












Safe Work Instruction	Issue date: 22/12/09
Train Water System (15): Safe Working	Review date: 15/03/11

Document no.	Work description		
SMS-06-SW-1257	This document describes safe work practices related to the maintenance of components within the Train Water System		
	Scope This document describes the hazards and controls for work by RSD staff on Rollingstock Water Systems This document does not replace technical 'how to' documents such as Engineering Instructions, Manufacturers' instructions etc		
Review date	References		
15/03/11	<ul style="list-style-type: none"> • OHS Act 2000 • OHS Regulations 2001 • Rail Safety Act 2008 • Code of Practice Low Voltage Electrical Work • AS 61010.1-2003 Safety requirements for electrical equipment for measurement, control & laboratory use • HB 187-2006 Guide to Selecting a Safe Multimeter • SMS-12-OI-0886 Red Flagging Trains in stabling yards, depots and Maintenance Centres • SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out • SMS-06-GD-0001 Guide to Manual Handling • SMS-06-SW-0274 Electrical Equipment Selection Inspection Testing • SMS-06-SW-0538 PPE for Electrical Work • SMS-06-SW-0269 Electric Shock Protocol • SMS-06-GD-0268 Working Around Electrical Equipment • SMS-06-SW-0836 Isolating 1500V DC OH using an Annett Key • SMS-06-SW-1133 Guard's Emergency Cock Lock-Out • SMS-06-SW-0838 Pantograph Raising and Lowering • SMS-06-SW-0487 Entering Trains from Ballast • SMS-06-SW-0488 Climbing out of Trains onto Ballast • SMS-06-SW-0405 Handling Sharps • SMS-06-SW-1130 Electrical Isolation Diesel Fleet • SMS-06-SW-1247 Train Lifting Jacks - Safe Operation • SMS-06-PR-0104 Workplace Risk Management. 		
Responsible supervisor	PPE and precautions	Competencies or qualifications	Licences or permits required
Line Manager	<ul style="list-style-type: none"> • High visibility vest or clothing • Safety footwear • Safety eye protection, as required • Protective gloves, as required 	<ul style="list-style-type: none"> • Rail Industry Safety Induction (RISI) • Site specific induction • Electrical Safety Awareness • Competent in the use of this SWI • Competent in the use of relevant technical documents (eg. EIs) • Trade Qualification as Required • Manual Handling Training 	<ul style="list-style-type: none"> • Plumbing Licence as required
Tools and equipment required			
<ul style="list-style-type: none"> • Red Flag • Personal Locks, Multi-locks and/or Danger tags, as required • Powered tools, as required • Hand tools 			
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.			

