Technical Reference for the Assessment and Registration of Competency

Cable Repairer

For reeling, trailing and flexible cables used in NSW Underground Coal Mines

MDG 2006

Produced by Mine Safety Operations Division,
New South Wales Department of Primary Industries

November 2005

NSW DEPARTMENT OF PRIMARY INDUSTRIES

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FOREWORD

Contemporary safety management requires fit for purpose equipment, competent personnel and appropriate procedures all within a managed work environment and supported by a systematic approach.

Underground coal mining presents engineering personnel with serious technical challenges; in this environment there often occurs potential for accumulation of explosive mixtures of methane and a further explosive dust hazard. A prime barrier to preventing explosions is the use of specially constructed mining cables and special (usually flameproof) plug attachments and glanding. These cables are used in a harsh environment and are regularly subject to abuse and damage. On average there are 600 cables damaged every month in NSW underground coal mine hazardous zones. This damage varies from minute pin holes to being pulled in half. To minimise the risk of fires, explosions and electric shock & burns it is essential that these damaged cables are returned to a condition that is as close to practical “as new”. To do this requires competent people and proper facilities with specialist test and repair equipment. The approved workshop and competent person's system approach, provide a framework for the provision of suitable facilities for the repair of flexible reeling, trailing and feeder cables for use in NSW underground coal mines.

Original cable manufacturers are not considered to have the necessary facilities and competent people to repair such cables.

This Technical Reference is intended to provide a basis from which cables can be restored to a fit for purpose condition, after damage, for the safety of mine workers, as required by legislation and community expectations.

This Technical Reference identifies the requirements for competent people repairing cables for use in coal mining environments in New South Wales.

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PREAMBLE

This Technical Reference is intended as an aid to applicants who are seeking accreditation as a Competent Person – Cable Repairs in the role of repair of cables for use in NSW underground coal mines.

Good engineering practice is a primary goal of the cable repair workshop and competent persons' schemes and a prerequisite to the granting of any workshop approval and competency assessment.

Note: Technical Reference MDG 2006 Specifies requirements for workshop approval.

The Technical Reference is divided into five sections and two appendices, applicants are advised to review Section 1 in the first instance, which will provide the necessary overview, definitions and further reference documents.

Section 2 – 5 provides the minimum assessment criteria for accreditation as a Competent Person – Cable Repairs. Competent personnel, with perquisite education, experience and application method (see Section 2-5) are an essential and integral part of the approval of cable repair workshops. Competent persons are individually assessed using a peer assessment scheme and then registered by the Department. Persons deemed competent are issued with a certificate signed by the Senior Inspector of Electrical Engineering.

SECTION 1 INTRODUCTION

1.1 Technical Reference validity and structure

Validity

Before use, applicants should check the validity of the Technical Reference with the Mine Safety, Department of Primary Industries.

Purpose of the Technical Reference

This Technical Reference is published as an aid to applicants who are seeking:

Accreditation as a competent person – cable repairs.

The Technical Reference sets out the minimum criteria and the method of assessment and processing applications for accreditation as a competent person – cable repairer.

This Technical Reference is primarily for persons working on cables used in NSW coal mines.

Technical Reference Structure

The Technical Reference has 4 sections and 1 appendix.

Section 1 – INTRODUCTION, outlines:
- The Technical Reference,
- Legislative requirements, and
- Definitions.

Section 2 – CABLE REPAIRS, outlines:
- Competency requirement for repairing cables,
- Example questions and observations in establishing competency, and
- Example assessors report.

Section 3 – CABLE TESTING / FAULT FINDING, outlines:
- Competency requirement for cable testing and fault finding,
- Example questions and observations in establishing competency, and
- Example assessors report.

Section 4 – PLUG / COUPLER INSPECTION, FITTING & COMPONENT REPLACEMENT outlines:
- Competency requirement for plug / coupler inspection, fitting and component replacement,
- Example questions and observations in establishing competency, and
- Example assessors report.

Section 5 - CRITERIA FOR COMPETENCIES TO BE ASSESSED FOR ACCREDITATION AS A COMPETENT PERSON – CABLE REPAIRS outlines:
- Overall criteria for competency accreditation
- Criteria for assessors,
- Criteria for assessment,
- Information to be provided to support the accreditation application,
- Example report form for establishing overall competency, and
- Example report form for the oral assessment.

