



MINE MECHANICAL ENGINEER CERTIFICATE OF COMPETENCE |  
MARCH – MAY 2014

# EXAMINATION PANEL REPORT

14 July 2014

## Summary of results and general comments

### Applications

Number applied: 8 (5 underground and 3 surface candidates)

Number approved: 7 (5 underground and 2 surface candidates)

Overall comments:

- Candidates need to demonstrate work experience as required in the application form with respect to: supervision, installation, commissioning, ongoing maintenance and testing of plant
- The examination panel advises candidates to exceed the on the job experience level rather than making application with only the bear minimum experience levels. It is evident from the answers being provided when candidates apply with the minimum level of experience.
- Candidates need to spend time at other locations/mines to broaden their knowledge and outlook.

## Written examination

### DATA

Dates: 6 March 2014

Location: Kurri Kurri TAFE

Underground candidates: 4

Surface candidates: 2

Total candidates: 6

Examination Papers:

- CME1 Underground Mechanical practices
- CME2 Underground legislation
- CME3 Surface Coal Mechanical practices

### RESULTS

Passed:

- CME1: 2
- CME2: 2
- CME3: 2

Highest Mark:

- CME1: 188.5 marks
- CME2: 88 marks
- CME3: 141.5 marks

Average Mark:

- CME1: 170 marks
- CME2: 69 marks
- CME3: 132.5 marks



## **CME1 Underground mechanical practices**

CME1 paper required 5 out of 8 questions to be answered. Q1 to Q4 were compulsory with the remaining question to be selected from Q5 to Q8. All questions are worth a total of 60 marks.

### **QUESTION 1 - Compulsory**

This question revolved around MDG 1032 *Guideline for the prevention, early detection and suppression of fires in coal mines*. The question was broken down into six sections from within the sections of MDG 1032.

Recommendations: Candidates need to be aware of the relevant section of MDGs which require Mechanical Engineering input.

Highest mark: 36  
Lowest mark: 12  
Average mark: 24

### **QUESTION 2 - Compulsory**

A scenario question featuring a RTV that failed to shut down when overheating. You are required to investigate this incident and answer a series of questions relating to the failure.

Recommendations: Incident investigation is a key role of a Manager of Mechanical Engineering in determining causal factors to prevent reoccurrences. Candidates should have a sound understanding of incident investigation techniques.

Highest mark: 44  
Lowest mark: 28  
Average mark: 38.5

### **QUESTION 3 - Compulsory**

This question is designed to test the candidate's general knowledge on topics and subjects within the mining industry.

Recommendations: Part of the candidate's preparation should be to review MDGs, Guidelines and relevant standards commonly used by the mining industry to help develop their basic knowledge.

Highest mark: 48  
Lowest mark: 32  
Average mark: 42

### **QUESTION 4 - Compulsory**

This question was around the upgrade of the main drift belt at your mine. The existing belting was to be replaced with a steel cord construction belt.

Recommendations: Candidates need to be aware of the different types of conveyor belting constructions as well as their care and maintenance in preventing catastrophic failures. Although steel cord belting is not common for everyday use they do play a significant role in drift belt applications and/or long highly loaded overland conveyors.

Highest mark: 40  
Lowest mark: 13  
Average mark: 28.75

### **QUESTION 5 – Elective**

Attempted by 1 candidate

This question looked at construction zones on the surface of a coal operation, including a list of activities being undertaken. The works included excavation works, demolition, asbestos removal, working at heights and the cladding of rooves and walls of buildings. Candidates were asked a series of questions specific to these activities.

Recommendation: Candidates need to be aware of the requirements for construction works being undertaken at a coal operation, this would include awareness of the codes of practice referred to in this application.

Highest mark: 45  
Lowest mark: 45  
Average mark: 45

### QUESTION 6 – Elective

Attempted by 1 candidate

Candidates were given an incident scenario involving a rubber Tyred vehicle (RTV) transporting supplies from the surface to the longwall face, a distance of some 14kms. Checks had revealed a number of failures including delamination, side wall failures and incidences of overheating.