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	<p>Note</p> <p>Pre work brief and task risk assessment</p> <p>Ensure a pre-work brief and detailed task risk assessment is undertaken with all team members involved in the work activity. If any new/additional team members arrive any time later they must be briefed before they commence work.</p>
	<p>Warning</p> <p>The following warnings apply throughout this SWI:</p> <ul style="list-style-type: none"> Working with powered tools can be hazardous. Where possible use non-powered or battery operated tools. If powered tools are required, always work in accordance with the relevant SWI or manufacturer's instruction, if no SWI available Work on various components within this system may result in exposure to biological hazards. Always wash hands after water systems work, particularly before eating, drinking, smoking or moving onto clean water work Components of the Water System are fed by electricity and/or pneumatics. Both energy sources are hazardous. Failure to isolate before working on this equipment could result in serious injury or death always work in accordance with above referenced SWI's Slip hazards. Falls, even on the same level, can result in serious injury. Ensure any spills are cleaned up immediately Manual handling, including in a tight work space. Make use of manual handling aids (eg. trolleys), wherever possible. Additionally seek assistance, as required, and ensure correct manual handling techniques, in accordance with training, are maintained throughout the task refer to: <u>SMS-06-GD-0001 Guide to Manual Handling</u>
	<p>Note</p> <p>In many water system tasks, it will be necessary to turn off the water supply and bleed water</p>
Competency	<p>Staff are to be trained and supervised to ensure they:</p> <ul style="list-style-type: none"> Transport required parts, tools and equipment to and from the work area using manual aids (such as trolleys, electrical maintenance vehicle etc) so as to minimise the risk of manual handling injuries Carry out the tasks in accordance with technical documents (eg. EIs, manufacturer's instructions) Implement necessary controls, in accordance with this document Work with Line Manager to identify any additional hazards and implement controls in accordance with relevant SWIs and other SMS components
Place Red Flag	<p>To notify persons that work is being carried out on the train you must place your Red Flag in accordance with <u>SMS-12-OI-0886 Red Flagging Trains in stabling yards, depots and Maintenance Centres</u></p>
Isolation:- Train Movement	<p>To protect from the movement of Electric Trains always</p> <ul style="list-style-type: none"> Lower the pantograph(s), in accordance with <u>SMS-06-SW-0838 Pantograph Raising and Lowering</u> and / or Isolate the road, in accordance with <u>SMS-06-SW-0836 Isolating 1500V DC OH using an Annett Key</u> and / or Isolate the guard's emergency cock, in accordance with <u>SMS-06-SW-1133 Guard's Emergency Cock Lock-Out</u> <p>To protect from the movement of Diesel Trains always:</p> <ul style="list-style-type: none"> Shut down the engine and apply the park brake fully Apply local road isolation, refer to: <u>SMS-06-SW-1130 Electrical Isolation Diesel Fleet</u> (e.g. lock the boom gate, position the stop board and position chocks)
Check	<p>Visually inspect that the pantograph(s) has been lowered from the overhead power supply</p>
	<p>Warning</p> <p>Ensure all pantographs are lowered in accordance with <u>SMS-06-SW-0838 Pantograph Raising and Lowering</u>. Visually check 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 INJURY or DEATH.</p>
Investigate Work Required	<p>Inspect the relevant equipment to determine the work required</p> <p>Identify any other relevant SWIs (eg. SWIs for relevant tools) that will document hazards and their controls</p> <p>Identify the relevant tools, equipment and parts that will be required</p> <p>Collect identified items from the store and transport to the location using manual handling aids (eg. trolleys)</p> <p>Where possible, climb in and out of the cars from platforms. If it is necessary to access from ballast always do so in accordance with <u>SMS-06-SW-0487 Entering Trains from Ballast</u> and <u>SMS-06-SW-0488 Climbing</u></p>

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	out of Trains onto Ballast	
	<p>Note</p> <p>Should testing/fault finding on live electrical equipment and or wiring be required, this is only to be carried out by qualified electricians or apprentices under their direct supervision, when:</p> <p>Competent in the requirements of electrical shock protocol in accordance with SMS-06-SW-0269 Electric Shock Protocol</p> <ul style="list-style-type: none"> Wearing all the PPE for electrical work in accordance with SMS-06-SW-0538 PPE for Electrical Work Using approved electrical test equipment (e.g. a multimeter that complies with AS 61010.1-2003) and refer to: HB 187-2006 guide to selecting a multimeter, also refer to: SMS-06-SW-0274 Electrical Equipment Selection Inspection Testing and SMS-06-GD-0268 Working Around Electrical Equipment 	
Isolation – Electrical Energy	<p>Before commencing any work on water system 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, electric powered components must be isolated as follows:</p> <ul style="list-style-type: none"> Access the equipment Control Cabinet and isolate electrically by switching the electrical switch and circuit breaker and Apply personal locks, multi-locks and/or tags to all isolations, in accordance with SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out and refer to: SMS-06-GD-0268 Working Around Electrical Equipment 	
	<p>Note</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"> Isolate the circuit Lock or seal (using tape) the Control Panel Attach a Danger Tag to the Control Panel door 	
Isolation – Pneumatic Energy	<p>All pneumatic powered components must be isolated as follows</p> <ul style="list-style-type: none"> Turn off the pneumatic gate valve Apply personal locks, multi-locks and/or tags to all isolations, in accordance with SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out 	
	<p>Warning</p> <ul style="list-style-type: none"> <i>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> 	
Carry Out Water System Work	<p>Once isolation and other relevant controls have been put in place, carry out the required work</p>	
	<p>Warning</p> <p>Water System work may expose persons to biological hazards in water. There are numerous controls in place to reduce the risk associated with this hazard. These include...</p> <ul style="list-style-type: none"> <i>Employees whose role is likely to expose them to effluent are to receive a Hepatitis B vaccination</i> <i>When working with contaminated water, rubber gloves and safety eye goggles or face shield are mandatory PPE</i> <i>Tasks involving contaminated water are not to be performed by those who have open wounds or skin abrasions</i> <i>If any skin is abraded or cut during these tasks, the wound should be immediately disinfected and the injured party provided medical attention</i> <i>If splashed in the eye or mouth with effluent, the affected area should be immediately washed out with clean water and the affected party provided with medical attention</i> <i>When work is complete, wash hands thoroughly</i> 	
	<p>Warning</p> <p>Some Water System work has unique hazards. These include:</p>	
Toilet Pan Removal & Replacement	<ul style="list-style-type: none"> Electric and pneumatic energies within toilet systems. Ensure all energy sources are isolated before work commences Practice safe manual handling techniques, refer to: SMS-06-GD-0001 Guide to Manual Handling Maintain personal hygiene Needle stick injury from syringes hidden in and around the toilet. Always wear protective gloves and work in accordance with SMS-06-SW-0405 Handling Sharps 	

