

Sep 2023

## **Examiners' report**

# Electrical engineer of coal mines other than underground coal mines certificate of competence

Examiners' report 2023

## **Written examination**

CEE3 – Legislation, Australian Standards and electrical engineering applicable to open-cut mining

### **Summary of results and general comments**

Exam date: 13 September 2023

Number of candidates: 4

Number passed: 2

Highest mark: 77.5%

Average mark: 63.5%

Lowest mark: 49.6%

Marking criteria: A candidate must get 72 out of 120 (60%) to pass the exam and pass the essential questions.

The marks indicated that some candidates have adequate technical knowledge relevant to the Statutory role of Electrical Engineer. However, some candidates received 0/10 for certain sections within the exam indicating that they do not currently have a well-rounded understanding of the different aspects and required technical knowledge for the role.

### **Question 1 (total of 10 marks) ASNZS 2081**

Highest mark: 8

Average mark: 6.6

Lowest mark: 5

### **Examiners' comments:**

Candidates struggled with questions relating to TCC's. Electrical Engineers are expected to be able to read and understand TCC's.

## **Question 2 (total of 10 marks) Power transformer and oil sampling**

Highest mark: 10

Average mark: 7.5

Lowest mark: 4

### **Examiners' comments:**

This question was answered competently by most candidates. However, some candidates were unfamiliar with Buchholz protection.

## **Question 3 (total of 10 marks) Multiple Choice Question**

Highest mark: 9

Average mark: 7.4

Lowest mark: 4.5

### **Examiners' comments:**

Most candidates answered this question competently.

## **Question 4 (total of 10 marks) WHS(M&Ps) Reg 2022**

Highest mark: 4

Average mark: 3.4

Lowest mark: 1.5

### **Examiners' comments:**

All candidates struggled with this question. The development of site PHMP's often requires input from the site Electrical Engineer to ensure a thorough evaluation of associated risks. Numerous PHMP's cover elements that interact with the mines EECF i.e. Winders & F&E.

## **Question 5 (total of 10 marks) WHS Act – Consultation**

Highest mark: 8

Average mark: 5.3

Lowest mark: 0

### **Examiners' comments:**

This question was answered well by most candidates.

## **Question 6 (total of 10 marks) WHS Act – Duty of care**

Highest mark: 5

Average mark: 2.9

Lowest mark: 0

### **Examiners' comments:**

This question was answered poorly by all candidates.

### **Question 7 (total of 10 marks) Earthing and lightning**

Highest mark: 9

Average mark: 7.6

Lowest mark: 5.5

#### **Examiners' comments:**

Essential question. Candidate must get at least 6 out of 10 marks on this question to pass this question.

Most candidates answered this question adequately. All candidates lacked knowledge of testing requirements for XLPE cables.

### **Question 8 (total of 10 marks) Power Calculation**

Highest mark: 7

Average mark: 5.9

Lowest mark: 4

#### **Examiners' comments:**

This question was answered well by most candidates. However, candidates struggled with the vector diagram portion of the question.

### **Question 9 (total of 10 marks) Protection**

Highest mark: 7.5

Average mark: 5.6

Lowest mark: 4

#### **Examiners' comments:**

Essential question. Candidates must get at least 6 out of 10 marks on this question to pass this question.

Calculations were completed adequately by most candidates.

Some candidates struggled with the following:

- Selecting appropriate protection settings based off calculated values.
- Identifying minimum design ratings for equipment based off calculated values.

### **Question 10 (total of 10 marks) Switchboards**

Highest mark: 10

Average mark: 8.6

Lowest mark: 5.5

#### **Examiners' comments:**

This question was answered competently by all candidates.

### **Question 11 (total of 10 marks) Arc Flash**

Highest mark: 10

Average mark: 7.9

Lowest mark: 5.5

#### **Examiners' comments:**

This question was answered well by all candidates.

### **Question 12 (total of 10 marks) Introduction to site**

Highest mark: 10

Average mark: 7.6

Lowest mark: 2.5

#### **Examiners' comments:**

Most candidates answered this question well.

Some candidates left sections of this question blank suggesting they may have run out of time.

## **Oral examination**

Date: 29 November 2023

Number of candidates: 2

Number deemed competent: 1

#### **Examiners' comments:**

The successful candidates were able to demonstrate in each question they could communicate and apply their technical knowledge.

Candidates were presented 3 scenarios involving:

- An Arc Flash incident at a mine
- Life Cycle Management of Earthing Systems
- Management of Statutory Notices.

All candidates answered the incident and life cycle questions well. Some candidates struggled with demonstrating their knowledge and ability to manage statutory notices.

As a Statutory Electrical Engineer, it is foreseeable that you will be required to deal with and respond to Statutory Notices i.e. S23, S191, S195 etc. and as such candidates are expected to know the different notices and be able to demonstrate that they would respond to them appropriately.

## Post Oral examination

Date: 22 May 2024

Number of candidates: 1

Number deemed competent: 0

### Examiners' comments:

Two scenarios were presented to candidates involving:

- HV Network Configurations
- Statutory Notice Compliance and Management

Themes handled well by the candidate:

- Risk Management
- Interlocking and tap changer knowledge.

Improvement opportunities:

- Knowledge of fault levels and network configurations
- Change Management
- Commissioning processes
- A structured approach to addressing scenarios will benefit candidates.

## More information

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Mining Competence Team

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## Acknowledgments

Electrical engineer of coal mines other than underground coal mines examination panel

© State of New South Wales through Regional NSW 2024. The information contained in this publication is based on knowledge and understanding at the time of writing Jun 2024. However, because of advances in knowledge, users are reminded of the need to ensure that the information upon which they rely is up to date and to check the currency of the information with the appropriate officer of the Regional NSW or the user's independent adviser.