many reports of :</p> <ul style="list-style-type: none"> • persistent cardiac arrhythmias (abnormal rhythm – see "Reference 1" in this SWI) or • myocardial infarction (heart attacks – see "Reference 2" in this SWI) or • cardiac muscle damage (see "Reference 3" in this SWI), suffered as a result of electric shock. <p>Fortunately, these delayed effects only seem to occur in a very small proportion of the total reported electric shocks.</p>	
	Ventricular Fibrillation	<p>A voltage that causes current to travel through the chest for one second may induce ventricular fibrillation at currents as low as 50mA. With an equivalent DC voltage the current required to induce ventricular fibrillation is several times higher.</p> <p>The symptoms of ventricular fibrillation may not occur until many hours after the electric shock, so a lack of immediate symptoms does not indicate that no damage has been done.</p>
	Burns	<p>Tissue heating due to resistance can cause extensive and deep burns. Higher-voltage (greater than or around 500V) shocks tend to cause internal burns due to the large energy (which is proportional to the square of the current) available from the source. Damage due to current is through tissue heating.</p>
	Neurological effects	<p>Current can cause interference with nerve condition and muscle contraction. At currents above approximately 10mA a person is unable to let go of a live conductor, thus sustaining a more prolonged electric shock and increasing the likelihood of more extensive injuries. This is known as the "let-go threshold".</p>


Warning

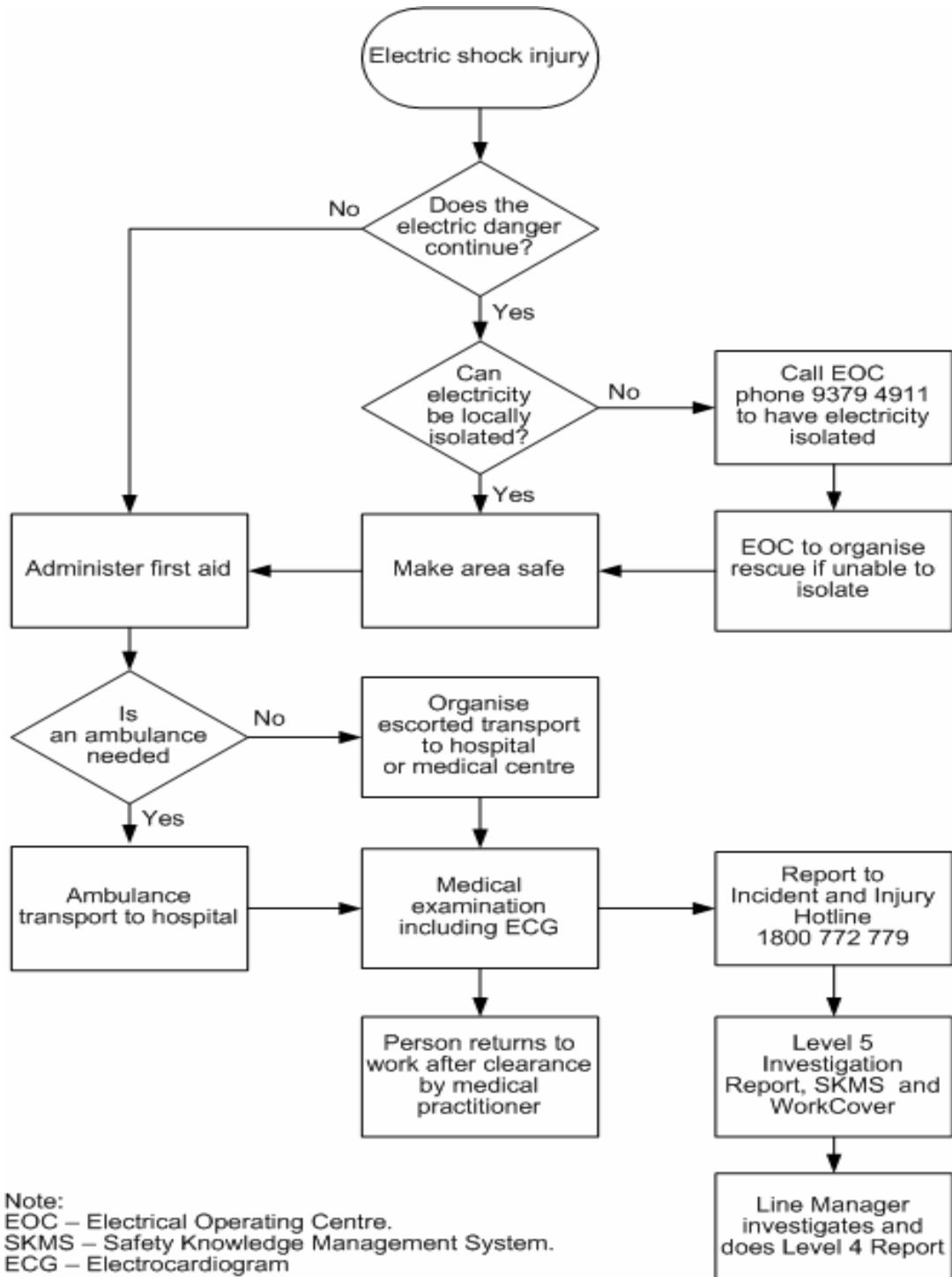
Never assume that the electrical apparatus is dead and safe to touch unless verified by an Electrical Worker.

