Cable Termination And Jointing

Issue date:08/04/08
Review date: 21/02/11

SWMS number:
SMS-06-SW-0994

SWMS Name:
Cable Termination And Jointing

SWMS Team:
Electrical Distribution Review Team

Custodian (Position):
Electrical Services Manager, Commercial Renewals

Assumptions:
Site specific risks are addressed and assessed in pre- work briefing

Approving Authority (Position):
Safety and Quality Manager Commercial Renewals

Content reviewed by Technical expert (SME) and RailCorp safety professional (position including Div/Group)
Electrical Services Manager & SEQ Coordinator Asset Management Group Commercial Renewals

Applicable Standards, Codes of Practice and guidance:

- OH&S Act 2000
- OH&S Regulation 2001
- Rail Safety Regulation 2003
- RailCorp Network Rules & Procedures
- RailCorp Safety Management System.
- MSDS for all chemicals and hazardous Substances used on site
- Electrical Safety Instructions
- SAA Wiring Rules
- WorkCover NSW Plant Guide
- EC14 – Guide to Electrical Workers' Safety Equipment
- National Code of Practice for Manual Handling [NOHSC:2005]

Equipment/Plant/Tools:

- Explosive Power tool
- Plant as required
- Barriers, Witches hats and fencing
- Appropriate Plant or Hand Tools
- Services Search Detectors/Diagrams
- Fire Extinguishers
- Containment, spill kit

Records/Reporting:

- Worksite Protection Plan
- Pre-work Brief
- Electrical Test Tags
- Electrical Safety Instructions
- Hot Work Permit (During Total Fire Ban)
- Fire Brigade
- Daily Plant Checklist
- Services Search
- Environmental Plan
- Insulation Resistance
- MSDS for gases / Chemicals for Cable Types
- Site layout documentation

Permits/licences required:

- Explosive Power Tools Certificate
- Electrical Permit
- Plant Operators Certification
- Cable Jointing Certification

Personal Protective Equipment required:

- Safety Boots
- High Visibility Vests
- Hardhats
- Protective Clothing
- Safety Glasses

And as specified below.

- Gloves
- During all Site Works a FIRST AIDER MUST be Present

Inspection requirements
Nil

Service schedule:
Nil

MIMS or METRE Ref:
Nil

Training/Qualification required:

- Construction Industry Induction
- Track Safety Awareness or

RISI (Rail Industry Safety Induction)

And as specified below.

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1	Supervisor undertakes site pre-work briefing and gives local induction.	Staff not Listening to Pre-Work Brief	B -	Identify all hazards, Staff to ensure they are properly Briefed as to risks involving Worksite.	D	Team Leader / Work Group Leader / All Staff	Pre-Work Briefing SMS-06-FM-0163
2	Supervisor verifies competence of personnel doing the task and currency of permits for work.	Expired Competency Cards & Permits, Unqualified type of Personnel for the Task.	B -	Visual Inspection of Personnel Competency Cards & Currency of Permits	D	Team Leader / Work Group Leader	Safety Training & Competence SMS-11-SR-0128
3	Review SWMS and confirm it is current.	Use of a SWMS that is out of date	C -	Ensure SWMS is current and up to date.	D	Team Leader / Work Group Leader	SWMS & SWI's SMS-06-PR-0023
4	Verify that plant and equipment for the task is fit-for-purpose.	Plant & Equipment kept in poor working condition	C +	Conduct a Daily Plant Checklist	D	All Staff	Plant SMS-06-GD-0225
5	Evaluate the environment	Uneven ground	C-	Level up ground. Clear pathways	D	All Staff	Environmental Plan. Uneven Surfaces SMS-06-PR-0104
		Undergrowth	C-	Clear only excess undergrowth as required	D	Team Leader / Work Group Leader / All Staff	PPE- SMS-06-GD-0323, Working Outdoors SMS-06-PR-0104 Irritation from Dust SMS-06-SW-0535
		Water obstacle/ drain	C-	Redivert water, pump away or install drain	D		
		Dust	C-	Water down area, keep vehicular traffic down	D		
		Ultra violet injuries	B-	PPE Sunscreen, hat sunglasses	D		
		Venomous bite & stings	C-	Remove undergrowth. Take care when opening, lifting items.	D		
		Needles	C-	Inspect work area. Remove undergrowth. Take care when opening, lifting items.	D		Needle Sticks SMS-06-PR-0223
		Trains	B+	Relevant Work Site Protection and Protection officer for site	D	Protection Officer.	Network rules and Procedures, Safety Management SMS-01-PO-0126

