Commissioning & Conducting Tests on Rolling Stock Fleet

SWMS number:
SMS-06-SW-1299

SWMS Name:
Commissioning & Conducting Tests on Rolling Stock Fleet

SWMS Team:
Developed using material previously produced by Epping Chatswood Rail Line (ECRL) SWMS Team Engineers: Mark Rieper, Ian Ying, Lee Murray, David Parkinson

Custodian (Position):
Manager Services and Support Rollingstock Division (RSD)

Assumptions:

Except where noted, all installation of test equipment is performed at an RSD Maintenance Centre in a controlled work environment with access to referenced controls.

All work is carried out by competent persons to whom have the expertise required to perform the task of installation of test equipment.

Approving Authority (Position):
GM Safety and Environment

Applicable Standards, Codes of Practice and guidance:

- Occupational Health and Safety (OHS) Act 2000
- Occupational Health and Safety (OHS) Regulation 2001
- NSW Rail Safety Act 2008
- NSW Rail Safety (General) Regulation 2008
- ASCC National Standard for Manual Tasks 2007
- National Code of Practice for the Prevention of musculoskeletal disorders caused form performing manual tasks

Plant/Equipment/Tools:

- Red Flag
- Appropriate trade tools
- Mobile steps
- Torch
- Non-conductive ladder
- Trolley
- Trip stop(s)
- Brake position marker(s)
- Tools of trade as required
- Residual Current Device (RSD) or Earth Leakage Device (ELD) test before use
- Wheel chocks
- Lock-Out Tag-Out Device
- Wheel Chocks
- Lock-Out Tag-Out Device (LOTO)

Records/Reporting:
Engineering Reports (refer each Principal Engineer)

Permits/licences required:
Track possession authority or equivalent, if required

Content reviewed by Technical expert (SME) and RailCorp safety professional (position including Div/Group)

Initial assessment by:

Peter Gaul – A/Safety Manager RSD
Kelly Bickham – A/Safety Facilitator E&P

Reviewed
Suresh Singh (Safety Manager)
Darren Stuart (Safety Project Officer)
Terry O'toole (Safety Facilitator)

PPE required:

- Hard Hat, if conducting tests on a construction site
- Lace up safety footwear
- High Visibility vest or clothing (Orange)
- Harness for working at heights
- Height safety equipment as

- AS 3760 In-service inspection and testing of electrical equipment
- Competent person for testing electrical equipment
- AS 61010.1 Safety of electrical equipment for measurement control and laboratory use
- Train Operators Manual
- Operator Specific Procedures
- NWT300 Planning Work in the Rail Corridor
- NWT308 Control Signal Blocking
- NWT310 No Authority Required

Inspection requirements

- Power leads tested 6 monthly
- Visual inspection of leads for damage before use
- Visual inspection of power and pneumatic tools for damage and operability

Service schedule:

- Technical Maintenance Plan (TMP) Reports (as required)

MIMS or METRE Ref:

Not Applicable

Training/Qualifications required:

- Rail Industry Safety Induction RISI
- Electrical Safety Awareness
- Network RollingStock maintenance (NRM)
- OHS Construction Induction (Green Card) if conducting tests on a Construction Site
- Relevant tunnel induction, as required
- Departing station Induction, as required
- Site specific induction
- Manual handling training
- All persons to be briefed in relation to SWIs referenced
- Relevant trade qualifications
- Height safety training
- Trade qualified as required
- Site Road Isolation training as required
- Site Power Testing training as required

required

- Appropriate safety eyewear for power tool use
- Bump hat when working under train
- Appropriate protective gloves as required
- Appropriate hearing protection for power tool use
- Appropriate respirator/filter
- Face Shield (as Required)
- Long sleeve shirt or overalls

Number	Step	Hazard or human error (Safety/Environmental hazards identified, including physical environment, human errors, plant and equipment)	Risk ranking before controls	Control (to be Implemented to eliminate or reduce the risk to the lowest practicable level)	Risk ranking after controls	Responsibility	Job step to be completed In accordance with (name associated documentation)
	General Hazards These Hazards and Controls apply throughout this SWMS	Runaway vehicle (e.g. Overhead installation vehicles, trolleys etc) collides with vehicle being tested or technician (pedestrian)	C4, F3 = B-	• Physical protection (hard controls) (such as signalling, point locking etc.) to be provided and agreed to, prior to work commencing • Protection plan for non maintenance centre activities • Pre-work briefs • Supervision • Site speeded restrictions • Trained operators • High visibility vests and clothing	C4, F1 = C-	Principal Engineer	NWT 300

