

## Mining engineering manager of underground mines other than coal mines certificate of competence

Written examination held 6 July 2018

### Instructions to candidates

Legislation to be assessed:

*Work Health and Safety Act 2011*

Work Health and Safety Regulation 2017

*Work Health and Safety (Mines and Petroleum Sites) Act 2013*

Work Health and Safety (Mines and Petroleum Sites) Regulation 2014

*Explosives Act 2003*

Explosives Regulation 2013

Explosives Australian Standard AS 2187

### Part A – Legislation knowledge

#### QUESTION 1 Associated Non-Technical Skills (ANTS)

You are the manager of a large mine that has a skilled workforce with a low turnover rate, good training systems, good documented procedures and well-maintained fit-for-purpose equipment. However, the mine continues to have incidents where procedures are not followed by workers.

What appropriate actions would you take to ensure that procedures are followed by workers? (10 marks)

#### QUESTION 2 Principal control plans

- The electrical engineering control plan and mechanical engineering control plan are two of the four prescribed principal control plans. Name the other two prescribed principal control plans. (2 marks)
- For an electrical engineering control plan, list four control measures for risks to health and safety. (4 marks)
- For a mechanical engineering control plan, list four control measures for risks to health and safety. (4 marks)

### QUESTION 3 Enforcement notices

Under what circumstances (with reference to the legislation) may an inspector serve:

- a) A notice of concern
- b) An improvement notice
- c) A prohibition notice

For each notice give at least one example of when an inspector may serve such a notice. (10 marks)

### QUESTION 4 Air quality and monitoring

- a) When must an operator of a mine manage risks to health and safety associated with extremes of either or both the temperature and moisture content of air? (2 marks)
- b) What are the 8-hour, time-weighted average atmospheric concentrations of airborne dust that a mine operator must ensure that no person at the mine or petroleum site is exposed to while working at a mine? (2 marks)
- c) When must air monitoring be carried out to determine the airborne concentration of a substance or mixture at the workplace to which an exposure standard applies? (2 marks)
- d) How long do the results of air monitoring carried out under c) above need to be kept? (2 marks)
- e) Who is able to access the results of air monitoring carried out under c) above? (2 marks)

### QUESTION 5 Contractor management

- a) What are the duties of a mine operator with regard to managing contractors' activities who work at their mine? (4 marks)
- b) What must be included in the mine's contractor management plan? (6 marks)

Refer to the relevant legislation and use your own words in your answer.

### QUESTION 6 Mine survey plans

The mine operator of a mine must ensure that a detailed survey plan of an underground mine is prepared for the mine.

- a) Who may prepare and certify the mine survey plan? (2 marks)
- b) What must be included and shown on the mine survey plan if present at the mine? (8 marks)

### QUESTION 7 Operation of underground mobile equipment

- a) In your own words explain what you consider are the most serious hazards that need to be identified and addressed in the operation of mobile equipment in an underground mine. List a minimum of six hazards. (4 marks)

- b) Describe what controls you would consider as mining engineering manager for each of the hazards identified in (a) above. (6 marks)

## Part B – Legislation knowledge and application

### QUESTION 8 Principal mining hazard (PMH)

The risks of inrush and rock inundation in underground mines employing caving and open stoping mining methods are well known and documented.

As the newly appointed mining engineering manager for such an underground mine you have decided that the hazards of inrush and inundation are deemed to be principal mining hazards as defined by legislation.

- a) List and briefly describe the prescribed specific operational control measures for managing health and safety risks relating to underground inrush and inundation. (3 marks)
- b) You wish to review the operation's management plans for inrush and inundation and produce a compliant principal hazard management plan (PHMP). Briefly describe the process that you would follow and refer to any associated legislative requirements regarding such a process. (6 marks)
- c) List, categorise, and describe possible controls that you would consider for implementation in order to safeguard all foreseeable personnel from injury from rockfall/rock inundation/rilling whilst being required to work in the vicinity of a block cave production level draw point. In categorising the controls refer to the hierarchy of controls (clauses 35 & 36 WHSR), ie:
- i. Elimination
  - ii. Substitution
  - iii. Isolation
  - iv. Engineering
  - v. Administrative
  - vi. PPE (6 marks)

### QUESTION 9 Response to serious incident

In this scenario, you are the mining engineering manager at a mine has a friction winder and a skip above cage operating in a 400-metre-deep shaft. There are two cage access points: one on the surface plat, and the other on 4 Level, which is 400 metres below surface. The mine also has a decline entry.

You have just been notified by the surface control room operator that they have received an emergency radio alert of an incident in the shaft involving a cage containing two workers. The winder driver had radioed the alarm to the control room and reported that as the cage was approaching the surface plat, the skip above the cage impacted the extendable surface plat. The winder driver stopped the winder and contacted the two workers in the cage who were shaken but uninjured.

You have since found that the extendable plat has been severely damaged and cannot be retracted to allow the cage to come up to the surface plat location. The skip is clear of and just below the damaged extendable plat. The cage is undamaged and located about 10 metres below the surface plat.

As the mining engineering manager, explain the actions you would take:

- a) immediately after you are first told of the incident. (5 marks)
- b) to ensure the safe rescue to surface of the two persons in the cage. (5 marks)
- c) to ensure that a similar shaft incident does not occur again at the mine. (5 marks)

Refer to the relevant legislation and use your own words in your answer.

## More information

NSW Department of Planning and Environment

Resources Regulator

Mining Competence Team

T: 02 4063 6461

Email: [minesafety.competence@planning.nsw.gov.au](mailto:minesafety.competence@planning.nsw.gov.au)

## Acknowledgments

### Mining engineering manager underground mines other than coal mines examination panel

© State of New South Wales through the NSW Department of Planning and Environment 2019.

This publication is copyright. You may download, display, print and reproduce this material in an unaltered form only (retaining this notice) for your personal use or for non-commercial use within your organisation. To copy, adapt, publish, distribute or commercialise any of this publication you will need to seek permission from the NSW Department of Planning and Environment.

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (May 2019). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the NSW Department of Planning and Environment or the user's independent advisor.

DOC18/811697