

# EXAMINER'S REPORT

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

July – October 2019

### Written examination

Summary of results and general comments

Examination date:	24 July 2019
Number candidates:	7
Number who passed:	5
Highest overall mark:	71.25%
Average overall mark:	60.24%
Lowest overall mark:	47.5%

### CEE3 – Legislation, Australian standards and electrical engineering applicable to open cut mining

#### Question 1 (total of 10 marks)

Highest mark:	8.5
Average mark:	6.5
Lowest mark:	2

#### Examiner's comments

The electric shock question was handled well by candidates. Several people were confused with the engineering controls used and struggled to develop an investigation plan to identify the voltage.

**Question 2 (total of 10 marks)**

Highest mark: 10

Average mark: 7.1

Lowest mark: 6

**Examiner's comments**

Most answered well, however some candidates struggled to develop an investigation plan to identify the voltage.

**Question 3 (total of 10 marks)**

Highest mark: 9.5

Average mark: 6.43

Lowest mark: 4.5

**Examiner's comments**

Answered well. Some candidates did not interpret the log scale correctly. The key objectives as listed in standard were not well known.

**Question 4 (total of 10 marks)**

Highest mark: 9

Average mark: 5.57

Lowest mark: 2

**Examiner's comments**

Mixed results for a question that involved calculations. Some got all sections correct, others confused MVA and MW in their calculations.

**Question 5 (total of 10 marks)**

Highest mark: 9

Average mark: 7.57

Lowest mark: 3

**Examiner's comments**

Insufficient knowledge of AS1674.2 and the classification of welding environments.

**Question 6 (total of 10 marks)**

Highest mark: 9.5

Average mark: 5.86

Lowest mark: 3.5

**Examiner's comments**

Poor knowledge of the detailed requirements for the Electrical Engineering Control Plan.

**Question 7 (total of 10 marks)**

Highest mark: 9

Average mark: 6.5

Lowest mark: 4

**Examiner's comments**

Identifying the key attributes of mining cable design is still not handled well across all candidates.

Workshop pre-repair test not well understood.

**Question 8 (total of 10 marks)**

Highest mark: 9

Average mark: 8.21

Lowest mark: 7

**Examiner's comments**

Generally, well answered.

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

Highest mark: 6

Average mark: 4

Lowest mark: 1

**Examiner's comments**

Candidates generally focused on describing what lifecycle management was; rather than identifying potential hazards associated with the introduction of the batteries and at what point in the 'lifecycle' they should be addressed.

Candidates should also answer questions in an engineering and not make general comments about ensuring it is safe.

### Question 10 (total of 10 marks)

Highest mark: 7

Average mark: 5.64

Lowest mark: 1

#### Examiner's comments

Candidates demonstrated lack of awareness of AS1768 as well as its content.

### Question 11 (total of 10 marks)

Highest mark: 6

Average mark: 4.57

Lowest mark: 1.5

#### Examiner's comments

Lack of detail provided on what to look for on a new circuit breaker to ensure it is compatible.

Lack of understanding on commissioning tests and expected results.

### Question 12 (total of 10 marks)

Highest mark: 5.5

Average mark: 3.71

Lowest mark: 2

#### Examiner's comments

Lack of understanding of the main electrical standards. Missed practical introduction to site requirements. Lack of knowledge of mobile equipment drive systems.

## Oral examination

Date: 16 October 2019

Number of candidates: 6

Number deemed competent: 1

## Comments

For the oral examination the examiners asked three questions:

The first question involved reviewing a series of photographs of electrical installations. The candidates were asked to identify potential hazards they saw as the Electrical Engineer. All candidates were able to identify obvious visible hazards and non-conformances. However most struggled to recognise these as visual cues for significant underlying engineering issues that may pose a risk to workers.

The second question involved a scenario based on an expansion project that was taking place at a mine that you had recently been employed at as the Electrical Engineer. The expansion was in relation to infrastructure upgrades to the office block, maintenance workshop and bath house and included the installation of a VSD pump to maintain water pressure and the installation of a large UPS. The examiners were looking at the candidates' approach to assuring themselves that the project risks had been identified and treatment plans were in place. All candidates acknowledged the design risk assessment, power system and scope of work. However, some candidates struggled to acknowledge all the tools available to them for tracking and auditing the project plan and addressing issues associated with the VSD and UPS.

The third question involved the recent electric shock incidents involving test equipment that were reported in the weekly summary updates. The question involved, the candidates previously reviewing the incidents and what they would do as the Electrical Engineer to review and develop their systems to complete similar tasks. All candidates reported that they received the weekly summaries and gave responses. A percentage of the candidates answered the question from a lower level, they did not structure a response from Electrical Engineers' perspective. Some answered this question with a structured approach and to a satisfactory level.

## Overall:

The results of the oral exams were generally a reflection of the written exam results, with many candidates failing to demonstrate a structured approach to addressing the scenarios presented or display a sound understanding of key engineering principles associate with electrical protection and earthing.

Candidates presenting for the oral exam should review their written exam results, identify and address any areas of weakness. When responding to questions, candidates should pitch their responses as an Electrical Engineer and not as a tradesperson.

## More information

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## Acknowledgments

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

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