Number	Step	Hazard or human error (Safety/Environmental hazards identified, including physical environment, human errors, plant and equipment)	Risk ranking before controls	Control (to be Implemented to eliminate or reduce the risk to the lowest practicable level)	Risk ranking after controls	Responsibility	Job step to be completed In accordance with (name associated documentation)
		Manual handling of test equipment (e.g. trip stop) to and from train to ground level	C3, F4 = B-	• Reduced distance of lift by using terminal door or lift to platform and then down to 4 ft, with assistance, using a non-conductive ladder as required • Manual handling training • Portable lighting, as required • Pre-work brief • Team lift • Manual handling aids	C3, F3 = C+	Principal Engineer	SMS-06-GD-0001 Guide to Manual Handling SMS-06-SW-0264 Portable Ladders, Stepladders and Step Platforms SMS-06-SW-1134 Trip Stop Device-Safe Operation

Number	Step	Hazard or human error (Safety/Environmental hazards identified, including physical environment, human errors, plant and equipment)	Risk ranking before controls	Control (to be Implemented to eliminate or reduce the risk to the lowest practicable level)	Risk ranking after controls	Responsibility	Job step to be completed In accordance with (name associated documentation)
		Slips trip and falls Scenarios • Climbing in and out of train (wet boots) • In tunnel (low head room) • Greasy floor (maintenance pit) • Trips on track • Trips by leads from monitoring equipment • Strike head on underside of vehicle	C3, F3 = C+	• Entry and Exit using the platform, wherever possible • Entry and Exit using referenced SWIs when platform not available • Use of ladder (non-conductive), as required • Lace up safety footwear • Towels for drying off footwear before entry, as required • Portable lighting, as required • Pit lighting • Pre-entry inspection, in accordance with reference SWI • Portable lighting, as required • Hard hat (construction site) • Two person task • Communication • Experienced users working in accordance with SWI • requirement) • Portable lighting, as required • Pre-work brief • Potable stairs in maintenance centres	C3, F2 = C		SMS-06-SW-0264 Portable Ladders, Stepladders and Step Platforms SMS-06-SW-0487 Entering Trains from Ballast SMS-06-SW-0488 Climbing out of Trains onto Ballast SMS-06-GD-0001 Guide to Manual Handling

Number	Step	Hazard or human error (Safety/Environmental hazards identified, including physical environment, human errors, plant and equipment)	Risk ranking before controls	Control (to be Implemented to eliminate or reduce the risk to the lowest practicable level)	Risk ranking after controls	Responsibility	Job step to be completed In accordance with (name associated documentation)
		Strains and sprains climbing in and out of train	C2, F4 = C+	• Entry and Exit using the platform, wherever possible • Entry and Exit using referenced SWIs when platform not available • Use of ladder (non-conductive), as required • Safety footwear • Portable lighting, as required • Use a firm grip, keep back straight, bend knees and avoid twisting, bending or overreaching • Use manual handling aids such as trolleys • Use team lift • Work in accordance with Manual Handling Training • Pre-work assessment and briefing • Potable stairs in maintenance centres • Protection plan • Speed restrictions	C2, F3 = C-		SMS-06-SW-0264 Portable Ladders, Stepladders and Step Platforms SMS-06-SW-0487 Entering Trains from Ballast SMS-06-SW-0488 Climbing out of Trains onto Ballast

Number	Step	Hazard or human error (Safety/Environmental hazards identified, including physical environment, human errors, plant and equipment)	Risk ranking before controls	Control (to be Implemented to eliminate or reduce the risk to the lowest practicable level)	Risk ranking after controls	Responsibility	Job step to be completed In accordance with (name associated documentation)
		Struck by or contact with moving trains or unexpected train movement	C4. F3 = B -	• Rail Industry Safety Induction RISI • Shunters • Red flag • Protection officer • NWT 308 • NWT 310 • Traffic management plan • Pre –work brief • Supervision • Site Induction • High Visibility Vest • Trained Drivers • Sounding Horns • Medical Standards and Health Assessments • Site Speed Restrictions • Protection Plan Briefing • Route knowledge • Chocks	C4, F1 = C -	Principal Engineer	SMS-12-OI-0886 Red Flagging Trains in stabling yards, depots and Maintenance Centres SMS-06-SW-1133 Guards Emergency Cock Lock-Out NWT 300 NWT 308 NWT 310