Recommendation: Candidates need to understand the limitations placed on tyres so they can fully investigate the modes of failure and implement prevention techniques.

Highest mark: 20  
Lowest mark: 20  
Average mark: 20

### QUESTION 7 – Elective

Attempted by 2 candidates

Candidates were given a list of longwall components being overhauled at the mine during the longwall relocation. Candidates were asked to identify hazards and implement controls associated with the scope of works. Included was types of isolation as well as energy sources being used to assist with the scope of works.

Recommendation: Candidates need a sound understanding of hazard identification, risk control techniques, together with methods of energy isolation/dissipation.

Highest mark: 53  
Lowest mark: 30  
Average mark: 41.5

### QUESTION 8 – Elective

Attempted by 0 candidates

Candidates were given a work scope for the repairs to an underground below seam bin. Candidates were asked a series of questions relating to the hazards and control measures as well as specific challenges associated with below seam bins. There was a particular focus the replacement and ongoing maintenance of the liner plates within the bin.

Recommendation: Underground storage systems whether it is above seam or below seam bin have their own inherent hazards and risks. Candidates need to familiarise themselves with bins as they tend to be a forgotten piece of infrastructure at a coal operation.

Highest mark: X  
Lowest mark: X  
Average mark: X

## CME2 Underground legislation

All questions were to be attempted and all were worth a total of 20 marks.

### QUESTION 1

This question was from WH&S Regs 2011 "Duties of a manufacturer". A scenario question where a Consultant Design Engineer designed a hydraulically operated air and water hose reeler for the supply of air and water to the development panel's continuous miner. As Manager of Mechanical Engineering you

were provided with all the required information and drawings from the designer. The question required you to outline the specific duties of a PCBU that manufacture plant and how you intend on fulfilling your role.

Recommendation: As the Manager of Mechanical Engineering you need to understand the roles and responsibilities of all people involved in the supply chain of plant.

Highest mark: 17  
Lowest mark: 17  
Average mark: 17

## QUESTION 2

This question was from WH&S Regs 2011, "Review of control measures". Candidates were required to provide a list of conditions which would lead to a review of control measures and how this would be best achieved.

Recommendations: As Manager of Mechanical Engineering you need to be familiar with the changes in circumstances which would warrant a review of existing control measures

Highest mark: 14  
Lowest mark: 4  
Average mark: 9.5

## QUESTION 3

This question was from CMH&S Regs 2006, "Mechanical Engineering Management Plan" subclause (viii). Candidates were asked to describe in their own words how they would best achieve the requirements of Subclause (viii)

Recommendation: Candidates need to be able to interpret the requirements of clauses of legislation and how to best apply them, not just copy or paste words directly from legislation when answering the questions.

Highest mark: 18  
Lowest mark: 4  
Average mark: 11.5

## QUESTION 4

This question was from CMH&S Regs 2006. Candidates were asked a series of questions regarding the reviewing and amending of the Mechanical Engineering Management Plan.

Recommendation: Candidates need to understand the process of reviewing together with amending and the notification of any changes to the current Health and safety management plans.

Highest mark: 19  
Lowest mark: 13  
Average mark: 15

## QUESTION 5

Candidates were provided with a copy of Gazettal No 38 "Diesel Fuel Used Underground" and asked a series of questions from within the Gazettal as to how you would implement, ensure compliance and audit the outcomes.

Recommendation: Candidates need to be aware Gazettal's form part of the legislative framework and have standing within the law.  
Therefore candidates need to be able to interpret the requirements and implement the conditions of the Gazettal.

Highest mark: 20  
Lowest mark: 6

Average mark: 14.5

### **CME3 Surface coal mechanical practices**

CME3 contained two parts; Part A was open book while Part B was closed book. Each question was worth 25 marks. Part A contained questions 1 through to 3. Part B contained questions 4 through to 8.

#### **QUESTION 1**

This question was from WH&S Regs 2011 “Duties of a manufacturer”. A scenario question where a Consultant Design Engineer designed a hydraulically operated air and water hose reeler for the supply of air and water to the development panel’s continuous miner. As Manager of Mechanical Engineering you were provided with all the required information and drawings from the designer. The question required you to outline the specific duties of a PCBU that manufacture plant and how you intend on fulfilling your role.