Appendix A – Application form for accreditation as a Competent Person – Cable Repairs

1.2 LEGISLATIVE AND OTHER REQUIREMENTS

Workshops are required to be approved under the requirements of the Coal Mines (Underground) Regulation 1999 clause 146, which states:

> **Facilities for maintenance**
>
> (1) A mine electrical engineer shall ensure that repairs on any flexible cable used in a hazardous zone at the mine are carried out at a workshop that has been approved for the purpose.

Australian Standards AS 1747 reference is made to competency of key personnel involved in the process of overhaul and repair of cables and associated fittings. The Department provides an assessment program and issues a "Certificate of Registration as a Competent Person" to those persons that satisfy the requirements detailed in this Technical Reference.

1.3 DEFINITIONS

Approved Cable Repair Workshop - a quality accredited facility, with at least one competent person in full-time employ and the necessary equipment and procedures deemed suitable to receive an approval as a cable repair workshop. Approved workshops are required by the Department and Australian Standards to keep historical records of all repairs made to cables used in NSW coal mines.

Competent Person - a person who has been verified as competent for the repair and testing of electrical reeling, trailing and feeder cables as defined in AS/NZS1747. This also includes the inspection, testing, fitting and replacement of parts of restrained and bolted plugs. Applicants shall have adequate knowledge and expertise to ensure compliance with the applicable parts of:

- AS/NZS 3800, "Electrical equipment for explosive atmospheres - Overhaul and repair".
- AS 1747 "Reeling, trailing and feeder cables used for mining - Repair and testing".

Competent persons are required to work under the auspices of an approved workshop.

Department - means Mine Safety, Department of Primary Industries.

SECTION 2 – CABLE REPAIRS

Competency requirements

Demonstration of competency - Cable Repair

This provides a summary of each of the essential elements of this competency module. The assessment for this module can be done "in-house". The assessment must be done by a person or persons that satisfy the following criteria:

- Qualifications as a certificate IV assessor, and
- Qualifications as a class A competent person, with experience of managing a cable repair facility, or Competent Person – Cable Repairs (formerly Class B competent person - cable repairs).

Assessment	Description	Section Tasks	Training Completed / Competent			Date	Assessors Initials
			1.1KV	3.3/6.6KV	11KV		
2.1 Risk Assessment.	To be able to identify and control risk.	Perform a risk assessment on a selected section within this Module. Note the assessor may review a previous risk assessment conducted by the person.		☐			
2.2 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 275	☐				
		Type 209	☐	☐	☐		
		Type 240	☐	☐	☐		
		Type 241	☐	☐	☐		
		Type 245	☐	☐	☐		
		Type 260	☐	☐	☐		
		Type 409		☐	☐		
		Type 440		☐	☐		
		Type 441		☐	☐		
		Type 450		☐	☐		
2.3 Repair Materials.	To be able to identify the different repair materials used in the repair process and the storage requirements of the repair tapes	Semi-conductive repair tape	☐				
		CSP repair tape	☐				
		PCP repair tape	☐				
		Dielectric repair tape	☐				
		Storage of repair tape	☐				

Assessment	Description	Section Tasks	Training Completed / Competent			Date	Assessors Initials
			1.1KV	3.3/6.6KV	11KV		
2.4 Cable Preparation.	Removal of damaged materials and preparation of cores for repair.	Sheath	☐	☐	☐		
		Power Cores	☐	☐	☐		
		Earth Cores	☐	☐	☐		
		Pilot cores	☐	☐	☐		
2.5 Splicing of conductors.	To be able to join all types of conductors found in mining cables.	Power cores	☐	☐	☐		
		Earth cores	☐	☐	☐		
		Pilot cores	☐	☐	☐		
		Screens	☐	☐	☐		
2.6 Splicing Methods.	To be able to demonstrate the ability to join cables and/or conductors using different methods.	Single ferrule	☐	☐	☐		
		Multi ferrule	☐	☐			
		Hot shot		☐	☐		
2.7 Soldering.	To be able to identify different types of solder and flux. Correct soldering methods.	Correct techniques	☐				
		Minimise migration	☐				
		Flux and solder requirements	☐				
		Correct use of PPE	☐				
2.8 Replacement of insulation or covering.	To understand the requirements and application of different types of repair materials.	Power cores	☐	☐	☐		
		Pilot cores	☐	☐	☐		
		Earth cores	☐	☐	☐		
		Outer sheath	☐	☐	☐		
2.9 Joining Pliable Armour.	To be able to return mechanical protection back to a suitable condition.	Join armour	☐	☐	☐		
		Alternative methods	☐	☐	☐		
2.10 Replacement of Sheath.	To be able to return sheath back to an as new condition to retain its electrical and mechanical properties.	Sheath construction – semi- con screened	☐	☐	☐		
		Sheath construction – metallic screened	☐	☐	☐		
		Sheath tapers	☐	☐	☐		
		Application of sheath repair tapes	☐	☐	☐		
2.11 Vulcanising.	To be able to identify when a repair has cured and completed repairs. How to test for hardness.	Vulcanising times	☐	☐	☐		
		Temperature requirements	☐	☐	☐		
		Hardness testing	☐	☐	☐		
		ID tag requirements	☐	☐	☐		