Number	Step	Hazard or human error (Safety/Environmental hazards identified, including physical environment, human errors, plant and equipment)	Risk ranking before controls	Control (to be Implemented to eliminate or reduce the risk to the lowest practicable level)	Risk ranking after controls	Responsibility	Job step to be completed In accordance with (name associated documentation)
		Train strikes construction site vehicles	C4, F3 = B+	• NWT 308 • NWT 310 • Protection officer • Perimeter fences • Sounding horns • Route knowledge • Site traffic management plan	C4, F1 = C+	Principal Engineer	
		Strike head on low head room (e.g. when working in a tunnel or examining under train)		• See above “General Hazards”- Slips Trips and Falls			SMS-06-SW-0386 Personal Protective Equipment SMS-06-SW-0812 Working in the Pit

Number	Step	Hazard or human error (Safety/Environmental hazards identified, including physical environment, human errors, plant and equipment)	Risk ranking before controls	Control (to be Implemented to eliminate or reduce the risk to the lowest practicable level)	Risk ranking after controls	Responsibility	Job step to be completed In accordance with (name associated documentation)
		Interaction with live electrical components, low and extra low voltage. Inside, outside, on the roof of train and under the train	C4, F1= C-	• Relevant circuit breaker turned off and tagged out before installing • Low voltage monitoring equipment • Covered terminals • Fitting work undertaken by an electrical tradesperson or electrical engineer • Lowering pantograph • Red flag • Road isolated using Annett Key system • Some protected terminals • Power supply already fitted at maintenance centre • Work carried out in accordance with 'Work on Low Voltage Installations' SWI • Undertake electrical isolation wherever possible • Pre-work brief	C1, F1= D		SMS-06-SW-0269 Electric Shock Protocol SMS-06-SW-0838 Pantograph Raising and Lowering SMS-06-SW-0276 Work on Low Voltage Installations

	Tools & Equipment Hazards These Hazards and Controls apply to the use of power tools such as grinders and drills used to mount testing equipment. 1. Electric Tools	Electric shock from power leads	C3, F 4 = B-	• Testing and Tagging • Pre-use inspection and remove damaged leads • Residual Current Device (RCD) or Earth Leakage Device (ELD) • Use battery drills, when possible • Electric Shock Protocol	C2, F 2 = D	Supervisor and authorised employee	SMS-06-SW-0274 Electrical Equipment Selection Inspection Testing SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out
		Noise	C2, F 4 = C +	• Hearing protection • Pre-work brief • Supervision • Work in accordance with relevant tool SWIs	C2, F 2 = D		SMS-06-SW-0386 Personal Protective Equipment
		Dust	C2, F 3 = C -	• Appropriate eyewear and PPE • Appropriate Respirator/filter • Training in the use of PPE • Supervision • Pre-work brief • Hygiene practice	C2, F 2 = D		

		"Kick Back" – Sudden movement of tool	C3, F 4 = C +	• Competent Operator working in accordance with referenced SWI • Pre-work assessment and briefing • Pre-use inspection • Keep clear of path of moving tool • Check that guard returns correctly • Workable guard and continuous inspection • Supervision	C2, F 2 = D		SMS-06-SW-0474 Angle Grinders SMS-06-SW-0479 Power Drills
		Projectiles	C3, F 3 = C +	• Safety Eyewear • Face shield, for high speed equipment (i.e. Grinders) • Pre-use checks • Competent Operator working in accordance with relevant SWI (see "kick back") • Supervision • Pre-work brief	C2, F 2 = D		SMS-06-SW-0386 Personal Protective Equipment

