










Safe Work Instruction	Issue date: 23/11/09
<b>Auxiliary Equipment System (07): Safe Working</b>	Review date: 31/01/11

<b>Document no.</b> SMS-06-SW-1250	<b>Work description</b> <p>This SWI describes safe work practices related to the maintenance of components within the train auxiliary equipment system</p>		
	<b>Scope</b> <p>This SWI describes the hazards and controls for work by RSD staff on Rollingstock train auxiliary equipment</p> <p>This document does not replace technical 'how to' documents such as Engineering Instructions, Manufacturers' instructions etc</p> <p>In addition to the inclusions of this document, any electrical work is to be carried out in accordance with <a href="#">SMS-06-GD-0268 Working Around Electrical Equipment</a></p> <p>To minimise the risk of falls, all work on auxiliary equipment is to be carried out from an authorised fixed or mobile work platform. If this is not possible, additional controls, in accordance <a href="#">SMS-06-GD-0240 Working At Heights</a>, will be required. These controls are to be determined through risk assessment carried out in accordance with <a href="#">SMS-06-PR-0104 Workplace Risk Management</a>.</p>		
<b>Review date</b> 31/01/11	<b>References</b> <ul style="list-style-type: none"> <li>• OHS Act 2000</li> <li>• Rail Safety Act 2008</li> <li>• OHS Regulations 2001(Clause 64, 80, 81, 207 &amp; 208)</li> <li>• Code of Practice Low Voltage Electrical Work</li> <li>• AS 61010.1-2003 Safety requirements for electrical equipment for measurement, control &amp; laboratory use</li> <li>• HB 187-2006 Guide to Selecting a Safe Multimeter</li> <li>• <a href="#">SMS-12-OI-0886 Red Flagging Trains in stabling yards, depots and Maintenance Centres</a></li> <li>• <a href="#">SMS-06-SW-0836 Isolating 1500V DC OH using an Annett Key</a></li> <li>• <a href="#">SMS-06-SW-1133 Guard's Emergency Cock Lock-Out</a></li> <li>• <a href="#">SMS-06-SW-0838 Pantograph Raising and Lowering</a></li> <li>• <a href="#">SMS-06-SW-0264 Portable Ladders, Stepladders and Step Platforms</a></li> <li>• <a href="#">SMS-06-GD-0268 Working Around Electrical Equipment</a></li> <li>• <a href="#">SMS-06-SW-0538 PPE for Electrical Work</a></li> <li>• <a href="#">SMS-06-SW-0269 Electric Shock Protocol</a></li> <li>• <a href="#">SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out</a></li> <li>• <a href="#">SMS-06-SW-0405 Handling Sharps</a></li> <li>• <a href="#">SMS-06-GD-0240 Working At Heights</a></li> <li>• <a href="#">SMS-06-PR-0104 Workplace Risk Management</a></li> <li>• <a href="#">SMS-06-GD-0001 Guide to Manual Handling</a></li> <li>• <a href="#">SMS-06-SW-0487 Entering Trains from Ballast</a></li> <li>• <a href="#">SMS-06-SW-0488 Climbing out of Trains onto Ballast</a></li> <li>• <a href="#">SMS-06-SW-1130 Electrical Isolation Diesel Fleet</a></li> <li>• <a href="#">SMS-06-SW-1162 Portable Work Platform</a></li> </ul>		
<b>Responsible supervisor</b>	<b>PPE and precautions</b>	<b>Competencies or qualifications</b>	<b>Licences or permits required</b>
Line Manager	<ul style="list-style-type: none"> <li>• High visibility vest or clothing</li> <li>• Safety Footwear</li> <li>• Safety Eyewear</li> </ul>	<ul style="list-style-type: none"> <li>• Rail Industry Safety Induction (RISI)</li> <li>• Site specific induction</li> <li>• Electrical Safety Awareness</li> <li>• Electrical Trade Certificate, as required</li> <li>• Manual Handling Training</li> </ul>	

