

Isolating 1500v DC OH using a Supplementary Lock

Document No. SMS-06-SW-0837	Work description This SWI describes the safe work practices for Isolating 1500 Volt DC Overhead Wiring supply in Maintenance Centres using the Supplementary Lock System.		
	Scope This SWI applies to the isolation of the 1500 Volt DC Overhead Wiring supply using a Supplementary Lock in all Rollingstock Maintenance Centres		
Review date 20/10/10	References <ul style="list-style-type: none"> • NSW OHS Act 2000 • NSW OHS Regulation 2001, Part 5.4 • Rail Safety Act 2008 • AS4024.1 Safeguarding of machinery • SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out • SMS-06-SW-0836 Isolating 1500V DC OH using an Annett Key • SMS-06-SW-0838 Pantograph Raising and Lowering • SMS-12-OI-886 Red Flagging Trains in stabling yards, depots and Maintenance Centres <p>Supersedes SIN 2203 and 2204</p>		
Responsible supervisor Line Manager	PPE and precautions <ul style="list-style-type: none"> • High visibility clothing or vest • Safety Footwear 	Competencies or qualifications <ul style="list-style-type: none"> • Electrical Safety Awareness • Course code ER39 Road Isolation to level A 'AR' or level B 'BR' • RISI 	Licences or permits required
Tools and equipment required Supplementary Lock System Stop Boards Points Clip and Lock as 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.			
 Warning <ul style="list-style-type: none"> • Failure to comply fully with the steps in this Safe Work Instruction could lead to serious injury or death 			
Introduction	<p>The Supplementary Lock System is a system of locks and keys that ensures that the 1500 Volt DC Overhead Wiring supply is isolated (cut out) while employees are working on the road or in the pit and does not allow the power to be reinstated (cut back in) until all employees have removed their locks</p> <p>The system is fitted to roads in the Maintenance Centre where only a few people work at the same time (e.g. stabling roads). It is to be used by both staff and contractors</p> <p>This system ensures that electrical power is removed to prevent unauthorised train movements and allow maintenance work to be carried out when the road is isolated</p> <p>A person must be accredited in Course code ER39 Road Isolation, to level 'A' in Road Isolation (endorsed as 'AR' on the certificate) or level 'B' in Road Isolation (endorsed as 'BR' on the certificate) to operate the Supplementary Lock System and Road Isolating Switch</p>		
		 <div style="display: flex; justify-content: space-around; align-items: center;"> Anchor Pin Road Isolating Switch RIS Handle </div> <p>Figure 1 – Road Isolating Switch</p>	

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	<p>Note</p> <p>Staff are not to leave the maintenance centre with:</p> <ul style="list-style-type: none"> • an Annett Token System key, or • Supplementary Lock key, or • A Road Isolating Switch (RIS) key
	<p>Warning</p> <ul style="list-style-type: none"> • To prevent an incident or serious injury, Supplementary Locks and keys are issued to the Maintenance Centre by the Regional Electrical Engineer. They are to be kept in the Operations Planner's office on a shadow board locked with a Road Isolating Switch (RIS) lock.
Responsibilities	<p>The Operations Planner is to:</p> <ul style="list-style-type: none"> • Make sure that supplementary lock and keys are correctly issued to employees • Record the issuing and return in the Operations Planner's logbook • Before starting duty, check that supplementary locks are being used as per the entries in the Operations Planner's log book • Before finishing duty, enter full details of roads still isolated by the use of supplementary locks in the Operations Planner's log book to inform the next Operations Planner on duty • Report any road with a defective isolating switch or any defective high-level access gate lock to the approved repairer • Make sure that no train movements take place on a road where employees are working on cars, and instruct shunters accordingly • Determine if it is necessary to clip/lock the points on some roads, to prevent another train being driven from a live road to the isolated road and inadvertently energising the 1500 Volt Overhead Wiring. This could result in a serious electric shock or death • Ensure that stop boards or similar are in position, as required • Make sure that all relevant employees and qualified contractors have received an employee briefing in the use of the Supplementary Lock System
Issuing locks and keys	<p>The Operations Planner is to issue a supplementary lock and key to the protection officer working on the road</p>
	<p>Note</p> <p>So that it is possible to identify who has a specific lock or key if it goes missing; record the Name, Lock and Key number in the Operations Planner's hand over book</p>
Isolating an Area	<p>To isolate the area the 'AR' / 'BR' Road Isolation accredited person is to:</p> <ol style="list-style-type: none"> 1. Make an announcement over the Public Announcement (PA) system to notify staff which area is about to be isolated (cut out), except when local noise restrictions prohibit this. Then look for and inform other personnel that may be affected by the isolation 2. Ensure all pantographs are lowered and isolated on all cars in that area, by undertaking a visual inspection in accordance with SMS-06-SW-0838 Pantograph Raising and Lowering
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 SMS-06-SW-0838 Pantograph Raising and Lowering. 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>

