

EXAMINER REPORT

Undermanager of underground coal mines

September to November 2018

Written examination

UB1 – Mining Legislation

Summary of results and general comments

Exam Date: 27 September 2018

Number of Candidates: 34

Number who passed: 12

Highest mark: 85%

Average mark: 50.5%

Lowest mark: 29%

Question 1 (total of 20 marks)

Highest mark 20

Average mark: 8.12

Lowest mark: 0

Examiner comments — this question was generally poorly answered by candidates with a limited understanding of the legal obligations relating to provisions of operating Diesel equipment underground.

Question 2 (total 20 marks)

Highest mark: 18

Average mark: 9.74

Lowest mark: 4

Examiner comments — this question was poorly answered by many candidates, with limited knowledge being demonstrated of the requirements which must be met. A number of candidates demonstrated a strong knowledge which was reflected in the higher marks.

Question 3 (total 20 marks)

Highest mark: 20

Average mark: 10.21

Lowest mark: 4

Examiner comments — this question was generally poorly answered by candidates with a limited understanding of the legal obligations relating to the provision of information, training and instruction to workers. Only one candidate was able to demonstrate a solid understanding of these requirements.

Question 4 (total 20 marks)

Highest mark: 18

Average mark: 10.29

Lowest mark: 3

Examiners comments – this question required the candidate to demonstrate an understanding of the notification requirements and in general was poorly answered with limited detail.

A number of candidates scored good marks by providing a comprehensive answer outlining the requirements of Section 15 of the WHS (Mines & Petroleum) Act 2013.

Question 5 (total 20 marks)

Highest mark: 20

Average mark: 12.15

Lowest mark: 5

Examiners comments – in general, this question in relation to the legislated obligations for review of control measures was poorly answered with very limited detail or overly general without specific reference to the legislated requirements.

However, some candidates scored good marks by providing comprehensive responses outlining the requirements of clause 10 and/or clause 9 of the WHS (Mines and Petroleum) Regulations 2014.

UB2 – Mine Ventilation

Summary of results and general comments

Exam Date: 27 September 2018

Number of Candidates: 36

Number who passed: 21

Highest mark: 71.5%

Average mark: 58%

Lowest mark: 29.5%

Question 1 (total 100 marks)

Highest mark: 77

Average mark: 61.28

Lowest mark: 42

Examiners comments –

- A number of candidates in Q1A were unable to provide appropriate production rates for Bord and Pillar units, instead relying on longwall development rate assumptions. These inappropriate production rates then have an adverse effect on their answers for Q1E gas calculations and thus flow into Q1C panel quantities and Q1F total air quantities for fan calculations
- Question 2A clearly requests the candidate to identify hazards and ventilation requirements relative to the information supplied in Question 1. Many candidates provided a very generic schedule of hazards without providing an explanation of how the hazard and subsequent controls specifically impacts on the mine design and arrangements provided in Question 1.
- Question 1B directs the candidate to ventilate the mine plan with consideration of ventilation limitations specific to the provided mine plan that were not always recognised. For example, despite the reference to a recent spontaneous combustion incident at the Jacobs Creek Mine.
- A number of candidates failed to optimise the mine layout by allocating the 500 district to return and the 300 district to intake. This ventilation design would reduce resistance whilst also reducing leakage. Both outcomes are advantageous in designing ventilation systems to manage the risk of spontaneous combustion and deliver an efficient ventilation circuit. An undermanager needs to understand these principles.

