

April 2024 – November 2024

Deputy of underground coal mines certificate of competence

Examiners' report 2024

Written examination

Coal mining practice and legislation

Summary of results and general comments

Exam date: 10 April 2024

Number of candidates: 120

Number who passed: 83

Highest mark: 82

Lowest mark: 39.5

Question 1 (total of 10 marks)

Highest mark: 10

Average mark: 7.8

Lowest mark: 0

Examiners' comments:

Majority of candidates did not recognise that Cut and Flit panels rely on brattice ventilation, coupled with scrubber fans on the continuous miner to enable both dust and gas make to be managed in an extended plunge. Thus answers referencing auxiliary ventilation, extending tubes to the face, and use of venturi's did not address the question.

Candidates that did not score well failed to mention one or more of the following:

- reduce plunge length whilst grading through the fault
- maintain / clean the scrubber fan
- familiarise the crew with the Frictional Ignition MP or TARP
- recognising that the Frictional Ignition event was immediately notifiable
- numerous answers were not practical (i.e. slowing the cutter drum on the miner)

- numerous candidates appeared to confuse Support Rules and TARPS

Question 2 (total of 10 marks)

Highest mark: 10

Average mark: 5

Lowest mark: 0

Examiners' comments:

Process steps for completing a Q1 test should have addressed the following

- recording the time the core was taken (cut into the core barrel),
- recording the time the core was placed into the gas cannister and sealed
- completing 20 minute test to measure initial gas desorption rate and recording the results underground

Candidates failed to understand the purpose of the Q1 was to aid in determining loss? during the process of taking a core.

Candidates that did not perform well in 2C failed to mention **(the question asked for checks and inspection relative to gas make):**

- ensure suction is available to the hole being drilled
- ensuring ventilation was sufficient to manage any gas make
- undertaking gas readings and ensuring gas is managed
- numerous answers did not relate to what the question had asked

Question 3 (total of 10 marks)

Highest mark: 10

Average mark: 7.9

Lowest mark: 3

Examiners' comments:

Candidates did not recognise the significance of 15m of roadway where primary support was not installed to the Mine's Support rules. A similar event occurred a few years ago (as reported on the Resources Regulator website at the time) that resulted in a roof fall.

Candidates that did not recognise the need

- to assess the risk of personnel working beneath the roof where support was not installed to standard
- did not consider removing personnel off the miner to flit the miner outbye of the affected area
- consider the installation of a telltale or similar in the affected area
- reporting to development department and Geotechnical department in addition to just the Undermanager

Question 4 (total of 10 marks)

Highest mark: 10

Average mark: 7.1

Lowest mark: 1

Examiners' comments:

Ventilation – this question stated the candidate is required to *briefly explain* what the minimum requirements are, and how they should be *verified* in several scenarios.

Candidates who did not score well in this question did one, or several of the following:

- *did not* briefly explain what the minimum requirements are in their responses
- only provided calculations to these questions.
- candidates *did not* provide any response to how this is *verified* to ensure compliance with these minimum legislated requirements.

This question was an opportunity for candidates to demonstrate appropriate knowledge relating to the minimum legislated ventilation requirements in:

- a) a development panel
- b) a longwall panel
- c) roadways with diesels operating in them

Question 5 (total of 10 marks)

Highest mark: 8.5

Average mark: 4.6

Lowest mark: 1.5

Examiners' comments:

Pre-shift – This question stated the candidate is required to *briefly explain* what actions *should be taken* during several steps of a pre-shift inspection at a mine which has shut down over the weekend.

This question was for the candidate to demonstrate their knowledge on pre-shift inspections, and managing the risks associated with powering up the mine without an undermanager overseeing the process. Several significant incidents have occurred in our industry relating to this very scenario, which is why it is critical to conduct the pre-shift inspection process in a staged approach, after consulting with the workgroups assisting, so *all* involved understand *what* they are required to *do* and *when*, and under *specific conditions*.

Candidates who did not score well in this question did one, or several of the following:

- made no reference to a system of work, i.e. power up procedure to review with the workers.
- motherhood statements such as 'testing for gas' does not demonstrate you understand how to manage this hazard relating to powering the mine
- assuming the mine was powered up until the district transformers does not demonstrate you understand what a mine shutdown involves

- assumed the question was a memory test with regards to the mine inspection program requirements
- in relation to how many persons in addition to yourself can be underground under your supervision, the legislation states an undermanager is required for **15 or more persons** underground. Therefore, **14 persons**, in addition to yourself **can be** underground.

Question 6 (total of 10 marks)

Highest mark: 8.5

Average mark: 5.8

Lowest mark: 2.5

Examiners' comments:

Longwall relocation – this question stated the candidate is **the deputy** and is required to **briefly describe** what actions **should be taken** and any relevant **verification processes** during several steps of an incident.