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3.	Stand on the metal base plate in front of the structure supporting the road-isolating switch to protect you from electric shock. Refer to Figure 2 – Metal Base Plate	
	Warning <ul style="list-style-type: none">Failure to stand on the metal base plate may result in electric shock if the Road Isolating Switch's handle potential rises above earth	
4.	Unlock the RIS (Road Isolation Switch) lock, then remove the anchor pin and place it in the hole in the switch. Isolate the area by pushing the RIS handle down into the "To Rail" position handle to lock the handle in the horizontal position. Refer to Figure 6 – Anchor Pin	
	Warning <ul style="list-style-type: none">Do not look up at the blade (in case of arcing) whenever moving the Road Isolation Switch (RIS) handle as this could lead to a serious eye injury	
5.	Check that the switch handle for the area isolated is fully in the "To Rail" position	
6.	Check that the knife switch blade at the top of the switch has moved into the open position to isolate the area, Refer to Figure 4 - Knife Switch Blade in Cut Out Position	
	Note At Hornsby the isolation switch on 15b Road isolates both 15 and 16 Roads	
7.	Use the RIS lock to lock the road isolating switch in the "To Rail" position	
8.	Place a "Stop" board / lower boom gate between the rails on top of the road in front of isolation point at Sydney end and clip/lock the points if required	

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	<p>Warning</p> <ul style="list-style-type: none"> Cars must not be moved in or out of a road while it is isolated as this could result in the 1500V Overhead Wiring being inadvertently energised. This could result in a serious electric shock or death
Working under a Supplementary Lock System	<p>The person who has been issued with the supplementary lock and key is to:</p> <ul style="list-style-type: none"> Check that the road isolating switch for the road they are working on is fully in the "To Rail" position Use the key to lock the supplementary lock into one of the spare holes in the switch handle Keep their supplementary key until they have finished their work
	<p>Warning</p> <ul style="list-style-type: none"> <i>Do not use ordinary locks if supplementary locks are not available. Contact your Line Manager for assistance</i>

Reinstating Power to the Area	When the work is complete and the protection is no longer necessary, the person who has been issued with the supplementary lock and key is to:
1.	Use their key to unlock and remove the supplementary lock from the switch handle
2.	Return the supplementary lock and key to the Operations Planner
	<p>Warning</p> <ul style="list-style-type: none"> <i>To prevent a breakdown in the 1500 Volt DC Overhead Wiring isolation system procedure, do not use ordinary locks if supplementary locks are not available. Contact your Line Manager for assistance</i>
	The 'AR' or 'BR' Road Isolation accredited person is then to:
3.	Replace each supplementary lock and key on the shadow board when it is returned
4.	Unlock and remove the RIS lock when all supplementary locks and keys have been returned
5.	Ensure all pantographs are lowered and isolated on all cars in that area, by undertaking a visual inspection in accordance with SMS-06-SW-0838 Pantograph Raising and Lowering
	<p>Warning</p> <ul style="list-style-type: none"> <i>Failure to confirm that all pantographs are lowered correctly, by undertaking a visual inspection could lead to serious injury or death</i>
6.	Check for Red Flags to identify persons that may be affected when the 1500V DC Overhead is reinstated (cut back in)
7.	Make an announcement over the Public Announcement (PA) system to notify staff which area is about to be reinstated (cut back in). On the running side make an announcement over the PA. When local noise restrictions prohibit this, look for and inform personnel that may be affected by reinstating power to the area
8.	Stand on the metal base plate in front of the structure supporting the road-isolating switch to protect you from electric shock. Refer to Figure 2 – Metal Base Plate
	<p>Warning</p> <ul style="list-style-type: none"> <i>Failure to stand on the metal base plate may result in electric shock if the Road Isolating Switch's handle potential rises above earth</i>
9.	Remove the anchor pin from the switch handle, and then place it into a hole in the handle so that handle can be pulled to the "Close" position
	<p>Warning</p> <ul style="list-style-type: none"> <i>Do not look up at the blade (in case of arcing) whenever moving the Road Isolation Switch (RIS) handle as this could lead to a serious eye injury</i>

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10.	Check that the knife switch blade for the road that has just been reinstated (cut back in) is fully in the "Close" position. Refer to Figure 5 – Knife Switch Blade in Cut In Position	
11.	To ensure that the road cannot be accidentally isolated, remove the anchor pin from the switch handle and use it to lock the road isolating switch using the RIS lock	
12.	Remove the "Stop" board / open boom gate and any points clip/lock that may be fitted	

Lost or broken keys	In the event of a lost or broken key:
1.	The employee with the lost or broken supplementary key is to immediately report the loss or damage to the Operations Planner
2.	The Operations Planner is to make sure that the key is really lost or broken
	<p>Note <i>Do not use the lock until you have received a replacement lock or key. The Service Manager must approve the issue of a replacement key or lock</i></p>
3.	Once confirmed, the Operations Planner is to wait for the locksmith to arrive to deliver a replacement lock and key or to cut a duplicate from the emergency key
4.	Once the situation is rectified the Operations Planner is to submit a full report to the Service Manager
Additional controls	
<i>Additional isolation or other controls may be required depending upon the work being undertaken. Refer to relevant SWI</i>	