		Cuts and abrasions from contact with moving tool	C2, F 3 = C -	• Competent Operator working in accordance with relevant tool SWI • Appropriate gloves • Keep clear of cutting tools • Supervision • Pre-work brief • Keep hands clear	C2, F 2 = D		
		Sparks and hot metal generated by tool use. Fire hazard	C2, F 3 = C-	• Competent Operator working in accordance with relevant SWI (see “kick back”) • Long sleeved shirts or overalls • Additional controls as dictated by outcome of Hot Work risk assessment • Appropriate protective Gloves • Appropriate eye protection • Use correct cutting wheels (soft wheels for hard metal, hard wheels for soft metal) • Remove flammable materials within the vicinity of the work being undertaken • Pre-work brief • Supervision • Extinguishers readily available	C2, F 1 = D		SMS-06-PR-0329 Hot work

1	**Performing Brake Tests**						
1.1	Fitting equipment to test vehicle	Manual handling of test equipment (e.g. trip stop) to and from train to ground level		• See “General Hazards” - Manual Handling of Test Equipment		Principal Brake Engineer or Qualified Trades Person.	SMS-06-GD-0001 Guide to Manual Handling
		Interaction with live electrical components, low and extra low voltage. Inside, outside, on the roof of train and under the train		• See “General Hazards” - Interaction with Live Electrical Components			SMS-06-SW-0838 Pantograph Raising and Lowering SMS-06-SW-0836 Isolating 1500V DC OH using an Annett Key SMS-06-SW-0269 Electric Shock Protocol SMS-12-OI-0886 Red Flagging Trains in stabling yards, depots and Maintenance Centres

		Slips trip and falls Scenarios • Climbing in and out of train • In tunnel • Greasy floor (maintenance pit) • Trips on track • Trips by leads from monitoring equipment		• See “General Hazards” - Slips Trips and Falls			SMS-06-SW-0812 Working in the Pit
		Strike head on underside of vehicle		• See above “General Hazards”- Slips Trips and Falls			SMS-06-SW-0812 Working in the Pit
1.2	Access train from relevant departing station	Manual handling of test equipment (e.g. trip stop) to and from train to ground level		• See “General Hazards” - Manual Handling of Test Equipment • Team Lift			SMS-06-GD-0001 Guide to Manual Handling
1.3	Turn off brake test equipment	Nil					
1.4	Travel by train to test area	Struck by or contact with moving trains or unexpected train movement		• See above “General Hazards”		Train Crew & Area Manager	
		Train strikes construction site vehicles		• See “General Hazards” - Train Strikes Construction Site Vehicles •			
1.5	Prepare test point (fitting trip	Manual handling of test		• See “General Hazards” - Manual		Principal Brake	

	stops, placing markers etc)	equipment (e.g. trip stop) to and from train to ground level		Handling of Test Equipment		Engineer Qualified trades Person.	
		Strains and sprains climbing in and out of train		• See “General Hazards” - Strains and Sprains Climbing In and Out of Train			
		Slips trip and falls Scenarios • Climbing in and out of train • In tunnel • Greasy floor (maintenance pit) • Trips on track • Trips by leads from monitoring equipment		• See “General Hazards” - Slips Trips and Falls			
		Strike head on low head room		• See above “General Hazards”- Slips Trips and Falls			
		Struck by or contact with moving trains or unexpected train movement		• See above “General Hazards”			
		Pinch while fitting trip stop	C2, F3 = C-	• Team lift • Communication • Experienced users working in accordance with SWI • Pre-work brief • Appropriate protective gloves	C2, F1 = D		SMS-06-SW-1134 Trip Stop Device – Safe Operation

		Runaway vehicle (e.g. Overhead installation vehicles, trolleys etc) collides with test vehicle or technician		• See “General Hazards” - Run Away Train			
1.6	Start brake tests	Struck by or contact with moving trains or unexpected train movement		• See above “General Hazards”		Protection Officer (if required)	
		Train strikes construction site vehicles		• See “General Hazards” - Train Strikes Construction Site Vehicles •			
		Injury to staff working on the train during brake test (sudden stop)	C2, F3 = C-	• Pre-work briefing in accordance with system requirement • Remain seated during testing • Use of handrails • Use PA system to warn before brake testing	C2, F2 = D		SMS-10-SR-0040 Communication
		Runaway vehicle (e.g. Overhead installation vehicles, trolleys etc) collides with test vehicle or technician		• See “General Hazards” - Run Away Train			
1.7	Confirm remote readings or, as required, adjusting testing	Strains and sprains climbing in and out of train		• See “General Hazards” - Strains and Sprains Climbing In and Out of Train		Principal Brake Engineer	