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<b>Tools and equipment required</b>	
<ul style="list-style-type: none"> <li>• Red Flag</li> <li>• Personal Locks, Multi-locks (Hasps) and/or Danger tags, as required</li> <li>• Power tools as required</li> <li>• Hand tools</li> </ul>	
<b>IF CONTROL MEASURES ARE NOT SUITABLE AND MAJOR CHANGES ARE NEEDED, CONDUCT A RISK ASSESSMENT IN CONSULTATION AND DEVELOP NEW CONTROLS ACCORDING TO <a href="#">SMS-06-PR-0104 WORKPLACE RISK MANAGEMENT</a>.</b>	
	<p><b>Warning</b></p> <p>The following warnings apply throughout this SWI:</p> <ul style="list-style-type: none"> <li>• Isolation of relevant circuit, including the placement of a lock and/or tag in accordance with <a href="#">SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out</a>, is required before any work on electrical components commences. Failure to correctly isolate electrical equipment before interacting with it could result in injury or death. Always verify isolation has been achieved before proceeding with work</li> <li>• To prevent falls when working at height ensure you work in accordance with <a href="#">SMS-06-SW-0264 Portable Ladders, Stepladders and Step Platforms</a></li> <li>• Working with power tools can be hazardous. Where possible use non-powered or battery operated tools. If power tools are required, always work in accordance with the relevant SWI</li> <li>• Always remove all metal wrist, hand and neck jewellery and chains to prevent them becoming conductors should they come in contact with a live piece of equipment which could result in serious injury or death</li> </ul>
<b>Competency</b>	<p>Staff are to be trained and supervised to ensure they:</p> <ul style="list-style-type: none"> <li>• Transport required parts, tools and equipment to and from the work area using manual aids (such as bags) so as to minimise the risk of manual handling injuries</li> <li>• Carry out the tasks in accordance with technical documents (eg. EIs)</li> <li>• Implement necessary controls, in accordance with this document</li> <li>• Work with Line Manager to identify any additional hazards and implement controls in accordance with relevant SWIs and other SMS components</li> </ul>
<b>Place Red Flag</b>	To notify persons that work on auxiliary equipment systems is being carried out on the train you must place a Red Flag in accordance with <a href="#">SMS-12-OI-0886 Red Flagging Trains in stabling yards, depots and Maintenance Centres</a>
<b>Pre Work observation only</b>	<p>Once your Red Flag is in place, inspect the relevant component(s) to determine the work required</p> <p>Identify the relevant tools, equipment and parts that will be required</p> <p>Identify any other relevant SWIs (eg. SWIs for relevant tools) that will document hazards and their controls</p> <p>Collect identified items from the store and transport to the location using manual handling aids (eg. bags, trolleys, or Electric powered maintenance vehicles)</p> <p>Where possible, climb in and out of the cars from platforms. If it is necessary to access from floor level or ballast always do so in accordance with <a href="#">SMS-06-SW-1162 Portable Work Platform</a>, <a href="#">SMS-06-SW-0264 Portable Ladders, Stepladders and Step Platforms</a>, or <a href="#">SMS-06-SW-0487 Entering Trains from Ballast</a> and <a href="#">SMS-06-SW-0488 Climbing out of Trains onto Ballast</a></p>
	<p><b>Note</b></p> <p>Should testing/fault finding on live electrical equipment and or wiring be required, this is only to be carried out:</p> <ul style="list-style-type: none"> <li>• By qualified electricians or apprentices under their direct supervision, when:</li> <li>• Competent in the requirements of electrical shock protocol in accordance with <a href="#">SMS-06-SW-0269 Electric Shock Protocol</a></li> <li>• Wearing all the PPE for electrical work in accordance with <a href="#">SMS-06-SW-0538 PPE for Electrical Work</a></li> <li>• Using approved electrical test equipment (e.g. a multimeter that complies with AS 61010.1-2003)</li> </ul>