Candidates who did not score well in this question did one, or several, of the following:

- **did not** explain that you as the deputy are required to inspect for the presence of methane for the battery powered tool to enter the hazardous zone (in addition to any permits/sign-out of tools etc)

Other marks were not obtained for the following reasons:

- barring down any other loose material in the area that may pose a risk to workers
- check on the welfare of workers following this incident – often we see candidates ask for witness statements first before checking in the welfare of those involved
- inform other workers in the district of the event
- inspect roof monitoring devices in the area
- inspect surrounding areas for any other signs of deterioration
- source equipment for re-supporting the area when accessible
- commence preliminary risk assessments for how the re-support could occur, i.e. what considerations should be made

With regards to the next steps of reporting that is required from this incident, many candidates responded with 'the regulator'. Is this the responsibility of the deputy? A more **appropriate** response would be to conduct the incident investigation, record all relevant matters on your statutory report, notify the oncoming deputy of the incident and the status of the incident area.

Question 7 (total of 10 marks)

Highest mark: 8

Average mark: 5.6

Lowest mark: 3.5

Examiners' comments:

This question is broken into 3 parts:

1. *initial actions* following the event
2. actions that should be taken *prior to production commencing*, and
3. finally *who* should be notified and *when*.

Candidates who did not score well in this question did one, or several of the following in not identifying:

- the need for the authority to mine to be revoked and a new one re-issued
- the crew to be trained in the new authority to mine
- an incident investigation to occur
- the scene to be released from the regulator (it was stated to ensure authorised to recommence production, however this is not the same thing).

With regards to *who* should be notified and *when* following this incident, many candidates *only responded* with the regulator as soon as reasonably practicable. Is this the responsibility of the deputy? A more *appropriate* response would be the Undermanager and CRO as soon as reasonably practicable, the MEM/tech services department this shift, the oncoming deputy end of shift. Other notifications would be to the regulator immediately and ISHR.

Question 8 (total of 10 marks)

Highest mark: 9

Average mark: 6.4

Lowest mark: 3

Examiners' comments:

Candidates were reasonable in identifying the legality in shot-firing. Candidates could reasonably identify as a deputy the need to check and confirm the contract shot-firer credentials were current and the relevant checking of site skills needed by the contractor were either confirmed by them or the undermanager, and the contractor was introduced to site through the appropriate contractor management processes.

A large portion of candidates were aware that the question was targeting the controlling actions to allow the shot-firing to occur as part of a mine's procedures and allowed the shotfirer to complete their tasks under their responsibilities. Candidates were not deducted marks if they were identifying the steps of shot-firing in their answer.

Candidates could reasonably identify the need to check that a shot-firing design would be needed and that the relevant High Risk Activity authorisation was also current.

When addressing the underground, candidates that were above average could articulate the need to ensure segregation of workers to the shot site through barricading and the distinct use of sentries. In quite a few applications answers, candidates did not have this key control in place.

Once the site was barricaded and established, candidates outlining the hazards from shotfiring were mixed. Candidates who performed well included:

- inspection for other strata hazards at the job site
- familiarization of work area with shot-firer
- inspection for flammable gas, candidates were deducted marks for stating that gas as <0.5% methane. Due to being outside the hazardous zone, the gas concentration is required to be <0.25%.
- consultation with shotfirer that the plan was executable and checked the plan was correctly drilled and placement was adequate prior to firing.
- other controls per sites shot-firing procedures were generally stated such as communications with control, blast matting, stone dusting and isolation of relevant power cables, water & airline services that are or could be affected by the firing exercise.

Most candidates could answer the process for investigation post a misfire including the control of the misfired shot, but a high volume of candidates forgot to ensure the reporting included notification to both the Resources Regulator and the Industry Safety and Health Representative due to being a High Potential Incident.

Question 9 (total of 10 marks)

Highest mark: 10

Average mark: 5.8

Lowest mark: 0

Examiners' comments:

Few candidates were able to clearly articulate their answer in simple form from the viewpoint of a deputy. It was also evident that a large pool of candidates were not even aware of the importance of simple common use electrical nomenclature used in the industry.

A few candidates answered the question as a longwall panel rather than reading the questions as a development panel question.

Most candidates could articulate the importance of locations of cables with respect to vehicle contact risk and demarcation needed to safely work around installations.

The three questions were not asking for intricate knowledge of electrical detail rather the types of electrical infrastructure that a deputy would likely inspect for within a development panel for areas, including the production and panel areas.