Typical questions and / or observations that may be asked / made to demonstrate competency in the majority of the essential elements of the cable repair module:

2.2 Cable Identification	1. Ask the applicant to identify the following cable types -275, 209.1, 241.1, 241.3, 260, 409, 441, 450
2.3 Repair Materials	1. What materials are used in the construction of the cable you are repairing? 2. Under what conditions are they stored? 3. Identify the following repair tapes - Semi Conductive, CSP repair tape, REP 90 repair tape.
2.5 Splicing of conductors - Joining Power Conductors	1 What criteria would you use to determine that sections of cable were suitable to be joined? 2 Demonstrate how you would prepare a cable to be spliced. 3 What are the other acceptable methods of splicing /joining cables? 4 Where / when is it permissible to use these alternate methods? 5 How would you set the lengths of the remaining conductors to coincide with the first conductor length? 6 What type of solder would you use for multi ferrule and single ferrule splices? 7 Where would you find the requirements for splicing cables?
2.5 Splicing of conductors - Joining Pilot Conductors	1 Demonstrate the methods used to join pilot conductors. 2 Where is solder used when joining pilots? 3 Are there any circumstances where a ferrule may be used to join a pilot?
2.5 Splicing of conductors - Joining Earth Conductors	1 Describe the types of earths used in the construction of cables. 2 Describe the methods that are acceptable when joining these earths.(demonstrate if possible) 3 With metallic earths how do you restore tension after repairs have been completed?
2.6 Splicing Methods	1 Demonstrate a single ferrule splice on a conductor 2 Demonstrate a multi ferrule splice on a conductor 3 Demonstrate a Hot / Shot splice on a conductor
2.8 Replacement of Insulation	1 Demonstrate & describe the steps in the preparation of a power conductor prior to the application of insulation. 2 Describe the differences present if the cable were: a) Semi-conductive screened. b) High Voltage. 3 Why is it important to ensure the cleanliness of the insulation? 4 What length would you cut the tapers on the insulation?
2.9 Joining Pliable Armour	1 Describe how you would join a pliable wire armoured cable. 2 Are there any alternatives & where may they be applied.
2.10 Replacement of Sheath	1 Explain the construction of the sheath component. 2 What is the essential difference in the construction of sheath for semi-conductive & metallic screened cables? 3 Demonstrate & explain how tapers are achieved on cable sheath. 4 Demonstrate how cable sheath is applied. 5 Explain any considerations you deem to be important when applying sheath.
2.11 Vulcanising	1 Demonstrate how you would set up a vulcaniser to vulcanise a repair. 2 What are common problems when vulcanising cables. 3 How would you determine that a cable was vulcanised. 4 Demonstrate the use of a Shore "A" Durometer. 5 What effect does an increase in cable CSA or voltage have on the vulcanising times?
Desirable Criteria	1 Task Methodology. 2 Housekeeping. 3 Safety & the application of safe working practices.

Assessment Results Form – Cable Repair Competency Module.

Assessors	
Name _____	Name _____
Comments from Assessors	
Comments from Applicant	
I _____ have received a copy of, and agree with, the Assessment Criteria for **'CABLE REPAIR'**	
starting on _____ Date _____	Signed _____
Assessment Result	
Competency achieved -YES / NO Signature Assessor _____ Date _____	
Competency achieved -YES / NO Signature Assessor _____ Date _____	
Signature Candidate _____	Date _____
Appeal Required YES / NO If YES, record # _____	Assessment agreed to by all parties YES / NO
Are any changes required to the Assessment process YES / NO If YES, record # _____	

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SECTION 3 – CABLE TESTING / FAULT FINDING

Competency requirements

Demonstration of competency - Cable Testing / Fault Finding

This provides a summary of each of the essential elements of this competency module. The assessment for this module can be done "in-house". The assessment must be done by a person or persons that satisfy the following criteria:

- Qualifications as a certificate IV assessor, and
- Qualifications as a class A competent person, with experience of managing a cable repair facility, or Competent Person – Cable Repairs (formerly Class B competent person - cable repairs).