	equipment	Slips trip and falls Scenarios • Climbing in and out of train • In tunnel • Greasy floor (maintenance pit) • Trips on track • Trips by leads from monitoring equipment		• See “General Hazards” - Slips Trips and Falls		Principal Brake Engineer	
		Strike head (if working in low head room tunnel)		• See above “General Hazards”- Slips Trips and Falls			
		Struck by or contact with moving trains or unexpected train movement		• See above “General Hazards”			
		Trip on track		• See above “General Hazards”- Slips Trips and Falls			
		Strike head on testing train		• See above “General Hazards”- Slips Trips and Falls			
		Burns from touching hot brake components	C2, F3 = C-	• Use of infrared thermometer • Appropriate protective gloves • Work on the brakes when the components have cooled down	C2, F2 = D		

		Interaction with live electrical components, low and extra low voltage. Inside, outside, on the roof of train and under the train		• See “General Hazards” - Interaction with Live Electrical Components			SMS-06-SW-0838 Pantograph Raising and Lowering, SMS-06-SW-0269 Electric Shock Protocol
1.8	Access electrical cabinets, as required	Interaction with live electrical components, low and extra low voltage. Inside, outside, on the roof of train and under the train		• See “General Hazards” – Interaction with Live Electrical Components		Principal Brake Engineer	SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out SMS-06-SW-0269 Electric Shock Protocol SMS-06-SW-0276 Work on Low Voltage Installations
		Slips trip and falls Scenarios • Climbing in and out of train • In tunnel • Greasy floor (maintenance pit) • Trips on track • Trips by leads from monitoring equipment		• See “General Hazards” - Slips Trips and Falls			

1.9	Collect external equipment (trip stops, markers etc)	See Step 1.5		• See Step 1.5		See Step 1.5	
1.10	Turn off test equipment	Nil					
1.11	Travel by train from test area	See Step 1.4		• See Step 1.4		See Step 1.4	
1.12	Exit train to station	See Step 1.2		• See Step 1.2		See Step 1.2	
1.13	Remove test equipment	See Step 1.1		• See Step 1.1		See Step 1.1	

2	**Performing Traction Tests**						
2.1	Fitting equipment to test vehicle	Manual handling of test equipment (e.g. trip stop) to and from train to ground level		• See “General Hazards” - Manual Handling of Test Equipment • Team lift		Principal Brake Engineer	SMS-06-GD-0001 Guide to Manual Handling
		Interaction with live electrical components, low and extra low voltage. Inside, outside, on the roof of train and under the train		• See “General Hazards” - Interaction with Live Electrical Components			SMS-06-SW-0838 Pantograph Raising and Lowering SMS-06-SW-0836 Isolating 1500V DC OH using an Annett Key SMS-06-SW-0269 Electric Shock Protocol SMS-12-OI-0886 Red Flagging Trains in stabling yards, depots and Maintenance Centres

		Slips trip and falls Scenarios • Climbing in and out of train • In tunnel • Greasy floor (maintenance pit) • Trips on track • Trips by leads from monitoring equipment		• See “General Hazards” - Slips Trips and Falls			SMS-06-SW-0812 Working in the Pit
		Strike head on underside of vehicle		• See above “General Hazards”- Slips Trips and Falls		Principal Brake Engineer	SMS-06-SW-0812 Working in the Pit

		Interaction with live electrical components, low and extra low voltage. Inside, outside, on the roof of train and under the train		• See “General Hazards” - Interaction with Live Electrical Components			SMS-06-SW-0838 Pantograph Raising and Lowering SMS-06-SW-0836 Isolating 1500V DC OH using an Annett Key SMS-06-SW-0269 Electric Shock Protocol SMS-12-OI-0886 Red Flagging Trains in stabling yards, depots and Maintenance Centres
		Fall from roof	C3, F4 = B-	• Access via high roads • Guarded edges • Pre -work assessment • Pre - work briefing • Use of train as additional fall protection, in accordance with referenced SWI • Lace up safety footwear • Height safety equipment in use • Use ladders and scaffolding (where practical)	C2, F2 = D		SMS-06-SW-0264 Portable Ladders, Stepladders and Step Platforms SMS-06-SW-1160 Working on High Roads
2.2	Access train from relevant departing station	Manual handling of test equipment (e.g. trip stop) to and from train to ground level		• See “General Hazards” - Manual Handling of Test Equipment		Electrical Systems Engineer	SMS-06-GD-0001 Guide to Manual Handling

