

NSW
Resources
Regulator

MODULES | CERTIFICATES OF COMPETENCE

CABLE REPAIR SIGNATORY MODULES

WHS (Mines and Petroleum Sites) legislation



Document control

Published by NSW Department of Planning and Environment, NSW Resources Regulator

Title: Cable repair signatory modules

First published: September 2017

Authorised by: Director Mine Safety Performance

RM8 reference: PUB17/665

Amendment schedule

Date	Version	Amendment

© State of New South Wales through the NSW Department of Planning and Environment 2017.

This publication is copyright. You may download, display, print and reproduce this material in an unaltered form only (retaining this notice) for your personal use or for non-commercial use within your organisation. To copy, adapt, publish, distribute or commercialise any of this publication you will need to seek permission from the NSW Department of Planning and Environment.

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (January 2018). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the NSW Department of Planning and Environment or the user's independent advisor.

Contents

Module 1 - Repair of Electric Reeling and Trailing Cables	3
Module 1 competency assessment results.....	8
Assessor 1	8
Assessor 2 (if applicable)	8
Candidate.....	9
Module 2 - Testing and fault location: Reeling and Trailing Cables	10
Module 2 competency assessment results.....	15
Assessor 1	15
Assessor 2 (if applicable)	15
Candidate.....	16
Module 3 - Inspection, fitting and replacement of parts of explosion protected restrained plugs and receptacles and bolted couplers	17
Module 3 competency assessment results.....	20
Assessor 1	20
Assessor 2 (if applicable)	20
Candidate.....	21

Module 1 - Repair of Electric Reeling and Trailing Cables

This provides a summary of each of the essential elements of this competency module. The assessment for this module must be done at an approved cable repair workshop. The assessment must be done by a person or persons who satisfy the following criteria:

- Qualifications as a certificate IV assessor,
- Qualifications as a Cable Repair Signatory (formerly Class B competent person - cable repairs) or a Class A competent person, and
- minimum of two years' experience managing a cable repair facility.

NOTE: Where the figures 1.1, 3.3 and 11 are used this relates to the voltage rating of the cable in kilovolts.

Assessment	Description	Section Tasks	Training Completed			Date	Assessors Initials
			1.1KV	3.3 / 6.6 KV	11KV		
1.1 Basic OH&S Training.	Foundation knowledge of workplace health and safety.	•Lifting, manual handling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		• Isolation practices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		• Sharps, burns, first aid including CPR, electric shock reporting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		• Toxicology (heavy metals, PCB's, fumes from heavy metals and insulation materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
1.2 Risk Assessment.	To be able to identify and control risk.	Perform a risk assessment on a selected section within this Module	<input type="checkbox"/>				
		• Type 275	<input type="checkbox"/>				

Assessment	Description	Section Tasks	Training Completed			Date	Assessors Initials
			1.1KV	3.3 / 6.6 KV	11KV		
1.3 Cable Identification.	To be able to identify the construction of different cables to ensure that the correct materials are used in the repair process.	•Type 209		<input type="checkbox"/>			
		•Type 240		<input type="checkbox"/>			
		•Type 241		<input type="checkbox"/>			
		•Type 260		<input type="checkbox"/>			
		•Type 245		<input type="checkbox"/>			
		•Type 409		<input type="checkbox"/>			
		•Type 440		<input type="checkbox"/>			
		•Type 441		<input type="checkbox"/>			
		•Type 450		<input type="checkbox"/>			
	•Review certificate/report of new cable compliance to standards		<input type="checkbox"/>				
1.4 Repair Materials.	To be able to identify the different repair materials used in the repair process and the storage requirements of repair tapes.	•Semi-conductive repair tape		<input type="checkbox"/>			
		•CSP repair tape		<input type="checkbox"/>			
		•PCP repair tape		<input type="checkbox"/>			

Assessment	Description	Section Tasks	Training Completed			Date	Assessors Initials
			1.1KV	3.3 / 6.6 KV	11KV		
		<ul style="list-style-type: none"> • Dielectric repair tape 	<input type="checkbox"/>				
		<ul style="list-style-type: none"> • Storage of repair tape 	<input type="checkbox"/>				
1.5	Cable preparation.	Removal of damaged materials and preparation of cores for repair.	<ul style="list-style-type: none"> • Sheath 				
			<ul style="list-style-type: none"> • Power Cores 				
			<ul style="list-style-type: none"> • Earth Cores 				
			<ul style="list-style-type: none"> • Pilot cores 				
1.6	Splicing of conductors.	To be able to join all types of conductors found in mining cables.	<ul style="list-style-type: none"> • Power cores 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
			<ul style="list-style-type: none"> • Earth cores 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
			<ul style="list-style-type: none"> • Pilot cores 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
			<ul style="list-style-type: none"> • Screens 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.7	Splicing methods.	To be able to demonstrate the ability to join cables and/or conductors using different methods.	<ul style="list-style-type: none"> • Single ferrule 				
			<ul style="list-style-type: none"> • Multi ferrule 				
			<ul style="list-style-type: none"> • Hot shot 				
1.8	Soldering.	To be able to identify different types of solder and flux.	<ul style="list-style-type: none"> • Correct soldering techniques 				
			<ul style="list-style-type: none"> • Minimise solder migration 				