- A number of candidates continued to rely heavily on 'rules of thumb' or use assumptions that are not explained or justified. It is important that each candidate should briefly explain why their assumptions are appropriate for the ventilation question. Providing an explanation for each assumption allows the candidate to demonstrate their knowledge of ventilation principles and concepts.
- Unfortunately, many candidates provided limited information in their answers making it difficult to determine the level of knowledge. This is reflected in some candidate's marks.
- The candidates who obtained good marks in the ventilation paper provided answers from the perspective of an undermanager, identified potential hazards associated with the ventilation arrangements and provide specific measures to control the risks from those hazards. Answers need to reflect the hazards, risks and control measures specific to the mine plan.
- The current format of the ventilation paper Question 1 is consistent with previous papers. Candidates are required to provide an explanation of their understanding of ventilation principles in relation to the data and other details provided in the exam either written into the question or through observation of the mine plan.
- A number of candidates did not provide gas calculations or were unable to implement the appropriate methodology to calculate gas quantities in Q1E. This flows into their answers for Q1C Panel quantities and Q1F, total air quantities for fan calculations

Question 2 (total 100 marks)

Highest mark: 70

Average mark: 54.72

Lowest mark: 17

Examiners comments –

- Fewer candidates achieved good results from answering Question 2.
- Question 2A clearly requests the candidate to identify hazards and ventilation requirements relative to the information supplied in Question 1. Many candidates provided a very generic schedule of hazards without providing an explanation of how the hazard and subsequent controls specifically impacts on the mine design and arrangements provided in Question one.
- Ventilation limitations specific to the provided mine plan were not always recognised. For example; Despite the reference to a recent Spontaneous Combustion incident at the Jacobs Creek Mine, the mine was not necessarily designed to allow ready control of Spontaneous Combustion or sealing of individual districts. A number of candidates did not identify this as posing a risk or sufficiently described means of controlling this risk.
- Question 2B - although most candidates managed to secure reasonable marks for this question, it is a little disappointing that few candidates demonstrated a comprehensive knowledge of the Spontaneous Combustion TARP contents. Knowledge of TARP's is a core competence for all operational undermanagers.
- Question 2C - the question requires an understanding of spontaneous combustion management principles and concepts. Being able to demonstrate knowledge of general spontaneous combustion principles and how these principles are applied to *this* mine plan, allowed some candidates to receive good marks.
- Question 2D - many candidates had a reasonable working knowledge of monitoring arrangements required.
- The current format of the ventilation paper is consistent with previous papers. Candidates are required to provide an explanation of their understanding of ventilation principles in relation to the data and other details provided in the exam. Candidates are encouraged to approach questions such as these, from the perspective of an undermanager, considering what hazards are presented in the mine plan and details provided, and also what aspects will need to be included in the relevant management systems.

UB3 – Coal Mining Practice

Summary of results and general comments

Exam Date: 28 September 2018

Number of Candidates: 24

Number who passed: 23

Highest mark: 89%

Average mark: 71.4%

Lowest mark: 55%

Question 1 (total 20 marks)

Highest mark: 16

Average mark: 11.82

Lowest mark: 8

Examiners Comments – this question in relation to an injury caused by falling coal was generally answered quite well. Most candidates took immediate action to manage the injury and accident site.

The requirements around notification were less well understood. A number of candidates did not use geotechnical expertise to examine the cause of the failure.

Question 2 (total 20 marks)

Highest mark: 15

Average mark: 12.6

Lowest mark: 10

Examiners comments – this question required the candidate to control a situation where a longwall has experienced a loss of horizon control and was generally answered quite well. Most candidates identified the key risks associated with the recovery and applied appropriate actions to manage these risks. A number of candidates appeared unclear on the type of investigation required for a significant event such as this scenario.

Question 3 (total 20 marks)

Highest mark: 17

Average mark: 12.7

Lowest mark: 10

Examiners comments - this question required the candidate to manage a rib fall onto a continuous miner where the rib protection has been damaged in close proximity to workers. Most candidates answered the first part of the question well, taking immediate action to control the incident and assist the workers involved. A number of candidates appeared to be unclear of the notifications required for this incident. The investigation of the incident was answered poorly by a number of candidates with a number failing to address the serious nature of this incident, with candidates again failing to use geotechnical expertise in the investigation.

