

MINE ELECTRICAL ENGINEER CERTIFICATE OF COMPETENCE |
MARCH – MAY 2014

Examination panel report

November 2014

Summary of results and general comments

In the opinion of the examiners, some candidates are sitting the examination too early in their careers in the hope that they will get through the process. Many candidates are passing the written exam by as little as half a mark. In many cases these candidates are then failing their three oral attempts and then having to sit the examination again. Those who have had relevant experience and prepared well are able to use their experience in how they approach the answers and not just try and make an answer up on the spot.

It is well understood by the examiners that the oral test can be a nervous situation however, the examiners try to give time to allow the candidate to relax and present their answers in an engineering manner. The examiners prepare questions beforehand and expect the candidate will start to answer the question at a basic level. The question will then extend to seek a greater knowledge of the subject. The examiners feel that many candidates require leading to the technical part of a question and are not arriving there by their own line of answers.

The examiners are looking for the candidates to demonstrate their "thought process" coupled with their technical knowledge and experience to work their way through the issue. Answers can vary but risks and acceptable risks are always present and often managed in many ways.

Written examination

Date: 6 March 2014

Total number examined: 5

New candidates 0

Candidates resitting: 5

Statistics

CEE1 Application of electrical engineering to mining	
Number of candidate examined	2
Number of candidates that passed	1
Paper CEE1 is marked out of	50 (Note: usually out of 60. One question duplicated)
All questions are of equal value	10 marks
Minimum mark obtained	25.5
Maximum mark obtained	30.5
Average mark obtained	28
Pass mark	30 (60%)

Question	Minimum mark	Maximum mark	Average mark	Comments
1	5.5	6	5.75	Candidates generally know the site voltage and MVA rating of a typical mobile station. The time/current graph was not well answered with curves being placed on the wrong side of the TX curve.
2	4	4.5	4.25	Candidates did not appear to read the question properly. Provisions for HV work in cl19 are clear. Considerations under s7 of AS3007 are also clear.
3	7	8.5	7.75	Overall candidates answered the question in line with MDG33.
4				Duplicated question.
5	3	8.5	5.75	Generally the question was answered adequately. This cable information question should produce a better result as it is a fundamental need.
6	4.5	4.5	4.5	The candidates did not understand the requirements of AS3010.

CEE2 – Legislation and standards applicable to underground coal mines

Number of candidates examined	5
Number of candidates that passed	4
Paper CEE2 is marked out of	120
All questions are of equal value	10 marks
Minimum mark obtained	65
Maximum mark obtained	80
Average mark obtained	74
Pass mark	72 (60%)

Question	Minimum mark	Maximum mark	Average mark	Comments
1	3	7.5	5.6	Mixed understanding of basic needs. People still need to understand the fundamentals required.
2	3.5	9	6	Cable management is a common theme and a fundamental need. Still there are mixed answers being shown.
3	5.5	8.5	7.2	Most candidates answered well. Message on electrical work on energised conductors is sinking in.
4	5.5	7.5	6.2	This question was reasonably well answered but only basic understanding exhibited. Not enough technical knowledge.
5	3	7.5	5.9	Answered reasonably. Importance of combined earth and pilot resistance not well understood.

Question	Minimum mark	Maximum mark	Average mark	Comments
6	0	7	2.9	There was little understanding of the requirements for inverter installations.
7	1.5	7.5	4.3	Overall poorly answered. Engineers should have sound knowledge of primary duty of care and requirements of 1674.2.
8	5.5	7	5.9	The candidates had an adequate understanding of legislative/standard requirements.
9	6	10	7.6	Candidates answered the question well overall with some mixing up the ANZEx, AUSEx and IECEEx.
10	6.5	8	7.2	This was a repeat question and reasonably well answered, as it should be.
11	3.5	10	7.7	Range of answers given in this question. Part B asked for 'with the aid of any sketches describe your understanding of the relationship of the Act and Reg'. Many candidates failed to adequately describe the relationship.
12	5	10	7.4	An improvement in understanding of I.S. entity concepts has been noted over last few exams.