It is not seen as unreasonable for deputy candidates to understand the colours used in defining voltage types in use at the mines. Many candidates could not elaborate the transition from High Voltage (HV) infrastructure to Low Voltage (LV) infrastructure and the importance of the need to have HV or other non-approved apparatus outside of the Hazardous Zone (HZ).

Many candidates could not define the colours in general as:

RED – High Voltage >1200 V

BLUE – 415V to 1,200V

ORANGE – up to 415V

Candidates were not marked down by including other types of apparatus such as 1000V motors and also equipment that constitutes Extra-low Voltage (ELV) or electrical safety circuit controls, such as earth leakage and pilot circuit monitoring.

It is recommended that candidates enquire and become familiar in the types of electrical apparatus used as they are required to be known in everyday deputy responsibilities.

Question 10 (total of 10 marks)

Highest mark: 10

Average mark: 6.2

Lowest mark: 1

Examiners' comments:

Candidates attempted to answer the question as a matrix of hazards or just listing the hazards and controls. Marks were impacted from these choices to answer.

Candidates with above average marks were competent in the following areas by clearly:

1. outlining the communications arrangements and risk management expectations needed prior to the jobs commencing, outlining key control expectation to workers.
2. identifying the need for the key hazards as well as the matters required by legislation (inclusive of mandatory inspections required during the shift), not just stating "inspection program".
3. stating the isolation of distinct plant such as Roof Supports in the working area atop the shearer, AFC Conveyor Chain, BSL Chain, Shearer haulage and ranging arms and panline functions via relevant face operating systems). Rather than "isolate the face" which was commonly used.
4. outlining the matters for face side access and strata controls via TARPs or relevant permit processes that exist in industry, rather than stating "implanting the Strata Management Plan".
5. stating the checking and monitoring of relevant procedures and job instruction (such as work orders) along with the checking the status of planned controls are in place.

Oral examination

Exam date: 23 & 24 July 2024

Number of candidates: 92

Number deemed competent: 27

Post oral examination

Exam date: 13 & 14 November 2024

Number of candidates: 59

Number deemed competent: 22

Examiners' comments:

Oral examination feedback is broken down below into the categories of areas of improvement and areas of strength.

Areas of strength:

The candidates responses that proved successful in the examination could display:

- Clear understanding of the application of the legislation with respect to their own duties as a deputy.
- Strong decision making skill in the areas of emergency, with clear understanding of the consequence of decisions made in the scenario and the mitigation of risk during the decisions making.
- Clear understanding of the role of a deputy in scenarios for ventilation questions, including:
 - not only the techniques being applied but the reason for their application.
 - the standard monitoring of the environment for the application being applied. This was evident in tailgate brattice scenarios.
 - understanding of the pressure differential when dealing with gas.
 - concentration on managing the greater hazard with respect to concentrations of methane i.e. quick to determine the most efficient and safe practice of degassing.
 - In the moment thinking for alternate solutions to problems, rather than remembering a practice oral question they had with a mentor.
- Treated the responses with a system of thinking that could be replicated and applied across most questions. For example, treating a scenario with the assessment of risk rather quickly responding with a quick and jumbled response.
- A better level of understanding of the coal dust explosion requirements in legislation and the exact make up of their barriers used at their individual sites.

Areas of improvement:

Examiners general feedback from the 2024 year remains consistent with previous years, so far as the candidates are under prepared to arrive in the mindset of the role as a deputy.

Consistent commentary was issued on the basis that candidates were:

- STILL failing on very basic ventilation principles. In relation to ventilating a heading or series of headings, degassing headings using an auxiliary fan or brattice. Most importantly understanding the legislated requirements of minimum ventilation levels for production in development and longwall panels, along with the underlying principles of why those levels are used.
- poor to average understanding of differential pressure principles.
- arriving in the oral examinations and parroting answers that were not answering the questions. This was reported to be the case in ventilation questions across the examinations.

Advice for future candidates:

Some simple tips for future candidates:

1. Get out of your comfort zone. Treat the exam as this your future and you want to pass to coach others in the future. It is evident that candidates are preparing themselves as “just enough to pass”.
2. Get a process for answering questions. Especially questions that are testing your thought process required to be a deputy. You are a day-to-day supervisor with supervisor duties. This requires you to know the supervisor and monitoring processes you need to apply every day.
3. Work out what you don't know from a principle hazard stand point and plan to have exposure to these things during your training. It is evident in written and oral exams when a candidate has no clear overview or understanding of deputy duties with these legislated requirements.
4. Prepare better. Candidates who did not reach the competency were impacted by a lack of preparation.
5. Consult the briefing papers and sessions to gain assistance.

More information

NSW Resources

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Acknowledgements

Deputy of underground coal mines certificate of competence examination panel.

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