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<i>Water & Holdover Tank Removal & Replacement</i>	<ul style="list-style-type: none"> Electric energy to the tanks. Ensure isolation is carried out before work commences Jack related hazards when removing some water tanks requires the jacking of the carriage. Always work in accordance with SMS-06-SW-1247 Train Lifting Jacks – Safe Operation Sharp edges on mounting equipment. Ensure protective gloves are worn during this task Manual handling hazards. Ensure the tank has been decanted to reduce its weight. Where possible use manual handling aids and/or seek assistance as required, and ensure correct manual handling techniques, in accordance with training, are maintained throughout the task. SMS-06-GD-0001 Guide to Manual Handling Exposure to dust. Wear eye and respiratory protection 	
<i>Water Filter Removal & Replacement</i>	<ul style="list-style-type: none"> Jacking hazards, when the removal of some water filters requires the jacking of the carriage. Always work in accordance with SMS-06-SW-1247 Train Lifting Jacks – Safe Operation Practice safe manual handling techniques, refer to: SMS-06-GD-0001 Guide to Manual Handling Biological hazards, when removing used filters. Always wear gloves when handling 	
<i>Water Chiller Removal & Replacement</i>	<ul style="list-style-type: none"> Electric energy to the Chiller. Ensure isolation is carried out before work commences Injuries such as burns to eyes and frostbite from contact with refrigerant gas. Wear eye protection and protective gloves when undertaking any air conditioning work, even if gas has been removed 	
	Note <ul style="list-style-type: none"> Always carry out work in accordance with relevant Engineering, Operational and Manufacturer's instructions 	
Clean Up	<p>Once work is complete, clean up any remaining spills and remove tools, equipment & parts and dispose of rubbish in waste disposal containers / bins</p> <p>Remove any contaminated clothing and wash hands thoroughly</p>	
Remove Isolation	<p>Once area is safe, remove all previously applied isolations, in accordance with the referenced SWI</p>	
	Warning <ul style="list-style-type: none"> <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> 	
Remove Red Flag	<p>Remove your Red Flag, in accordance with SMS-12-OI-0886 Red Flagging Trains in Stabling Yards, Depots and Maintenance Centres</p>	
Notify	<p>Notify Line Manager (supervisor or foreman) of completion, as required</p>	

Additional controls	
<ul style="list-style-type: none"> <i>Other controls may be necessary, depending upon the work being carried out. Refer to relevant SWIs</i> <i>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</i> 	