2.3	Start up traction test equipment	Interaction with live electrical components, low and extra low voltage. Inside, outside, on the roof of train and under the train		• See “General Hazards” - Interaction with Live Electrical Components			
		Slips trip and falls Scenarios • Climbing in and out of train • In tunnel • Greasy floor (maintenance pit) • Trips on track • Trips by leads from monitoring equipment		• See “General Hazards” - Slips Trips and Falls			
2.4	Travel by train to test area	Train strikes pedestrians	C4, F4 = B+	• Perimeter fences • Pedestrian Education Programs • Signage • Trained driver • Sounding horns • Protection plan	C4, F2 = C+	Train Crew & Area Manager	
		Train strikes construction site vehicles		• See “General Hazards” - Train Strikes Construction Site Vehicles •			

		Runaway vehicle (e.g. Overhead vehicles, trolleys etc) roll down gradient from Chatswood end into test train		• See “General Hazards” – Run Away Train			
2.5	Start traction tests	Struck by or contact with moving trains or unexpected train movement		• See above “General Hazards”		Protection Officer (if available) or the Electrical Systems Engineer Protection Officer (if available) or the Electrical Systems Engineer	
		Train strikes construction site vehicles		• See “General Hazards” - Train Strikes Construction Site Vehicles •			
		Injury to staff on the train during unexpected stop		• See above “General Hazards”			SMS-10-SR-0040 Communication
		Runaway vehicle (eg. Overhead installation vehicles, trolleys etc) collides with test vehicle or technician		• See “General Hazards” - Run Away Train			
2.6	Confirm remote readings or, as required, adjusting testing equipment	Strains and sprains climbing in and out of train		• See “General Hazards” - Strains and Sprains Climbing In and Out of Train			
		Slips trip and falls Scenarios • Climbing in and out of train • In tunnel • Greasy floor (maintenance pit) • Trips on track • Trips by leads from monitoring equipment		• See “General Hazards” - Slips Trips and Falls			

		Strike head on low head room		• See above “General Hazards”- Slips Trips and Falls			
		Struck by or contact with moving trains or unexpected train movement		• See above “General Hazards”			
		Strike head on testing train		• See above “General Hazards”- Slips Trips and Falls			
		Interaction with live electrical components, low and extra low voltage. Inside, outside, on the roof of train and under the train		• See “General Hazards” – Interaction with Live Electrical Components			SMS-06-SW-0838 Pantograph Raising and Lowering SMS-06-SW-0269 Electric Shock Protocol SMS-12-OI-0886 Red Flagging Trains in stabling yards, depots and Maintenance Centres

2.7	Access electrical cabinets, as required	Interaction with live electrical components, low and extra low voltage. Inside, outside, on the roof of train and under the train		• See “General Hazards” – Interaction with Live Electrical Components		Electrical Systems Engineer	SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out SMS-06-SW-0269 Electric Shock Protocol SMS-06-SW-0276 Work on Low Voltage Installations
2.8	Turn off test equipment	Nil					
2.9	Travel by train from test area	See Step 2.4		• See Step 2.4		See Step 2.4	
2.10	Exit train to station	See Step 2.2		• See Step 2.2		See Step 2.2	
2.11	Remove test equipment	See Step 2.1		• See Step 2.1		See Step 2.1	

3	**Performing Electrical Tests using Roof Mounted Equipment**						
3.1	Fitting equipment to roof of test vehicle	Interaction with live electrical components, low and extra low voltage. Inside, outside, on the roof of train and under the train		• See “General Hazards” – Interaction with Live Electrical Components		Electrical Systems Engineer	SMS-06-SW-0838 Pantograph Raising and Lowering SMS-06-SW-0836 Isolating 1500V DC OH using an Annett Key SMS-06-SW-0269 Electric Shock Protocol SMS-12-OI-0886 Red Flagging Trains in stabling yards, depots and Maintenance Centres
		Fall from roof		• See Step 2.1 – Fall From Roof			SMS-06-SW-0264 Portable Ladders, Stepladders and Step Platforms SMS-06-SW-1160 Working on High Roads