Assessment	Description	Section Tasks	Training Completed / Competent			Date	Assessors Initials
			1.1KV	3.3/6.6KV	11KV		
3.1 Risk Assessment	To be able to identify and control risk.	Perform a risk assessment on a selected section within this Module	☐	☐	☐		
3.2 Cable History	To be able to access the history records and identify potential issues and to provide information to update records.	Access records	☐	☐	☐		
		Interpret records	☐	☐	☐		
		Update records	☐	☐	☐		
3.3 Electrical Terms	To be able to understand the electrical terms used when reading instruments and recording test results.	Open circuit	☐				
		Short circuit	☐				
		Meg, Gig ohms	☐				
		Resistance	☐				
		Voltage	☐				
		Current	☐				
3.4 Test Equipment	To understand how to read and safely operate test equipment. The correct application of test equipment when testing cables.	Ohm meter	☐				
		Megger	☐	☐	☐		
		Hi pot	☐	☐	☐		
		Sym load	☐				
		Discharge Stick	☐	☐	☐		
		Partial Break	☐				
3.5 Continuity and Phase Rotation	To be able to demonstrate the method of test and to understand and record the results of the test.	Purpose of phase rotation	☐				
		Circuit connections	☐				
		Power core resistance	☐				
		Earth core resistance	☐				
		Pilot core resistance	☐				

Assessment	Description	Section Tasks	Training Completed / Competent			Date	Assessors Initials
			1.1KV	3.3/6.6KV	11KV		
3.6 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	☐	☐	☐		
		Circuit connections	☐	☐	☐		
		Power core insulation	☐	☐	☐		
		Pilot core insulation	☐	☐	☐		
		Test voltages	☐	☐	☐		
		Fault finding	☐	☐	☐		
3.7 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	☐	☐	☐		
		Circuit connections	☐	☐	☐		
		Circuit connections	☐	☐	☐		
		Test Voltages and Times	☐	☐	☐		
		Discharging	☐	☐	☐		
		Fault finding	☐	☐	☐		
3.8 Partial Break Test	To be able to demonstrate the method of test and to understand the purpose of the test.	Purpose of Partial Break Test	☐	☐	☐		
		Circuit connections	☐	☐	☐		
		Fault Finding	☐	☐	☐		
		Test requirements	☐	☐	☐		
3.9 Symmetrical Load Test	To be able to demonstrate the method of test and to understand the purpose of the test.	Purpose of test	☐	☐	☐		
		Circuit connections	☐	☐	☐		
		Test requirements	☐	☐	☐		
3.10 Sheath Test	To be able to demonstrate the method of test and to understand the purpose of the test.	Purpose of test	☐	☐	☐		
		Circuit connections	☐	☐	☐		
		Test Voltages	☐	☐	☐		
		Test requirements	☐	☐	☐		

Typical questions and / or observations that may be asked / made to demonstrate competency in the majority of the essential elements of the cable testing and fault finding module:

3.1 Risk Assessment	Review a risk assessment completed by the applicant
3.2 Review of Cable History	1 Why should prior history test records be reviewed?
3.3 Electrical Terms	1 The applicant should be able to describe the following electrical terms. 2 Open circuit 3 Short circuit 4 Resistance 5 Voltage 6 Current 7 Demonstrate how you would take a reading from a Ohm meter 8 Demonstrate how you would take a reading from a Megger
3.5 Continuity & Phase Rotation	1 Why do you perform these tests? 2 How do you know that a) Power conductor is acceptable. b) Pilot conductor is acceptable. c) Earth conductor is acceptable. 3 How would you perform this test if you only had access to one termination? 4 Demonstrate how you would carry out this test. 5 Apart from conductors what other components are tested for continuity.
3.6 Insulation Resistance Test	1 Why are insulation tests performed? 2 When would you determine that a cable had failed this test? 3 Demonstrate how you would carry out this test. 4 What are the minimum allowable readings for the cable you are testing? 5 Do these readings vary with different voltages, cable constructions or lengths?
3.7 High Voltage Equipment	1 Where would you find requirements for electrical equipment used for tests? 2 How does a capacitor discharge unit (surge generator) locate a fault? 3 Demonstrate how you test/locate a cable/fault using this equipment. 4 Where would you find the information relating to the maximum pulse voltages for the cable you are testing? 5 Demonstrate the correct use of a discharge stick. 6 How would you apply the test voltage? 7 What are the requirements if you need to exceed the maximum voltage?
3.7 High Voltage Proof Test	1 What component part of a cable is tested by the High Voltage proof test? 2 Describe what happens during the test. 3 What are the test connections for the proof test? 4 Why are the connections made in this manner? 5 What type of voltage (AC/DC) does the test unit you are using utilise to perform the test? 6 Where are the selected test voltages listed? 7 Demonstrate how you would carry out this test.
3.8 Partial Break Test	1 Explain how the equipment locates a fault. 2 Demonstrate how the connections are made to the cable. 3 How do you determine where a fault is located? 4 What are the requirements if partial break testing armoured cables. 5 Could you test conductors in parallel? Explain your answer.
3.9 Symmetrical Load Test	1 What is the purpose of this test? 2 Demonstrate the test connections. 3 Explain how you would determine that the cable was faulty. 4 What would you do if the instrument indicated a fault?

3.10 **Sheath Test**	1 What voltage would you use for the cable under test? 2 How did you determine that the voltage was appropriate? 3 Do test voltages vary with cable construction? 4 Demonstrate how you would use this machine. 5 Why do we earth the earth and power conductors on the cable under test? 6 Explain why & how we rate the electrical cables condition.
Desirable Criteria	1 Task Methodology. 2 Housekeeping. 3 Safety & the application of safe working practices.

Assessment Results Form – Cable Testing / Fault Finding Competency Module.

Assessors	
Name _____	Name _____
Comments from Assessors	
Comments from Applicant	
I _____ have received a copy of, and agree with, the Assessment Criteria for **'CABLE TESTING / FAULT FINDING'**	
starting on _____ Date _____	Signed _____
Assessment Result	
Competency achieved -YES / NO Signature Assessor _____ Date _____	
Competency achieved -YES / NO Signature Assessor _____ Date _____	
Signature Candidate _____	Date _____
Appeal Required YES / NO If YES, record # _____	Assessment agreed to by all parties YES / NO
Are any changes required to the Assessment process YES / NO If YES, record # _____	

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SECTION 4 – PLUG / COUPLER INSPECTION, FITTING & COMPONENT REPLACEMENT

Competency requirements

Demonstration of competency - Plug / Coupler Inspection, Fitting & Component Replacement

This provides a summary of each of the essential elements of this competency module. The assessment for this module can be done "in-house". The assessment must be done by a person or persons that satisfy the following criteria:

- Qualifications as a certificate IV assessor, and
- Qualifications as a class A competent person, with experience of managing a cable repair facility, or Competent Person – Cable Repairs (formerly Class B competent person - cable repairs).

Assessment	Description	Section Tasks	Training Completed			Date	Assessors Initials
			1.1 KV	3.3/6.6KV	11KV		
4.1 Risk Assessment	To be able to identify and control risk.	Perform a risk assessment on a selected section within this Module		☐			
4.2 Plug / Coupler Identification	To be able to identify different types of plugs and couplers. Use of the correct Industry terms.	Restrained Plug	☐	☐	☐		
		Restrained Receptacle	☐	☐	☐		
		Bolted Coupler	☐	☐	☐		
		Bolted Adaptor	☐	☐	☐		
4.3 Plug / Coupler Inspection	External mechanical checks and interior, socket and gland checks.	External Checks	☐	☐	☐		
		Internal Checks	☐	☐	☐		
4.4 Plug / Coupler Phasing	To be able to identify the correct phasing for voltage, current and pin configurations.	125amp 660V - 1.1KV 4 pin	☐	☐			
		150 amp 660V - 11KV 4 pin	☐	☐	☐		
		300 amp 660V - 11KV 4 pin	☐	☐	☐		
		425 amp 660V - 11KV 4 pin	☐	☐	☐		
		300 amp 3.3KV 6 pin		☐			
		425 amp 3.3KV 6 pin		☐			

