NSW Resources
Resources Regulator

July 2024 – March 2025

Mechanical engineering manager of underground coal mines certificate of competence

Examiners' report 2024-2025

Written examination

CME1 – Mechanical engineering applicable to underground coal mines

Summary of results and general comments

Exam date: 31 July 2024

Number of candidates: 8

Number who passed: 4

Highest mark: 68%

Average mark: 58.9%

Lowest mark: 45.2%

Question 1 – Shaft sinking winder

Highest mark: 22

Average mark: 15.4

Lowest mark: 8

Examiners' comments – majority of candidates had a poor understanding of the design configuration, functionality, and operation of stage winders for shaft sinking. This is particularly disappointing as there is a major shaft sinking project utilising multiple stage and kibble winders currently underway at a NSW underground coal mine, which candidates could seek information on and/or seek a site visit.

Question 2 – AS3584.2 Diesel engine systems – explosion protected

Highest mark: 15

Average mark: 14.1

Lowest mark: 12

Examiners' comments – poor knowledge of DES flame joint types. Limited knowledge of shutdown systems. Most candidates got coolant, low water, and oil pressure, but forgot strangler, E stops, fuel shut down systems, etc.

Question 3 – Multiple choice and short answers

Highest mark: 24

Average mark: 20.6

Lowest mark: 14.5

Examiners' comments – general knowledge managed satisfactorily.

Question 4 – Fire suppression

Highest mark: 19

Average mark: 11.5

Lowest mark: 6

Examiners' comments – candidates had a poor understanding of workings and differences of various FSS, with confusion of LOP systems and the use of pyrotube to melt and initiate the automated response.

Question 5 – Conveyor gantry structural integrity

Highest mark: 23

Average mark: 18.3

Lowest mark: 15

Examiners' comments – candidates generally understood issues involved and managed appropriately.

Question 6 – Stockpile dozer

Highest mark: 23

Average mark: 15.4

Lowest mark: 9

Examiners' comments – lack of awareness of controls placed on stockpile dozers to mitigate the hazard of falling into a valve, and whether the operator should be rescued before the dozer was recovered. Often the dozer was recovered before the operator was considered. The lack of practical hands-on knowledge of equipment recovery was evident in the responses.

Question 7 – Hot work

Highest mark: 18

Average mark: 13.6

Lowest mark: 11

Examiners' comments – candidates were not aware of SafeWork recommendations, but had a working knowledge of issues associated with hot work.

Question 8 – Blasting and painting SEP

Highest mark: 22

Average mark: 16.8

Lowest mark: 11

Examiners' comments – generally answered satisfactorily, however, some candidates only identified generic hazard/controls.

Question 9 – Transport Braking Systems (TBS) (Essential)

Highest mark: 19

Average mark: 12.5

Lowest mark: 0

Examiners' comments – most candidates could not answer all essential elements, providing only the minimum to be deemed competent for the element. Generally poor overall knowledge of the requirements of TBS design, and what is considered an effective brake test (deceleration force, distance, vehicle speed, etc).

Question 10 – Short answer scaffolding

Highest mark: 13

Average mark: 9

Lowest mark: 7

Examiners' comments – no candidate was deemed competent. Candidates lacked knowledge and understanding of types of scaffolding, competency requirements for each type (including engineered scaffolds), and key geometry of scaffolds.

CME2 – Legislation and Australian Standards applicable to underground coal mines

Summary of results and general comments

Exam date: 31 July 2024

Number of candidates: 8

Number who passed: 6

Highest mark: 79.6%

Average mark: 67.4%

Lowest mark: 54.8%

Question 1 – Role of mechanical engineer and MECP (Essential)

Highest mark: 23

Average mark: 21.3

Lowest mark: 18

Examiners' comments – all candidates were considered competent for the essential question.

Question 2 – Managing risks to health and safety

Highest mark: 20

Average mark: 15.6

Lowest mark: 6

Examiners' comments – generally understood the requirements to manage risk, but not always clear on the details of the legislated process.