Assessment	Description	Section Tasks	Training Completed			Date	Assessors Initials
			1.1KV	3.3 / 6.6 KV	11KV		
		<ul style="list-style-type: none"> • Flux and solder requirements 	<input type="checkbox"/>				
		<ul style="list-style-type: none"> • Correct use of PPE 	<input type="checkbox"/>				
1.9 Replacement of insulation or covering.	To understand the requirements and application of different types of repair materials.	<ul style="list-style-type: none"> • Power cores 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<ul style="list-style-type: none"> • Pilot cores 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<ul style="list-style-type: none"> • Earth cores 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<ul style="list-style-type: none"> • Outer sheath 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
1.10 Joining pliable armour.	To return mechanical protection back to a suitable condition.	<p>Note: Discussion only required for this element, no practical demonstration</p>					
		<ul style="list-style-type: none"> • Join armour 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<ul style="list-style-type: none"> • Alternate methods 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
1.11 Replacement of sheath.	To return a sheath back to an as new condition to retain its electrical and mechanical properties.	<ul style="list-style-type: none"> • Sheath construction –semi-con screened 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<ul style="list-style-type: none"> • Sheath construction – metallic screened 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<ul style="list-style-type: none"> • Sheath tapers 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<ul style="list-style-type: none"> • Application of sheath repair tapes 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Assessment	Description	Section Tasks	Training Completed			Date	Assessors Initials
			1.1KV	3.3 / 6.6 KV	11KV		
1.12 Vulcanising.	To identify when a repair has cured and how to test for hardness. How to identify completed repairs.	•Vulcanising times		<input type="checkbox"/>			
		•Temperature requirements		<input type="checkbox"/>			
		•Hardness testing		<input type="checkbox"/>			
		•ID tag requirements		<input type="checkbox"/>			
		•Measurement/test instrument calibration		<input type="checkbox"/>			
1.13 Compliance reporting	Cable repair compliance and non-compliance reporting	•Reject non-compliance		<input type="checkbox"/>			

Module 1 competency assessment results

Assessor 1

Name:	
Qualification reference:	
Result:	<input type="checkbox"/> Competent <input type="checkbox"/> Not yet competent
Comments:	
Signature	
Date	

Assessor 2 (if applicable)

Name:	
Qualification reference:	
Result:	<input type="checkbox"/> Competent <input type="checkbox"/> Not yet competent
Comments:	
Signature	
Date	

Candidate

I have received a copy of, and agree with the assessment criteria and assessment result for module 1.

Cable repair workshop experience commenced

Name	
Signature	
Date	

Module 2 - Testing and fault location: Reeling and Trailing Cables

This provides a summary of each of the essential elements of this competency module. The assessment for this module must be done at an approved cable repair workshop. The assessment must be done by a person or persons who satisfy the following criteria:

- Qualifications as a certificate IV assessor,
- Qualifications as a Cable Repair Signatory (formerly Class B competent person - cable repairs) or a Class A competent person, and
- minimum of two years' experience managing a cable repair facility.

NOTE: Where the figures 1.1, 3.3 and 11 are used this relates to the voltage rating of the cable in kilovolts.

Assessment	Description	Section Tasks	Training Completed			Date	Assessors Initials
			1.1KV	3.3 / 6.6 KV	11KV		
2.1 Basic OH&S Training	Foundation knowledge of workplace health and safety.	Precautions for setup, operating and discharging of high voltage test circuits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
2.2 Risk Assessment	To be able to identify and control risk.	Perform a risk assessment on a selected section within this Module	<input type="checkbox"/>				
2.3 Cable History	Access the historical records, identify potential issues and provide information to update records.	• Access records	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		• Interpret records	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		• Update records	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		• Open circuit	<input type="checkbox"/>				