Assessment	Description	Section Tasks	Training Completed			Date	Assessors Initials
			1.1 KV	3.3/6.6KV	11KV		
4.5 Plug / Coupler Fitting	To be able to demonstrate the correct method of fitting plugs and couplers.	Core preparation	☐	☐	☐		
		Correct termination lengths	☐	☐	☐		
		Preparation of cores	☐	☐	☐		
		Soldering/Crimp Techniques	☐	☐	☐		
		Sheath Protrusion	☐	☐	☐		
		Sheath Clamping	☐	☐	☐		
		Creepage & Clearance	☐	☐	☐		
4.6 Cable Tails, Leads and Terminations	To be able to prepare, fit and inspect tails and Terminations.	Inspections	☐	☐	☐		
		Tails to metallic screened cables and conductive cables	☐	☐	☐		
		Terminations to metallic screened and conductive cables	☐	☐	☐		
4.7 Flame proofing Requirements	To be able to demonstrate basic knowledge of flame proofing requirements.	Understanding Exd. e. m	☐	☐	☐		
		Understanding Zone 0-1-2	☐	☐	☐		
		How flame paths are measured 'L' and 'l'	☐	☐	☐		
		Inspection of Flame paths	☐	☐	☐		
		Identification of corrosion	☐	☐	☐		
		Use of AS/NZS3800 corrosion curves	☐	☐	☐		

Typical questions and / or observations that may be asked / made to demonstrate competency in the majority of the essential elements of the Plug / Coupler Inspection, Fitting & Component Replacement module:

4.1 Risk Assessment	Review a risk assessment completed by the applicant
4.2 Plug / Coupler ID	Explain the difference between the following Restrained Plug, Restrained Receptacle, Bolted Adaptor, Bolted Coupler.
4.3 Plug / Coupler Inspection	1 Demonstrate how you inspect a plug or coupler. 2 Why do you inspect the earth sleeves & flanges? 3 How would you determine that a plug or coupler is unfit for service? 4 Where would you obtain information regarding plugs and couplers?
4.4 Plug / Coupler Fitting	1 Demonstrate how you prepare a cable to fit a coupler. 2 How do you know what length to strip back the sheath & insulation? 3 If you did not have any information on strip back lengths how would you determine appropriate lengths? 4 Explain the terms clearance & creepage and where they apply to couplers. 5 What does a dull crystallised texture on a soldered connection indicate? 6 Demonstrate a soldered connection. 7 What are the requirements for solder & flux? 8 When would you use an encapsulating compound in a coupler?
4.5 Plug / Coupler Phasing	1 How would you identify plug and coupler voltages? 2 Were would you find the information to check if the plug / coupler phasing is correct?
4.6 Cable Tails, Leads and Terminations	1 What inspections would you perform on cable tails and terminations? 2 Demonstrate the preparation of a set of tails. 3 Why is it important to include stress relief between the earth screens and power conductors on high voltage terminations? 4 Where would you find the strip back lengths for a termination?
4.7 Flame Proofing Requirements	1 Explain the terms Exd, Exe, Exm. 2 Why are the flameproof properties of plugs / couplers important? 3 Where would you find information for flame paths on plugs and couplers? *4* What is meant buy the terms Zone 0, 1, 2?
Desirable Criteria	1 Task Methodology. 2 Housekeeping. 3 Safety & the application of safe working practices.

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Assessment Results Form – Plug / Coupler Inspection, Fitting & Component Replacement Competency Module.

Assessors	
Name _____	Name _____
Comments from Assessors	
Comments from Applicant	
I _____ have received a copy of, and agree with, the Assessment Criteria for 'PLUG / COUPLER INSPECTION, FITTING & COMPONENT REPLACEMENT starting on _____ Signed _____ Date _____	
Assessment Result Competency achieved -YES / NO Signature Assessor _____ Date _____ Competency achieved -YES / NO Signature Assessor _____ Date _____ Signature Candidate _____ Date _____	
Appeal Required YES / NO If YES, record # _____	Assessment agreed to by all parties YES / NO
Are any changes required to the Assessment process YES / NO If YES, record # _____	

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SECTION 5 - CRITERIA FOR COMPETENCIES TO BE ASSESSED FOR ACCREDITATION AS A COMPETENT PERSON – CABLE REPAIRS

Before accreditation as a Competent Person – Cable Repairs, an applicant must be able to demonstrate competency in:

1. Repair of Electric Reeling and Trailing Cables including explosion protected cable fittings
2. Testing and fault location - Reeling and Trailing Cables including explosion protected cable fittings
3. Inspection and replacement of parts of explosion protected restrained and bolted couplers.