Recommendation: As the Manager of Mechanical Engineering you need to understand the roles and responsibilities of all persons involved in the supply chain of plant.

Highest mark: 25  
Lowest mark: 20  
Average mark: 22.5

#### **QUESTION 2**

This question was from CMH&S Regs 2006, “Mechanical Engineering Management Plan” subclause (viii). Candidates were asked to describe in their own words how they would best achieve the requirements of Subclause (viii).

Recommendation: Candidates need to be able to interpret the requirements of clauses of legislation and how to best apply them not just copy or paste words directly from legislation when answering the questions.

Highest mark: 20  
Lowest mark: 20  
Average mark: 20

#### **QUESTION 3**

This question was from CMH&S Regs 2006. Candidates were asked a series of questions regarding the reviewing and amending of the Mechanical Engineering Management Plan.

Recommendation: Candidates need to understand the process of reviewing together with amending and the notification of any changes to the current Health and safety management plans.

Highest mark: 21  
Lowest mark: 19  
Average mark: 20

#### **QUESTION 4**

This question is designed to test the candidate’s general knowledge on topics and subjects within the mining industry.

Recommendations: Part of the candidate’s preparation should be to review MGDs, Guidelines and relevant standards commonly used by the mining industry to help develop their basic knowledge.

Highest mark: 17.5  
Lowest mark: 16.5  
Average mark: 17

### QUESTION 5

This question revolved around MDG 1032 *Guideline for the prevention, early detection and suppression of fires in coal mines*. The question was broken down into six parts from within the sections of MDG 1032.

Recommendations: Candidates need to be aware of the relevant section of MDGs which require Mechanical Engineering input.

Highest mark: 13  
Lowest mark: 8  
Average mark: 10.5

### QUESTION 6

This question looked at construction zones on the surface of a coal operation which included a list of activities being undertaken. These include excavation works, demolition, asbestos removal, working at heights and the cladding of roofs and walls of buildings. Candidates were asked a series of questions specific to these activities

Recommendation: Candidates need to be aware of the requirements for construction works being undertaken at a coal operation, these would include awareness of all relevant codes of practice applicable to the works being carried out.

Highest mark: 23  
Lowest mark: 13  
Average mark: 18

### QUESTION 7

Candidates were asked a series of question around hazard identification and risk controls associated with the operation and maintenance of a large drag line.

Recommendation: Candidates need a sound understanding of hazard identification and the assessment of risks together with the implementation of controls.

Highest mark: 15  
Lowest mark: 10  
Average mark: 12.5

### QUESTION 8

This question was around the upgrading, operation and maintenance of the main overland conveyor at your mine. The existing belting is to be replaced with a steel cord construction belt.

Recommendations: Candidates need to be aware of the different types of conveyor belt construction as well as their care and maintenance in preventing catastrophic failures. Although steel cord belting is not common for everyday use they do play a significant role in long highly loaded overland conveyors.

Highest mark: 20  
Lowest mark: 4  
Average mark: 12

## Oral examination

### Underground

Dates:	15, 20 & 21 May 2014
Candidates eligible:	17
Candidates examined:	9
Deemed Competent:	4

### Surface Operations

Dates:	14 May 2014
Candidates eligible:	5
Candidates examined:	5
Deemed Competent:	3

## Oral examination: Areas of discussion

### Underground Topics

- Written examination review 1st candidates
- Roles of MME
- Introduction to site for new plant
- Winders
- Safety bulletin 12-01 "In-service failures of explosion protected diesel engine systems during 2010 and 2011"
- Incident investigation "crane rollover"

### Surface Topics

- Written examination review 1st candidates
- Roles of MME
- Introduction to site for new plant
- Fluid power isolation (braking circuit electric trucks)
- Incident investigation "crane rollover"

## More information

[Business Processes & Authorisations](#)

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## Acknowledgments

[Mine Mechanical Engineer Examination Panel](#)

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