Question 4 (total 20 marks)

Highest mark: 16

Average mark: 13.59

Lowest mark: 10

Examiners comments – candidates were asked to manage an incident which happened to be a notifiable incident. Most candidates identified that this incident was notifiable, but a number struggled to adequately communicate the response to this incident with a few failing to adequately describe the need and process of investigation.

Question 5 (total 20 marks)

Highest mark: 20

Average mark: 16.24

Lowest mark: 12

Examiners comments – this question was answered quite well. Generally, the knowledge expressed was good regarding Frictional Ignition hazard and control. Where candidates may have lost marks it was linked to their appreciation of Hierarchy of controls and undermanager's responsibilities

Question 6 (total 20 marks)

Highest mark: 17

Average mark: 14.44

Lowest mark: 13

Examiners comments – this question in relation to an incident of loss of control of a shuttle car was generally answered quite well. Most candidates took immediate action to control the incident and minimise residual risks. Most candidates were aware of the resultant obligations for reporting and the framework for an effective investigation into the incident.

However, some candidates did not address the welfare of the shuttle car operator and most candidates did not consider consultation with the equipment OEM as part of the subsequent investigation.

Question 7 (total 20 marks)

Highest mark: 19

Average mark: 15.6

Lowest mark: 9

Examiners comments – this question was answered well by most candidates demonstrating good knowledge and an understanding of frictional ignition risks, controls and management obligations.

Question 8 (total 20 marks)

Highest mark 20

Average mark: 16

Lowest mark: 10

Examiners comments – only a limited number of candidates attempted this question in relation to coal bursts. The candidates that did attempt the question generally answered it quite well, demonstrating an understanding of the difference between a gas outburst and a coal burst, and a satisfactory level of understanding of the factors contributing to coal burst risk, and the systems available for monitoring and addressing the risk.

Oral examination

Date: 6-7 December 2018

Number of candidates: 19

Number deemed competent: 9

General comments

- A slightly lower than usual success rate for the oral examination.

- The examiners wish to remind candidates to review their weaknesses from written exams and/or previous oral examinations and ensure they are fully across the detail before their oral examination. Examiners wish to see that an undermanager candidate would follow up on any weaknesses rather than just accept them.
- Candidates generally understood the legislated obligations with respect to notification of incidents when scenarios were put to them.
- Candidates are reminded that their Associated Non-Technical Skills are being examined in an oral exam. Beyond technical knowledge, the candidate needs to demonstrate associated skills including; leadership, clear communications, a willingness to engage and consult appropriately, facilitation of team work, situational awareness, and decision making which is clear, considered and risk based.
- When confronted with an emergency situation the candidate must have a good understanding of the emergency response protocols in place, specifically understand the undermanager's role in the emergency management plans, and under an appropriate circumstance the importance of establishing an Incident Management Team.
- Candidates demonstrated a wide range of competency in the management of significant incidents, particularly complex incidents which incorporate several issues at the same time. Candidates are reminded of the need to follow a structured approach in identifying and addressing the hazards, and also the need to take control of the situation.
- Candidates generally demonstrated sound competency in subjects of spontaneous combustion, legislation framework, windblast and the use of explosives in coal mines.
- The need for benchmarking mines across the state has always been an important aspect of a candidate's preparation for their undermanager's exam. A candidate should approach the task of benchmarking from the perspective of identifying the major coal mining hazards and visiting those operations which provide an opportunity to learn how those hazards are managed.
- It is common for candidates to approach scenario questions in an oral exam from the perspective of a deputy or their current role. Each answer provided needs to be from the perspective of an undermanager. By doing this the candidate can more readily demonstrate his/her knowledge, both technical and practical.
- Candidates are reminded that the undermanager's role is an operational role requiring a structured management approach which incorporates practical mining solutions. The importance of this holistic approach to the role cannot be overstated.

More information

- NSW Department of Planning and Environment
- Resources Regulator
- Mining Competence Team
- T: 02 4063 6461
- Email: minesafety.competence@planning.nsw.gov.au

Acknowledgements

Undermanager of underground coal mines examination panel

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CM9 reference: DOC19/260606