



**EXAMINATION PANEL REPORT FOR  
MINE MECHANICAL ENGINEERS August 2013**

**APPLICATIONS**

<b>Number applied: 18</b> 12 underground candidates, 6 surface operations candidates	<b>Number approved: 18</b> 12 underground candidates 6 surface operations candidates
<b>Overall comments:</b>	
<ul style="list-style-type: none"> <li>· Candidates need to ensure their applications are completed correctly and contain all required documentation</li> <li>· Candidates need to demonstrate work experience as required in the application form with respect to: supervision, installation, commissioning, ongoing maintenance and testing of plant</li> <li>· The examination panel advises all candidates to exceed the on-the-job experience level rather than making application with only the bare minimum experience</li> </ul>	

**WRITTEN EXAMINATION**

<b>Dates:</b>	21 August 2013
<b>Location</b>	Kurri Kurri TAFE
<b>Total number of candidates</b>	17
<b>Number of candidates: underground</b>	11
<b>Number of candidates: surface operations</b>	6
<b>Passed CME 1</b>	10
<b>Passed CME 2</b>	7
<b>Passed CME 3 surface ops</b>	4
<b>Highest mark CME 1</b>	201 marks
<b>Highest mark CME 2</b>	79 marks
<b>Highest mark CME 3 surface ops</b>	137.5 marks
<b>Average mark CME 1</b>	191.18 marks
<b>Average mark CME 2</b>	72.21 marks
<b>Average mark CME 3 surface ops</b>	126.7 marks
<b>Examination papers</b>	
<ul style="list-style-type: none"> <li>· CME 1 Underground mechanical practices</li> <li>· CME 2 Underground legislation</li> <li>· CME 3 Surface coal mechanical practices</li> </ul>	
<p>- <b>Analysis of questions: CME 1</b> Underground mechanical practices 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.</p>	

**Q1. Total marks = 60****Compulsory question:**

This question was written about overhauling powered roof support at a coal operation during a longwall relocation. Candidates were asked questions regarding prioritising works, consulting documentation to be used, methods to manage risks, competencies assessment of trades working on the plant, supervision of works over the scheduled period (10 days x 24 hours) and auditing of the health and safety systems.

**Recommendations:**

Candidates needed a good understanding of project management as well as program execution. This included the use of reference material, use and control of specialised contractors, including the environment and the overall assurance works are being completed in accordance with the mine SOPs and HS&E management plan.

**Total highest mark = 44****Total lowest mark = 26****Total average mark = 36.18****Q2. Total mark = 60****Compulsory question**

This question looked at the acquisition of new RTVs through a tendering process. Candidates were asked questions about the development of the tender specification using referencing material, the type of information tenderers provide, training processes offered for new technology introduced to site, the overall evaluation of the plant and resolution of ongoing EXDes failures.

**Recommendations:**

Candidates needed to understand the plant procurement process to ensure when plant arrived on site as far as reasonably practicable it was fit for purpose, and a process was established to provide ongoing training for maintenance personnel when new technology was introduced. The plant needed to be evaluated to ensure it met the expectation of the operation and any continuous problems were resolved in a timely manner.

**Highest mark = 42****Lowest mark = 18****Average mark = 31.91****Q3. Total marks = 60****Compulsory question****Multiple choice:**

This question was designed to test the candidates' general knowledge on topics and subjects within the mining industry.

**Recommendations:**

Part of the candidates' preparation should be to review MGDs, guidelines and relevant standards commonly used by the mining industry to help develop basic knowledge.

**Highest mark = 52**  
**Lowest mark = 40**  
**Average mark = 45.09**

**Q4 Total marks = 60**

**Compulsory question**

This question was written about an incident in which a pedestrian was injured when hit by a load haul dump (LHD) vehicle.

**Recommendations:**

Candidates needed a sound knowledge of incident/accident investigation, identification of casual factors, the development and implementation of investigation outcomes, plant auditing and the introduction of protected systems that would alert operators to potential vehicle/pedestrian interaction.

**Highest mark = 44**  
**Lowest mark = 33**  
**Average mark = 37.82**

**Q5 Total marks = 60**

**Elective question: attempted by three candidates**

A scenario was written around a coal operation receiving a government official's Improvement Notice related to a series of notifiable events on the operation's coal clearance (conveyor) system.

Candidates were asked questions relating to installation, settings, testing and continuous monitoring and effectiveness from a list of field devices found on a coal clearance system.

**Recommendation:**

Candidates needed to have a good knowledge of the requirements of AS 1755 and *Coal Mine Health and Safety Regulation 2006* for the safe operation of conveyors operating in an underground environment or reclaim tunnels. These would include all the types of protective devices, location and operational parameters.

**Highest mark = 46**  
**Lowest mark = 38**  
**Average mark = 43.33**

**Q6 Total marks = 60**

**Elective question: attempted by four candidates**

This question was written about a change in the mining process that has led to an increase in the number of drill rods failing due to bending, potentially increasing the risk to operators of such equipment.