3.2	Access train from relevant departing station	Manual handling of test equipment (e.g. trip stop) to and from train to ground level		• See “General Hazards” - Manual Handling of Test Equipment			SMS-06-GD-0001 Guide to Manual Handling
3.3	Start up electrical test equipment	Interaction with live electrical components, low and extra low voltage. Inside, outside, on the roof of train and under the train		• See “General Hazards” – Interaction with Live Electrical Components			SMS-06-SW-0269 Electric Shock Protocol
		Slips trip and falls		• See “General Hazards”			
3.4	Start electrical tests	Struck by or contact with moving trains or unexpected train movement		• See above “General Hazards”			
		Train strikes construction site vehicles		• See “General Hazards” - Train Strikes Construction Site Vehicles •			
		Runaway vehicle (e.g. Overhead installation vehicles, trolleys etc) collides with test vehicle or technician		• See “General Hazards” - Run Away Train			
3.5	Turn off test equipment	Nil					
3.6	Remove test equipment	See Step 3.1		• See Step 3.1		See Step 3.1	

4	**Performing Bogie Parameter Tests**						
4.1	Fitting equipment to under and side of test vehicle (within a maintenance centre)	Manual handling of test equipment (e.g. trip stop) to and from train to ground level		• See “General Hazards” - Manual Handling of Test Equipment		Electrical Systems Engineer	SMS-06-GD-0001 Guide to Manual Handling
		Interaction with live electrical components, low and extra low voltage. Inside, outside, on the roof of train and under the train		• See “General Hazards” – Interaction with Live Electrical Components			SMS-06-SW-0838 Pantograph Raising and Lowering SMS-06-SW-0836 Isolating 1500V DC OH using an Annett Key SMS-06-SW-0269 Electric Shock Protocol SMS-12-OI-0886 Red Flagging Trains in stabling yards, depots and Maintenance Centres

		Slips trip and falls Scenarios • Climbing in and out of train • In tunnel • Greasy floor (maintenance pit) • Trips on track • Trips by leads from monitoring equipment		• See “General Hazards” - Slips Trips and Falls		Electrical Systems Engineer	SMS-06-SW-0812 Working in the Pit
		Strike head on underside of vehicle		• See above “General Hazards”- Slips Trips and Falls			SMS-06-SW-0812 Working in the Pit
4.1 b	Fitting equipment to under and side of test vehicle (in the field)	Manual handling of test equipment (e.g. trip stop) to and from train to ground level		• See “General Hazards” - Manual Handling of Test Equipment			SMS-06-GD-0001 Guide to Manual Handling
		Interaction with live electrical components, low and extra low voltage. Inside, outside, on the roof of train and under the train		• See “General Hazards” – Interaction with Live Electrical Components			SMS-06-SW-0838 Pantograph Raising and Lowering SMS-06-SW-0269 Electric Shock Protocol
		Strike head on underside of vehicle		• See above “General Hazards”- Slips Trips and Falls			
		Hidden Dangerous fauna (e.g. spiders and snakes)	C1, F 4 = C -	• Portable lighting, as required	C1, F 2 = D		

		Contact with hot track or components	C2, F 4 = C+	• Appropriate protective gloves • Long sleeve protective clothing	C2, F 3 = C-	Electrical Systems Engineer	
		Strike by vehicle (other than train) being tested		• See above “General Hazards”			
4.2	Access test vehicle	Manual handling of test equipment (e.g. trip stop) to and from train to ground level		• See “General Hazards” - Manual Handling of Test Equipment			SMS-06-GD-0001 Guide to Manual Handling
		Slips trip and falls Scenarios • Climbing in and out of train • In tunnel • Greasy floor (maintenance pit) • Trips on track • Trips by leads from monitoring equipment		• See “General Hazards” -Slips Trips and Falls			SMS-06-SW-0264 Portable Ladders, Stepladders and Step Platforms SMS-06-SW-0487 Entering Trains from Ballast SMS-06-SW-0488 Climbing out of Trains onto Ballast
		Strains and sprains climbing in and out of train		• See “General Hazards” - Strains and Sprains Climbing In and Out of Train			SMS-06-SW-0264 Portable Ladders, Stepladders and Step Platforms
4.3	Start up test equipment	Interaction with live electrical components, low and extra low voltage. Inside, outside, on the roof of train and under the train		• See “General Hazards” – Interaction with Live Electrical Components			SMS-06-SW-0269 Electric Shock Protocol