CEE3 – Legislation and standards applicable to surface coal mines

Number of candidates examined	1
Paper CEE1 is marked out of	120
All questions are of equal value	10 marks
Pass mark	72 (60%)
Comments	Due to only one candidate sitting paper, CEE3 statistics and comments on performance are not provided.

Oral examination

Date: 1 May 2014

Total number examined: 5

Post oral candidates 3

Passed: 2

Comments

Generally the candidates showed a limited technical knowledge of the basics in electrical engineering when answering the questions.

The switchyard scenario question did show a great deal of difference between candidates and none of them really handled it well or demonstrated a sound understanding of critical issues involved. It was surprising to the examiners that the candidates did not use the correct symbols when they were drawing the components within the switch yard.

Few candidates were able to demonstrate a sound understanding of project management.

Oral questions are based on events or issues managers of electrical engineering/qualified electrical engineers have or are currently facing.

All orals were opened with the examiners introducing themselves and the candidate giving a brief update of their role and what they had done since passing the written or failing the last oral. Any first time candidates were questioned on any aspect of the written that they had performed poorly in.

Questions examined in the oral examinations

Underground

Question 1

Candidates were given a sketch of a proposed new high voltage switch yard showing two transformers and a switch room. They were asked to draw what they would expect to see within the switchyard, switch room and at the point of attachment.

The question developed into:

- How earthing was achieved
- The size of the transformers
- Positioning and rating of NER/NERs
- What operational issues could be foreseen that would affect future maintenance?

Earthing and NER configuration was not answered well in some cases.

Question 2

This question was based on the arrangements at Newstan and Awaba mines. Candidates were asked to introduce a second underground 11kv feeder from a mine adjacent to their mine. The question expanded into how the project would be managed and what role the manager of electrical engineering would take.

Some candidates did not demonstrate sound project management skills.

Question 3

The third question involved the candidate, in the role of manager of electrical engineering, receiving a call from the longwall following relocation further into the mine. The information given was that the face lights were flashing when large plant started and there were issues when the shearer started with other plant dropping out.

The examiners were looking for a practical approach that started by looking at what was happening and what approach they would take. The examiners were looking for candidates to start with the basics by checking that the transformer's tap settings were correct, and the face start-up sequence was correct, to whether the surface power factor correction plant or automatic tap changers were working correctly.

Question 4

The final question presented a situation where, as the manager of electrical engineering, the candidate came across an electrician conducting live testing on the surface. The question looked at how the candidate would manage this situation.

The answers given by candidates varied for this question and most treated contract electricians differently. The examiners were looking to see whether the candidate knew the respective work health & safety Regulations, how they would implement them and what options were open to them.

Surface

Question 1

Candidates were given a sketch of a proposed new high voltage switch yard showing two transformers and a switch room. They were asked to draw what they would expect to see within the switchyard, switch room and at the point of attachment.

The question developed into:

- How earthing was achieved
- The size of the transformers
- Positioning and rating of NER/NERs
- What operational issues could be foreseen that would affect future maintenance?

Earthing and NER configuration was not answered well in some cases.

Question 2

Candidates were asked to relocate a face shovel from one mine to another mine, the route in which the shovel had to travel included travelling through a live powerline, main road and creek.

The question involved project management, identifying who would be involved with the relocation and engineering aspects the qualified electrical engineer would face in his role.

Question 3

The third question involved the candidate, as the qualified electrical engineer, receiving a call from the dragline/shovel, following relocation further into the mine, that there were issues when the plant started with other plant dropping out.

The examiners were looking for a practical approach that started by looking what was happening and what approach they would take. The examiners were looking for candidates to start with the basics from checking tap settings to looking whether surface power factor correction plant or automatic tap changers were working correctly.

Question 4

The final question presented a situation where, as the qualified electrical engineering, the candidate came across an electrician conducting live testing on the surface. The question looked at how the candidate would manage this situation.

The answers given by candidates varied for this question and most treated contract electricians differently. The examiners were looking to see whether the candidate knew the respective work health & safety Regulations, and how they would implement them and what options were open to them.

More information

Business Processes & Authorisations

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Acknowledgments

Steve Bentham, Inspector of Electrical Engineering and convenor of the Mine Electrical Engineer Examination Panel

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