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		Roadways	C-	Relevant Work Site Protection and Protection officer for site	D	Traffic Controller	Traffic Plan, Work-on/near Roads SMS-06-GD-0372
6	Locate services	Damage to services	B+	Services searches, diagrams on site	D	Team Leader / Work Group Leader	Services Search Checklist SMS-06-FM-0384
				Approved water exposure of services			
				Hand dig to expose services			
7	Clear the work area / site	Electric Shock Unauthorised work	B+	Site layout documented	D	Authorised Person, Team Leader / Work Group Leader / All Staff	Electrical Equipment SMS-06-GD-0268 Electrical Permits SMS-06-EN-0577
				Permits and authorised work			
8	Site set up	Manual Handling	C+	Correct technique / site specific PPE	D	All Staff	Manual Handling SMS-06-GD-0001
		Plant moving	C+	Site specific PPE	D	Team Leader / Work Group Leader / All Staff	PPE- SMS-06-GD-0323 Plant & Equipment Safety SMS-11-GD-0243 Pre work Briefing SMS-06-FM-0163
				Lookouts			
				Pre Work Brief			
		Adjacent equipment	C-	Permits and authorised work	D		Electrical Equipment SMS-06-GD-0268
				Lookouts			
		Dangerous goods	C+	Quarantine area	D		Hazardous Substances SMS-06-GD-0199
		Temporary power	C-	See Low Voltage SWMS	D	Team Leader / Work Group Leader	Electrical Equipment SMS-06-GD-0268
9	Identify Cables	Electric shock	C+	Permits or Authorised work	D	Authorised Person, Team Leader / Work Group Leader	Electrical Equipment SMS-06-GD-0268 Electrical Permits SMS-06-EN-0577 ESI,S
		Loss of services	C-	Drawings / locators / visual	D		Services Search Checklist SMS-06-FM-0384

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		Wrong cable	C+	Drawings / locators / visual	D		Electrical Equipment SMS-06-GD-0268
	Identify Cables – spiking	Explosive tool	B+	PPE ear / face cover Ticketed operator	D	Explosive Power Tools Certificated Person, Team Leader / Work Group Leader	PPE- SMS-06-GD-0323 ESI,S
		Noise	C-	Ear protection	D		PPE- SMS-06-GD-0323
	Identify Cables – pressurised	Gas explosion	A	Bleed or remove pressure as manufacturer instruction / procedure	D	Authorised Person, Team Leader / Work Group Leader	Environmental Plan, Hazardous Substances SMS-06-GD-0199 MSDS
		Contamination	B-	Containment, Spill kit on hand	D		
		Poisonous / chemical	B-	MSDS and wash hands	D		
10	Joint / terminate Cut cable / cap cable	Injury from plant / tools	B+	Tagged tools and inspected plant	D	Team Leader / Work Group Leader	Plant & Equipment Safety SMS-11-GD-0243
		Cuts / abrasions	B+	PPE	D	Team Leader / Work Group Leader / All Staff	PPE- SMS-06-GD-0323
		Dust / fumes	C-	PPE as MSDS for cable type	D		
		Injury from cable under tension	B+	Secure cable ends	D		Manual Handling SMS-06-GD-0001 Pre work Briefing SMS-06-FM-0163
		Manual handling strains	C+	Correct techniques, site specific measures as Pre Work Brief	D	All Staff	
		Burns	B+	PPE as pre work brief	D	First Aid Officer	PPE- SMS-06-GD-0323
10	Joint / terminate Cut cable / cap cable (Cont……)	Fire	B+	Extinguishers or water supply	D	Team Leader / Work Group Leader	Fire Procedures SMS-06-PR-0329
		Explosion	B+	MSDS for gases, plant inspections	D		Hazardous Substances SMS-06-GD-0199 MSDS
				Ventilation			
		Electrical contact	A	Barriers , Pre work brief	D	Authorised Person, Team Leader / Work Group Leader	Electrical Equipment SMS-06-GD-0268 ESI,S
		Contamination (personal)	B-	MSDS, appropriate cap for cable	D		MSDS
11	Preparation / terminating / stripping	Cuts , abrasions	B+	PPE as pre work brief	D	All Staff	PPE- SMS-06-GD-0323
		Burns	B+	PPE as pre work brief	D	First Aid Officer	