		Slips trip and falls Scenarios • Climbing in and out of train • In tunnel • Greasy floor (maintenance pit) • Trips on track • Trips by leads from monitoring equipment		• See “General Hazards” -Slips Trips and Falls			
4.4	Start tests	Struck by or contact with moving trains or unexpected train movement		• See above “General Hazards”			
		Train strikes construction site vehicles		• See “General Hazards” - Train Strikes Construction Site Vehicles •			
		Runaway vehicle (e.g. Overhead installation vehicles, trolleys etc) collides with test vehicle or technician		• See “General Hazards” – Run Away Train			
4.5	Turn off test equipment	Nil					
4.6	Remove test equipment	See Step 4.1		• See Step 4.1		See Step 4.1	

NOTE: Each work group or team member must sign off on the SWMS to acknowledge they have been briefed about or instructed in the SWMS

Team member name (Please print)	Team Member signature	Instructor/ Briefer name	Date	Team member name (Please print)	Team Member signature	Instructor/ Briefer name	Date

RailCorp Level 2 Risk Matrix - Regional & Local (Workplace)		Likelihood/Frequency						
		Event Frequency	Less than once every 1000 years	Once every 100 to 1,000 years	Once every 10 to 100 years	Once every 1 to 10 years	More than once per year up to and including 10 times per year	More than 10 times per year
		Historical (Likelihood)	Unheard of in the rail industry	Has occurred once or twice in the rail industry	Has occurred many times in the rail industry, but not in NSW	Has occurred once or twice in NSW	Has occurred frequently in NSW	Has occurred frequently at specific locations
		Workplace Predictive (Likelihood)	Not expected to occur	May occur only in exceptional circumstances	Could occur at some time but not likely	You would expect it to occur at least once in the next 10 years performing similar activities	You would expect it to occur at least once this year performing similar activities	You would expect it to occur at least once this month performing similar activities
			F1	F2	F3	F4	F5	F6
Consequence			Incredible	Improbable	Remote	Occasional	Probable	Frequent
>10 Fatalities	C6	Disastrous	B-	B+	A	A	A	A
2-10 Fatalities	C5	Catastrophic	C+	B-	B+	A	A	A
1 Fatality (2-10 Major Injuries)	C4	Critical	C-	C+	B-	B+	A	A
1 Major Injury	C3	Major	D	C-	C+	B-	B+	A
1 or more Minor Injuries	C2	Minor	D	D	C-	C+	B-	B+
First aid treatment, or illness/injury not requiring treatment	C1	Negligible	D	D	D	C-	C+	B-

Extreme
High
Medium
Low

Definition for Use - Regional & Local level (Workplace)

Used for workplace hazards and safety risks that do not consider the whole of the network. Indicatively this matrix is appropriate for use where the hazards under consideration are up to 10% of the total network exposure. This includes regional and local workplace risk assessments.

As an example, the Level 2 scale would be used when examining the risk of slips, trips and falls on specific RailCorp platforms within a region or at a particular station, or the risk of fire within a depot.

There are 3 options for descriptors which can be used to determine the frequency category. One set of descriptors is provided for frequency, one for historical likelihood, and one for predictive liklihood in the workplace. Choose the most appropriate.

To score the risk, follow the steps:

1. Identify the magnitude of the credible consequence if the risk were to occur. If applicable, risks should be considered in terms of the safety (this matrix), commercial and environmental impact (using other matricies).

2. Identify the likelihood of this level of consequence occurring. (This is done after considering the effectiveness of the current controls in place)

3. Score the risk using the combination of likelihood and consequence ranking.

Note: Where there are a range of credible consequences which may lead to a different level or risks and/or where the controls may be different. It may be useful to score the risk more than once.