**Recommendation:**

Candidates needed to understand the process of investigation and implementation of engineering controls in an effort to prevent serious injury. The candidates need to understand the benefits of change management in assessing this type of incident.

**Highest mark = 42**  
**Lowest mark = 33**  
**Average mark = 37.25**

**Q7 Total marks = 60**

**Elective question: One candidate attempted this question**

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

**Recommendation:**

Candidates needed to be aware of the requirements for construction works being undertaken at a coal operation. These included awareness of the codes of practice referred to in this application.

**Highest mark = 37**  
**Lowest mark = 37**  
**Average mark = 37**

**Q8 Total marks = 60**

**Elective question: Two candidate attempted this question**

The candidates were asked to describe the actions of a series of protection devices associated with drift winders. Candidate were also asked to describe methods of inspecting and testing haulage ropes, discussing the advantages and disadvantages as well as the operations of various brake functions on a drift haulage system.

**Recommendation:**

Rope haulage systems are high-risk plant and as such candidates should be familiar with the associated MDGs, Australian Standards and codes of practice controlling the safe use of powered winding systems.

**Highest mark = 41**  
**Lowest mark = 36**  
**Average mark = 42**

#### **- Analysis of questions: CME 2 Legislation**

This examination saw a change in the format of the legislation paper. For the second time the examination was in the open book format. Candidates were allowed access to Work Health and Safety and Coal Health and Safety legislation. Candidates were required to answer five out of five questions, with two questions being selected from Work Health and Safety Regulations, two questions were selected from *CMHSR 2006* and one question related to a Gazettal notice that was provided as part of the open book format.

**Q1. Total marks = 20**

**Compulsory question**

***WH&S Regulation 2011***

Part 3.1 "Managing risk to health and safety"

**Recommendation:**

This question required candidates to identify the roles and responsibilities of the duty holder, together with the control of risks to health and safety if not reasonably practical to do so and ongoing maintenance of the implemented control measures.

**Highest mark = 20**

**Lowest mark = 14**

**Average mark = 17.43**

**Q2. Total marks = 20**

**Compulsory question**

***WH&S Regulation 2011***

Part 4.3 "Confined spaces"

**Recommendations:**

Candidates needed to have an appreciation for the overall management of confined spaces, as well as the responsibilities of the duty holder (PCBU) to ensure they were compliant with the legislative requirements.

**Highest mark = 17**

**Lowest mark = 5**

**Average mark = 12.0**

**Q3 Total marks = 20**

**Compulsory question**

***Coal Mine Health & Safety Regulations 2006***

"Diesel particulate matter"

**Recommendation:**

Diesel particulate matter has been identified as a major health hazard and requires a number of specific control measures. Mechanical Engineers are required to participate in the control of diesel particulate and should have a good knowledge of the subject.

**Highest mark = 18**

**Lowest mark = 6**

**Average mark = 12.43**

**Q4 Total marks = 20**

**Compulsory question**

***Coal Mine Health & Safety Regulations 2006***

"Isolation arrangements"

**Recommendation:**

Energy isolation is a major hazard management control. Candidates needed to be conversant with their site's "Isolation Management plan", the different methods of isolation together with the various energy sources requiring isolation.

**Highest mark = 19**

**Lowest mark = 10**

**Average mark = 15.14**

**Q5 total marks = 20**

**Compulsory question**

**Gazettal No 24 dated 2 February 2007**

“Requirements for design registration of powered winding systems”

Candidates were asked to interpret the gazettal with respect to alterations to a powered system, together with the competency of the verifier and the meaning of “functional safety approach”.

**Recommendation:**

Plant that is design registered e.g. (powered winding systems) cannot be altered or upgraded without going through a formal process. Candidates needed to be fully conversant with the required process as well as the competency requirements of the verifier.

**Highest mark = 20**

**Lowest mark = 11.5**

**Average mark = 15.21**

- **Analysis of questions: CME 3 surface mechanical practices**

This year for the second time the paper was broken into two parts, A and B with both parts being compulsory.

Part A: Legislation - this section consisted of three questions and was open book format. This allowed candidates to refer to the *WH&S Regulation* and *CMH&S Regulation* in answering the questions.

Part B: Mechanical practices - this section was closed book format and consisted of five questions.

**Part A Compulsory question “open book format”**

**Q1.Total marks = 25**

***WH&S Regulation 2011***

Part 3.1 “Managing risk to health and safety”

**Recommendation:**

This question required the candidates to identify the roles and responsibilities of the duty holder, together with the control of risks to health and safety if not reasonably practical to do so and ongoing maintenance of the implemented control measures.

**Highest mark = 22.5**

**Lowest mark = 16**

**Average mark = 20.60**

**Q2 Total marks = 25**

**Compulsory question**

***WH&S Regulation 2011***

Part 4.3 “Confined spaces”

**Recommendations:**

Candidates needed to have an appreciation for the overall management of confined spaces, as well as the responsibilities of the duty holder (PCBU) to

ensure they were compliant with the legislative requirements.