Assessment	Description	Section Tasks	Training Completed			Date	Assessors Initials
			1.1KV	3.3 / 6.6 KV	11KV		
2.4 Electrical Terms	To be able to understand the electrical terms used when reading instruments and recording test results.	• Short circuit		<input type="checkbox"/>			
		• Meg, Gig ohms		<input type="checkbox"/>			
		• Resistance		<input type="checkbox"/>			
		• Voltage		<input type="checkbox"/>			
		• Current		<input type="checkbox"/>			
2.5 Test Equipment	To understand how to read and safely operate test equipment. The correct application of test equipment when testing cables.	• Ohm meter		<input type="checkbox"/>			
		• Insulation Tester		<input type="checkbox"/>			
		• Hi pot		<input type="checkbox"/>			
		• Sym load		<input type="checkbox"/>			
		• Discharge Stick		<input type="checkbox"/>			
		• Partial Break		<input type="checkbox"/>			
		• Purpose of phase rotation		<input type="checkbox"/>			

Assessment	Description	Section Tasks	Training Completed			Date	Assessors Initials
			1.1KV	3.3 / 6.6 KV	11KV		
2.6 Continuity and Phase Rotation	To be able to demonstrate the method of test and to understand and record the results of the test.	•Circuit connections	<input type="checkbox"/>				
		•Power core resistance	<input type="checkbox"/>				
		•Earth core resistance	<input type="checkbox"/>				
		•Pilot core resistance	<input type="checkbox"/>				
2.7 Insulation Resistance	To be able to demonstrate the method of test and to understand and record the results of the test.	•Purpose of Insulation Test	<input type="checkbox"/>				
		•Circuit connections	<input type="checkbox"/>				
		•Power core insulation	<input type="checkbox"/>				
		•Pilot core insulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		•Test Voltages	<input type="checkbox"/>				
		•Fault finding	<input type="checkbox"/>				
2.8 High Voltage Proof Test	To be able to demonstrate the method of test and to understand and record the results of the test.	•Purpose of Proof test	<input type="checkbox"/>				
		•Circuit connections	<input type="checkbox"/>				

Assessment	Description	Section Tasks	Training Completed			Date	Assessors Initials
			1.1KV	3.3 / 6.6 KV	11KV		
		<ul style="list-style-type: none"> • Test Voltages and Times 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<ul style="list-style-type: none"> • Discharging 	<input type="checkbox"/>				
		<ul style="list-style-type: none"> • Fault finding 	<input type="checkbox"/>				
2.9	Partial Break Test	To be able to demonstrate the method of test and to understand the purpose of the test.	<ul style="list-style-type: none"> • Purpose of Partial Break Test 	<input type="checkbox"/>			
			<ul style="list-style-type: none"> • Circuit connections 	<input type="checkbox"/>			
			<ul style="list-style-type: none"> • Fault Finding 	<input type="checkbox"/>			
			<ul style="list-style-type: none"> • Test requirements 	<input type="checkbox"/>			
2.10	Symmetrical Load Test	To be able to demonstrate the method of test and to understand the purpose of the test.	<ul style="list-style-type: none"> • Purpose of test 	<input type="checkbox"/>			
			<ul style="list-style-type: none"> • Circuit connections 	<input type="checkbox"/>			
			<ul style="list-style-type: none"> • Test requirements 	<input type="checkbox"/>			
2.11	Sheath Test	To be able to demonstrate the method of test and to understand the purpose of the test.	<ul style="list-style-type: none"> • Purpose of test 	<input type="checkbox"/>			
			<ul style="list-style-type: none"> • Circuit connections 	<input type="checkbox"/>			

Assessment	Description	Section Tasks	Training Completed			Date	Assessors Initials
			1.1KV	3.3 / 6.6 KV	11KV		
		<ul style="list-style-type: none"> • Test Voltages 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<ul style="list-style-type: none"> • Test requirements 	<input type="checkbox"/>				
2.12 Compliance reporting	Cable testing compliance and non-compliance reporting	<ul style="list-style-type: none"> • Reject non-compliance 	<input type="checkbox"/>				

Module 2 competency assessment results

Assessor 1

Name:	
Qualification reference:	
Result:	<input type="checkbox"/> Competent <input type="checkbox"/> Not yet competent
Comments:	
Signature	
Date	

Assessor 2 (if applicable)

Name:	
Qualification reference:	
Result:	<input type="checkbox"/> Competent <input type="checkbox"/> Not yet competent
Comments:	
Signature	
Date	

Candidate

I have received a copy of, and agree with the assessment criteria and assessment result for module 2.

Cable repair workshop experience commenced

Name	
Signature	
Date	

Module 3 - Inspection, fitting and replacement of parts of explosion protected restrained plugs and receptacles and bolted couplers

This provides a summary of each of the essential elements of this competency module. The assessment for this module must be done at an approved cable repair workshop. The assessment must be done by a person or persons who satisfy the following criteria:

- Qualifications as a certificate IV assessor,
- Qualifications as a Cable Repair Signatory (formerly Class B competent person - cable repairs) or a Class A competent person, and
- Minimum of two years' experience managing a cable repair facility.