And

4. Successfully complete an oral examination encompassing the above.

1, 2 & 3 can be completed "in-house" at an approved cable repair workshop.
4, which is an oral assessment, is conducted by peer assessment to verify the candidate's knowledge.
Note 1: The candidate must have at least two years experience in repairing cables in accordance with AS1747 before sitting Module 4.

The "in-house" assessment for 1, 2 and 3 must be done by a person or persons that satisfy the following criteria:

- Qualifications as a certificate IV assessor, and
- Qualifications as a class A competent person, with experience of managing a cable repair facility, or Competent Person – Cable Repairs (formerly Class B competent person - cable repairs).

The assessment for module 4 must be done by a team of at least two persons. The team qualifications shall satisfy the following criteria:

- Qualifications as a certificate IV assessor, and
- Qualifications as a class A competent person, with experience of managing a cable repair facility, or Competent Person – Cable Repairs (formerly Class B competent person - cable repairs), and
- At least one person independent of the organisation for whom the candidate works.

When deemed competent by the above process, a candidate may apply to the NSW Department of Primary industries, Mine Safety to be accredited as a Competent Person – Cable Repairs (formerly Class B competent person - cable repairs). In applying for accreditation the candidate must supply the following information.

1. A completed assessment for CABLE REPAIRS (see Section 2 for requirements)
2. A completed assessment CABLE TESTING / FAULT FINDING (see Section 3 for requirements)
3. A completed assessment for PLUG / COUPLER INSPECTION, FITTING & COMPONENT REPLACEMENT (see Section 4 for requirements)
4. A completed assessment summary for Cable Repair Competency (see Section 5)
5. Copy of all questions and the associated answers for the Oral assessment.
6. A copy of assessors qualifications as a certificate IV assessor, and qualifications as a class A competent person, with experience of managing a cable repair facility, or Competent Person – Cable Repairs (formerly Class B competent person - cable repairs)
7. Evidence of at least one independent assessor used in the oral assessment

.

The following sections contain a summary of the competency criteria for achieving a recognised Competent Person – Cable Repairs (formerly Class B Competency Certificate in Cable Repairs) to AS/NZS1747. Modules 1,2 and 3 are internally assessed within Approved Workshops. Candidates must have 2 years experience in an Approved workshop before sitting for Module 4, which is an oral assessment, which is conducted externally to verify the candidate's knowledge.
Workplace Training / Assessment plans must be submitted with this document when applying for a Class B certificate to verify competencies.

SUMMARY OF OVERALL COMPETENCY

Company Information

Candidate Name _____
Nominated by _____

Company _____
Start Date _____

Contents

	Cable Testing / Fault finding	**Assessors Comments**	**Competent**
1.1	Risk Assessment		☐
1.2	Electrical Terms		☐
1.3	Test Equipment		☐
1.4	Continuity and Phase Rotation		☐
1.5	Insulation Resistance		☐
1.6	High Voltage Proof Test		☐
1.7	Partial Break Test		☐
1.8	Symmetrical Load Test		☐
1.9	Sheath Test		☐
	Cable Repair		
2.1	Risk Assessment		☐
2.2	Cable Identification		☐
2.3	Repair Materials		☐
2.4	Cable Preparation		☐
2.5	Splicing of Conductors		☐
2.6	Splicing Methods		☐
2.7	Soldering		☐
2.8	Replacement of Insulation and Sheath		☐
2.9	Vulcanising		☐
	Plug / Coupler Fitting		
3.1	Risk Assessment		☐
3.2	Plug / Coupler Identification		☐
3.3	Plug Inspection		☐
3.4	Plug Phasing		☐
3.5	Plug Fitting		☐
3.6	Cable Tails, Leads and Terminations		☐
3.7	Flame Proofing Requirements		☐
	Oral Assessment		
1.1	Oral Assessment		☐

Oral Assessment

Assessment Criteria has not been defined for this section (this could be formed by the assessors using the assessment tools / plans submitted with this document)
Knowledge of AS1747, AS1802, AS2802, AS1972, AS1299, AS1300, AS3800. etc.