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		Contamination	B-	MSDS, appropriate cap for cable	D	Team Leader / Work Group Leader	MSDS, Hazardous Substances SMS-06-GD-0199
		Chemical fumes	B+	MSDS for cable type, cleaning jointing products	D		
		Electrical contact – IR testing, capacitance, induction	A	Authorised work, shorting wires used, earth cables, communication for tests	D	Authorised Person, Team Leader / Work Group Leader	Electrical Equipment SMS-06-GD-0268 ESI,S
		Manual handling	C+	Correct techniques, site specific measures as Pre Work Brief	D	All Staff	Manual Handling SMS-06-GD-0001
		Fire	B+	Extinguishers or water supply	D	Team Leader / Work Group Leader	Fire Procedures SMS-06-PR-0329
		explosion	B+	MSDS for gases, plant inspections	D	Team Leader / Work Group Leader	Hazardous Substances SMS-06-GD-0199 MSDS
		Injury from plant	B+	Tagged tools and inspected plant	D		Plant & Equipment Safety SMS-11-GD-0243
12	Preparation / terminating / stripping	Environmental spills	B-	Containment, spill kit on hand	D	Team Leader / Work Group Leader / All Staff	Environmental Protection Authority, relevant Authorities
13	Testing and connection	Electrical contact	A	Electrical permit	D	Authorised Person, Team Leader / Work Group Leader	Electrical Permits SMS-06-EN-0577 ESI,S
				Communication for IR tests			Electrical Equipment SMS-06-GD-0268 ESI,S
				Shorting wires			
		IR testing	B-	Shorting wires communication	D		
13	Testing and connection (Cont…….)	Manual handling	C+	Correct techniques, site specific measures as Pre Work Brief	D	Team Leader / Work Group Leader / All Staff	Manual Handling SMS-06-GD-0001
		Cuts and abrasions	B+	PPE as pre work brief	D		PPE- SMS-06-GD-0323
14	Clear site	Leaving tools behind	C-	Visual inspections	D	Team Leader /	House Keeping

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		Materials remaining	C-	Visual inspections	D	Work Group Leader	SMS-16-FM-0069
		Electrical contact	A	Permits, authorised work	D	Authorised Person, Team Leader / Work Group Leader	Electrical Permits SMS-06-EN-0577 ESI,S
		Manual handling	C+	Correct techniques, site specific measures as Pre Work Brief	D	All Staff	Manual Handling SMS-06-GD-0001
☐	Additional Site specific hazards						

Legend
PWB – Pre Work Brief
ESI's – Electrical Safety Instructions
MSDS – Material Safety Data Sheet
PPE – Personal Protective Equipment
RDELE – Renewals Distribution Electrical
SWMS – Safe Work Method Statement
IR – Insulation Resistance

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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.