**Highest mark = 23**

**Lowest mark = 13**

**Average mark = 17.80**

**Q3 Total marks = 25**

**Compulsory question**

***Coal Mine Health & Safety Regulations 2006:***

**“Isolation arrangements”**

**Recommendation:**

Energy isolation is a major hazard management control. Candidates needed to be conversant with their site’s “Isolation Management plan”, the different methods of isolation, together with the various energy sources requiring isolation.

**Highest mark = 19.5**

**Lowest mark = 10**

**Average mark = 15.90**

**Part B: Compulsory “closed book format”**

**Q4 Total marks = 25**

**Multiple choice:**

This question was designed to test the candidates’ general knowledge of topics and subjects within the mining industry.

**Recommendations:**

Part of the candidates’ preparation should be to review MGDs, guidelines and relevant standards commonly used by the mining industry to help develop their knowledge.

**Highest mark = 20**

**Lowest mark = 15**

**Average mark = 17.0**

**Q5 Total marks = 25**

This question was designed to see how candidates would manage major works around the replacement of an undercarriage of a large face shovel. Candidates were asked questions about preparation of works to be carried out, hazard identification, risk control measures, specialised equipment/personnel together with the legislative obligations in the management of such works.

**Recommendations:**

Candidates needed to develop a sound understanding of project management, hazard identification, risk mitigation as well as contractor management when undertaking such large complex tasks.

**Highest mark = 21**

**Lowest mark = 12**

**Average mark = 16.0**

**Q6 Total marks = 25**

Candidates were questioned about the safe management of the reclaim conveyor associated with wash coal stock piles. This included the safety features expected to be found on a stockpile push dozer, together with reference material a candidate would consult.

**Recommendations:**

Wash coal stockpiles, reclaim tunnel conveyors and the use of push dozers are a common practice at surface operations.

Candidates needed to be aware of the major hazards, risk mitigation processes in the safe management of such assets including the reference to codes of practice and MDGs.

**Highest mark = 20****Lowest mark = 13****Average mark = 17.6****Q7 Total marks = 25**

Candidates were given an incident scenario in which a major structural failure had occurred at the head end of a stockpile discharge conveyor disrupting coal flow from the operation, with the structure being 25 years old.

**Recommendation:**

Candidates needed to develop a systematic approach to incident management, together with the development of a recovery plan. This would also include the revision of the structure's management plan to accommodate aging structures in an attempt to prevent future structural failures.

**Highest mark = 14****Lowest mark = 8.5****Average mark = 12.5****Q8 Total marks = 25**

This question required candidates to manage a major shut down at a CHPP. This included the management of 100 contractors undertaking various works around the plant. Candidates were asked to identify major hazards associated with the work list provided and plan how to manage the identified hazards. Also included was a notifiable incident that required scene sterilisation.

**Recommendation:**

The management of contractors associated with major works onsite is not new. Candidates needed to develop systems for the management of contractors to ensure safe systems of work are being followed and to ensure adequate supervision is provided for the duration of the works. The incident added some complexity to the question that required the candidates to revise the work plan to accommodate the sterilised work area.

**Highest mark = 13.5****Lowest mark = 4****Average mark = 9.3**

## ORAL EXAMINATION

<b>Dates: surface operations</b>	22 October 2013: Thornton
<b>Number of candidates eligible:</b>	7
<b>Number of candidates examined:</b>	6
<b>Candidates deemed as competent</b>	4
<b>Dates: underground operations:</b>	23 to 25 October 2013 : Thornton & Wollongong
<b>Number of candidates eligible:</b>	23
<b>Number of candidates examined:</b>	14
<b>Candidates deemed as competent</b>	7
<b>Oral examination: areas of discussion</b>	
Underground oral topics	
<ul style="list-style-type: none"><li>· Written examination review for first-time candidates</li><li>· Roles of a plant safety file</li><li>· MU 13-01 <i>Non-reporting of failed ExDes components</i></li><li>· SB 08-05 <i>In-service failures of explosion-protected diesel engine systems</i></li><li>· Duties of the MME, for first-time candidates</li><li>· High risk activity welding in a hazardous zone</li><li>· Roles of exemptions</li><li>· Management of aged steel structures</li><li>· Incident management of a failed structure</li><li>· Incident investigation “release of high pressure fluid”</li></ul>	
Surface oral topics	
<ul style="list-style-type: none"><li>· Written examination review, for first-time candidates</li><li>· Role of plant safety files</li><li>· Duties of the MME, for first-time candidates</li><li>· Selection of service providers</li><li>· Management of aged steel structures</li><li>· Incident management of a failed structure</li><li>· Roles of exemptions</li><li>· Incident investigation “release of high pressure fluid”</li></ul>	