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Procedure when person receives an electric shock	All persons (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.
	<p>In life threatening situations – seek help</p> <p>If a person appears to have received a serious electric shock, seek urgent medical attention, immediately call 000 (or 112 from a mobile phone) for an ambulance and if necessary rescue services.</p> <p>Employee(s) / rescuer(s), are to take all necessary actions, without endangering their own life, to make the area 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.</p> <p>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.</p> <p>If the shock is due to contact with the electrical supply network, contact the Electrical Operating Centre (EOC) to have the electrical supply removed or to organise a rescue using accredited RailCorp staff, in accordance with SMS-06-SW-0271 Rescue from Live Low Voltage. All electric shock incidents associated with the electricity supply network must be reported to the EOC, irrespective of whether removal and/or isolation of electrical supply is needed.</p> <p>Stay well clear of any electrical apparatus for which the victim may be in contact.</p> <p>The incident scene is not to be left unattended until it has been made safe. EOC can assist in organising this.</p>
First Aid	Persons trained in first aid should follow first aid steps DRABCD (Danger, Response, Airway, Breathing, Circulation and Defibrillation). Others should follow the instructions given by the ambulance call line operator.

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Figure 1 **Rescue and treatment of electric shock injury**



Warning

The rescuer is to be careful not to also become a casualty; a dead or injured rescuer cannot rescue anyone!

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Procedure when person receives an electric shock	If ambulance transport is not used	<p>The injured person is not to be left alone or allowed to drive to the medical facility. Heart problems can occur up to several hours following an electric shock.</p> <p>Line Managers are to arrange to have another person, where possible a qualified first aider and preferably one knowing the details of the incident, to:</p> <ul style="list-style-type: none"> • drive the injured person(s) to the nearest hospital/medical centre, or • accompany them in a taxi to the nearest hospital/medical centre • wait until all tests are completed.
	Initial treatment	<p>Injured person(s) are to attend a medical centre/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.</p> <p>On arrival at the medical centre/hospital for an evaluation, the accompanying person is to call the Incident Hotline and request the SMS-06-FM-0270 Electric Shock Incident - ECG Request to be faxed to the medical centre/hospital.</p>
	After assessment	<p>Medical clearance is to be obtained prior to transporting the employee home or back to work. If the person is discharged after examination, the employee's Line Manager is to arrange:</p> <ul style="list-style-type: none"> • appropriate transport back to the workplace or to the injured employee's residence • a person to accompany the employee.
	Continuing treatment	<p>In the event of ongoing medical problems, including palpitations and/or pain, the injured person(s) should seek prompt medical attention.</p>
	Incident reporting	<p>All incidents, regardless of their severity, are to be reported to the employee's Line Manager and to the Safety Incident hotline 1800 772 779, either by the person or by their Line Manager if they are unable to make the call.</p> <p>All accidents involving electricity are to be reported to the EOC. Phone 9379 4911.</p> <p>The employee's Line Manager is to make sure that a completed SMS-17-FM-0219 Level 5 Incident Investigation reaches the relevant Investigations Manager as soon as possible and no longer than 24 hours after the accident.</p> <p>All initial incident investigation documentation should be directed to the Infrastructure Group's Safety Investigations Manager, including a SMS-17-FM-0157 Level 4 Incident Investigation, if required after consideration of the Level 5 Incident Investigation.</p> <p>The Site Manager / Team Leader is to prepare / collate / direct all medical reports, forms and associated documentation to the Regional/Divisional Safety and Systems Manager and to the Injury Management Centre.</p>
	Statutory notification	<p>Line Managers are to notify the relevant regulatory bodies of any incident that may require notification. See SMS-17-SR-0099 Incident Reporting and Notification for details of Notifiable Occurrences.</p> <p>RailCorp has its own electrical distribution network and is to report serious electrical accidents involving the network to the Department of Water and Energy. A serious electrical accident is one where a person:</p> <ul style="list-style-type: none"> • dies, or • suffers permanent disability, or • is hospitalised, or • receives treatment from a health care professional (not including observation only) or • is unable to return to work after a medical check. <p>RailCorp is to notify WorkCover about an electric shock that involves a risk of serious injury to a person.</p>

Additional controls