Question 3 – WHS Act – Primary duty of care

Highest mark: 22

Average mark: 17.1

Lowest mark: 13

Examiners' comments – candidates had poor knowledge of how to manage the life cycle of equipment, with some candidates not knowing the basic requirements of WHS Act Section 19.

Question 4 – WHS Regulation – Confined space

Highest mark: 23

Average mark: 19.9

Lowest mark: 14

Examiners' comments – candidates generally performed okay on practical examples in the workplace, however, the relationship to controls were sometimes lacking.

Question 5 – Lifting and cranage SEP

Highest mark: 19

Average mark: 14.4

Lowest mark: 9

Examiners' comments – candidates identified the correct cross section of people for the RA review. However, most candidates struggled with how to review the incident, identify critical elements, or plan and develop specific controls to address absent defences.

Question 6 – Airborne contaminants

Highest mark: 20

Average mark: 13.8

Lowest mark: 7

Examiners' comments – question answered very well or very poorly depending on the candidate's familiarity with SWA workplace exposure standards for airborne contaminants. It was disappointing that candidates rotated persons through hazardous tasks to satisfy exposure, rather than addressing the risk. Candidates were unfamiliar with the latest controls around PAPR, on gun extraction, and distance of standby people from the source of the fume.

Question 7 – Falling objects

Highest mark: 23

Average mark: 18.4

Lowest mark: 15

Examiners' comments – candidates generally performed okay on practical examples in the workplace, however, the relationship to controls were sometimes lacking.

Question 8 – Winders

Highest mark: 23

Average mark: 18.3

Lowest mark: 11

Examiners' comments – candidates generally performed okay on practical examples in the workplace, however, the relationship to controls were sometimes lacking.

Question 9 – Entanglement

Highest mark: 22

Average mark: 14.6

Lowest mark: 10

Examiners' comments – although the key controls were understood there was a lack of knowledge of key geometry requirements of conveyor guards

Question 10 – SB24-02 LHD crowd cylinders

Highest mark: 22

Average mark: 15.4

Lowest mark: 0

Examiners' comments – generally satisfactory, however, some candidates ran out of time to complete the question

Oral examination

Exam date: 16 & 17 October 2024

Number of candidates: 6

Number deemed competent: 0

Topic 1 – Incident management

Examiners' comments: candidates lacked an understanding of energy control, and the effective management of personnel involved in an incident. They required too much prompting to gather information to identify root cause and the controls required to prevent reoccurrence.

Topic 2 – Proximity detection systems

Examiners' comments: candidates lacked understanding of what is required in a risk management process, and what is involved in scoping a risk assessment.

Topic 3 – Mining equipment purchase

Examiners' comments: candidates lacked knowledge of, and experience with, large mining equipment supply contracts. They required too much prompting to identify key hazards of moving large items around site, and frictional ignition issues.

Post oral examination

Exam date: 12 March 2025

Number of candidates: 4

Number deemed competent: 0

Topic 1 – Incident management

Examiners' comments:

Multiple candidates:

- did not check for hazards
- did not suitably isolate all energies before accessing the injured person
- did not manage the health of all persons
- disturbed the incident scene before it was released by the Regulator
- did not gather sufficient information to make sound engineering decisions and identify potential failure modes
- lacked, or did not implement, their structured investigation process
- required too much leading and prompting.

Topic 2 – Welding fumes

Examiners' comments: several candidates lacked specific knowledge of welding fume exposure limits and the health effects. Too much leading and prompting was required to identify suitable controls to eliminate, substitute, or engineer out hazards.

Topic 3 – Equipment failure

Examiners' comments: some candidates lacked knowledge of the topic, required too much prompting, and lacked a structured approach. They did not understand the issues or loading modes involved in the failure, and one candidate placed people at risk from high pressure hot hydraulic oil.

More information

NSW Resources

Resources Regulator

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Acknowledgements

Mechanical engineering manager of underground coal mines certificate of competence examination panel