NOTE: Where the figures 1.1, 3.3 and 11 are used this relates to the voltage rating of the cable in kilovolts.

Assessment	Description	Section Tasks	Training Completed			Date	Assessors Initials
			1.1KV	3.3 / 6.6 KV	11KV		
3.1 Risk Assessment	To be able to identify and control risk.	Perform a risk assessment on a selected section within this Module	<input type="checkbox"/>				
3.2 Plug / Coupler Identification	To be able to identify different types of plugs and couplers. Use of the correct Industry terms.	•Restrained Plug	<input type="checkbox"/>	<input type="checkbox"/>			
		•Restrained Receptacle	<input type="checkbox"/>	<input type="checkbox"/>			
		•Bolted Coupler	<input type="checkbox"/>				
		•Bolted Adaptor	<input type="checkbox"/>				
3.3 Plug / Coupler Inspection		•External Checks	<input type="checkbox"/>				

Assessment	Description	Section Tasks	Training Completed			Date	Assessors Initials
			1.1KV	3.3 / 6.6 KV	11KV		
	External mechanical checks and interior, socket and gland checks.	<ul style="list-style-type: none"> • Internal Checks 	<input type="checkbox"/>				
3.4 Plug / Coupler Phasing	To be able to identify the correct phasing for voltage, current and pin configurations.	<ul style="list-style-type: none"> • 125amp 660V - 1.1kV 4 Pin 	<input type="checkbox"/>				
		<ul style="list-style-type: none"> • 150amp 660V – 1.1kV 4 Pin 	<input type="checkbox"/>				
		<ul style="list-style-type: none"> • 300amp 660V – 1.1kV 4 Pin 	<input type="checkbox"/>				
		<ul style="list-style-type: none"> • 425amp 660V – 1.1kV 4 Pin 	<input type="checkbox"/>				
		<ul style="list-style-type: none"> • 300 amp 3.3kV 6 pin 		<input type="checkbox"/>			
		<ul style="list-style-type: none"> • 425 amp 3.3kV 6 pin 		<input type="checkbox"/>			
3.5 Plug / Coupler Fitting	To be able to demonstrate the correct method of fitting plugs and couplers.	<ul style="list-style-type: none"> • Preparation of cores 	<input type="checkbox"/>				
		<ul style="list-style-type: none"> • Correct Termination lengths 	<input type="checkbox"/>				
		<ul style="list-style-type: none"> • Soldering/Crimp Techniques 	<input type="checkbox"/>				
		<ul style="list-style-type: none"> • Sheath Protrusion 	<input type="checkbox"/>				
		<ul style="list-style-type: none"> • Sheath Clamping 	<input type="checkbox"/>				
		<ul style="list-style-type: none"> • Creepage & Clearance 	<input type="checkbox"/>				
		<ul style="list-style-type: none"> • Inspections 	<input type="checkbox"/>				

Assessment	Description	Section Tasks	Training Completed			Date	Assessors Initials
			1.1KV	3.3 / 6.6 KV	11KV		
3.6 Cable Tails, Leads and Terminations	To be able to prepare, fit and inspect tails and Terminations.	•Tails to metallic screened cables and conductive cables		<input type="checkbox"/>			
		•Terminate metallic screened and conductive cables		<input type="checkbox"/>			
3.7 Electrical explosion protection (Ex) requirements	To be able to demonstrate basic knowledge of explosion protection requirements.	•Understanding Ex d, Ex e, Ex m		<input type="checkbox"/>			
		•Verification against certification/approval documents		<input type="checkbox"/>			
		•Requirements / conditions associated from manufacturers, certification and approval documents		<input type="checkbox"/>			
		•Inspection of Flame paths, corrosion/indentation curves		<input type="checkbox"/>			
		•How flame paths are measured 'L' and 'I'		<input type="checkbox"/>			
		•Verification of measurement instrument calibration		<input type="checkbox"/>			
3.8 Compliance reporting	Compliance and non-compliance reporting	•Reject non-compliance		<input type="checkbox"/>			

Module 3 competency assessment results

Assessor 1

Name:	
Qualification reference:	
Result:	<input type="checkbox"/> Competent <input type="checkbox"/> Not yet competent
Comments:	
Signature	
Date	

Assessor 2 (if applicable)

Name:	
Qualification reference:	
Result:	<input type="checkbox"/> Competent <input type="checkbox"/> Not yet competent
Comments:	
Signature	
Date	

Candidate

I have received a copy of, and agree with the assessment criteria and assessment result for module 3.

Cable repair workshop experience commenced

Name	
Signature	
Date	