Date _____

Examiners names _____ _____

_____ _____

Notes from Examiners

Standard / Clause	Comments	Initials

Candidate has Passed / Failed the Oral assessment

Name _____ _____

Signed _____ _____

Mineral Resources – Mine Safety
PO Box 344, Hunter Region Mail Centre NSW 2310
516 High Street, Maitland NSW 2320

ABN 51 734 124 190
www.dpi.nsw.gov.au
Tel: 02 4931 6666
Fax: 02 4931 6790

APPENDIX A

APPLICATION FOR ASSESSMENT OF COMPETENCIES FOR RECOGNITION AS A COMPETENT PERSON – CABLE REPAIRS

Mineral Resources – Mine Safety
PO Box 344, Hunter Region Mail Centre NSW 2310
516 High Street, Maitland NSW 2320

ABN 51 734 124 190
www.dpi.nsw.gov.au
Tel: 02 4931 6666
Fax: 02 4931 6790

TO: Secretary
Mines Qualifications Board
Mine Safety
A branch of the NSW Department of Primary Industries
PO Box 344
Hunter Regional Mail Centre
MAITLAND, NSW 2310

APPLICATION FOR ASSESSMENT OF

COMPETENCIES FOR RECOGNITION AS A COMPETENT PERSON – CABLE REPAIRS

I wish to be assessed as a **Competent Person – Cable Repairs**

SUBMISSION REQUIREMENTS: (please complete and submit all 3 pages of Appendix A, along with requested attachments).

PERSONAL DETAILS OF APPLICANT

Name: ……. ……
(SURNAME in block letters) (Other Names)

Date of Birth:…….. Place of Birth: …….

Home Address:

Applicant's Address: Street: ……

Town: …….. State: …….. Postcode: ……

Home Phone No: …….. email: ……

Employer's Details:

Name: ……

Street: ……

Town: …….. State: …….. Postcode: ……

Ph: …… fax: ……. email: ……

Manager / Supervisor / Sponsor: ……

APPLICANT'S EXPERIENCE:
(YOUR EMPLOYER IS TO PROVIDE A STATEMENT OF TOTAL PRACTICAL CABLE REPAIR RELATED WORK EXPERIENCE BELOW)

Employer	Dates		Category of Employment
	From	To	

SUBMISSION ATTACHMENTS: (the following items are essential submissions for the assessment to commence):

APPLICANT'S KNOWLEDGE:
DOCUMENTS ATTACHED (Attach Certified Copies and tick box for inclusion)

- ☐ A completed assessment for CABLE REPAIRS (see Section 2 for requirements)
- ☐ A completed assessment CABLE TESTING / FAULT FINDING (see Section 3 for requirements)
- ☐ A completed assessment for PLUG / COUPLER INSPECTION, FITTING & COMPONENT REPLACEMENT (see Section 4 for requirements)
- ☐ A completed assessment summary for Cable Repair Competency (see Section 5)
- ☐ Copy of all questions and the associated answers for the Oral assessment.

ASSESSORS DETAILS

- ☐ A copy of assessors qualifications as a certificate IV assessor, and qualifications as a class A competent person, with experience of managing a cable repair facility, or Competent Person – Cable Repairs (formerly Class B competent person - cable repairs)
- ☐ Evidence of at least one independent assessor used in Module 4

APPLICANT FEE:

I enclose a (cheque / money order / other ……..) for the sum of $150 (GST included).
Note: Mine Safety, A branch of the NSW Department of Primary Industries - ABN 51 734 124 190-003

_____

I declare that the above information is a true record of work undertaken by the named applicant during the period specified

Signed

I declare that the above information is true

Signed

Made and signed before me at

this day of

Signature of JP

Appendix B

AMENDMENTS

MDG2006 is to become a quality document. This will require amendments being carried out to facilitate this. When amendments are issued they will be numbered in sequence and dated with the subsequent reprint of the guide including the amendment in the text and the appendix.

The user of MDG2006 should:

1. Advise the editor of changes, errors or omissions.
2. Keep the guide up to date with the latest amendment.
3. Send to:

The Editor, MDG2006
Paul De Gruchy
Mine Safety Officer Electrical Engineering
PO Box 344
Hunter Regional Mail centre NSW 2320

AMENDMENT UP-DATE SHEET

AMENDMENTS			
No	**Date of amendment**	**Date entered**	**Entered by**
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			