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<b>Isolation – Electrical Energy</b>	<p>Before commencing any work on electrical components, isolation is required to protect from injury or death. The isolation required may vary, depending upon the work, and should be determined in conjunction with relevant technical documents and, if in doubt, in conjunction with the Line Manager</p> <p>However, to protect from electrical energy within the auxiliary equipment system</p> <ul style="list-style-type: none"> <li>Access the auxiliary equipment system Control Panel</li> <li>Isolate electrically by switching the electrical switch and circuit breaker</li> <li>Apply personal locks, multi-locks and/or tags to all isolations, in accordance with <u>SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out</u></li> </ul>	
	<p><b>Note</b></p> <p>If due to its design, it is currently not possible to apply a lock or tag to a switch or circuit breaker:</p> <ul style="list-style-type: none"> <li>Isolate the circuit</li> <li>Lock or seal (using tape) the Control Panel</li> <li>Attach a Danger Tag to the Control Panel door</li> </ul>	
	<p><b>Warning</b></p> <ul style="list-style-type: none"> <li><i>Auxiliary systems on S&amp;L Sets, Double Deck &amp; Tangara's have multiple 120V &amp; 240V power sources. Failure to correctly isolate all energy sources could result in serious injury or death. Always verify that isolation has been achieved and, if in doubt, seek assistance from your Line Manager</i></li> </ul>	
<b>Isolation – Train Movement</b>	<p>To protect from the movement of Electric Trains whenever possible</p> <ul style="list-style-type: none"> <li>Lower the pantograph(s), in accordance with <u>SMS-06-SW-0838 Pantograph Raising and Lowering</u>, and</li> <li>Isolate the road, in accordance with <u>SMS-06-SW-0836 Isolating 1500V DC OH Using an Annett Key</u>, and</li> <li>Isolate the guard's emergency cock, in accordance with <u>SMS-06-SW-1133 Guard's Emergency Cock Lock-Out</u></li> </ul>	
	<p>To protect from the movement of Diesel Trains in addition to the red flag always:</p> <ul style="list-style-type: none"> <li>Shut down the engine and apply the park brake fully</li> <li>Apply local road isolation (e.g. lock the boom gate, position the stop board and position chocks)</li> </ul>	
<b>Check</b>	Visually inspect that the pantograph(s) has been lowered from the overhead power supply	
	<p><b>Warning</b></p> <p><i>Ensure all pantographs are lowered in accordance with <u>SMS-06-SW-0838 Pantograph Raising and Lowering</u>. <b>Visually check</b> that the pantographs are lowered. Do not simply rely on the pantograph air pressure gauge, this will not guarantee that the pantographs are lowered. Failure to confirm that pantographs are lowered correctly may lead to serious <b>INJURY</b> or <b>DEATH</b>.</i></p>	
	<p><b>Warning</b></p> <p>Always carry out a test to verify isolation has been achieved</p>	
<b>Carry Out Auxiliary System Work</b>	Once isolation and other relevant controls have been put in place, carry out the auxiliary equipment work	
	<p><b>Warning</b></p> <p>Some auxiliary equipment work has unique hazards. These include...</p>	
<i>Removing &amp; Replacing windscreen wiper consumables</i>	<ul style="list-style-type: none"> <li>Ensure isolation has been achieved to avoid any unexpected train movement</li> <li>Ensure all work is carried out from the protection of a fixed or portable work platform. <u>Always work in accordance with SMS-06-SW-0264 Portable Ladders, Stepladders and Step Platforms</u> when work at heights is carried out.</li> </ul>	
<i>Removing &amp; Replacing windscreen wiper &amp; washer electrical components</i>	<ul style="list-style-type: none"> <li>As above</li> <li>Verify and test isolation has been achieved to avoid electric shock from any live components. (see page 2)</li> </ul>	

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Removing & Replacing air horn components	<ul style="list-style-type: none"><li>Ensure all work is carried out from the protection of a fixed or portable work platform. <u>Always work in accordance with SMS-06-SW-0264 Portable Ladders, Stepladders and Step Platforms</u> when work at heights is carried out.</li><li>Ensure isolation has been achieved to avoid any unexpected train movement</li><li>Verify and test isolation has been achieved to avoid electric shock from any live components. (see page 2)</li><li>Ensure horn pneumatics are isolated to avoid any loud blasts of air.</li></ul>	
	<b>Note</b> <ul style="list-style-type: none"><li>Always carry out work in accordance with relevant technical documents (eg. EIs)</li></ul>	
Reinstate the electrical circuit	Before reinstating power always check for Red Flags and that equipment is safe to reinstate Look for and inform other personnel that may be affected by reinstating the circuit	
	<b>Warning</b> <ul style="list-style-type: none"><li><i>Only remove your own isolation. The removal of another persons lock and / or tag may result in their injury or death. Offenders will be subject to strict disciplinary action and may be subject to prosecution by the regulator</i></li></ul>	
Function Test	Ensure correct installation of replaced components by function testing	
Clean and Exit	Dispose of any removed components Remove Red Flag in accordance with <u>SMS-12-OI-0886 Red Flagging Trains in Stabling Yards, Depots and Maintenance Centres</u> Notify the Line Manager (supervisor or foreman) of completion, as required	
<b>Additional controls</b> <ul style="list-style-type: none"><li>Other controls may be necessary, depending upon the work being carried out. Refer to relevant SWIs</li><li>If you identify additional hazards and / or controls relevant to this SWI, notify your Safety Facilitator or Line Manager as soon as practicable, so they can be noted and used to continuously improve this document</li></ul>		